

DESIGN DISCOURSE

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The aim of this essay is the summary of a design process. The process had distinct stages that includes selection of project and the aspects that informed the decision, context studies, the theoretical approach, precedent studies, concept development and final design concept. This process spanned a period of roughly eight months. The development was not linear and revision and refinement was continuously necessary to reach the final product.

Different aspects informed the decision to make the Cradle Of Humankind World Heritage Site (COH WHS), and the design of a new Interpretation Centre facility as part of the development, the focus of this dissertation process.

The most important aspects include the unique character of the COH WHS development as well as the South African identity and heritage value. The complete and detailed research study done by DACEL, which was used as framework during the process development, enabled the design of a single building as part of a broad and far reaching development scheme.

For the sake of unity and the ability of this essay to be read as a stand alone document, some of the facts and information contained in the briefing document will be repeated. Reading of the complete document will, however, give a more informed view of this broad context and study area.

DESCRIPTION

The Cradle of Humankind World Heritage Site (COH WHS) covers an area of over 47 000 hectares in the north-western corner of Gauteng, straddling the boundary between Gauteng and North West Provinces. The area is of outstanding universal value as it contains a complex of palaeontological and palaeo-anthropological sites which have yielded some of the most valuable evidence worldwide of the origins of modern humans.

Embedded in the rocks found in the numerous dolomitic caves in the area are the fossilised remains of hominids, their lithicultural remains and fossils of other plants, animals and pollen. These give a complete picture of the hominids and their surroundings dating back over 3.3 million years. The richness and variety of these deposits, their excellent preservation in the caves, and the age of the specimens, make this area of world significance. Coupled with this, the area contains archaeological sites dating to the Early Stone Age, the Middle Stone Age, Late Stone Age, the Early and Late Iron Age, and recent history such as Anglo-Boer War relics. It also has significant ecological value containing many plant communities some of which are rare, with associated diverse animal communities. The area is largely unspoilt and scenically attractive, making it an important potential tourism destination. It is also close to the major urban areas of Pretoria and Johannesburg, international and local airports, and the freeway system. The area already boasts a number of private nature reserves and game farms, trout farms, the oldest Gold Mine in the Witwatersrand, arts and crafts outlets, small hotels, lodges, conference centres and restaurants. The site extends across over 30 farms, many of which have been extensively subdivided, and many of which are in private hands. Therefore plans for its future management must be drawn up in close consultation with all interested and affected parties including the landowners and people living and working in the area.

SIGNIFICANCE

The global significance of the COH WHS is given in the "Application for inclusion on World Heritage List" where it is stated that: The Sterkfontein Valley landscape comprises a number of fossil-bearing cave deposits which are considered to be of outstanding value, because they encapsulate a superbly preserved record of the fauna, including an invaluable record of the stages in the emergence and evolution of humanity, over the past 3,5 million years.

This makes it one of the most important sites for human evolutionary studies and research. It was the Sterkfontein fossil specimens that provided the proof that *Australopithecus* could be classified as a member of the Homidae (the family of humans) and that established Africa as the cradle of humankind. These cave deposits provide a unique testimony of the presence, the structure, functioning and behaviour of *Australopithecus africanus* which shows many ape-like features and several human-like traits.

Fossils of a robust australopithecine known as *Australopithecus robustus* or *Paranthropus robustus* have also been recovered, for example from Kromdraai and Swartkrans. There are three scientific viewpoints as to what these fossils may represent. Some scientists hold that *A. africanus* was the ancestor of early *Homo*, but not of the robust apemen, alternatively it was the ancestor of the robust apemen but not of *Homo*, or that *A. africanus* represents the last common ancestor of both early *Homo* and the robust australopithecines. Also, fossils of the genus *Homo* from about 2.0 million years onwards have come from Sterkfontein and are associated with early stages in the stone tool cultures of Africa.

Thus it was these fossil discoveries in the Sterkfontein Valley that resulted in an understanding of the time, place and mode of evolution of the human family. Also, given the number of fossil specimens, it has made it possible for palaeo-anthropologists to study populations of early hominids in terms of their demography, variability, growth and development, functioning, behaviour and ecology. The Sterkfontein Valley cave sites are also valuable for the study of extinctions of communities of animals and the conditions under which this ancient fauna either adapted or became extinct.

In addition to its global, scientific and research significance, the COH WHS is also significant in a number of other critically important aspects.

Given the relative degree of land still in a natural state which has not been significantly transformed by the actions of people, the COH WHS has important ecological significance especially for the conservation of biological diversity and for ensuring that the spectrum of current ecosystems continues to be sustained into the future. The site is considered to be important for the conservation of Bankenveld grassland, an example of the natural Highveld landscape, and various rare and threatened species of plants and animals.

It is these natural, aesthetic, fossil and archaeological resources that give the area its important socio-economic significance. There is little doubt that the COH WHS is a key tourist destination for local, national, and international tourist markets. Its tourism significance is not only relevant to Gauteng but to the whole of South Africa and therefore needs to be developed further in order for its full potential to be realised. The COH WHS is considered in the light of its tourism development potential to be an important and significant area for investment. In view of this development potential, the site is significant in terms of contributing to South Africa's economic growth and development plan, and in a local sense to job creation, skills development, and the establishment of SMMEs and new markets for local products. The potential is therefore for possible substantial and sustainable economic development that would significantly contribute locally, regionally and nationally. The resources of the COH WHS are also of value and significance if they are used for education and interpretation and to create learning opportunities for students and visitors to the site. The potential for creating awareness of the origins of humankind amongst people visiting the COH WHS is possibly unparalleled anywhere else. This is because of its richness in fossils and other resources, its easy access, and proximity to the greater Johannesburg metro area with its international airport that is the country's largest port of entry for foreign visitors.

Theoretical Approach

The aim of this dissertation is not a study of the evolution of humankind, but the development of an architectural symbol system that can be applied as a framework tool to emphasise the importance of the Cradle of Humankind World Heritage Site.

The principles that guided the development of this framework tool were informed by the theoretical works, *Intentions In Architecture* and *Genius Loci - Towards a Phenomenology In Architecture* By Christian Norberg-Schultz.

The development and origins of a suitable symbol system necessitates the study of the context in more depth. The site derives its importance from its inherent natural properties that facilitated the process of human evolution within its borders. The process of evolution presupposes a dynamic interaction between the natural environment and the Hominid development. The study of this dynamic interaction demanded that a distinction be made between the Hominid and the ecosystem in which the Hominid had its origins.

The interaction process brings us to the human processes critical to survival and primary to the process of evolution, perception and socialization. Perception gives an organism knowledge and insight of his immediate environment, on the basis of this knowledge, choices are made that influence future circumstances of the particular individual. The knowledge an individual obtains over a period of time forms the basis of his/her frame of reference. Study revealed that a multitude of factors influence perception. It is a fundamental misunderstanding that a similar world is given a priori to all. Perception is based on the individual's history and frame of reference. This frame of reference is in turn based on the society in which he is a participating member. Interaction between members of a society gives rise to a collective creation of a symbol-system. The creation of a symbol-system is thus crucial for a successful interaction between community members.

The perception of space is a gradual construction and is dependant on education of the individual within a society. A symbol-system can thus be described as an interpretation medium between individuals. A symbol-system parallels complexity in the society context and is developed according to interpretation need. Socialization can be seen as the process of adjustment of an organism to its environment. One of the products of the socialization process is the development of common signs and symbols that makes communication possible. Communication can be seen as necessary to integrate the individual in the common world and give him a sense of security.

It can be seen that order can be given to our environment by assigning symbols to it.

The COH WHS can be considered as a stage that made the above activities possible during the process of evolution. According to Norberg-Schultz, the natural landscape can be divided into Romantic, Cosmic, and Classic archetypal categories, each with its own characteristics. The COH WHS can according to these categories be described as having Classic characteristics. The Classic landscape can be described as a meaningful order of distinct, individual places with a "human" dimension.

The "Classic" landscape was first discovered in Greece and played a large role in the later Roman environment. The character of the classic landscape is neither monotonous nor multifarious, but we find a composition of distinct elements. Valleys and ridges are clearly defined and can be described as creating individual, defined spaces in the environment. In the classic landscape neither the ground surface nor sky dominates and a human scale is perceived where all is in equilibrium and in order. In this landscape human fellowship is possible and every part conserves its identity within the totality. The individual is neither absorbed by an abstract system nor has to find his private hiding space.

This then, can be described as the most suitable environment for the promotion of the process of evolution. In the COH WHS context, man could see himself as equal partner to nature and as nature complementing his own being. This stable relationship helped to release human vitality and it is not difficult to understand why the process of human evolution had its roots in this classic landscape.

To arrive at a suitable architectural framework that can be utilized as a interpretational tool, a symbol -system needs to be developed. For the framework to be suitable, it must be able to present a coherent, holistic image of the site and the role it played in the process of evolution. This informed the choice to model the symbol-system on the natural landscape. The natural environment will thus be used to inform a metaphoric language based on mass -, space -, and surface - elements. These elements will be further interpreted in terms of form, texture, order, character, light and time. This nature based symbol -system will ensure an accessible, multi -functional and adaptable architectural framework. A suitable framework will also aid the generation of identification and orientation. "The existential purpose of building (architecture) is therefore to make a site become a place that is to uncover the meanings potentially present in the given environment." Norberg-Schultz further describes how man can create an existential foothold through the acts of visualisation, complementation and symbolization.

The ultimate goal therefore, is the creation of an architectural product that can, by its mere identity, aid in the interpretation of the importance of the Cradle of Humankind World Heritage Site. What clues then, can we find in the physical context of the proposed Mohale's Gate site? How can this be used to emphasize the meaning of the COH? A study of the topography of the site area reveals a natural gateway or entrance to the COH WHS. This relates to the need to create a centre that forms a introductory landmark in the natural landscape. The topography of the Mohale's Gate site reveals a dynamic character where a certain level of instability exists.

How can this relate to evolution?

We know that everything in nature tends towards a state of equilibrium. A state of instability can be compared to the process of evolution in that it remains in a state of change or flux. Through the act of building, man reveals his understanding of nature. By creating a landmark in the landscape, a higher level of worth can be associated to the process of evolution in this particular landscape.

To whom must this meaning be revealed? Who will benefit from an increase in meaning in this concept?

Ultimately all of humankind, because the process of evolution is something all humans can relate to. The manner in which the meaning and importance of the COH can be revealed to the users must form the basis of this investigation. This will generate the most appropriate solution. The natural context and its characteristics must form the basis of the design concept.

How will this context be presented to the users?

This experience can be equated to the process of evolution where humanoids had a close relationship with nature. It was experienced through all the senses. All levels of perception were utilized in the interpretation of the environment, this also ensured survival. The interaction between the individual and his perception of the physical environment is thus the basis that informs the design concept. Contrast creates voids to be filled by individual interpretation. The aim of this project is to construct a framework of architectural systems able to evoke individual interpretation of the context.

Precedents:

The precedents that was studied was chosen on merit of belonging to the same building typology and on subjectively admired design concepts. All the precedents are of pavilion type buildings that have a strong connection with its site and surrounding topography.

Theory:

Architecture cannot exist without people to experience it. The visitors to this centre are thus the crucial element to make this project successful. The most valuable property of the area, the process of evolution that occurred there, underlines the universality of the expected visitor profile. This profile includes local as well as foreign visitors to the area and to the building. To refer back to the theoretical approach, a suitable symbol-system must be developed. This system must be universal to convey the importance of the area to every visitor.

This need to find a suitable symbol-system necessitated a study into the basic forms of perception, the senses. Through our senses we experience our environment and receive information from it. The following action, to judge these perceptions, is a personal and highly subjective act that is uncontrollable. Because the end product of this process is an architectural composition or building, architectural elements must be composed in such a manner that evokes a unique sensory experience. This perception is not only for perception's sake, but intended to convey the full meaning inherent in the site.

The theoretical concept guidelines mentioned in the theoretical approach were developed and refined parallel to the concept design phase of the building. The design phase was not linear and the boundaries between the different stages and concepts are not clear and defined. For the sake of description, the concepts are divided into five different stages.

The first concept design comprised a layout where the functions are contained in fragmented spaces. These functions are linked with a path that leads visitors through the different parts of the building on a linear route. In this concept, the exhibition areas and supporting functions are compactly arranged. The building is also situated on the more steeply sloping east-facing part of the site.

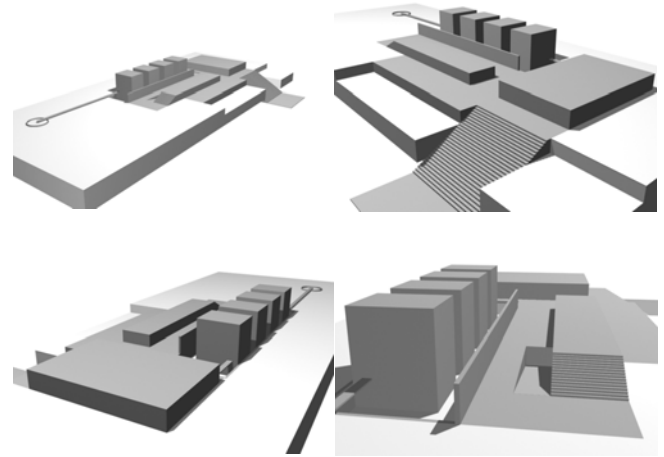


Fig. 1 3D block model of first building concept design

The critique on the first concept design led to the design of the second. In this design, the more private exhibition areas and the supporting public functions are separately grouped but linked with a path that also forms a linear route that takes visitors through the different functions of the building while simultaneously exposing them to the natural environment. An attempt was made to extend the building functions into the landscape and create a unifying whole. This building concept was also situated on the sloping, east-facing part of the site. After critical assessment of the second design, a third concept was developed.

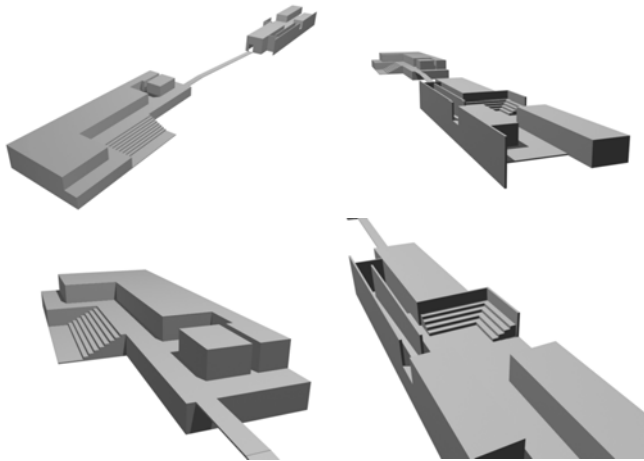


Fig. 2 3D block model of second building concept design

The third concept design was situated on the less-sloping part of the site. The decision to situate the building on this part of the site was influenced by various aspects. These aspects include the enormous environmental impact by building on the steeper slopes, a need for the Interpretation Centre to be located as close as possible to the visitors parking area as well as accessibility to the building site during the construction phase. The third building concept unified the functions contained in the previous concept designs in a more coherent whole. In this design, the building functions are arranged around an outdoor amphitheatre that also functions as an outdoor socializing space that extends the building functions into the site and natural environment. This design also aimed to find a balance between the overall building design, and the functional needs contained in the building. A linear route guides visitors through the building and connects the various private and supporting functions. The critique on this design included a possible feeling of isolation of the building from its surrounding site. The enclosing, inward-facing quality created by the amphitheatre might aggravate this view. The connection of the building with its site forms an important guideline to the success of the design and cannot be compromised.

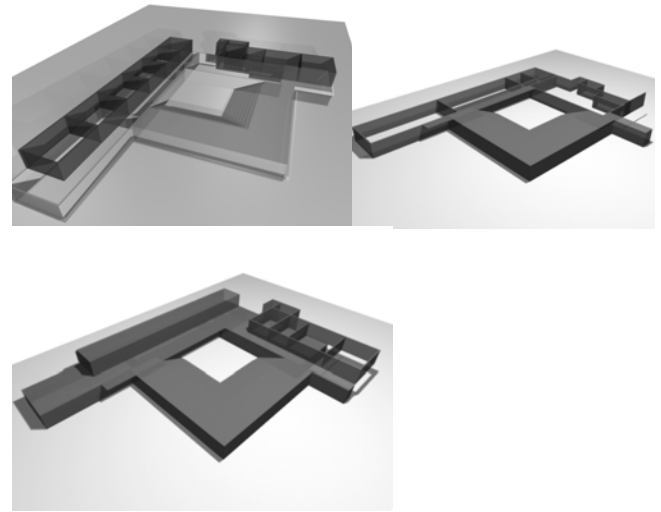


Fig. 3 3D block model of third building concept design

The fourth concept design is a refined continuation from the previous. This design can be described as an unfolding of the previous concept. The functions are fragmented and arranged along a linear route. Visitors arrive at the centre and are taken on a linear tour of discovery through the building. The different functions of the building are divided by enclosed as well as open social spaces that act as buffers. Views onto the landscape and building functions are guided by walls and stairs along the route.

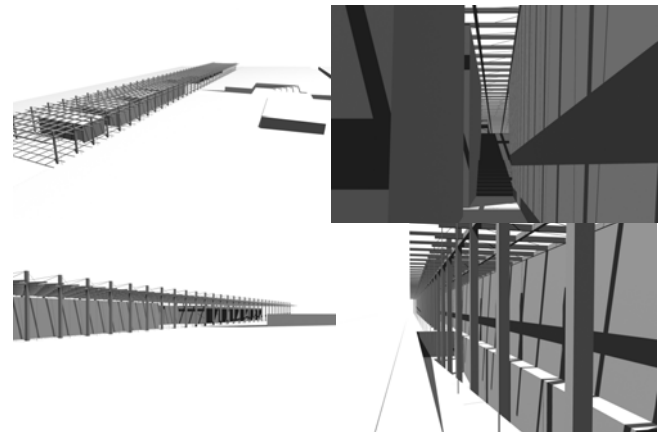


Fig. 4 3D block model of fourth building concept design

The theory that was developed during all the previous concept designs is most clearly manifested in the fifth and final design. In this design, equilibrium was sought between the natural setting and the building mass. With its function as gateway and introduction to the COH WHS, the Interpretation Centre had to have a degree of monumentality without being dominating. The unique quality and value of the site and area demanded an equally distinctive and unique building design.

The aim of the design was not to recreate a fake, cave type scenario, but a unique sensory experience that prepares visitors for the real cave geology experience.

With its name best describing its function, the Interpretation Centre have to present visitors with the full value and identity of the area in an informative and entertaining manner. With its design the building aimed to extend its function as container of information by becoming an interpretation tool in itself. This was done by creating a structure that acts as setting or stage for a sensory experience accessible to all visitors. As mentioned, the design aimed to focus attention on the intrinsic qualities of the site and environment.

Two main elements were interpreted in the final design, time as a factor of evolution and light as factor of architecture. Architectural elements were used in the building to represent light and time in different relationships. These divers' relationships will form part of the experience and can be seen as metaphor of light conditions found in and near cave geology. Elements that represent these relationships is used both internally and externally in the building. External elements include the louvered steel shade structures that create shadow patterns according to the time of day and sun position. In the exhibition and auditorium functions, light levels are intentionally reduced to create the desired ambiance. The contrast in light levels with which visitors are confronted while moving from one function to another further adds to the experience of the building.

The best way to describe the design might be to subdivide it under the six senses of human perception:

Tactility

Materials were chosen that matched the qualities of the site in terms of mass and roughness of texture. Off-shutter concrete was extensively used in floor, wall and roof structures. Materials considered experienced by most people on an everyday basis was avoided in an attempt to create a distinctive tactile opportunity. Visitors are presented with different occasions to come in contact with the structural elements. This includes proximity and narrowing of passages and structural elements in direct opposition to the expected flow of human traffic patterns. The borders where the building structure ends and the natural site material starts, is diffused in an attempt to fuse the tactile experience.

Visual

By design of its layout, the structure guides visitor's views according to observation point. The design aimed to supply visitors with a multitude of viewpoints on the linear route. This views was intended to make observers aware of the position of the location of the building in the natural setting.

Auditory

Part of the experience of visitors to the building will be the sounds of nature. Although man made sounds cannot be eliminated, the building design aimed to provide a setting for sound perception. Noise generating activities such as the exhibition and multimedia theatre is shielded in an attempt to keep noise levels down. The building structure itself acts as a barrier between the road, the parking area and the social areas of the building.

Movement

Together with the concept of time associated with the process of evolution, movement through the building is designed on a linear route and can be seen as metaphor of a timeline. During this process of movement, visitors might acquire insight as they are exposed to the exhibits and the setting. The movement can be seen as a dynamic action that links visitors to the site and the meaning inherent in it.



Fig. 5 Top view of 3D model.

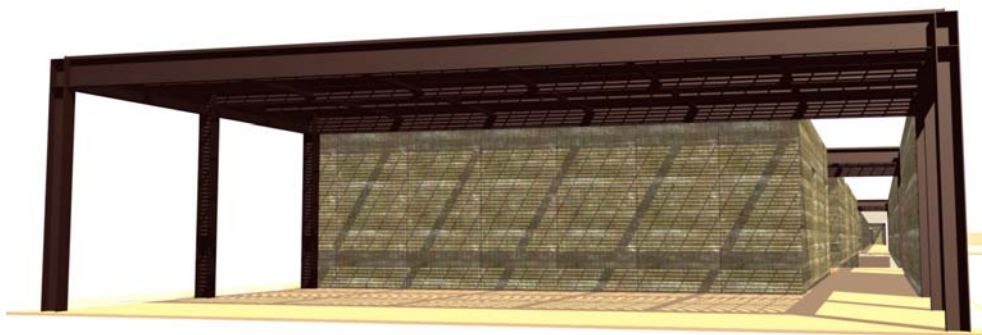


Fig. 6 Approach and entrance to building.

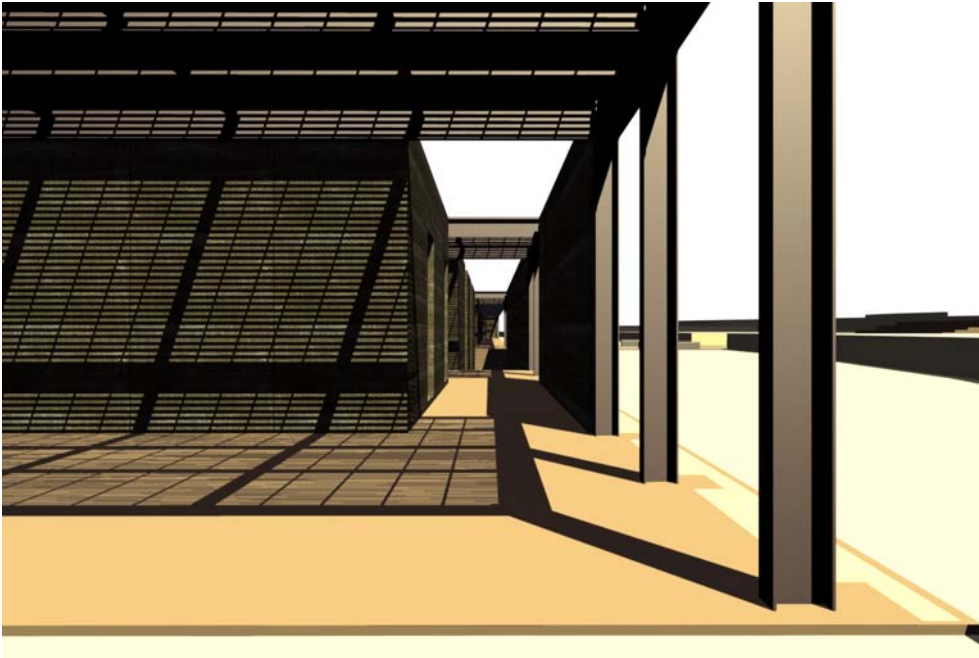


Fig. 7 View towards entrance.

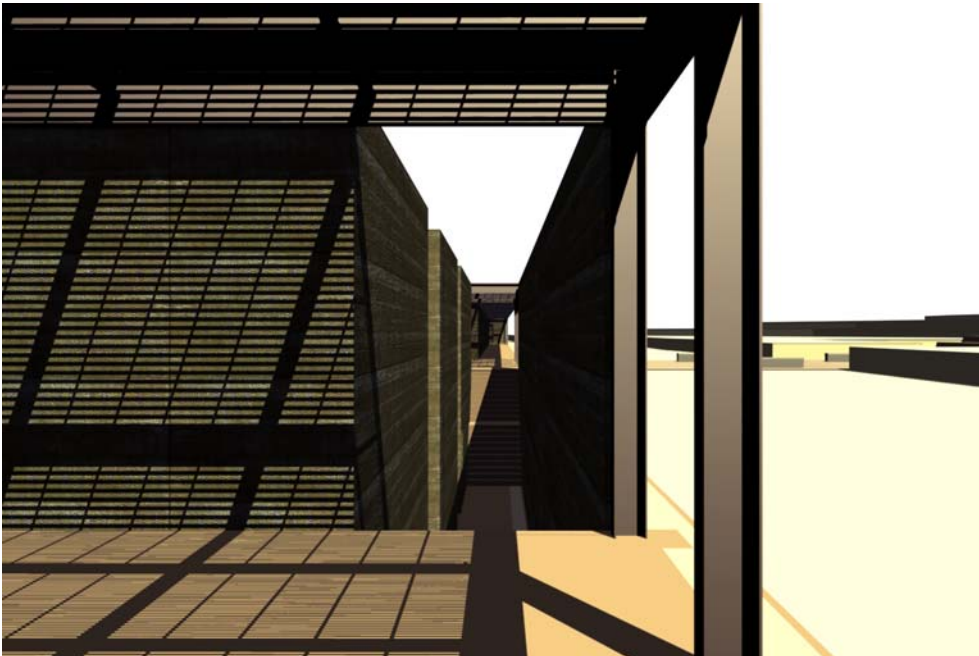


Fig. 8 View of lower level from shading structure.

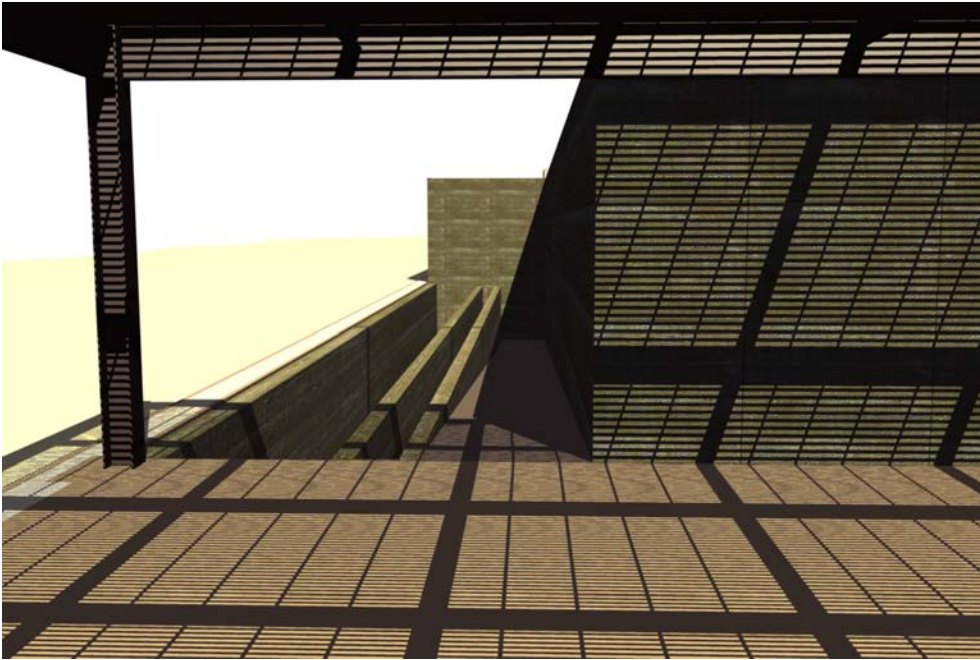


Fig. 9 View of ramp to lower level on eastern side of building.

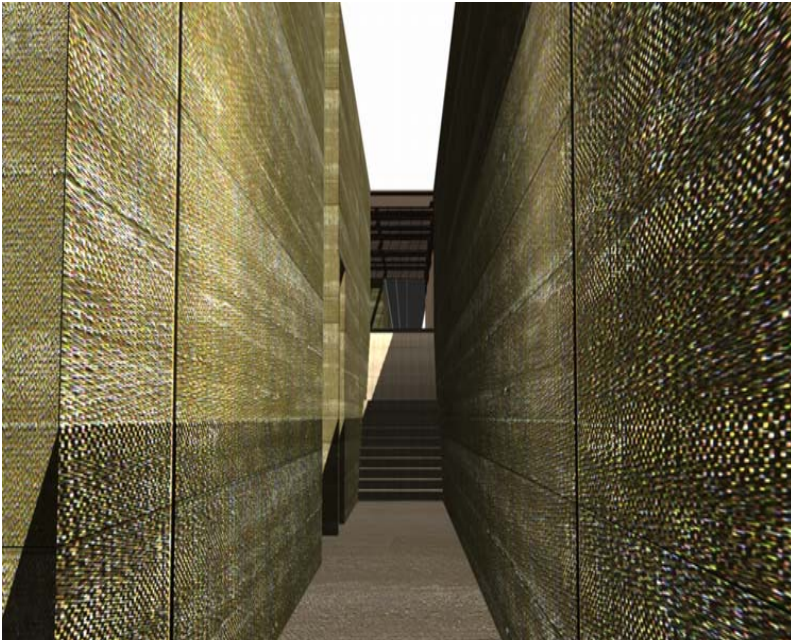


Fig. 10 View of walkway on lower level.



Fig. 11 View of stairs leading to upper level.

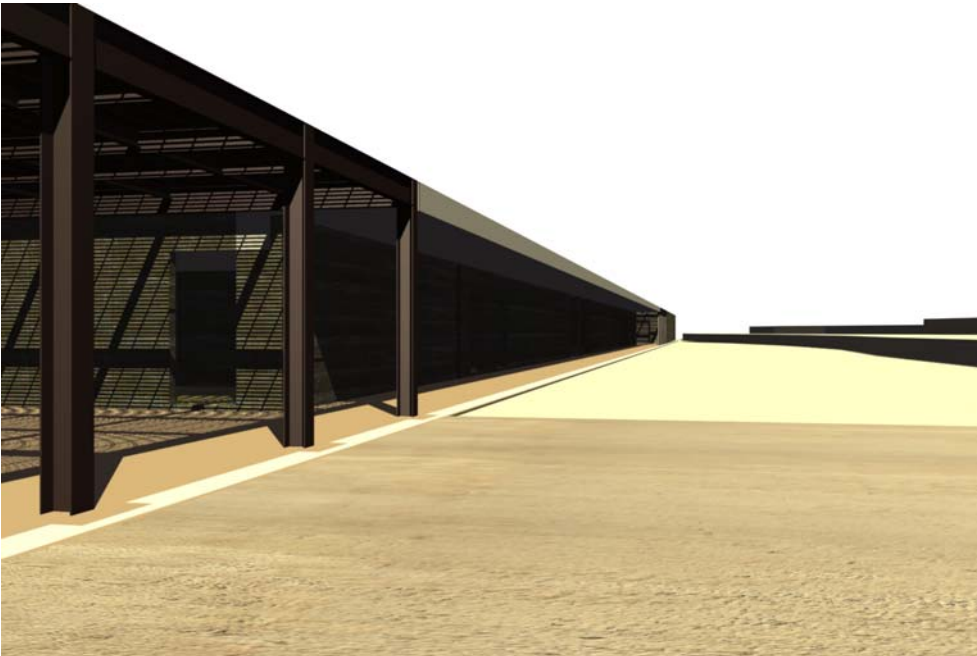


Fig. 12 View of west facing facade of the building..



Fig. 13 View of shade structure between conference and ablution functions.

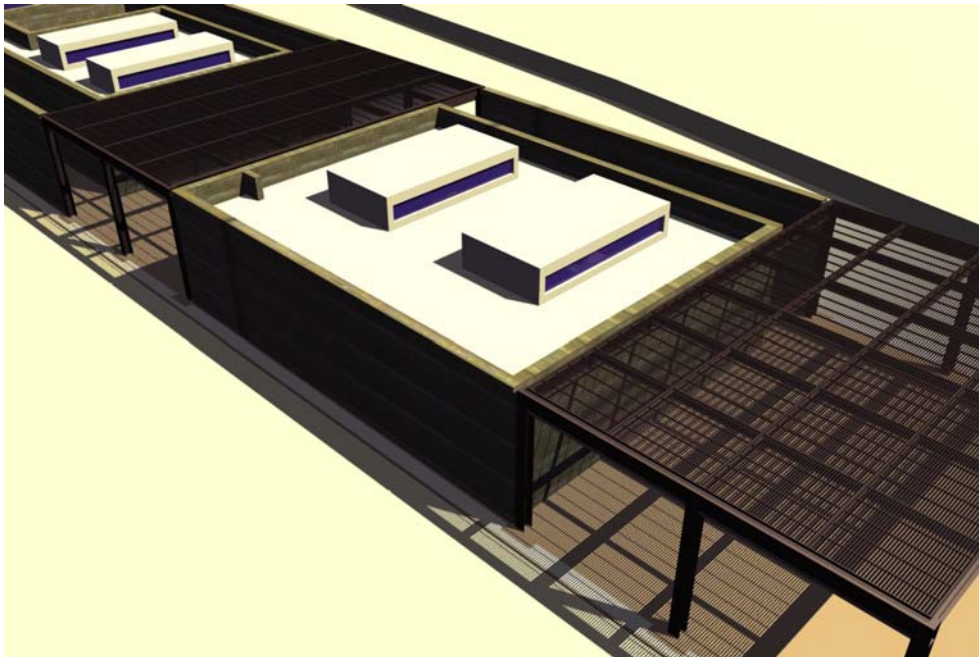


Fig. 14 Top view of reception and retail function.

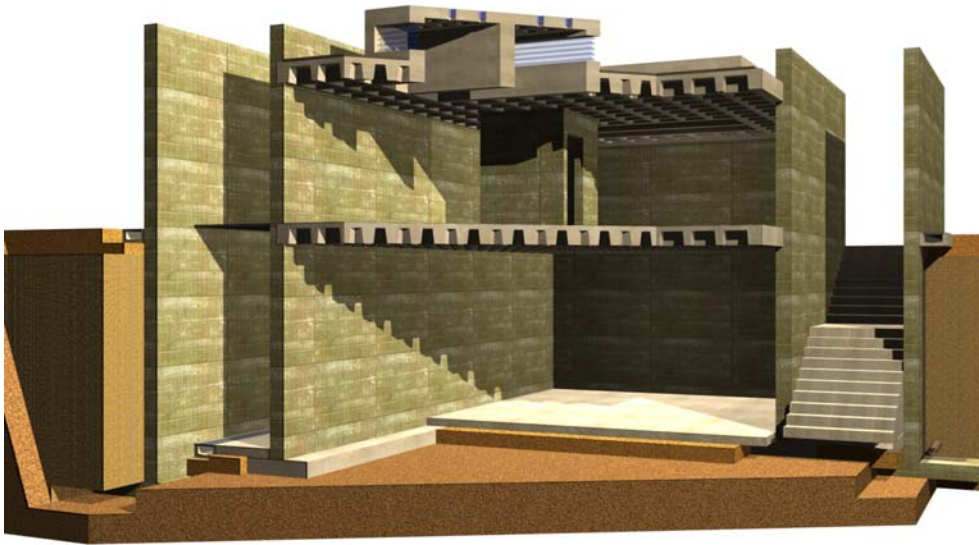


Fig. 15 3D model slice indicating building structure assembly.



Fig. 16 3D detail indicating assembly and material use.

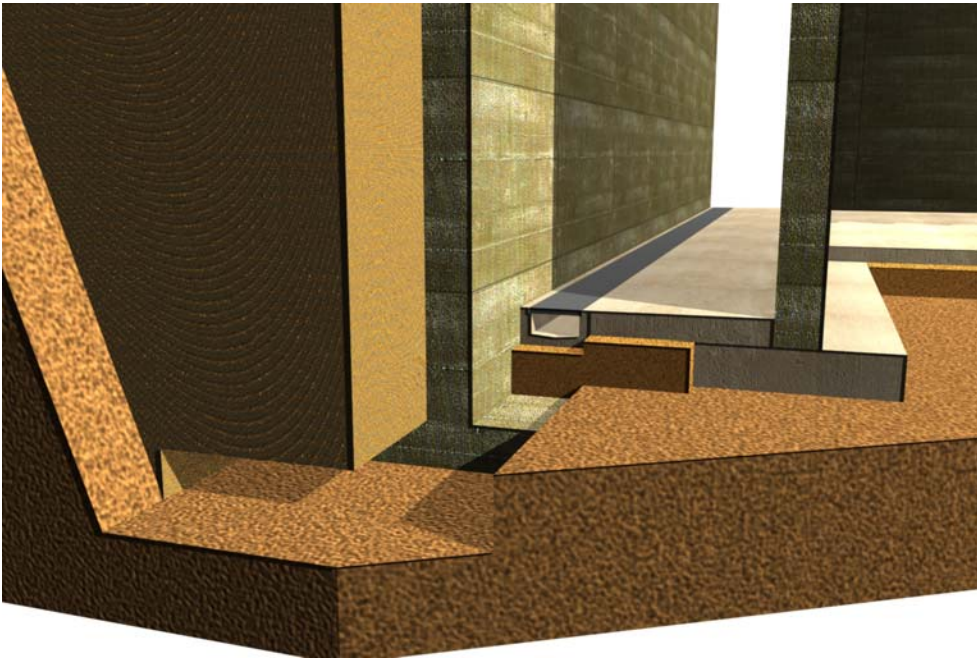


Fig. 17 3D detail of building foundation and drainage channel.



Fig. 18 3D model interior of staff office and conference functions.

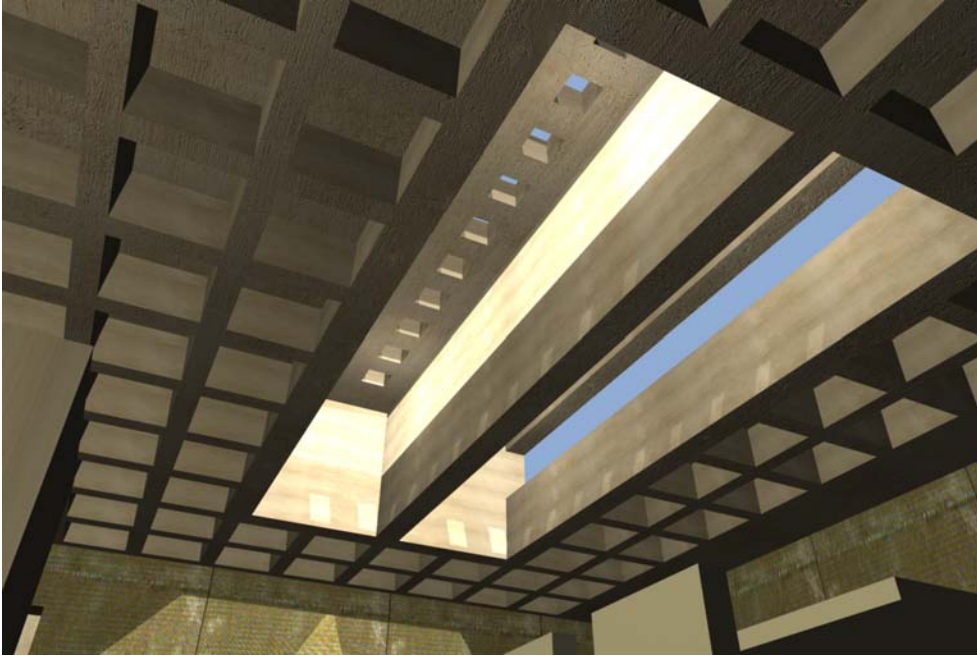


Fig. 19 View of roof monitor structure.

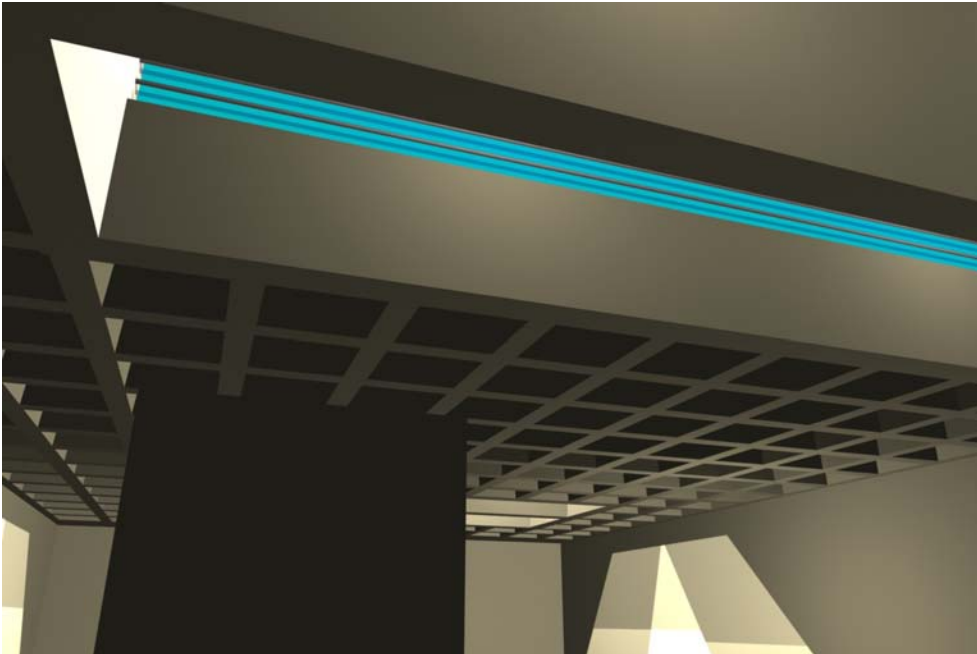


Fig. 20 3D model of roof detail in office function.

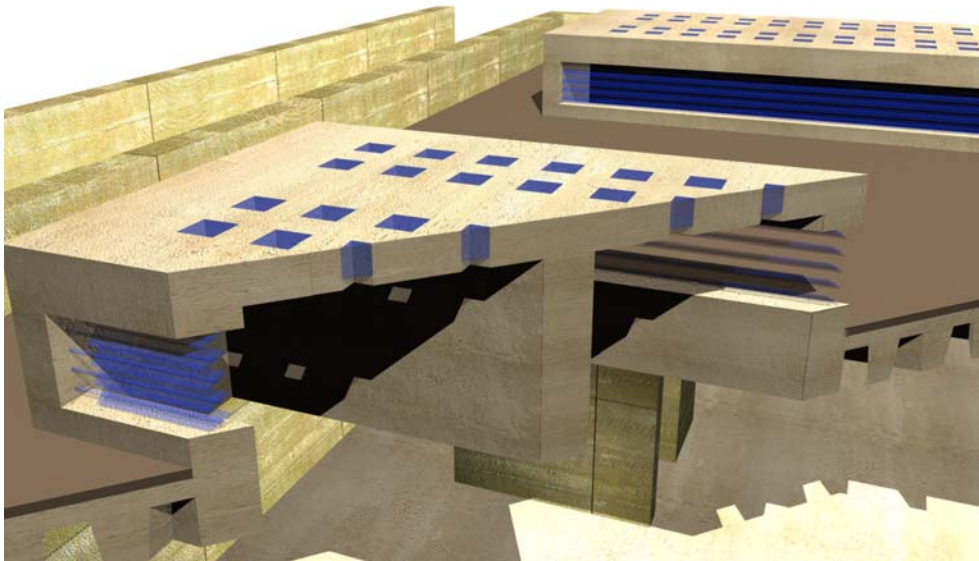


Fig. 21 Section through roof monitor structure.

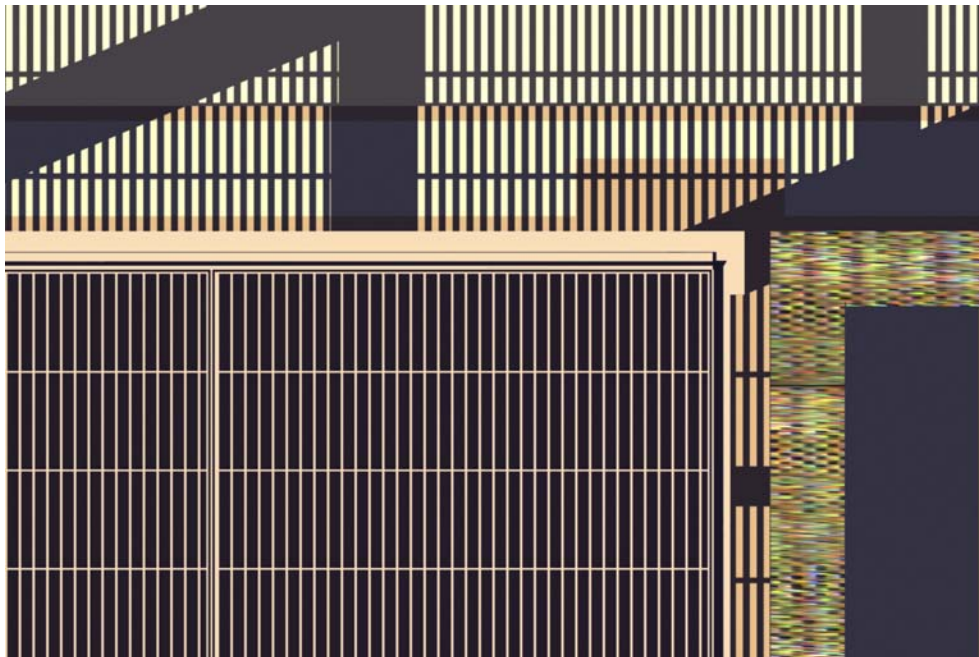


Fig. 22 View of shade structure detail and shading patterns.



Fig. 23 3D interior view of auditorium.



Fig. 24 3D view of auditorium seating.