Ebb & Flow Ecological Center

This project is for an Ecological Center located on an approximately three-acre plot of land located in Puerto Balandra, Baja California. Balandra Beach is located approximately two miles from La Paz, Mexico. *Ebb & Flow Ecological Center* will explore our human relationship natural environment. The design will also promote sustainability through materials and energy efficiency. Natural light will be used to define and facilitate the use of the spaces as an observation and educational facility. In addition, the use and control of natural ventilation and the use of sustainable materials are important.

The design concept engages the context of the site, seeking a deeper connection to the city of La Paz. It is emblematic of the relationship we want to have with our natural world through the use of rectilinear and curvilinear relationships. The memorable spaces will bond the visitors with the site and natural environment through physical and emotional connections, thus creating an awareness of the human relationship with the natural world.

Approaching the structure, the rectilinear and curvilinear forms are in obvious juxtaposition. This juxtaposition is meant to symbolize humanism (rectilinear) and naturalism (curvilinear.) The world that mankind has made throughout history is often in strong opposition to the natural world. Making this evident is key in the experience of users of the ecological center.

The ecological center also features many sustainable features. One example: vegetative (or green) roofs seen on the rectilinear forms of the ecological center. Additionally, the rectilinear forms of the design are constructed of concrete that is wrapped in insulation from the exterior. This allows for the thermal mass of the concrete to cool the interior spaces throughout the day. Finally, the portion of roof above the central corridor is retracting, allowing for an open air communal area straight down through the middle of the space.

Design Concept: Reciprocation

Q: What is it that humanity can gain from observing the **ebb and flow** of the ecosystem at Balandra Beach?

A: In order to be a fully integrated member of an ecosystem, humans have to observe and acknowledge the natural balance of an ecosystem by participating

in the give and take relationships that naturally occur.

Reciprocation of Protection:

<u>Clown Fish:</u> Protects the anemone

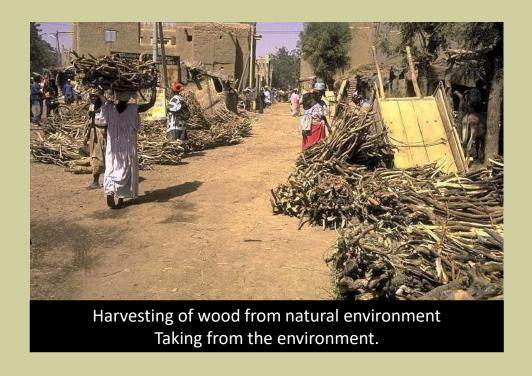
from fish who feed on it.

Anemone: Protects the clown fish from predators through it's stinging tentacles

Design Concept: Reciprocation

This means that instead of advocating for the common parasitic relationship between humanity and nature, we must strive for a mutualistic relationship in which both humanity and nature benefits.

This means that if we take, we must give.





Inspirational Images



IMAGE 1:

<u>Species 1: Cactus</u> – Benefits from the wren through cleansing it of insects that harm it.

<u>Species 2: Cactus Wren</u> – Benefits from the cactus by eating insects (gaining a meal)

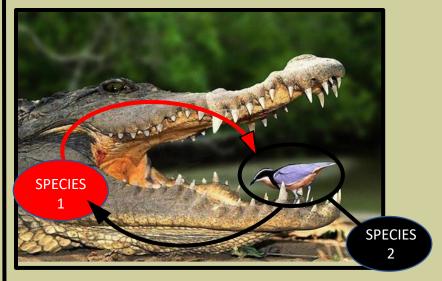


IMAGE 2:

Species 1: Crocodile – Benefits from the Plover by having food removed from the mouth that could cause it's teeth to rot.

Species 2: Plover – Benefits from the Crocodile through consuming the food out of the crocodiles teeth, gaining a meal.

IMAGE 1

IMAGE 2

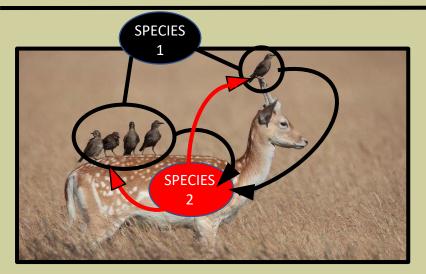


IMAGE 3

IMAGE 3

Species 1: Antelope – Benefits from the Myna Birds by having an additional set of eyes looking out for nearby predators.

Species 2: Myna Birds – Benefits from the antelope by eating insects that are pushed out of the tall grasses by the antelope walking.

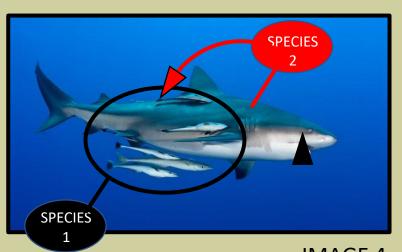


IMAGE 4

IMAGE 4

Species 1: Remora – Benefits from the Bull shark by eating parasites and other species off of the skin of the shark, gaining a meal.

Species 2: Bull Shark – Benefits from the Remora because, although its not their favorite, they can eat the Remora in times of need.

Site Analysis

SITE INFORMATION:

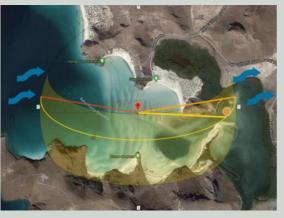
- Approximately 3 Acres
- Two Miles from La Paz, Mexico
- Contains existing parking
- Winds come from the west in the evenings.
- Water Temperature changes drastically over the year.
- Home to mostly small ground fauna and birds
- Flora resembles that typical of moderate desert locations, cacti, agave, etc.
- Located on the Sea of Cortez which has been described as an aquarium.
 Home to a very wide range of aquatic life.



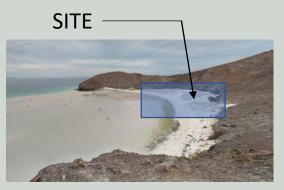
Site Analysis



ARIEL VIEW OF SITE



SUN PATH DIAGRAM

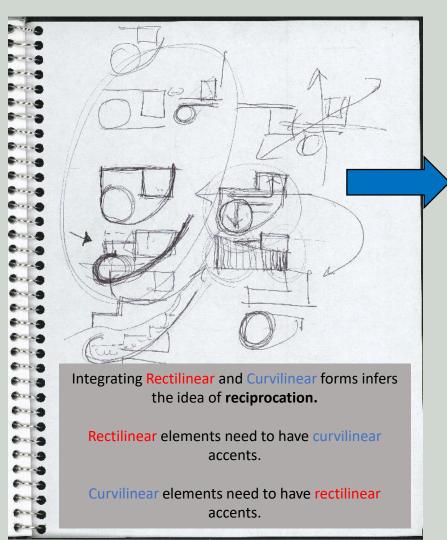


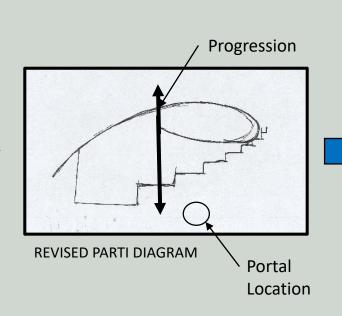
VANTAGE POINT 1



VANTAGE POINT 1

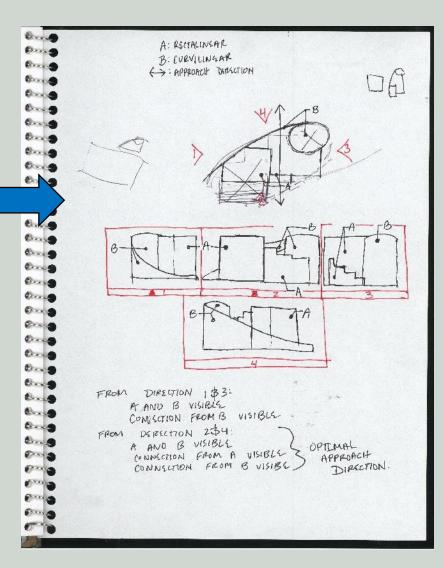
Parti/Model Development – Portal/Progression





In order to experience the parti effectively, there is a certain portal location and spatial relationship that needs to be followed.

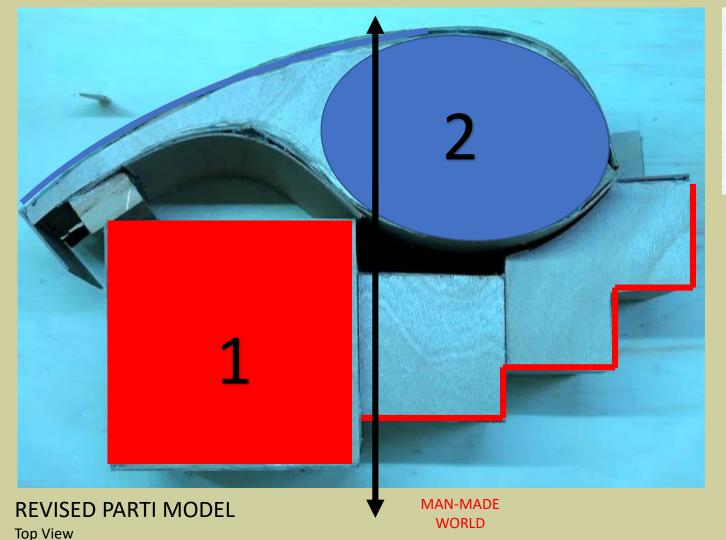
Approach directions were analyzed by extruding the parti into a 3D sketch and it was determined that approaching from the south and the north is the optimal progression because of the visible elements visible from those directions.

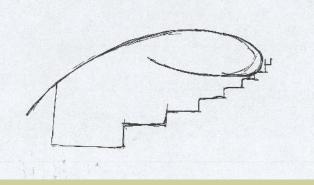


SKETCH BOOK EXCERPT

Revised Parti Model - Evaluation

NATURAL WORLD



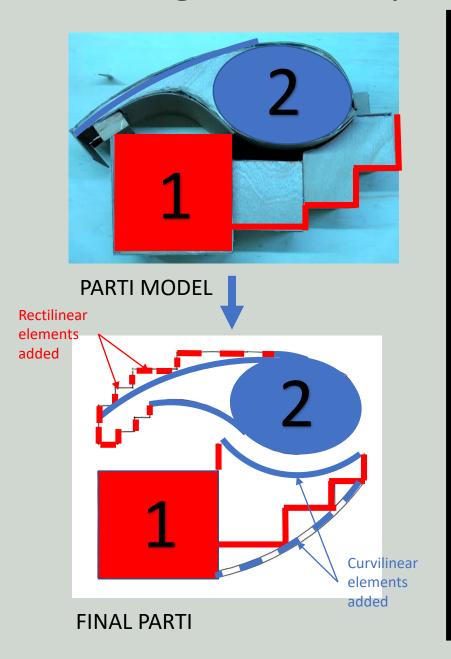


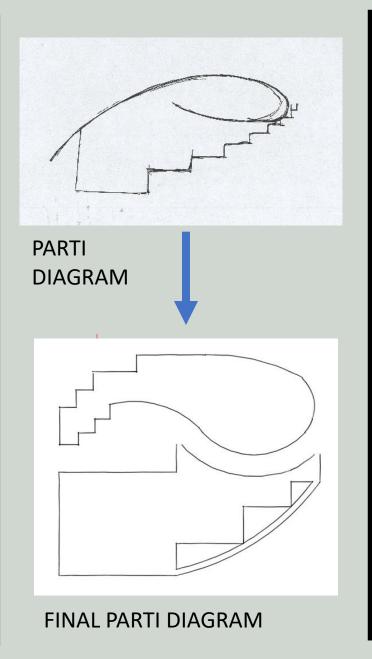
PARTI DIAGRAM

It was discovered that the rectilinear elements and the curvilinear need to show more integration with each other in order to strengthen the idea of reciprocation in the model.

This will also increase the possible directions of progression through the model.

Parti Diagram - Analysis





Entity 1 has rectilinear attributes, signified by the blue marks.

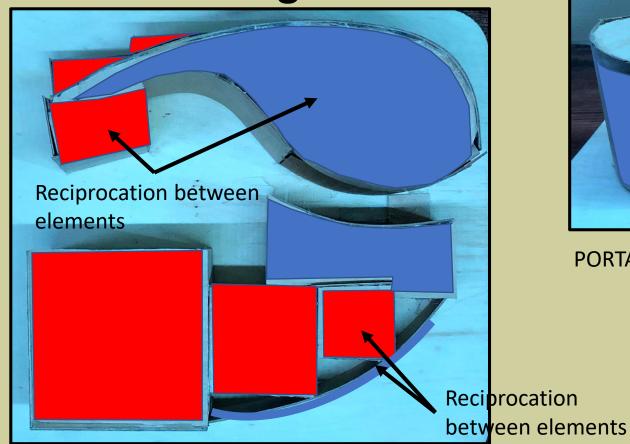
Entity 2 has curvilinear attributes, signified by the red marks.

Despite containing opposite forms, both entities are roughly equal in size and are **reciprocating** their qualities to the other entity.

It was discovered that the rectilinear elements and the curvilinear need to show more integration with each other in order to strengthen the idea of reciprocation in the model.

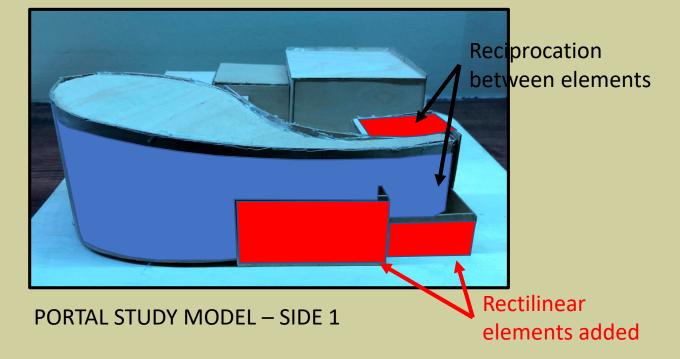
This will also increase the possible directions of progression through the model.

Portal Massing Model

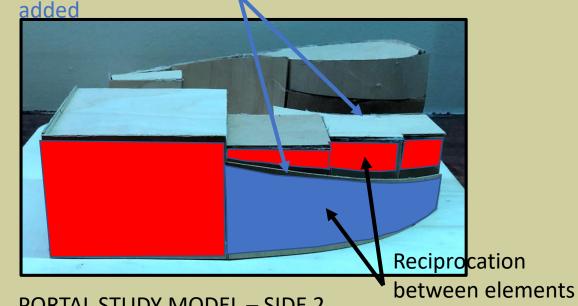


Portal Study Model - Top View

The Portal Study Model which was derived from revisions to the parti model and diagram, is a much stronger representation of reciprocation between rectilinear forms and curvilinear forms (or Man and Nature.)

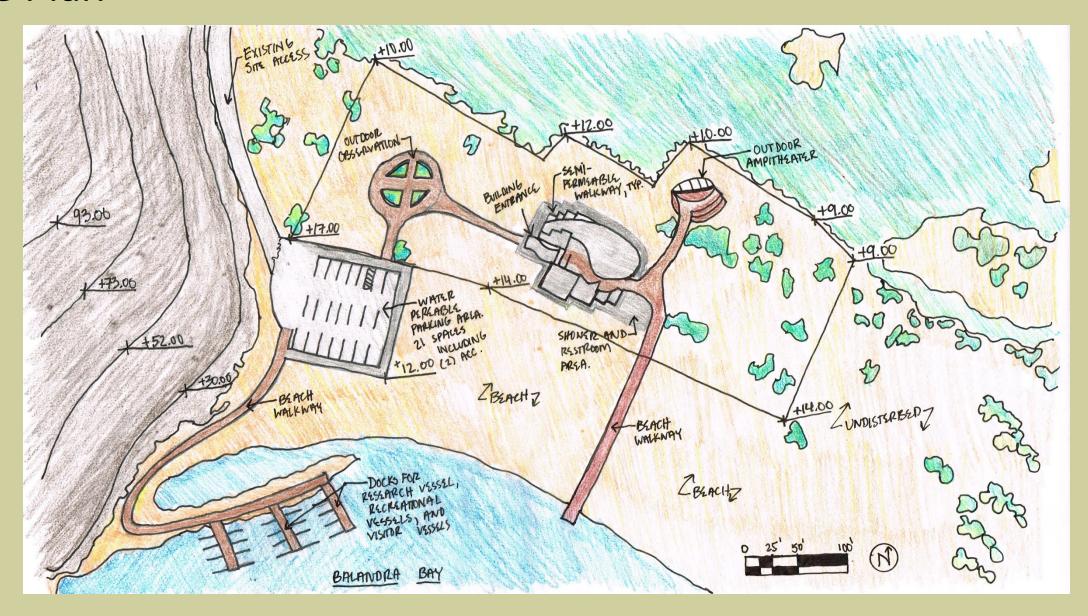


Curvilinear elements

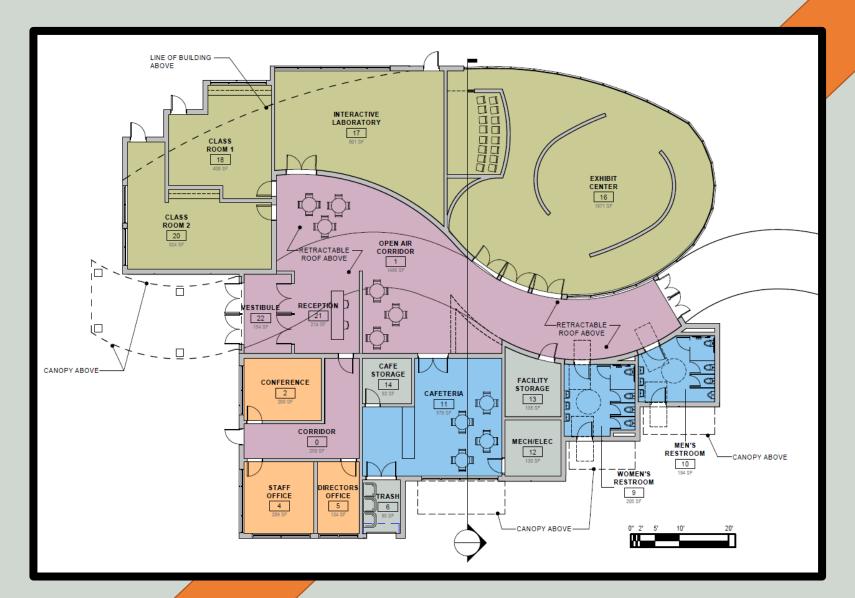


PORTAL STUDY MODEL – SIDE 2

Site Plan

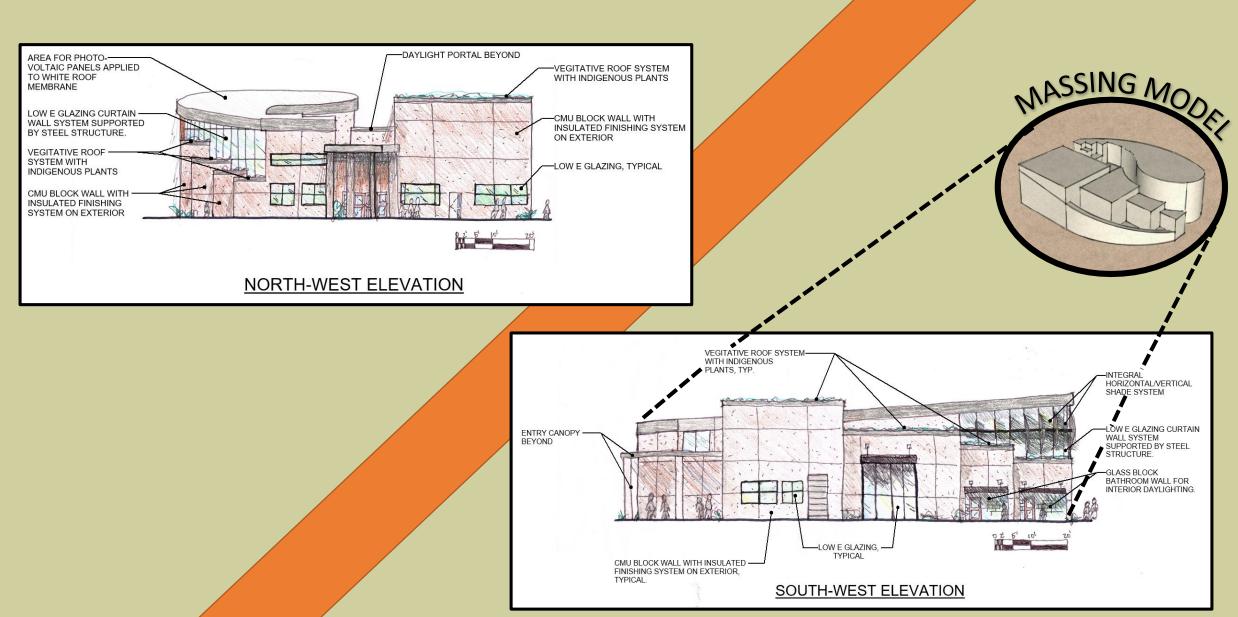


Floor Plan

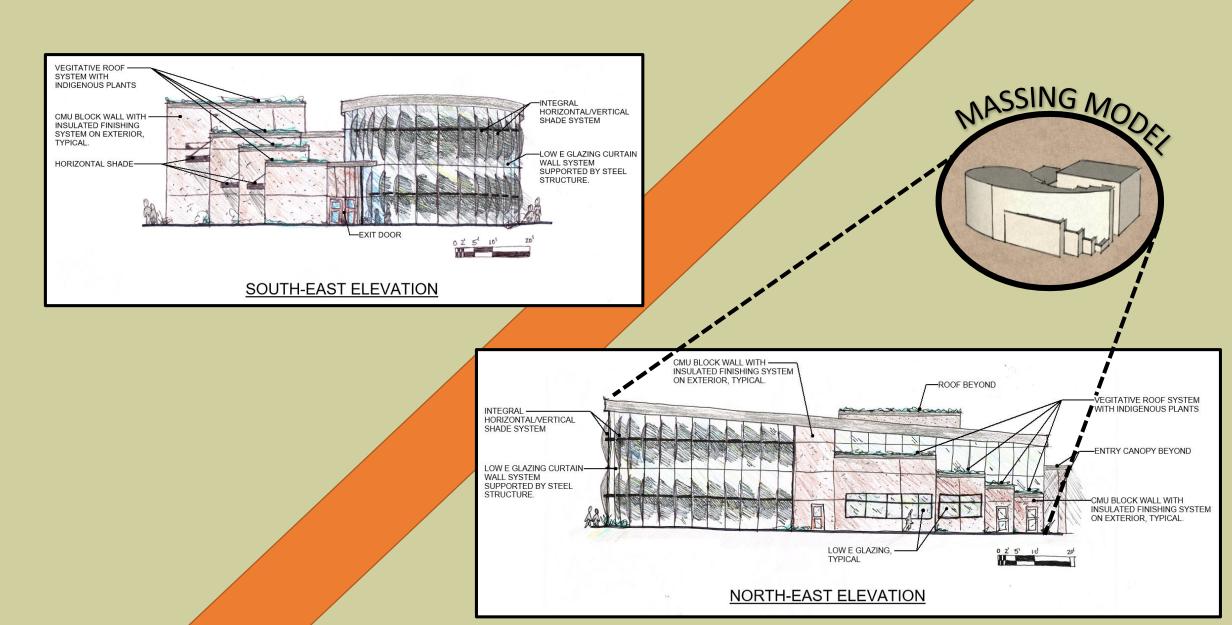


EDUCATIONAL CIRCULATION EDUCATIONAL ADMIN. UTILITY/ **STORAGE**

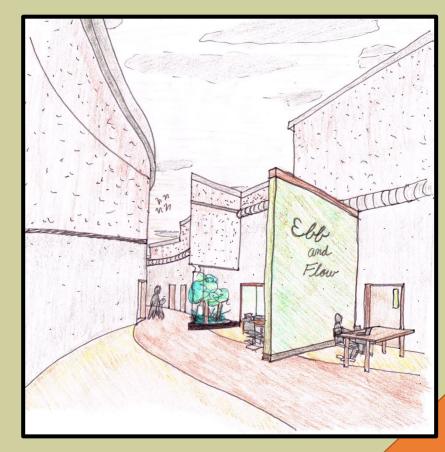
Exterior **Elevations**



Exterior Elevations



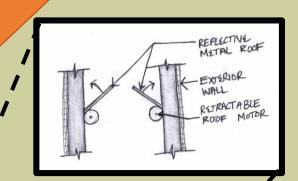
Section/Perspectives

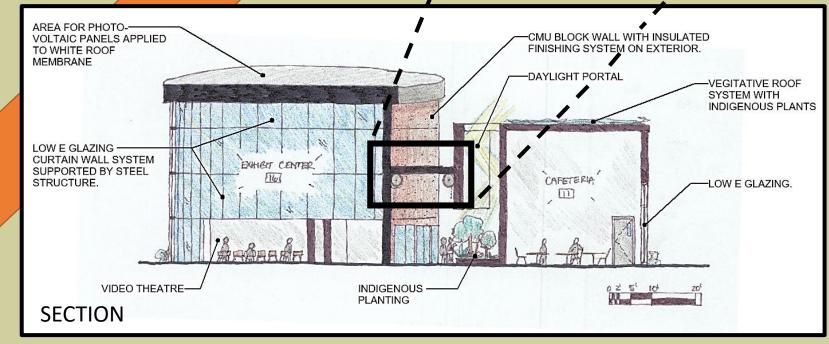


INTERIOR PERSPECTIVE

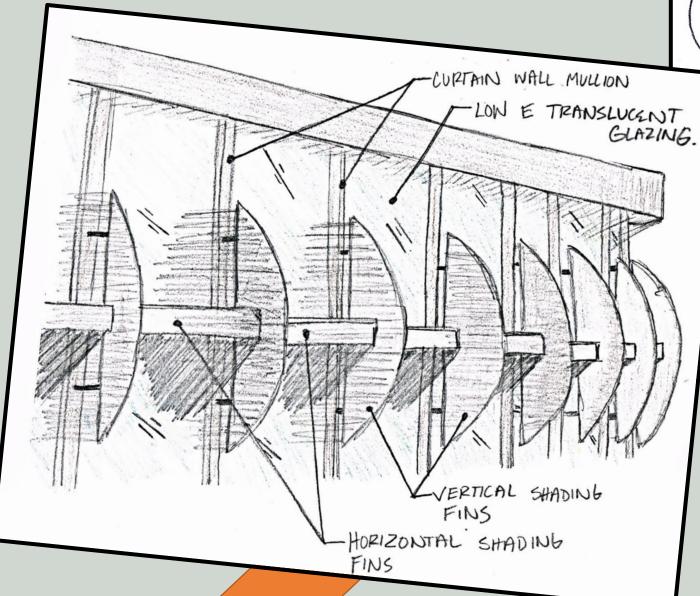
HIGHLIGHTED SUSTAINABLE FEATURES:

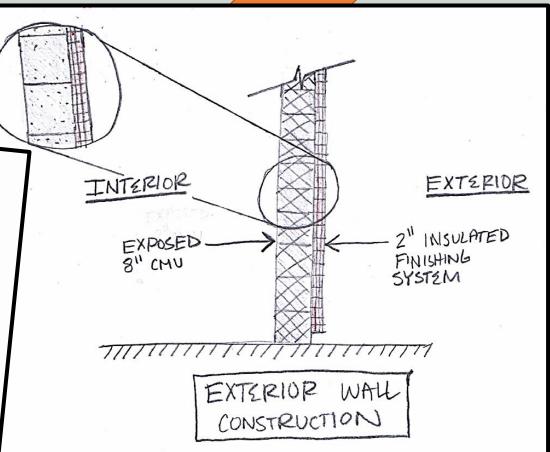
- Retractable roof portion to allow for natural ventilation
- Horizontal and vertical shade systems and the use of translucent glazing and glass block to allow for natural daylighting without passive solar heat gain.
- Sustainable MEP systems that responds to building occupancy.
- Vegetative roofing systems as a roof insulator and for water management purposes.
 - Concrete block exterior walls insulated from exterior as to not absorb heat from the sun, but exposed on interior to absorb heat from interior spaces.





DETAIL SKETCHES





Model Photos







