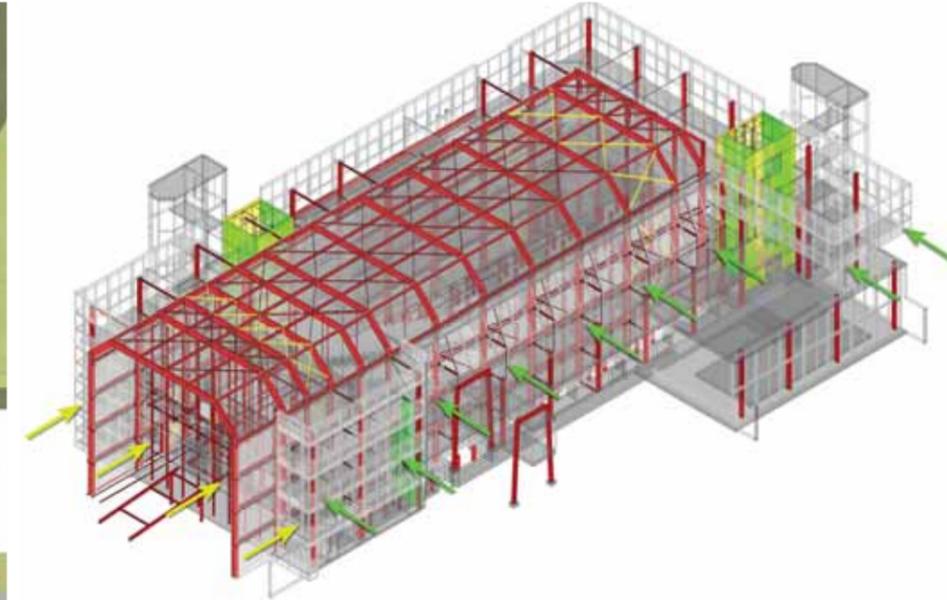


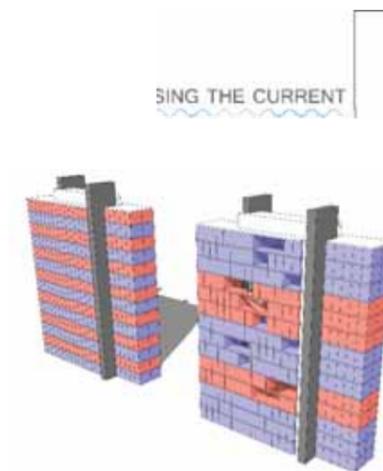
# potentials for Potentiala



## Summary

Multidisciplinary project about the re-development of the Potentiala, a building on the TU campus. The building needed to be energy-neutral, which was completely impossible for this outdated building. Nevertheless we tried and almost succeed. The integration of this aspects was what MIO was all about. The design was very much influenced by the energy requirements. For example the solar panels on the roof and in all the facades, the algae tubes in the cultural building Corona and the pond in front of the Potentiala.

Corona, the building recognized by the auditorium was the part I personally developed, with structural calculations. This building is currently a laboratory, in the design was tried to give this laboratory a second life, resulting in a really industrial architecture. Delicious ugly I would call it.



## Concept

In the design students will receive a fully independent room -to feel at home-, a living room and shared kitchen per floor -to casually meet other students-, workplaces mixed with professors -to emphasize learning performance- and a bar -to have a drink and enjoy the view-. A building fully equipped for an honours student to live, study and enjoy at the TU/e. The new campus is divided per function. Potentiala will house all University College related functions as living, working, study-areas and lecture rooms. A cultural hub will be created in Corona, with the associations from the Bunker and improved facilities like a large multi-use theatre.

The concept of using the current is recognizable on many levels of the design:

### Urban | Using the current buildings

Van Embden and Choisy's strong visions are still recognizable everywhere in the TU/e Science Park and therefore incorporated in this design. The current buildings are used as much as possible to reduce energy waste during construction and demolition.

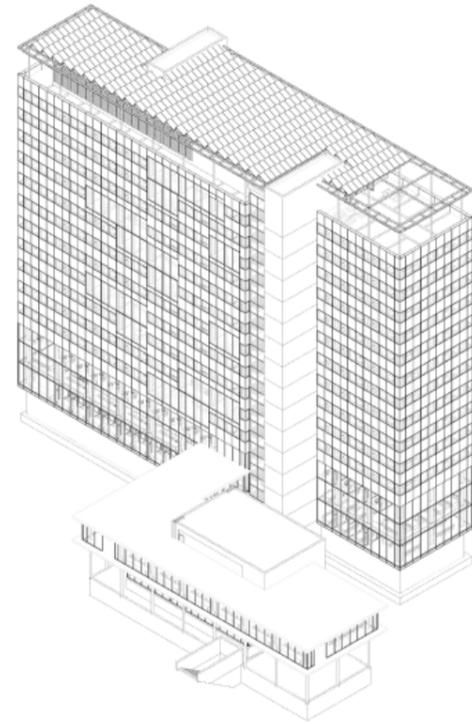
### Social | Using the resident's social current

Residential floors of Potentiala (floor 4 to 13) are connected via the staircases in the living rooms, to enhance social currents. To eliminate the effect of a social barrier, floors are connected per three and two.

### Energy | Using the Dommel's current

By directing the Dommel alongside Potentiala, the excess heat of the geothermal heat pump can be exchanged in the current for the necessary cold via a heat exchanger in the pond in front of Potentiala.





### Potentiaal

The Potentiaal houses education on the first 3 floors, above the student housing is placed.

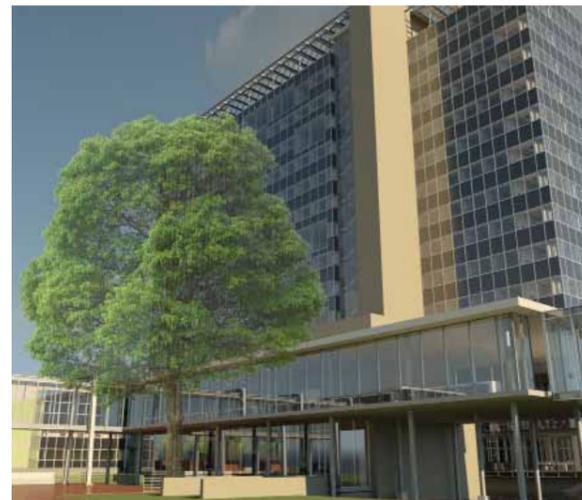
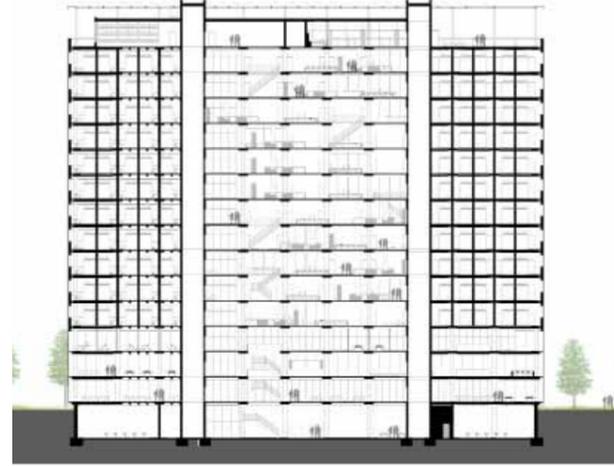
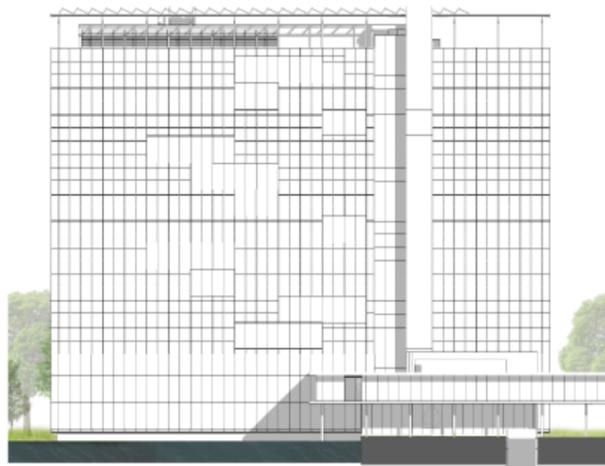
On the education floors the main goals are: Promoting interaction, communication and innovation through open spaces, transparency and a spacious design. These open floors give a great view at the surrounding park, the terraces and the Dommel and offer a variety of workspaces. Floors are characterized by voids and the exposed cassette floors, giving it a raw, industrial look. The current head beams are preserved to define the space and to conserve structural stability.

### Ground floor

Student enter via the lobby of the Voorgebouw with a reception for visitors. Here are also the mailboxes of the residents.

A visitor enters via the first floor to the University College as in every other TU/e building. The ground floor of the Potentiaal offers various workspaces for different amount of students, open workspaces and a Print-shop.

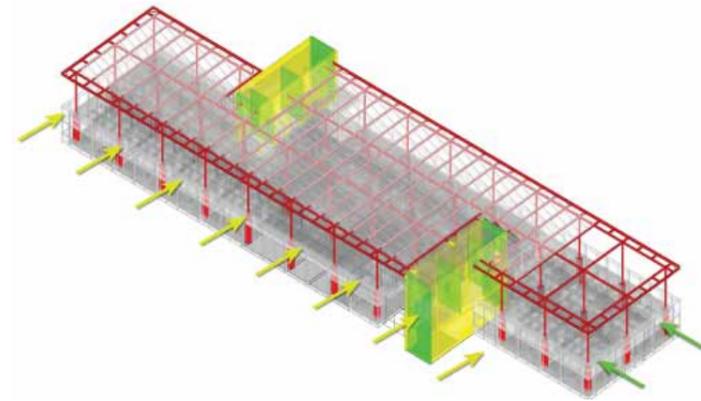
As aforementioned, visitors and students enter from this floor to adjoining floors. From the walkway system of the TU/e students can enter via MetaForum, LaPlace or Impuls. The Voorgebouw is an important structure to introduce Potentiaal to visitors, without it, a hard confrontation would be uncomfortable.



### Housing

Because of the cultural differences between students on a university campus and because of expectations regarding housing, we opted for self-sustainable rooms. To promote social interaction between students from all over the world who don't know each other, we chose for a concept in which we incorporate living rooms on a small scale to every floor. We did this in a way quite opposite of how the potential is currently organized. Instead of the very horizontally oriented floor plans the potential currently has, we wanted to extend the social interaction to several floors at once, by connecting them with stairs inside the living rooms. These living rooms are situated in horizontal voids opposed to the traditional vertical voids, making them a lot more manageable for the human scale and more suitable for a living room.

The living rooms show up in the facade in a playful way, reflecting the dynamics they contain inside and showing how the building is arranged.

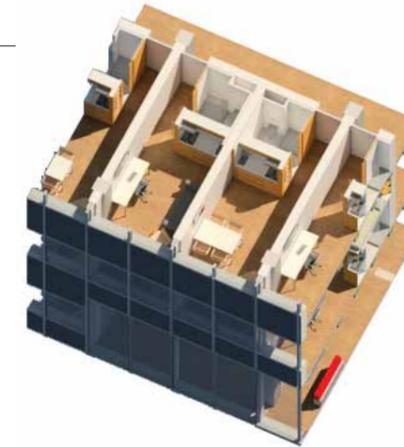
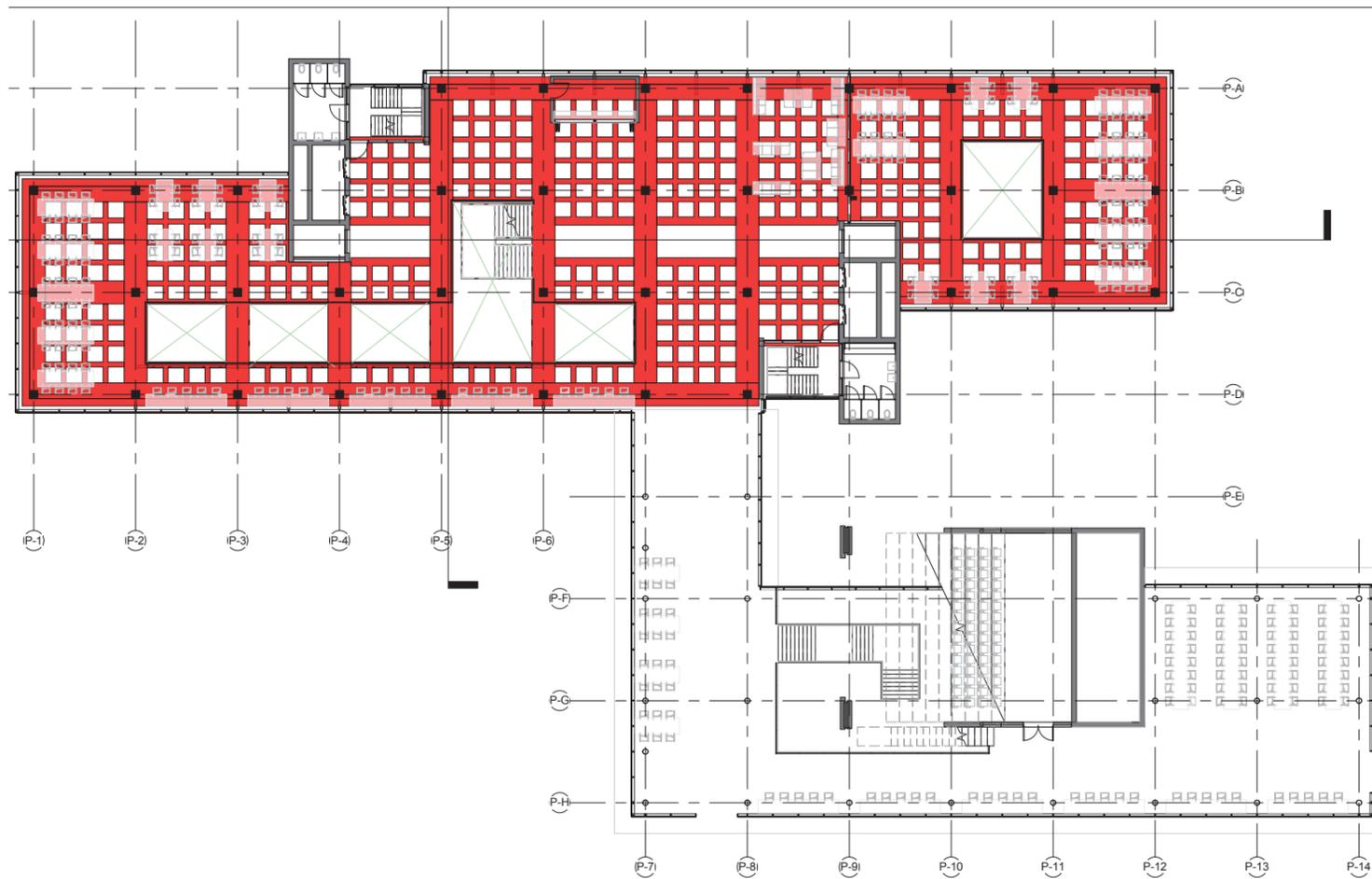


### Roof extension

The roof extension contains the machine room as well as the student cafe. The student cafe gives the college students, just like every TU/e faculty, a cafe of their own and one with a fantastic view. It's oriented to the south with a terrace, with large folding doors to connect the bar with the outside.

The steel structure though is the only visible piece from the ground. It's a very integral designed piece, serving several functions. For one it's an architectural ornament to the Potential. Since the existing eave of the Potential is not really an ending to the building, we designed this roof structure as a sort of crown on the building. This element frames the existing outline of the building, creating a clearly defined ending of the building. The structure also serves as the place for the roof solar panels to be mounted. Because of its raised position in respect to the roof, the PV cells are lifted up from the shadow of the concrete cores, thus being more efficient and fitting even more panels.

Lastly the outline beams also houses the railing system for the window washer basket. It follows the entire facade and then passes along the inside of the cores, going over the cafe and machine room, thus giving the basket a place to park out of view and accessible to the window washers.

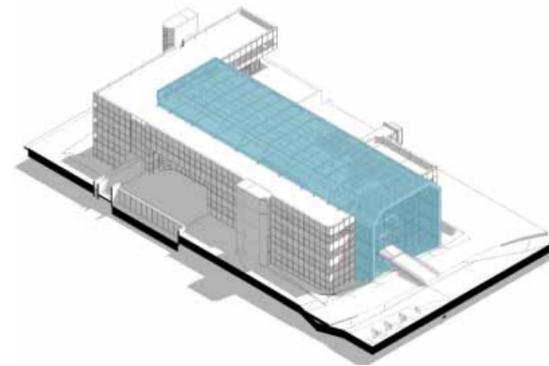
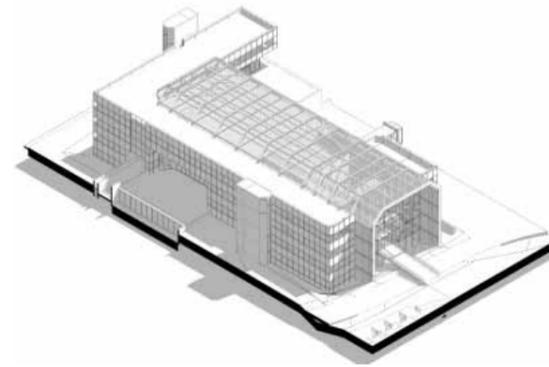


### Corona

The word 'ugly' is the first thing that came into our mind when visiting the current Corona. It is a functional designed building with hardly any architecture in it. But the building has also an impressive touch. The openness and visibility of the structure is one of the things that make this building more exciting. Wandering through the building on several walkways above the laboratory is really a nice experience. Although it looks industrial a non-comfortable there are several cosy places in the building. A small corner with a coffee machine and two chairs for example. In the new design we tried to preserve the ugly laboratory design of theseventies and upgrade it to a contemporary building.

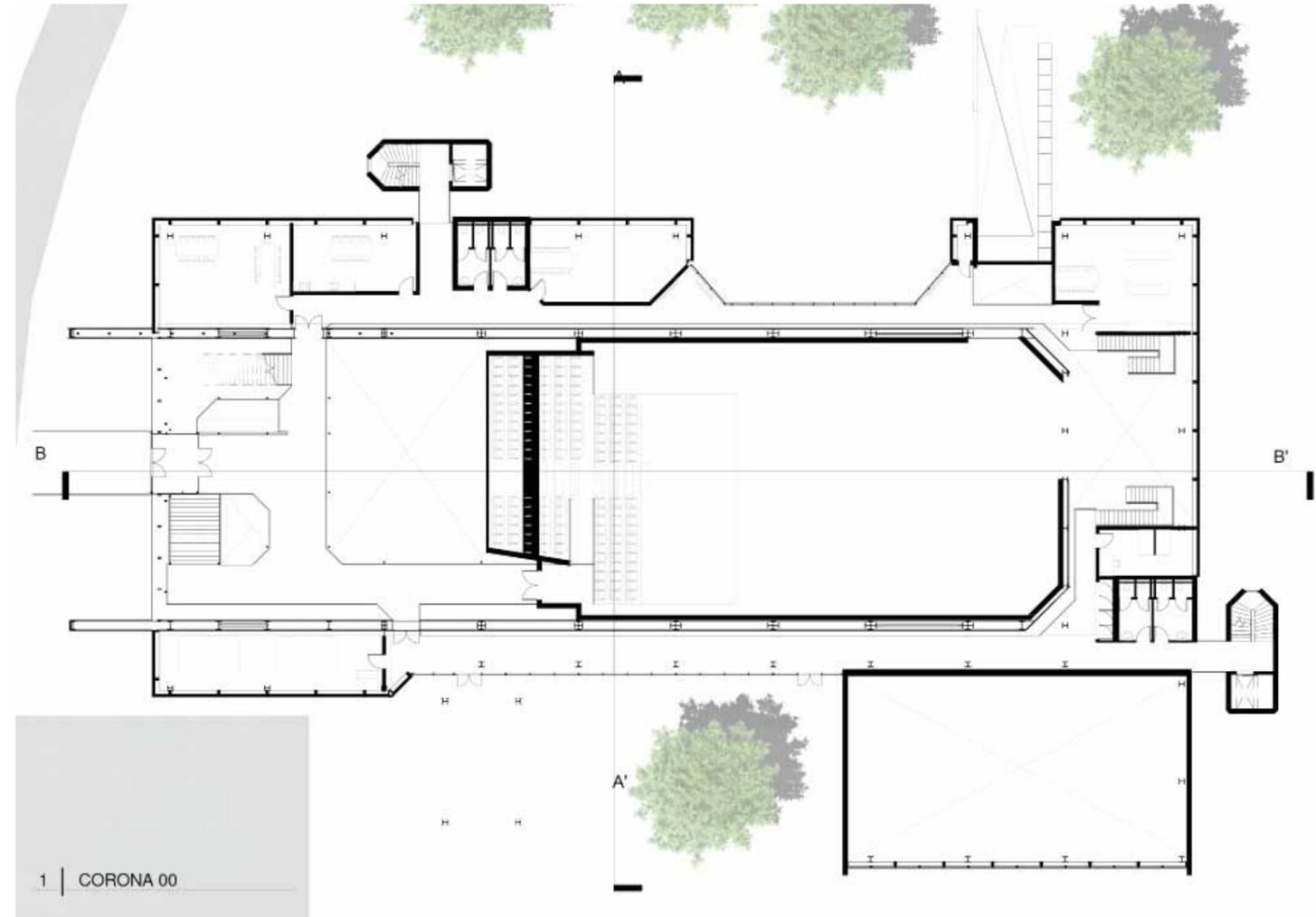
### Two boxes

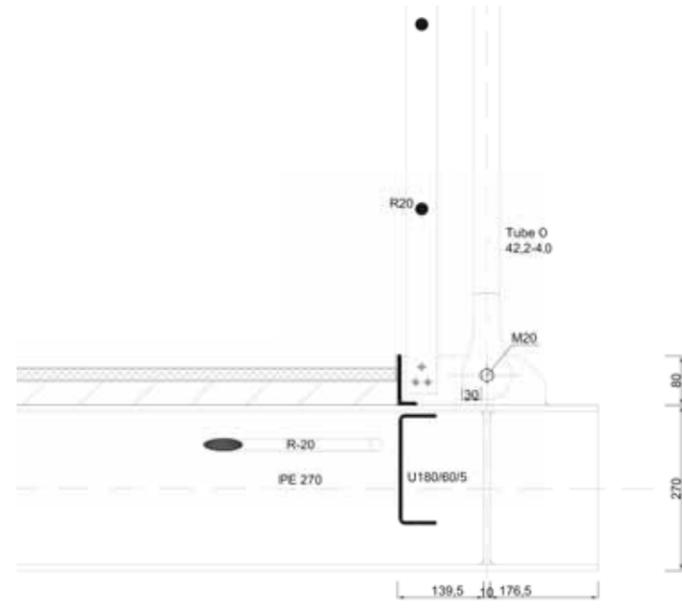
The design principle of the Corona is based on splitting two social currents. On one hand the visitors of theatre and concerts in the large room in de middle box, on the other hand the students who use the society rooms in the second box. The currents are split because of the different needs of both the users. The visitors are guided directly to the large room. The students can roam through the outer U shape of the building. The front entrance is also the student entrance, but the stairs in the foyer make clear that the way down is the main route. The stairs to level 1 are much smaller. In the outer box all the cultural societies are housed. Those societies are blended in the U shape. This has been done by practical reasons.



### Morphology

The inner box is based on the case of Faraday. The 'broken' corners form a strong signal to refer to the current. The box is designed in one way that the façade and the roof will fade. It is a wrap-around of the public area. The box is designed larger than the outer box to stand out and show that it is public and important. That is also why it is orientated to the park. In the box only the core functions are located. Those are: foyer, bar, reception desk and the large concert room. All supporting facilities are placed in the outer box. This is done to not disturb the shape and the experience of this shape





**Walkways**  
 The walkways in the foyer are really characteristic and form the space. They are inspired on the current walkways existing in the Corona, including the 45 degrees corners. They are build up by steel beams and steel plates (sometimes with wooden plates in the current situation). A soft finishing is needed to guarantee the sound comfort in the foyer. The walkways in the foyer are not supported. They are hung to the spans at the top of the foyer. The walkways split up the space in a more 'human sized' space, but because it is free of columns at -1 level the visiting public will not be disturbed by the columns. In the outer box the current walkways will be used.

The detail of the walkway is based on practical, industrial steelwork. Just like the Corona is in the current situation. The floor spans from beam to beam over a distance of 4 meters max. Therefore is chosen to apply steel plates to span this distance. The plates do not guarantee the stability, that is done by the braces below the walkway. This adds the wanted esthetics to the industrial walkway. The top layer of the floor is sound absorbing material to enlarge the sound comfort in the foyer.

The structural beams are wider that the walkway is dimensioned. This is done to design one detail with a large amount of freedom to adjust the size of the walkway. The tensile bars are satisfied at the gridline. So the forces are distributed direct to the spans, instead of the girders. But it is undesirable to design bridges with the same width as a gridline. The bridges would be far too large. On the render two sheets back the different bridge sizes are shown with the uniform tensile bar connection. On top of the IPE270 beam two plates are welded. These plates form the connection to the tensile bar, which is connected with a M20 bolt to the plates. The beam is strengthened at the tension line. So not only the upper flange takes all the loads. The tensile bar end with and screwed round element. To form a uniform detail the railing hasn't been integrated with the tensile bar. The U profile doesn't have a structural function. It is designed form an edge to the walkways.

