Nasher Sculpture Center

ABS 643
Lighting Design Final Project

Perry Abrams
11/30/07
Born In October of 1921 To Russian/Jewish Immigrants

Credits Van Gogh’s Piece “Postman Joseph Roulin” as the piece that affected him most growing up.

Began Collection of Art in the 1960’s with first major piece being Jean Arp’s “Torso with buds.”

Served on the President’s Committee of the Arts

Served as a Delegate to the United Nations

Served on the President’s Commission on Urban Housing

Credits His Wife Patsy with the expansion of the collection during their marriage until her death in 1988.

Died in March of this Year due to abrupt illness.
Nasher Collection

Work Of Old Masters Such As:
Giacometti, Rodin and Picasso

Work of More Contemporary Artists Including:
Donald Judd, Andy Warhol and Roy Lichtenstein

Work of Modernist Artists Including:
Henry Moore, Joan Miro, Barbara Hepworth

The Nasher Collection Focuses Mostly on Sculpture however, some Paintings are included as well as commissioned pieces such as portraits by Andy Warhol of the Nasher Family.
Nasher Charitable Works

Large Donations To Duke University for it’s Art Museum.

Collaborations with the Guggenheim Museum

Commissions of Art Pieces for Public Places Including A Piece by Beverly Pepper for The NorthPark Center.
Various works in the Field of Museums including:

Centre Pompidou with Richard Rogers with it’s elegant Structural Expression.

The Zentrum Paul Klee which features an undulating curved roof.

The Menil Collection that utilizes a “roof of leaves.”

Other Museum Projects Include: Whitney Museum of American Art, the Isabella Stewart Gardner Museum, the Los Angeles County Museum of Art, the Art Institute of Chicago and the High Museum of Art expansion in Georgia.
Renzo Piano: Day-Lighting Experience

Works That Use Day-Lighting and Experiments with it’s usage:

The New York Times Building which incorporates a series of ceramic tubes that function as a diffusing element.

The Zentrum Paul Klee that uses automated louvers, and incorporated shading panels.

The Menil Collection which utilizes automated louvers and the aforementioned “roof of leaves” that filters daylight.
The building is comprised of two parts; the building itself and a sculpture garden adjacent to the building. The ground floor of the building houses light sensitive works as well as an auditorium which the garden terraces downward to creating an open air theatre. The second floor is a very interesting space which uses daylight as it’s main source of lighting and houses works that are not susceptible to damage from sunlight. The garden space is slightly lower then street level and encompassed by travertine clad walls. The foliage used includes oaks, elms, myrtles and willow trees.
The Integrated day-lighting roof system is a series of over 500,000 shell-like structures that are made to diffuse light as it enters the building.

Engineering Firm Arup was brought in to design the shells using a complex computer simulation. The engineers calculated a precise shape for the “shells” using the natural lighting conditions of Dallas as a basis.
The model was then processed into a real form using an industrial 3D model “printing” technology. The models were then tested under-real world conditions and when changes were needed they could be implemented within moments to achieve the desired affect.

A benefit of this procedure was that the prototype shells could be used as a basis to create the finalized system through a process of sand-casting.
The finished roof design allows for 95% of the day-light to be shaded and filtered onto the high-performance glass and then into the galleries below.

The artificial lighting system is integrated into the support structure of the roof and is controls are in place so the luminaries are sympathetic to the day-light conditions present and will dim and raise as needed for optimum comfort. This system also benefits cooling loads as the heat from lamps is less of an when they are operating at lower levels.
An AGI32 Study Model was made to test the lighting conditions of one of the Museum spaces in the building. It should be noted that this is only theoretical and does not provide the specific quantities of Foot Candles in the space, but is a general idea of what one can expect with different light sources in a similar space.

The Luminaries used were Fictional 275 Watt High Pressure Sodium Lamps that come as standard fixtures with the program.
AGI32 Testing

The values shown are quite low which is an issue with the fixtures used and placement. The larger numbers are at 6’-0” above finished floor and smaller numbers are at 6” above finished floor.

The mean lighting seems to be approximately 12 Foot Candles at 6’ above finished floor and 7 Foot Candles a 6” above finished floor. These values are rather low and do not reflect the true values of the museum.
AGI32 Testing Rendering

Sample Rendering Of Space From Test
This Second Test was an attempt to recreate the day-lighting of the spaces in AGI32. Parameters were set to “fake” the conditions in the Museum because of the lack of the design parameters of the shell system used. The results at 6’-0” finished floor were much higher then expected and once again don’t reflect actual conditions.

The Mean Foot Candle rating of the room is approximately 58 near the center and drops to 44 Foot Candles near the edges of the building.
Conclusion

The design of the Nasher Sculpture Center seems to be quite successful in its approach to the use of day-lighting in a museum space that maximizes the amount of natural lighting and utilizing it in conjunction with artificial luminaries. The lessons that can be learned are quite varied but they generally revolve around use of properly designed day-light filters to resist the effect of glare while also providing ample light. It is also notable that luminaries used in buildings that focus on day-lighting must utilize control systems that let them be adjusted given the needs of the building on a day to day basis in unison with the climate and time of day of operation.
Credits


Hickey, Jerrold; Shavelson, Michael B. "Raymond Nasher and the Collector’s Art." _Bostonia_ (Spring 2007): N. pag.


Credits

Raymond Nasher [Online Image] Available, Photo By Anthony Gutierrez
http://www.nytimes.com/2007/03/20/arts/design/20nasher.html?ex=1332043200&en=2e420cda5f0d6ea6&ei=5088&partner=rssnyt&emc=rss

Exterior of Nasher Sculpture Center [Online Image] Available
Photo By Tim Hursley

Centre Pompidou in Paris France [Online Image] Available
Photo By Howard Davis
http://www.greatbuildings.com/buildings/Centre_Pompidou.html

Photo Not Credited
http://www.lbl.gov/Science-Articles/Archive/sb-EETD-NYT-building.html

Photo By Arnd Florian

Roof Of Nasher Sculpture Center [Online Image] Available
Photo By Michel Denance

Shell Diagram [Online Image] Available
Image By Arup

Actual Aluminum Shells [Online Image] Available
Image By Michel Denance

Interior of Nasher Sculpture Center at Night [Online Image] Available
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