

Sustainability of Constructions. Van Abbemuseum, Eindhoven

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ABSTRACT: Eindhoven is a city of the Netherlands. Van Abbemuseum is a newly renovated museum in 2003. The historical museum building, dating from 1936, is designed by architect Kropholler, and architect Abel Cahen designed the integration into the spectacular new wing. Also the old part of the museum is welcoming to the visitors from the main street, while the small pink aluminium clad entrance house is an entrance to the new wing.

In this case study, the sustainability topic will be discussed how they could manage to hold the old building still standing for the entrance part of the whole museum complex, old and new. During the observations, the advantages of the new construction system will be underlined to show how a new wing can be successful in the sustainability of old constructions from the use of new materials as iron and steel in both structural solutions and also in constructional details.

1 GENERAL INTRODUCTION

1.1 *Van Abbemuseum*

The Van Abbemuseum is one of the popular museums to lead for modern and contemporary art in Europe. It was opened in 1936. And since that date, there has been many acclaimed exhibitions and built an extensive, internationally renowned collection of more than 2700 works of art. The reputation of the collections is depending on the quality of the individual works of art, among which are masterpieces by Picasso, Chagall, El Lissitzky, Beuys, Weiner, Gordon and McCarthy.

The Van Abbemuseum officially reopened in 2003, after the completion of the renovation of the old building with the addition of the expansive new wing. In the old building, temporary exhibitions, about general politics and special concern alongside focused presentations of individual artists are exhibited. In the new building, Plug In, a radical new approach, has been developed to exhibit the famous collection. Also in the new building, Living Archive, which includes a series of documentary exhibitions based on the museum archive, is located.

The two contrasting aims of radicalism and hospitality, experimenting with the subjects and forms of exhibitions and museum projects, are the aim of the Van Abbemuseum over the coming years to work with.

1.2 *The spaces in the plan of Van Abbemuseum*

The new building and old building are having lots of different spaces due to functions. Towering part is a great chance to see the overall view of the new entrance from the back side of the building, linked to the city center, from the inside of a pink colored hub, having an aluminium structure. River Dommel widened to create a charming entrance towards museum via café. The library is an opportunity to search inside of a digital archive about art and everything. The auditorium gives a nice chance to watch the movies, sitting over the red comfortable chairs. Bookshop serves you in every manner, by selling books about art, building itself, cities and by selling specially designed objects as souvenirs. The entrance of the bookshop is covered with the stairs up and there are nice cartoons over the surrounded walls. The shelves of the objects can be moved to open and to close the bookshop everyday



Photograph 1. New entrance to Van Abbemuseum through café in the new building (photo by Y.K.Aktuglu, 12/2006) .

1.3 *The newly designed spaces*

The newly designed spaces, including the administration section, the library, and the cafeteria are playing a very important role to support the life of the museum for today. The design principles for making a museum sustainable in today's conditions require the logical use of materials and also the contrast of the materials as togetherness of stone cladding and glass, or steel supporters and glass.

But esp. the use of structural steel is making the value increase in the name of functionality of a museum building, coming from past and still living today.

2 STRUCTURAL STEEL USE IN THE SPACES

Water welcomes the visitors, both to the new entrance from the inside of the pink hub, with an aluminum structure and also with a bridge over the water, from the front of the library towards the main entrance in front of the old building. For the strength of the structural steel is very high, then the new structural system in first and second manner as main structural system and secondary structural elements, has effect on the spaces, created newly and also it makes them be more enriched.

2.1 *Café*

The steel stairs, inside the café for up, is made of the lightest material in a very economical and very logical construction technique. The glass holders of the stairs are connected to the steel plate with double screws, and it ends with another steel plate at the top of the glass to hold them.

The glass facade is being carried by the steel connection elements, passing the loads to the columns behind the glasses, supported by the steel mullions. In this way, a transparency is gained for getting more daylight inside the café.

The first floor of the café is going out from the façade to create a balcony outside.

2.2 *The openings*

From exhibition halls toward outside, there are some openings as doors with glass and additionally a glass attachment with structural steel framing, having also a steel decking over the river. This adds a value to the new building with its brilliant effect from outside, and with a smiling light toward inside.

The connection level between old building and new building is constructed with structural steel material, with nice details, creating a flying floor again over the river.

The opening towards the back side street is covered with glass having lots of writings on it as a security of the visitors not to crack the transparent surface.

2.3 *Library*

The opening, from the library basement level toward outside above the river, is constructed with circular hollow section columns or let's say it as mullions to carry the loads of glass cladding with additional detailing, creates an attractive space to call the readers to that place to read their books inside of the nature.

There is a very light booking section with steel shelves to carry the books, with glass and structural steel cantilevered corridors in front of the shelves, and there is a very light stairs connecting the basement and ground level of the library with light steel detailing. The advantage of steel shelving is giving you an nice working space with the very thin shelf thickness. All of these are enough to represent an information area in a very shining position also by getting the full daylight from the top roof.

2.4 *Steel bridge*

Steel bridge is connecting you to the main entrance in the old building by making you fly over the river.

2.5 *Glass façade*

The courtyard named "above beyond below" is covered with glass and steel mullions, to create a semi-closed space without a roof cover to make people be available to attend to a concert in this courtyard.

The whole façade of the new building is constructed with glass and steel mullions to have a flowing mirror surface to make the new addition more brilliant around the water composition as a link with the river.

2.6 *Entrance from the back side to the new building*

At the back side of the museum, there is a very charming and attractive small aluminium hub in pink, calling you to come inside by passing the wooden covered, in floor, garden terrace of the café such as floating over the river. The going out upper floor of the café through the glass fa-

acades gives you another exciting moment in the manner of a clue to be a sustainable building in future.

The flat metal lines over together with the stone cladding of the new building give an impression as being ready to fly.

2.7 *Vertical circulation spaces covered with glass and steel trusses*

There is a main and dense vertical circulation space full with daylight coming inside through the glasses, carried by hanged structural steel trusses, in white color, composed with nice details as vertical wall participants and also nearly horizontal roof claddings.

In the next space for stairs, also at the top there is an opening with steel and glass to get daylight inside.

From the top part of the mid- vertical circulation space, it is nice to have an idea about toward the café and the other entrance door in pink near the river, by looking out inside the glass cladding, carried by circular hollow sections, replaced in horizontal position.



Photograph 2. An overview to Café decking over River Dommel(photo by Y.K.Aktuglu, 12/2006) .

2.8 *The book shop*

The book shop is not only a very attractive selling place for the very carefully prepared souvenirs, but also the whole door pieces in the form of shelves to exhibit the goods are calling you to visit it. These door pieces are turning in their axis to be open during the day, and later to be closed in the evening.

2.9 *Auditorium*

There is a small steel spiral stairs to go up part of the auditorium, creating an attractive magnet inside a closed and dark space.

2.10 *Additional features*

There is not any addition to the old building as new. The normal height of the old building is accepted as they are since the first day. And the walls are brick, and they are being melted between the other urban texture.

At the other part of the complex, the new feature is being bold with totally new wings. It can be only seen the top of the clock tower of the old building.

Even though it can be a dark afternoon, the metal flat lines in vertical placement are enough effective to present the existence of the new building with the help of the water of the river Dommel.



Photograph 3. The back side view of Van Abbemuseum through new wings (photo by Y.K.Aktuglu, 12/2006) .



Photograph 4. Main entrance to Van Abbemuseum from old building(photo by Y.K.Aktuglu, 12/2006) .

3 CONCLUSION

3.1 *The building itself*

The properties of the buildings, both old and new are enough capable to be sustainable in the future. They are in contact with nature, when it is available to get an opening to out by the use of structural steel and glass.

The functions of the spaces seem to be in service for all days of the future times, including museum's potential of digital archives.

The café, over the River Dommel widened, is totally a unique atmosphere to live in a preparation section before the real art.

The library, full with documents, is a great resource for researches.

The auditorium is another magnificent space to be linked with the movable artificial life, on the screen.

The bookshop is a miniature of the global museum life.

With all these parts, Van Abbemuseum is a successful candidate in the list of the museums, from the point of sustainability.

3.2 The value added to the city in the meaning of sustainability of the Van Abbemuseum

The activities of Van Abbemuseum is attracting the people living in Eindhoven, and the students studying in TUeindhoven, nearer to art titles with exhibitions, workshops, musical performances, etc. with free entrance. This kind of occasions are making the city life more enjoyable and more cultural, in a daily life scenario. For the presence of the old building of Van Abbemuseum, it is aimed to make its function as museum to stay in a sustainable manner for other generations by enlarging its capacity.

The Van Abbemuseum is a very successful sustainable museum complex, supported and riched with the use of the structural steel to make its spaces be in contact with nature at maximum.

3.3 References

several visits, on different times, to Van Abbemuseum on 12-15.11.2006

several guide books about Eindhoven

<http://www.vanabbemuseum.nl/engels/gebouw/gebouw.htm>