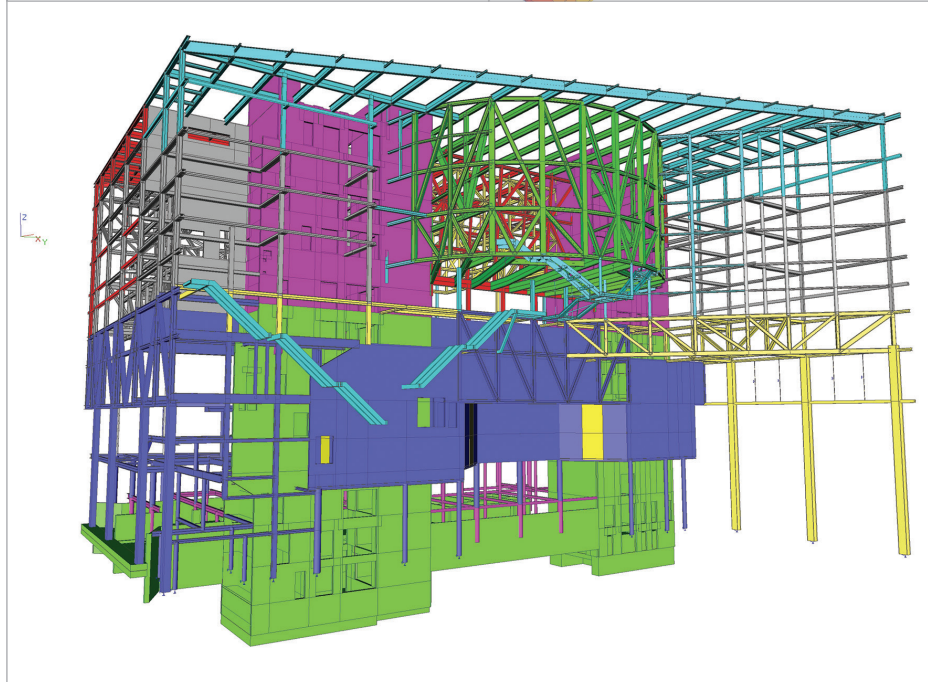
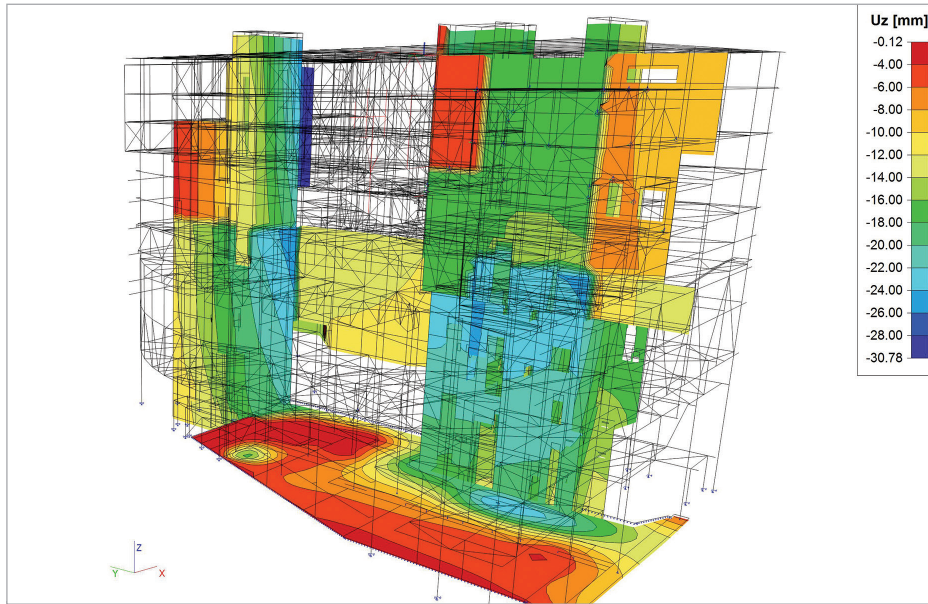


Music Palace - Utrecht, The Netherlands



The existing Vredenburg music centre in Utrecht, the Netherlands, will be extended with 4 new music halls. The new music theatre will house different music biotopes, classical, jazz and pop music. The jazz and pop biotopes in other locations in Utrecht are outdated and no longer live up to the modern demands.

Above the new “Pop Hall”, the “Crossover Hall” and the “Jazz Hall” will be situated. The new (round) “Chamber Music Hall” will be built as a cantilever above the existing “Symphony Hall”.

Because of the large spans, the new halls will be built of steel. The steel structures will be supported by two connected concrete cores, which form the backbone of the building. The foyers, restaurants and plaza functions are situated between the halls as a public area.

Owing to the demands regarding noise, the halls will be made with a box-in-box structure. The Jazz Hall and the Crossover Hall are suspended on top of the building and span approx. 20 m from core to façade. Heavy columns have been integrated into the façade to support these halls. The span has been constructed with trusses, which are part of the outer box.

The Chamber Music Hall has been suspended from the concrete core as a cantilevering element, which places it above the existing Symphony Hall without coming into contact with it. Therefore, these two halls are completely separated and structure-borne sound cannot occur.

Since both concrete cores have halls which cantilever 16 m, horizontal deformations occur in the building. As a result of the cantilevers, the cores bend approx. 40 mm. This deformation has been calculated and the final outfitting will take this deformation into account.

A lot of attention has also been paid to the dynamic behaviour of the floors of the halls.

For the expedition zone on level -1, a 6.5 m-deep building pit has been made. The building pit was built from steel sheet piles and underwater concrete.

At the location of the cores, the high foundation pressure is absorbed by grout injection piles, fitted with a permanent steel tube with a large bearing capacity.

The chosen building method ensures that the ground water outside the building pit is not influenced, in order to meet all the demands set for the vicinity.

Use of Scia Engineer

The entire main bearing structure has been designed with the finite element program Scia Engineer. The concrete walls and floors have been entered as 2D elements. The concrete beams and the steel structure have been designed with 1D bar elements. The foundation piles have been entered as springs. With the calculation model, the entire force distribution of the main bearing structure has been analysed and the forces have been determined for the following engineering process.

The 3D model was also the basis of the calculations for the construction phase of the project.

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zonneveld ingenieurs®

Zonneveld ingenieurs b.v. was founded in 1981 as an office specialised in structural engineering. Over the past thirty years, the company has gained a lot of experience in a wide variety of projects. The management consists of five very experienced consulting engineers. All (approx. 30) employees are highly qualified and have extensive experience.

Nowadays, Zonneveld ingenieurs is a specialist in high-rise and inner-city redevelopment.

Zonneveld ingenieurs is a precursor in the field of sustainability and when it comes to using BIM.

A few of the most significant reference projects are:

- Ministries of Justice and the Interior, The Hague
- City Hall, Utrecht
- PGGM Buiding, Zeist
- Music Palace, Utrecht
- City Hall, Nieuwegein

Project information

Owner	Municipality of Utrecht
Architect	Main architect: Architectuurstudio HH, Amsterdam, The Netherlands
General Contractor	Heijmans Bouw bv, Rosmalen, The Netherlands
Engineering Office	Zonneveld ingenieurs bv, Rotterdam, The Netherlands
Location	Utrecht, The Netherlands
Construction Period	03/2010 to 2014

Short description | Music Palace

The existing Vredenburg music centre will be extended with 4 new music halls, built of steel. The steel structures will be supported by two connected cores, which form the backbone of the building. The foyers, restaurants and plaza functions are situated between the halls as a public area. Because of the demands regarding noise, the halls will be made with a box-in-box structure. The entire main bearing structure has been designed with the finite element program Scia Engineer. With the calculation model, the entire force distribution of the main bearing structure has been analysed and the forces have been determined for the following engineering process. The 3D model was also the basis of the calculations for the construction phase of the project.

