There is a saying that “the wind blows the Loess Plateau”. The Loess Plateau accounts for about 7% of China’s land area, covering an area of approximately 650,000 square kilometers, forming a “thousands of ravines” loess landform. Affected by the strong wind, the loess blows toward mainland China, bringing “sandstorms” and affecting people’s lives.

To reduce the problem as much as possible, we have conducted detailed studies on the Loess Plateau and artificial simulation device experiments. The construction loess collection device is placed in the wind gap. After a long collection period, the collector’s will be covered with loess, and people can walk on it. At the same time, after rain and wind, the accumulated loess will form sculptures for people to appreciate and visit.
The Loess Plateau is formed by the accumulation of wind. Loess is widely distributed on the Loess Plateau, and the thickest part reaches 200 meters. At the same time, under the influence of strong winds, the phenomenon of “sandstorms” has been brought to inland China.
The desertification of Mu Us Desert is severe, and it is affected by the wind, which blows sand to the Loess Plateau. The Escarpment is formed at the junction of the Mu Us Desert and the Loess Plateau. Through zoom in Escarpment, we found that the formation of the Escarpment has an indispensable connection with the wind direction. And Wind Gap appears, which is the primary place for loess accumulation.
LOESS COLLECTOR MATERIAL ANALYSIS
Research and study of different casting methods and structures. Various forms of Loess Collector were cast to better understand the formation and capture form of loess by studying materials such as PVA glue, glue gun, and mesh grid.

Casting Loess
- Sand was mixed into water and PVA glue to be casted into excavated sand.
- After 12 hours of waiting, the resultant form reinforces the idea that sand as a casting material can be molded from itself.
- Partially enlarged, it can be seen that the cast model is very hard.

Liquid Mesh Form
- Mesh structure derived from flow of liquid traveling down contours of excavated sand via gravity.
- Resultant mesh inverted as positive form as a base structure to initiate dust trapping in the wind.
- Under the light, the structure forms a beautiful reflection.

Duest Mesh Trapping
- Using excavated form to create an inverted mesh structure that can suggest growth accumulation patterns of sand.
- An inverted mesh structure is formed.
- Due to the deformity of the forms, sand accumulates and appears to densify on surfaces parallel to the direction sand is dropped.

LOESS COLLECTOR EFFECT ANALYSIS
A more organic structure for dust trapping was tested in this phase. By stretching and pulling apart a woven surface, openings are created, held together by single threads that become the size of individual sand particles itself. The sand particles trapped in the threads appear as if they’re held suspended in the air.

Fine Cotton Mesh
- By tearing the Fine Cotton Mesh, and experimenting with blowing sand to the surface.
- With the effect of partial magnification, the floating sand on the surface can be seen more clearly.
- The effects of light and casted shadows start to imitate clouds of sands or dust flying overhead.

Fiberglass Mesh
- The surface of Fiberglass Mesh is more translucent, and the absorption of sand is better than that of Fine Cotton Mesh.
- The density of Fiberglass Mesh is denser than that of Fine Cotton Mesh, and the mesh effect is more obvious after tearing.
- The effect of light transmission is so pretty.

Formal Application
- Using the mesh grid, cast into a loess collector structure.
- By wrapping a layer of gauze on the mesh grid, which can better capture more loess.
- The effect of the loess collector on lighting.

(The models were built with teammate Tim Chen)
After studying various factors such as terrain and wind direction, the tuyere is the most accessible place to catch more loess. Therefore, we decided to install loess collectors at the tuyeres to collect more loess.
As time goes by, the thickness of the loess collected by the collector also increases. Eventually, the loess will cover the entire installation and form paths for people to play. At the same time, the loess accumulated on the ground will eventually become a sculpture with the accumulation of rainwater, which is a local characteristic.
Solar Pannel Station

September, 2022

Site: East New York, Brooklyn

Instructor: Laura Gonzalez Fierro

Team Work With Yilin Zheng

By reusing the abandoned substation which turns it into Solar farming, the solar panel is transmitted to the battery through the transformer, providing battery sales, leasing and other services for the surrounding residents, and providing convenience for the lives of the surrounding residents.
Site Map

New York Goals

Estimated New York Energy Consumption in 2010: ~3600 Trillion BTU

Estimated New York Energy Consumption in 2021: ~3742 Trillion BTU

Site Selection
- Substation
- Vacant Lots
- School Bus Parking Lots

New York Law 97

- 2025: 60% of solar and 50% of energy reductions through efficiency
- 2030: 25% of electricity generated by renewable energy and 3.5 billion kWh of energy savings
- 2035: 50% of all energy used
- 2040: 50% of all energy used
- 2050: 50% of all energy used
PROPOSED PROGRAM

Ground Floor

Second Floor

Third Floor

Fourth Floor
People living in this area can enjoy the pastoral happiness in urban civilization at the same time. My design revolves around the advantages of this area, connecting the agricultural land and the residents of the surrounding communities through design. The interaction between agriculture and urban structure is the main goal of this area. Create new economic value by strengthening the relationship between people and land.
ONE ROOF IDEA

Train Station
Area: 1500 m²
Property: Government

Open Activity Space
Area: 6000 m²
Property: Government

Future Farm
Area: 4000 m²
Property: Government

Laboratory
Area: 5000 m²
Property: Government for Private

Agricultural Museum
Area: 6000 m²
Property: Government

Farm Market
Area: 7500 m²
Property: Government

Farm School
Area: 4000 m²
Property: Government
It expresses different scenes in the site, and each scene is full of agricultural culture, allowing visitors to have different agricultural experiences.
The photos were taken on a winter day in Washington DC. The shooting locations are the White House, Washington Monument, Capitol, Lincoln Memorial, and Washington Railway Station. The buildings are all in neoclassical style, with masonry as the main material, and the use of ancient Roman columns makes the whole buildings look particularly dignified and magnificent that show the “serious” atmosphere of the capital.
IBCT Class

KALEIDOSCOPE

AT ST. JOHN THE DIVINE

January, 2023

Instructor: Sharon Yavo

Team Work With
Jerry Schmit,
Maggie Su, Seung
Ho Shin, Xinyi Lin
Why Kaleidoscope?
The architectural history of Cathedral

The cathedral is a combination of different architecture style. The original conception of the cathedral was devised by George Heins and Christopher LaFarge and showed a pseudo Byzantine configuration with Romanesque elements. Following the death of partner architect Geroge Heins in 1907, the trustees elected to hire Ralph Adams Cram to take over the design and to revise the style of the cathedral more towards gothic. This explains the uniquely romanesque arcade seen within the apse of the church which is completely shrouded in an otherwise gothic enclosure.
Why Kaleidoscope?
The events of Cathedral

In our research, we also see different events on the cathedral's calendar. These events range from liturgical, social, to entertainment and artistic, and more. The cathedral is a concentrated of people's different aspects of life in one place.

In this way, the form and the function of the church is just like a Kaleidoscope in which different information and images are collected, pieced up and layered together. Therefore we take it as our main concept for our site-specific intervention.
Iteration One

In the first iteration, we brainstormed around the idea of Kaleidoscope. Our shared methods are using mirrors and reflective materials. They are in different scales, different forms, and also has different ways of interactions with the visitors.
Iteration Two

In this iteration, we tried to further develop the “pyramid” idea. We made prototypes and tried to make it simple. We thought about construction techniques. We also tried to combine the cathedral’s event calendar by printing texts on the stairs.
Iteration Three

In this iteration we revised the form and prioritize the concept of kaleidoscope. We resort to the basic form of kaleidoscope and a modular approach. We thought about details, constructions and interactions in this process.
Final Iteration
Construction and testing effect
Used as separate Kaleidoscopes
Separate on site and put-together
Interactions with users and visitors
Rethinking BIM Class

September, 2022

Instructor: Joseph Brennan

Team Work With
Mingrui Jiang
Yang Fei