

Welcome to
Sustainable Theme Park
and Museum

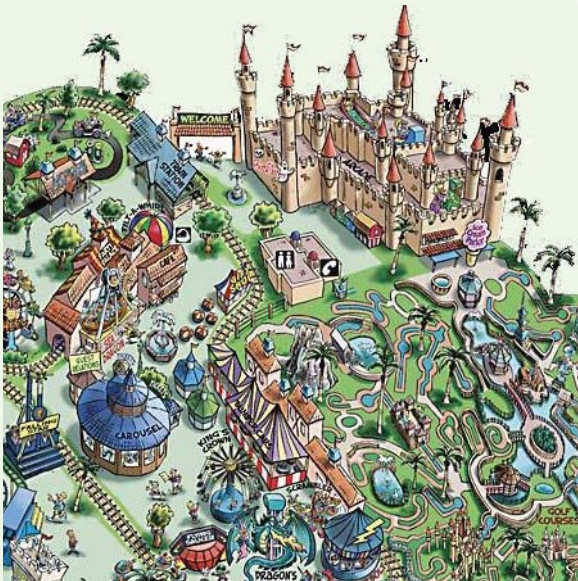
Case Statement

This project is an indoor facility consisting of both theme park and museum components with the integration of green and sustainable elements.

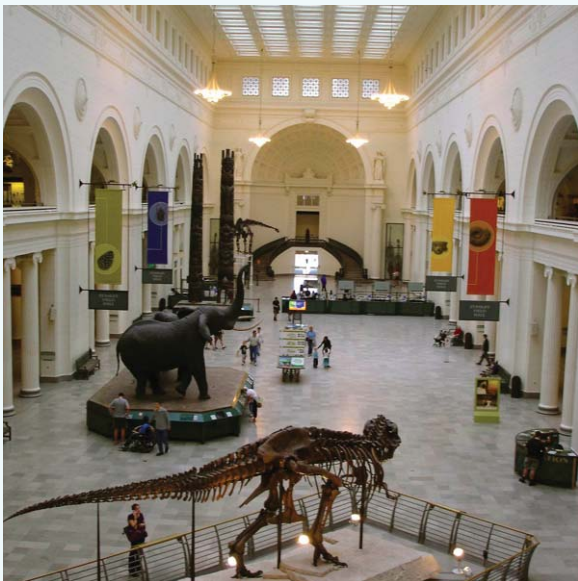
What is it?



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Reasons

The reason I chose this topic is because I am interested in the design of theme parks and the rethinking of its design to address sustainability issues. This project is important because we need to educate the younger generation on issues and preventative solutions toward sustainability in a fun and interesting way. This facility will not only be educational, but will also create a stronger bond among family and friends.



Why is it important?



Themes

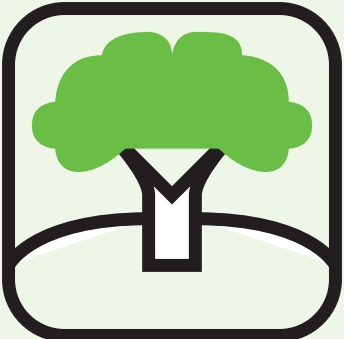
There are 4 major themes of sustainability that is used for this building.



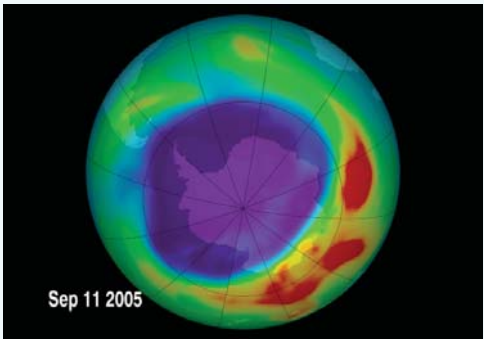
Water



Fire
(Energy)



Land
(Earth)



Air



Themes

Each theme consists of 3 levels: history, problem, and solution. The museum has of 12 exhibition spaces.



History

History of aquatic lives

Water pollution

Problem

Lack of fresh water
Water wasting
Rise of sea level
Flood/ Tsunami
Lack of water cycle

Solution

Desalination

Less wasting water

Recycle water



History

Industrial revolution

various forms of energies

Transportation Development

Problem

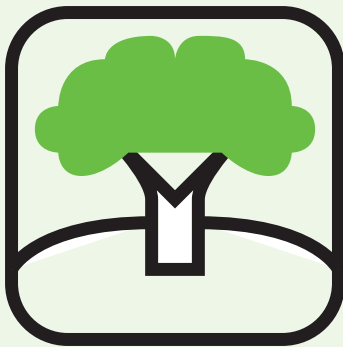
Low in fossil fuel

Transportation

Wasting energy

Solution

Recycle energy
Use of clean energy
Save energy
Use of eco car
Use of public transportation
Use of less fossil fuel



History

Exceed use of papers
Exceed use of trees
Birth of Earth
Urbanization
More Concrete

Problem

Less trees

Wasting of trees

Decrease of animals

Solution

Plant more trees

Walk and Bike



History

Global Warming

Problem

Acid rain
Air pollution
Exceeding CO2
Ozone layer depletion
Global Warming

Solution

Produce clean air

Sub-Themes

There are 2 sub-themes that are also important toward sustainability. These 2 themes do not have specific exhibition space but are expressed through restaurants and trash bins.



Food

History

- Fast food
- Transportation
- Development

Problem

- Obesity
- Waste in food
- Transportation energy

Solution

- Eat healthy
- Local food
- Organic food

Program

- A healthy restaurant
- with organic food



Material

History

- Natural material
- New material

Problem

- Waste material
- Too much trash
- Waste management

Solution

- Reduce
- Reuse
- Recycle

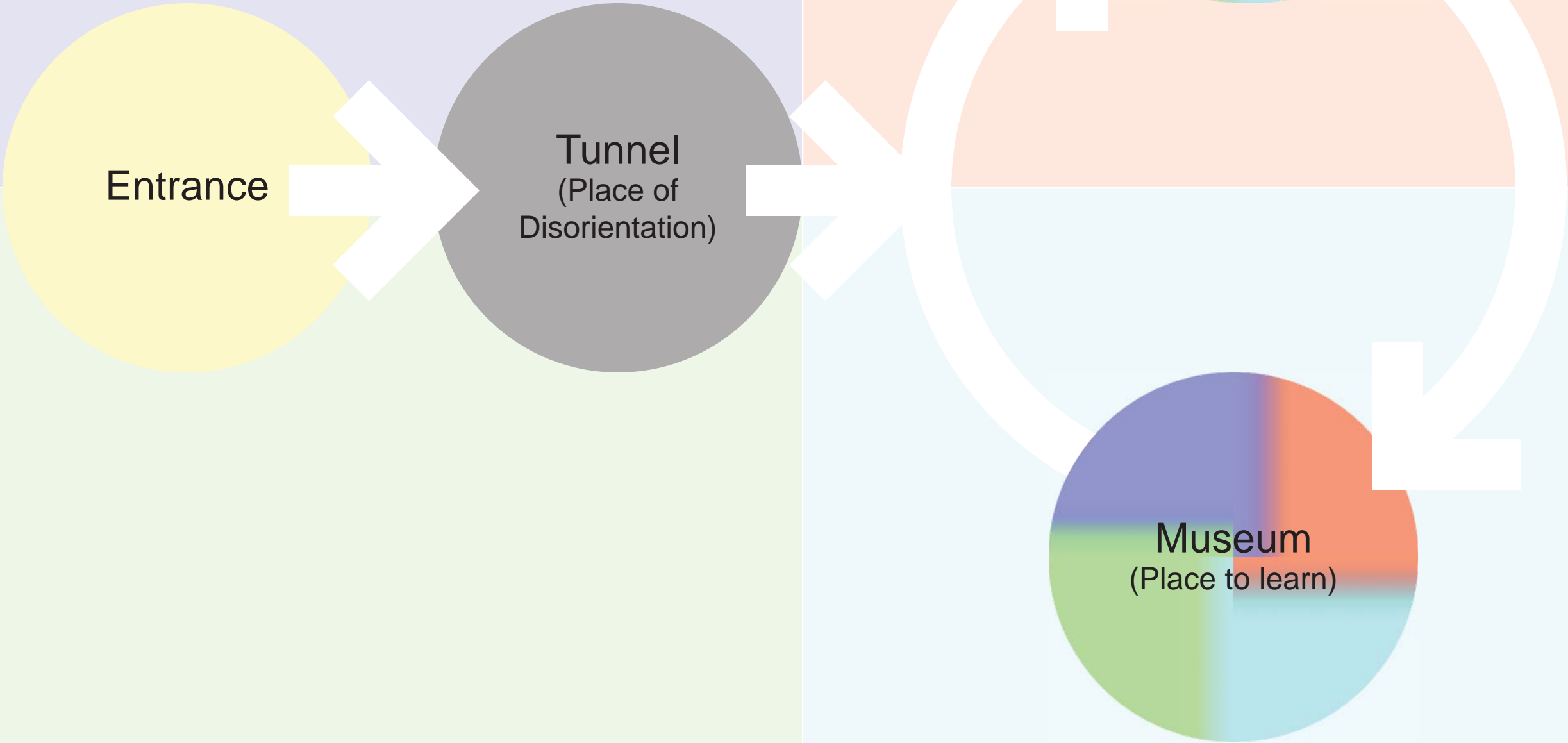
Program

- Minimize trash
- 3Rs
- Recycle management



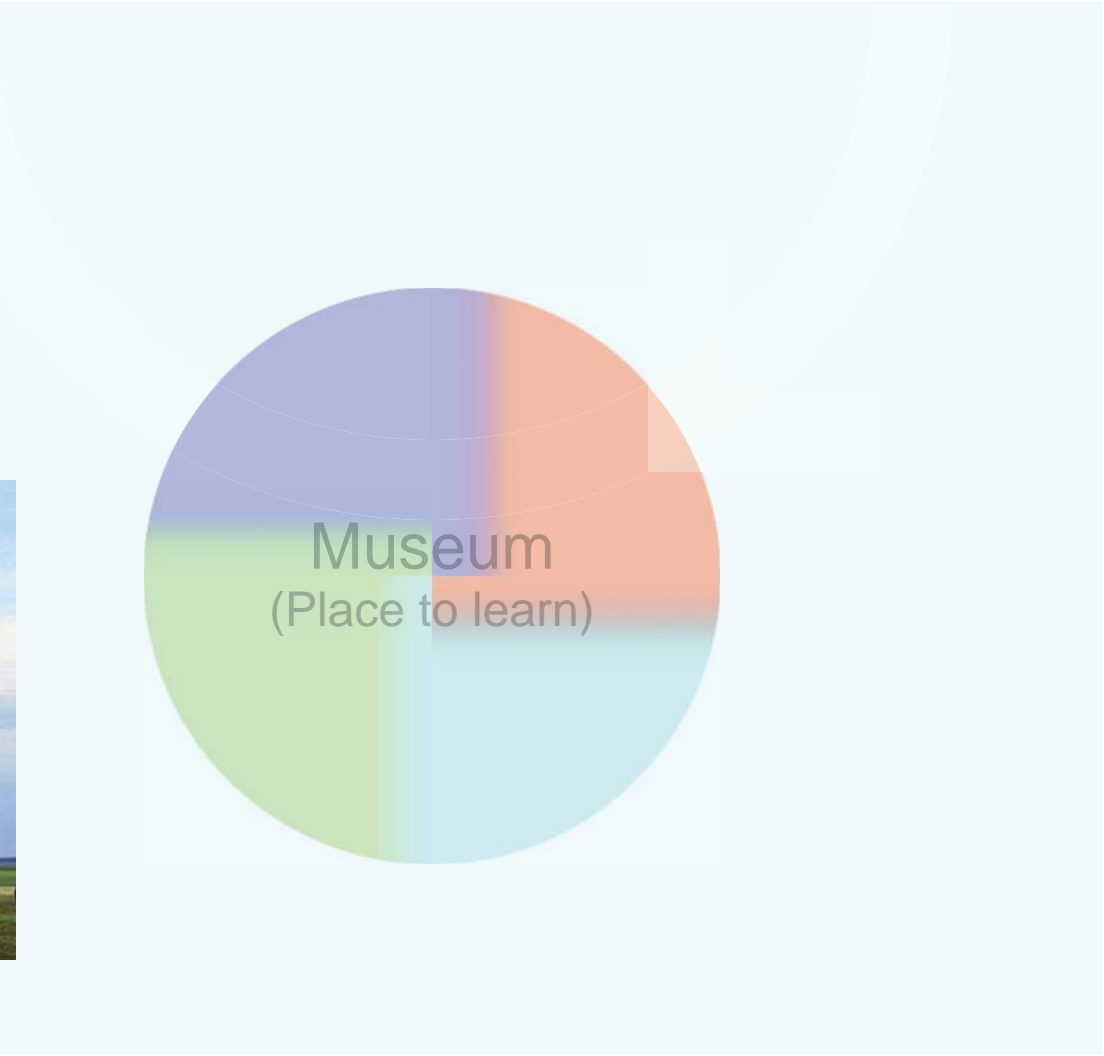
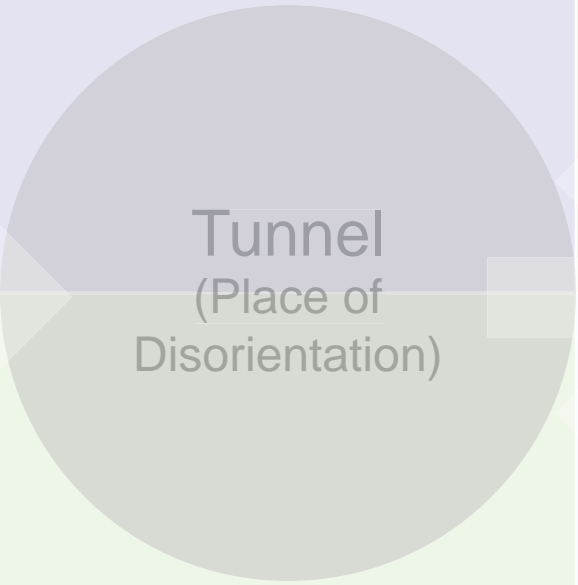
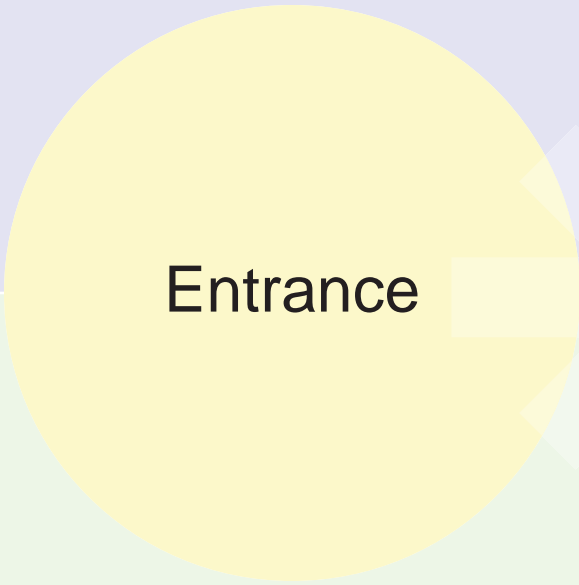
Bubble Diagram

This simplified bubble diagram explains the 4 major elements of the design intent.



Entrance

First bubble is the entrance of the building. Visitors are able to see the exterior exhibits of the building and views from the entry would give them a pre-view of the inside activities.



Place of Disorientation

The second bubble is about a space called “Place of Disorientation.” This is where people strip away their original belief toward the environment and prepare to learn and develop new understandings as they walk through the tunnel. For example, many people are influenced by western culture where they believe that humans are supposed to dominate the environment and develop and increase in number.



Entrance

Tunnel
(Place of Disorientation)



“God blessed them and said to them, ‘Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground.’”

-Genesis 1:28

Theme Park
(Place to engage and have fun)

Museum
(Place to learn)

Place of
Disorientation

However, people should not dominate the environment since it has been helping humans develop. People will cease to develop in the future if they continue to dominate the environment. It is important for humans to save and preserve the environment, and to keep in mind that we are just borrowing, not dominating it.



"Treat the earth well:
it was not given to you
by your parents, it was
loaned to you by your
children. We do not in-
herit the Earth from our
Ancestors, we borrow it
from our Children."
-Ancient Indian Proverb

Entrance

Tunnel
(Place of
Disorientation)

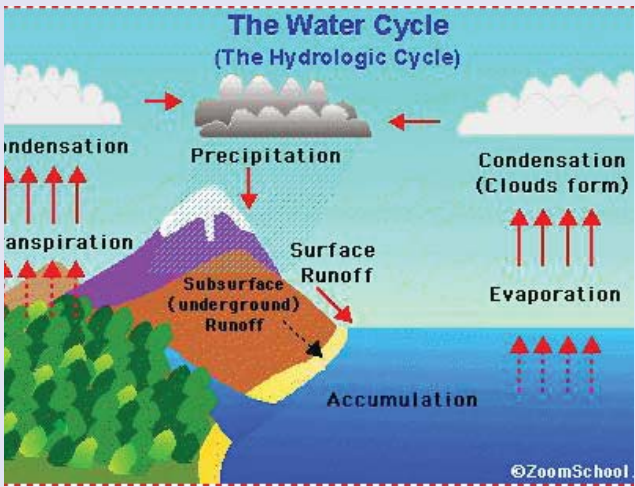


Theme Park
(Place to engage
and have fun)

Museum
(Place to learn)

Place to Learn

After the place of disorientation, one is directed to the museum where he/she can select one theme (Air, Earth, Energy, and Water) and move from History level, Problem level, and to Solution level. In other words, one will acquire complete knowledge of a theme in sustainability when he/she goes through the 3 levels.

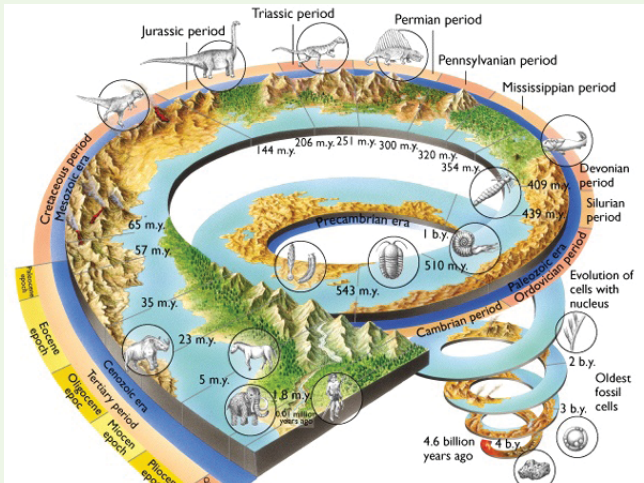


Entrance

Tunnel
(Place of
Disorientation)

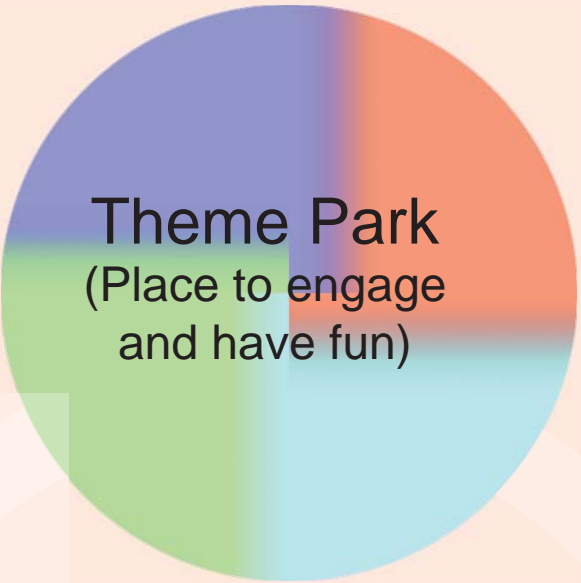
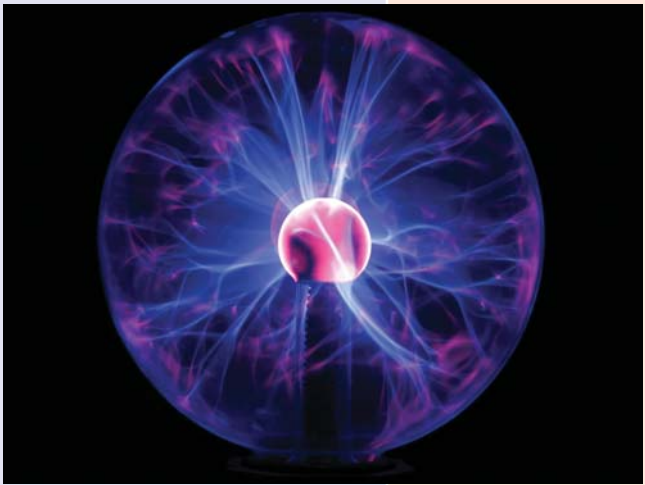
Theme Park
(Place to engage
and have fun)

Museum
(Place to learn)

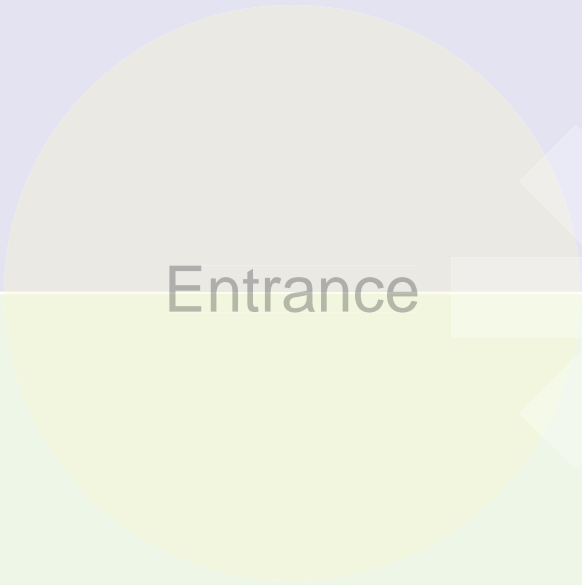


**Place to engage
and have fun**

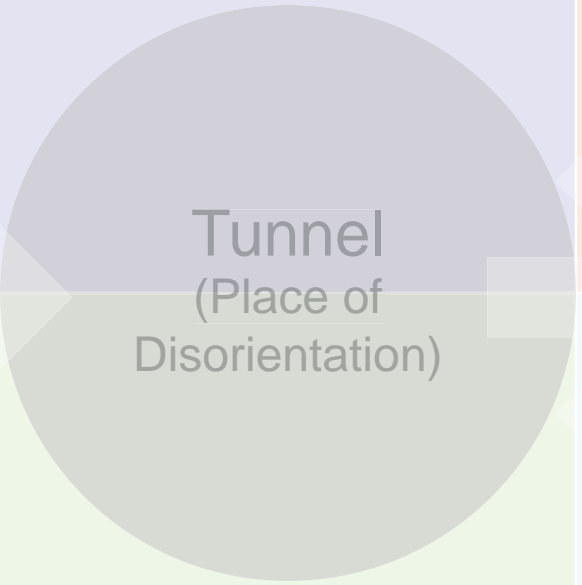
The theme park is accessed through the Museum. It is a part where one engages with sustainable attractions and simply have fun. Going through 3 levels of one theme in the museum and engaging in an attraction in the theme park is considered as one routine. One will continue the same sequence with other themes after completing one routine.



Theme Park
(Place to engage
and have fun)



Entrance



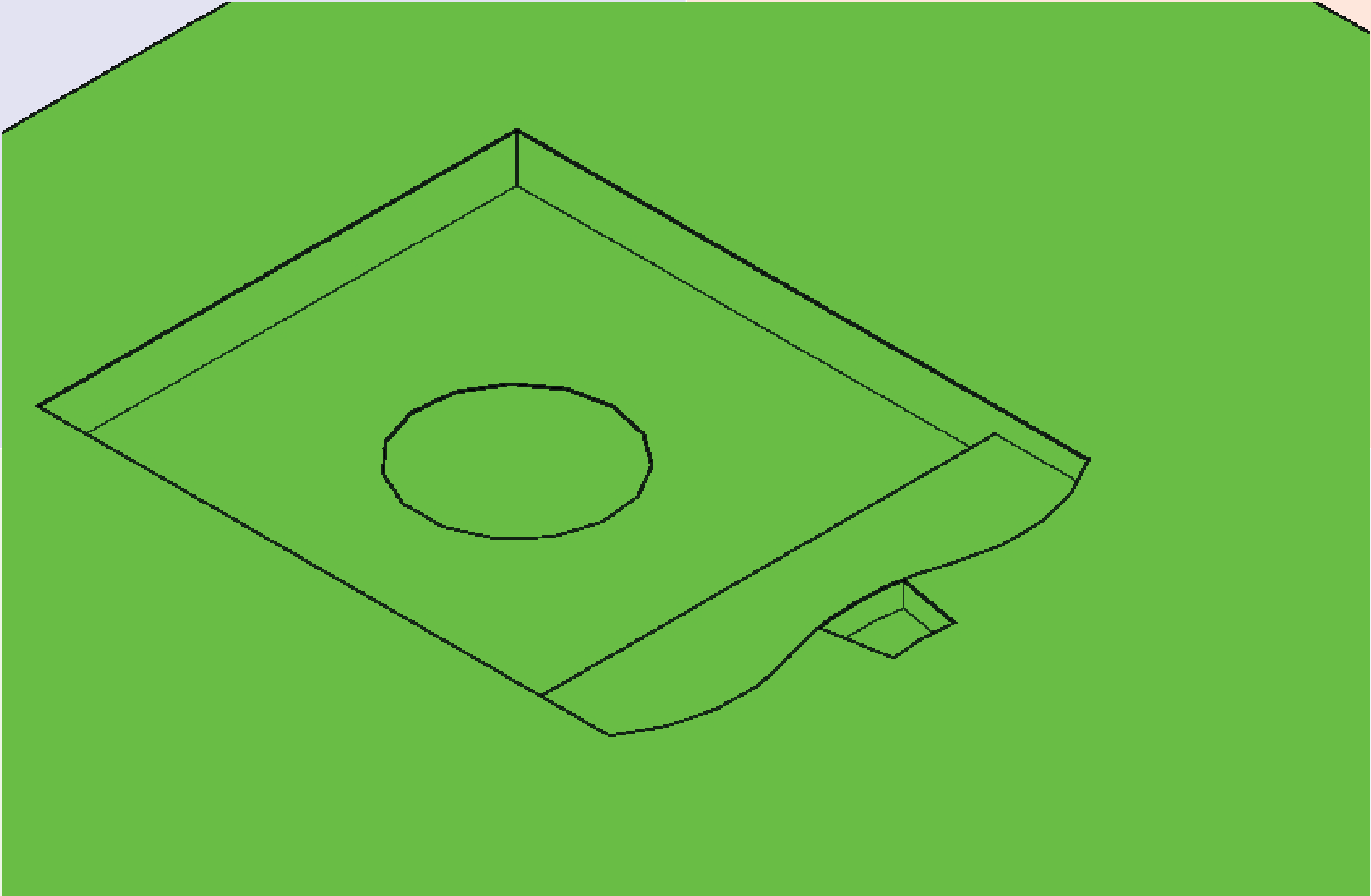
Tunnel
(Place of
Disorientation)



Museum
(Place to learn)

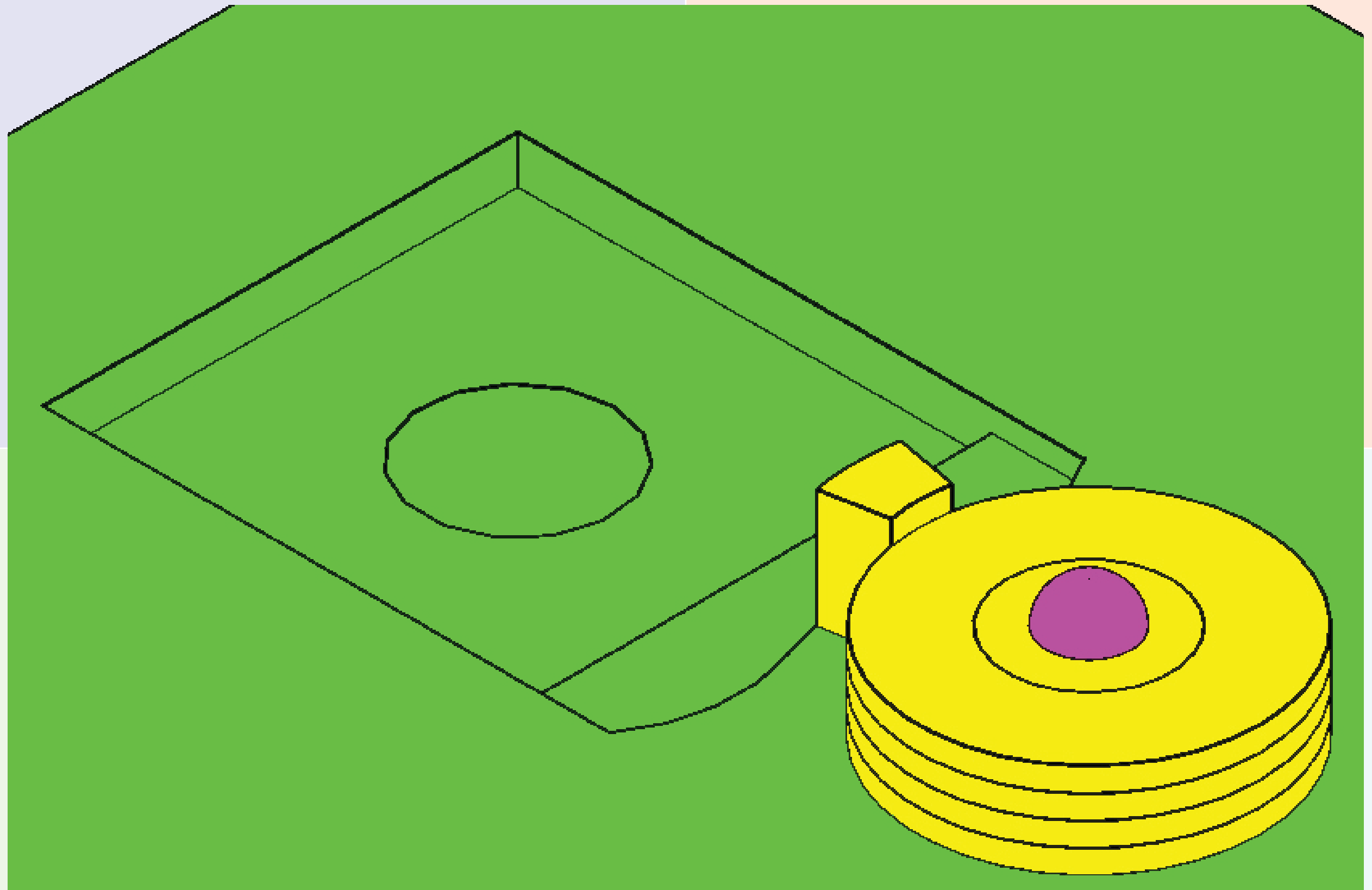
Site

Application of the
previous bubble
diagram into the
prototypical site.



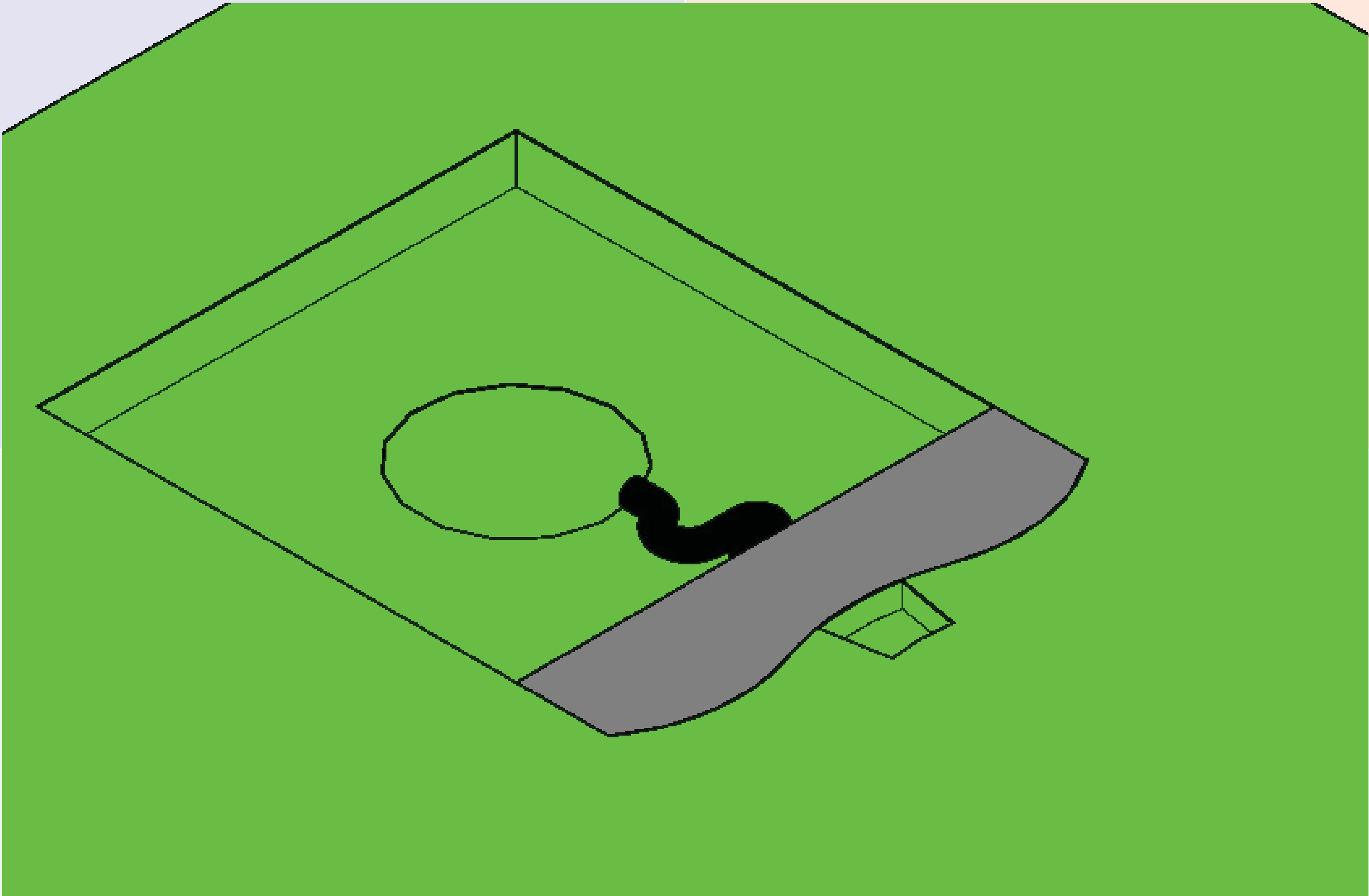
Parking Lot

Yellow represents the spiral parking lot that illustrates the circulation of the museum/theme park building. Pink represents a small exhibit that teaches one how to be sustainable through transportation.



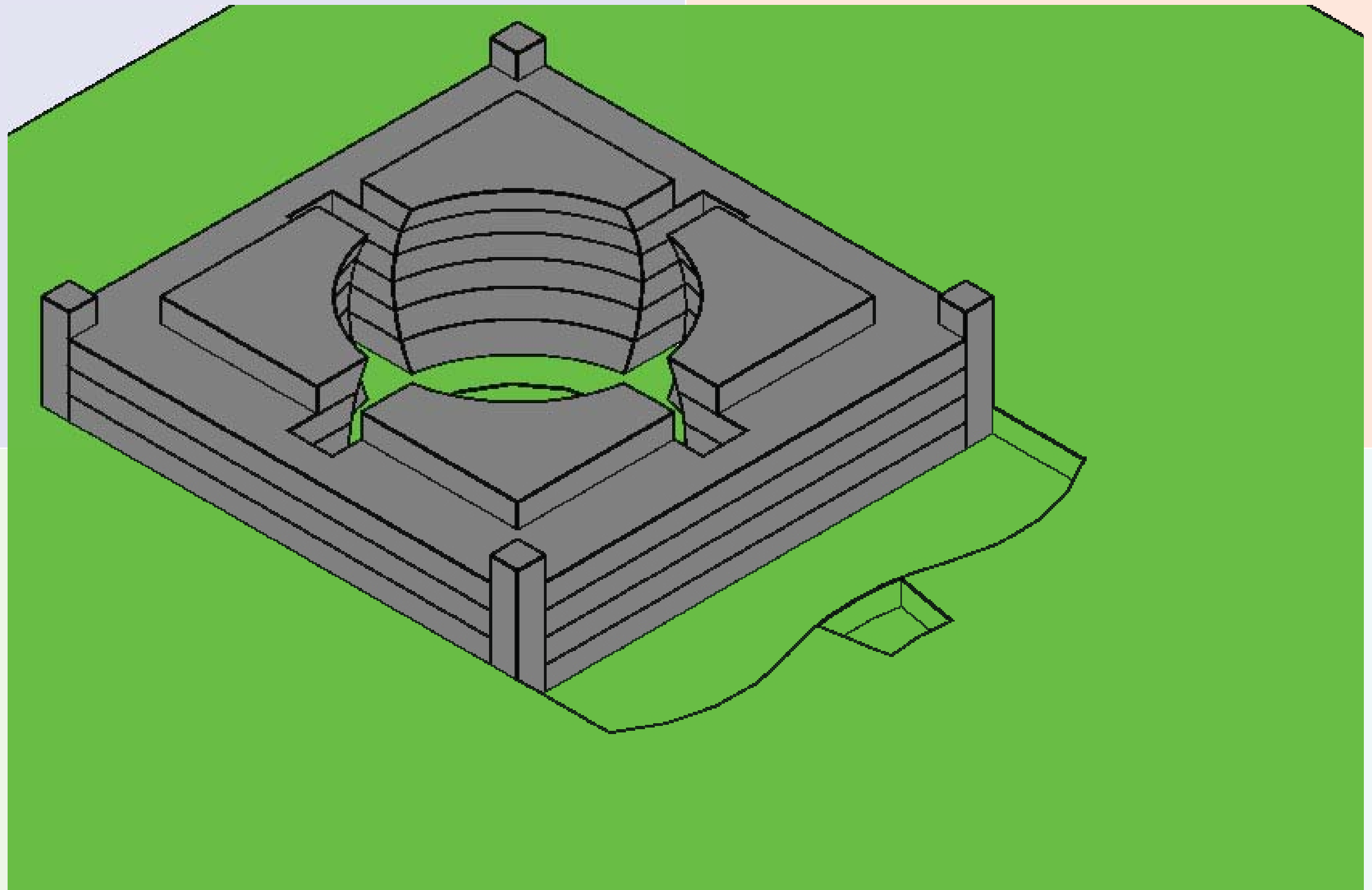
Entrance and Tunnel

Gray represents the main entrance hall where you can find ticket booths and museum stores. Black represents the “Place of Disorientation” that connects entrance hall and the theme park sphere. The entrance and Place of Disorientation are located in basement level.



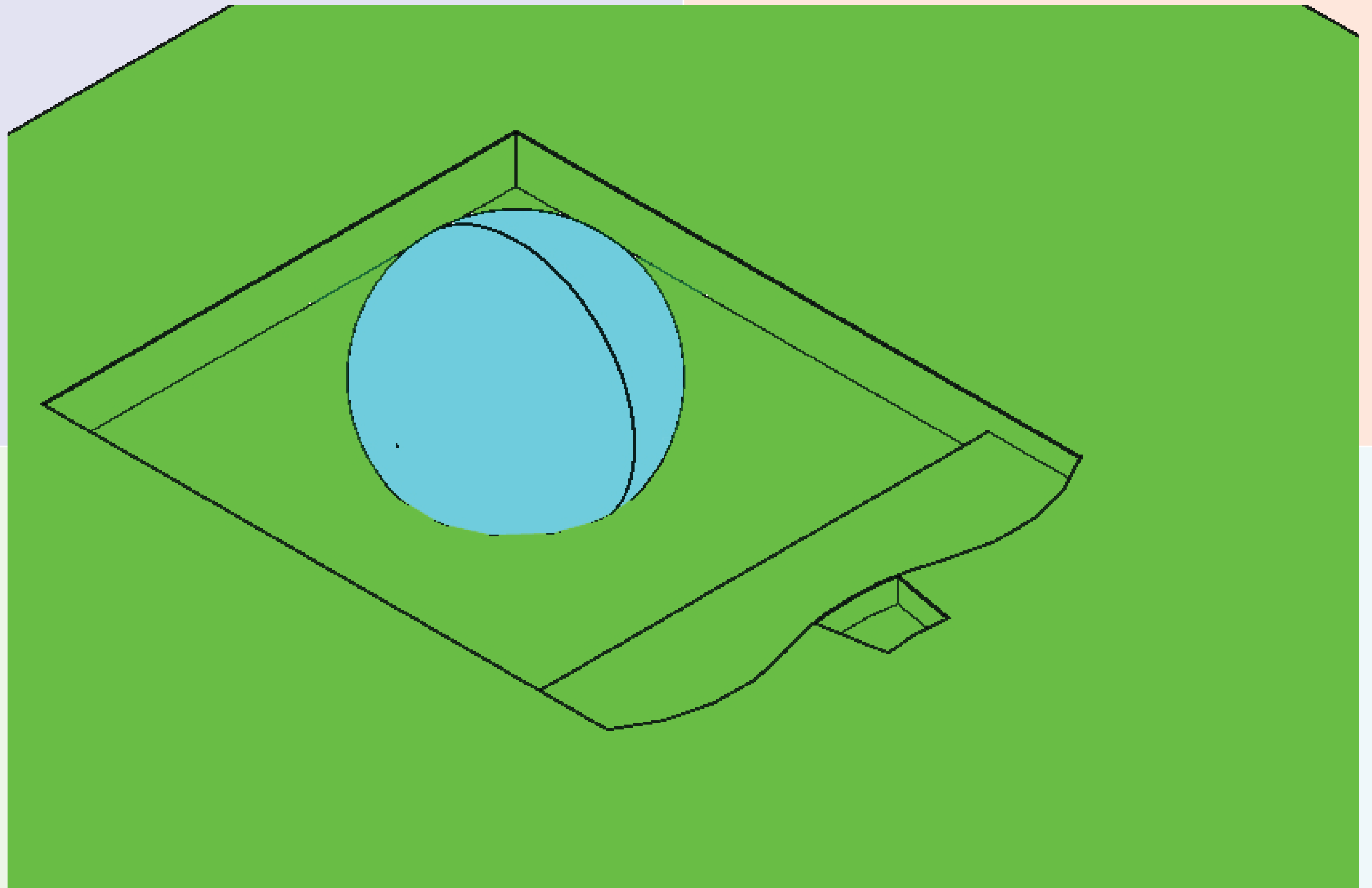
Museum

This is the museum part of the design. There are 2 basement levels for support and 4 upper ground levels for the museum. are located in basement level.



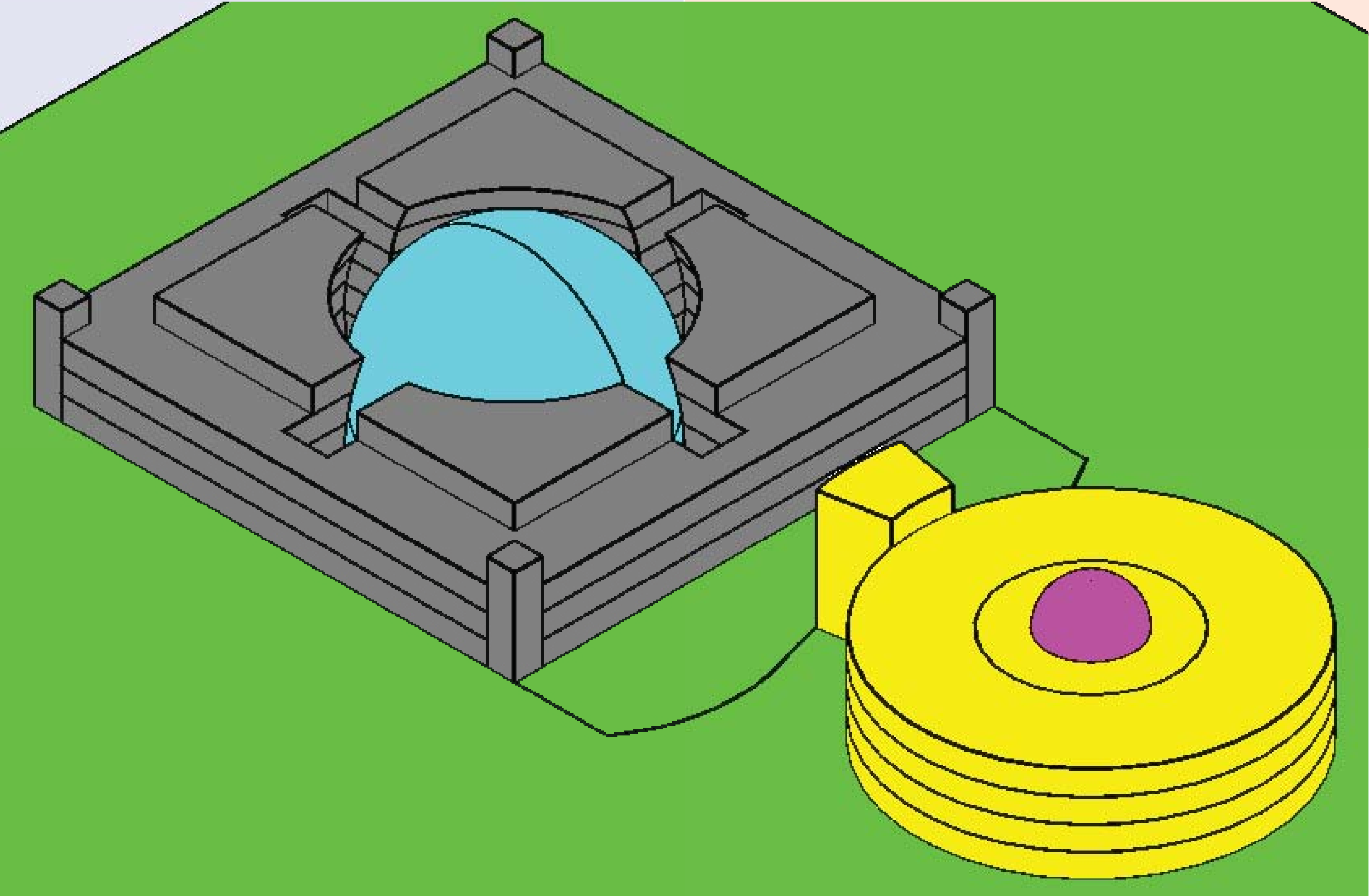
Theme Park

The sphere is the center piece of the design. This is where theme park is located.



Overall Design

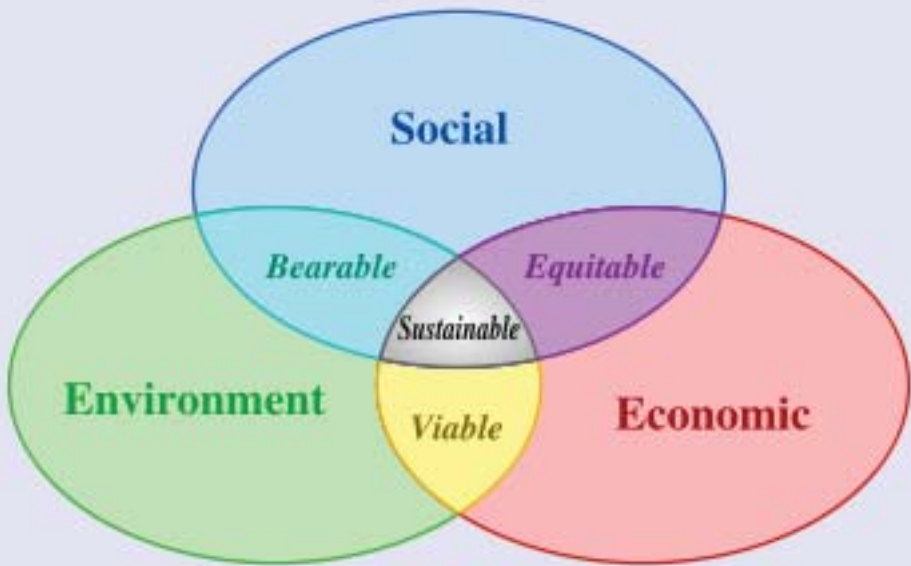
- Yellow-Parking
- Pink-Transportation Exhibition
- Green-Site and Entry hall
- Gray-Museum
- Blue-Theme Park



Site

This design is an universal design and non- site specific. listed are the criteria for the site, and the building can be applied to any city meeting the criteria.

The building is non-site specific. The building can be repetitive and plugged into any cities. In order to be a sustainable building, the site has to be socially, environmentally, and economically sustainable.



City

The site has be close to a city with many people in order to be socially sustainable. If not enough people do not come to the place, the project would fail.

Bad example: suburbs

Land

There needs to be enough land and the building can not be placed over any parks.

Bad example: Manhattan, New York

Public transportation

Encourage people to use public transportation in stead of driving their own cars to reduce the use of fossil fuels. However there will be special parking spaces for eco-cars.

Bad example: Los Angeles

Rain

There needs to be moderate or more rain in order to recycle rain water for agriculture and flushing toilets.

Bad example: Las Vegas

Water

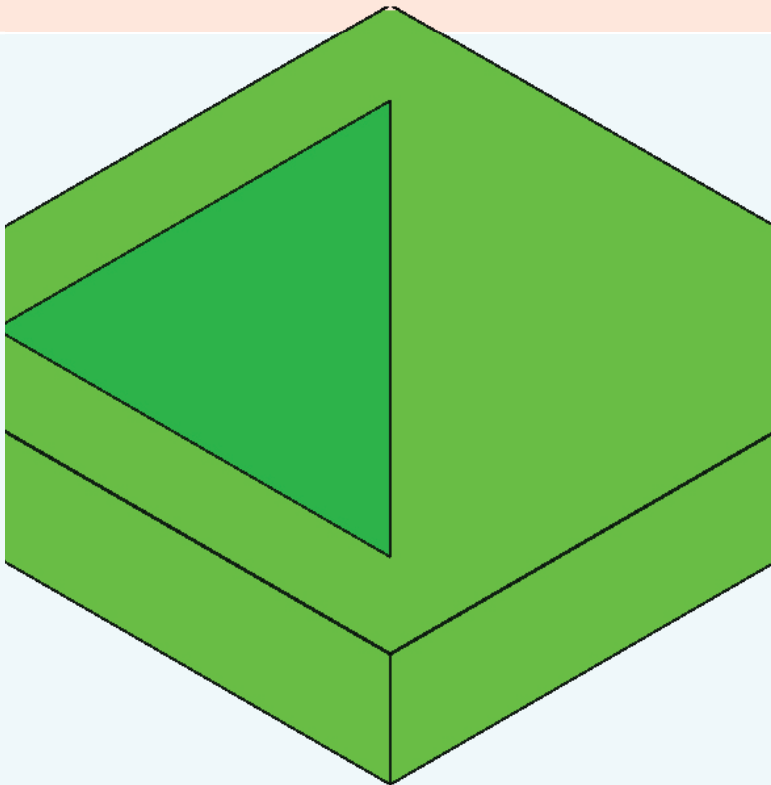
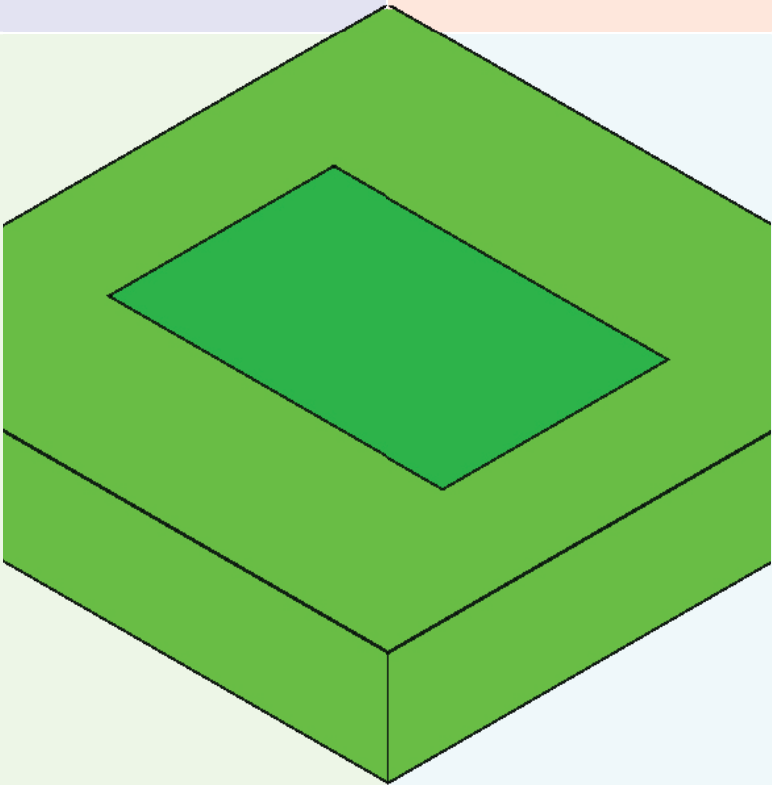
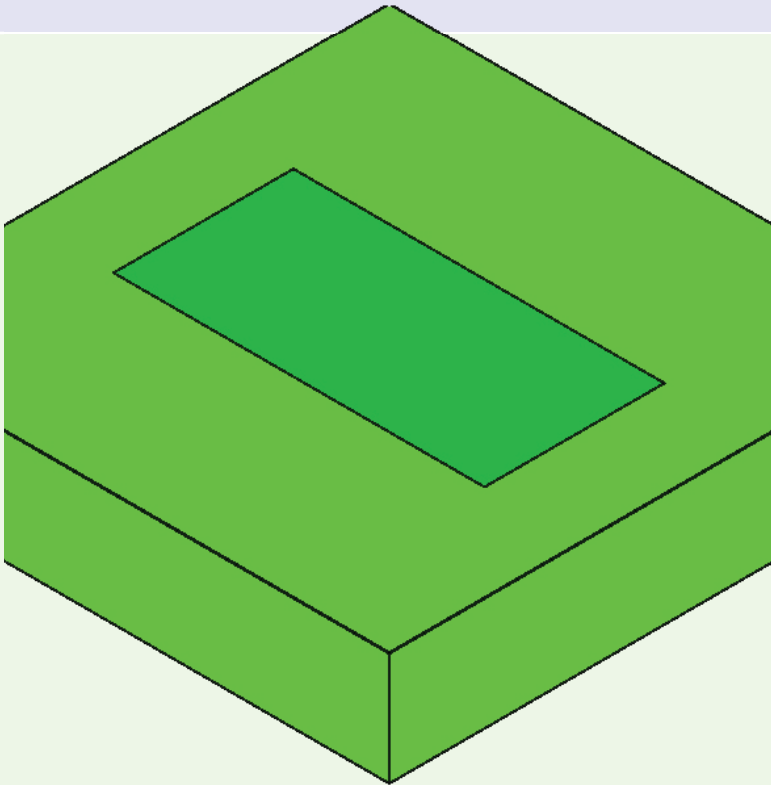
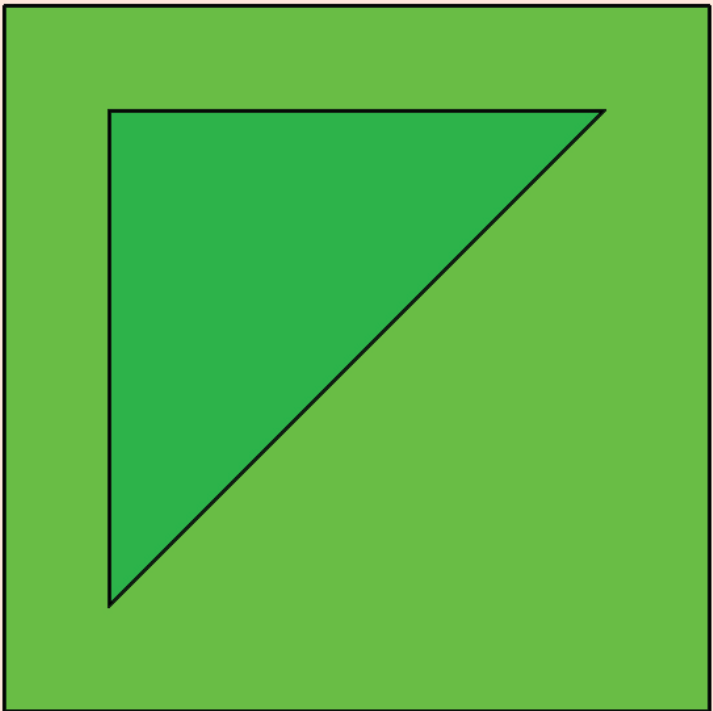
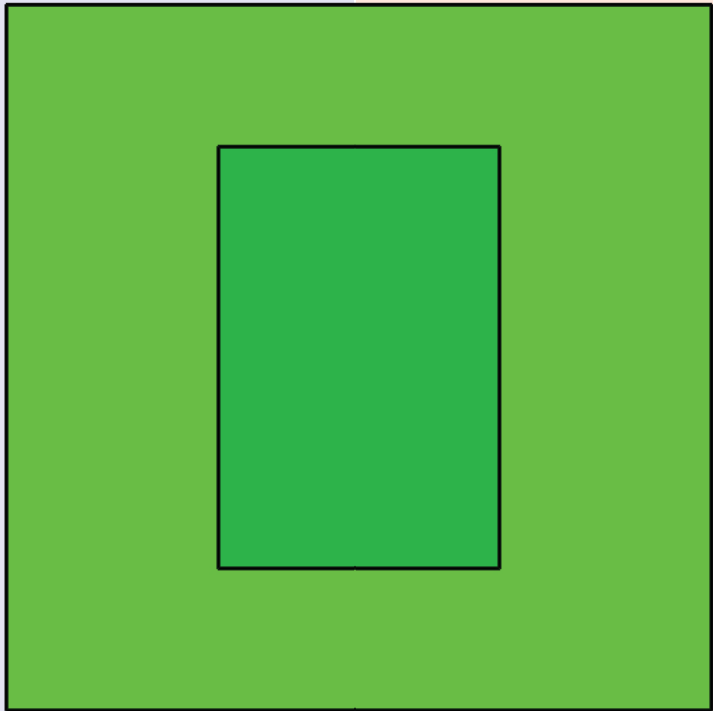
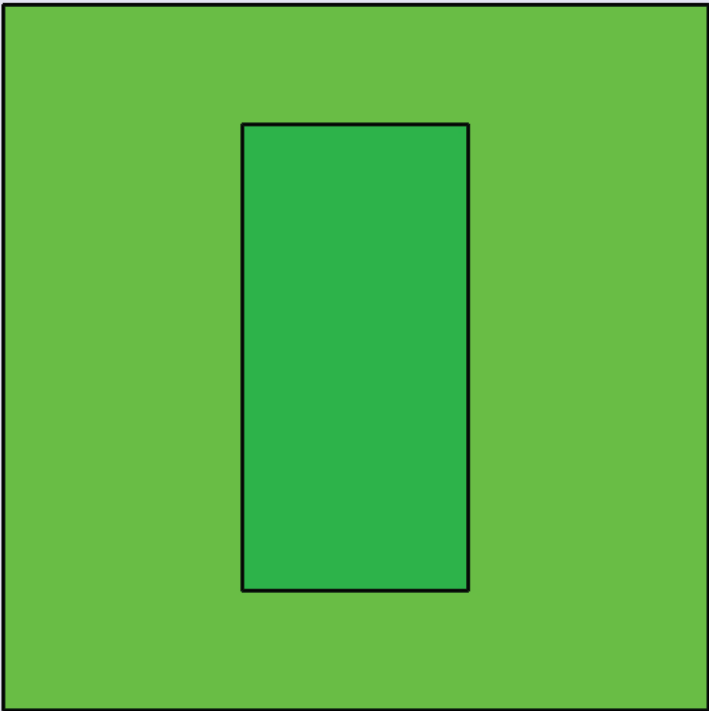
The site needs to be closer to water resources, such as rivers, lakes, or oceans, in order to be able to use water generated energy.

Sun and Wind

There needs to be moderate or more sun and wind on the site in order for photovoltaic panels and wind turbine generators work efficiently.

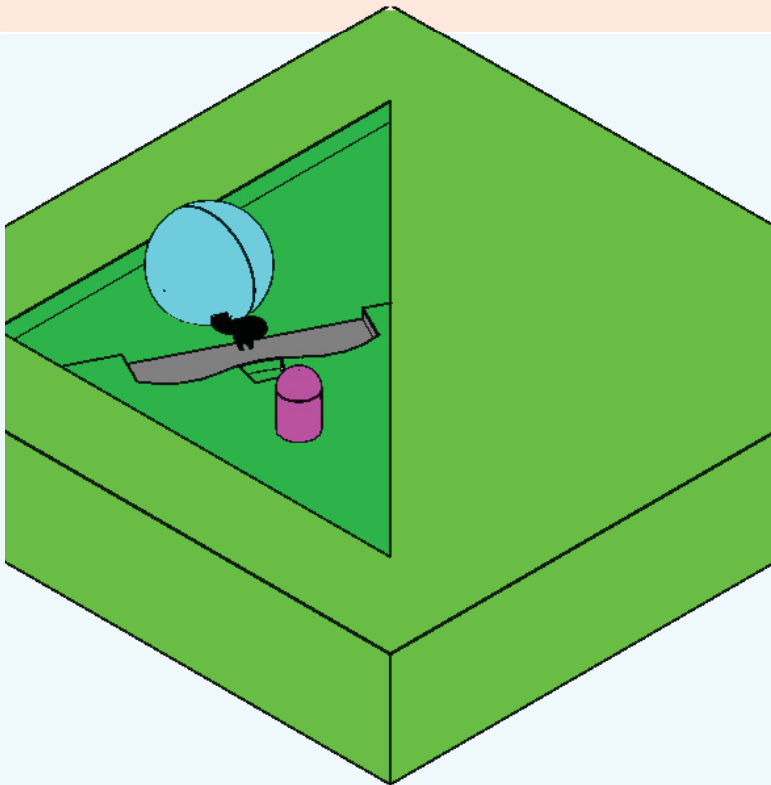
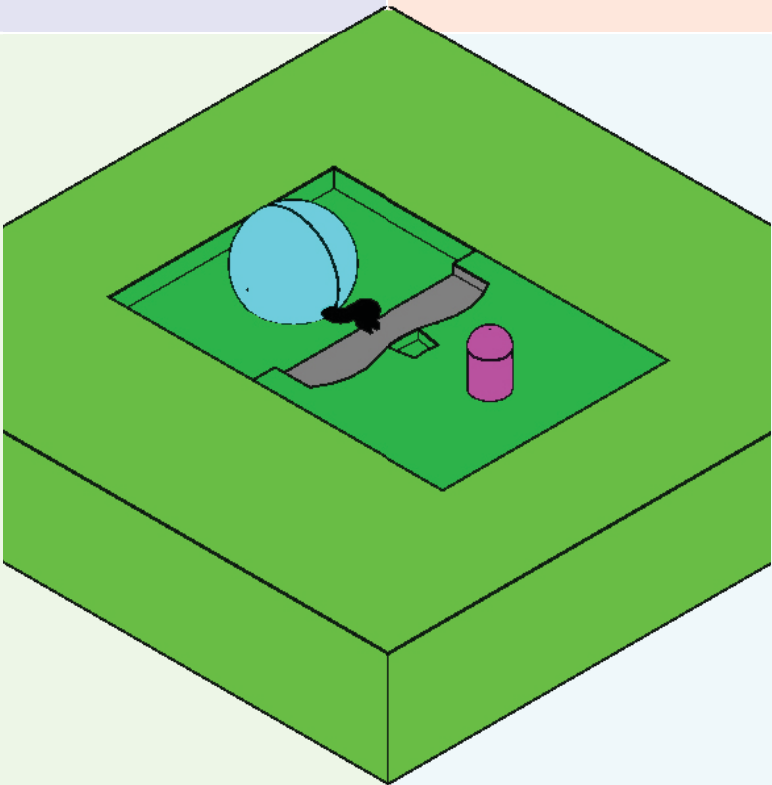
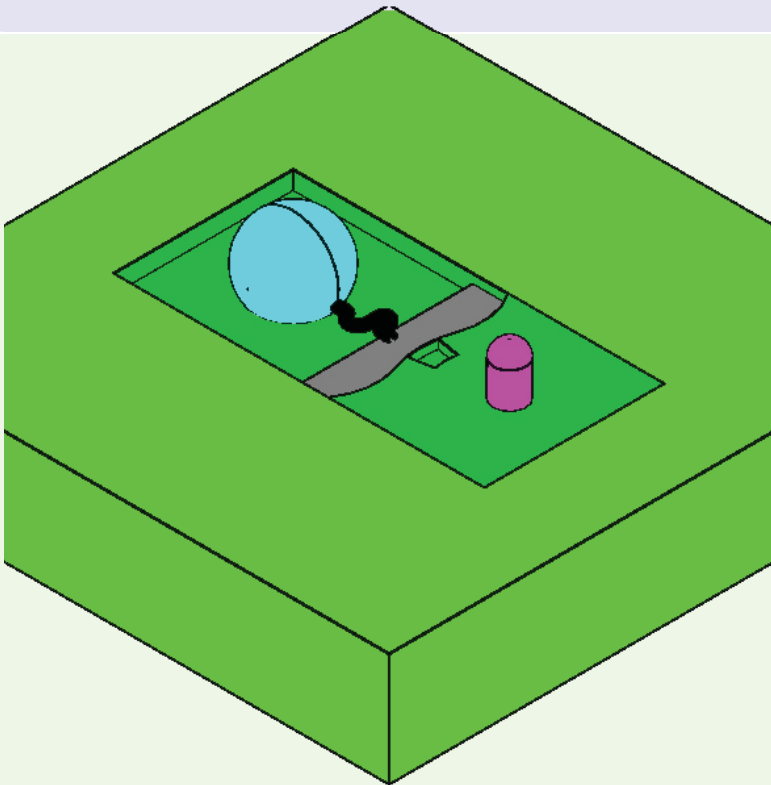
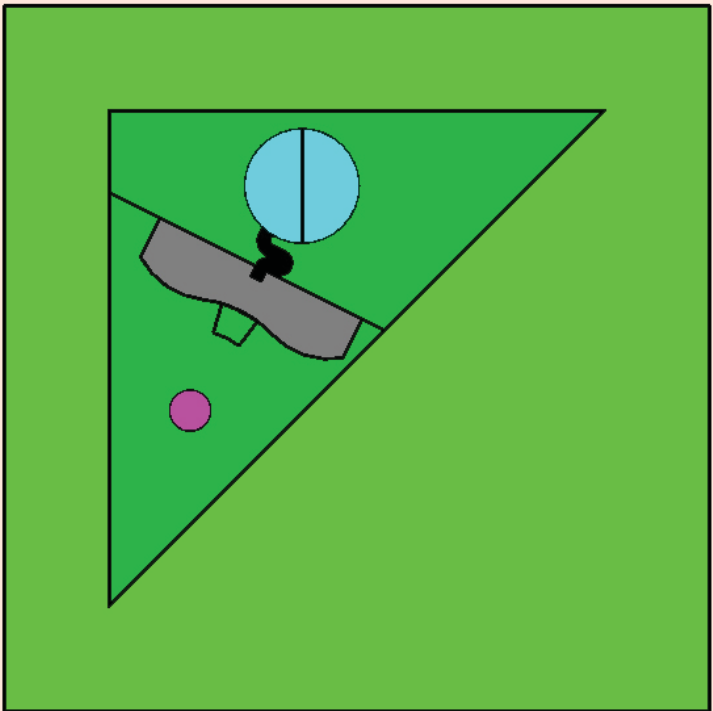
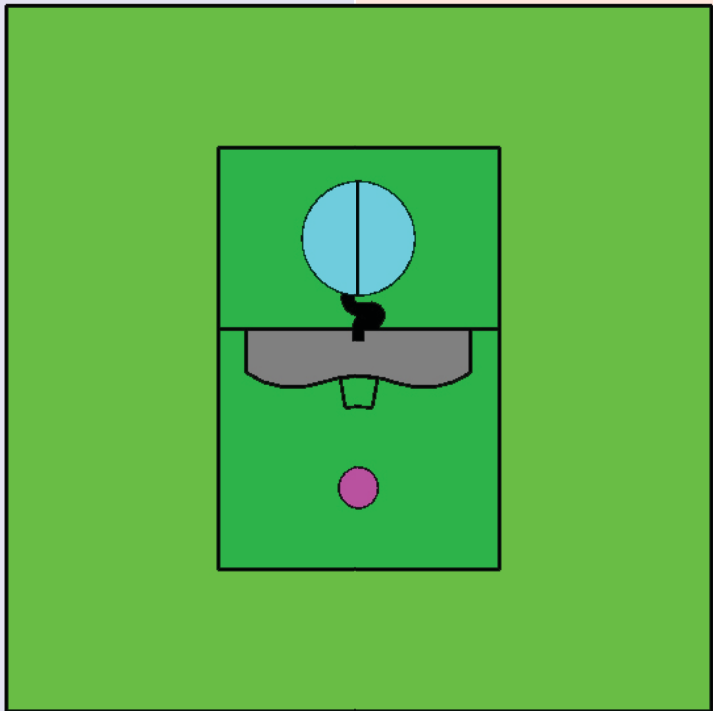
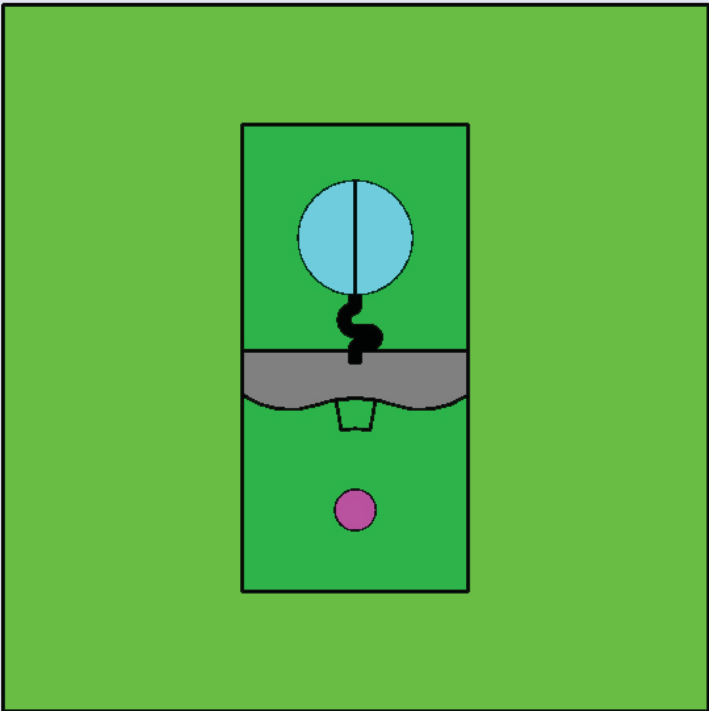
Non-site specific

The program of the building is not affected by the shape nor size of the site. These are the 3 proto-typical sites varying in size and shape.



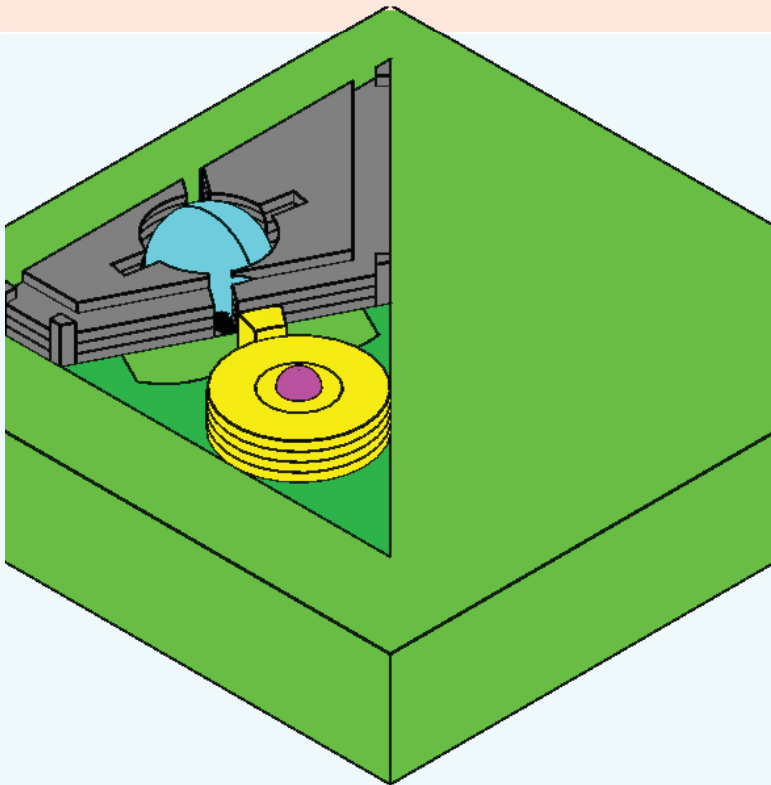
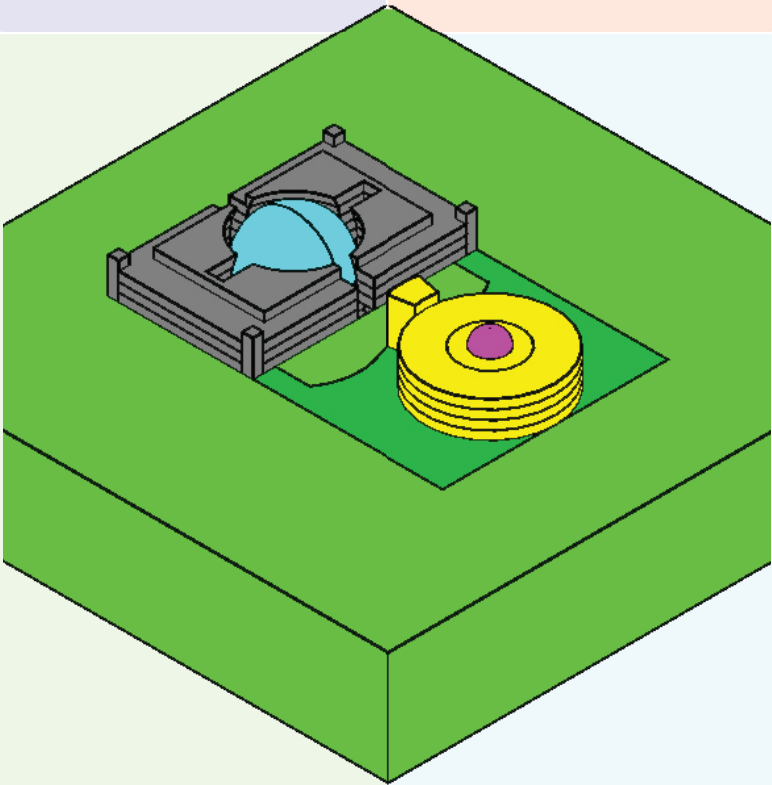
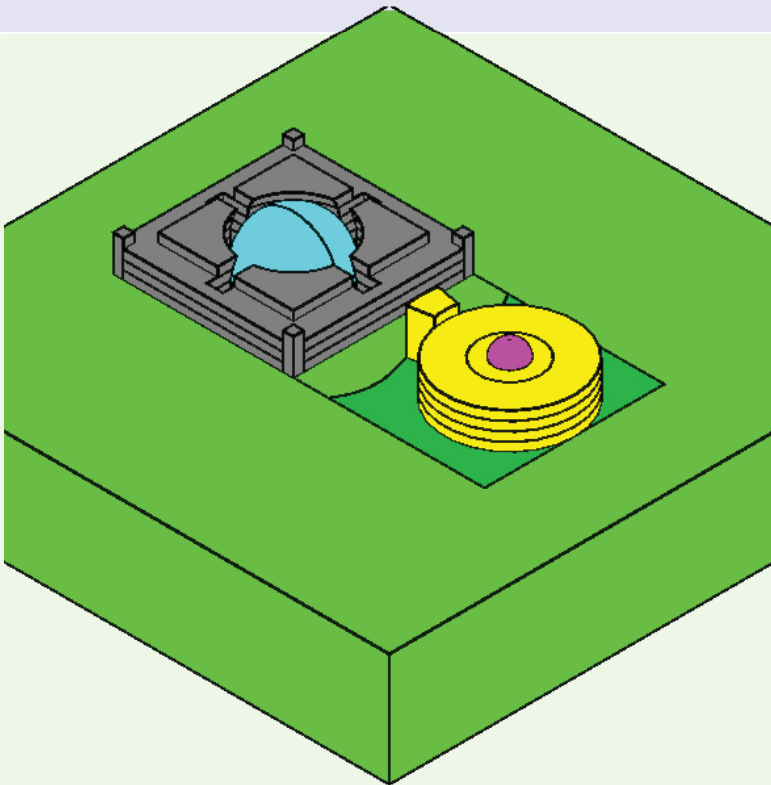
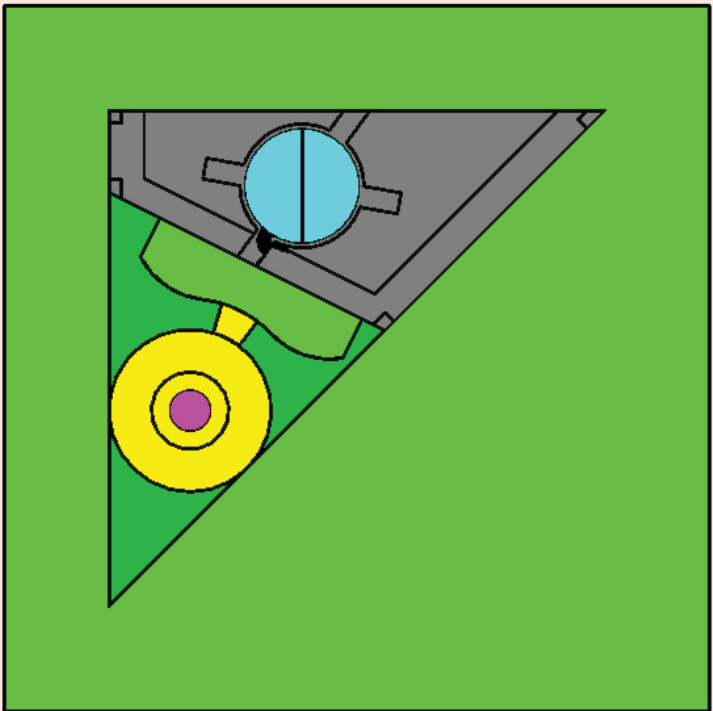
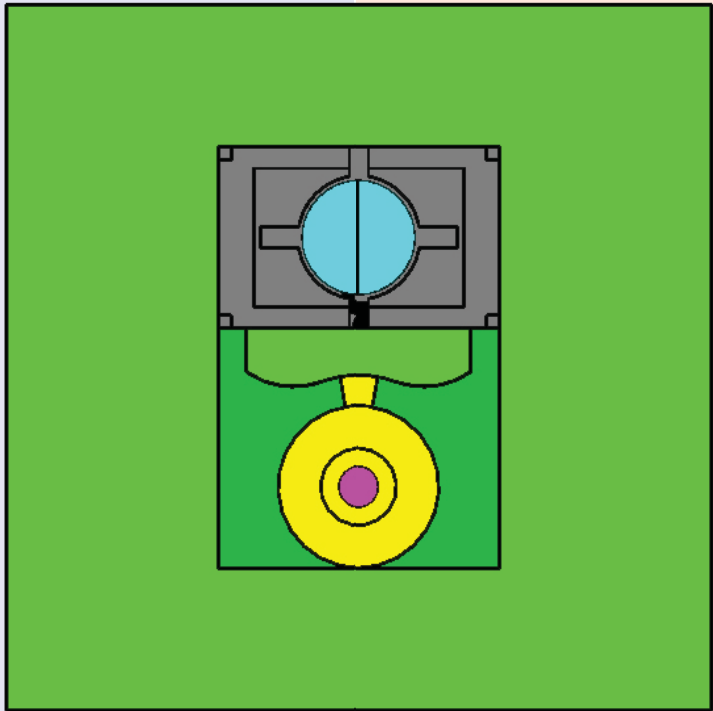
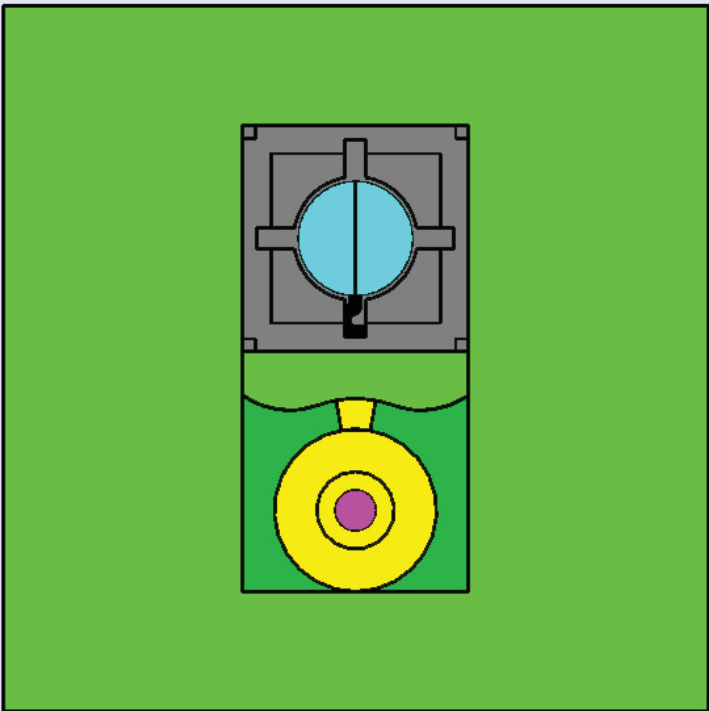
Non-site specific

The blue center piece sphere retains its shape and size, while the entrance hall and parking structure can be adjusted to the site.



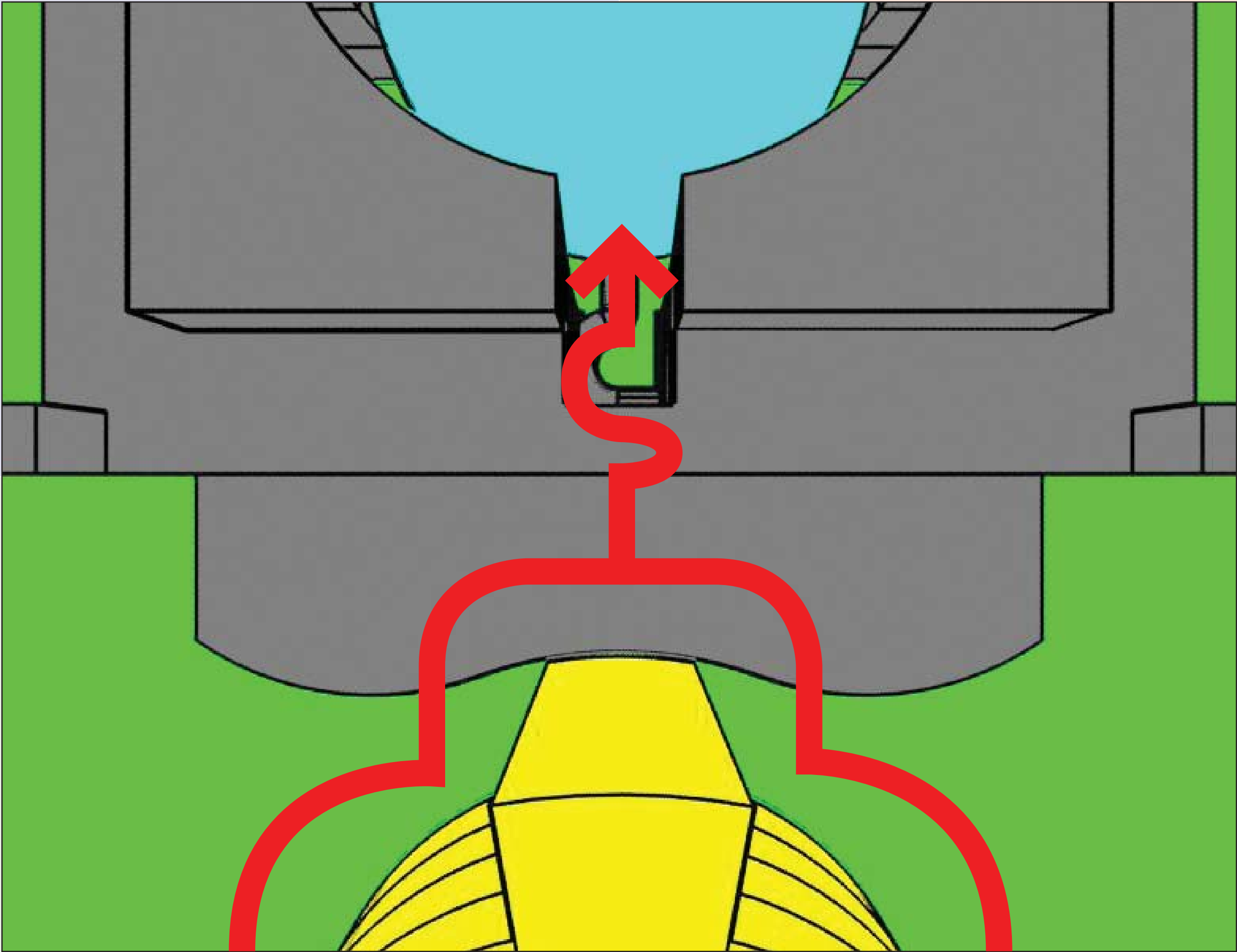
Non-site specific

Museum and
Parking Struc-
ture are simple
column and slab,
so the shape and
size are very flex-
ible.



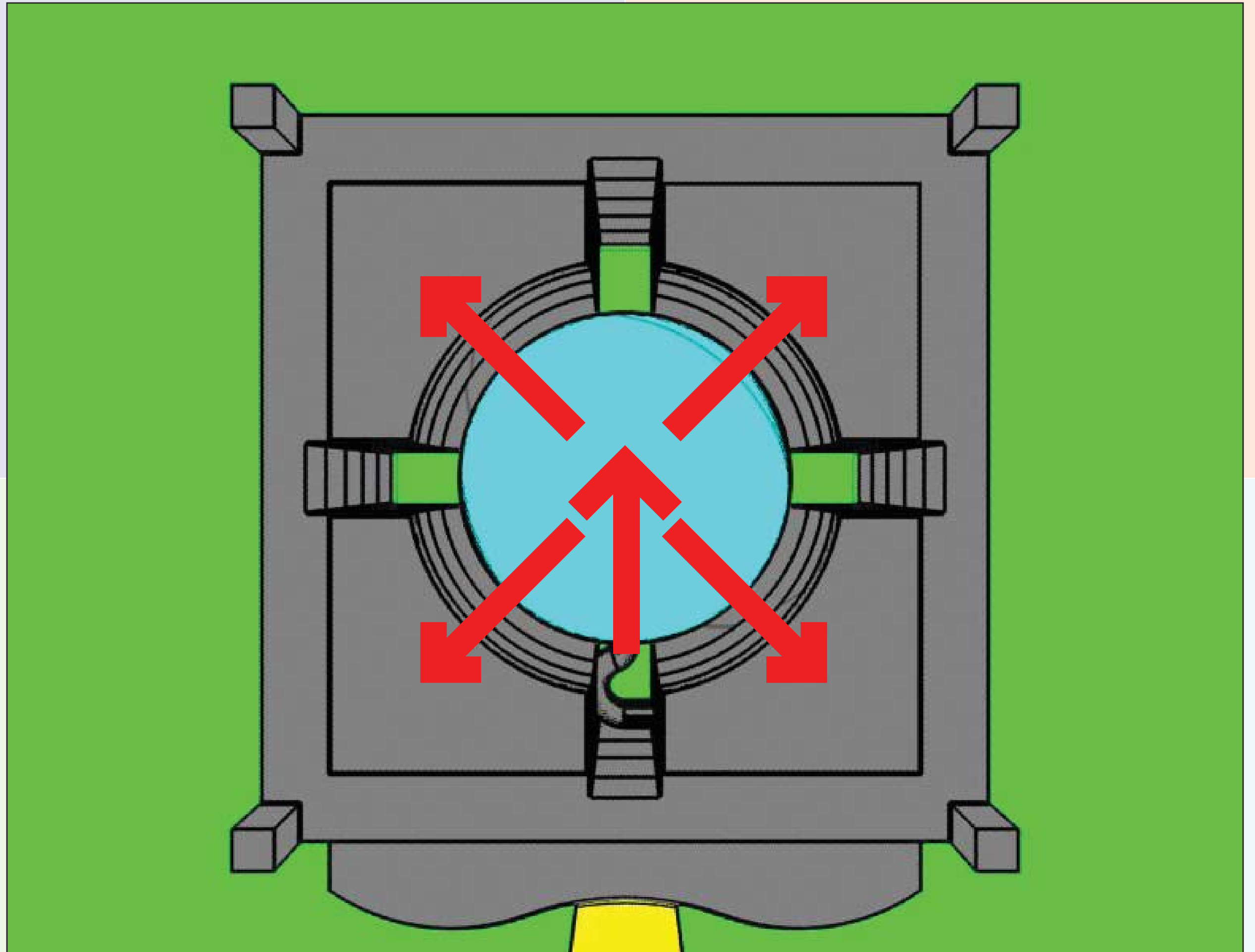
Entry

This diagram shows the circulation going through parking lot, entrance hall, ticket booth, and Place of Disorientation.



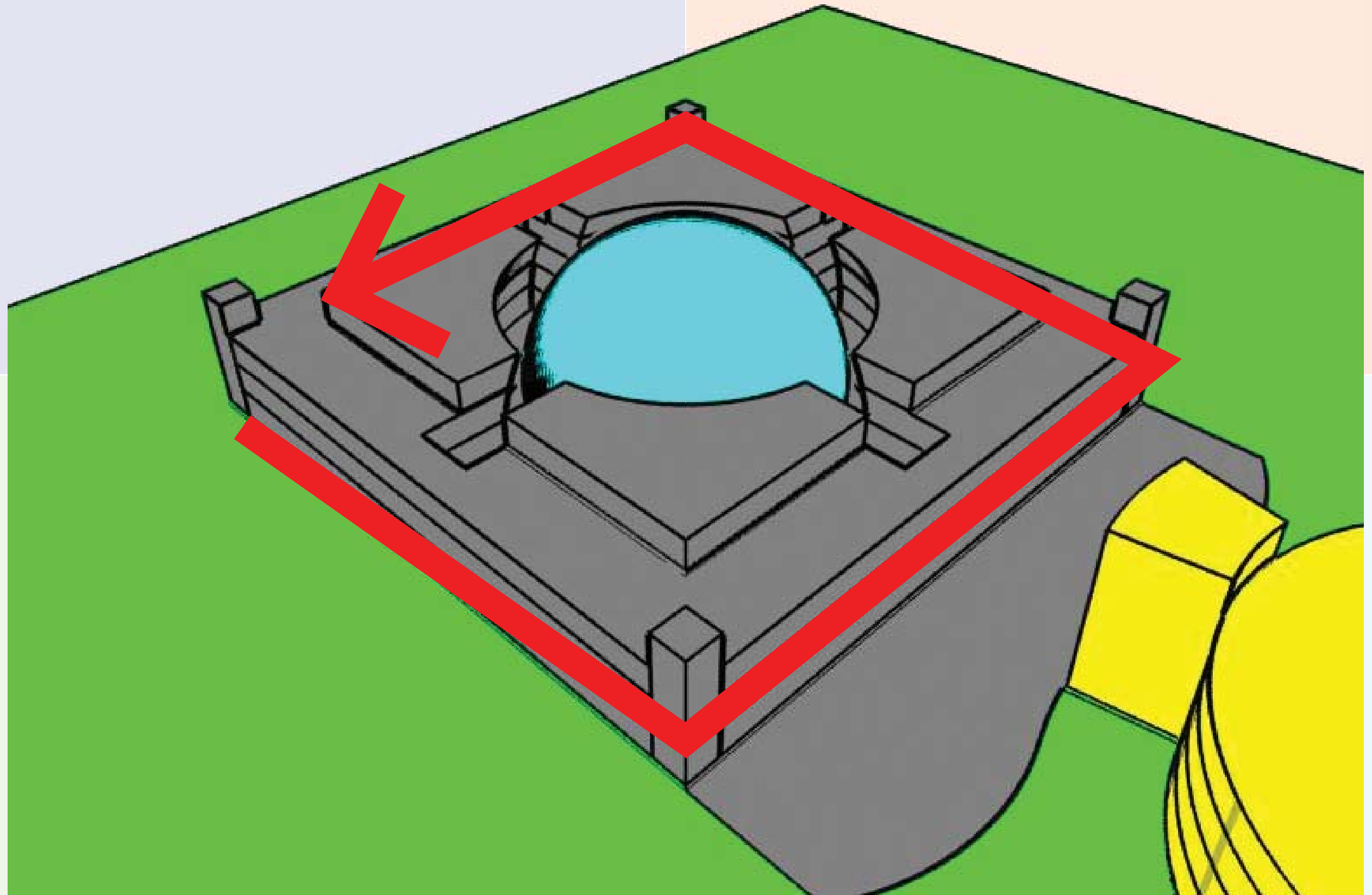
Sphere to museum

From Place of Disorientation, one enters to the sphere, and is directed to one of 4 different themes in the museum.



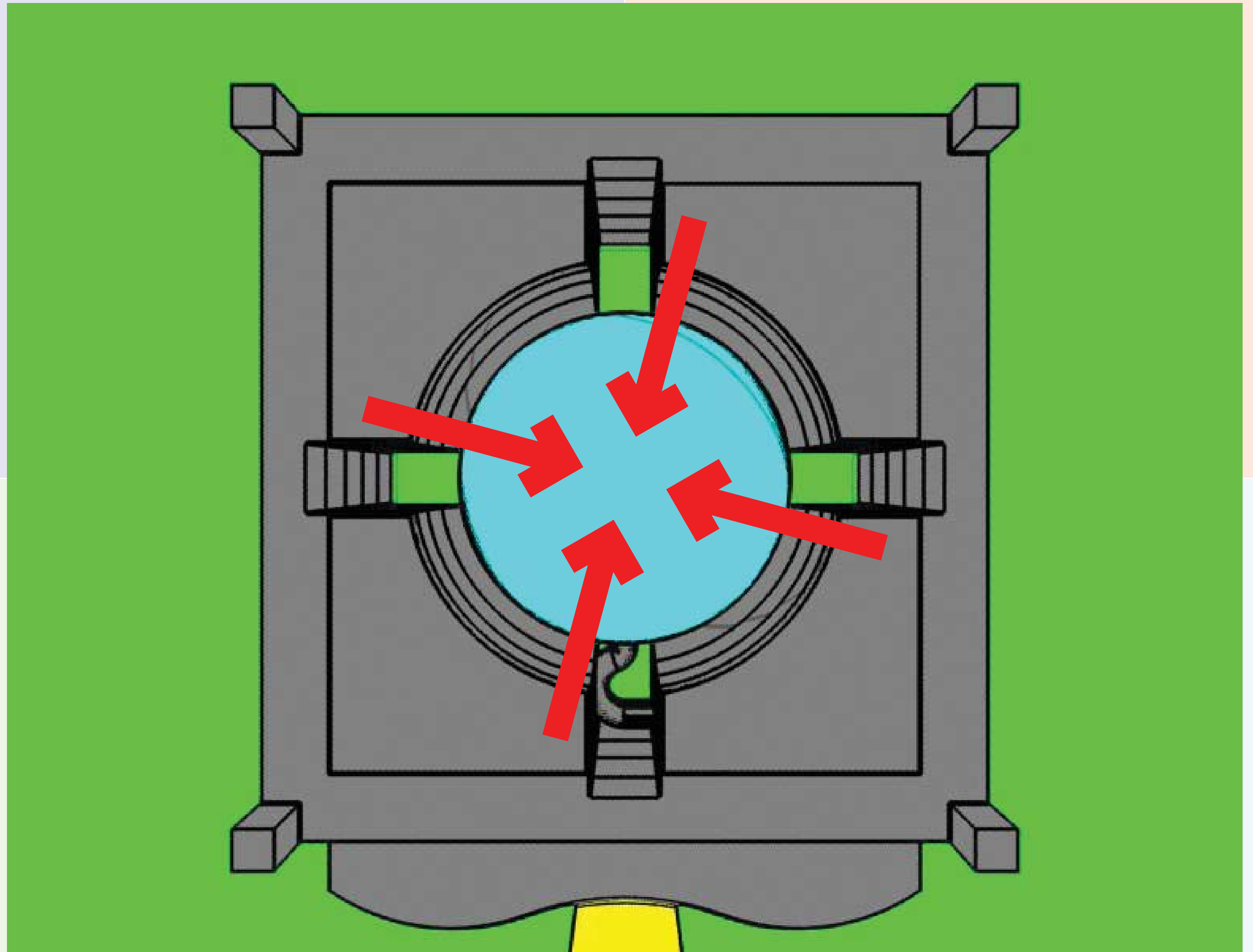
Museum circulation

Upon entering the museum space, one is directed from the 1st floor (History), to the 2nd floor (Problem), and to the 3rd floor (Solution) by going through the spiral circulation (as shown in the diagram).



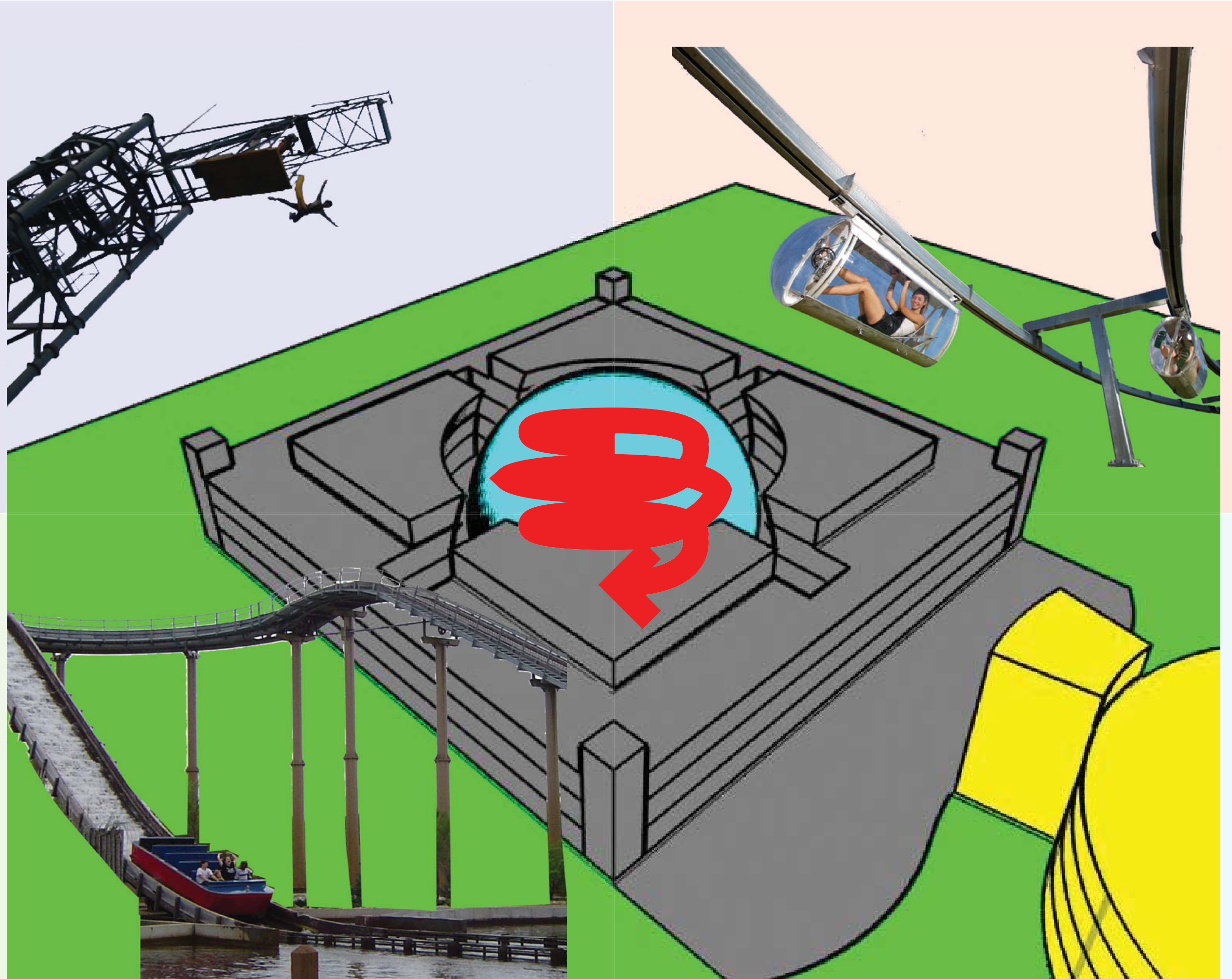
Museum to sphere

Once reaching the top floor of the museum spaces, one re-enters the sphere with the full knowledge of a theme that he/she has just passed.



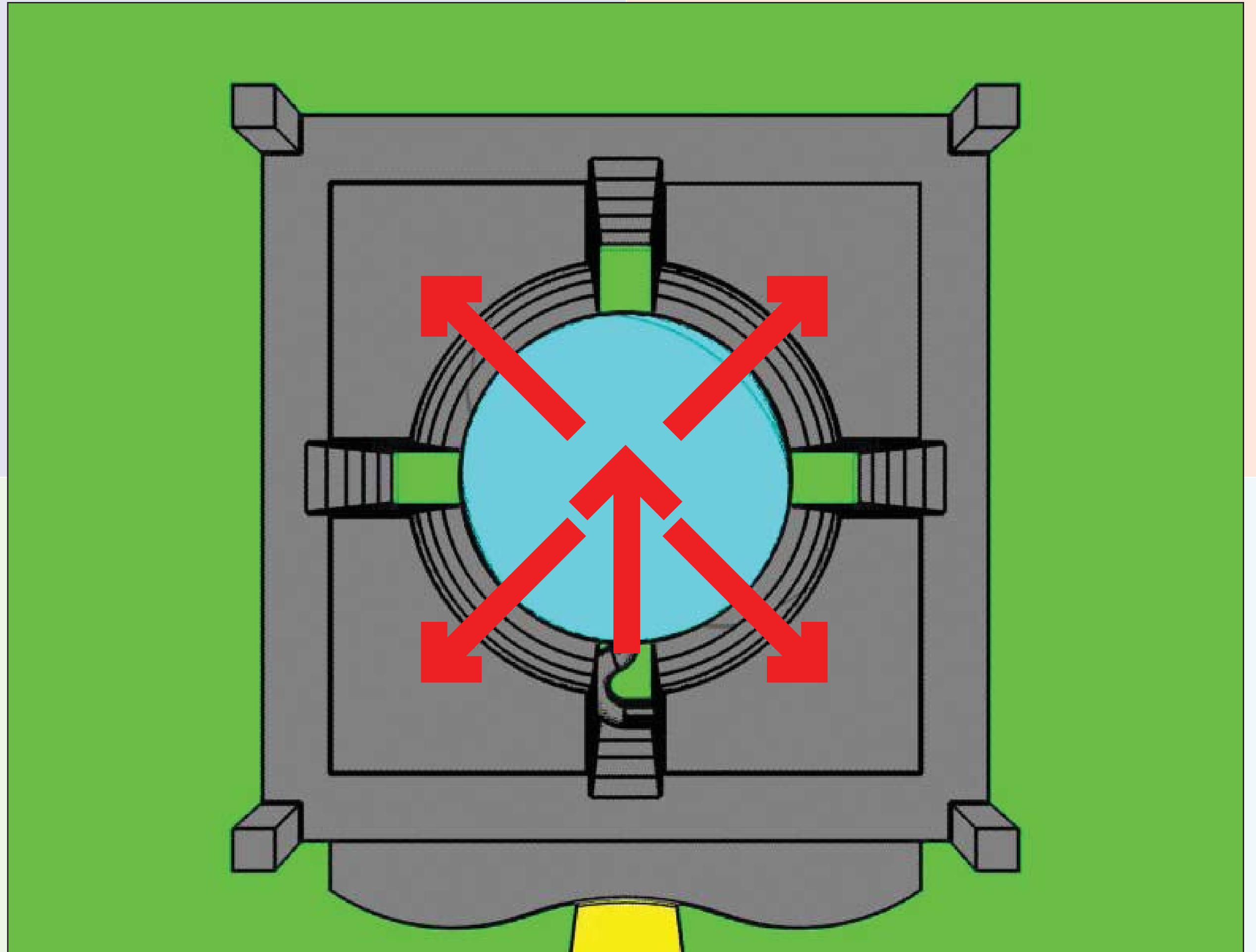
Sphere programs

Then, he/she will simply engage in sustainable attractions and have fun. The attractions will bring them back to the 1st floor.



Re-enter to museum

Once brought back to the 1st floor, one will choose another theme and repeat the same steps. He/she will explore the different part of the museum which will guide them to new attractions in the top floor, and return them to the 1st floor.



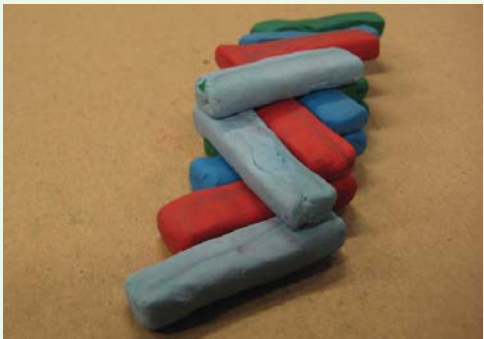
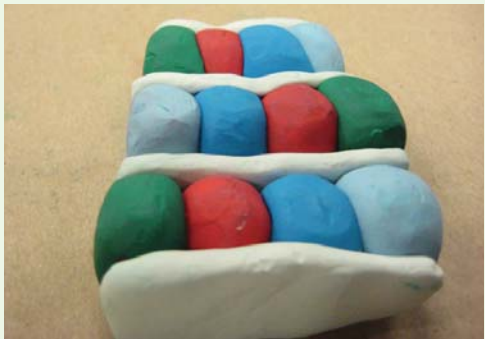
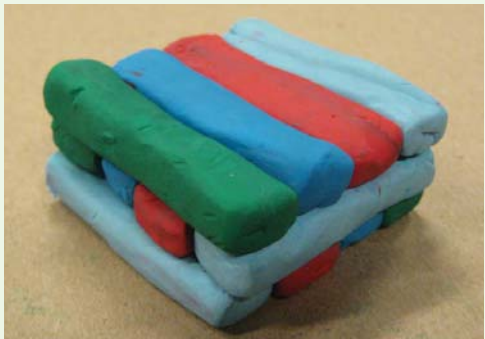
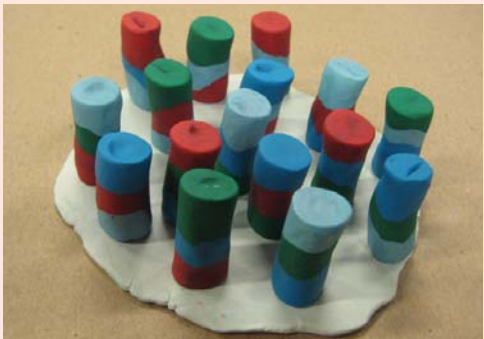
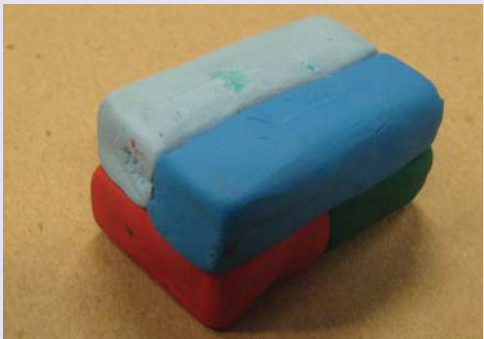
Parking structure

The parking structure has three layers. The outer yellow layer represents the parking spaces that ramp up, while the inner yellow layer ramps down for exiting the parking structure. The pink layer represents a small exhibition that serves as final reminder for visitors of how to be sustainable.



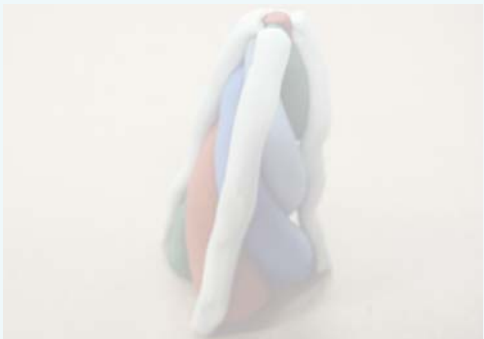
First schematic design

These are the first schematic clay models showing the relationship between the 4 themes. Each color represents the 4 themes, and white represents the circulation.



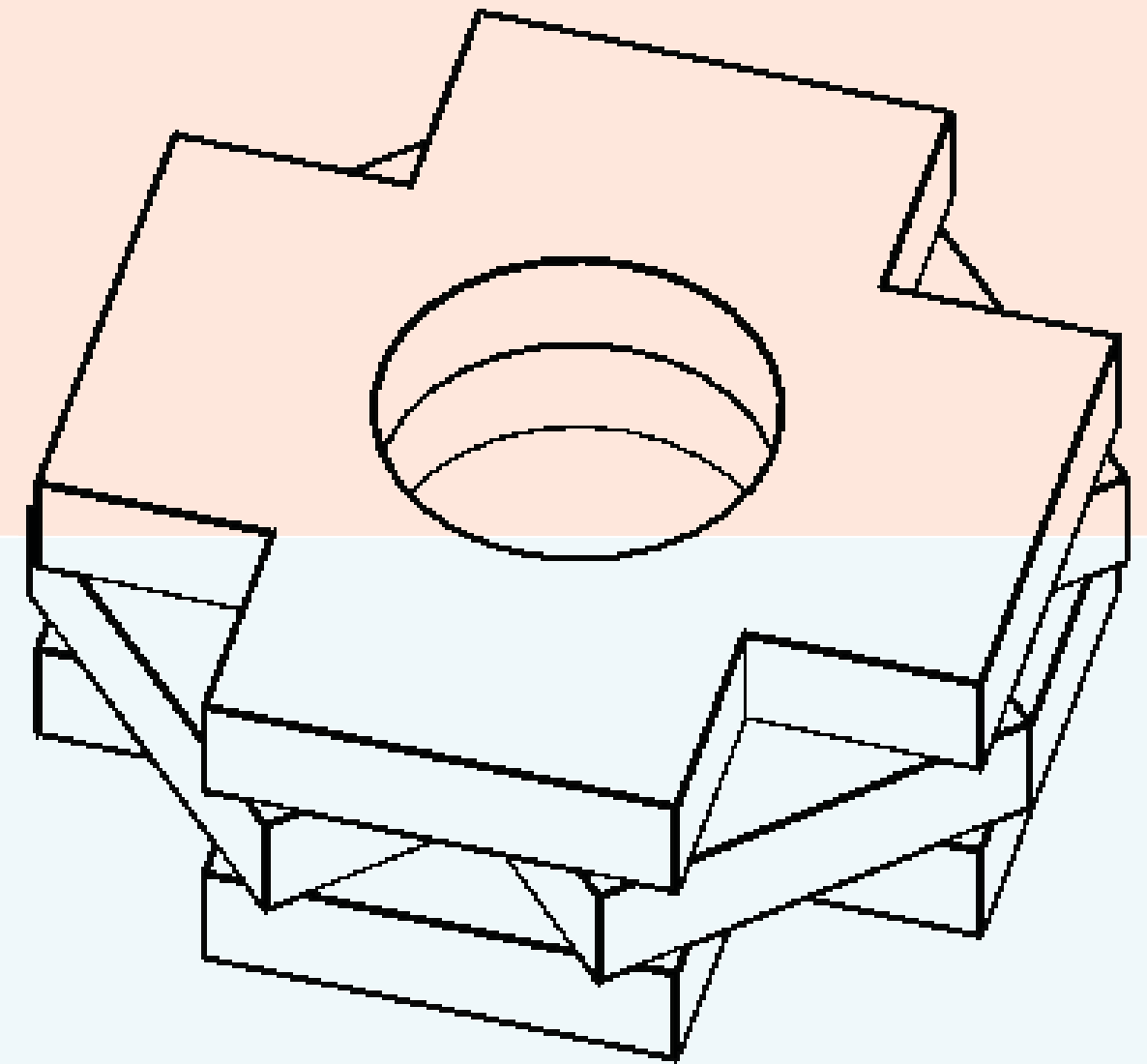
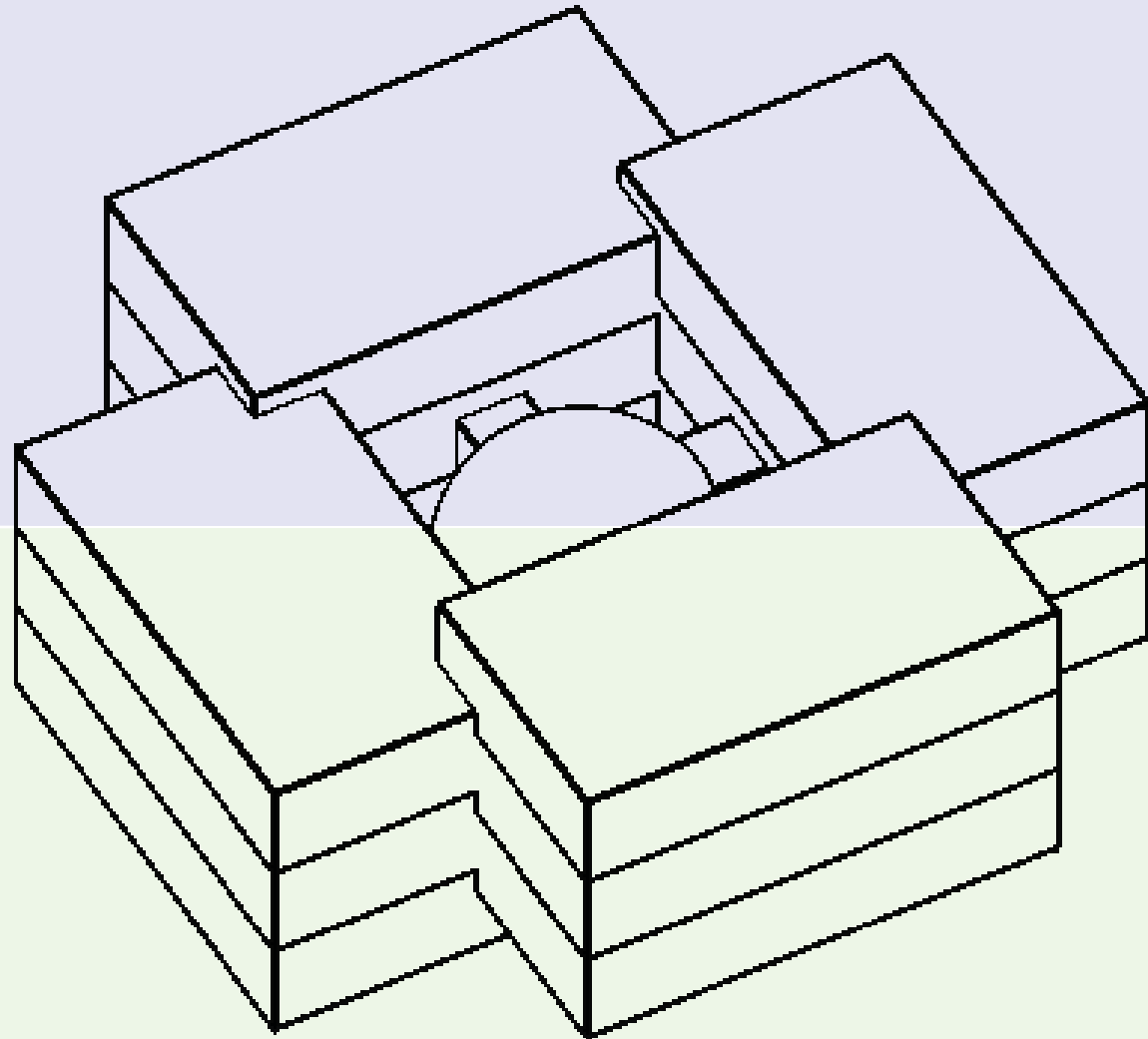
First schematic design

This model was chosen to be developed. The two main features were to have one center piece and spiral circulation.



First review design

These are the more developed schemes, one is having a center piece, and another is having a spiral circulation.



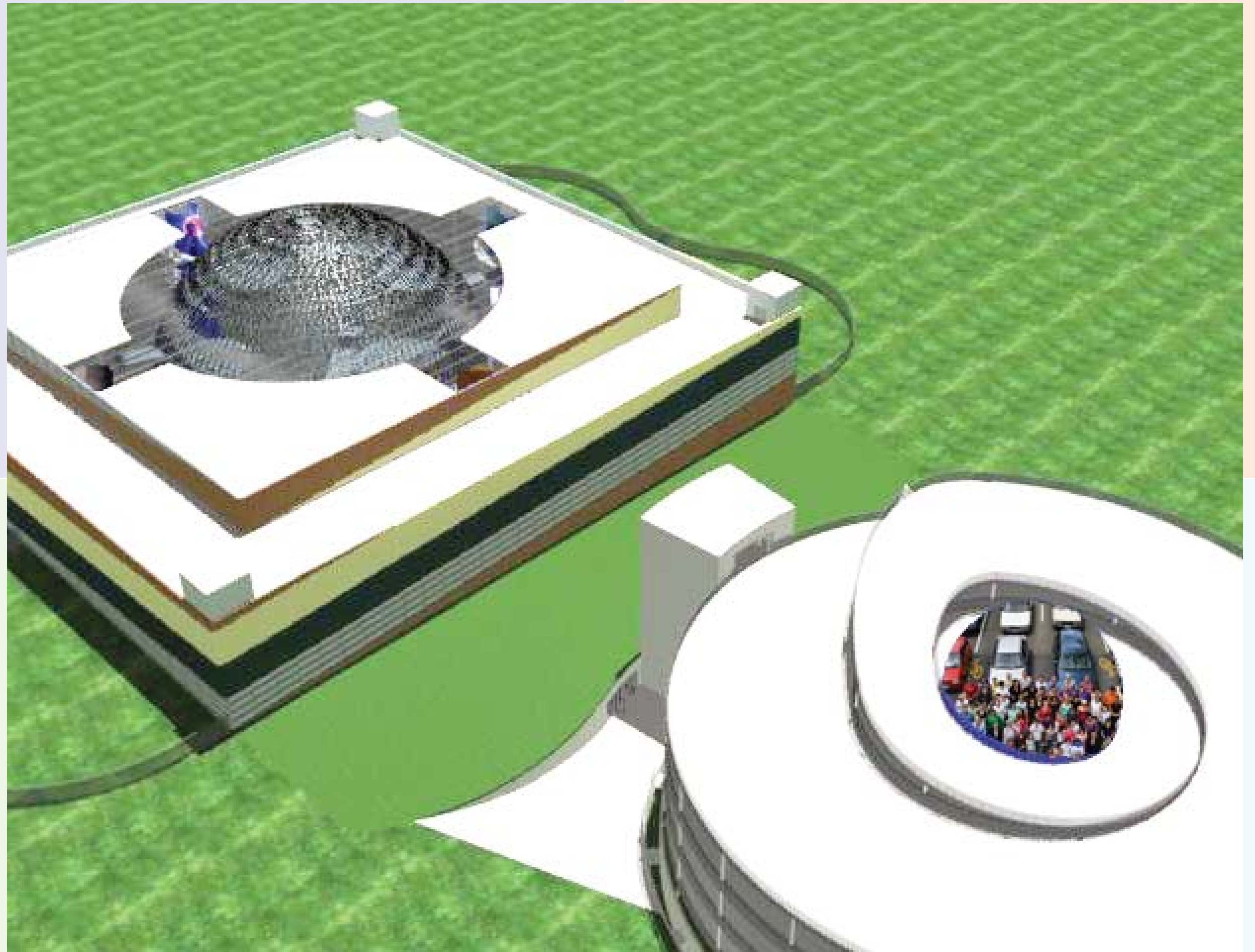
Mid-term design

The design for the mid-term review. Concepts of having a center piece, four themes, and spiral circulation is clearly shown.



Overall rendering

This is the rendering of the overall design.



1F Floor plan

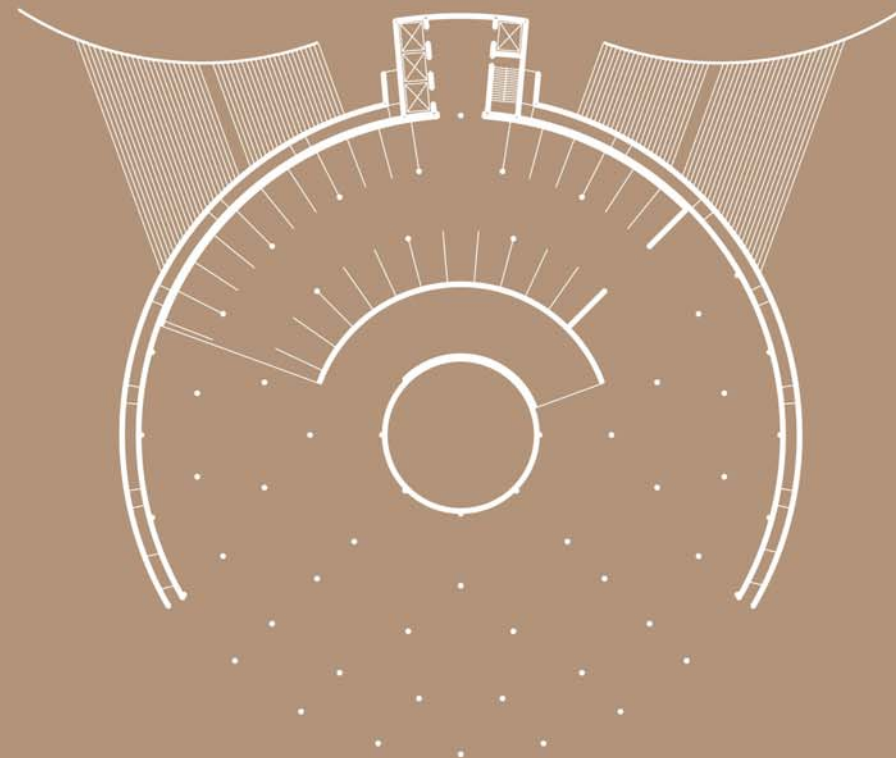
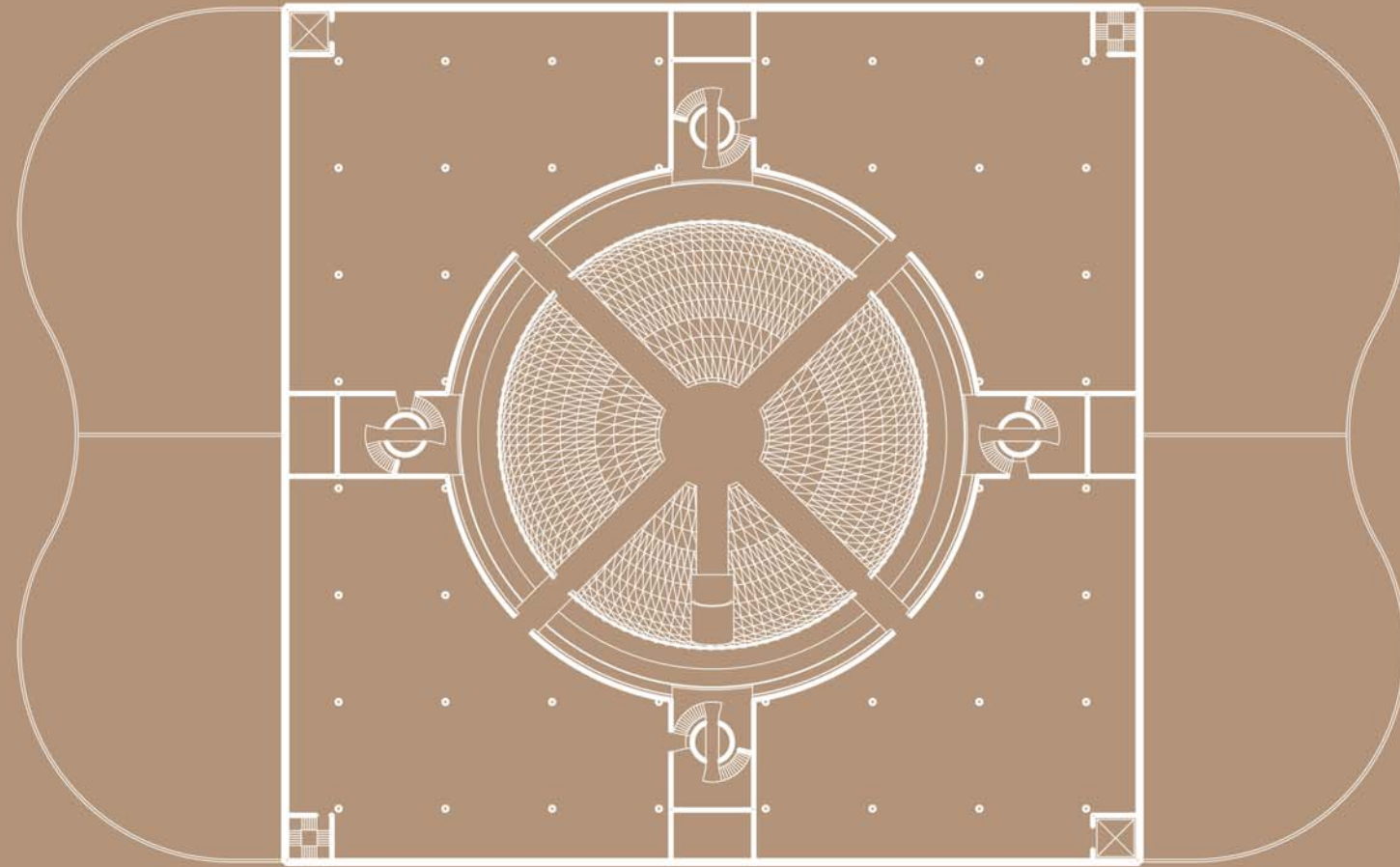
Main elements include:

- Parking Structure

- Accessible ramp and grand staircase to the main entrance

- 1st floor museum (History)

- Museum Garden



B1 Floor plan

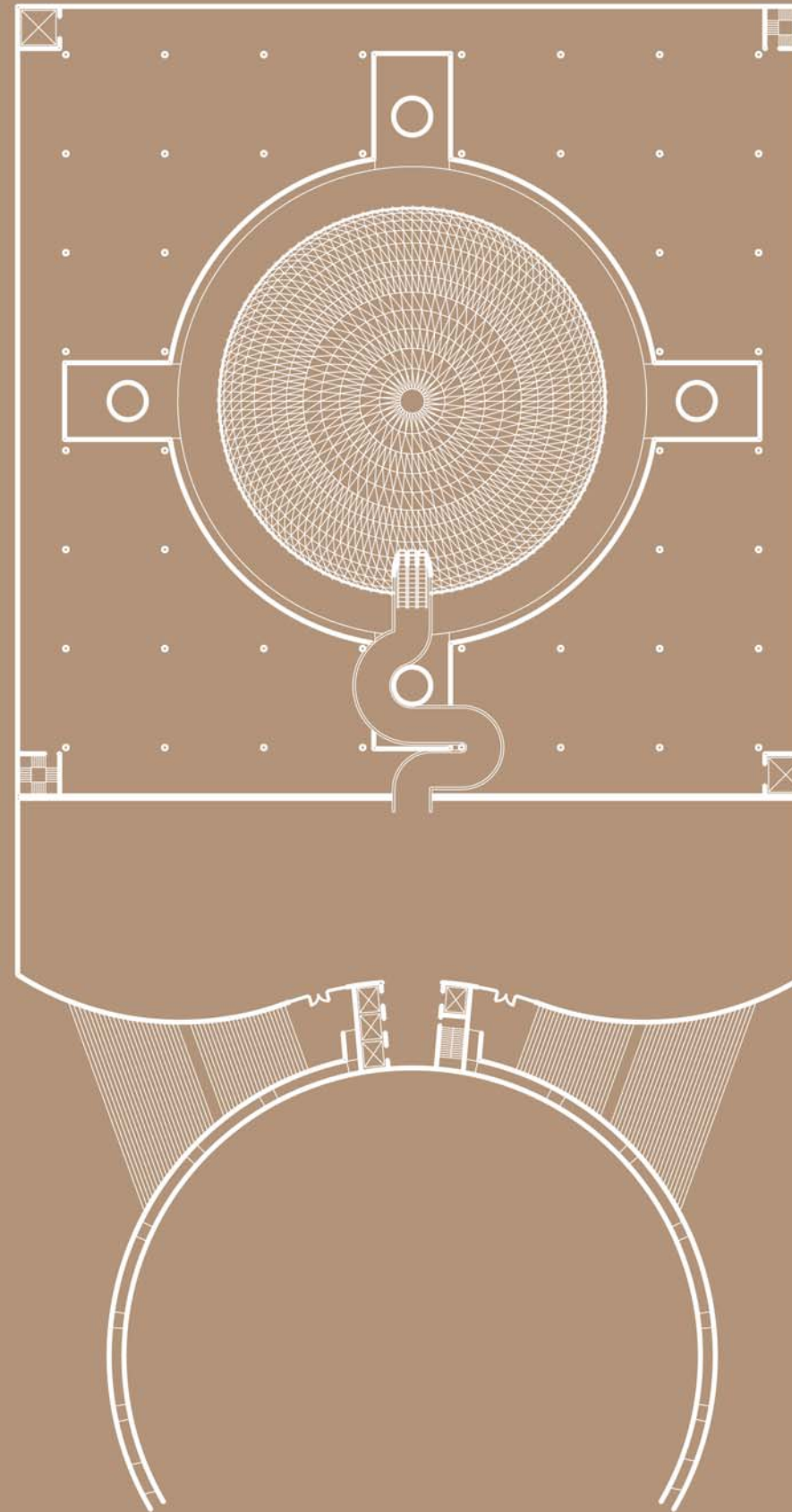
Main elements include:

-Museum/Theme Park backstage (lockers, offices, meeting rooms, etc.)

-Entrance Hall

-Place of Disorientation

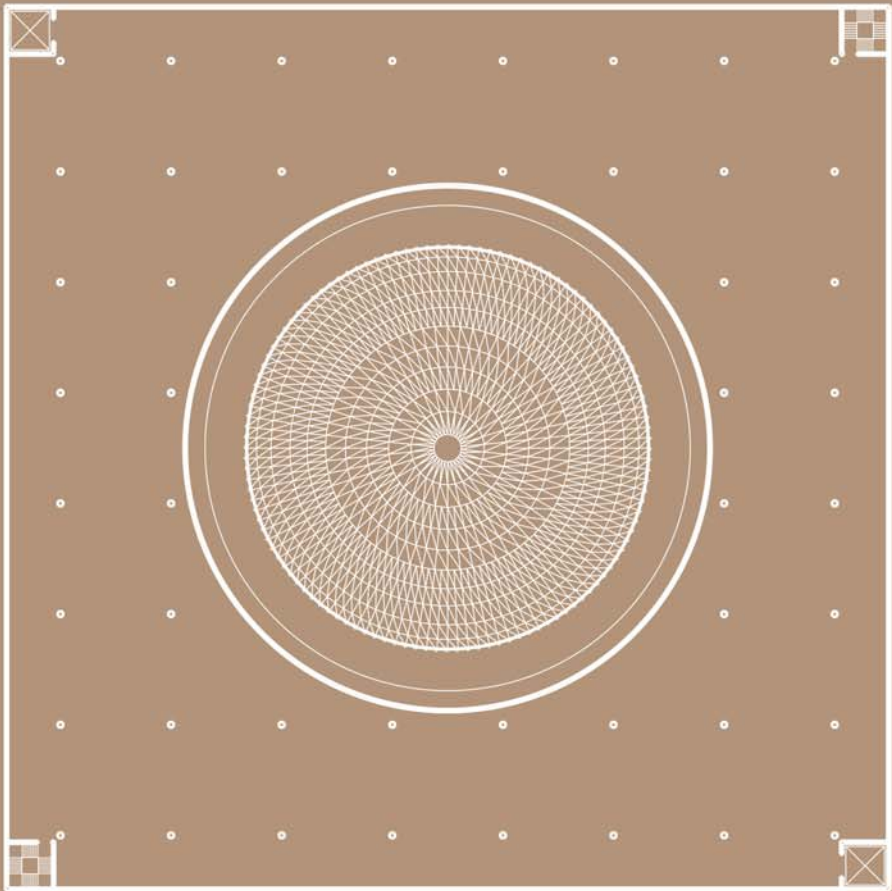
-Escalator leading to the sphere.



B2 Floor plan

Main elements
include:

-Museum Storage

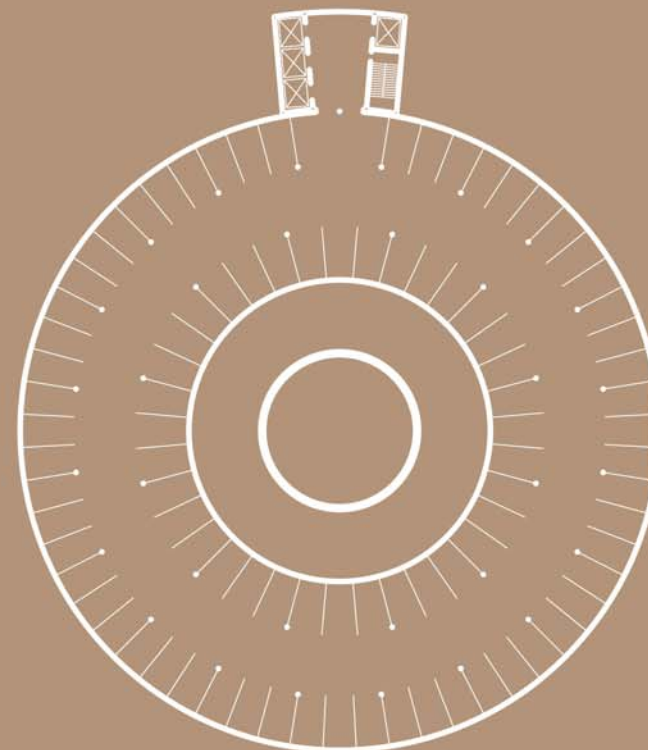
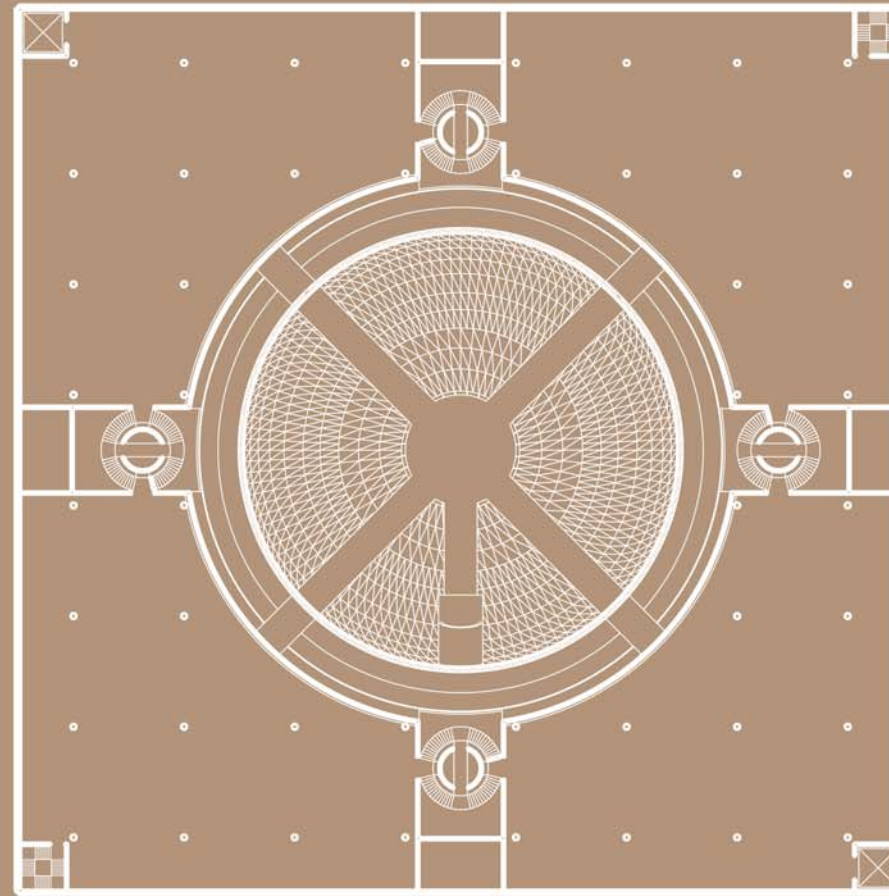


2F Floor plan

Main elements
include:

-Parking
Structure

-2nd floor
museum
(Problem)

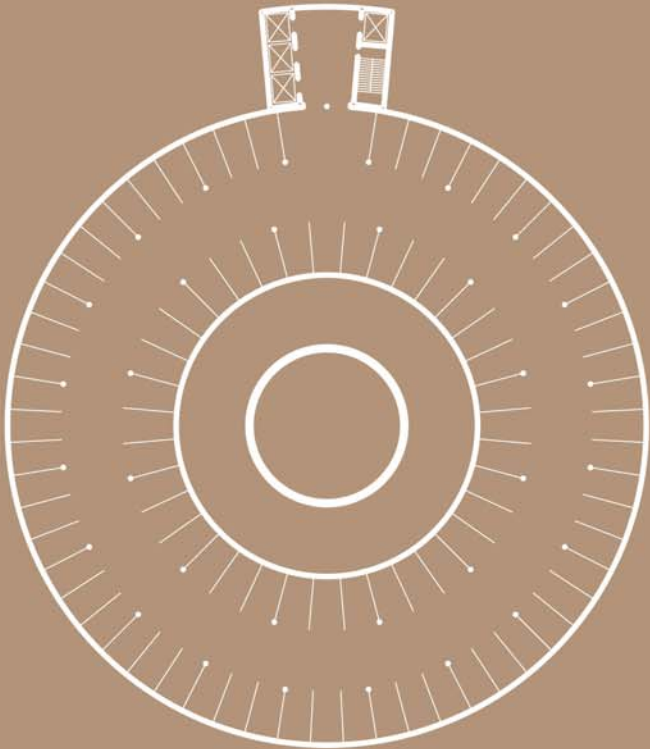
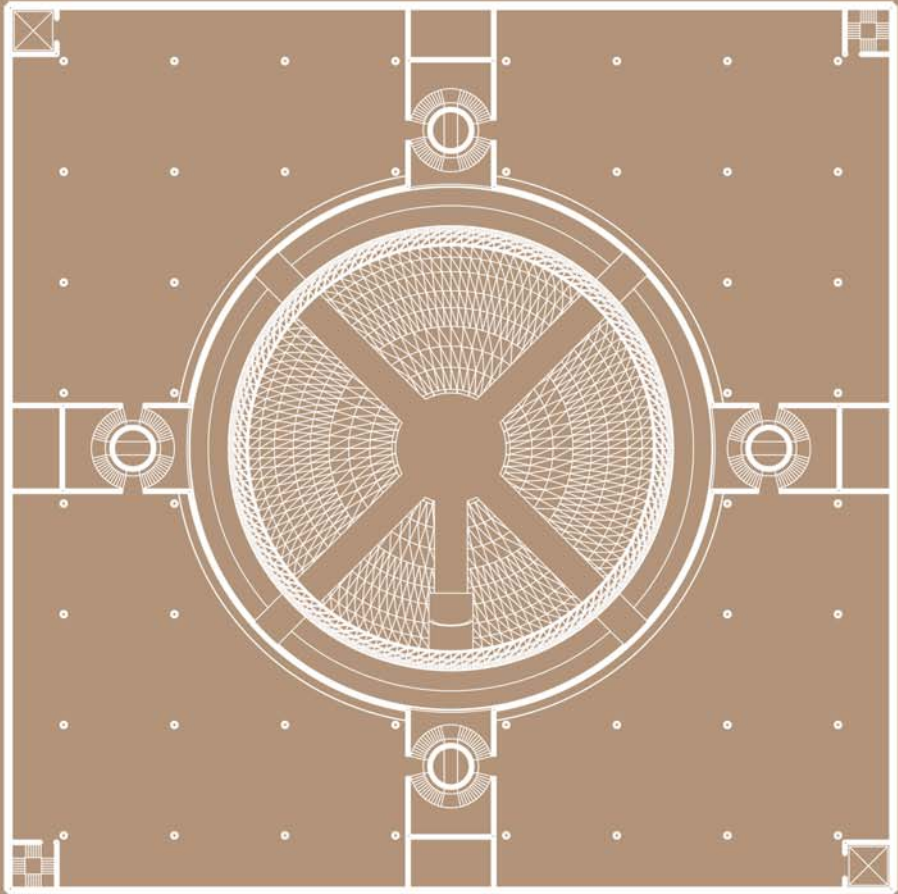


3F Floor plan

Main elements
include:

-Parking
Structure

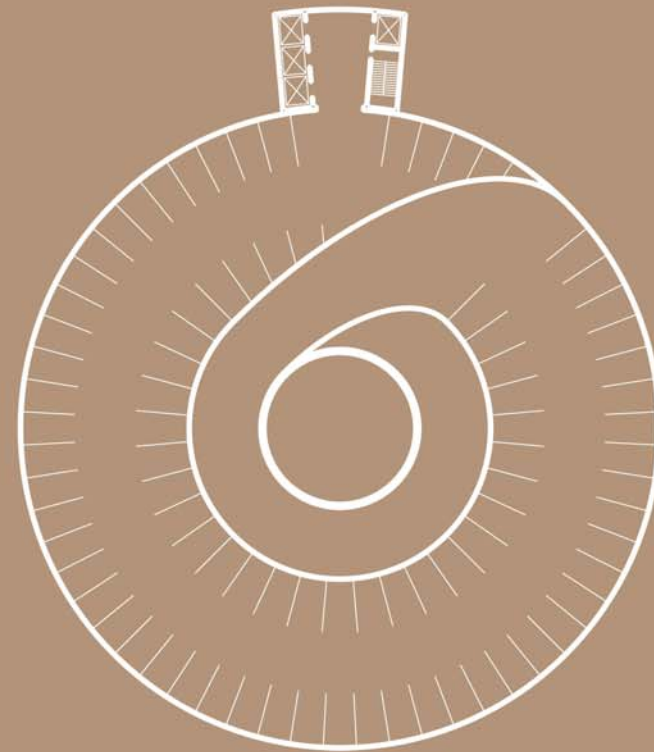
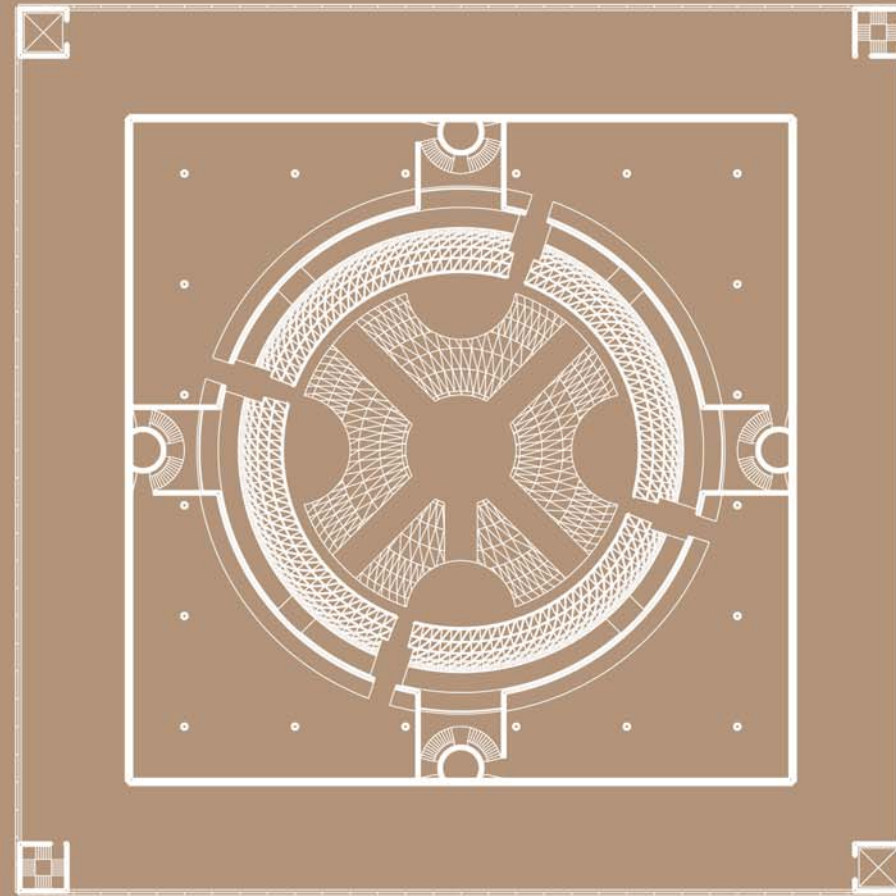
-3rd floor
museum
(Solution)



4F Floor plan

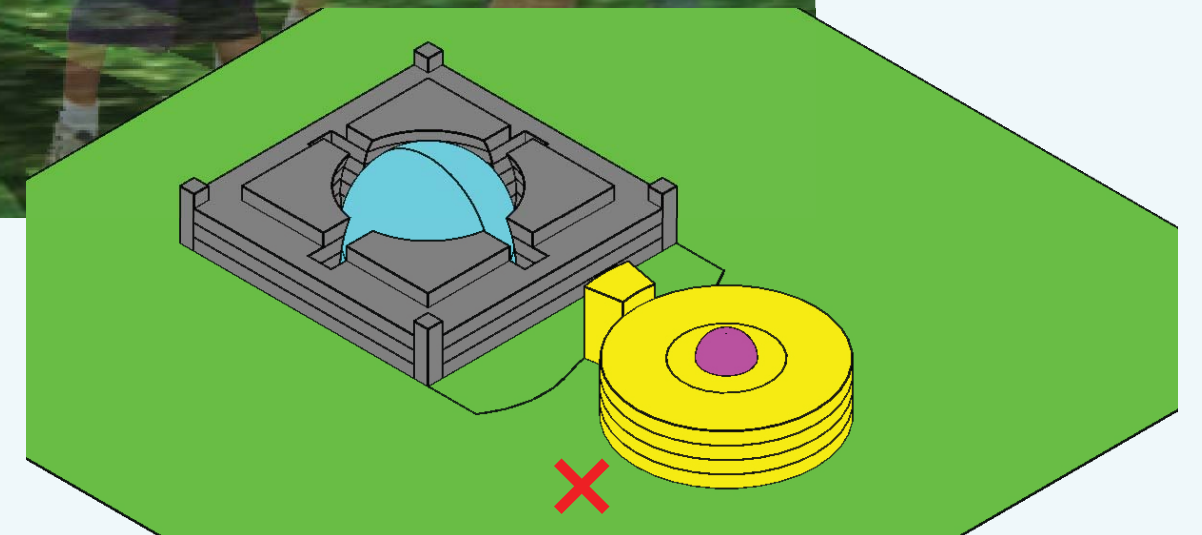
Main elements include:

- Parking Structure
- Museum Balcony
- Other necessary programs (Cafe, Kitchen, Bathrooms, etc.)
- Re-enter the sphere, and all the attractions



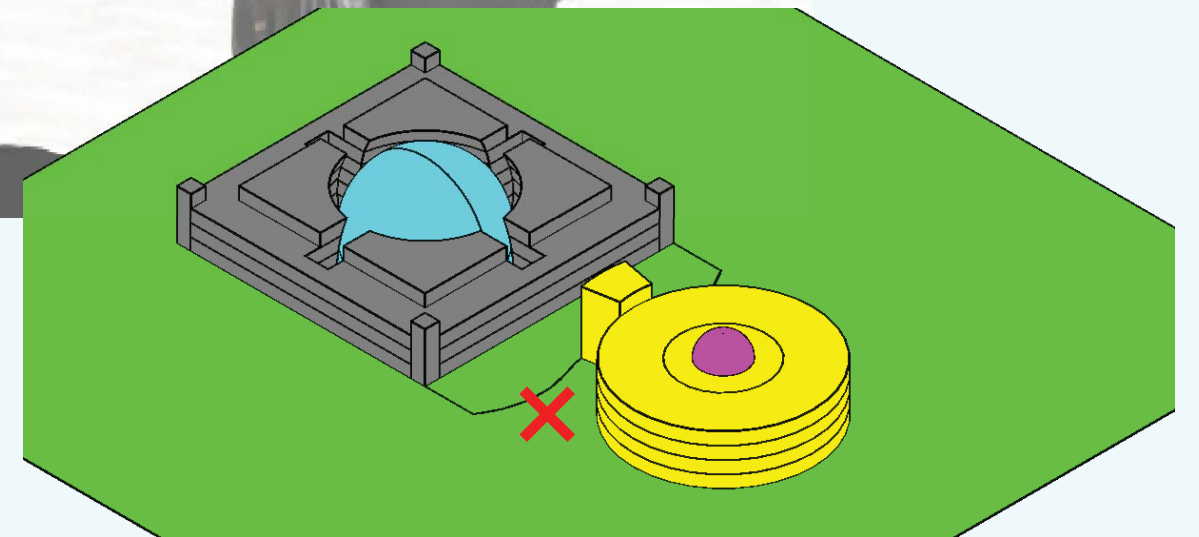
Rendering

-Outdoor space



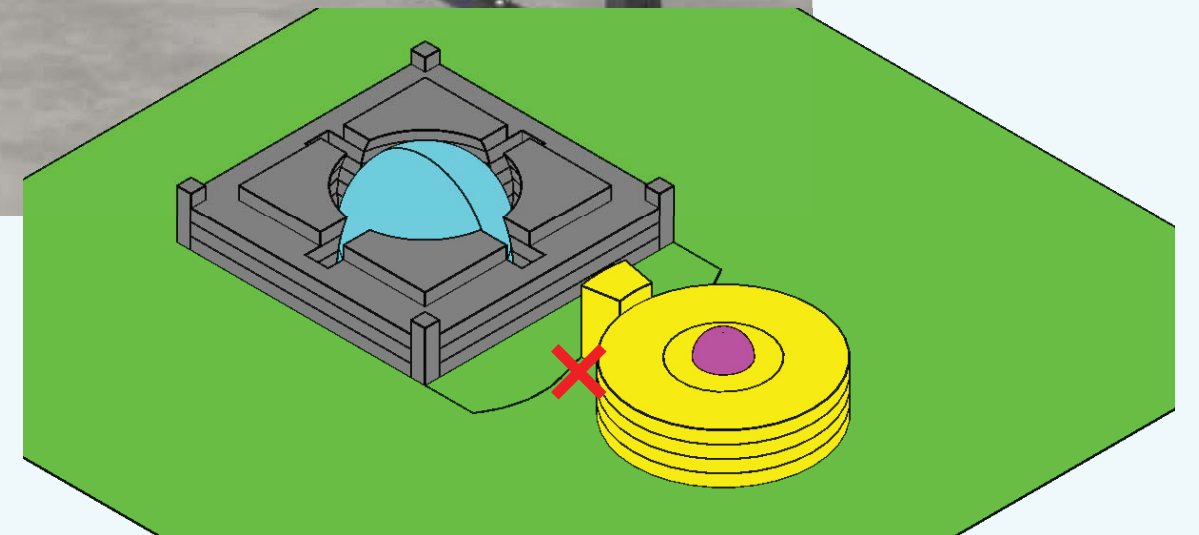
Rendering

-Toward the entrance



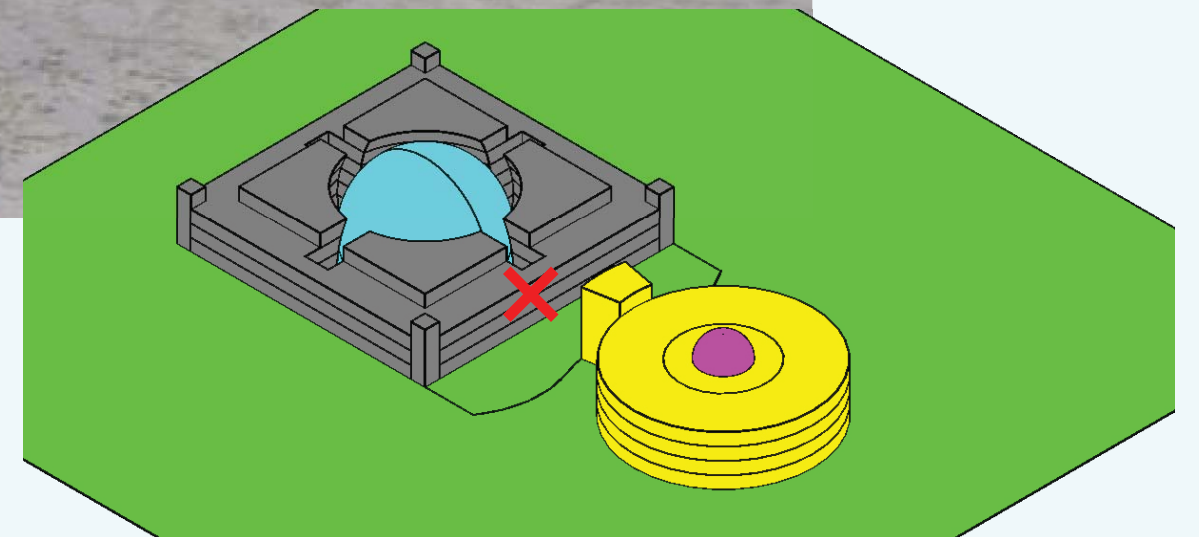
Rendering

-Main entry



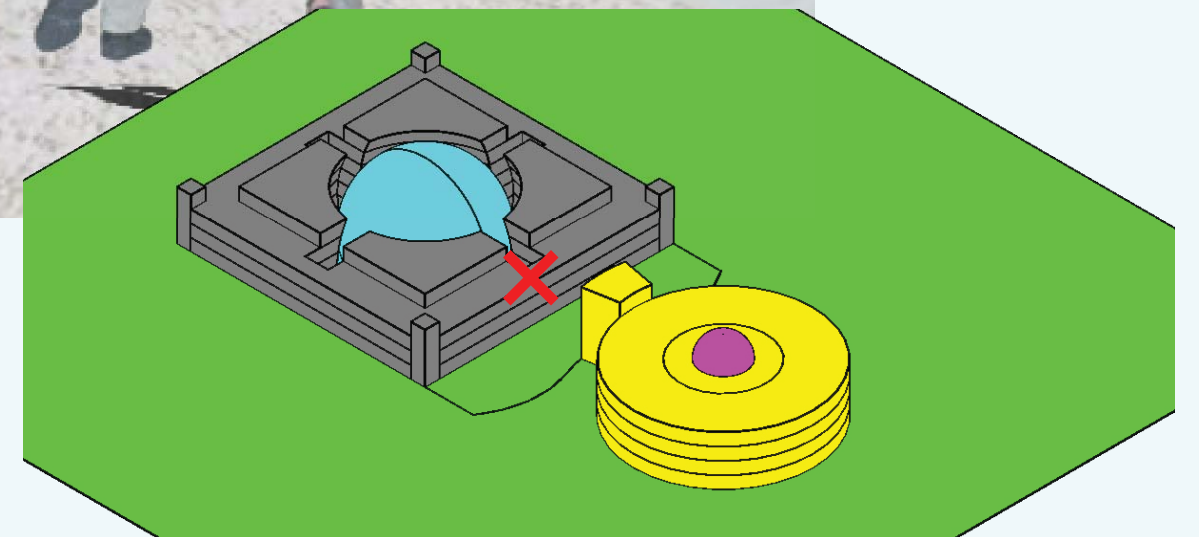
Rendering

-Place of
disorientation



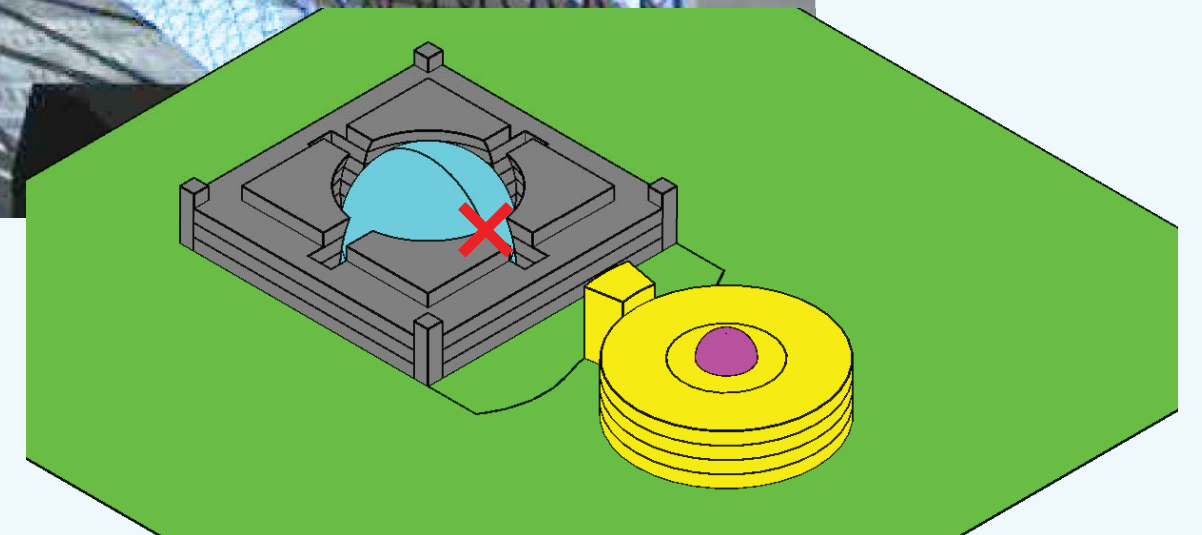
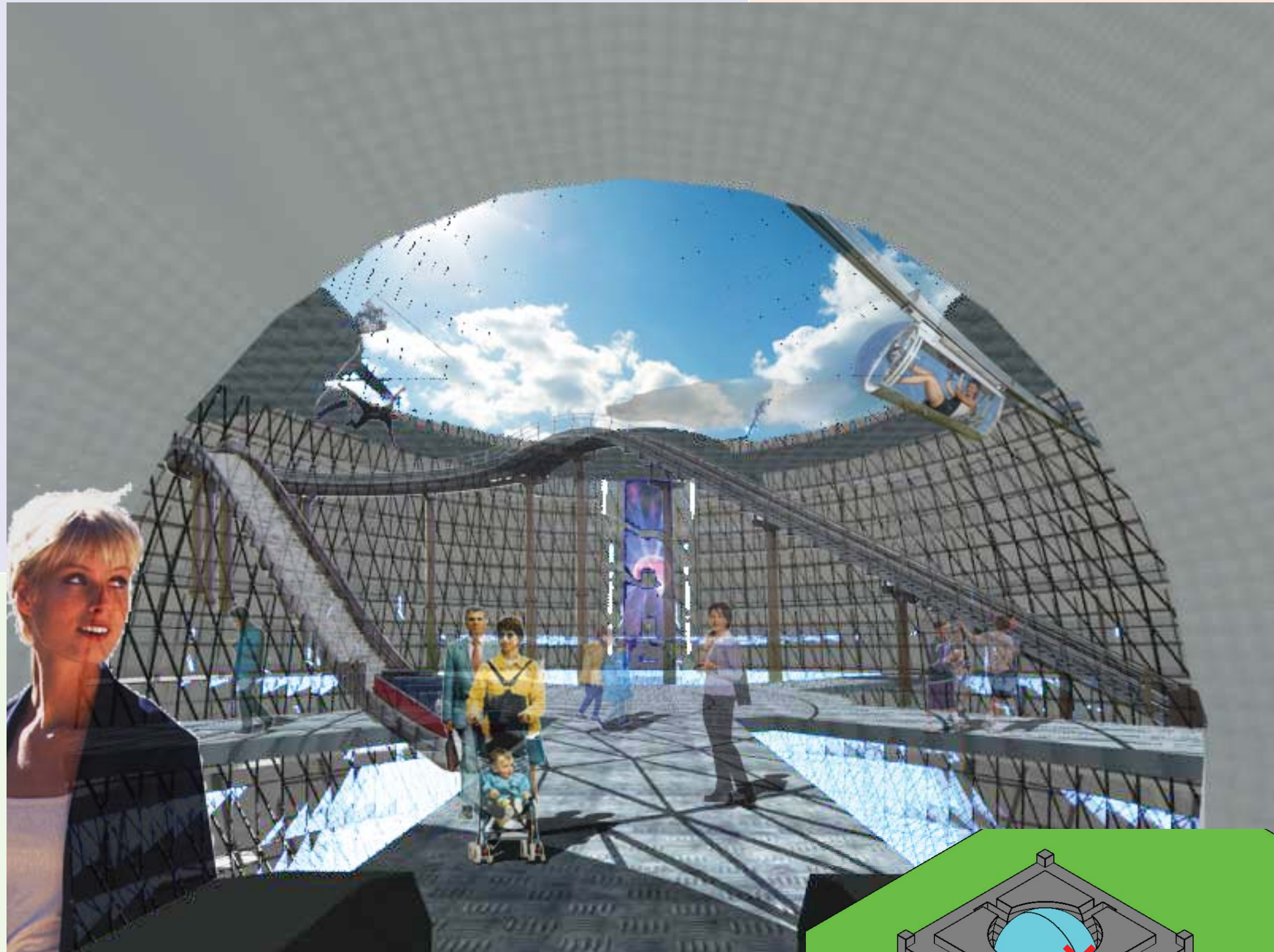
Rendering

-Escalator to
sphere



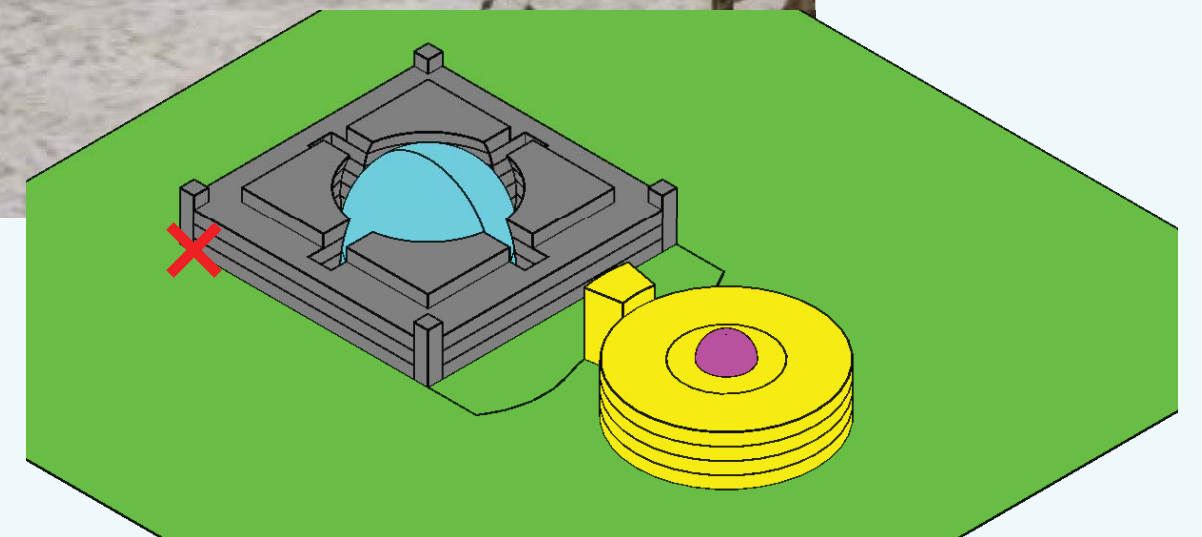
Rendering

-First sphere view



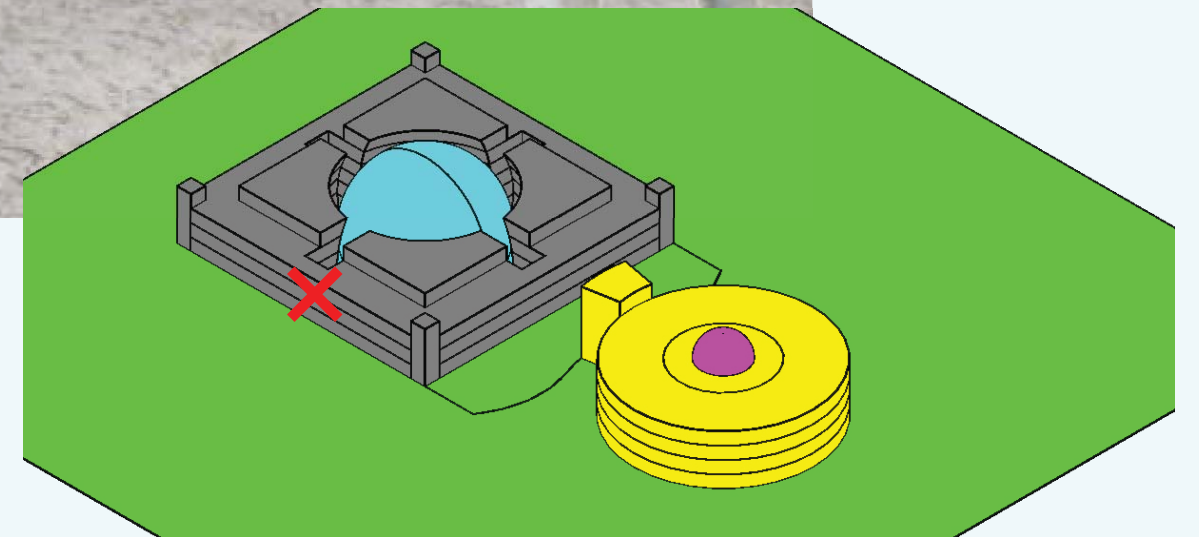
Rendering

-Earth history



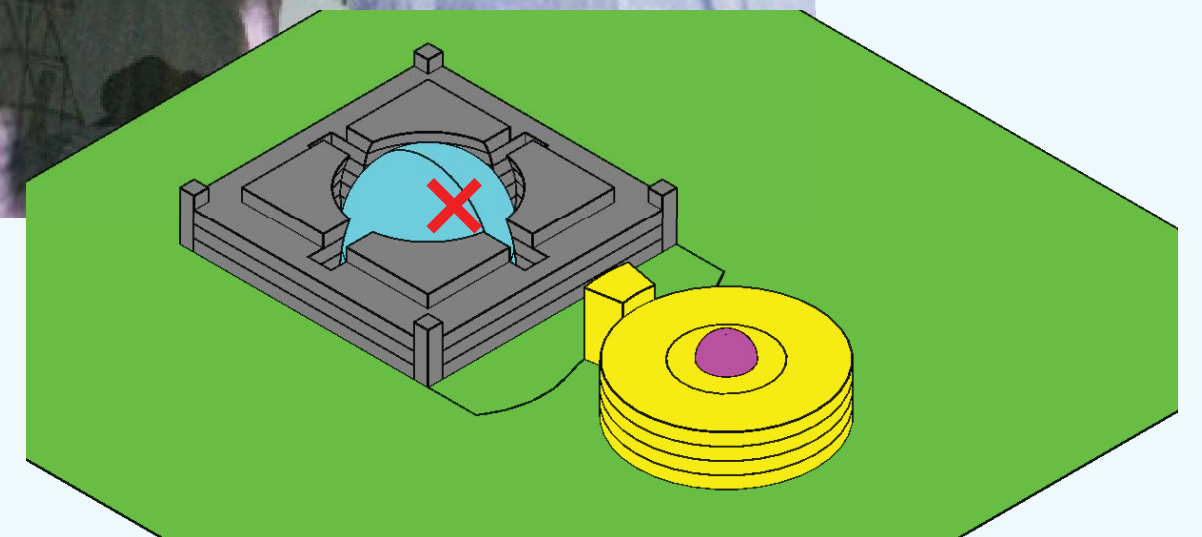
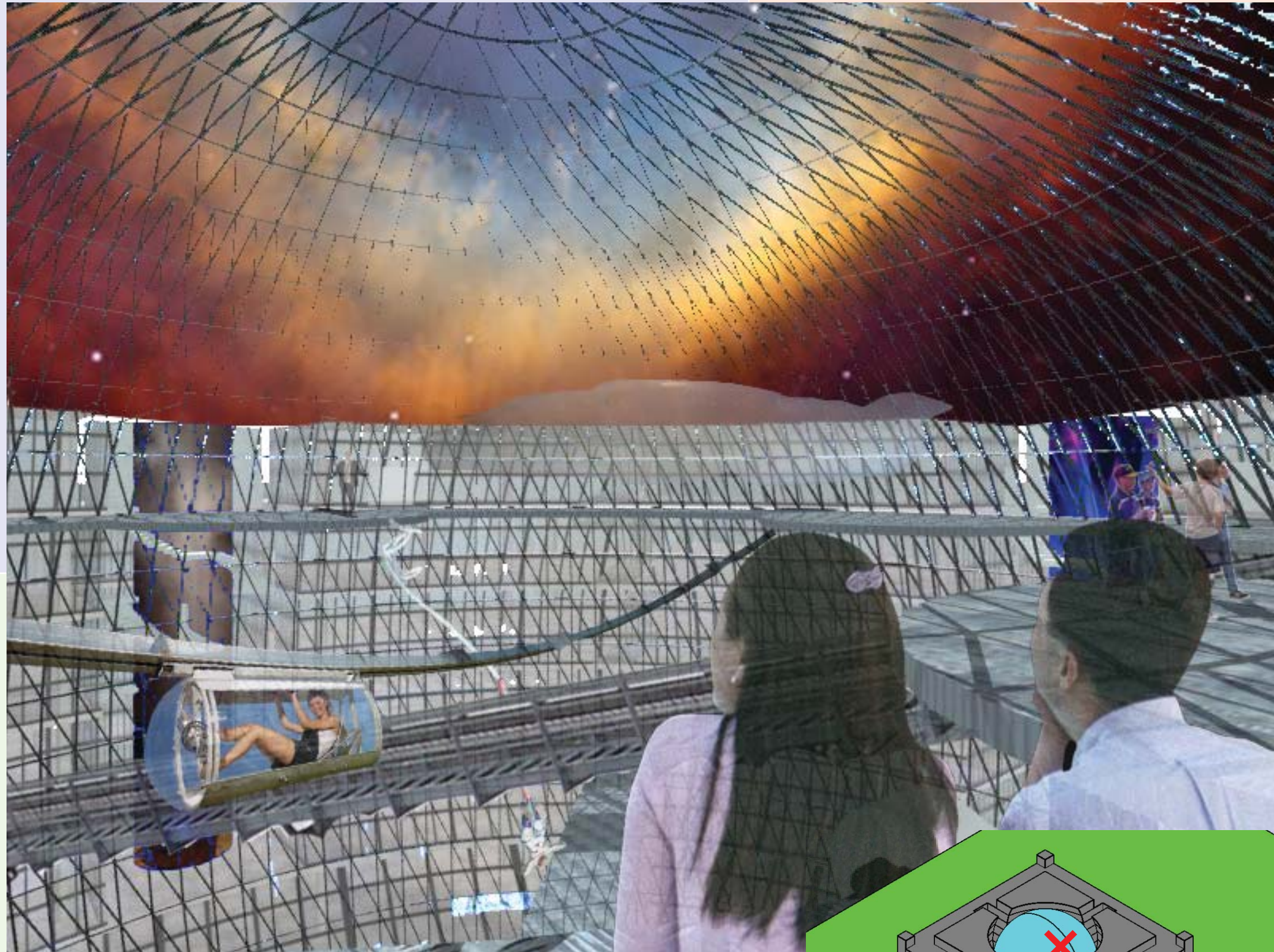
Rendering

-Energy staircase



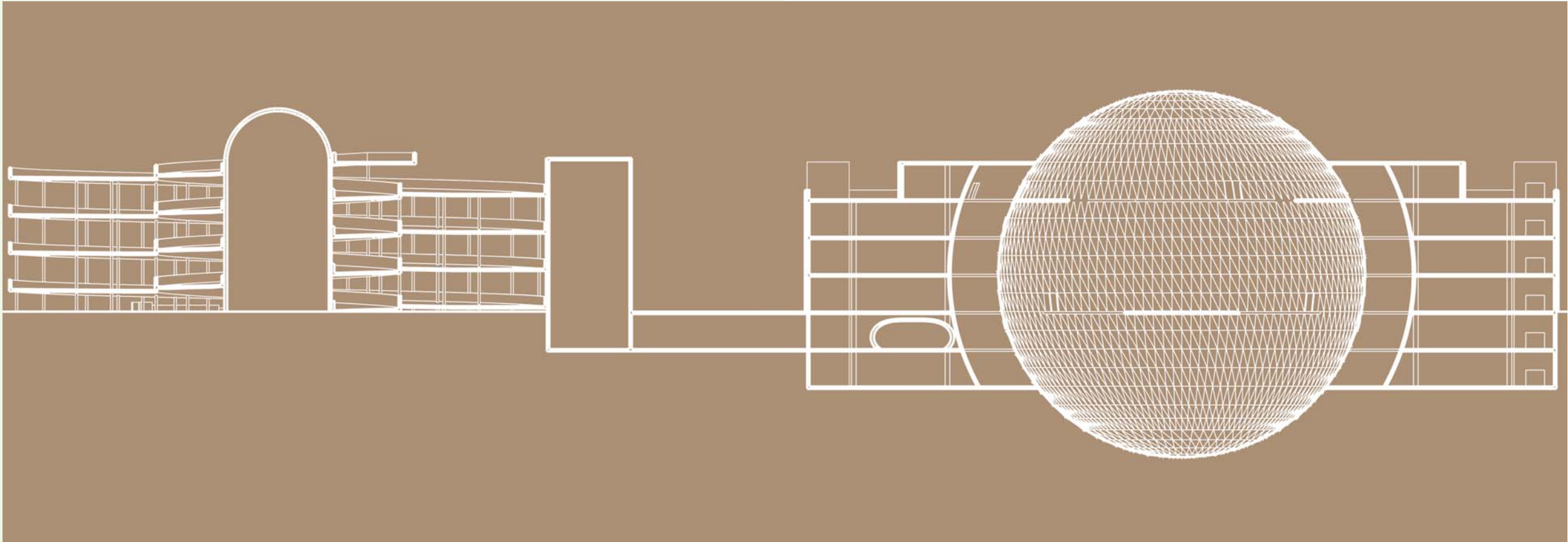
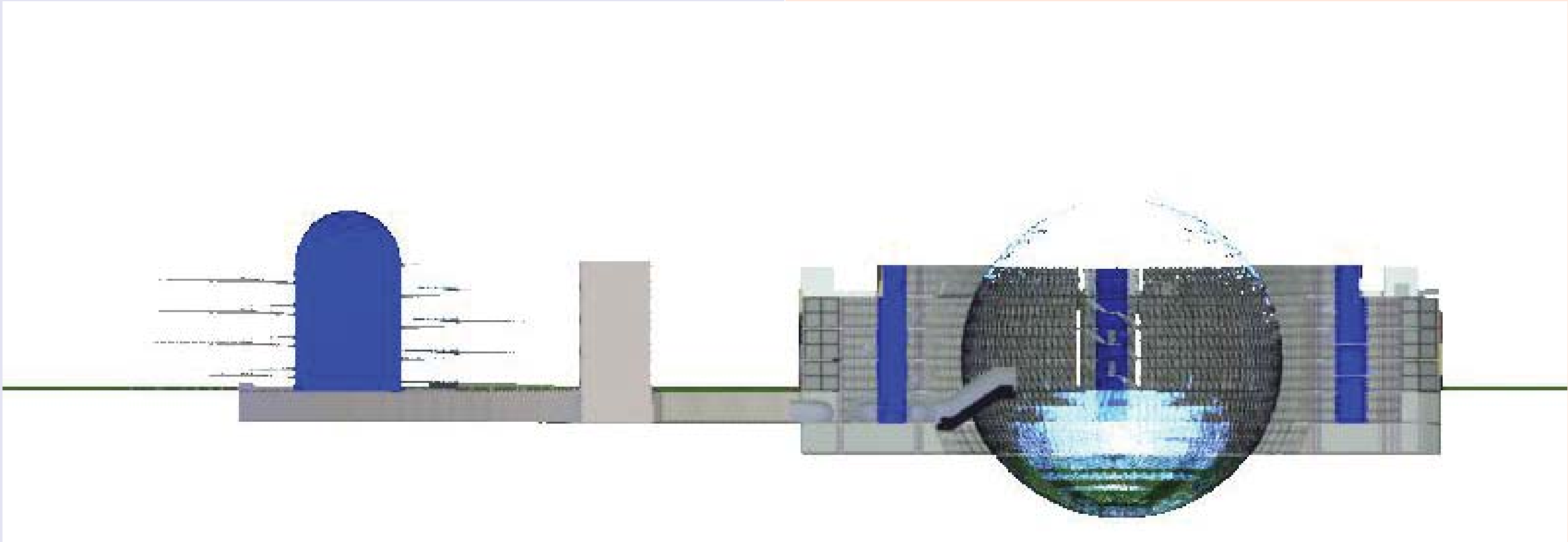
Rendering

-Return to sphere



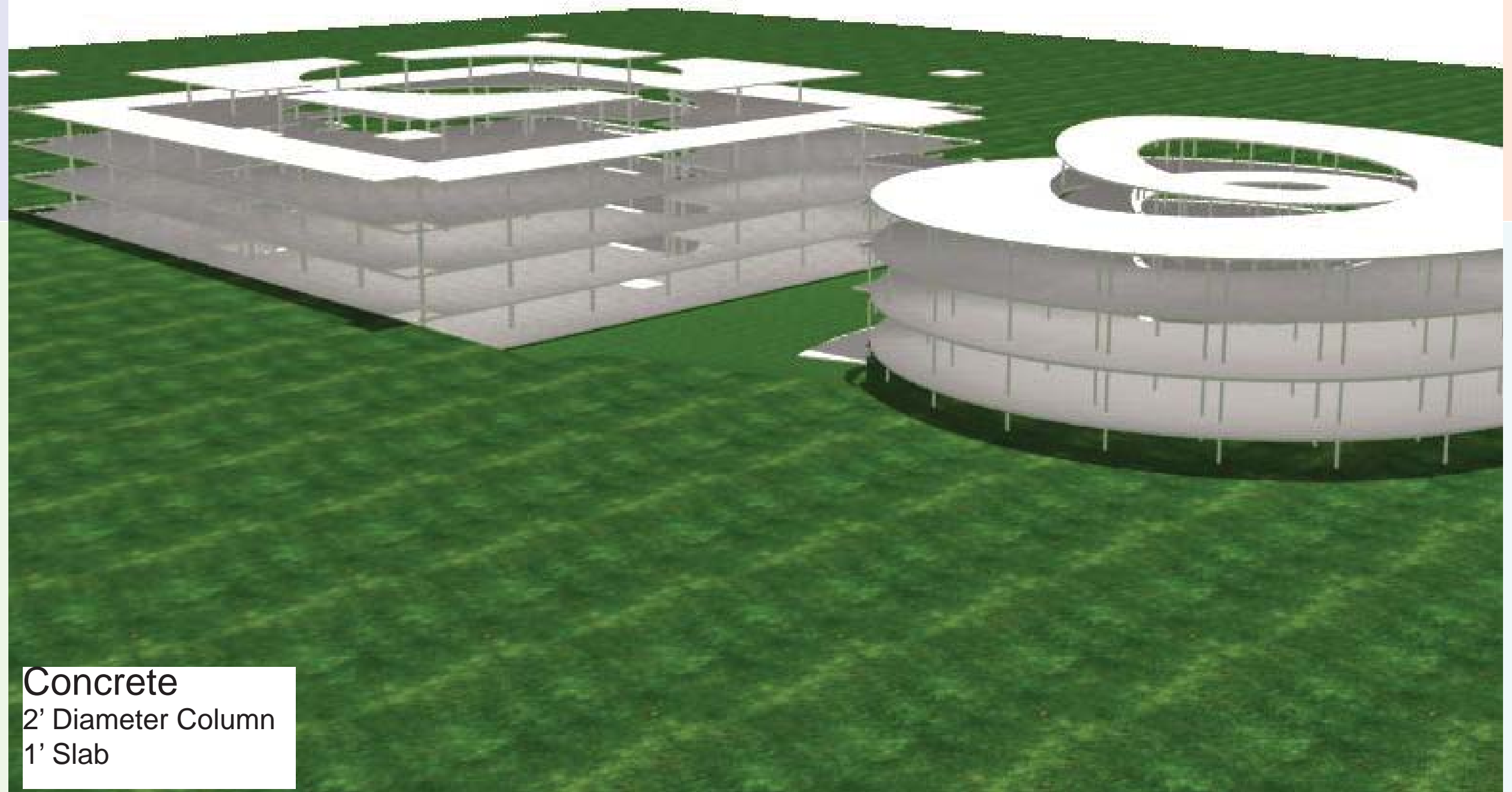
Section

The circulation of the parking structure implies the structure of the main building.



Concrete structure

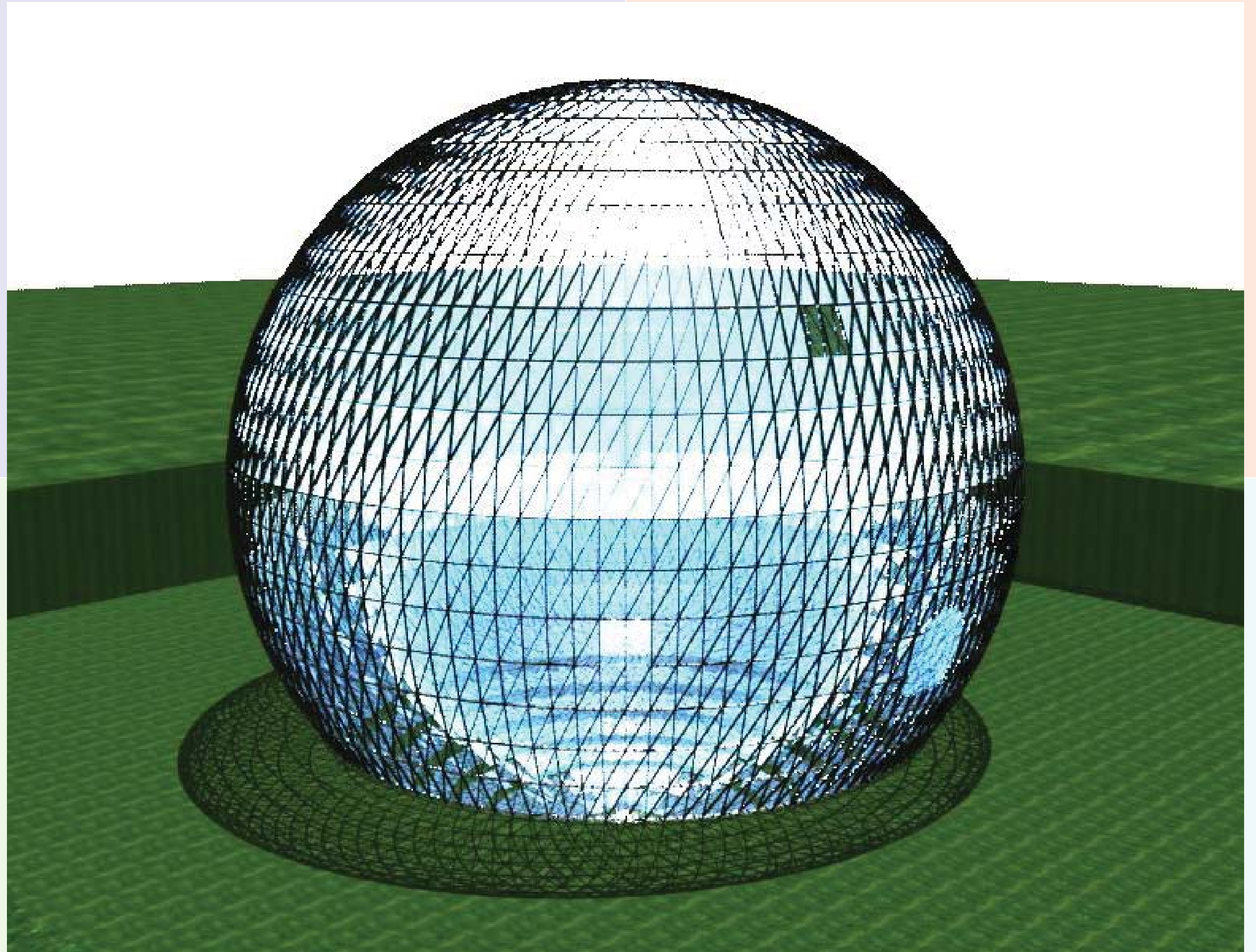
Low cost and flexible concrete column and slab structure. The columns are placed in a 40'x40' grid.



Concrete
2' Diameter Column
1' Slab

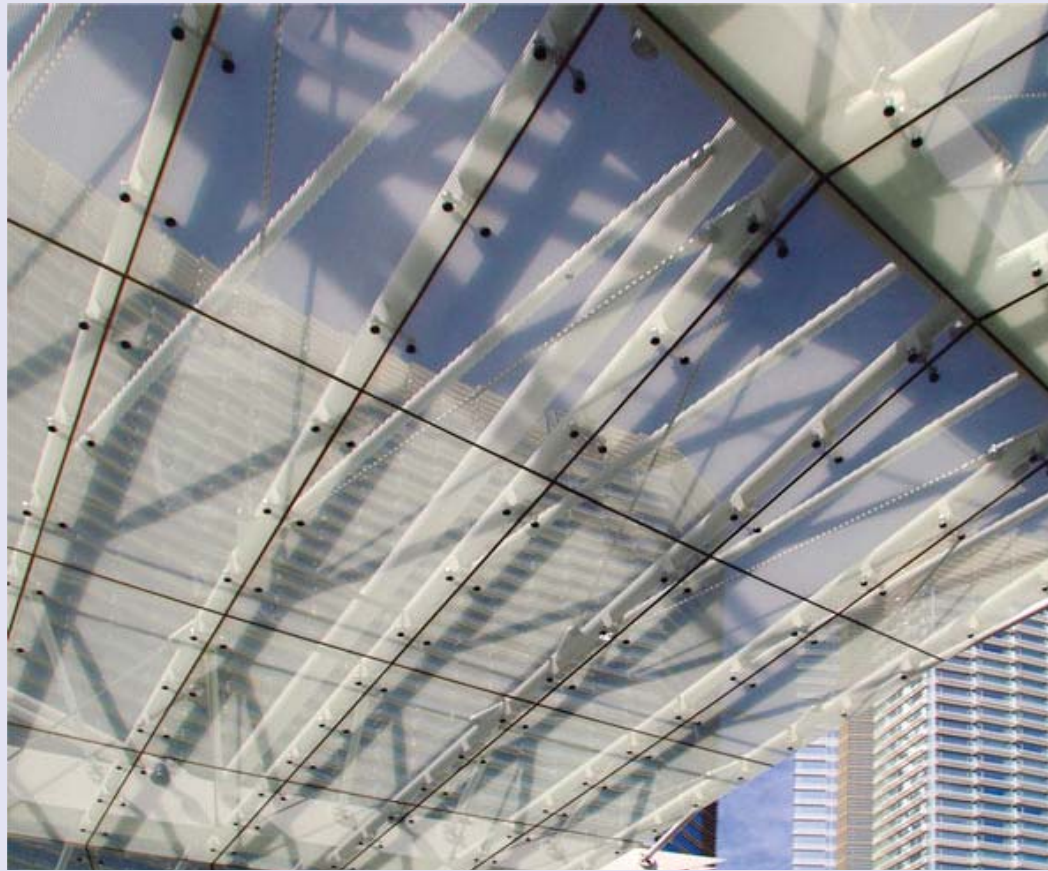
Glass sphere structure

The glass sphere has its own structure. There is a steel frame structure outside of the sphere, and glass panels are supported by spider joint.



Glass structure

These are the precedents for glass sphere structures. Most of the design decisions for the glass sphere structure were inspired by these case studies.




NOVUM

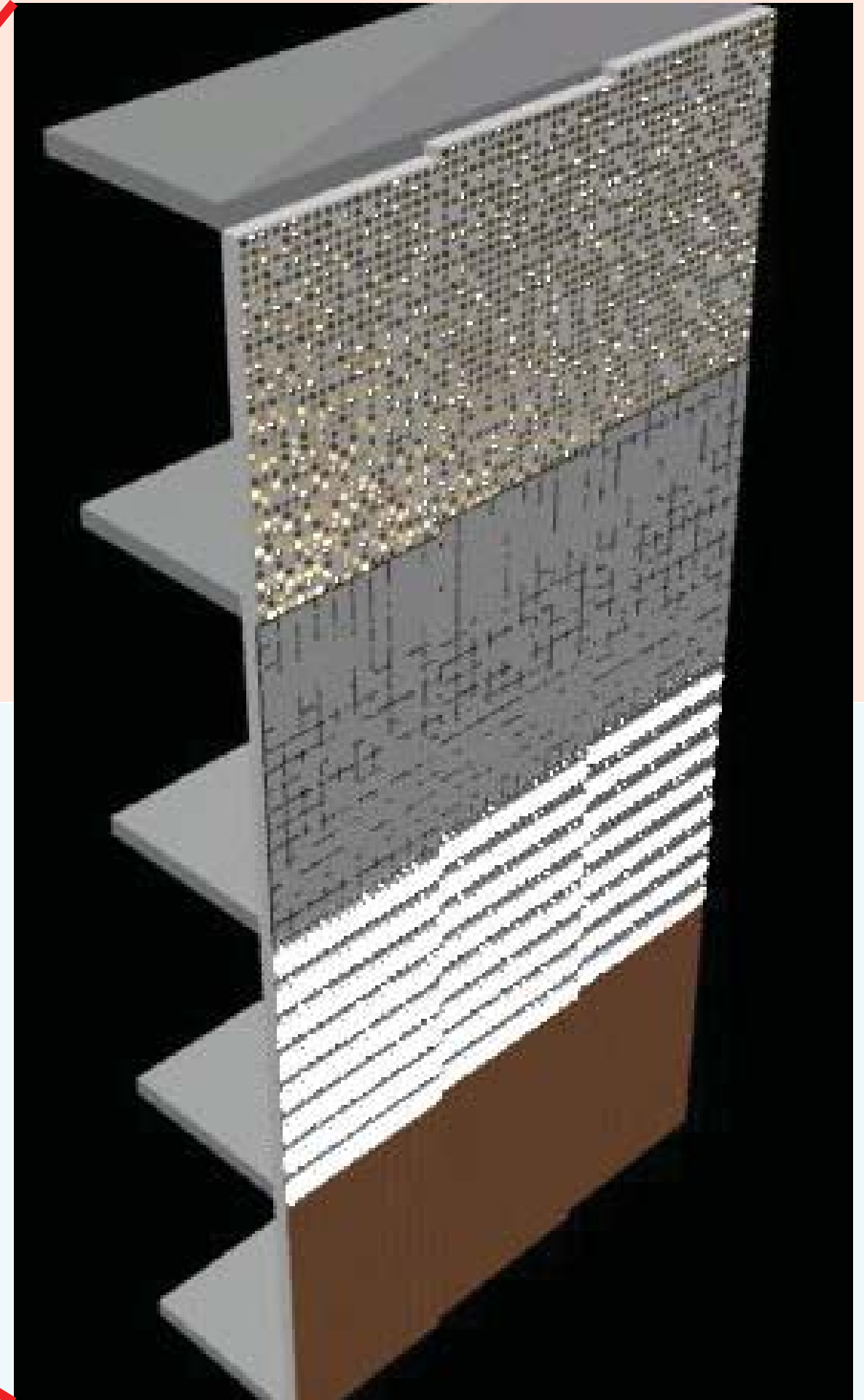
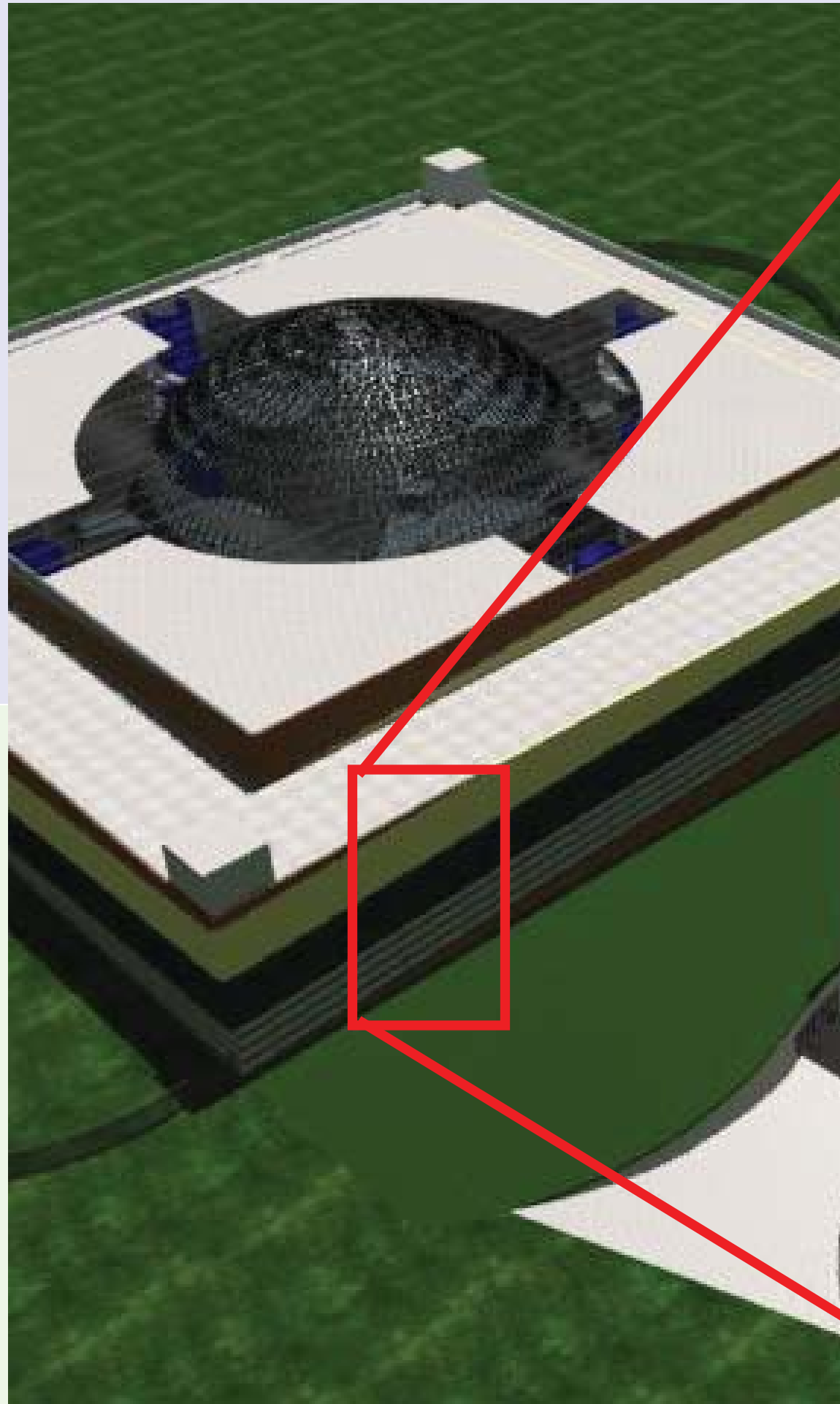


seele



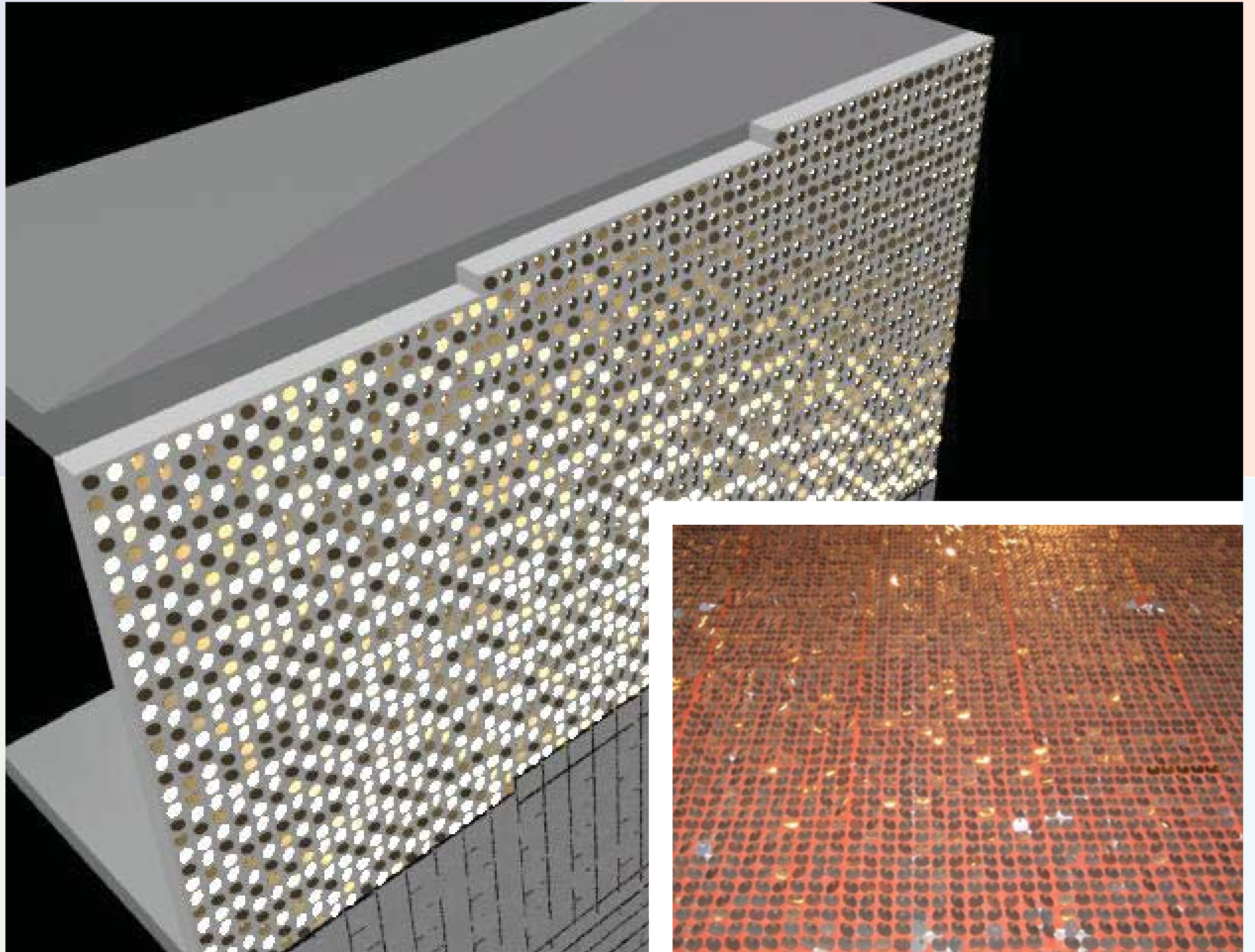
Facade details

The exterior of the building is constructed with curtain wall panel systems. The size of the curtain system is 10'x16'. The facade texture is different at the levels where the themes change. The curtain walls are 6" offset to create spiral look on the facade. The curtain wall consists lateral bracing for the lateral force on the building.



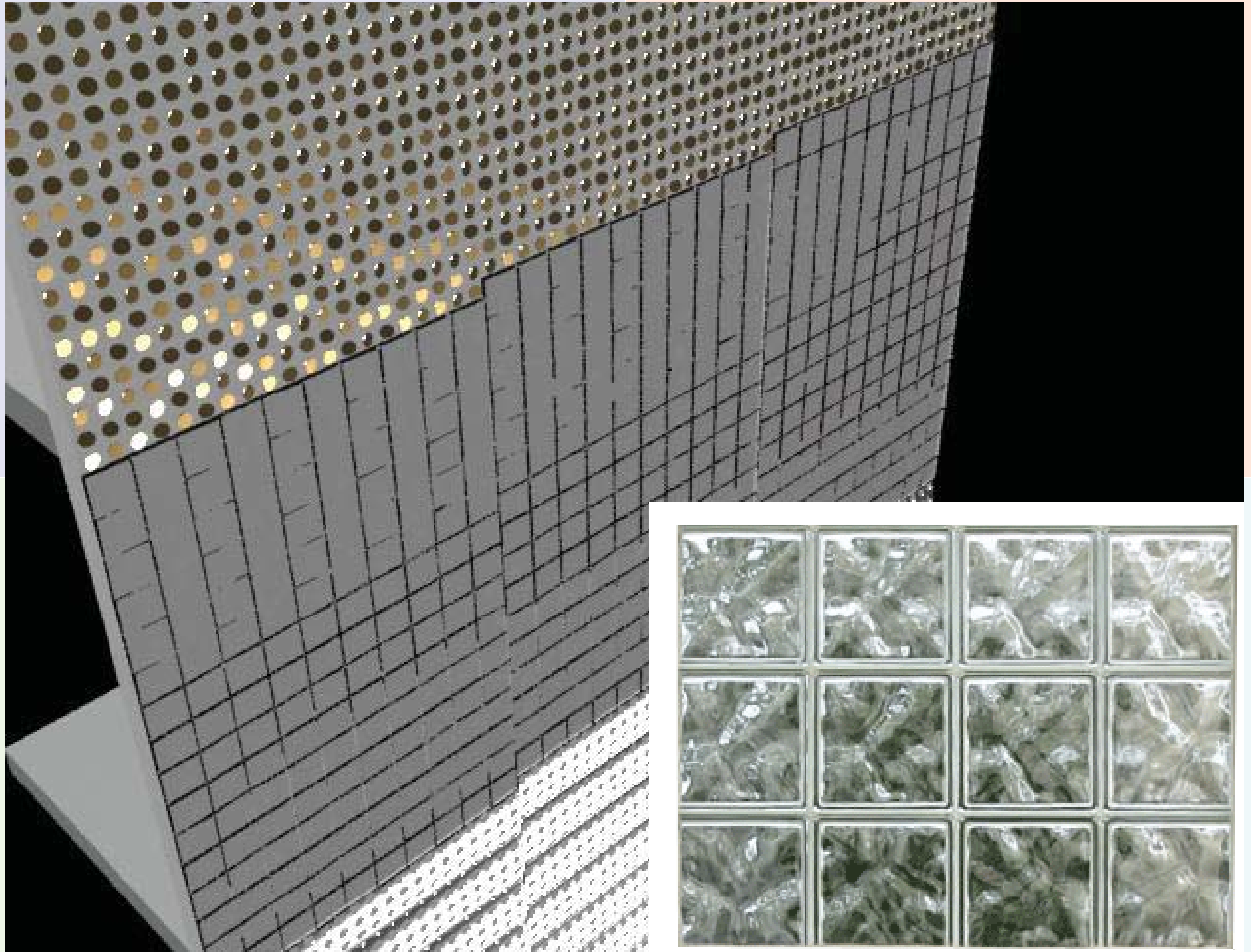
Air facade

This facade represents “Air”, where the metal charms visualize the movement of air.



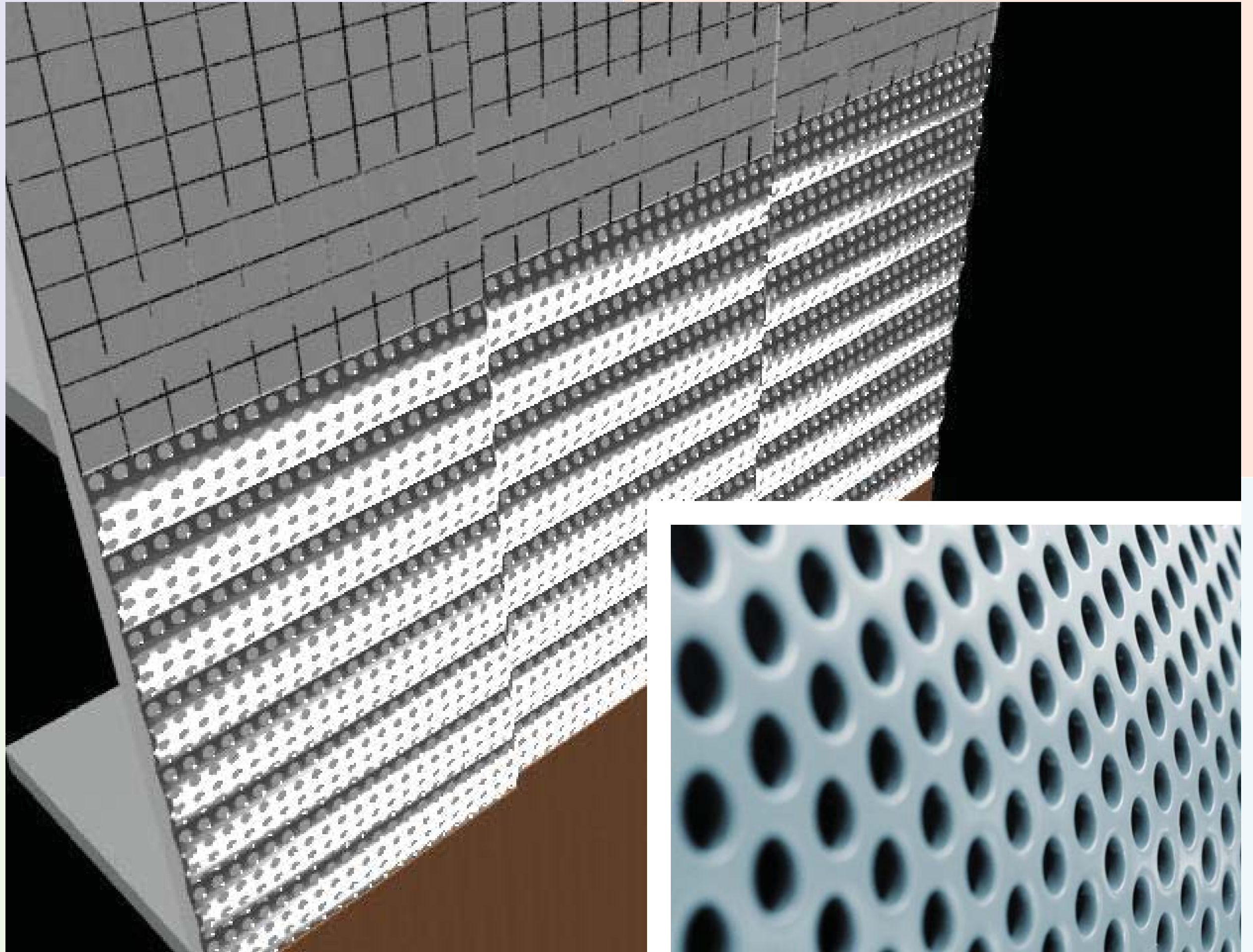
Water facade

This facade represents “Water”, where this wavy glass implies the texture of water.



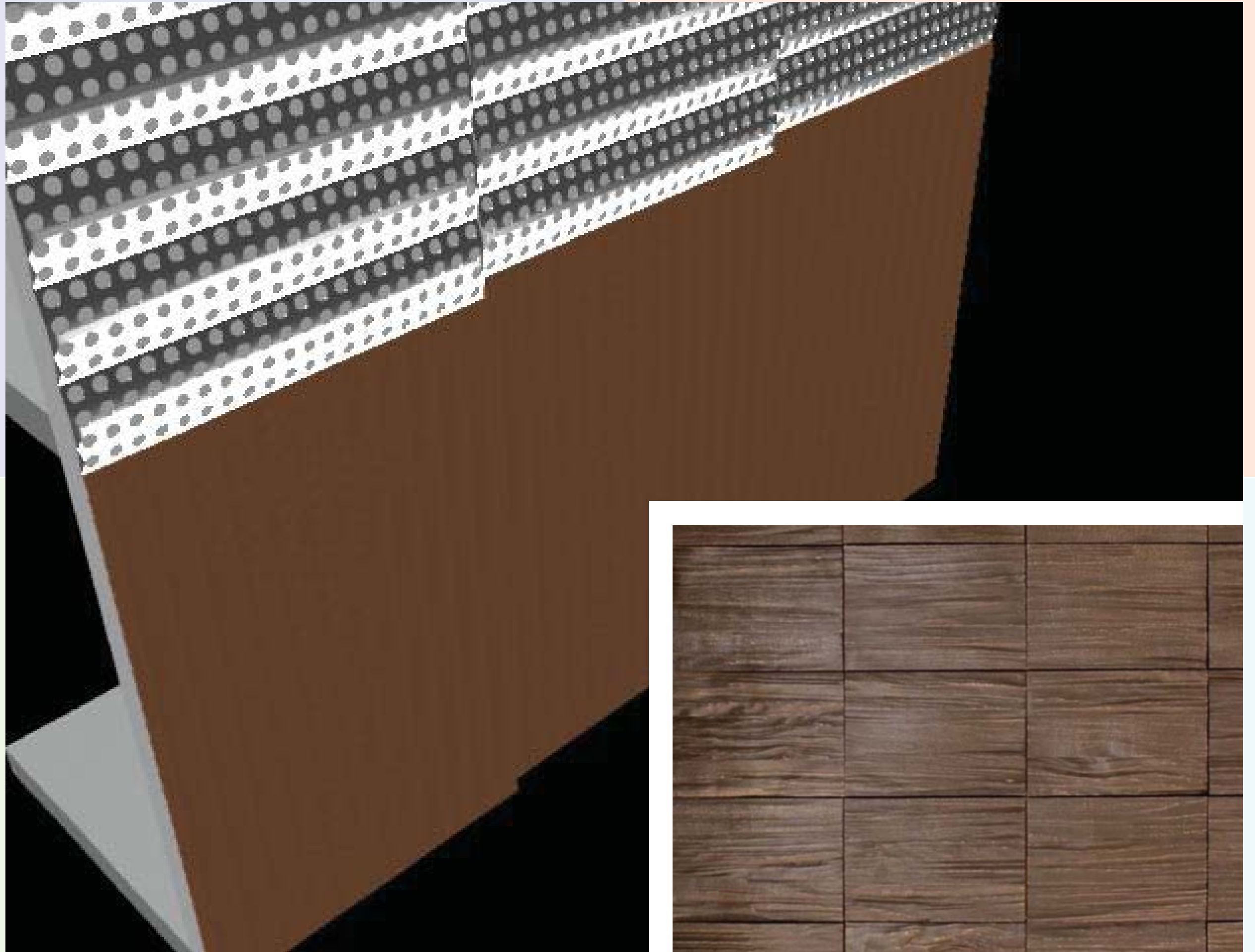
Energy facade

This facade represents “Energy”, where perforated metal is back lit with LED lights. The pulsing lights represent energy moving.



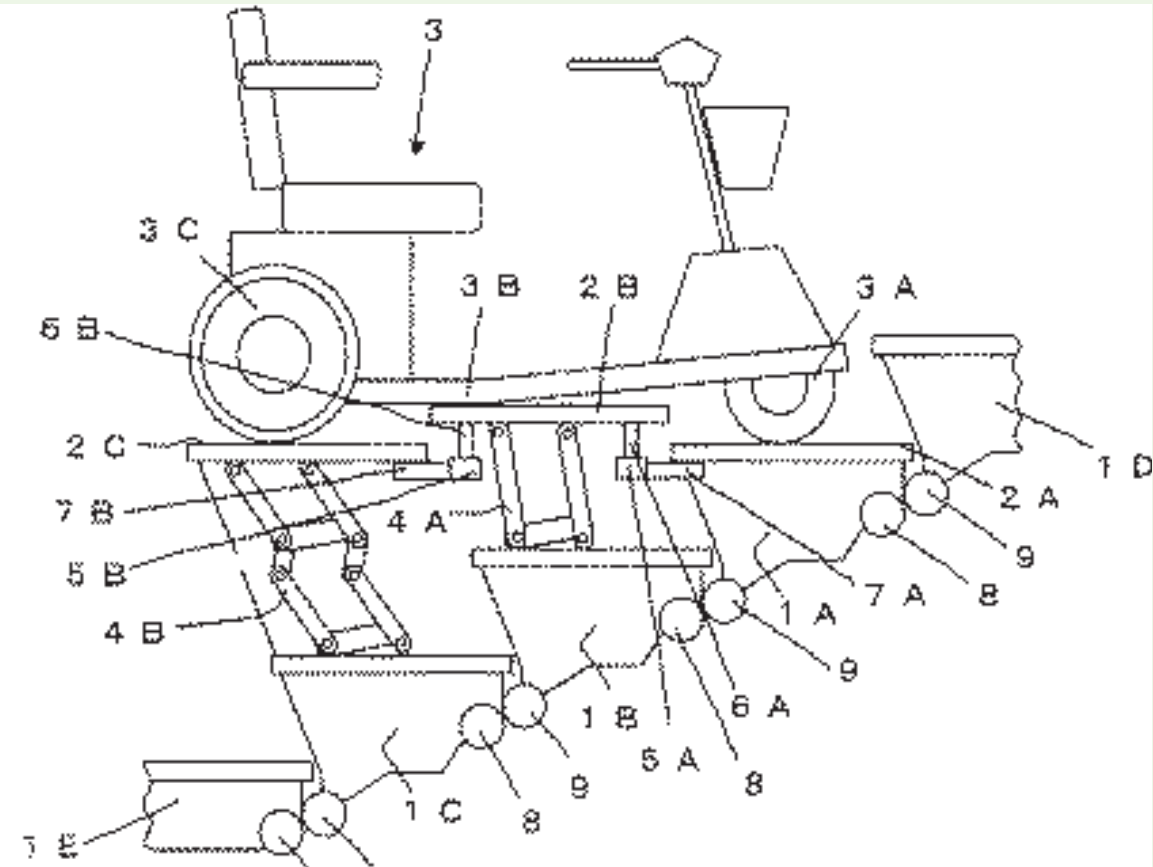
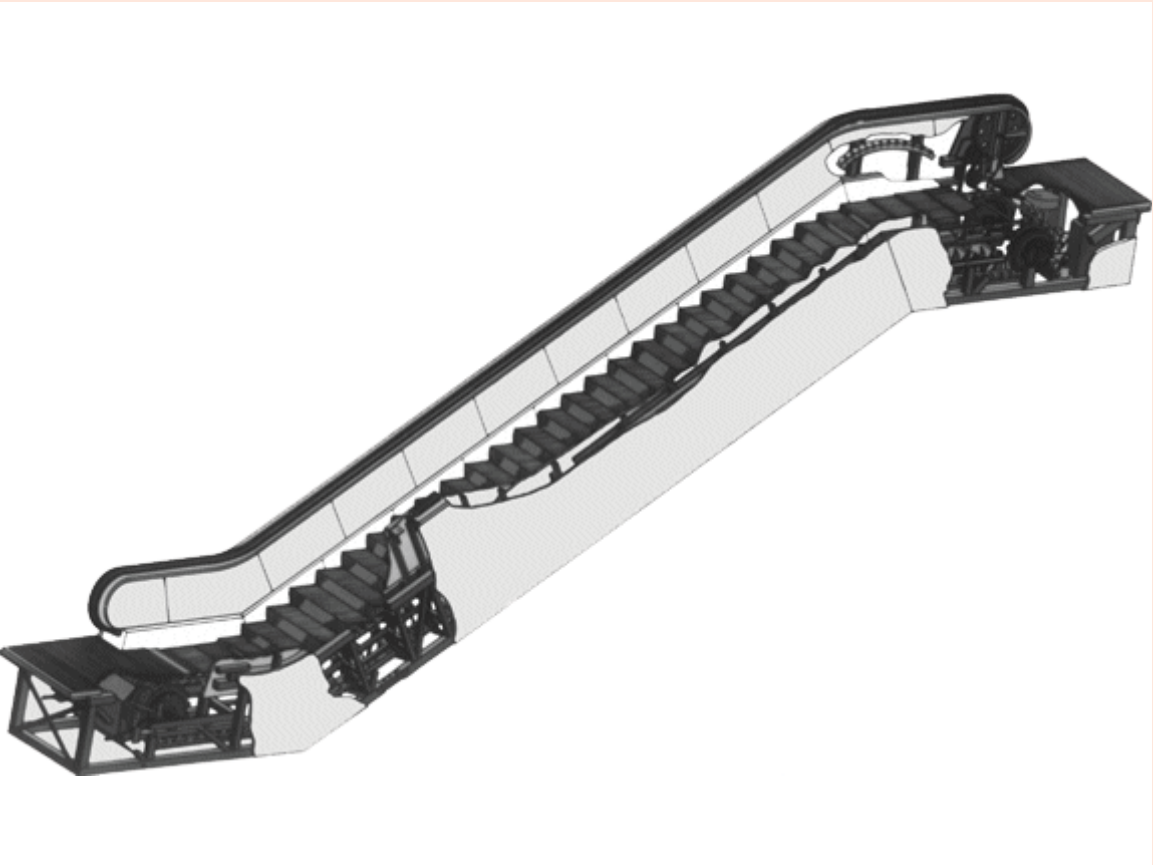
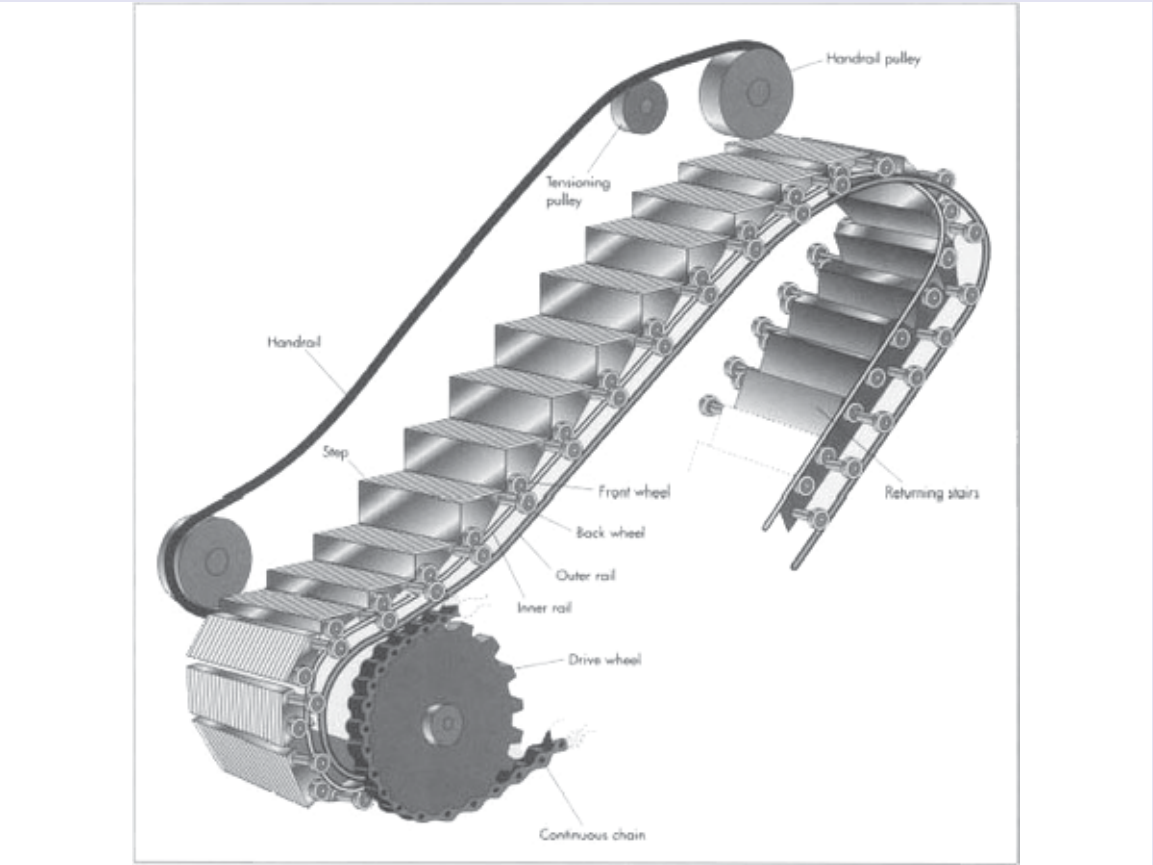
Earth facade

This facade represents “Earth”, where 4'x4' wood panels are used.



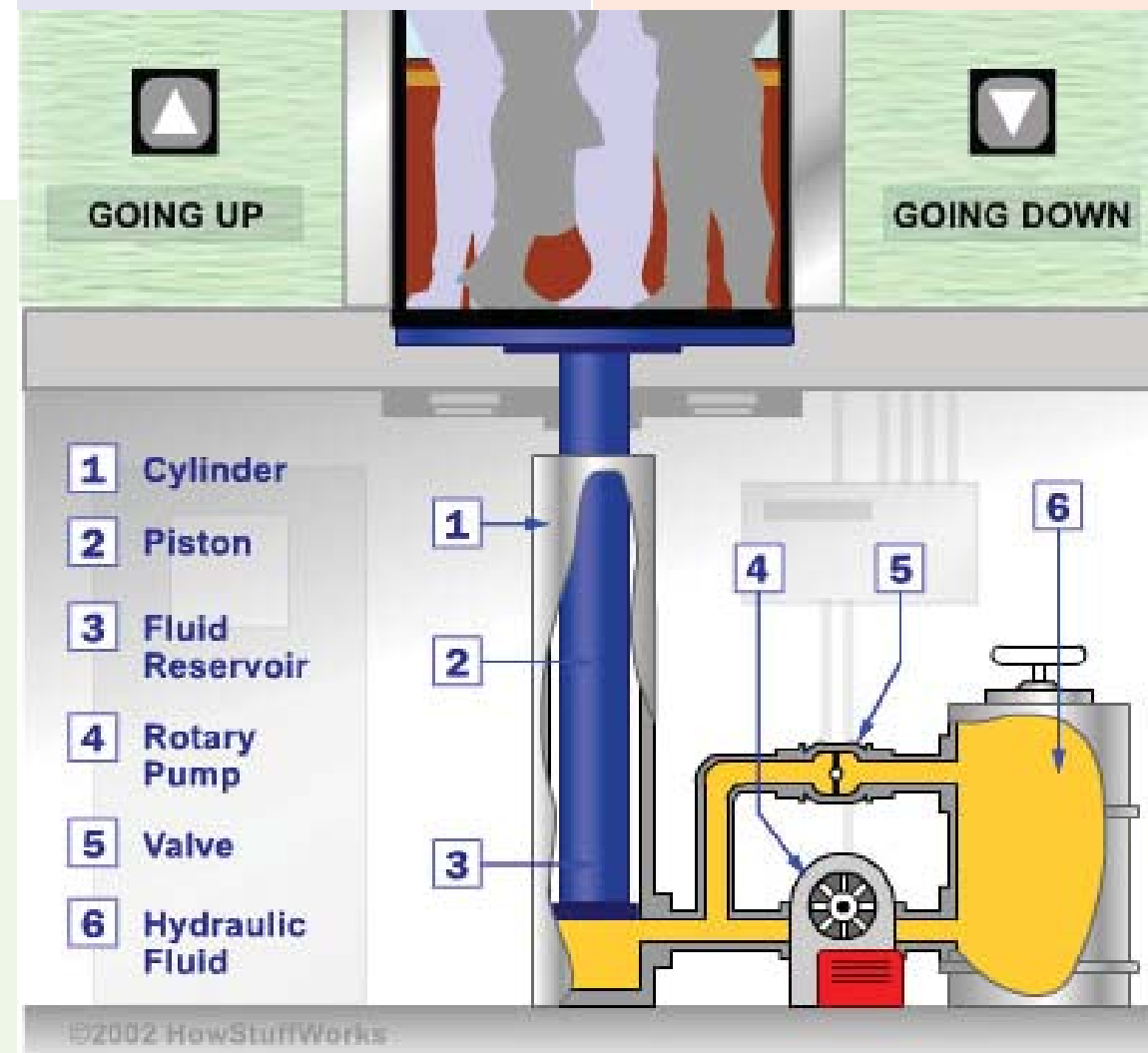
System
(Escalator)

An escalator that is accessible to wheel chair is used in the building.



System (Elevator)

All the elevators are hydraulic to have relationship with the “water” theme.



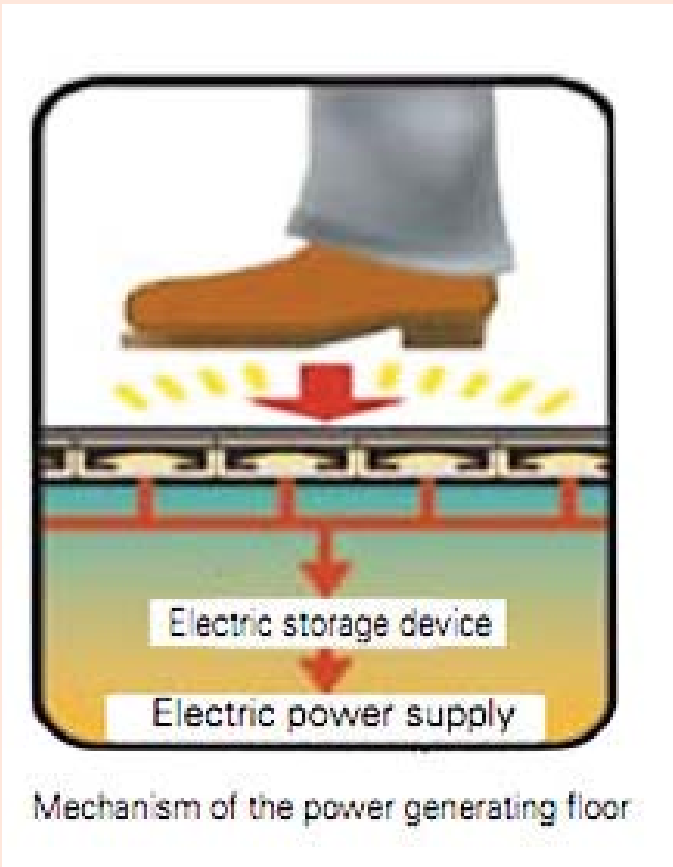
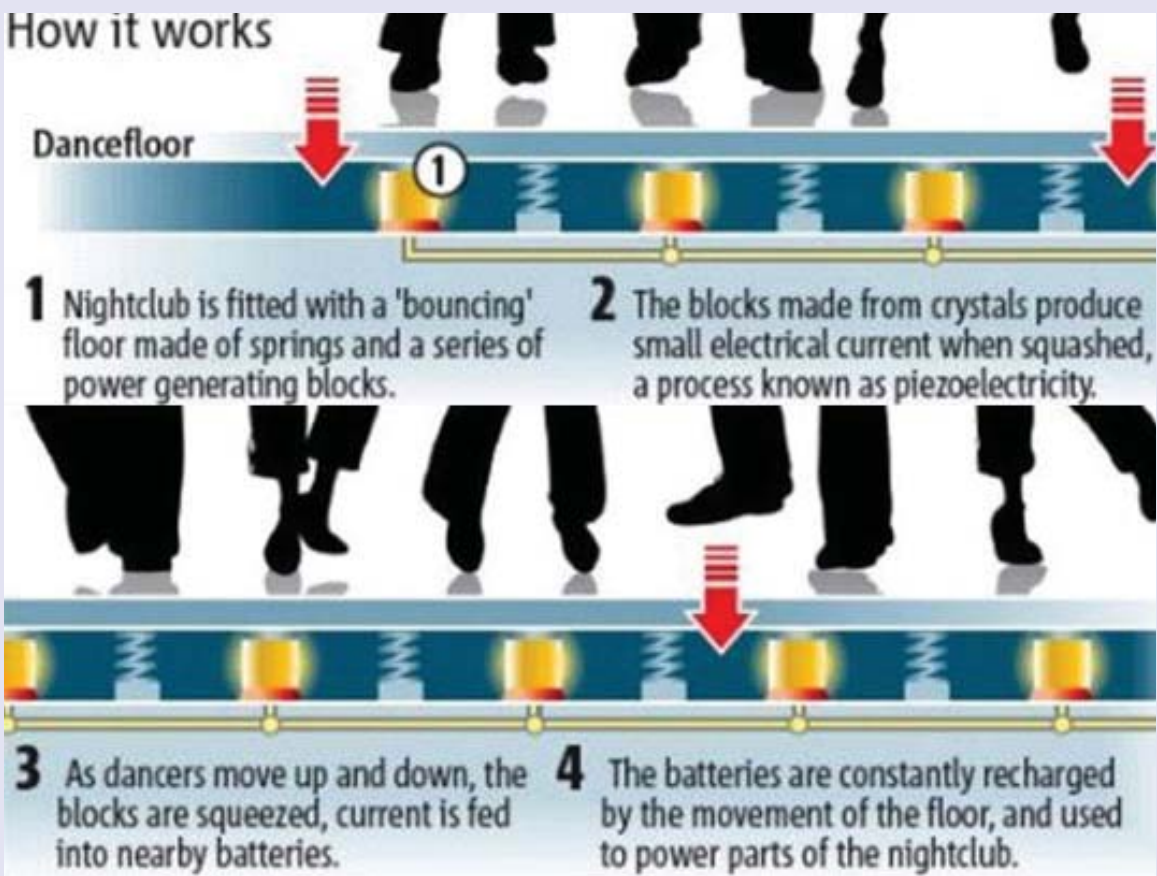
**System
(Shweeb)**

This attraction
is used in place-
ment of roller
coaster because
Shweeb uses no
electricity.



System (Energy generating floor pad)

This system is directly connect-
ed to the exterior
“Energy facade”
so movement
of people inside
is visible from
outside as light
movement.



System(Trans- solar Cloud)

Human made in-
terior cloud.



System (Other)

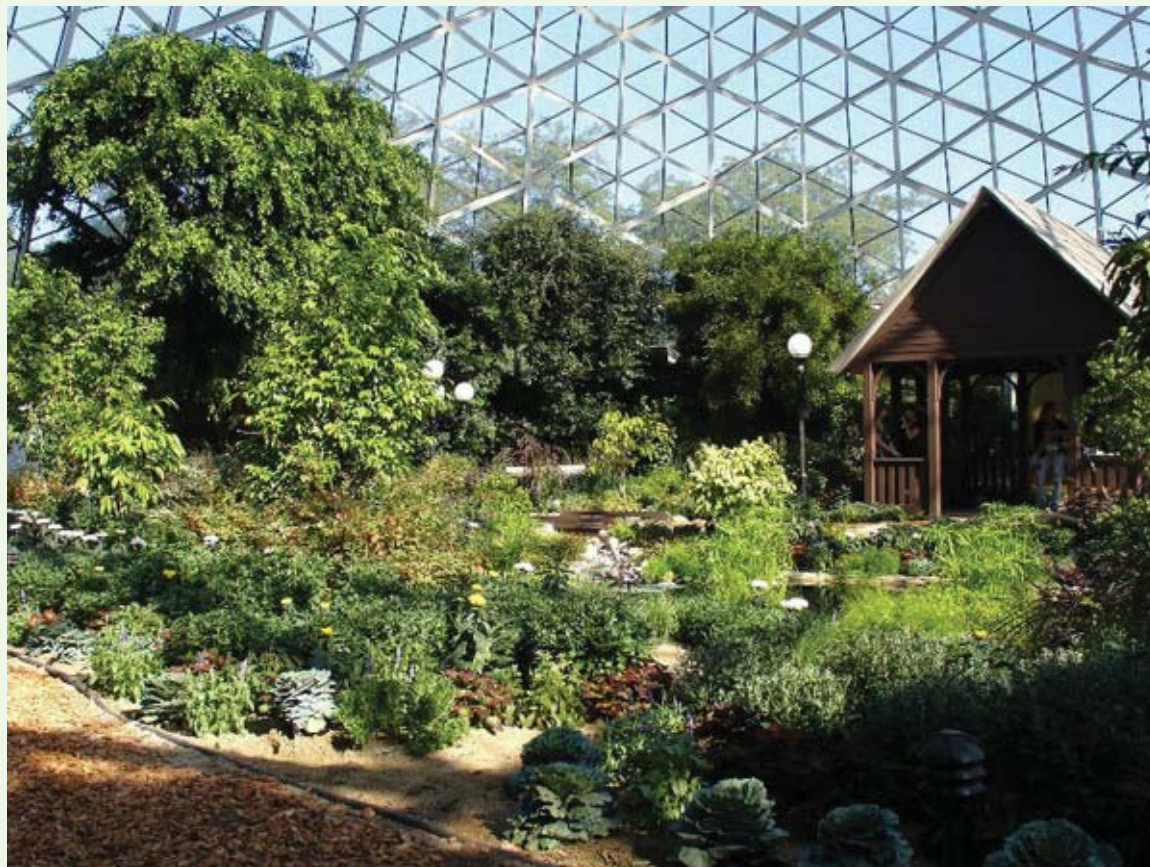
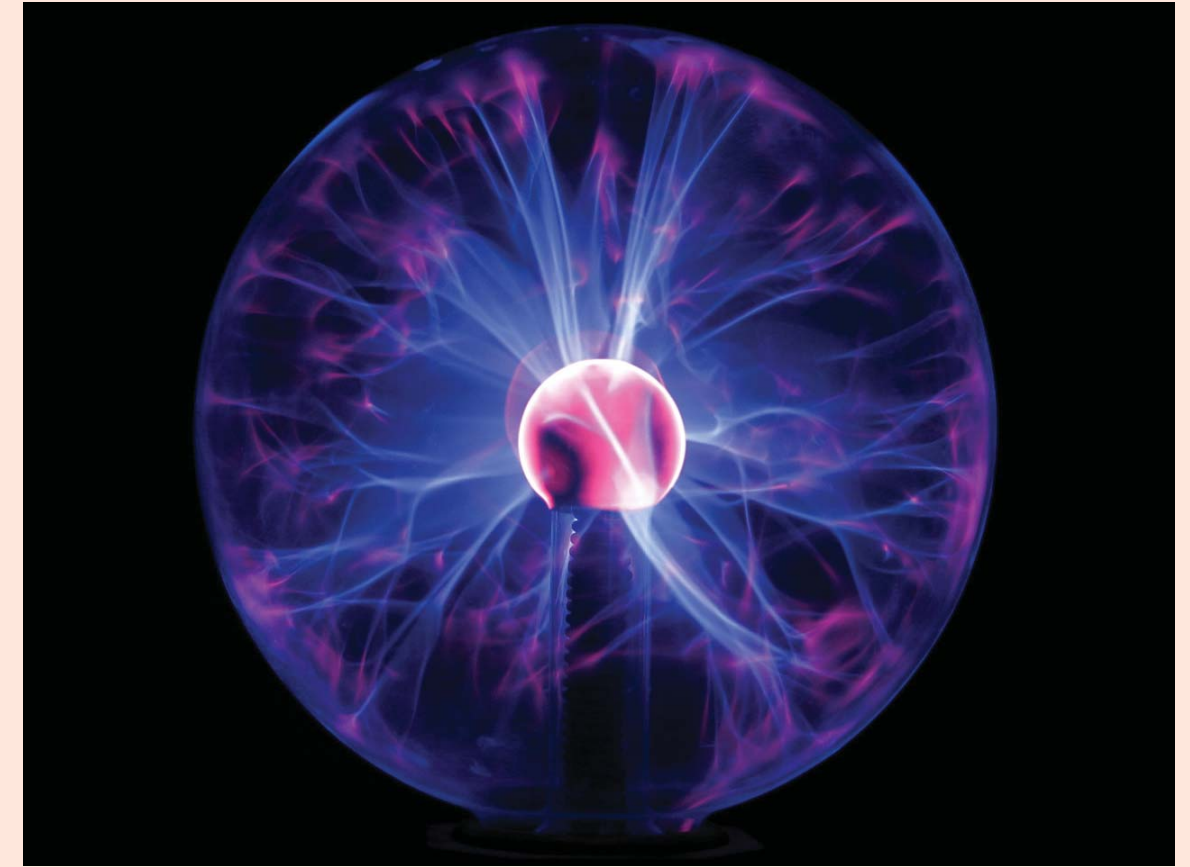
Examples:

-Water ride

-Giant plasma ball

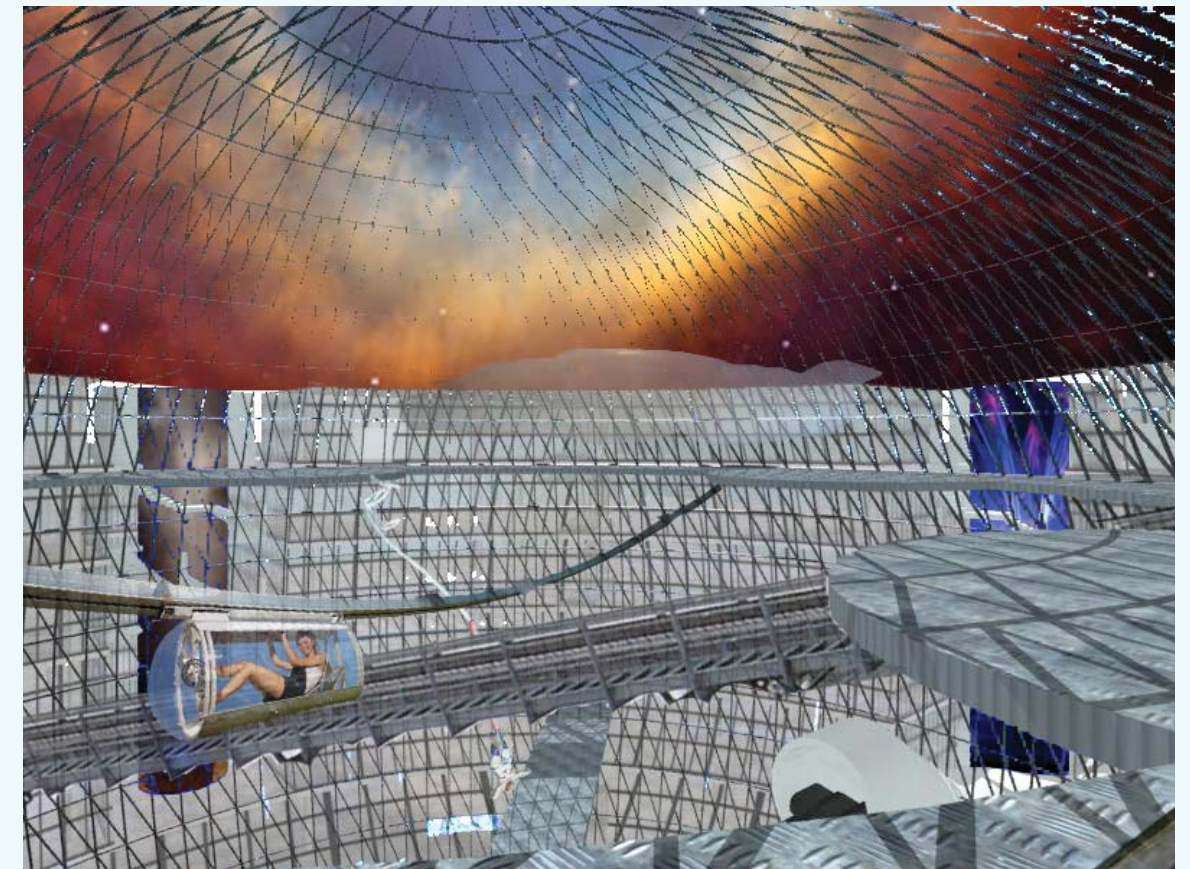
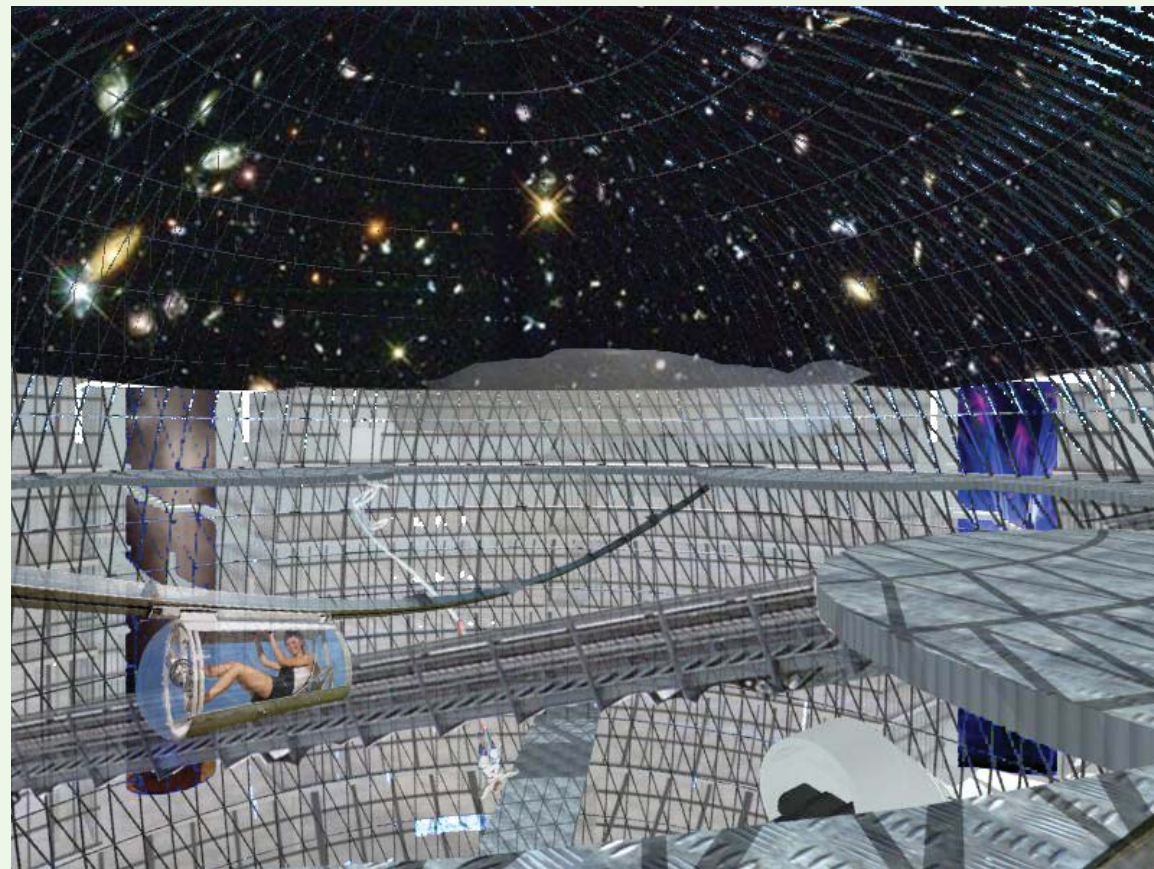
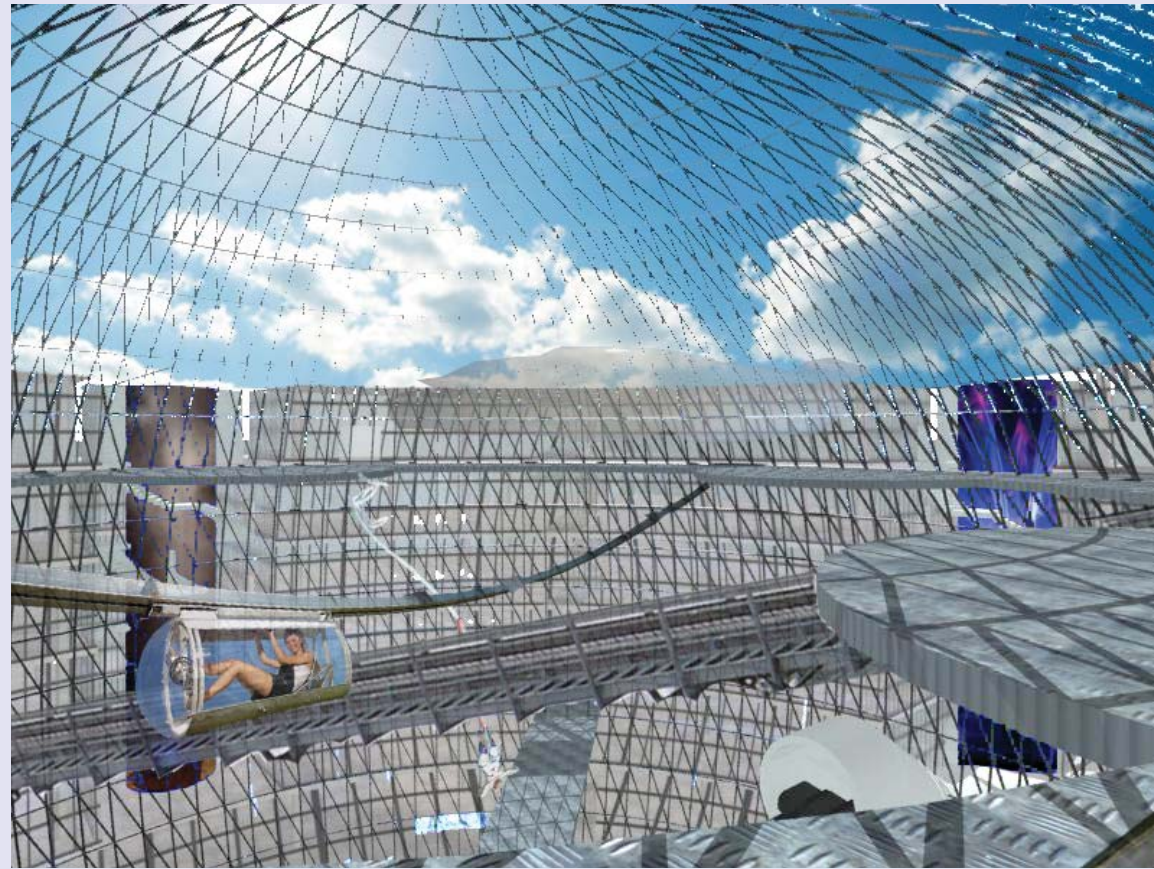
-Tornado generator

-Green house



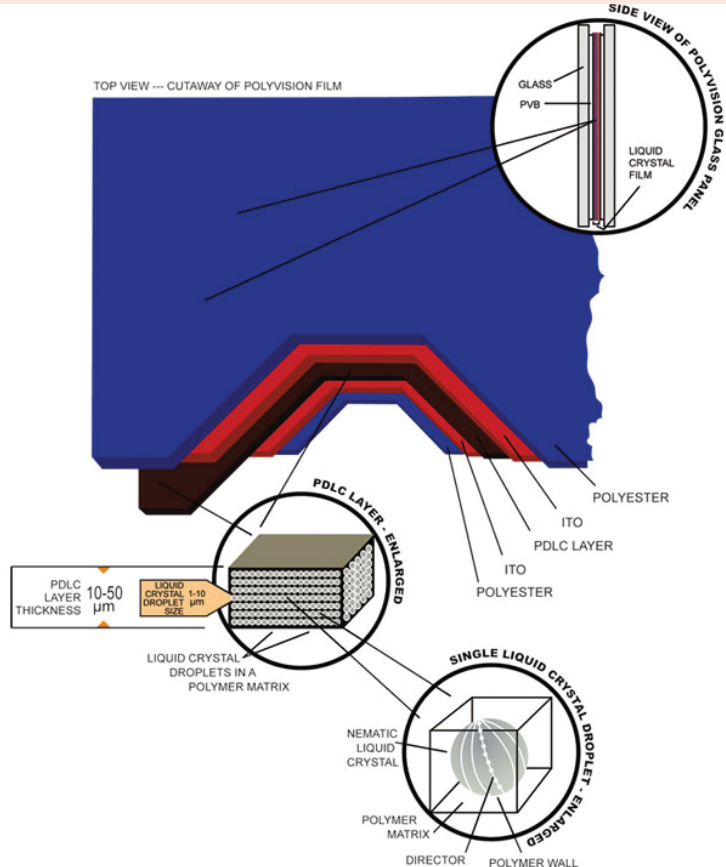
System (Projector)

The top half of the sphere will have a variety of characteristics. The glass can be clear or a screen that projects images of a forest or nebulae.



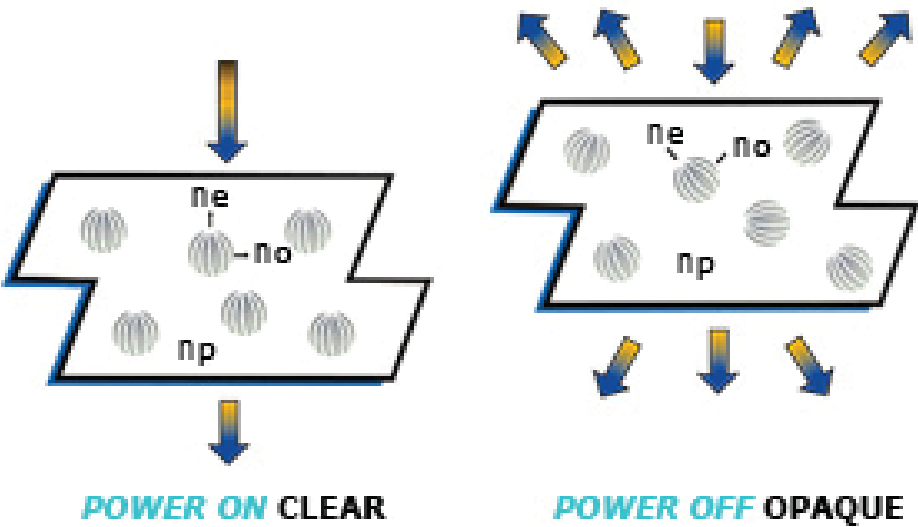
System (Poly Vision)

This glass system is applied on the top half of the sphere. It can be clear or translucent, so the sky can be visible from inside when the glass is clear. A giant image can be projected, when the glass is translucent.



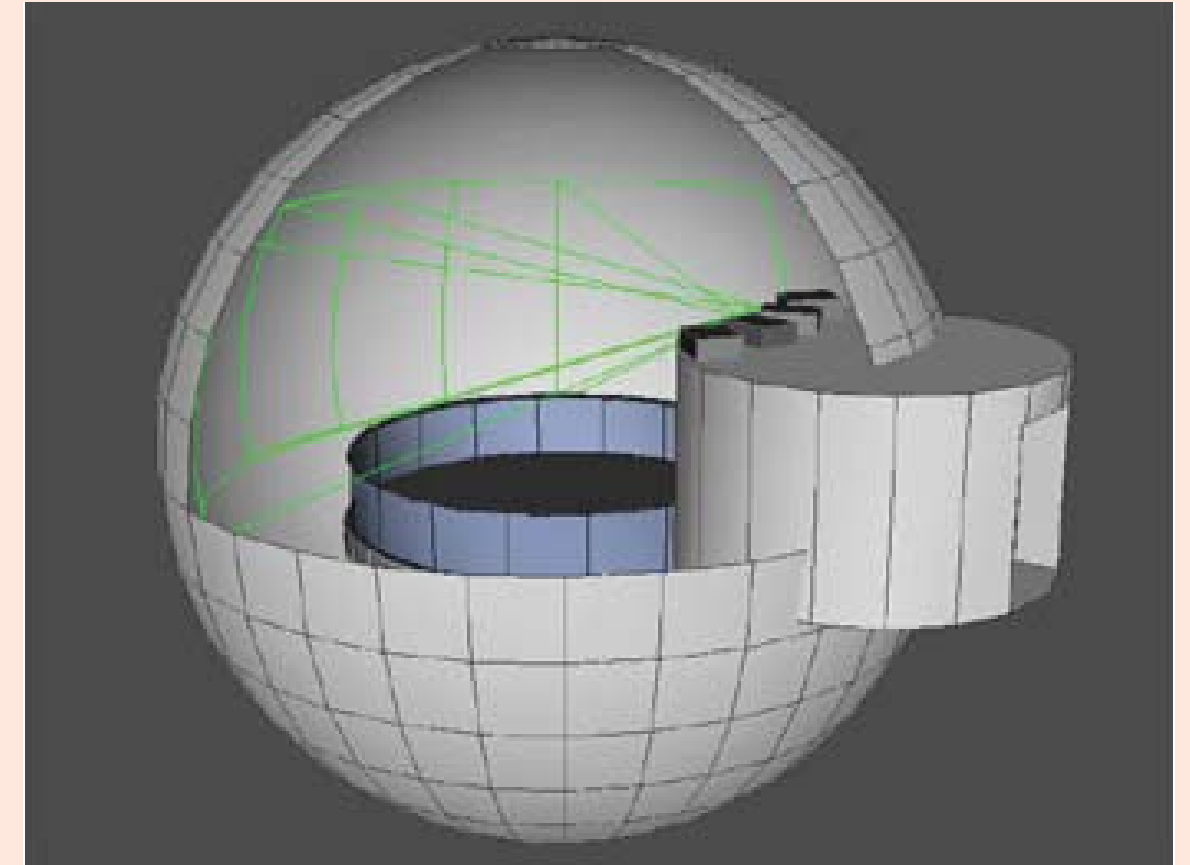
PolyVision®
a steelcase company

PDLC Light Scattering Mechanism (How It Works)



System (Coolux)

This projector system is perfect for projecting images on spherical surface.



coolux

