



## A challenge as hard as steel

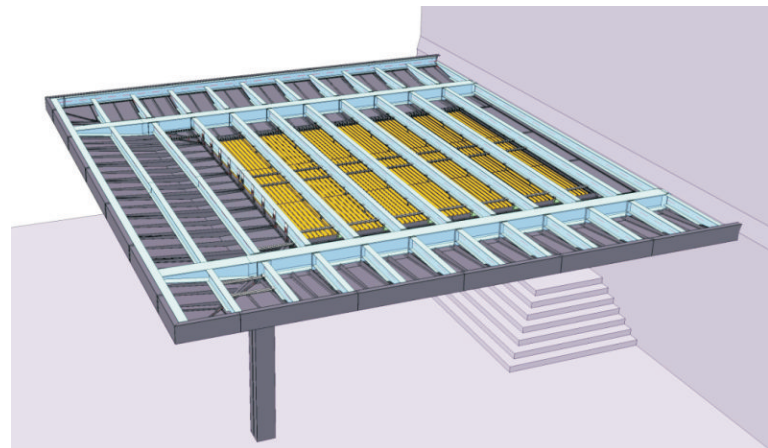
### Metal Engineering with HiCAD

The entrance area of a building is the calling card of every company. It is where a customer decides within seconds whether he feels welcome and comfortable or unwanted and out of place. How such a project can be constructively accomplished by use of most modern tools, shows the following article.

Since 1992 the Sioplan AG, located in Olten, has established itself as a planning office in facade and metal engineering. It supports architects and general contractors as well as metal engineering companies in the fields of consulting, project planning, submission, controlling and expert's reports. Thus, the Sioplan AG ensures a smooth and economic progress of the respective construction projects. In order to meet every challenge in a flexible and competent way, the company requires a CAD solution which not only optimally supports its engineers in the realization of their projects but which also allows them to design almost without limits. Hence, the planning office relies on HiCAD, the comprehensive solution of the ISD Group.

#### Time saving by automatizations

In the course of a former project in 2004, the Sioplan AG had to decide on whether it should invest in a new CAD system. This consideration was closely linked to thoughts about the future of metal engineering in general which lies, according to the company, definitely in 3-D. In order to still be able to use 2-D without re-



strictions, the decision fell upon a 2-D/3-D associative solution. The question when to apply which dimension is nonetheless decided by the Sioplan AG on a case-by-case basis and under consideration of the respective expenditure of time. "If the project contains a huge amount of sheet metal, it is sensible to use the 3-D in HiCAD. It allows a much faster creation of the sheet metal blank which only requires the push of a button because of its automatization. Considering that it needed to be calculated and created manually before, this technique saves us a lot of time", states Benjamin Lanz, design engineer at the Sioplan AG. Hence it is comprehensible, that he describes the way of designing sheet metals as "one of the most important functions in HiCAD". Because the implementation planning for metal engineering companies, where the sheet metal blank is mostly applied and which constitutes the majority of their work, is often under serious time pressure, it requires a realization at short notice. Thus, the automated generation of

#### » IN BRIEF

##### Sioplan AG

- Industry: Fassaden-/Metallbau
- Software: HiCAD
- Products: Consulting, project planning, submission, controlling, expert's reports
- Location: Olten, Switzerland
- [www.sioflan.ch](http://www.sioflan.ch)

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bills of materials as well as of single-part and workshop drawings is also of great help.

### **High planning security due to 3-D**

But working in 3-D holds even more advantages for the Olten company. These become, for example, apparent in the preparation of submission documentation. "Only by means of the third dimension we are able to create a comprehensive description because thus even special connections and complex design details can be displayed exactly. As a result, unexpected price surcharges due to possible additional expenses can be virtually eliminated", explains Lanz. In this context the easy visualization is of further help which is why the Sioplan AG designs, for example, complicated corners solely in 3-D. This allows for a thorough as well as quick examination of the design's function and its visual effect by the respective architect. Thus, all these factors lead to a higher planning security that is of inestimable value to the customer.

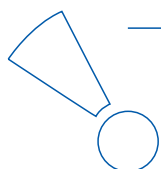
### **Increase in efficiency because of most modern CAD**

A further indispensable characteristic of HiCAD consists, according to the Sioplan AG, in the complete integration of the various industry solutions. Because today most designs are composed of different ma-

terials, they can contain numerous sheet metal and steel engineering elements as well as several beam systems. "Hence, a complete solution is very sensible, particularly since the individual industry solutions of HiCAD are very well developed", states Sioplan's designer and concludes further: "The cross-sectoral modeling as provided by the ISD Group, is a condition for us when it comes to metal engineering." It leads to an increase in efficiency that can also be observed in further functions of the CAD system. Many beams and connections, for example, that needed to be created manually before, can now be imported from corresponding libraries into the design via the LogiKal interface. Additionally, the possibility of part referencing results in an enormous reduction of the amount of work.

### **Aiming at tolerance**

In the scope of the redesign of the entry area of the health resort "kneipp hof" in Dussnang in 2009, the Sioplan AG was charged with the implementation planning of the projecting roof, which required a highly efficient working method. First of all it was necessary to remodel the existing building in HiCAD. Thus, in contrast to the 2-D, the 3-D visualization ensured that the error rate of the later design was reduced to virtually zero. The model then enabled the company to decide that the basic steel construction should be attached to the building with its back part, whereas its front part should be supported by stanchions. But while the Sioplan AG was entrusted with the design of the steel substructure another company was responsible for the add-on construction. This led to one of the biggest challenges of the project. Because both designs were created simultaneously, it was impossible to measure the add-on construction beforehand. Thus, including tolerances was of fundamental importance to the entire project. "Since the compatibility of both designs could have been controlled only a week before the assembly we would not have had



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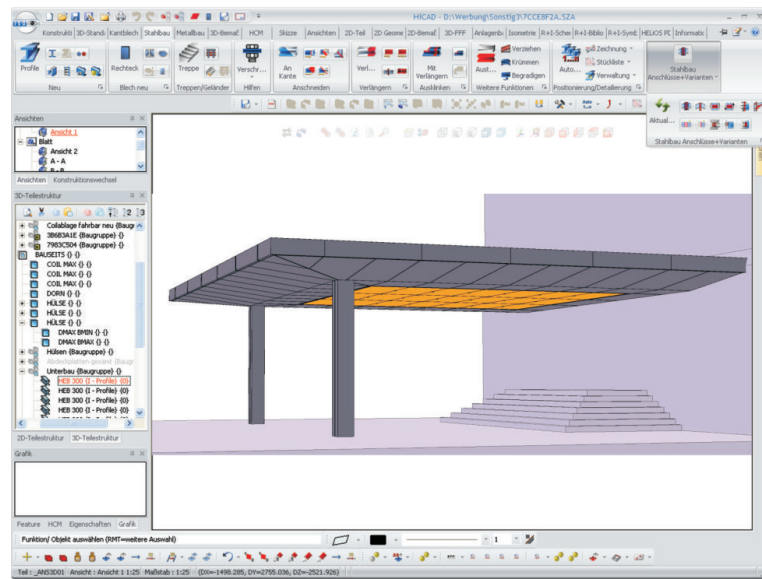
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sufficient time for the realization of alterations”, remembers Benjamin Lanz. This is why the substructure was, for example, connected to the steel beams in order to obtain equalization in the horizontal plane. Exactly this principle was also applied to the point fixings for the glass. By means of threaded beams they should be adjustable in their height approx. 50 mm because the cambered steel beams would subside about this size only theoretically. Therefore all contingencies had to be taken into account.

### Most modern tools facilitate enclosure

Eventually the entire steel design was enclosed with aluminium sheets. Because the cladding should lie in the field of vision, it was absolutely indispensable to ensure a uniform joint pattern. Working with HiCAD was therefore a huge advantage: “The 3-D visualization facilitated the design of the corner plates to a great extent because thus, it was much easier to model the respective intersections of the sheets”, explains Sioplan's designer. Further, it could not only directly be defined which approach would be the best to use for a specific task, its eventual visual effect could immediately be controlled as well. By means of the 3-D it could also be easily detected which flanges needed to be lengthened or cut out and how open spots in the design of the corner plates could be avoided the most efficiently. In addition to that the automatic positioning of the single sheets proved to be very helpful because a huge amount of sheets as well as various sheet types were employed in the enclosure. As it already became apparent in the description of the design of the corner plates, the project “kneipp hof” partly required very complicated sheet metal blanks. Due to the automatization they could be easily created in HiCAD at the push of a button and be forwarded to the executing metal engineering company as a DXF file.



### Glass ceiling with obstacles

Another challenge was the glass ceiling that should be integrated into the middle of the projecting roof and be illuminated from above by LEDs. Its design needed to provide the opportunity to change the single strips, to which the lights were affixed to, at any time. Therefore every single sheet had to be removable separately. Additionally the substructure was designed in a way that allowed the LED strips to be extended for a technical maintenance. Thus, even the greatest obstacles could be overcome easily and efficiently with the necessary know-how and a CAD system which optimally supports the user.

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