



TEKLA® Structures

FOR **PRECAST CONCRETE
MANUFACTURERS**



TEKLA STRUCTURES IN PRACTICE:

**OLTMANN &
PARTNER**

www.oltmanns-gmbh.de





TEKLA Structures

"IT ALL FITS TOGETHER!"

TEKLA STRUCTURES – A POWERFUL PLANNING TOOL

> Tekla Corporation is a leading international software company whose innovative software solutions have made customers' core businesses more effective for over 40 years. Commitment towards long-term product development has made Tekla the market-leader, offering the building industry Tekla Structures software, which encompasses specialized configurations for structural engineers, steel detailers and fabricators, precast concrete detailers and manufacturers, as well as contractors.

> TEKLA STRUCTURES AND ITS BUILT IN LIBRARY OF OVER 200 POWERFUL SYSTEM COMPONENTS MEANT THAT THE PLANNING PROCESS RAN VERY SMOOTHLY

ALL IN ONE MODEL

> Tekla is determined to increase the competitiveness of the precast concrete sector. Tekla Structures software is the first real parametric 3D building information modeling (BIM) solution for precast concrete detailers and manufacturers. It is the solution that integrates the entire workflow from sales and conceptual design to manufacture, erection and beyond. Innovative tools provide you with the ability to design and create an intelligent building model of any size or complexity and to coordinate different materials with ease and precision. The 3D model contains all the information required for different phases of a project. Oltmanns & Partner GmbH in Oldenburg, Germany, used Tekla Structures for project planning.

OLTMANN'S & PARTNER

> Oltmanns & Partner is a company with a long tradition. Founded in 1973, the change to Limited Liability status (a 'GmbH' company in German) took place in 1991. One of the four directors and partners is Hans-Georg Oltmanns, an approved quality engineer in the field of structural analysis. Oltmanns & Partner GmbH employs around 20 people and is a full-service provider, offering services in the fields of structural planning (statics), formwork and reinforcement planning, as well as solid construction. The latter also includes planning services covering heating/ventilation/sanitary installation, through the integration of external resources.

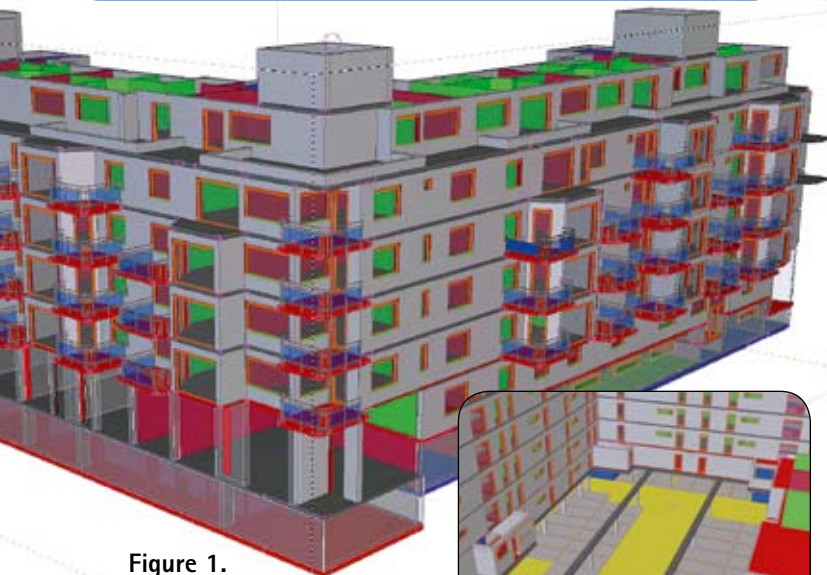


Figure 1.

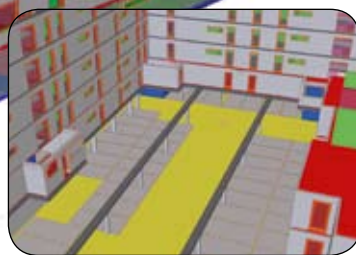


Figure 2.

INTEGRATED APPROACH TO PLANNING

> Mr. Oltmanns points out that it is this integrated approach to planning that enables the various planning disciplines to achieve the desired degree of close cooperation – in other words, "it all fits together"! This is achieved, not least, because of the exceptional data compatibility of Tekla Structures software. Tekla consistently seeks to perfect what is known as building information modeling (BIM) technology, a new IT technology, which provides for an unrestricted exchange of data in the planning process, as well as complete IT control of the overall process from the 'first stroke of the pen' right through to handover of the building.

PLANNING A COMPLEX RESIDENTIAL AND COMMERCIAL BUILDING

> The project presented here is a complex residential and commercial building called "Kommendör-kaptenen" that was to be built in Malmö, Sweden. Planning of the building covered the period from October 2005 to January 2006. Figure 1 shows an isometric view of the 3D computer model generated using Tekla Structures. The building is of an overall concrete and masonry structure. It comprises 24,665 cubic meters of enclosed space and accommodates, amongst other facilities, approximately 100 residential units. The design engineer at Oltmanns & Partner pointed out that the combination of the 3D functionality of Tekla Structures and its built in library of over 200 powerful system components meant that the planning process ran very smoothly. One example of this is the designing of the underground garage, where it was possible to achieve the required optimization between parking spaces and design features in a very simple and efficient manner. The result is shown in Figure 2.

INTELLIGENT CUSTOM COMPONENTS

> For special frequently recurring details, which could not be resolved using one of the system components provided in the system component library, the designers opted for the facility (provided by the component editor) to generate an 'intelligent custom component'. This was employed for a joining of the exterior and interior spaces, including window edging. Because Tekla Structures allows any structural drawing to be generated at any point from the ongoing 3D structural model, or even from portions of the model, designers can use this method to check that the design detail they have just created is structurally correct.

This is what is happening in the case of the self-generated custom component described above, as shown by the detailed drawing in Figure 3. The section generation functionality of Tekla Structures means that it is also easy to generate any required sections. Figure 4 is a section through the element shown in Figure 3. The reduction of time-consuming detailed work is a fundamental consideration in the



Figure 3.

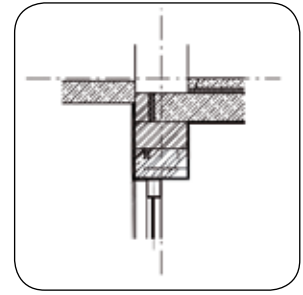


Figure 4.

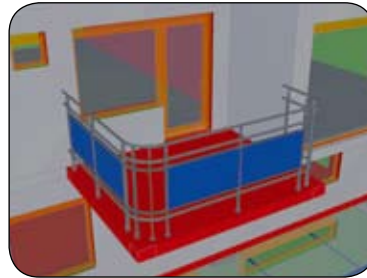


Figure 5.

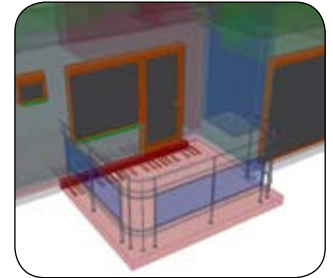


Figure 6.

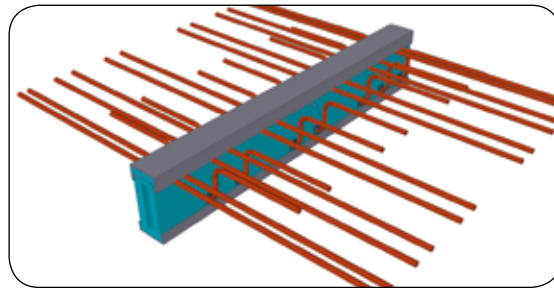


Figure 7.

creation of pioneering computer software. This aspect has been developed with exceptional consistency in the Tekla Structures software, as can be illustrated by yet another example. The siting of a balcony, umpteenth times, in a wide variety of locations on a building, involves a lot of detailed work – but not in this project!

Again, this was achieved by creating an intelligent custom component, which – once created – can be used over and over again, and can be automatically (!) adapted to the conditions in a wide variety of locations. Figure 5 is an overall view of this complex structural assembly.

COORDINATION OF DIFFERENT MATERIALS

> Figure 6 shows the balcony in a semi-transparent view, illustrating the capability offered by Tekla Structures to design in different materials. This structure includes steel, wood and glass, as well as other materials.

The thermal separation of the building is achieved by means of a Schöck isolating frame, shown as a single element in Figure 7, and shown bound into the concrete bed in Figure 8. Figure 9 shows the corresponding drawing, 'Schöck isolating frame, reinforcing mesh', the generation of this drawing being based entirely on the designer's own choices.

TEKLA STRUCTURES – INTELLIGENT 3D MODELING

ADD-ON ELEMENTS

> Although the catalogues of Tekla Structures offer a large number of ready-to-use concrete sections and other pre-cast parts (e.g. stairs, see Figure 10), the software also includes tools for inputting any structural elements into the system's internal catalogues (databases). This was what happened in the case of the granite panels provided on the façade, shown in dark grey in Figure 11 or again in red on the canted edge beam in Figure 12. Once these elements have been entered in the database, they become a permanent component and can be used as often as required, like any other element. Their geometrical parameters can then be entered, with intelligent adaptation of their characteristics, including automatic adjustment for modifications.

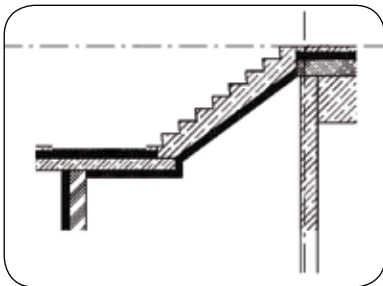


Figure 10.

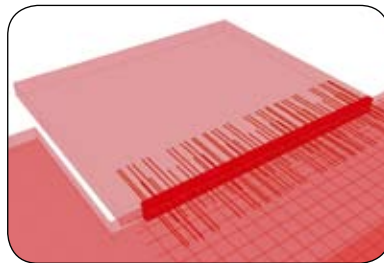


Figure 8.

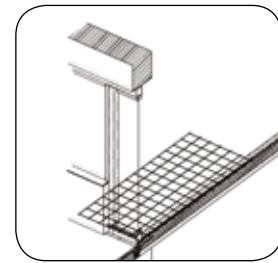


Figure 9.

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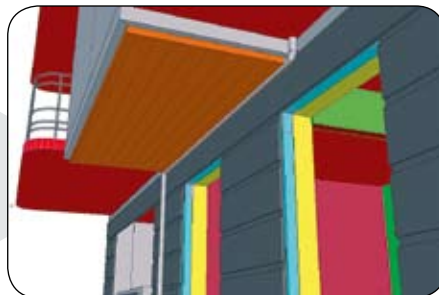


Figure 11.

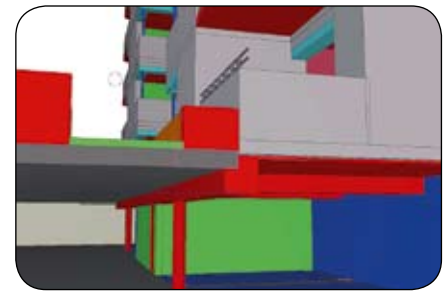


Figure 12.

OUTSTANDING VISUALIZATION

> Oltmanns & Partner GmbH stresses that, without a high-performance system such as Tekla Structures, the planning could not have been accomplished in the relatively short time span. In particular, the outstanding visualization capability of Tekla Structures, which enables modifications to be visualized immediately in virtually true-to-life form, allows the planner to effortlessly try out different variants in order to achieve an optimized final result. Figure 13 (cover) shows the south-east view of the architect's drawing – the close match between this drawing and the generated model (Figure 1) is quite clear. The construction phase of the building has begun, and completion is planned for mid-2007. Oltmanns & Partner GmbH currently have 4 licenses of Tekla Structures software for construction, and are considering increasing the number of licenses.

Check your local Tekla contact from:

www.tekla.com