

# Blending Jameel

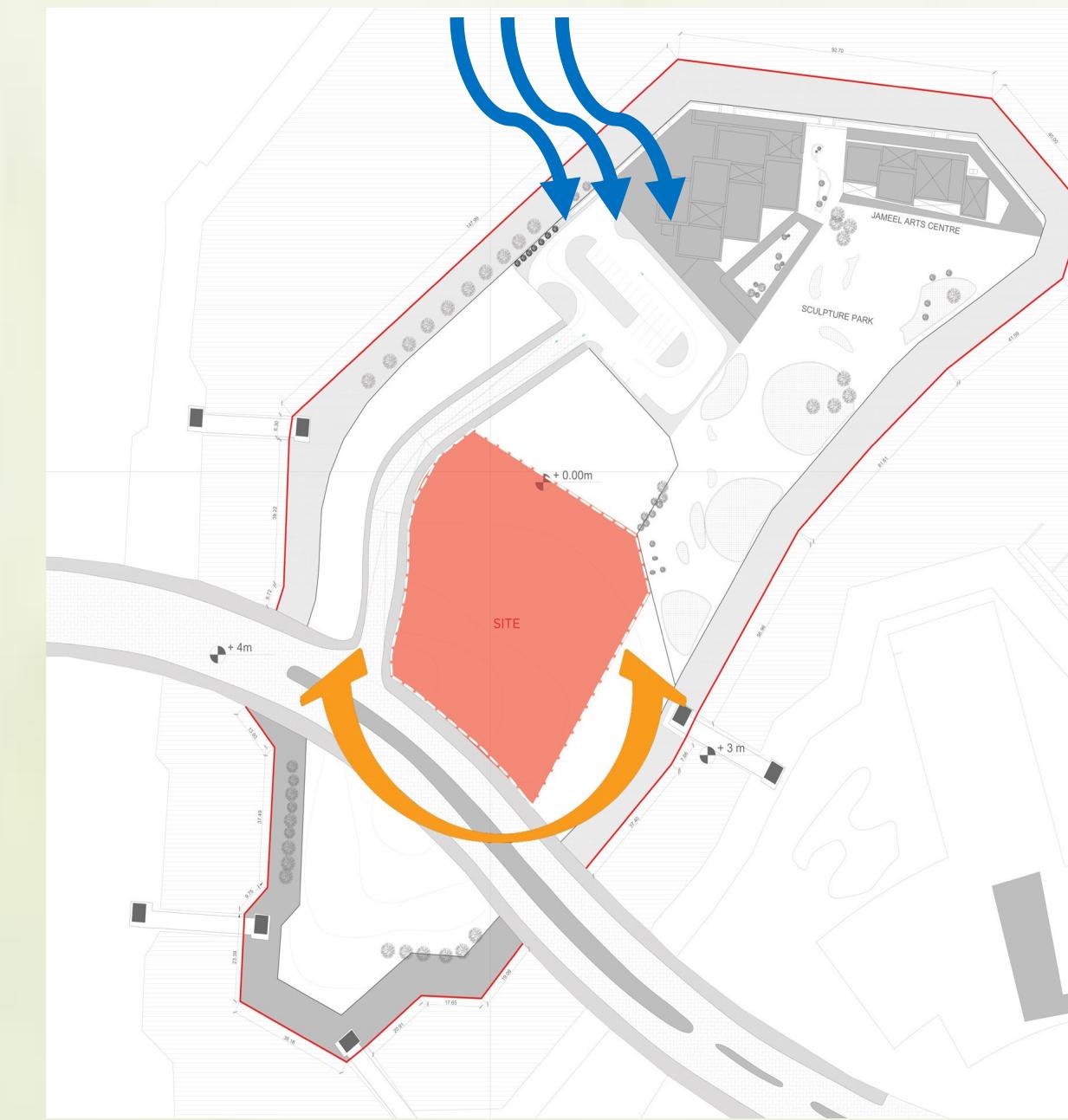
Team Greentopia



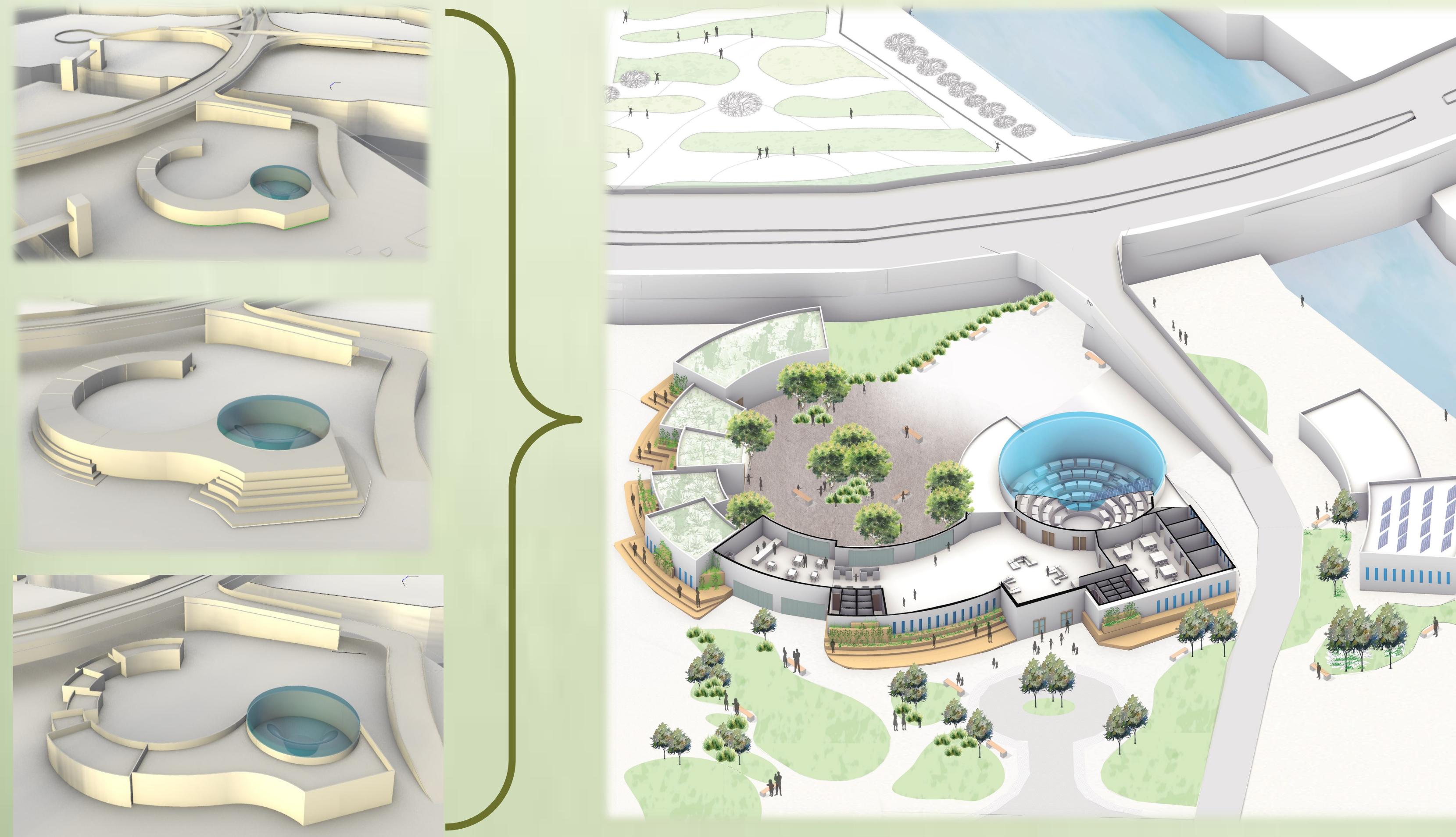
Hamza Bilal Dodhy

D10YD

Blending Jameel is situated in AL Jaddaf, Dubai. The site is embodied in the Dubai Creek, allowing open breathable spaces around the whole site. Art Jameel is an existing building constructed on the north side which already accommodates a parking area for visitors that can be used for contributing to the accessibility for the upcoming project. Blending Jameel is an extension for the existing building, Art Jameel, in terms of design. Following the complexity of the design and the blend with nature formed the initial project name. Due to neighboring areas and structures, the site experiences around 6 hours of direct sunlight which is utilized in the active Solar PV Panel systems located on top of the building. Embodied with water and breathable spaces, the site does experience wind from the north west side at around 12 km/h.



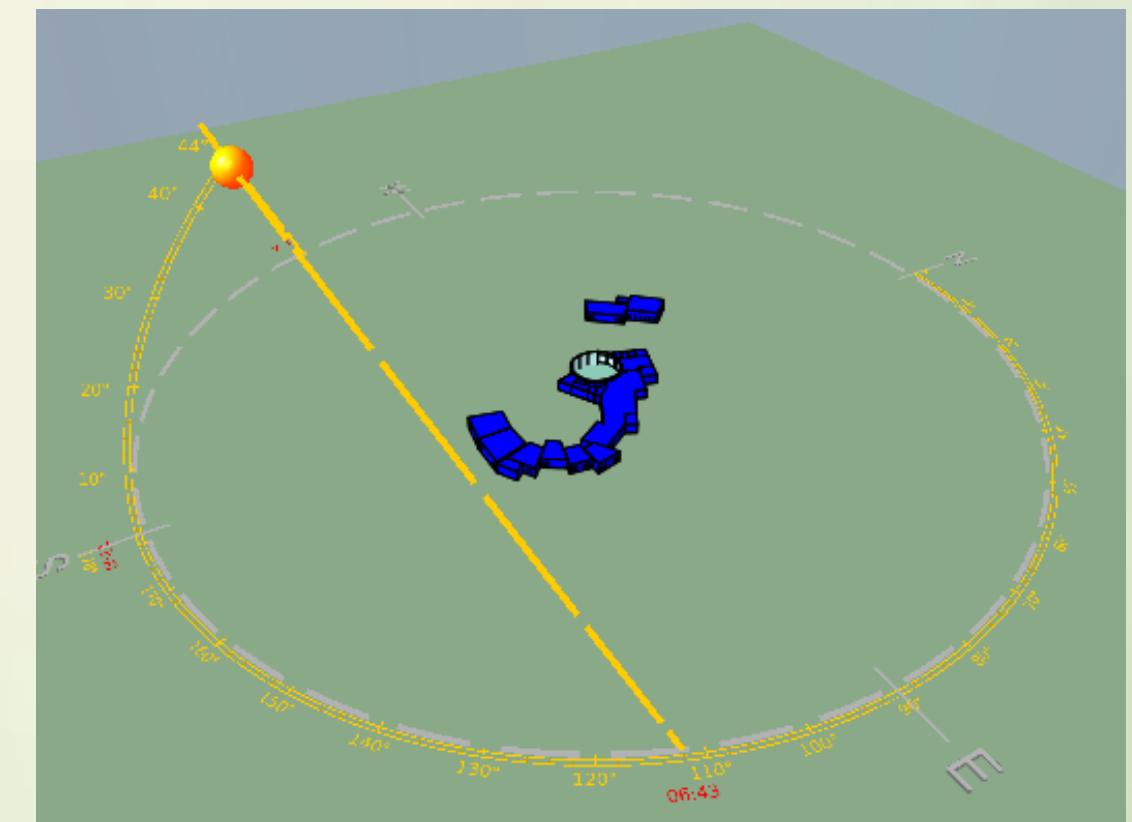
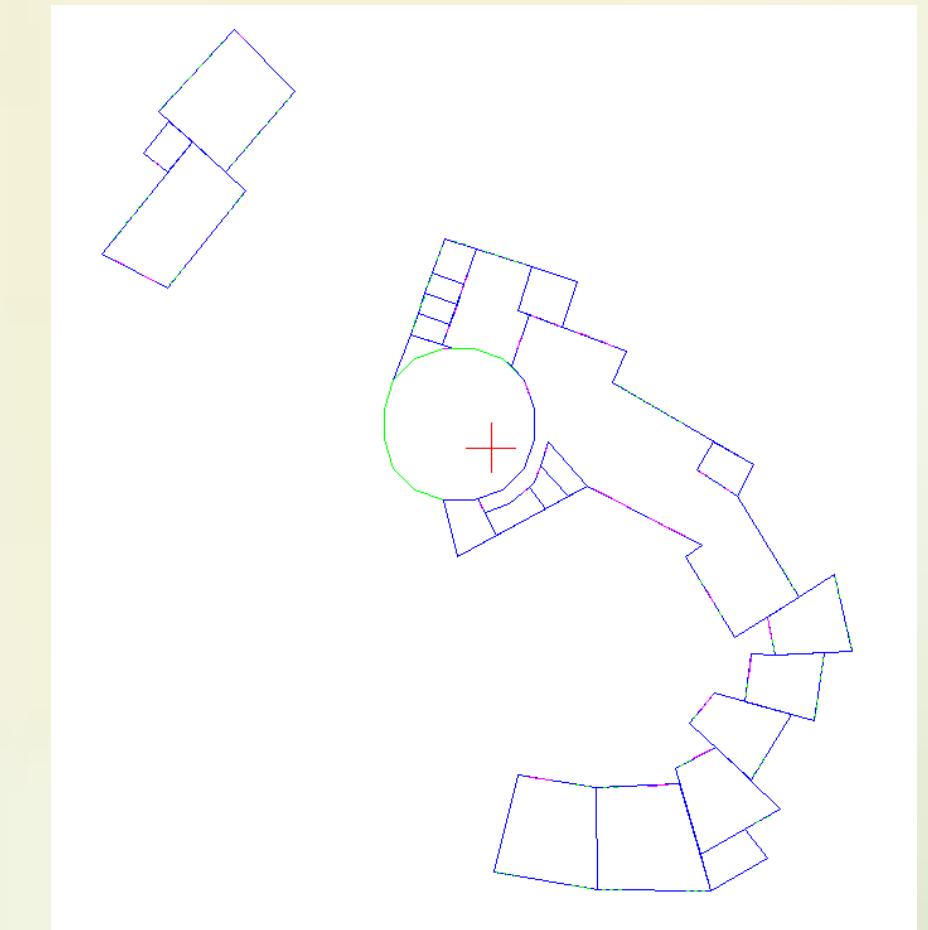
The initial designs made by the architects went through a number of iterations before reaching a conclusion on the final design. This process improved how the development of the project came to life. The iterations determine the initial basic design to the final design that consists of the spacing of zones and the surrounding characteristics that brings a personality to the design



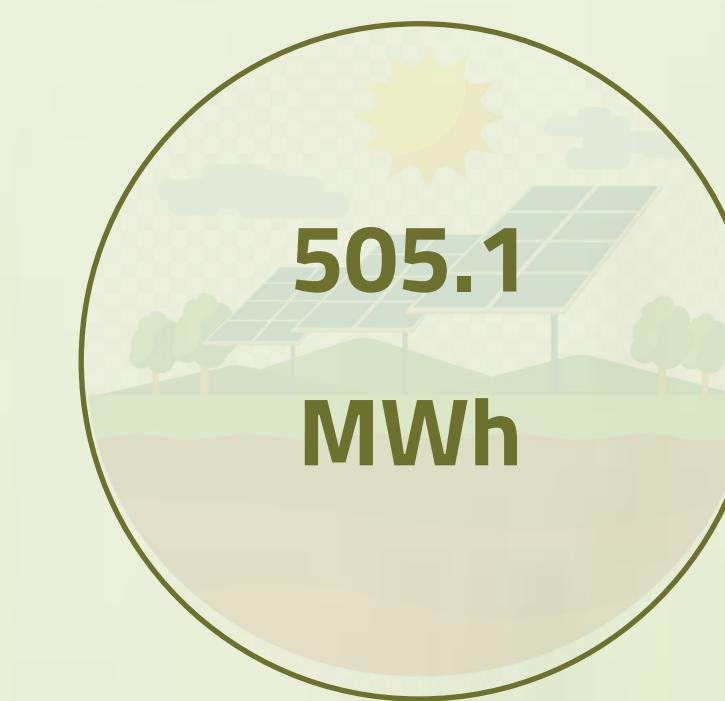
Giving an oversight of how the building performs post occupancy, various visuals can also be concluded. For the building templates, ASHRAE Standards and CIBSE Guide B was used to determine the air temperature for certain zones as well as the power consumption for generic electrical appliances. IES-VE has broken down the total building performance by each day of the year allowing to get an understanding of whether or not the design requires modifications or inputted values are improper. Due to some limitations regarding the software, the modelled design doesn't totally replicate the initial design, however, the modelled design in IES-VE takes the worst case scenario into consideration.

## HVAC Systems

Variable Air Volume systems are used throughout the building to ensure lower energy consumption, better temperature control, and better noise control. As the system provides varying air flow, different zone requirements can be met with this system and is essentially very cost effective as varying air flow means that the fan isn't working constantly essentially meaning that the systems use lesser power than other systems such as CAV,

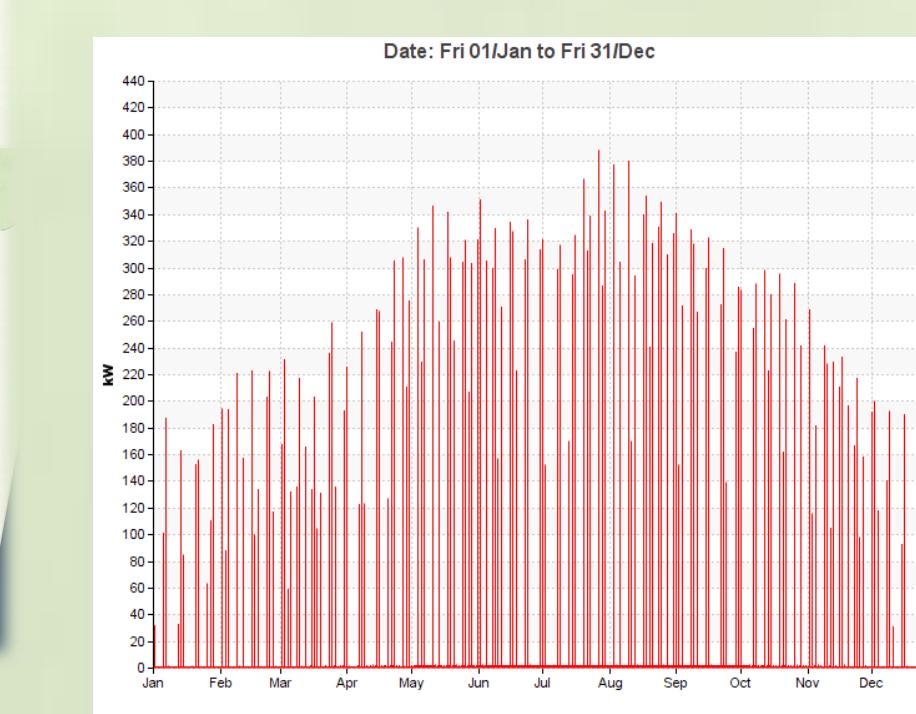


## Total Energy Consumption

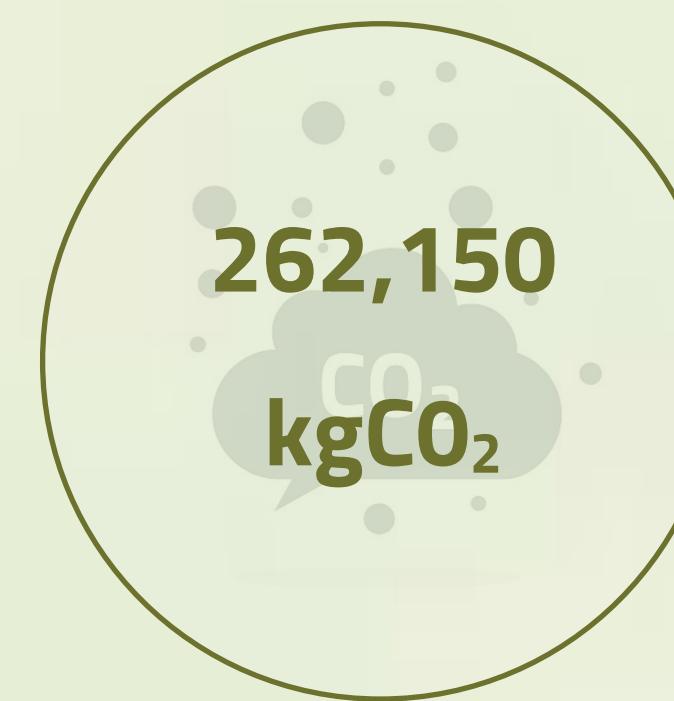


Peak Energy Consumption:

57.8 MWh in the month of August

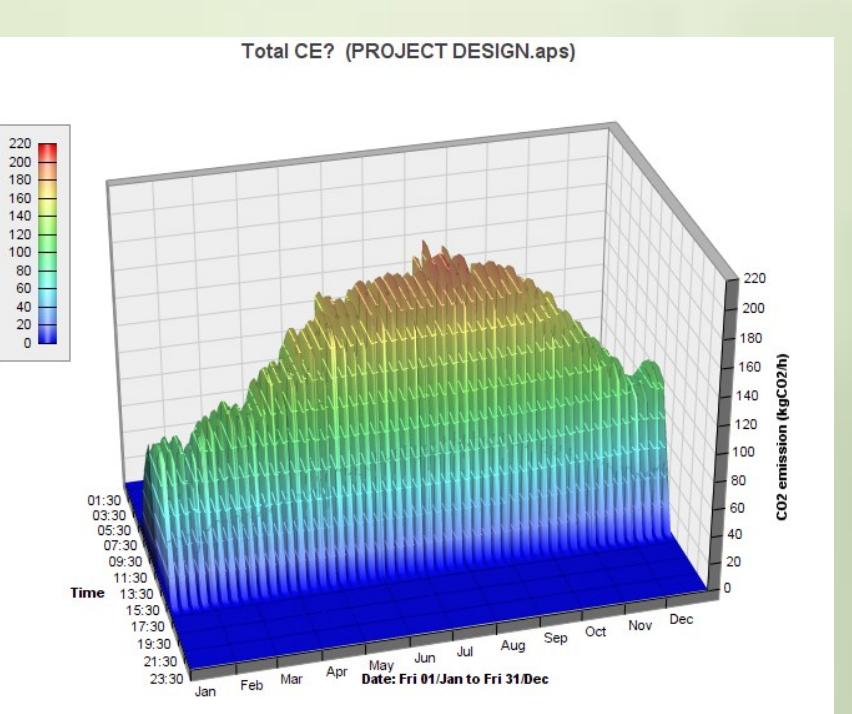


## Total Carbon Emissions

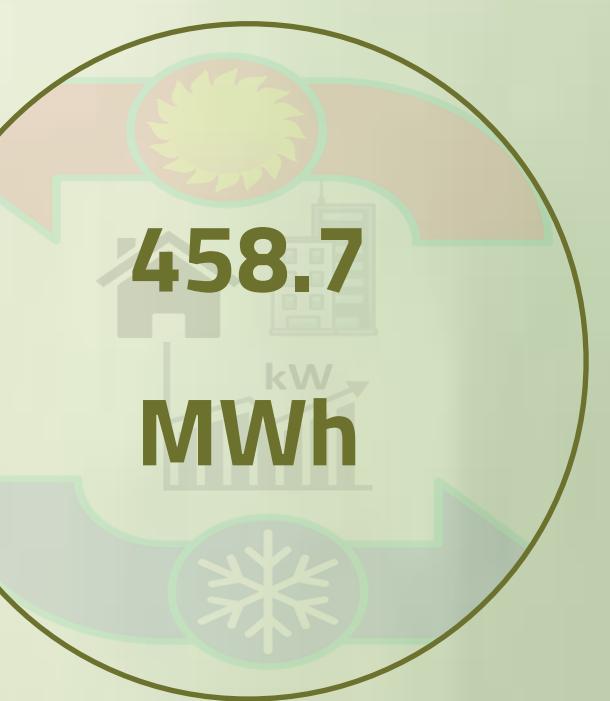


Peak Carbon Emissions:

30,020 kgCO2 in the month of August

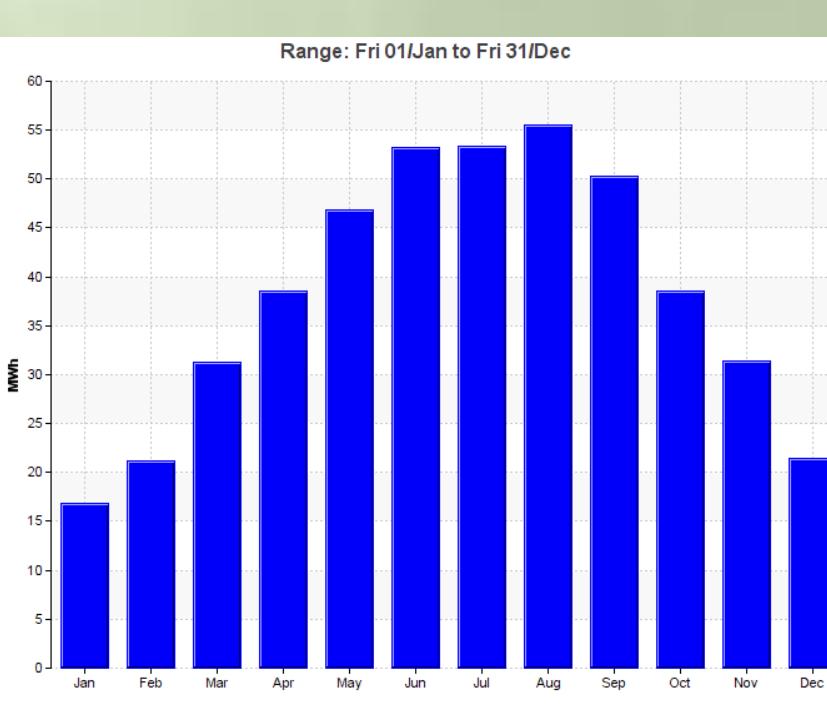


## Cooling Loads



Peak Cooling Loads:

55.5 MWh in the month of August

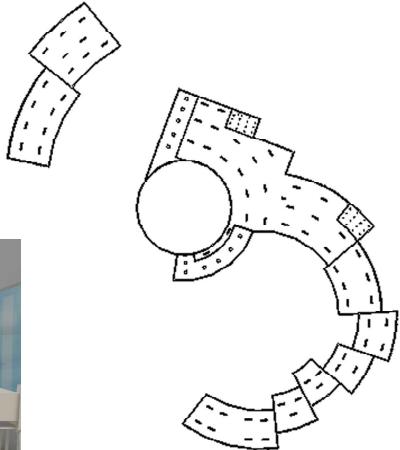


# ENERGY AND MEP

## ENERGY MANAGEMENT

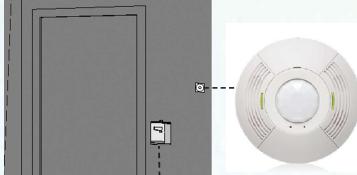
### LIGHTING

An essential part of reducing energy consumption within a structure is using LEDs. This structure has a TRI-LUX LED lighting system built throughout it. Energy.gov claims that LEDs consume 90% less energy than standard incandescent light bulbs and last over 25 times longer, which means that investing in LED lighting can significantly reduce annual electricity consumption. In order to achieve optimum efficiency, TRI-LUX LEDs were employed, which offers a maintenance benefit since the lights would come from the same supplier as opposed to having various suppliers for each room. LED layout throughout the whole building. The auditorium receives the most amount of daylight with a glass dome, concluding that the auditorium requires the least amount of lighting throughout the day.



| LEDs used from TRI-LUX            | Lumens/Bulb | Colour Temp (k) | Location   |
|-----------------------------------|-------------|-----------------|--|
| ArimoFit Sky M59 PW19 53-840 ETDD | 5300        | 4000            | Lobby, Auditorium, Offices and Exhibition Spaces |
| ArimoFit M84 PW16 30-840 ETDD     | 3000        | 4000            | Meeting Rooms and Service Rooms                  |
| Avelia C09 OA 2600-830 ETDD 01    | 2550        | 3000            | Bathrooms  |

### PROXIMITY SENSORS



The proximity sensors that are built into each room enable energy-efficient lighting since they prevent the usage of lighting when a room is vacant by turning the lights off automatically.

### SMART METERS

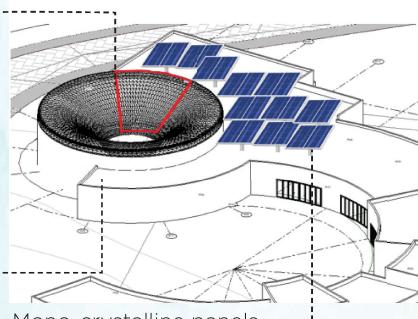
A smart meter is placed in the service room located inside the building which annotates the energy consumption of the building monthly or annually. This would help in understanding the room for improvement or any flaws that may occur during the installation phase. It is located strategically as whenever maintenance is required; the smart meter can be repaired without causing any interruptions to the workflow within the building.



## ENERGY GENERATION

### Building-integrated photovoltaics (BIPV)

Semi-transparent modules made of Amorphous crystalline silicon. Efficiency ranges from 6% - 14%. Reduce the area requirement, and they reduce the material and infrastructure costs of the building itself. Provides weather protection, noise protection, and daylight illumination savings due to superior thermal insulation properties.



### Air Source Heat Pumps

Heat source is outside air cheaper than GSHP and more practical to install

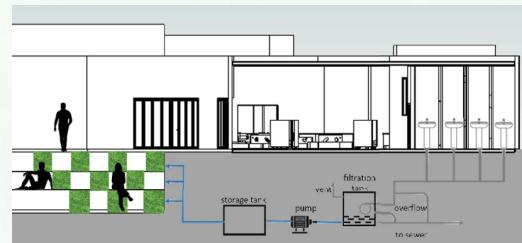
Made from high quality purest silicon, require less space, highest power output, Efficiencies of 15-20%, Reasonably long lifetimes (>25 years). Expensive. Better performance than other materials for low light conditions



## SUSTAINABILITY



We decided to mesh Art Jameels landscaping with our own creating these very fluid patches whilst respecting the very linear nature of the build through the planted steps, located towards the south of the site under the bridge, we have allocated for local farming



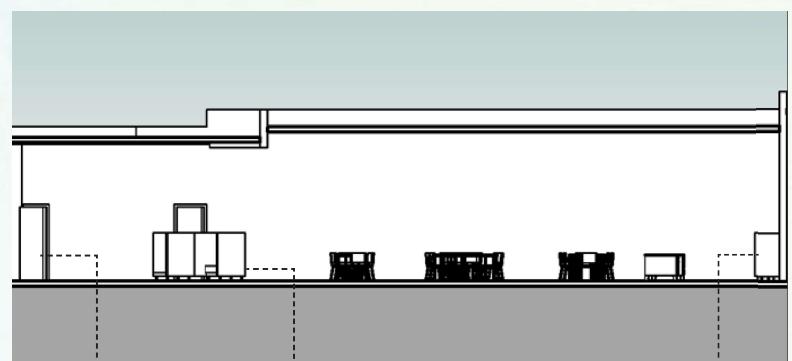
### ON SITE GREY WATER IRRIGATION SYSTEM

On-site grey water irrigation system  
100% greywater from the sinks is filtered and used for irrigation of the surrounding external farm an cleaning open courtyard.

Sustainable benefits: Reduce the need for fresh water, cuts down on the amount of wastewater in our sewer systems

### NATIVE PLANT LANDSCAPING

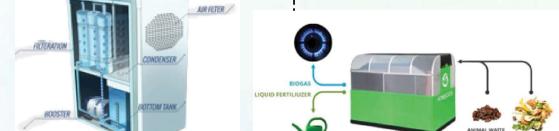
| Plant name                    | Water consumption                  |
|-------------------------------|------------------------------------|
| Carex tree                    | 1 liter per day                    |
| Olea tree                     | 10 liters per day                  |
| Hamelia tree                  | 0.2 liters in every 12 days        |
| Azadirachta indica            | 1.2 liters in every 3 days         |
| Aloe vera                     | 0.02 liters every week             |
| Kafiq (Amaranthus viridis)    | 0.30 liters every week             |
| Aspid (Zizaniopsis miliacea)  | 0.30 liters every week             |
| Ruban (Paspalum quadrifarium) | 0.00 liters every week (resistant) |
| Pearson Tugra                 | 0.02 liters every week (resistant) |



### Water from air dispensers



### Organic waste converter



Daily production capacity is up to 30 liters per day  
Can produce cold water, as well as hot drinking water.  
Up to 5 liters of fresh drinking water by water extraction using 1 KWH  
Facilitates significant water production in climates with humidity as low as 20%

The unit has the ability to take in up to 6 liters per day of any food waste or up to 15 liters per day of animal manure and turn it biogas as well as organic fertilizer.

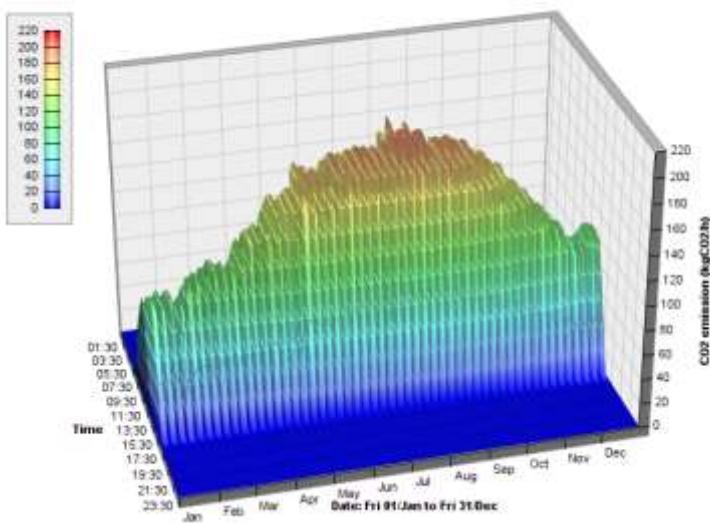
### Smart Bins



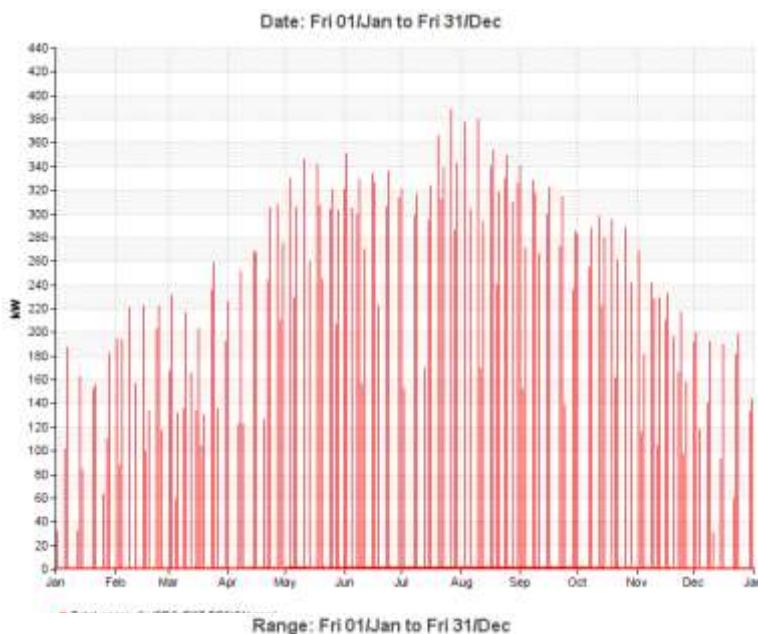
AI-based smart waste bin for recycling waste  
Sorts and compresses the waste automatically  
Wireless ultrasonic sensors controls the fill level and processes data for convenient waste management.  
80% decrease in waste disposal



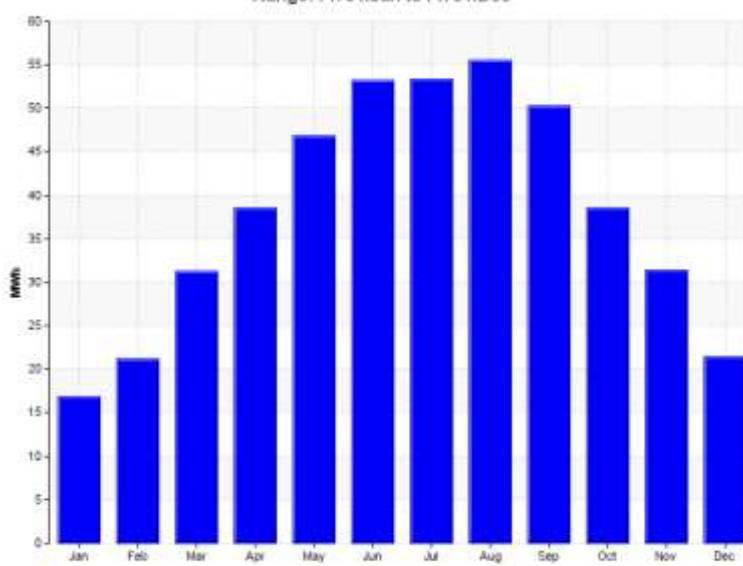
Total CE? (PROJECT DESIGN.aps)



Total Carbon Emissions



Total Energy Consumption



Sensible Cooling Loads

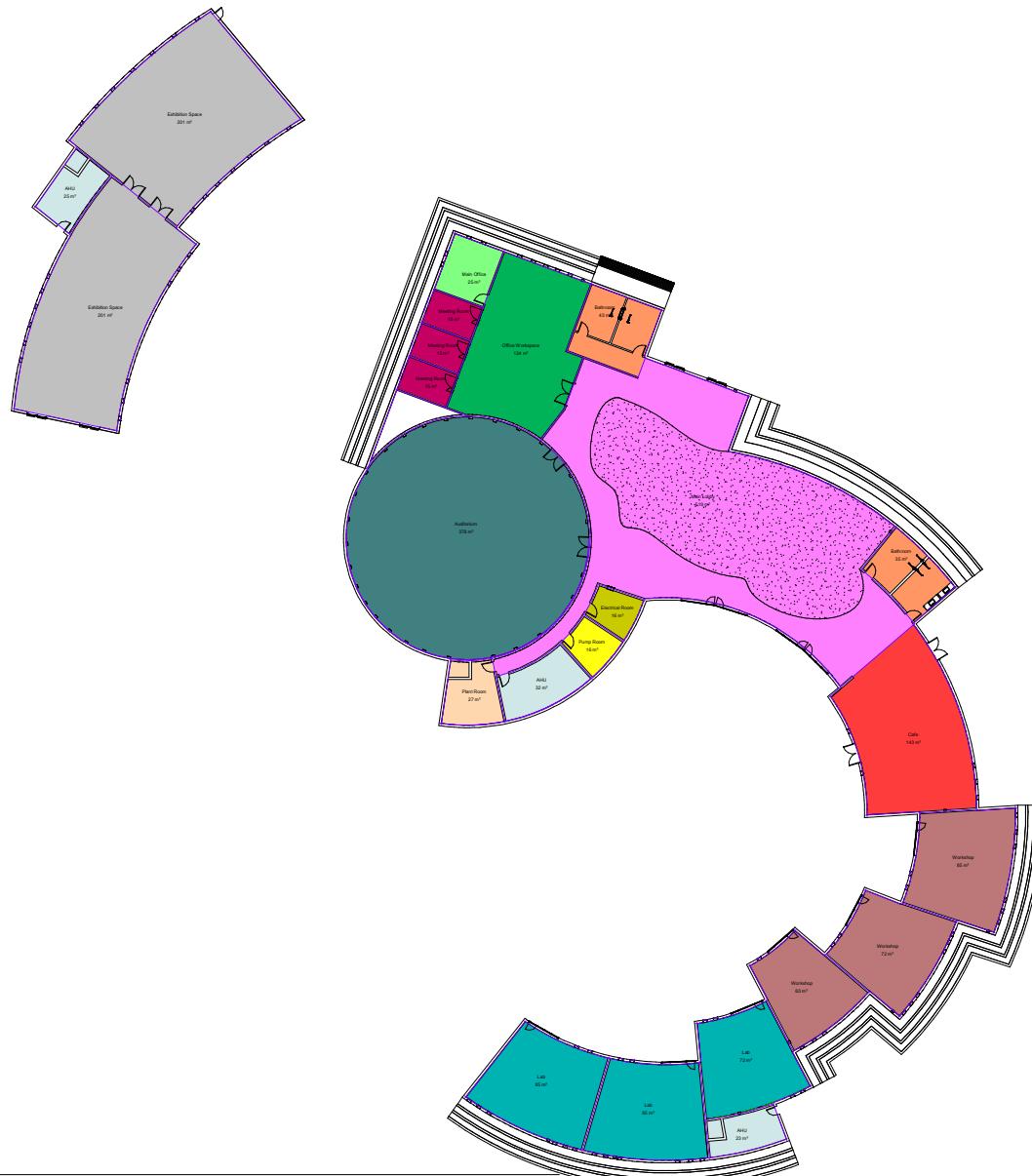


[www.autodesk.com/revit](http://www.autodesk.com/revit)

## Room Legend

- AHU
- Auditorium
- Bathroom
- Cafe
- Electrical Room
- Exhibition Space
- Lab
- Main Lobby
- Main Office
- Meeting Room
- Office Workspace
- Plant Room
- Pump Room
- Workshop

**1** Ground Level  
1 : 200



Blending Jameel

## Colored Floor Plan

Project number 0001

Date                      Issue Date

Drawn by Author

Student Name \_\_\_\_\_

CHOCOLATE

A101

Scale 1 : 200



[www.autodesk.com/revit](http://www.autodesk.com/revit)

Blending Jameel

## Ground Floor Plan

Project number 0001

Date                  Issue Date

Drawn by Author

**Student** \_\_\_\_\_ **Checker** \_\_\_\_\_

Checklist

A102

Scale 1 : 200

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### Ground Level

1 : 200

An architectural floor plan of a large, multi-story building complex. The plan includes several distinct areas: a large circular auditorium or theater on the left with tiered seating; a long, narrow rectangular hall or corridor running vertically; a large open courtyard with a curved walkway and a central fountain; and various smaller rooms, offices, and service areas. The plan uses fine lines for walls and larger, cross-hatched areas for courtyards and specific rooms. A red arrow points from the bottom right towards the central courtyard area.



[www.autodesk.com/revit](http://www.autodesk.com/revit)

Blending Jameel

## Roof Plan

Project number 0001

Date                      Issue Date

Drawn by Author

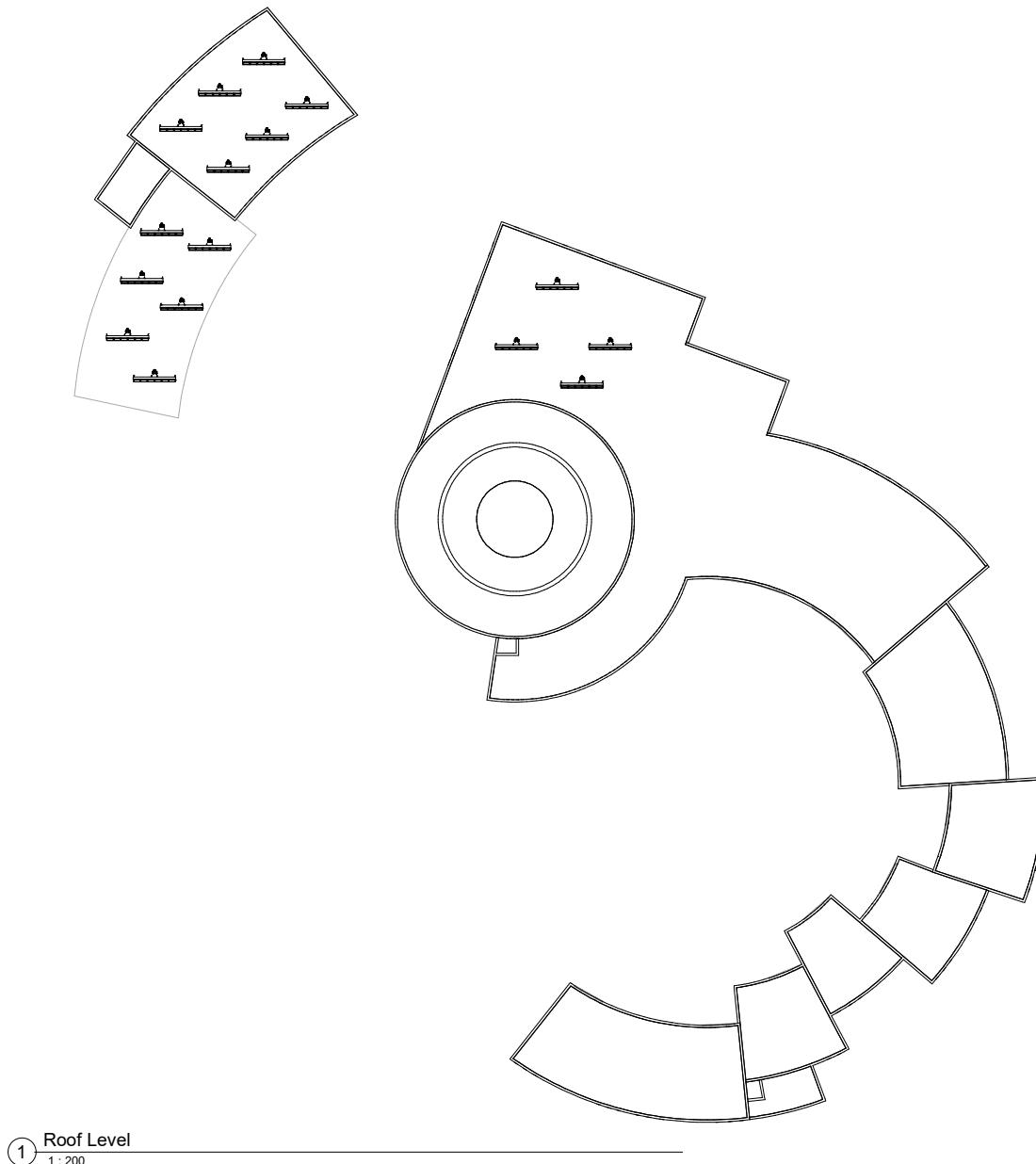
Slide 1

checked by

A103

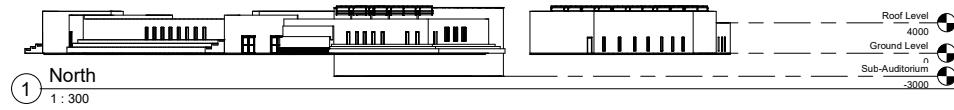
Scale 1 : 200

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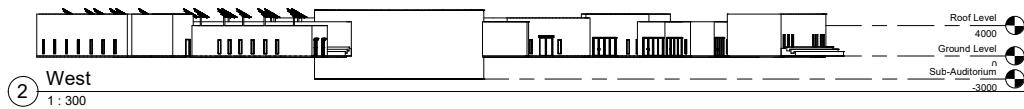




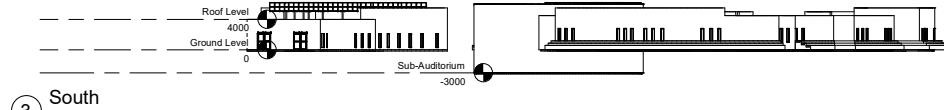
[www.autodesk.com/revit](http://www.autodesk.com/revit)



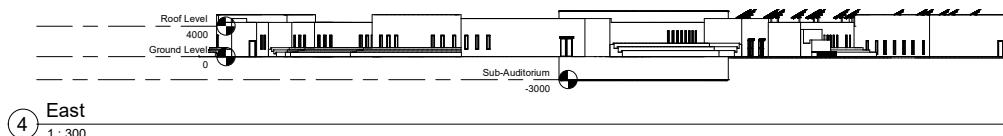
1 North  
1 : 300



2 West  
1 : 300



3 South  
1:300



4 East  
1:300

Blending Jameel

## Building Elevations

Project number 0001

**Issue Date**

Drawn by Author

Student Name \_\_\_\_\_

CHICKEN

A104

Scale 1 : 300



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Blending Jameel

## Service Risers and Plinths

Project number 0001

Date                      Issue Date

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Drawn by Author

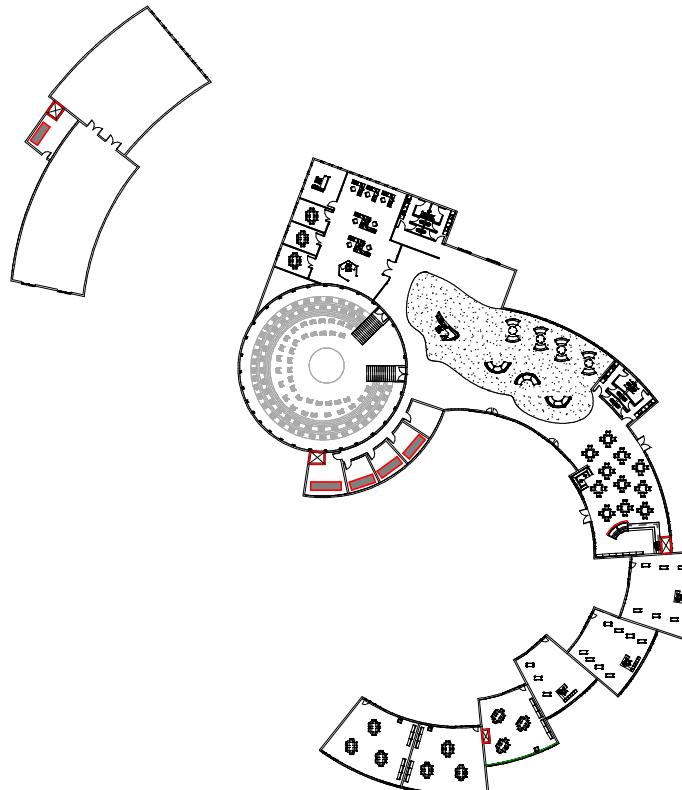
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Checked by \_\_\_\_\_

ANSWER

A104

Scale 1 : 300



1 Ground Level  
1 : 300



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Blending Jameel

## Area and Occupancy Plan

Project number 0001

Date                      Issue Date

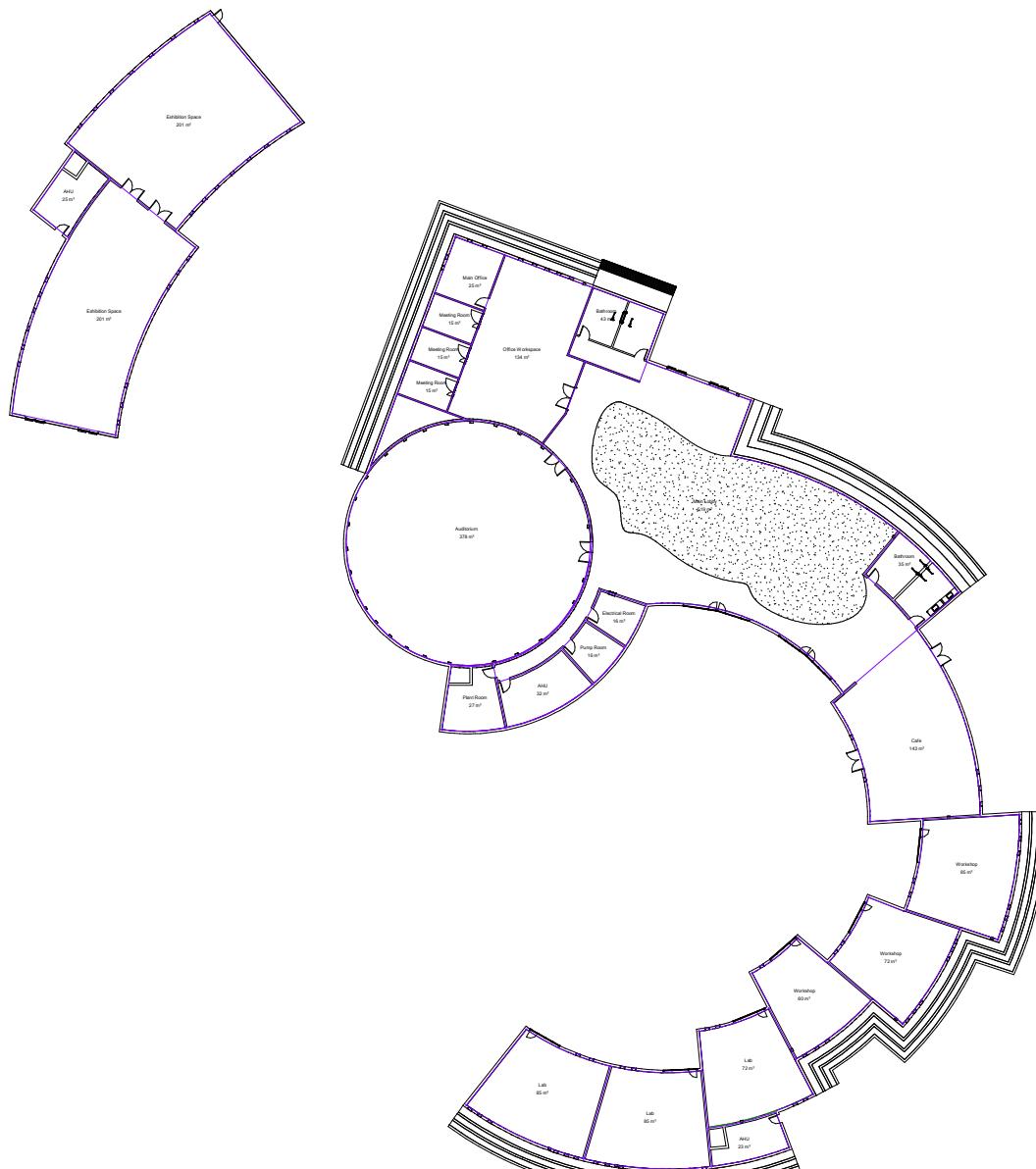
Author

Checked by **Checker**

ANSWER

A106

Scale 1 : 200



## 1 Ground Level

1 : 200



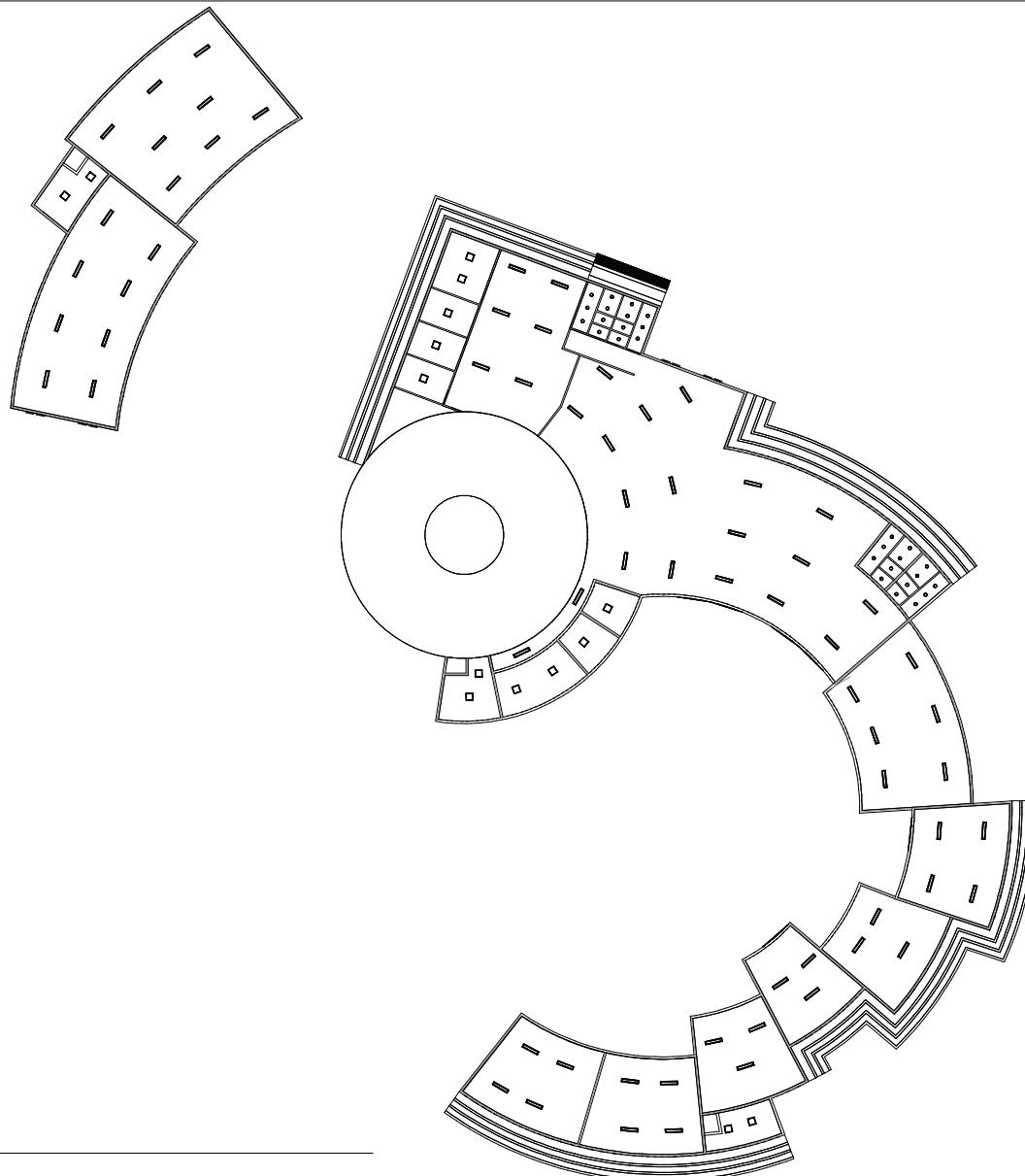
[www.autodesk.com/revit](http://www.autodesk.com/revit)

## Blending Jameel

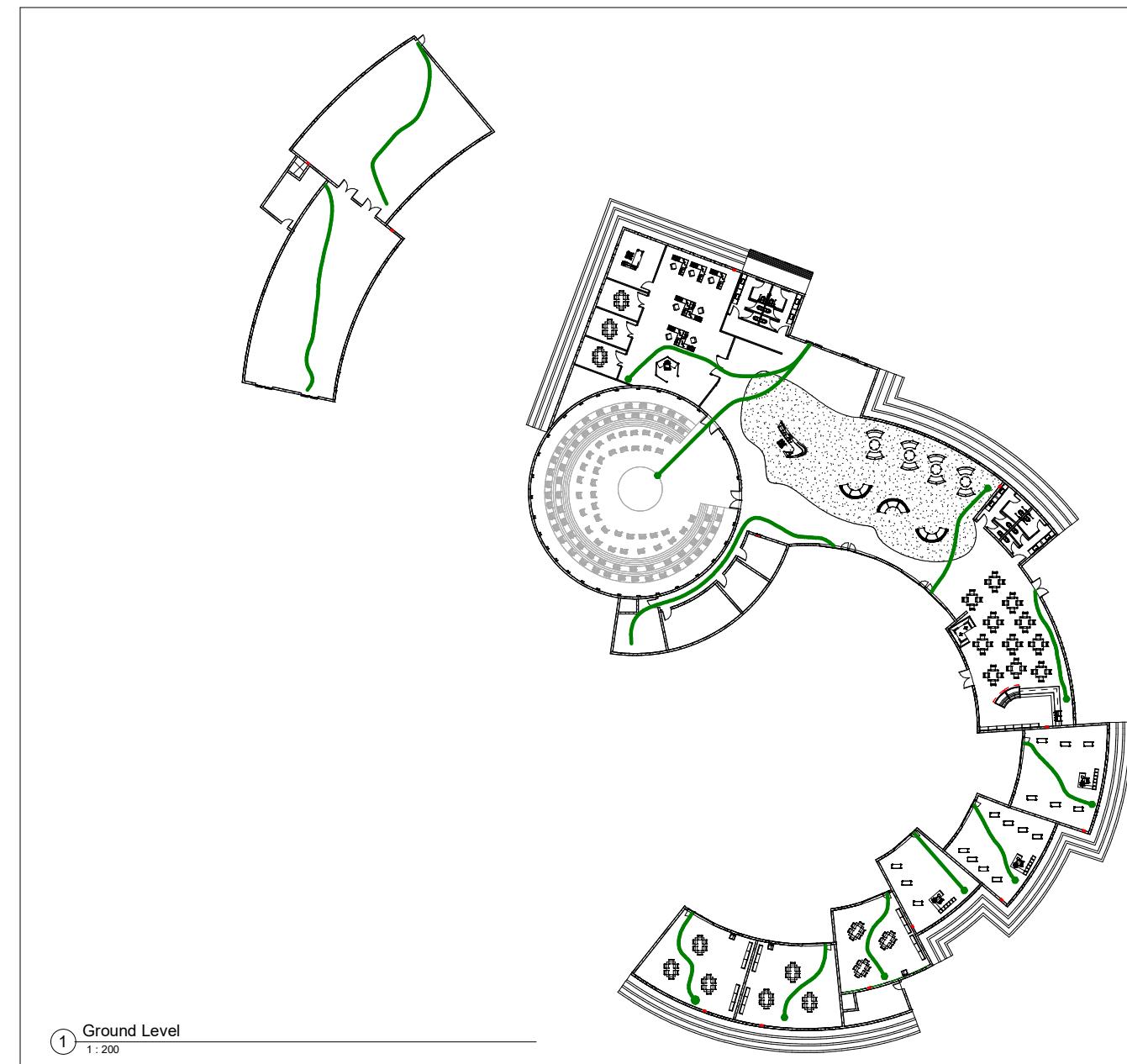
## Lighting

|                |            |
|----------------|------------|
| Project number | 0001       |
| Date           | Issue Date |
| Drawn by       | Author     |
| Checked by     | Checker    |
| A107           |            |
| Scale          | 1 : 200    |

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## 1 Lighting



[www.autodesk.com/revit](http://www.autodesk.com/revit)

Blending Jameel

## Fire Evacuation Plan

Project number 0001

Date                      Issue Date

Drawn by Author

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Checked by **Checker**

ANSWER

A108

Scale 1 : 200