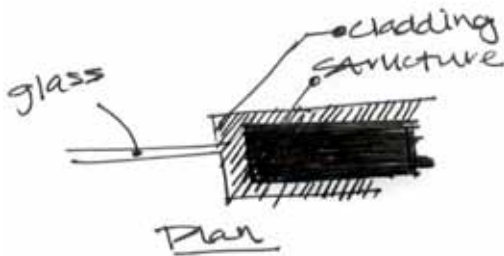


diagram: illustrates location of limestone on exterior of building.



Building Hypothesis:

In what ways does the detailing affect the exterior perception and understanding of the building with the use of stone?

Observations:

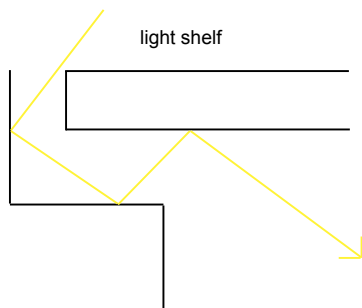
The building is clad in limestone. The mass of the limestone is helpful to visually ground the building to the site. The limestone walls that are extruded out of the site, also ground the building to the site.

The limestone cladding is approximately 3 1/2' X 3 1/2', and clads the exterior of the building the light color of the limestone material complements the brick exterior of the rest of the campus buildings at Johnson County Community College.

The aesthetics of the light color of the limestone is refreshing, and provides a clean "palette". It would be interesting to survey visitors to find out if they would prefer the building to be a different color or a different material. This will further be examined throughout the exploration of this building and project.

Observing the meeting and transition of materials is interesting, and will further be explored. Upon initial visual observations of the limestone is intersected with glass or brick.





Building Hypothesis:

Do the interactive light displays and the daylighting details in the building help achieve the architects overall design intent?

Observations:

The LED light installation was not designed by the architect but an artist collaboration on the project named Leo Villareal. Although the lighting installation and the building were designed by two different people, I think that they worked together to achieve an overall aesthetic. the designer of the installation, leop Villareal, was brought into the project early on and was in communication with both the architect and the contractor. Villareal uses 60,000 points of light to cover the 25' X 55' cantilevar. Villareal chooses to use white LED lights to corallate to the white limestone on the exterior of the museum.

Villareal writes his own software code that animates the panels with different patterns of light that are forever changing. To create the patterns Villareal observes the patterns of movement around the site, both traffics and pedestrian. The Led panels are usually nomore than 6 inches thick and 1 foot square. The panels connect to each other, and are most likely fastened to the building exterior with clips.

The Nerman also incorporates daylighting into its design. Along the exterior walls in the gallery there is what appears to be a light shelf system that floods the galleries with daylight while preventing direct light from damaging the artwork.

Both the LED and daylighting details help to promote the overall design intent. The Nerman is a very quite and clean building with subtle details. While the LED display is a more active detail it is palyed down with the use of white LED's and its placement underneath the cantilevar. The daylighting system washes the interior space wth natural light without harsh shadows and direct sunlight.



Building Hypothesis:

In what ways does the detailing affect the exterior perception and understanding of the building and the use of glass?

Observations:

The use of glass on the bottom portion of the building allows the building to have a sense of lightness. Contrasting with the limestone on top of the glass reveals the public lobby and creates a visual connection to the outside.



The glass panel is about 12 feet tall and 3 feet wide. The vertical mullions have been eliminated. Instead, there is glass that is perpendicular to the facade, and there is glass backing that provides lateral support.

The top and bottom of the glass are detailed in a way where it visually seems to disappear when it meets the ground. By eliminating the mullions visually with the use of glass, there is an emphasis on the volume of the stone, and it visually seems to float in the air.

It would be interesting to study this detail further to understand their technicals and how they were assembled together.



It would also be interesting to further study whether or not the structural system achieves the architect's design intent?

The architect's goal was to create a building that was minimalist in detailing, but elegant in volume. The main architectural feature of this building is the large cantilever. This cantilever is a structural feat, and it houses the largest main gallery and is located above the main entrance.

Hypothesis:

The building envelope helps to create a sense of lightness through the use of different building materials.

Forming of the survey and interview:

Question 1:

“On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.”

Reason:

In order to confirm our hypothesis, we have decided to form the survey starting with a sketch map to better understand how people perceive the structure. Whether they are aware of the lightness of the structure. By analysis these sketches we could have a better understanding of what people think of the structure, of places, and what place, element and attributes seem to be important for spatial order, spatial structure, place-learning and way-finding. Also, by labeling the material and the color of the structure we could have a better understanding of the users perception.

Expected Outcome:

We anticipated that the survey taker would draw out some indication of the cantilever; and the top geometry being a solid box that separates itself from the structure below. They would acknowledge the difference in the use of material.

Question 2:

“Looking at the drawing above, what you think is the basic scheme of the building, in other words, what you think the architect is trying to communicate through these shapes and materials?”

Reason:

By asking this open-ended question we would have a more in depth understanding of people’s perception of the structure and the materials.

Expected Outcome:

“The response would either reinforce or negate our analysis of question one. Help us to better understand their drawing and what he/she is trying to communicate.

Question 3:

"On a scale from 1 ~5 how successful do you think the use of materials and details are to support the design intention (Scheme) of the building? "

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Reason:

"By forming a likert scale question it would help us to understand, in a tangible way, how the user appreciated the materiality and the parti.

Expected Outcome:

" None.

Interview Method:

Unstructured Interview Reason:

"Because it is good for in-depth interviewing, we think it is appropriate to adapt such method by asking questions with no predetermined order would help us to gather a ver- ity of information and would allow them to elaborate and expand on the topic that they think its important.

Procedure:

Survey:

(location: Marvin Hall Studios & Nerman Museum of Contemporary Art)

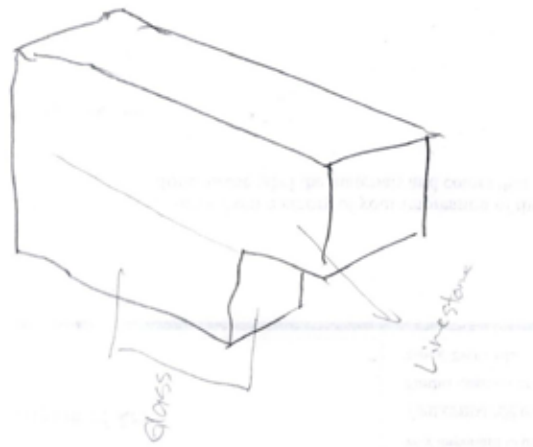
Before conducting the Survey we would introduce our self's and the project, explaining what the surveys would be used for then ask if they were willing to take our survey. Once we were given permission, we would hand out the survey and stand nearby if they had any questions. When the participant was done we would thank them and get some basic information. All of the surveys well be attached at the back of this document.

Interview:

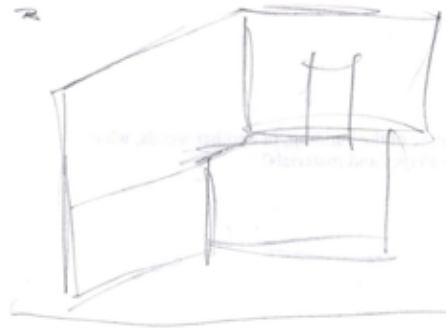
Before conducting the Interview we would Introduce our self's and the project, explaining what the Interview would be used for then ask if we could take 5 mints of their time to be interview. If they agreed then we would ask basic intro questions and then would carry on with the interview. The format of the interview is unstructured so once we got though the basic information we would go though the questions that were relevant for the par- ticipants and there understanding of the building. Once the interview were over we thanked them for taking the interview.

Outcome:

This image indicates that this person perceives the building as a unified form. They drew the building as one single form and not two separate forms indicating that they do not perceive the top form as floating. They do however begin to differentiate between the materials on the top and bottom forms.

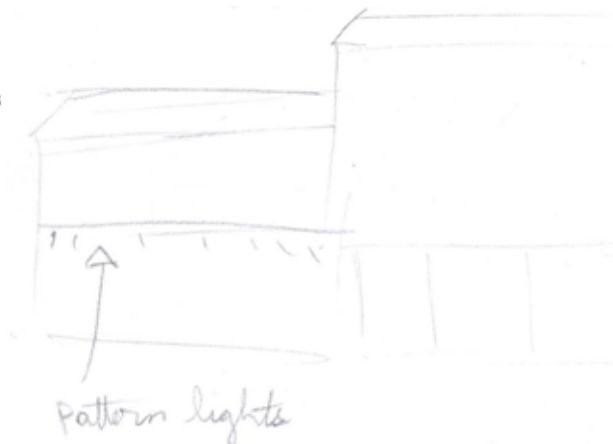


This image indicates that this person perceives the building as a unified form, very similar to the above drawing. However this person makes note of the glass at the end of the cantilever.



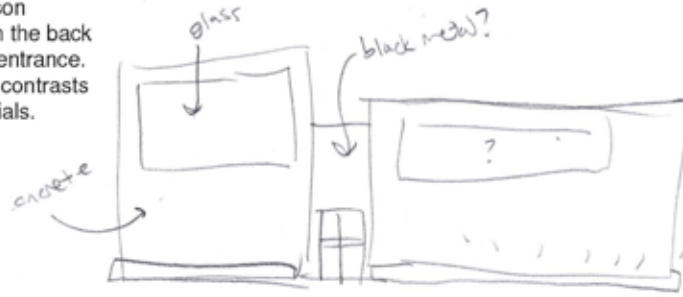
This image indicates that this person perceives the building as a giant cantilever. It also appears that they approached from the main entrance as the LED display is something that they boldly indicated.

In the answer to the second question the person talks about the simplicity and 'airy' quality of the building which doesn't seem to be indicated in the drawing.



www.real?

This image indicates the person experienced the building from the back entrance but never the main entrance. They also started to note the contrasts in the different exterior materials.



This image indicates the person experienced the building as a part of campus and not a single building. They make note of the contrast between the limestone of the museum and the red brick from the rest of campus.

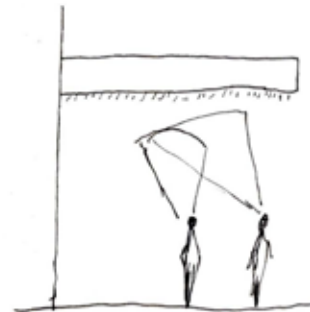
temporary art. when you are done please label the materials and colors that you



This image indicates that the main entry sequence is really important. Started to note the materials of the light display, however does not indicate an experience of the building as a whole.



VIEW LOOKING UP



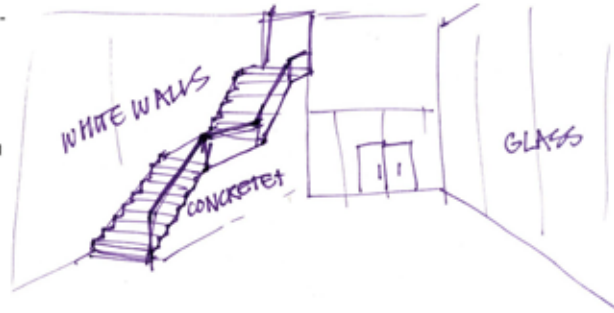
ELEVATION

LED LIGHTS, CONCRETE, METAL

This image indicates the person experienced the building as an interior space rather than an exterior form. Started to note materials by drawing the lines of the floor tiles and the railing mullions.



This image indicates the person experienced the building as a collection of materials rather than a unified structure. They made note of the contrasting materials within in the building as opposed to the buildings contrast with the rest of campus.

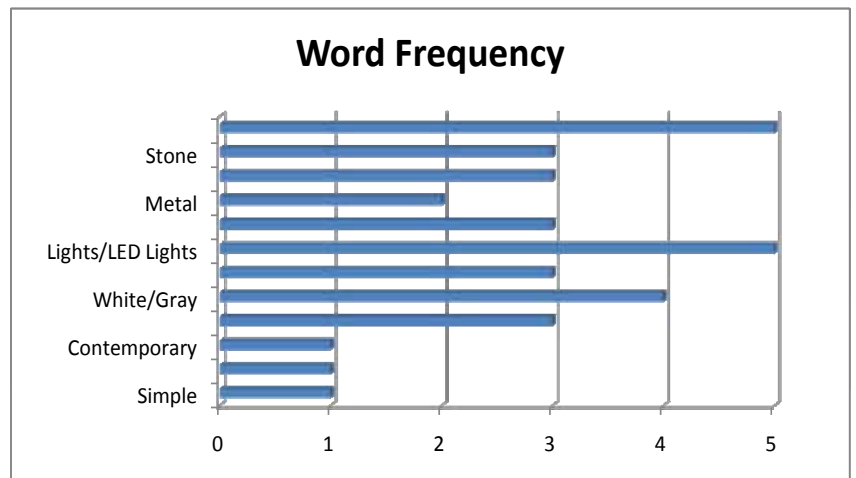
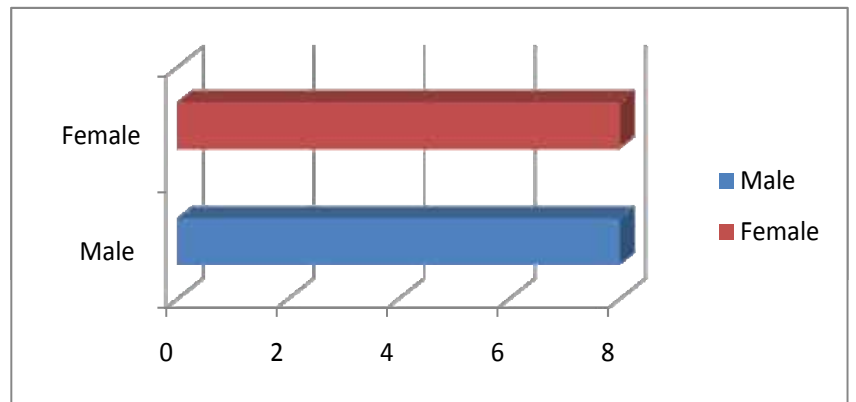
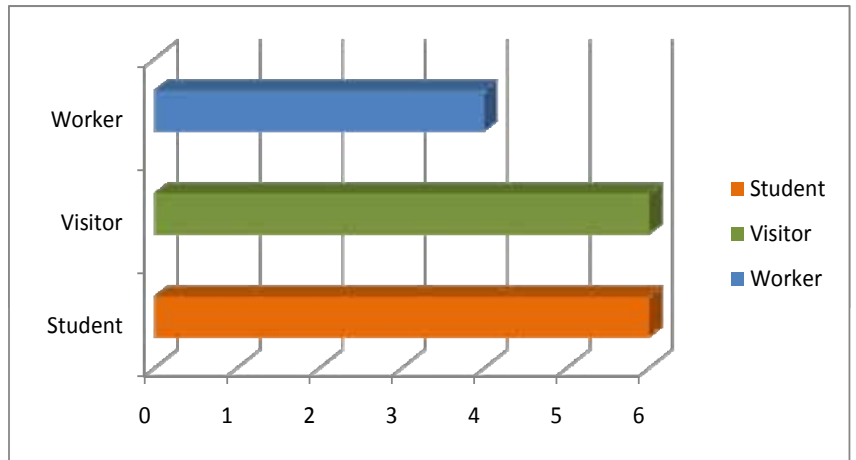


This image indicates that this person perceives the building as a series of interior spaces and not a unified structure.

They also made note of the white material indicating that they perceived the entire building as one color. Indicated in the following question that the building was very minimal in its color scheme.



Demographics and Data Illustrated.



Procedure and Outcome:

Interviewer:

The results for Interview was very successful the format allowed for the participant to guide the interview, and get to the points to that mattered to them. These are the response that we go from the four people that we interviewed.

Interview 1: Male Security

If you could use one word to describe this building what would it be and why?

Opulent. The difference of material and building style makes it stand out from the rest of campus. Also, the glass facade is only rated for 50 mph winds.

So this is not appropriate for Kansas. Is there anything else on the interior of the museum that doesn't function well?

Humidity and Acoustics. Also, the odor from the cafe. (as Carmen leaned against the glass railing) Please, do not lean against the glass railing. That is another issue with the interior of the building the glass railings throughout the building are not bracketed against the wall, so it wiggles. It is the same glass wall that is used on the exterior of the building.

Is there that you like about the building?

The skylights in the middle of the building. It functions really well. The stairwell under the skylight near the cafe.

Interview 2: The Receptionist

What is your position?

The Receptionist.

How long have you worked at the Nerman Museum?

It is her first day that she has worked there, but she has gone through a ten day training.

Which entry do you use to come to work?

From the back.

Do you like the glass facade?

Yes, it is nice to see that she is able to see outside. The weather, and different activities. In the mornings the light and the sun that enters the glass facade is distracting, because it gets in your eyes. But overall she likes it.

Is it too loud?

It is like a gym effect. The acoustics are sometimes loud. It echos.

Interview 3: Woman Security

How long has she worked there?

Ten years.

If you could use one word to describe this building what would it be and why?

Jetting.

Do you like the use of glass facade?

Yes, it brings the light inside of the building. But the morning light is an issue, but they usually put the shades down.

How do you usually approach the building?

She comes in from the first Quiveria entrance. Parks in the back, and comes in from there. But people enter from all directions.

Would you like to draw your perception of this building?

After observing the drawing. She did not draw the glass or annotate it.

We asked. Would you agree that the architect's intent is to design a floating box?

No, it is not floating.

How about the use of material?

It is different from the campus, but it is also on the edge of campus so I don't mind the use of limestone, and it being different from the rest of the buildings.

Overall, do you like this space as a museum?

It is very functional space and beautiful at the same time. The gallery is very spacious, but the signage of the building is difficult to see. It is not visible enough.

Interview 4: The Museum Coordinator

How long have you worked here?

Three years. He came to work three months before the end of the project.

Do you know when the artist was brought into the design process?

The artist, Leo Villareal, was brought on board early in the design process. The architect came across this artist's work in New York at a museum. At the time this was the largest installation that the artist had done. The LEDs come on at 9 and are turned off at 10pm. They are on a timer.

Are there heating and cooling issues?

No. Except for in the summer it can get quite hot unless we put the shades down. There is so much sun that comes in that you can get a tan in the summer. In one of the galleries they had to put up a wall to keep out the sun from the interior of the galleries. They also had to build an interior partition to create a more intimate gallery space. The building is perceived as small, whereas when the interior is perceived as very spacious. The architect must know what he is doing. The architect allowed the space to focus on the artwork.

Have there been any problems with the Materiality of the building?

The architect wanted the walls and the building to rise up out of the ground like a quarry. The exterior landscaping walls were quarried North of Topeka and brought to the site, and not laid the same way they were quarried, so the stone wicked the water up the side of the building. When the water froze up it cracked the stone. And now to fix this they are retrofitting it with granite, so it appears the same with the rest of the limestone.

Reflection:

Survey:

When reflecting on our questions that we included in our survey as well as our technique for administering our surveys we were disappointed in the way in which our surveys were perceived by the public, and so we learned that for the next time when writing questions that would be administered in a survey one needs to be even more specific than he or she already thinks that he or she is already being. We were hoping that those surveyed would pick up and denote the use of glass on the front of the facade and how it makes the cantilever on the building to appear to float, and seem more lightweight than it actually is. In those surveyed very few picked up on this. We learned that our questions were not specific enough in regard to the material on the exterior of the building, and how the exterior materials make it. In regards to the first question (the drawing) on the survey the question could be more specific to the exterior. However, though the survey did not supply all of the information that we were anticipating in our results the informal interviewing process was helpful for this, and filled in some of the gaps that we were missing in the information gained from our surveys.

Interview:

The informal format of the interviewing process was helpful in that the beginning and end of the interviews were energetic and engaging. However, though we informed those that were being interviewed that their answers would remain confidential some people felt as though they would be scruti-

nized or punished for their answers. A couple of the employees mentioned that they did not feel comfortable discussing the various aspects of how the building was failing in regards to water damage, sun exposure, and the overall layout or further aspects of the building because they thought that they could somehow lose their job over the conversation. Some people interviewed other than the Museum Coordinator avoided the topic of maintenance and building failure. The informal format of the interviewing process was helpful, but it was difficult to gain the same information from all of those surveyed because of the format. After interviewing we have learned that it would have probably benefited our mission if we were able to interview more of a variety of people, such as maintenance staff and other various specialties of employees within the Museum.

Conclusion:

After collecting the surveys and interviews and reflecting on the participants responses we have found information that supports our hypothesis and aspects that negate our hypothesis.

In terms of the building context, the information we gathered suggests that people are aware of the different use of material; limestone in comparison to JCCC campus which is mostly brick. Which supported our hypothesis. But most of them were reading the building as a solid entity as opposed to the floating box as we stated in our hypothesis.

In terms of the building itself, the data shows that the change of material - from limestone to glass was hardly noticed or mentioned in those metal maps. But most of the people did notice the interior quality of the building which is minimal, modern and provides a sense of lightness and spacious quality to the interior.

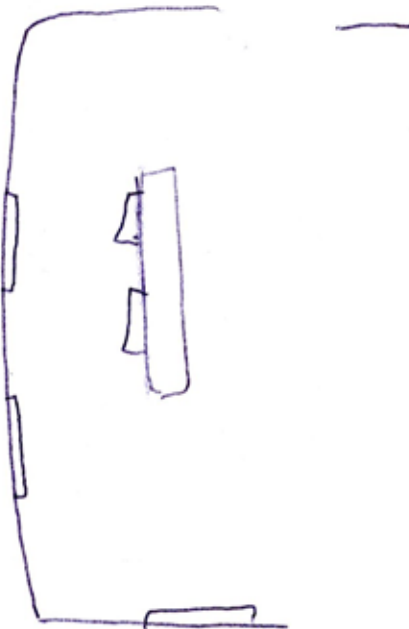
Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



grey & beige
white

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

open

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intencion (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



Came from
the side
entrance

Notice
change
materials

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

Neutral colors

brick, ~~glass~~, Metal, wanted to represent the museum
along with the college.

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

1 - not successful at all

2 - somewhat unsuccessful

3 - neutral

4 - somewhat successful

5 - very successful

0 - can't decide

Try not to be
color, Remember the
glass,

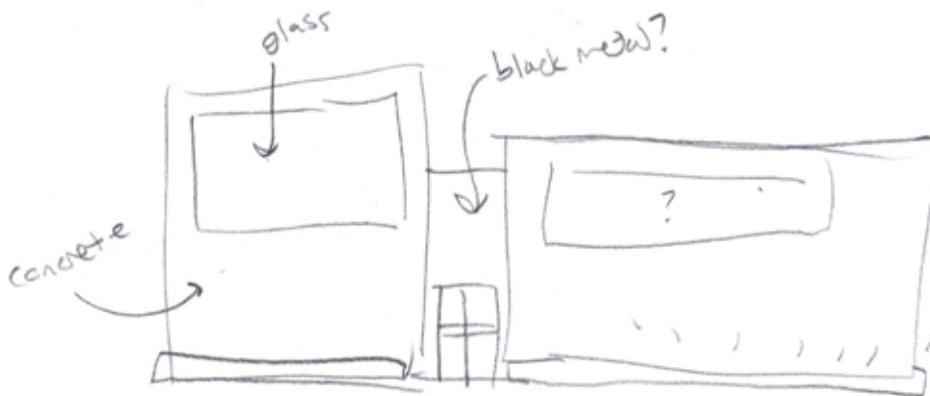
Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

"this is a gallery - a neutral but not unpreasant box for art to hang out in, contextually unboxed. also, light!"

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- ④ - somewhat successful
- 5 - very successful
- 0 - can't decide

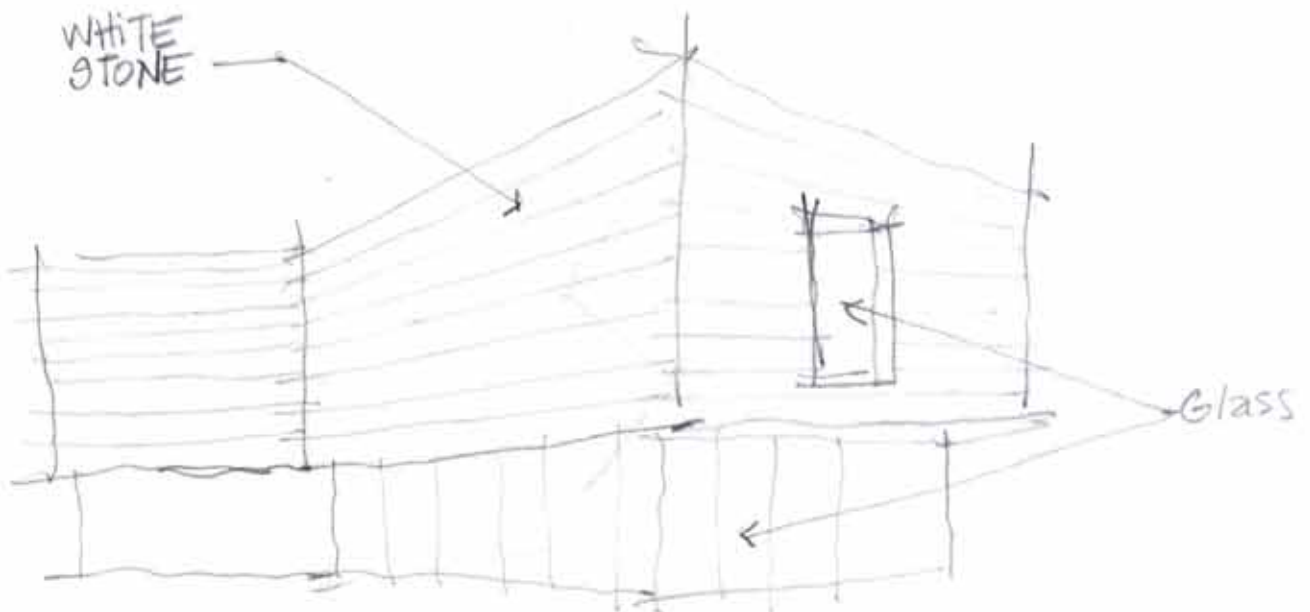
Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

He is after a very minimal building which is in contract to the brutalist, articulate buildings populating the rest of the campus.

different materiality

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

1 - not successful at all

2 - somewhat unsuccessful

3 - neutral

4 - somewhat successful

5 - very successful

0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.

- bldg perceived as part of the campus
- not perceived as single bldg



2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

THE BRICK SYMBOLIZES THE NATURAL CURVES OF THE LAND & THE DESIGN OF THE BUILDING IS A PIECE OF ART AS WELL BY THE USE OF SYMMETRY & ANGLES. THE LIMESTONE IS IN STRONG CONTRAST TO THE BRICK & GIVES OFF A REFLECTIVE MOUND.

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (scheme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

- bldg as part of its context
- contrast of materials

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.

Very Modern, different from the
surrounding buildings, lots of
glass, limestone

different
because
of different
materials

-surrounding
bldgs. = ~~limestone~~
red brick

NO DRAWING

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

Minimalist / Contemporary
to emphasize the Art

structure

↑
structure
conveyed in
finished design

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (scheme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



mirrored?

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

clean lines, lots of glass, simple, airy

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intension (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

Unique structure, like the art and
it's not like a regular building

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

5

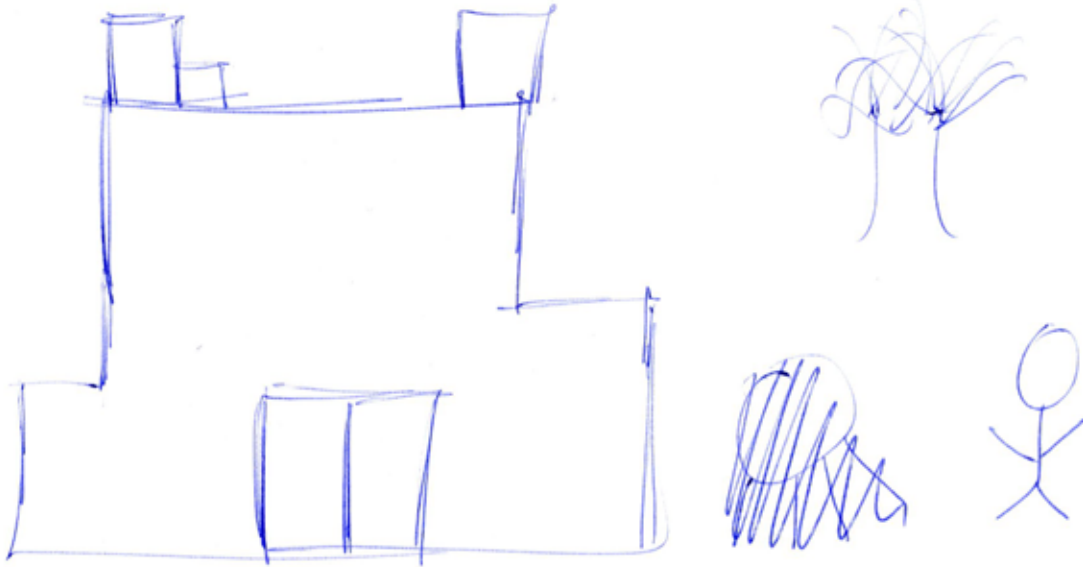
Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

Functional ← big, open space. the ~~architect~~ architect is trying to convey the calmness & piece of mind in art. ← why? use of materials?

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

5

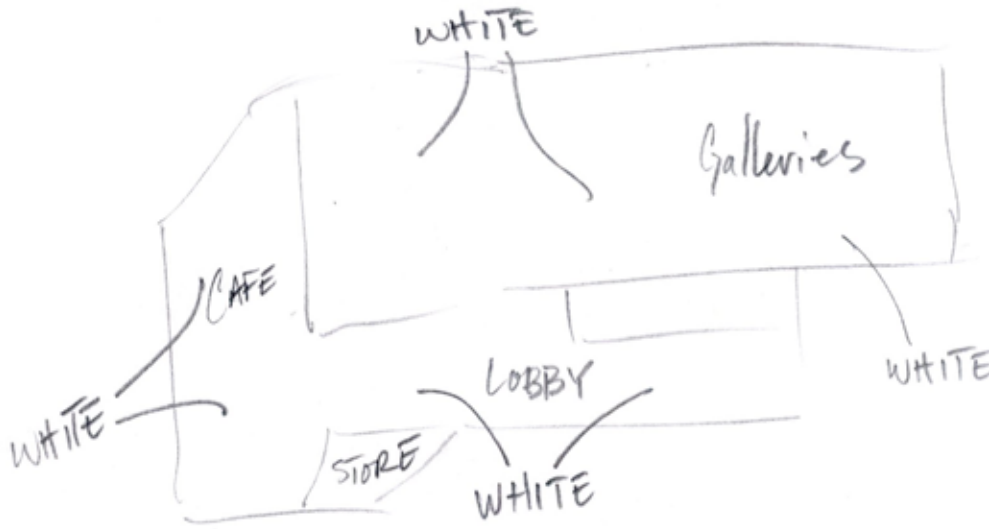
Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



**FOCUSED
ON INTERIOR**

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

minimalistic design, minimal color schematics

THE DESIGN/COLORS ALLOWS FOR THE ART TO
BE THE FOCUS

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intencion (shcme)?

1 - not successful at all

2 - somewhat unsuccessful

3 - neutral

4 - somewhat successful

5 - very successful

0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.

FISH BOWL

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intention (shcme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Survey_Nerman Museum of Art

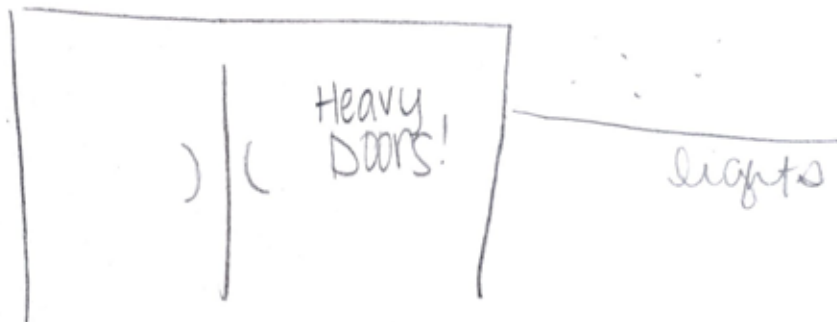
Thank you for participant in our survey. Your input is very important to us.

Your answer will remain confidential.

Further question or concern please feel free to contact us:

FIRST TIME THERE?

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



- no perception of the exterior of the bldg.
- only experience of the bldg is interior

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

Honestly didnt pay attention

- no perception of the bldg as a whole

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intendon (sheme)?

- 1 - not successful at all
- 2 - somewhat unsuccessful
- 3 - neutral
- 4 - somewhat successful
- 5 - very successful
- 0 - can't decide

Survey_Nerman Museum of Art

Thank you for participant in our survey. Your input is very important to us.

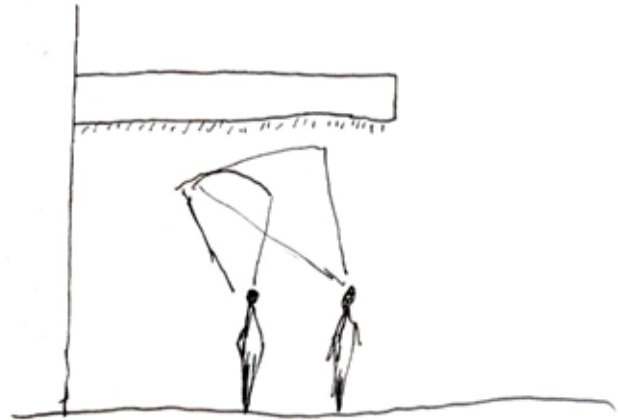
Your answer will remain confidential. ← IT BETTER

Further question or concern please feel free to contact us:

1. On the space provided below, please draw from memory of your impression of the Nerman Museum of Contemporary Art. When you are done please label the materials and colors that you could recall.



VIEW LOOKING UP



ELEVATION

MATERIAL- LED LIGHTS, CONCRETE, METAL

2. Looking at the drawing above, what you think is the basic scheme of the building, in another words, what you think the architect is trying to communicate through these shapes and materials?

A WAY TO LURE PEOPLE TOWARDS THE ENTRANCE

3. From scale 1 ~5 how successful you think the use of material and detailing is to support the design intencion (shcme)?

1 - not successful at all

2 - somewhat unsuccessful

3 - neutral

4 - somewhat successful

5 - very successful

0 - can't decide

correct

Original Hypothesis:

The building envelop helps create a sense of lightness through the use of different materials.

Initial Assumptions:

Based on interviews of employees of the Nerman we expect that the eastern glass facade creates a sense of lightness but also causes excess heat gain, harsh sun angles, and glare from the sun that is uncomfortable for employees at the front desk and in lower gallery.

Method of Research:

1. We created a 3D computer model to study shadows and sun angles of the Nerman.

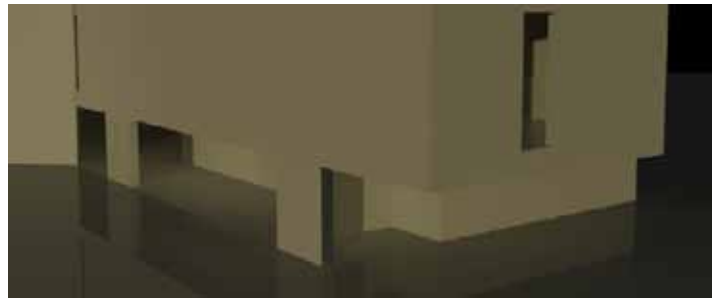
- Using floor plans, we built a 3D model in Rhino
- Set the location of the model and oriented it North
- Turned on the sun and shadows feature in 3ds Max
- Rendered the model with shadows during the spring and autumn equinoxes and winter and summer solstices every hour beginning at 7am to 12pm.

**Reasoning : The area that we are studying is on the east side of the building which receives the morning light. To better understand the sun angles and harshness of the light we studied how the light and shadows changed at various times of year six times throughout the morning.

-Analyzed the images and sun chart to prove or disprove assumptions.



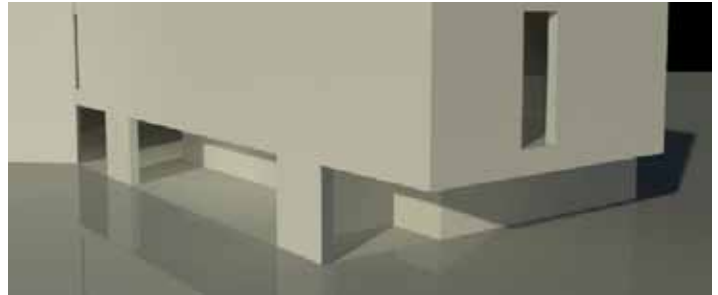
December 21 7 am



March 21 7 am



December 21 8 am



March 21 8 am



December 21 9 am



March 21 9 am



December 21 10 am



March 21 10 am



December 21 11 am



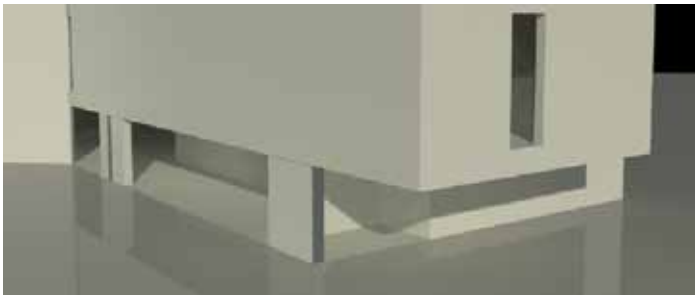
March 21 11 am



December 21 12 am

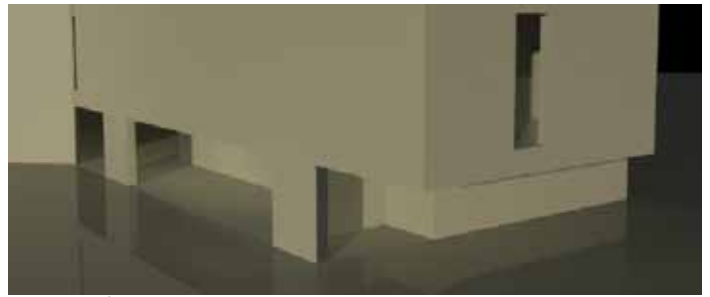


March 21 12 am



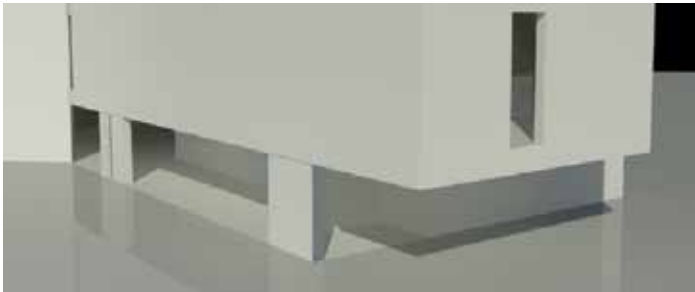
June 21

7 am



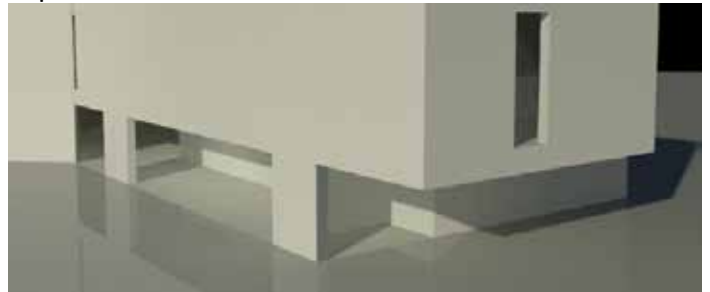
September 21

7 am



June 21

8 am



September 21

8 am



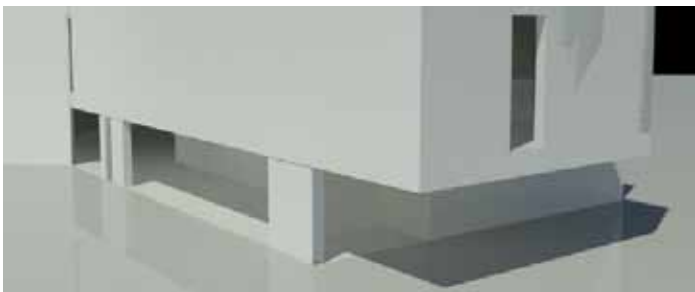
June 21

9 am



September 21

9 am



June 21

10 am



September 21

10 am



June 21

11 am



September 21

11 am



June 21

12 am

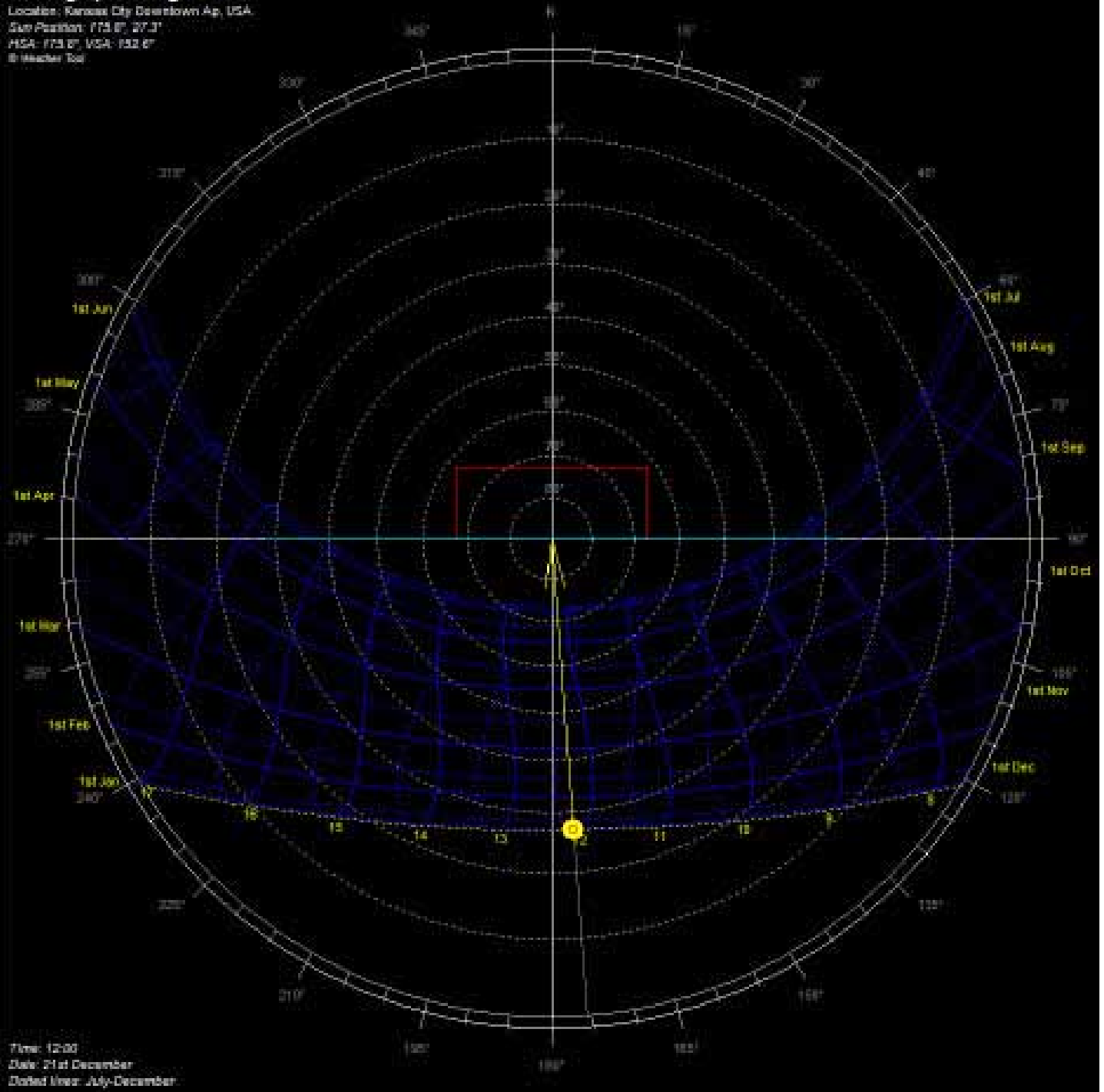


September 21

12 am

Stereographic Diagram

Location: Kansas City Downtown Ap, USA
 Site Position: 39.1°N, 94.6°W
 HGA: 173.0', MGA: 152.0'
 © Weather Tool



Comfort Percentages

NAME: Kansas City Downtown Ap
 LOCATION: USA
 WEEKDAYS: 00:00 - 24:00 Hrs
 WEEKENDS: 00:00 - 24:00 Hrs
 POSITION: 39.1°, -94.6°
 © Weather Tool

CLIMATE: Cfa

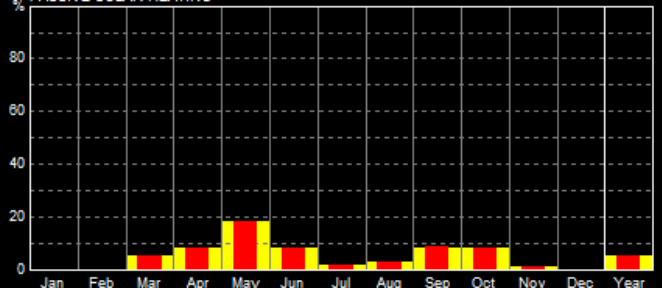
Moist mid-latitude climate with mild winters.

Humid subtropical with hot muggy summers and thunderstorms.

Winters are mild with precipitation from mid-latitude cyclones.

Warmest month above or equal to 22°C.

PASSIVE SOLAR HEATING



Data:

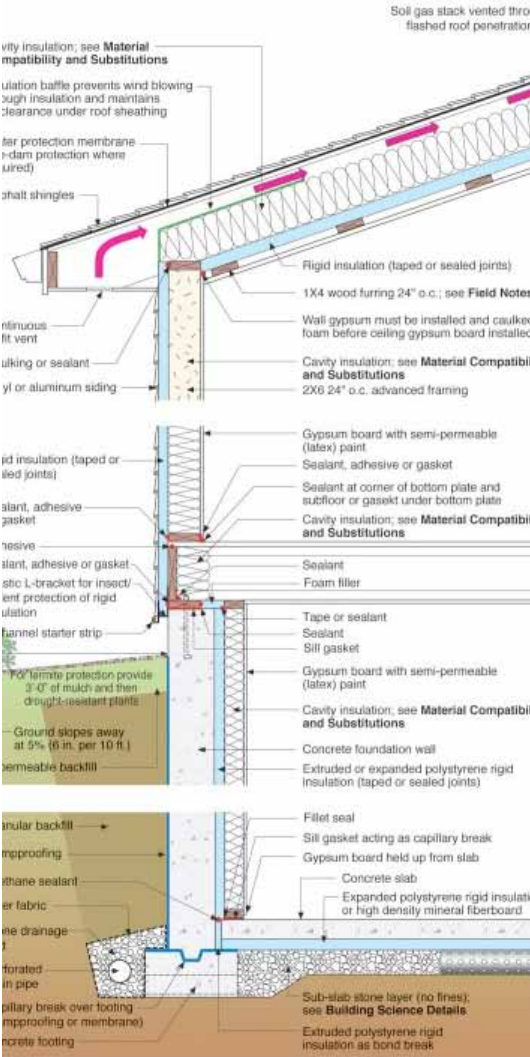
The data above shows the movement of the sun on the east facade during the year throughout the morning. The charts are of a stereographic chart illustrating the path of the sun over the year and a passive solar heating chart showing the little to no effect that passive heating will have in the climate.

Findings:

The data clearly supports our assumption and hypothesis that the design of the glass facade does create a lightness in the form, but at the cost of harsh morning light that creates unwanted solar heat, and solar glare. The rendered images show that throughout the year morning sun will reach in to the back wall of the lobby. During the summer the sun moves quickly throughout the space and by noon the glass facade is almost in the shade; even though the sun exposure is less during the summer

Overall, there is solar radiation entering the building from 8 am to 12am year round. The building has one very basic design element to help protect the interior. The design elements are interior shades that are manually operated for every glass panel of the glass facade. The interior shades will help cut down on unwanted glare but will not help with solar heat gain nor will they be used consistently and all of the time because they require someone lower the shades, most likely after the spaces is noticeably uncomfortable. This is a clear example where the architect valued the form of the building over the function and may not have considered how the building envelope would affect the building occupants, as well as, the price for having to mechanically heating and cooling the space, ultimately costing the College in terms of long-term operational building costs.

A solution that would decrease the amount of solar radiation that penetrates past the buildings glass facade on the east side of the building would be to use exterior shading devices or louvers to prevent sun from entering the interior space of the building. Another solution would be to plant trees on the East side of the building to help screen the sun. This may not be an immediate solution because the trees would have to mature in order to provide adequate shading. These design decisions would help to prevent the sun from entering the building and would reducing the need for extra heating in the winter and cooling in the summer. A louver system would prevent the heat from entering into the space and would also reduce the sun glare entering the space and creating an uncomfortable work environment for the employees.



When creating design guidelines for art museums in Kansas City we broke the research up into design guidelines for the Kansas climate and design guideline for art museums. We then came up with three different guidelines that should be used when designing art museums in Kansas City.

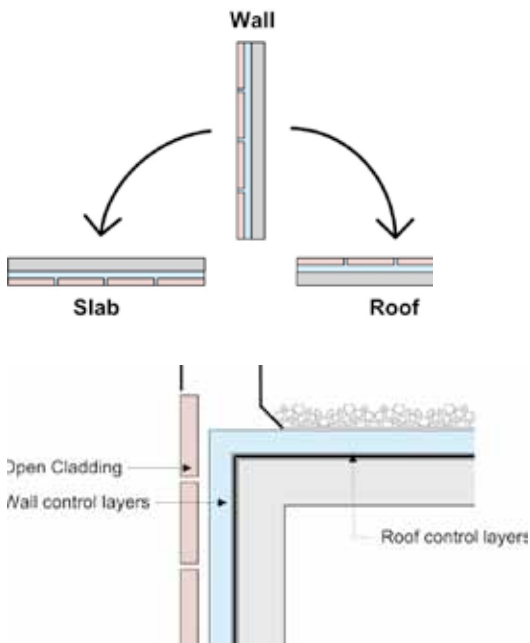
DESIGN GUIDELINES FOR KANSAS CITY

Studying building envelopes for the Mixed-Humid Climate are important because they act as guidelines and suggestions on how building envelopes should be designed, drawn, and constructed. Though they are not the right answer to every design or design decision they are helpful to learn from and to use as a guide for future projects., Missouri and Kansas are included in this Climate typology.

First there should be a resilient foundation (basement is recommended for possible tornadic weather activity). There can be wood, steel, and concrete framing and structure. Cladding can range in a variety of materials. Glass is not strongly encouraged unless it is protected by shading devices to withstand harsh summer sun to protect the building from solar heat gain and glare. There should be adequate ventilation for the building to be successful. Stagnant air can make a space uncomfortable for building occupants. There needs to be adequate roofing materials incorporated into the building, and the relationship between the wall of the building and the way in which it meets the roof needs to be considered and must be detailed correctly to minimize a possible water leak later on. Also, the connection and attention to detail at the joining of the wall to the roof can make the building operate more efficiently because the building is more air tight between the interior and exterior of the building. A building must be designed to be as air tight as possible, so that thermal bridging does not occur. An example, of a wall section where connections are considered is from buildingscience.com and is illustrated below. Though the project is a house which is a much smaller scale compared to the Nerman the principles are the same – Protect the structure and the interior of the building.

(Building Science Corporation, 2009)

The structure of the building and the interior of the building will be protected by designing, drawing, and constructing the perfect wall. The perfect wall will meet the foundations of the building as well as the roof correctly; which will protect the building from water and air. An article, that is helpful in understanding the basics of the construction of a wall system is The Perfect Wall by Joseph W. Lstiburek. In his article he states that a successful wall will include cladding (on the exterior of the building), 4 control layers (inside the cladding protecting the structure), and structure (on the interior of the building). The four control layers are: rain, air, vapor, and thermal. At the core of a wall that is constructed correctly is always focusing on and always protecting the struc-



ture of the building. There are two diagrams that are helpful in illustrating the layers of a wall, and the way in which the wall connects to the roof.

The structure of the building and the interior of the building will be protected by designing, drawing, and constructing the perfect wall. The perfect wall will meet the foundations of the building as well as the roof correctly; which will protect the building from water and air. An article, that is helpful in understanding the basics of the construction of a wall system is *The Perfect Wall* by Joseph W. Lstiburek. In his article he states that a successful wall will include cladding (on the exterior of the building), 4 control layers (inside the cladding protecting the structure), and structure (on the interior of the building). The four control layers are: rain, air, vapor, and thermal. At the core of a wall that is constructed correctly is always focusing on and always protecting the structure of the building. There are two diagrams that are helpful in illustrating the layers of a wall, and the way in which the wall connects to the roof.

The Nerman lacks in terms of shading devices for the east glass façade because strong harsh morning light does enter the space, and this causes summer thermal heat gain, as well as, strong glare that makes being in the lobby space uncomfortable for users and employees (because of the strong sunlight). The Nerman also lacks in terms of the correct connection between the wall system and roof system. This could have been drawn correctly and executed wrong or the detail of the connection may have been drawn wrong, and so water penetrating to the interior of the building was bound to happen eventually the question was just when was it going to happen. There is some water that has penetrated into the interior of the museum gallery space on the first and second floors. This is because of a faulty connection in the building façade that allowed air and water to penetrate the control layers, the structure, and and has now reached the interior of the building. A wall or roof connection has not been constructed correctly.



Building envelopes effect a building in many ways thou our previous studies we have found that the Nerman Building facade responds mostly to architectural atheistic then the programmatic or climatic needs of the building. This is mostly caused by the use of glass without proper shading and without regard to the programmatic need of the art. To understands if better design decisions could be formed with using glass in a museum, we looked at how the Kimbell Museum, the Beyeler Foundation museum, and the Bloch addition of Nelson Atkins use glass in there facades.

The Beyeler Foundation Museum is a modern art museum in Basel Switzerland in 1992-1997 by Renzo Piano Building Workshop. This building is partly embedded in landscape with heavy walls around most of the perimeter only open on the south side to a lily pond. The building modulates light into the galleries by a glass and steel roof. This roof is made up of a structural layer



of glass and steel shades by a collection of operable louvers, Opaque glass light shelf's and perforated steel panels. Then along the south side the roof extends to create a overhang to protect the light from entering the building. This building uses natural light in the galleries but provides the appropriate layers in the building envelope to protect the art.

The glass in facade of the Nerman building envelops works well aesthetically but does not adequately protect the art inside or modulate the temperature of the lobby. After studying the Beyeler Foundation Museum, the Nerman could have made changes to their overall building envelop by following some of the design principles found in Beyelers museum. The first would be to shade the glass either though layers of opaque glass, metal screens or a mixture of the both. Then another was to be sensitive to interior program in relation to the use of glass. If Kyu Sung Woo had taken these design principles into consideration during the schematic design phase it would have solved may of the current problems with the building envelope.

The Bloch addition to the Nelson Atkins Museum by Steven Holl is an art museum in Kansas City,

Missouri. It is a series of buildings embedded into the landscape that connect underground. The wall used as the enclosure as well as a light modulator to activate the space. The Nelson used those glass walls as a tools for collecting and circulating light. The opaque channel glass gathers light and diffuses a soft light into the galleries. The interior was designed in a very particular way to connect light, art, architecture and landscape together. In the Kansas City climate buildings need to be well insulated. The double facade is Steven Holl's solution. The pressurized air cavity between the layers function as insulation so that in the winter the heat lost through these facade would be minimized. But also allows the light into the building.

The outter layer is treated in a way that diffused the light and reducing light transmission to eliminated direct sunlight protect the artwork. The Nerman also attempts to create diffused light into the gallery space however since they used a simple glass façade they ran into problems. However the design of the glass façade in the Nerman museum fails to create diffused light or provide a thermal break therefore the simple glass façade is ineffective.



Louis Kahn's Kimbell museum of art in Fort Worth is one of the best examples we have when creating design principles for art museums. The Kimbell art museum consists of six vaults 120 ft long and 20 ft high. The climate in Fort Worth Texas is hot and has intense sun so protecting the space from both the sun's heat and glare were two very important elements to consider when designing the museum. The Museum has no glass facades and the interior space is washed with natural light that enters through a long slit in the top of each

vault. The Skylights in the top of the vault allow the daylight in while protecting the space from the sun's heat and glare.

Also the Building has covered arcades at the entrance which shades the entrance space and keeps it cool. In article 'the perfect wall' the clever wall is described as a brick exterior and concrete masonry unit as the structure. In the Kimbell museum Kahn uses a similar wall of structural concrete with travertine cladding. This wall is effective at keeping the sun out first and foremost because there is no glazing and secondly because it combines the four principal control layers (water, vapor, air, and thermal barrier) into one material. The concrete walls keep out the heat and light and make it easy to keep the space conditioned. In an art museum it is important that the art is viewed in a setting without any distractions therefore it is important to minimize the glare and heat of the sun caused by too much glass.

After looking at three different precedents we came up with three different design principals that should be used when designing envelopes for art museums.

1. Use of exterior shading devices for glass facades
2. Bring in diffuse natural daylight through translucent rather than transparent materials
3. Bring in diffuse natural daylight through skylights and light shelves

Works Cited: (for this portion of Research:

Building Science Corporation. (2009, April 27). Building Science Information. Retrieved April 04, 2011, from [buildingscience.com](http://www.buildingscience.com/documents/profiles/etw-louisville-profile): <http://www.buildingscience.com/documents/profiles/etw-louisville-profile>

Lstiburek, J. W. (2008, May 05). Insight : The Perfect WALL. Retrieved April 4, 2011, from Building Science Information: <http://www.buildingscience.com/documents/insights/bsi-001-the-perfect-wall>

Buchanan, Peter. *Ten Shades of Green: Architecture and the Natural World*. New York: Architectural League of New York, 2005. Print.

Brownlee, David Bruce., and Long David Gilson De. *Louis Kahn: in the Realm of Architecture*. New York: Rizzoli, 1991. Print.

Building Hypothesis :

The use of fixed louvers on the exterior of the New Orleans Center for Film may prevent thermal gain within the building, if calculated and placed correctly.

Initial Assumptions :

Buildings that have correctly implemented a fixed louver system are attractive spaces because light is able to penetrate a space without making it unpleasant due to solar heat gain and glare from the sun. When a shading device of any kind is not pursued on the exterior of a building and included in the design of a building direct sun will enter the building creating a harsh interior environment for the buildings occupants; this happens within the walls of the Nerman, as discussed in earlier reports, causing direct sun to enter the lobby as well as glare the space to be uncomfortable for the employees at the front desk and in lower gallery. However, when a shading device is implemented on the exterior of the building the sun is unable to penetrate a space keeping the interior of the building cool and preventing solar heat gain.

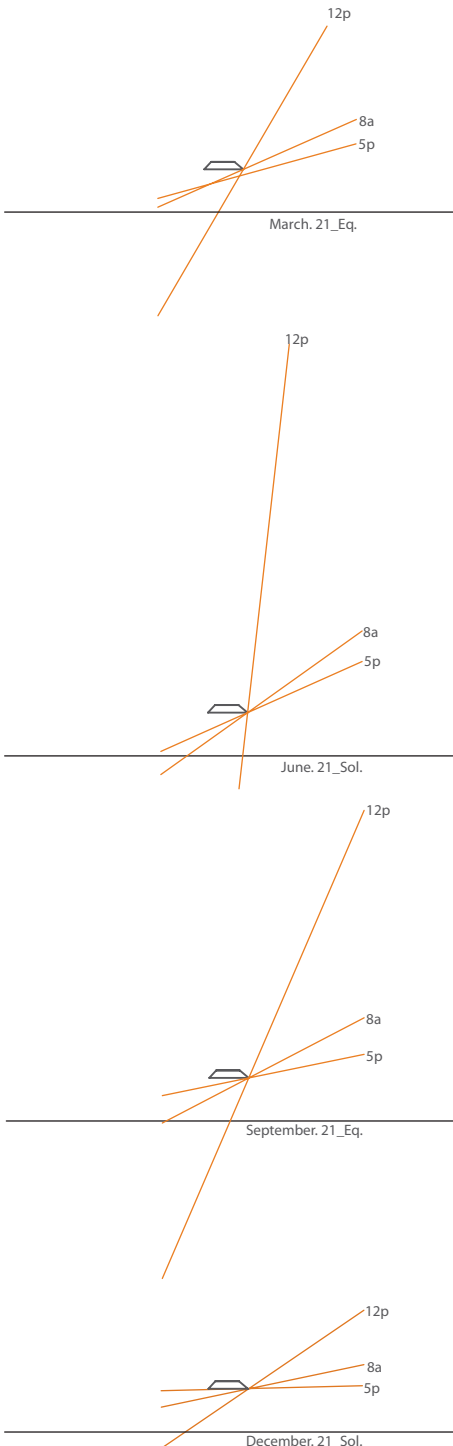
The use of exterior fixed louvers should protect the interior of my building from thermal heat gain. It is a necessity for the success of this space. If the use of the louver system is not implemented correctly on the South façade of the New Orleans Center For Film the ramping corridor will essentially become too hot to bare—essentially acting as a greenhouse.

Method of Research :

I created a 3D computer model of my building focusing on the building envelope that is essential to understand my building, and is crucial to the thesis of my project.

- Computer model created in SketchUp
- Set the location of the model and correctly oriented the building as it related to the North, South, East, and West.
- Turned on the sun and shadows feature in Sketchup
- Captured an image of the sun and shadows that is created by the building envelope. The images captured of the interior and the way in which the sun enters the building were taken at 8 am, 12 noon, and 5 pm during the Solstices and Equinoxes (March 21, June 21, September 21, December 21).

** Reasoning: The area that I studied that is core to my project is on the South façade that receives harsh hot sun. In order to better understand the way in



Hypothesis :

The use of fixed louvers on the exterior of the New Orleans Center for Film may prevent thermal gain within the building, if calculated and placed correctly.

The part of the New Orleans Center for Film is :

Two large boxes that shift along an axis. The axis is the circulation corridor that houses a system of ramps and two sets of fire stairs. The function of this space is not only circulation, but the ramps are the gallery space--where short films created by elementary children are screened.

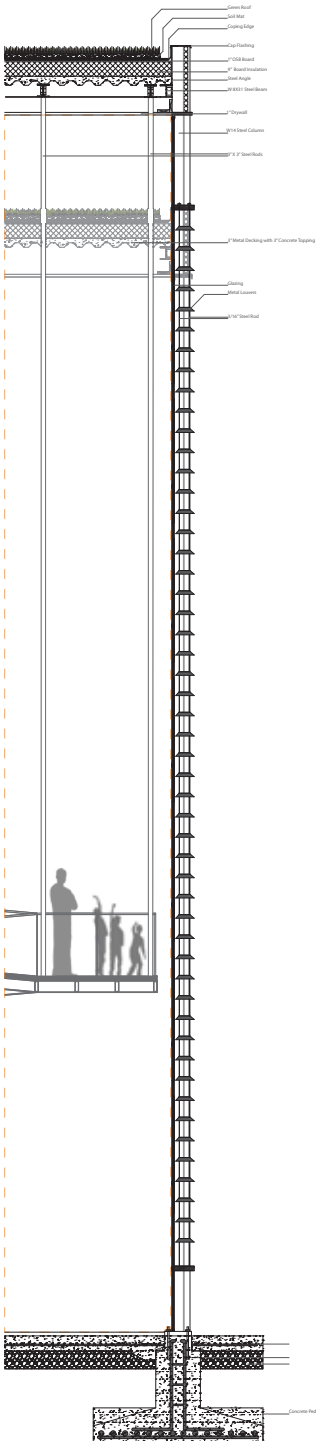
The use of glazing on the North and South facade of the circulation and ramping space within the New Orleans Center for Film is necessary to fulfill my design intention for lightness and transparency. This interior space within the building is important, and can be perceived as the Thesis of my project. The use of a clear story above this space as well as glazing on the North and South facade of this space expresses to visitors on the exterior of the building that the space housed within these characteristics make this portion of the building different from the rest of the building. Which is true, and is exactly what the expression of the envelope should be conveying. The remaining facade of the building is clad in a series of colored cement panels. The cement paneling expresses the spaces within are different than what is within the glazed corridor within the building envelope.

The use of exterior fixed louvers protecting the interior of the building from thermal heat gain is a necessity. If the use of a louver system is not implemented especially on the South facade of the New Orleans Center for Film the ramping corridor will essentially become too hot to bare--essentially acting as a greenhouse.

Intentions behind this design :

At night the New Orleans Center for film is transformed. The building is open in the evenings for students to work or a gallery opening. At night the building comes alive--from the exterior the building appears to glow in specific places. The glass boxes allow light to transform the night landscape. The colorful windows glow, and their colors are expressed to the exterior. The ramping corridor is seen from the exterior North and South facades. The winding, twisting, and bending ramps are seen from the exterior with parents and children occupying the ramps. They are admiring the short films that are playing on the screens suspended on the walls of the corridor.

Materials within the building and surrounding it will be touched by many. How do the materials respond? The materials are glass, concrete panels,



metal louvers, and living plants.

The materials of the envelope are prepared to be touched, and a student can do this in and around the exterior of the building while grasping a handrail, pushing/pulling/grasping a door knob, or the quality/mass of a floor material through ones shoes as he or she walks. Simple materials can change and evoke different emotions. Flexibility, color, and light of a building envelope is important for every visitor of the building in order for each experience of the building to complete and ever changing.

Considering materiality and sustainability conscious decisions will be made. These decisions affect the success or failure of the New Orleans Center for Film, and will affect each persons experience. The passive system of daylighting is implemented, and incorporated into the facade of my design project.

The building can be seen 'through and through' in multiple locations and from all sides of the building interior and exterior--North, South, East, and West.

The angle of the sun entering the building throughout the year is essential in determining the correct location of the fixed louver system. I have begun to explore and study the sun angles in New Orleans as illustrated below. I will continue to explore and study the angles of the sun, and complete a simulation of the sun to make certain that my fixed louver system works correctly. However, my expectations for the performance of the louver system is that the fixed louver system will protect the interior of the building from thermal heat gain as well as the harsh sun angles from the New Orleans sun.

Design Principles derived from the previous building study of the Nerman Museum at JCCC has informed my design decision to implement the use of louvers into my building design and building envelope. Though the major contributing factor was the early East sun, and in my project it is the continuous South sun. The problem conceptually is the same. Sun entered the Nerman and created glare and thermal heat gain. Which in turn made the interior lobby space uncomfortable for the occupants of the building. I am trying to avoid glare and thermal heat gain from the sun to the interior of my building by implementing a louver system and incorporating it into the building envelope for my project, The New Orleans Center for Film.

- + Case study of sun angles on previous page; demonstrating sun study analysis.
- + Wall section drawing to left implementing sun study analysis.

which the sun moves throughout the day, and how sun and shadows interact within my building I studied how the light and shadows changed at four different times of year at three different times throughout the day.

- Analyzed the images and sun chart to prove or disprove assumptions.

Closing Remarks :

The data clearly supports my assumption and hypothesis that the design of the fixed louver system does provide the interior of the building on the South facade protection from the sun entering the building. The images on the next page prove throughout the year that the sun does not enter through the fixed louver system anytime of year other than December 21 at 8 in the morning. The sun does not penetrate through the fixed louver system into the space, and what sunlight does enter the space is very minimal, and will not thermally heat the ramping corridor because it is entering the space in December. My initial assumptions on the solar performance of the fixed louver system on the South facade of this building is correct. Though I was wrong on my assumption on the amount of sunlight that would penetrate the building from the East facade on this portion of the building.

The building does not perform perfectly. The sun enters the space from the East facade which can cause morning solar heat gain because it is not protected by louvers or any other type of shading device. This is a problem with the design, and if I were to change the building envelope design of my project for the best solar performance I would change this portion. So, that the sun was not able to penetrate this portion of the interior of the space. Though this is not as harmful to the interior building quality as heat from the sun on the South facade; it could be uncomfortable for some of the building occupants, and because I want to provide a comfortable space for everyone in all portions of my building I would change this portion of my design.

