Reflection Methodology of Process

By the design of the new United Nations Environment Council

Chair: Materialisation
Studio: SADD (Strategic Architectural Design Development)
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Content:

In architecture or city planning, designers seem to be keen on the study of private and public space, and the transition between the two. The move between private and public space can also change from a well-defined boundary to a more loose transition. The transition becomes even more complicated when it comes to the design of a complex building, where different programs merged together.

CHAPTER 1: Project Description

The SADD graduation studio aims at designing the Environmental Council for United Nations (UNEC), a place where significant decision will be made due to planet problems and all the latest idea of sustainability could be shared. The plot locates on the north loan of existing UN headquarter, designed by Le Corbusier and Oscar Niemeyer.

Relationship with Master Plan (Urban Position)
The extension of 47th street, end with a green plaza now (HAMMARSKJOLD PLAZA) is taken as the starting point of the site arrangement. It will serve as a main connection between the city and waterfronts in the design. Also, take the way we designed the main connections in the master plan part, I decided to design this extension in the form of a pier extending into the water.

Since then, the design plot was divided into two parts. Considered the vision of the whole UNEC project, there are three key points: Integrated Waterfront Elevation Impression, gradient transition from public to private and security. I chose to locate the UNEC in the right part (left to the axis). The UNEC can be defined as an extension project of the UN Compound, reusing the space of original FDR, structure grid and expedition car road of UN. (Fig.1)

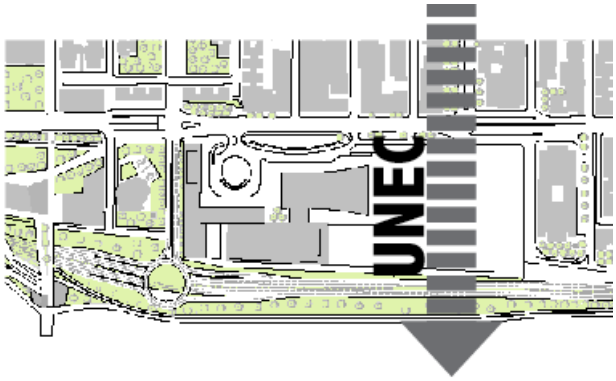


Fig.1 Site Arrangement, Yinglin Cao

CHAPTER 2: Methodology and Research

The research consists of two parts according to the scale of space. Part one firstly addresses how to transfer the boundary of UNEC to an attractive spot and user-friendly places in urban scale. In part two, it tries to develop the building from the structure to façade in accordance with the initial concept.

Part 1- Research on surrounding of UN (Urban Scale)
1. Security and Boarder
2. UN Deck
3. Public Plaza
4. UN Plaza

Part 2-Architectural Scale (focus part)
1. Main Construction
2. Roof

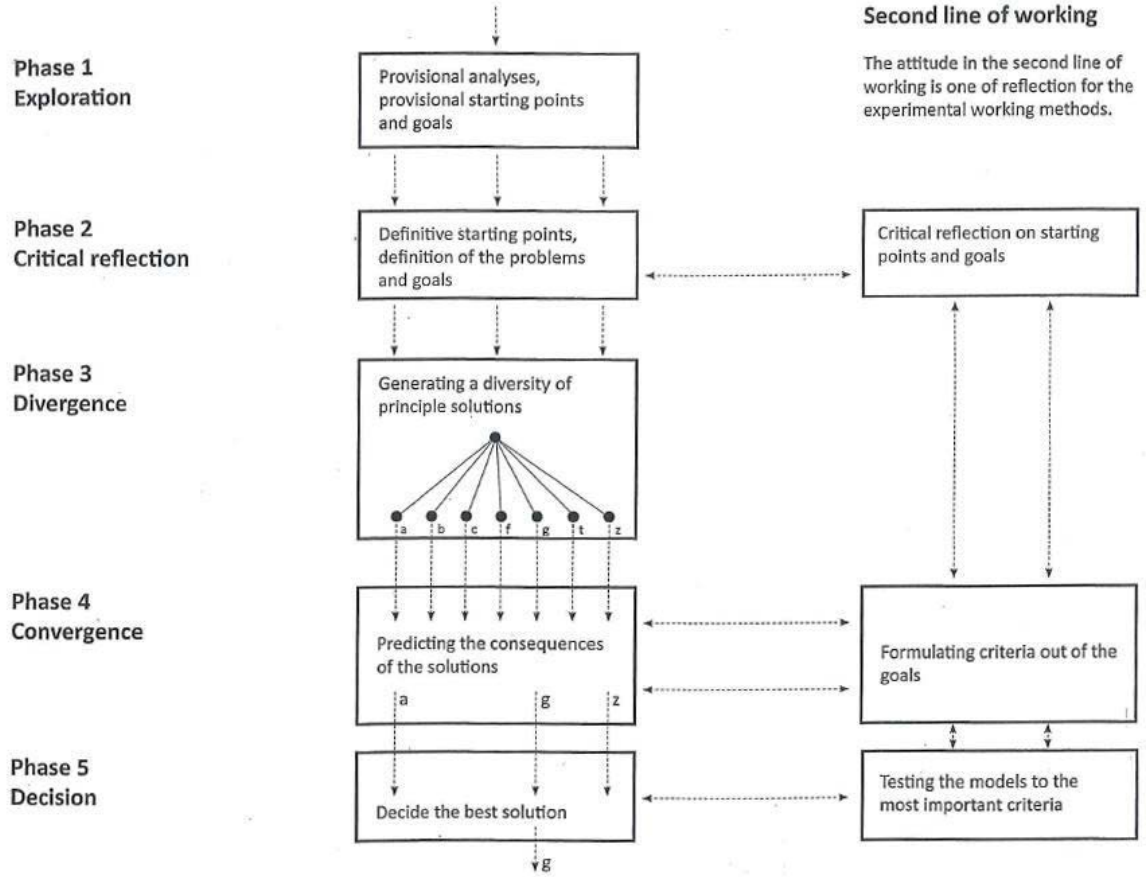
Building Scale (Architectural Position)
Following the principle of transition space laid out in the first part, this part aims to reveal the impact of the transition space on the indoor space. In UNEC, all the programs are categorized into three main function blocks (Chamber Council, Communication, Preparation Office) and one shared facility part.

What kind of space is needed in the UNEC building? How people use the space? Following factors clearly state out what kind of space is very important in UNEC building. First, the three functional spaces are inter-connected sometimes, so that essential connections are needed. For example, people working at the office area might need to use the auditoriums to give a lecture to the public, or between the council break, the delegates might want to use the library in shared facility part for further resource. Secondly, UNEC also has responsibility to show visitors how these it acts as a "coordinating organization to solve the world's problems in energy, waste and biodiversity. It is supported and fuelled by a network of regional 'sustainable' embassies."[1] Thirdly, it is also a place all the people exchange different opinions and ideas about sustainability. This kind of communication should happen at diverse kinds of places, which should not be limited to certain functional space.

All these communications are the main considerations in the design of transition space. To achieve a good balance between the privacy and openness of all four parts, we might treat them as a whole, which makes the transition space no difference from other types of space. As a matter of facts, transition space is important because it links and organizes all the other spaces. To ensure a better indoor experience, the transition space in the UNEC should not simply play the role separating the programs or just offering the required connection between them. It also attracts people to stay and create opportunities for social activities of people visiting or working there. Further more, self-navigation is also important. Color, images, and signage are often used to better guide people and help them to find their destination. Transition spaces with different characteristics are designed to help people navigate large, complex. All these principles could be used to design transition space that is good for people using the UNEC. The shared facility block could mainly served as the transition, framing the daily life of Manhattan flowing through its generous frame along the continues city street or an outdoor gallery to extend the public activities into the city as well as the city into the building.
The smooth transition space between different characteristic (hierarchy) space is very important for people to experience it, regardless of different level of privacy a private space or publicness of a public space. To design the UNEC building, it is crucial to design various forms of transition space that is positive for communication and identity of space. Actually, there are a lot of common forms of functional transition space inside buildings, such as corridors (horizontal or vertical), transportation areas and etc. They seem to simply let people pass through more than make people stay. It is

[1] Reader Msc3/4 Materialization, SADD 2012, p5

essential to have all these ‘passing’ transition space to ensure the operation of UNEC. But it could be more beneficial to put more functions into them and consider them as ‘stay’ platform that enable people to have a spontaneous communications. And with various forms of transition space, it will create more identifiable space with different characteristic in such a huge complex building.
In next chapter I will illustrate the main phases about the development of materialization: volume, structure and façade concept according to the methodological approach given by our tutor Maarten Korpershoek.



Basis cycle for a methodical approach, Maarten Korpershoek

CHAPTER 3: Design Developments

1. Main Construction (Volume + Structure+ Façade system)

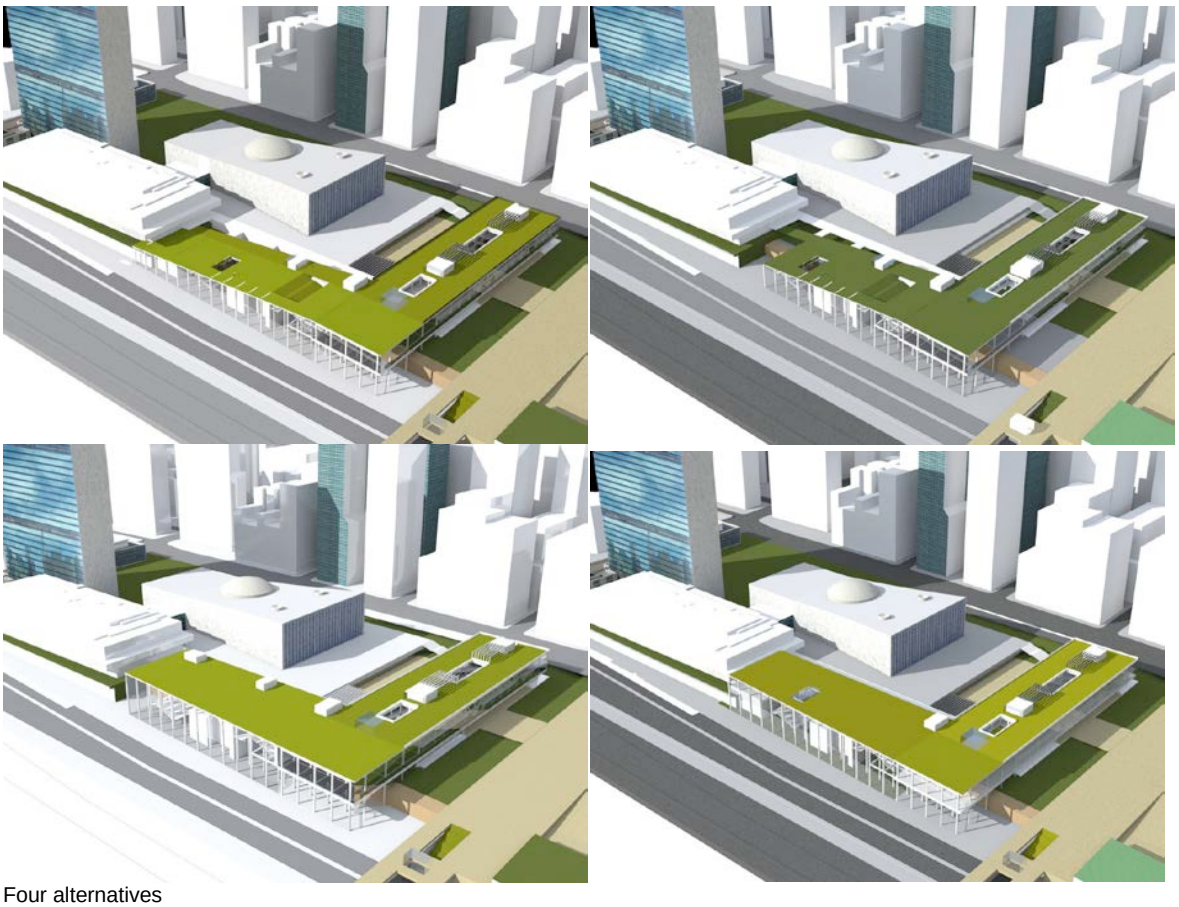
In this part I will illustrate all the phases of the design process that I have done to come up with the final design for the main structure and façade concept of my design. The different phases that I use for describing this design process are based on the research methodology in chapter 2. (See Fig.)

Phase 1: Exploration

It is important to clear the key values of the building before the investigation of reference project, which is a big complex, 3 different functions, connecting with the existing UN. First, I made a study of all the programs and analyzed their spatial and structural requirements for further development. For example, the auditorium requires a higher space and enough equipment room, while the office can be more compact and economic. So I did the case studies of some complex building with totally different programs in it. Apart from the complicated circulation arrangement, the structure system is also the focus point. To a building that can be used as a multifunctional architecture, the flexibility is very important. Take this as a starting point; I try to look up light structure system-steel construction. In spite of this the volume and relation with site also plays the vital role the during the exploration phase, all the other technical aspects like fire protection and the position of installations are also taken into consideration.

Phase 2: Critical reflection

Four different options show different compositions of rooftops and relations with existing UN.



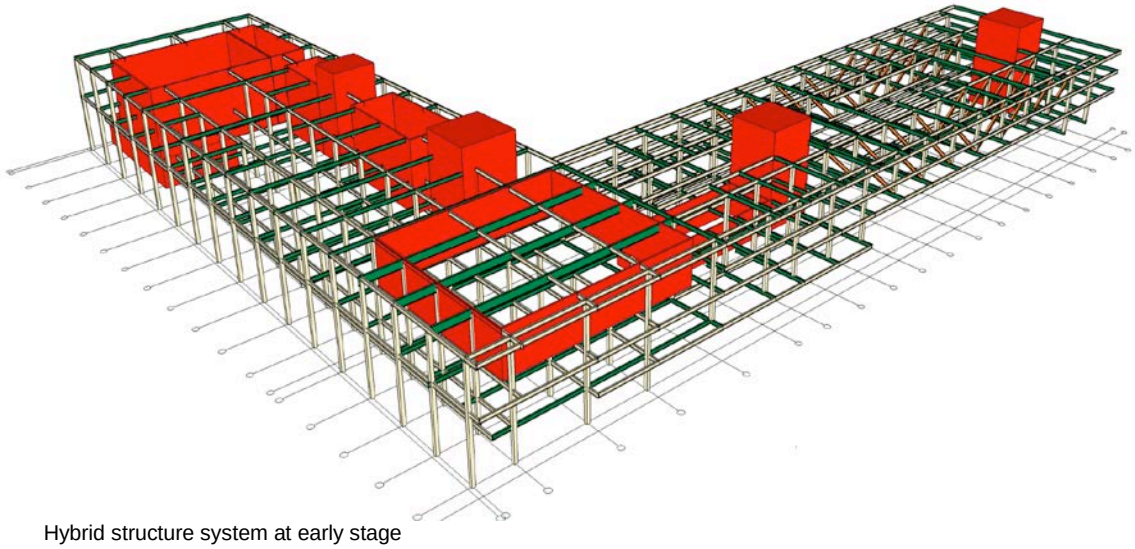
Four alternatives

Aiming for a scheme that can reflect the relation of program inside and the new with the existing, I finally chose the option that is disconnected with the existing and with a flat roof to develop further.

Final decision of volume

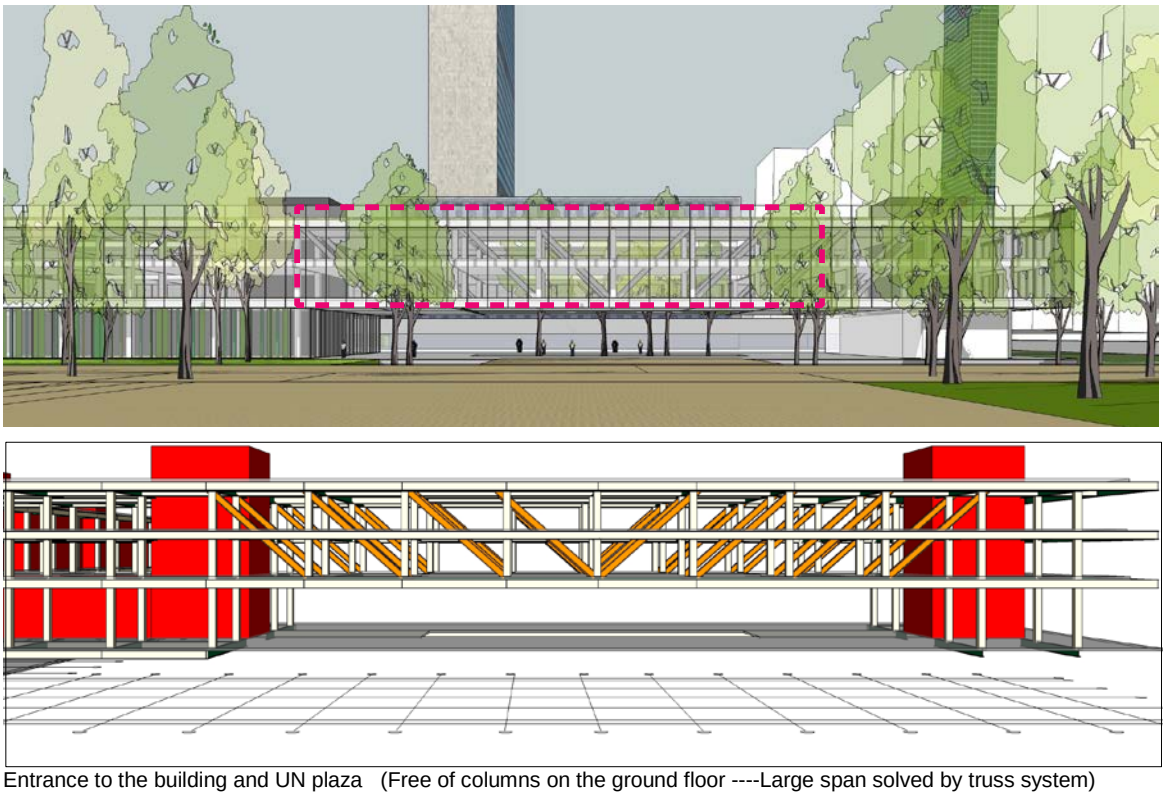
Phase 3: Divergence

During this phase I was testing different possibilities of the combined structure out of the analyses of the basic program requirement. With the volume scheme decided, a hybrid structural system of steel beam and concrete wall and partially truss supported came out.



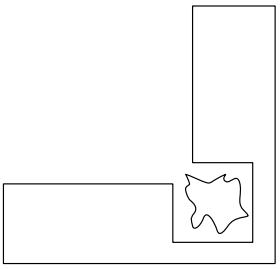
Hybrid structure system at early stage

Next to that I was also searching for a way to express the program difference also in the structural aspect, because as in an L-shaped building, the corner always shows its special quality as a joint point of two wings. Also with three different programs inside, I think a more explicit structural language is needed to strengthen the volume characteristics. That is to say, the structure needs to speak for itself.



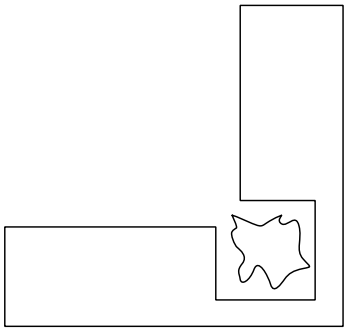
Entrance to the building and UN plaza (Free of columns on the ground floor ----Large span solved by truss system)

In order to achieve this aim, I try to make the corner special, standing out of the whole grid. By doing so, it not only becomes a special corner and an impressive icon for the city, but also achieves the balance between the programs and space.
Inspired by the existing chamber council of Oscar Niemeyer, why not use the special shape to show there is a special space inside? I tested a different material for the chamber council in the corner and even a different structure system to make it more out-standing. Using two corridors embrace the chamber council block in the middle and connect with each other and Offering a continues elevation of the building (Facing the east-riverside and north UN deck) reflects its inter-connection with programs inside and become also a more integral icon image to the public.



Phase 4: Convergence

At this stage, it is already clear that the inner façade and the outer façade should have different character to give response to the space next to them. Therefore I made further analysis about the two public (semi-public space) and then have the idea to give a totally different atmosphere to these two plazas- the inner one with more small scale, private and the outer one more connection between the city and the waterfront.



Phase 5: Decision

Eventually the final version of the facade design was put together as a hybrid structural system combination of concrete cores and steel columns & beams.

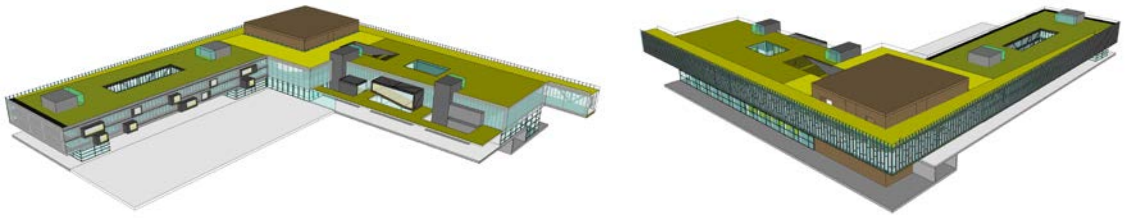
Step 1: Base

Step 2: Cores

Step 3: Columns and beams

Step 4: Concrete floor slabs

Step 5: Sticking out Boxes



Step 6 Connection and Facade

2.Roof as a Fifth Facade

Refererence:

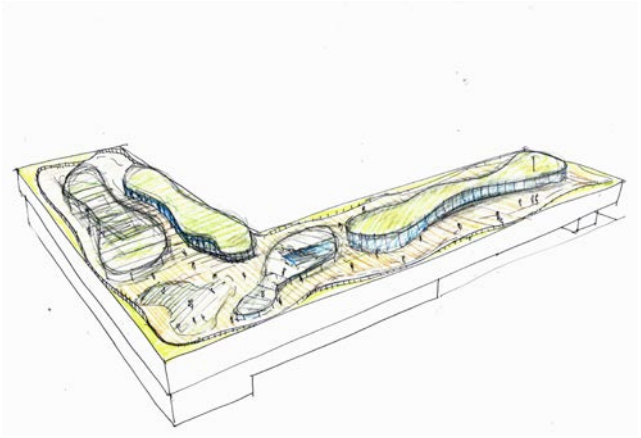
le marx

ıamidori Cultural Center
ıss and trees cover the 30 by 150 meters (98 by 492 feet) roof that extends over this garden-themed cultural facility. The green landscape is an extension of the surrounding park. In fact, it almost appears as if is a section of the park is lifted up by the supporting cones that emerge below.

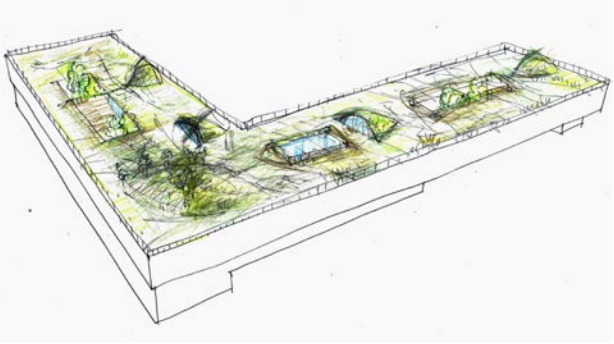
tama Prefectural University
ı 54,080 m2 (582,112 ft2) university is comprised of single-story clusters which contain laboratories and classrooms. The roof of these low-rise volumes is used as open-air boardwalk connecting the taller rectangular buildings that contain the lecture halls and student lounges. The square pattern on the roof – created by lawn, wooden decking, and openings – resembles the pattern of the rice fields in the area.

2. Rooftop Alternatives Comparison:

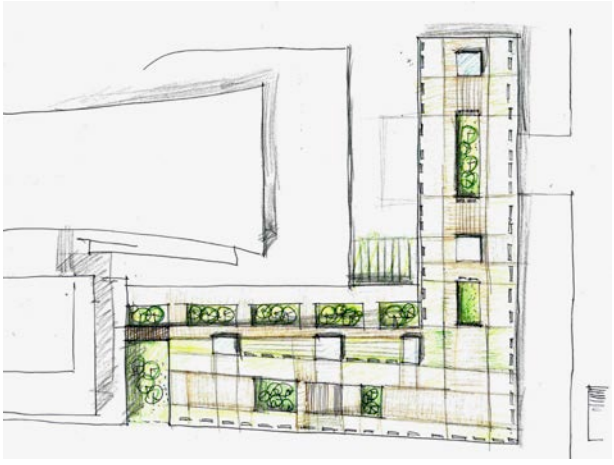
Alternative 1

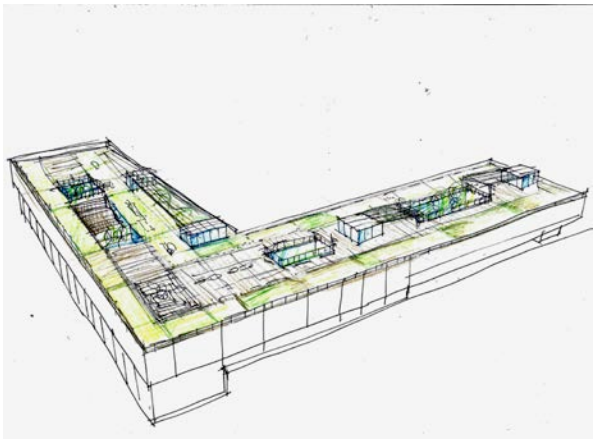


Alternative 2



Alternative 3





CHAPTER 4: Reflection

After the P2, I developed the design from the volume, composition, structure and façade, which is not what I had expected at first. But the design result become better and better, and the concept of the building is more clear and stronger. All the aspects altogether speak for the original concept: transition from the existing to the future. With the back and forth process, the structure system was changed from the steel beam and column structure to a hybrid structure system, which is the key point of the total development. It is not only a structural decision but also reflects its inter-connection with programs inside and become also a more integral icon to the public. On the other hand, I think phase 3 Divergence is a very important process, after you making several different alternatives, and comparing their own values and disadvantages, then you can pick out those key elements for further design. To me, development does not always mean to change but also change for better.