

IMd

Contact Remko Wiltjer, Rob Treels, Matthij Moons,
Arnout van IJsseldijk
Address Jan Leentvaarlaan 62
3065 DC Rotterdam, Netherlands
Phone +31 10-2012381
Email imd@imdbv.nl
Website www.imdbv.nl



Organisation

IMd Raadgevende Ingenieurs is an organisation with a great core of highly qualified employees, who have been applying their experience, know-how and expertise for many years with regard to advising about, designing and working out main structures for buildings. At present the firm consists of 40 highly educated employees. IMd is completely independent and does not have any business links with manufacturers, suppliers, contractors, developers and other interested parties who could influence our impartial and independent consultancy.

IMd is a member of the Dutch association of consulting engineers (ONRI) and possesses the "quality management system" certificate according to NEN-AND-ISO 9001.

It is a firm where the internal communication proceeds smoothly and all employees are kept informed about the most recent developments.

In the almost 50 years that our firm has existed the quality of our service has always been a key issue. The most important characteristics of this service for us are:

- A good product that fits the budget of the client
- A product that fits the concept of the architect
- Creativity and ingenuity
- A flexible and service-oriented attitude

Projects

They vary greatly: from prestigious office complexes to pedestrian bridges, from houses to complex shopping centres, from alterations to new-housing and from simple and small to complex and large. Each project has its own charm and is a

constructive challenge. The projects are carried out at the request of property developers, government organisations, foundations, architects, contractors and private parties. This diversity in clients is made possible because of the independence of the firm of consulting engineers.

View IMd Raadgevende Ingenieurs

The view of IMd is that the success of a project largely depends on the first stage of the design process. The cooperation between architect, client, mechanical engineer and structural engineer is decisive in order to have a fine design in complex projects. In the preliminary design various alternatives are presented for the structure of a building. The advantages and disadvantages of every constructive alternative will then be discussed in the design team. Wishes of the client and architect, requirements in the field of building physics, possibilities regarding the technical installations: they all affect the choice of an optimal structural design.

In addition to the constructive design, IMd regards its role as a coordinating engineer as very important. In its existence IMd has built up a perfect reputation. In addition to the inspection of the basic principles of the drawings and calculations of suppliers of prefabricated concrete and steel constructions, the content of these elements is also assessed with great care. We ask the client to make it possible for us to carry out the consultancy work in a constructive way. In the end this will create the best result for the client.

Entrance building "De Admirant" Eindhoven

Short Description

The grand finale of the vast inner city renewal project by 'Rond de Admirant CV' (Heijmans Real Estate) consists in the construction of a striking and futuristic building. The works started in October 2008 and the architectural name used for this construction is known as BLOB (BiLinear OBject).

Both the non-bearing (glass) façade construction and the concrete framework were designed in dimensioned by 'IMd Raadgevende Ingenieurs', using the 3-Dimensional computational software package Scia Engineer.

By using this computational software, the required material quantity was minimised, while the construction process was optimised.

Project Information

Owner: CV Rond de Admirant (Heijmans Vastgoed)
Architect: Massimiliano Fuksas Architetto
General Contractor: Heijmans Bouw Best B.V
Engineering Office: IMd Raadgevende Ingenieurs

Construction Start: 01/10/2008
Construction End: 01/03/2010
Location: City Center Eindhoven, Netherlands



Introduction

The ambitious inner city renewal project "Rond de Admirant" is located on the Emmasingel, near two monumental buildings: the former Philips head office "De Bruine Heer" ("The Brown Gentleman"), and the former factory site "De Witte Dame" ("The White Lady").

The Italian architectural firm Massimiliano Fuksas Architetto was asked by the developer to design the "De Witte Dame" plan.

The building's shape resembles a (half-) droplet, or egg; the largely transparent glass façade shows the occasional indentation. This modern architectural design - known as BLOB (BiLinear OBject) - has caused quite a stir in Eindhoven.

Because of the building's shape, the floor space decreases with each storey (measuring 1000 m² on the ground floor, and only 200 m² on the 4th floor); also, the 2nd, 3rd and 4th floors have large voids, stretching out to the façade.

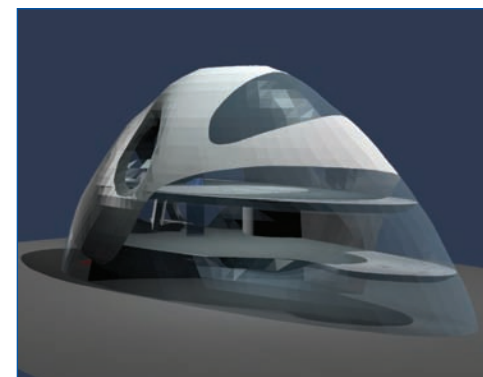
The steel construction is non-bearing, because of the glass façade; the concrete framework (floors, walls and columns) are therefore self-supporting. The framework also provides for stability, whereas the glass façade is only supported horizontally on storey-level.

Design

The concrete skeleton was designed as a 3-D model with the use of Scia Engineer.

The ground- and 1st floor are to be used as store locations, therefore, the principal insisted on relatively large spaces between the columns (maximum of approximately 9 metres). At the same time, the architect demanded similar edge distances on each floor, compared to the superjacent (curved) floor framing.

Because of these demands, hardly any column is placed directly above another, and every floor level (concrete floor, d = 400) is constructed as a transition slab (with high concentrations of punching stress and shear forces here and there, as well as flexural moments).



Entrance building "De Admirant" Eindhoven

A flat, in situ-placed slab floor was used, without column slabs and beams.

The 3-Dimensional computational model for the entire concrete framework has an important benefit: the adhesion factor can easily be determined, which means that the column positions are relatively easily optimised, in agreement with the architecture.

The same model was used to calculate the weight- and stability figures, as well as the required amount of reinforcement in the storey floors.

As part of the concept design, IMd has calculated the preliminary figures for the glass façade steel construction. This, too, was carried out using a 3-D computational model, which was transported from the architect's 3-D drawing compilation to Scia Engineer. Vertically, the façade construction only transfers its own weight and possible snow accumulation to the building's foundation; horizontally, it transfers the wind pressure to the storey floors of the concrete framework.

A large part of the façade lacks horizontal support, since the building's ridge - from the 2nd floor upwards - includes large voids. Thanks to the 3-Dimensional computational model, the required amount of steel necessary for the façade construction could be kept to a minimum: the building's shape itself was applied to achieve optimum result, implementing disc- and scale effect, as well as flexural force.

Taking into account the large size of the unsupported façade surface, the applied steel frames (pipes 90 x 90) can be considered exceptionally thin. The subsequent phase of the design process included the German consulting engineers Knippers Helbig, who - together with Fuksas - further developed the façade construction, using their 3-Dimensional software package. Their results, incidentally, did not differ from earlier calculations.

Development and execution

Construction works were started in October 2008, with the piling of FUNDEX poles. Prior to that, IMd presented the complete design- and reinforcement drawings for the concrete framework. Again, the 3-D model of the design phase was used to determine the amount of reinforcement in the walls and floors. Façade supplier Waagner-Biro, also a Scia software user, is to further develop the façade steel construction.

