The design process by BIM

Our team members are divided into two groups. They are architectural designer and environmental engineer. Environmental engineer analyzes or parallel with architectural design. That makes better environmental performance. So we meet approved the NGB(Near Zero Energy Building). For this design, we use design software: "archiCAD" which can share the dates with many software. Therefore, modeling can effectively save the time.

Project Concept

New Shinkiba station and a mobility system is proposed in this project to make better situation not only "Tokyo Olympic 2020" but also "beore/after Olympic". In addition, the project has other important points. The points are the roofs of new Shinkiba station and eco-stations. These illustrations show the details of this project.

Research 1. Location

This research is the location of site. Some problems were noticed. Firstly, the site has a lot of factory and highway. Second, there is a lot of noise and pollution. Third, there is no green area for relaxation. Therefore, we need to create a new type of PV power system. This product is very thin. And the method to use panel is to paste the film on glasses or existing building. Therefore, we can freely change its shape.

Proposal 1. Master plan

This shows the proposed plan of the site. The site is divided into several areas: new Shinkiba station, eco-station, stadium for Olympic, field warehouse, and leisure facilities. Visitors can use the vehicles driven by electricity. In addition, each eco-station generates electricity for these vehicles with photovoltaics (PV) power system. This is the method to use panel is to paste the film on glasses or existing building. Therefore, we can freely change its shape.

Proposal 2. Mobility system and eco-station

Mobility system is design for visitors. Visitors can use the vehicles driven by electricity. In addition, each eco-station generates electricity for these vehicles with photovoltaics (PV) power system. This is the method to use panel is to paste the film on glasses or existing building. Therefore, we can freely change its shape.

Proposal 3. New Shinkiba station and changing position of bridge to high

The main problem is the existing building. Instead of dropping the highway to GL, they can go to the catch facilities without having to worry about anything. Moreover, we examined some influences of dropping highway. These results are shown in the next pictures of airflow analysis.

Proposed type of solar panel

This project, we choose a new type of PV power system. This product is very thin. And the method to use panel is to paste the film on glasses or existing building. Therefore, we can freely change its shape.

Module of solar panel

This basic module is an equivalent triangle. Each side of the triangle is 1m. And there are two patterns: only glass type and panel type. As shown in the left figure, the shading pattern is formed due to the opaque panel.

Illumination analysis

This is the result of the shading analysis in a part of eco-station. Without opening, you will not be able to maintain sufficient brightness in the room. However, if you have an opening, it is possible to collect adequate daylight inside a room and obtain sufficient brightness. From this result, it can save energy in daytime by providing an opening.

Towards nZEB

Energy saving present the earth from becoming warm. In this case, we reduced electricity to achieve nZEB. An example of such an eco-station. The target of zero electricity utilization is quite different. We calculated amount of electricity consumption by Design Blade. Figure shows the electricity consumption for 11 eco-stations, a station, and 165 vehicles. All electricity is generated by PV installed on the roof of each eco-station.