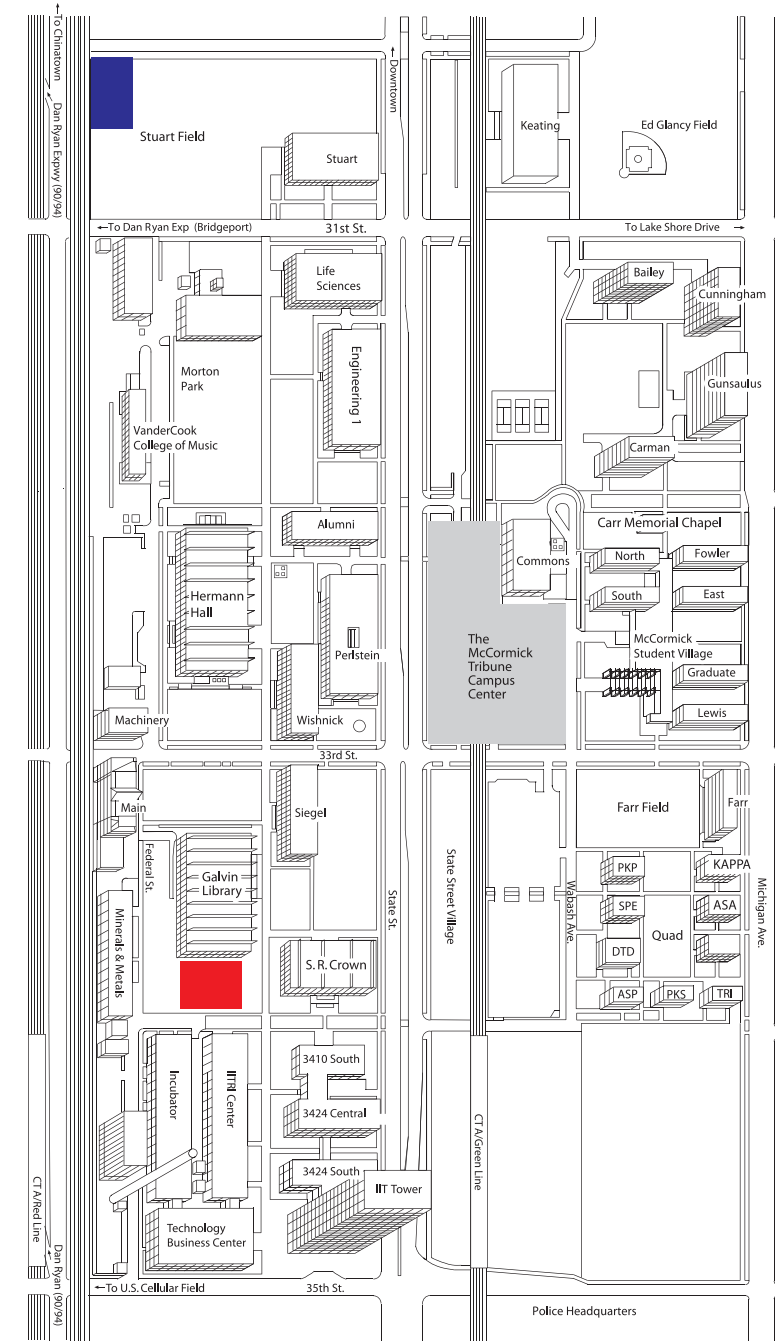




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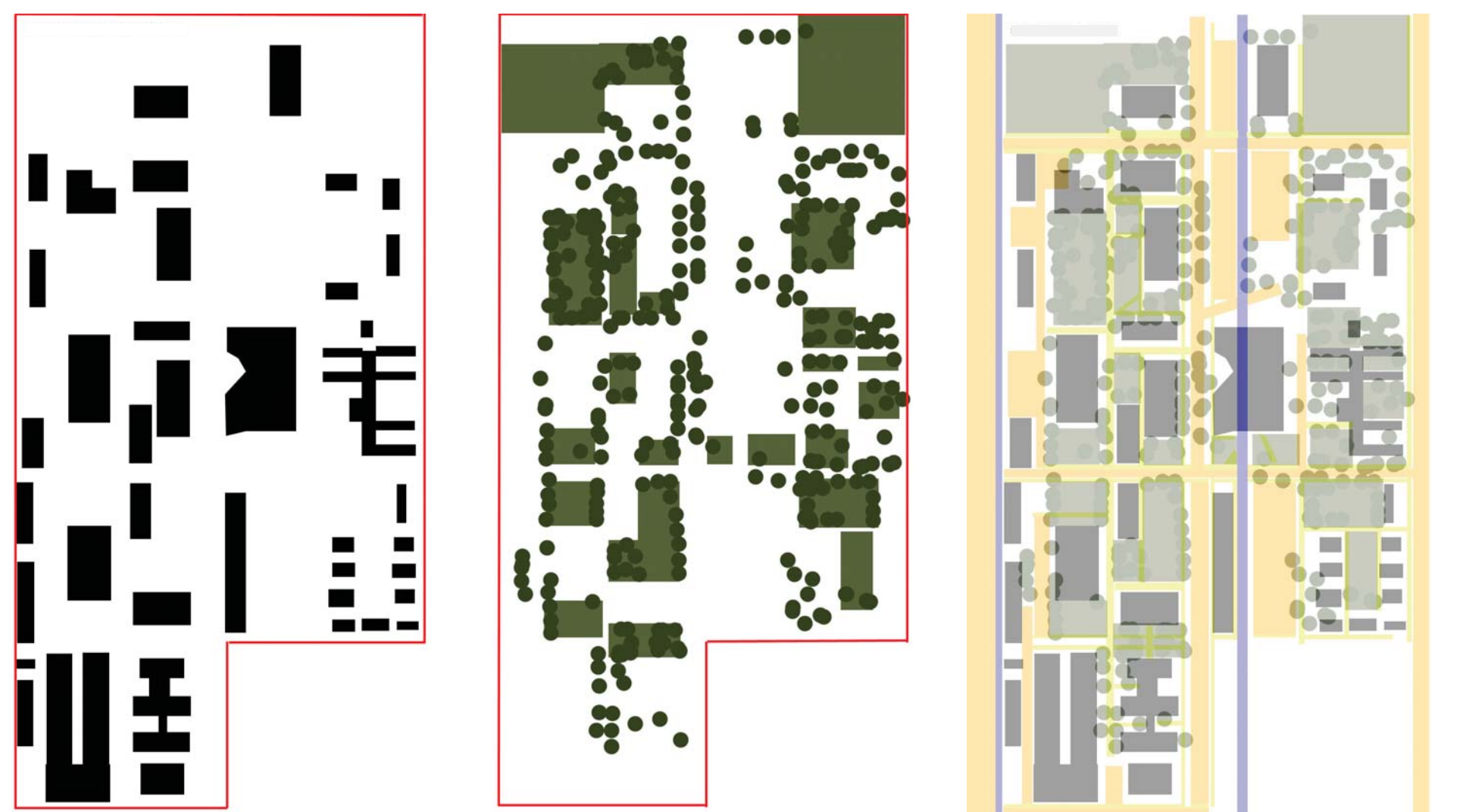
# Aesthetic Design of an Urban Cell Tower

## Site Analysis



When approaching the site, there were two different sets of criteria.

- Public, in the line of sight, open area
- Secluded, out of the way, closed area



IIT Campus Building Footprint Diagram IIT Campus Green/Trees Diagram IIT Campus Site Analysis

The Northwesternmost site was ideal because the seclusion removed unnecessary attention to the tower. This site gave us more options in creativity of the design, eliminating much of the pedestrian concerns.

## Zoning Code

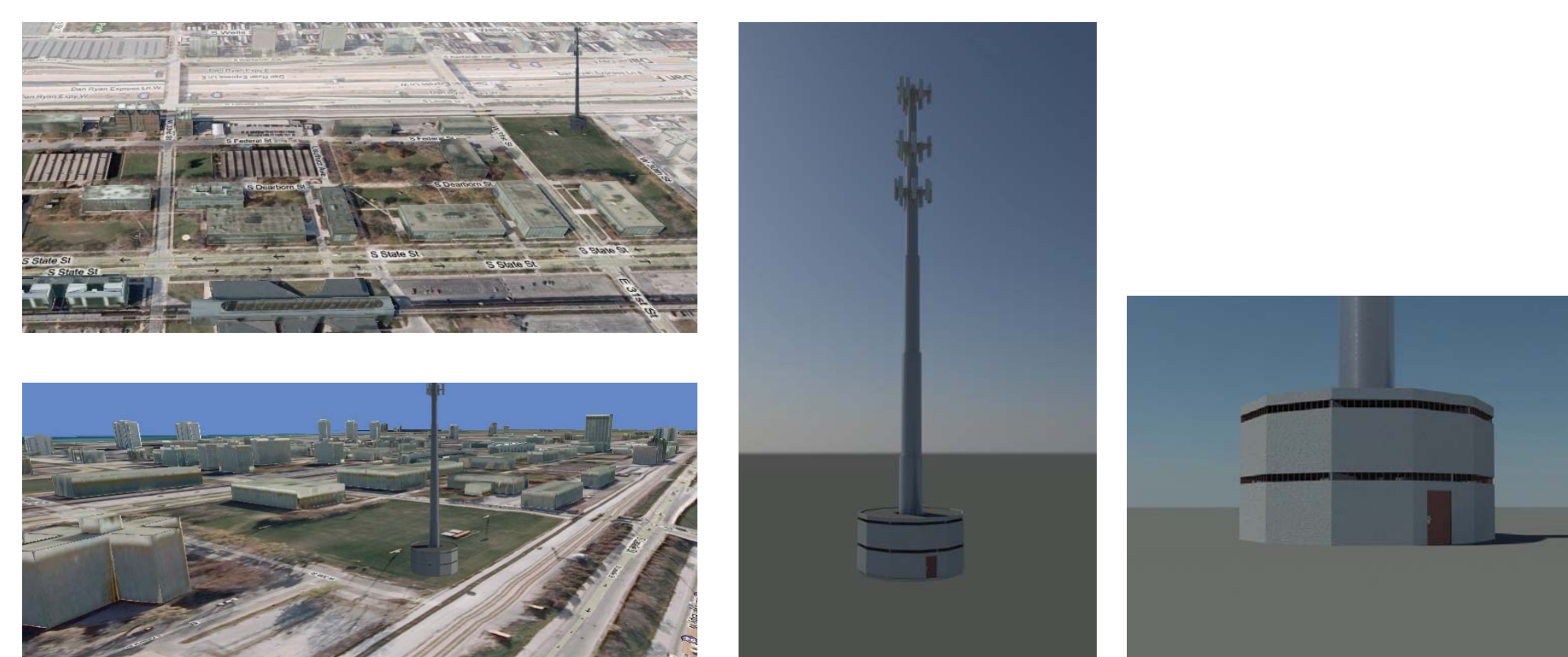
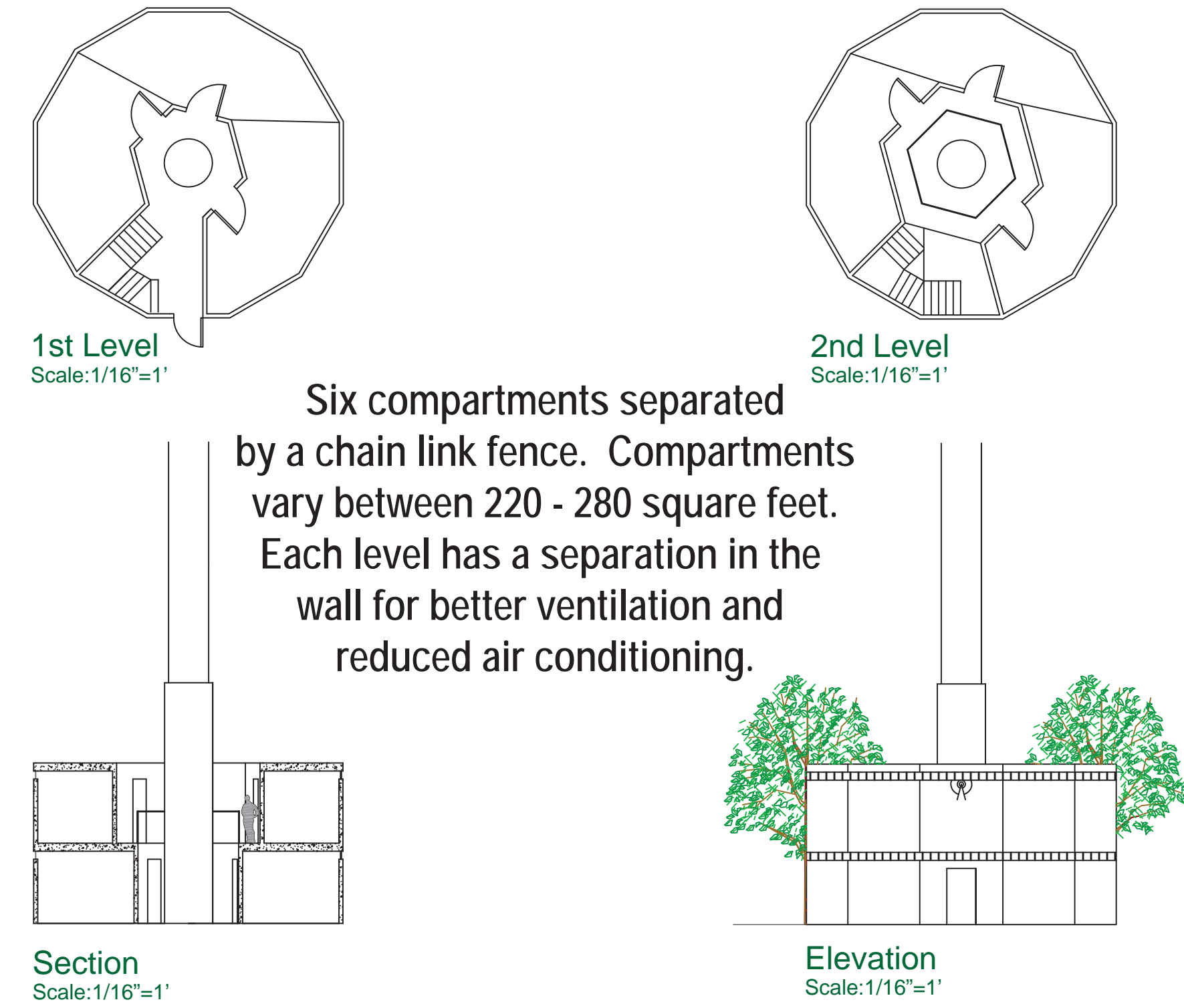
### General Standards:

- No artificial lighting on towers or antennas unless required by the FAA.
- Towers must have a galvanized steel finish or be painted neutral colors.

### Freestanding Structures:

- Tower cannot rise more than 150 ft from the curb
- Tower must be of a monopole construction (cylindrical, tapering steel tubes without guy wires).
- Tower must be constructed so that if failure does occur, it collapses on itself and not on surrounding structures.
- Freestanding facilities must be enclosed by a six foot fence with an anti climbing device that is not barbed or razor wire.
- Wireless communication facilities must be landscaped with plants to screen the view of the tower and equipment from adjacent residential properties

## Circle Design



## Existing Towers



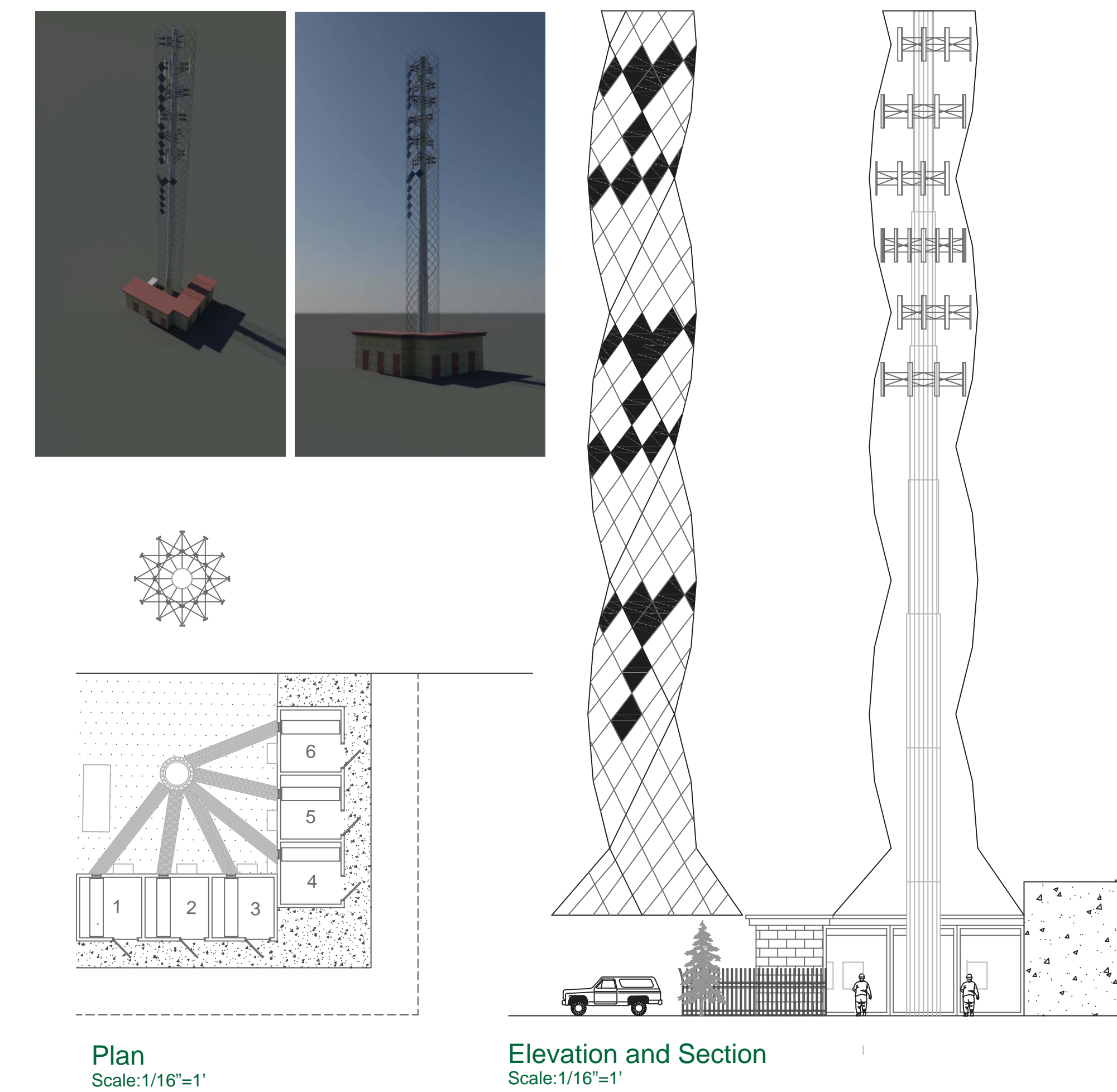
Aesthetic Towers



Unaesthetic Towers

## Sustainable Design

This design focused on sustainability and aesthetics of the tower itself. The tower is wrapped in an aluminum mesh and photovoltaic cells are placed within the spaces in the mesh. Based on their position, any pattern can be created.



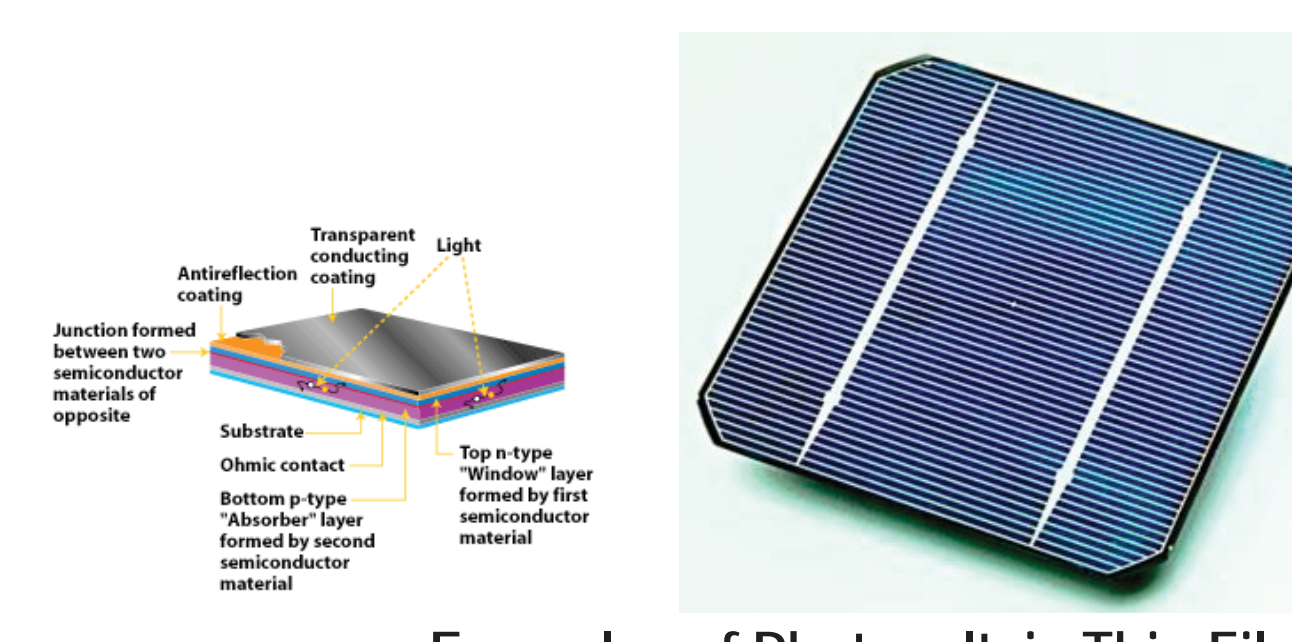
## Sustainable Technology

### Helix Wind Specifications:

- This S594 model is the only helix model that can be mounted to a monopole.
- Height: 19.8'
- Width: 4'
- Design Life: 30 years
- Energy Output: approximately 1000-1300 kW\*hr/year
- Cost: estimated to be \$16,000-17 including warranty

### Aerotecture Specifications:

- The Aerotecture wind turbines are made for roof tops. The 610V model specifications are listed below.
- Height: 10'
- Diameter: 6'
- Energy Output: approximately 1500 - 2000 kW\*hr/year
- Cost: estimated to be \$15,000

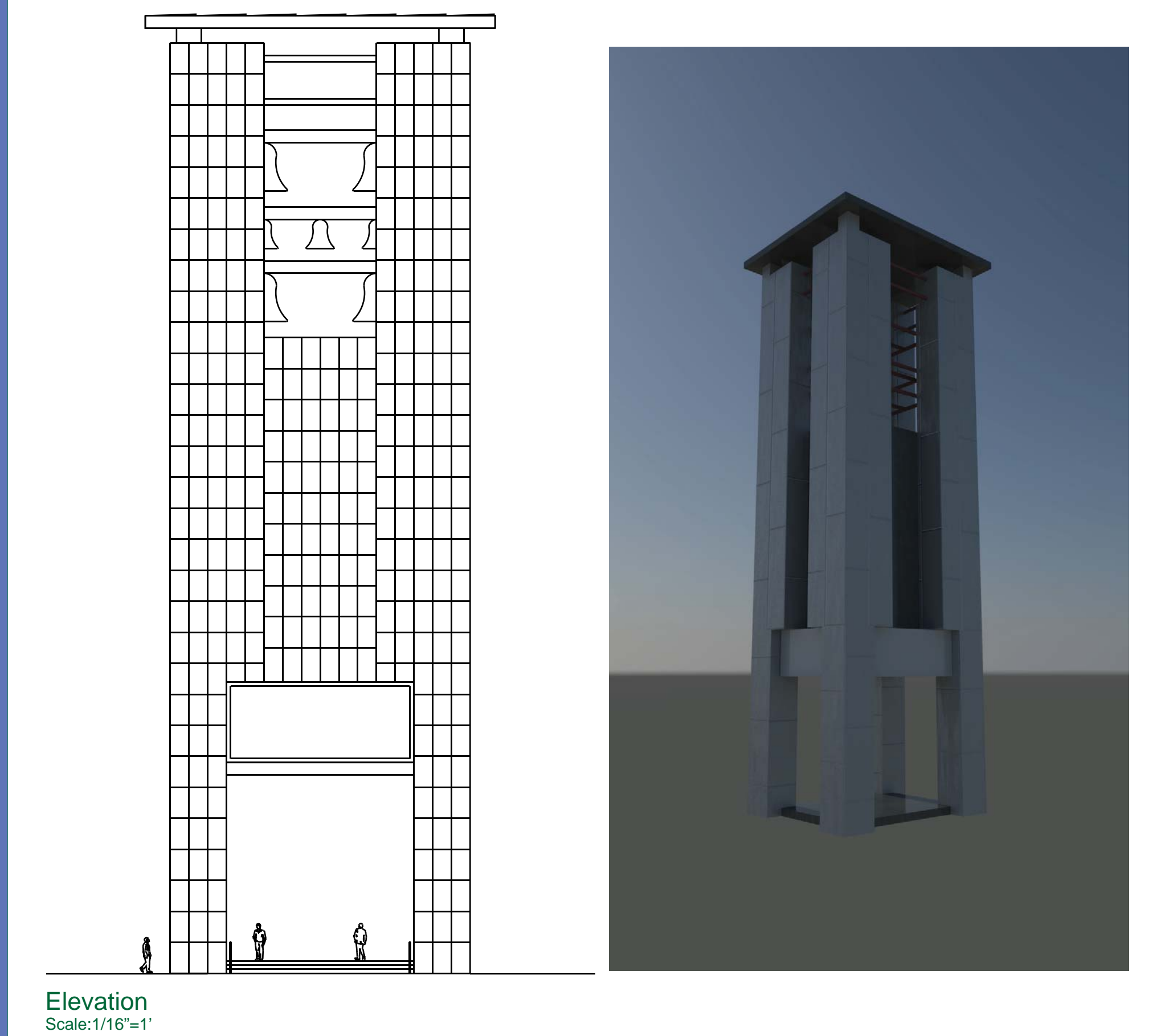


Examples of Photovoltaic Thin Film



Wind Turbine in Downtown Chicago

## Bell Tower Design



The bell tower design was created to go above and beyond the standard cell phone tower; it was designed to be a monument for IIT's campus. It raises the equipment building off the ground to allow a pavilion space below. With the addition of bells, the tower serves a different function that masks the actual cell tower.

## Conclusion

With the potential for new development near the IIT campus, such as the Michael Reese Hospital area, there will be an increasing need for expansion of cellular data capacity. With the designs that we are introducing, the expanding market will be provided for in the best possible way. While being able to be replicated on almost any urban site, the tower designs are able to fit the needs of most site constraints, and retain the ability to alter the appearance as a means of addressing the communities needs. The site that we have chosen is representative of one of those urban spaces, and is acting as a prototype from which to jump.

### What is next?

- Obtain approval from sponsor
- Submit proposal to IIT Planning Committee
- Submit the final design to city's ordinance board to ensure that all zoning requirements have been fulfilled