Wide range of PERI system solutions used during construction of the Calgary Cancer Centre

Calgary Cancer Centre (CCC), Calgary/Canada

The building of the Calgary Cancer Centre, a state-of-the-art cancer treatment and research centre, is not only the largest construction project currently being carried out in the province of Alberta in Canada, it is also the largest construction project PERI has ever taken on with regard to the volume of material on site. The use of 14 different perfectly coordinated PERI system solutions has made it possible to realise the complex design of the centre in an efficient manner.

By order of the government of Alberta, a hospital, a day care centre and a state-of-the-art research laboratory are being constructed on an area covering a total of 185,000 m². The aim is to offer patients groundbreaking cancer treatment and patient and family-centred care at the premises of the Foothills Medical Centre when the facility opens in 2023. This vision is symbolised by the highly unusual shape of the building: A child and an adult embracing each other and breathing as one. Once the project is complete, which is scheduled for November 2022, the building will consist of 18 storeys, 5 of them below ground level and 13 above ground.

A complex formwork and scaffolding solution from a single source

For the construction work, the customer is relying entirely on tried-and-tested PERI system solutions: Engineers from PERI developed plans to combine 14 different system solutions which have been tailored to meet on-site requirements. In addition to the most complex SKYTABLE structure ever executed and a state-of-the-art VARIOKIT VRB solution, a total of more than 15,000 m² of slab formwork, 4,000 m² of wall formwork, extensive scaffolding material and more than 12,000 MULTIPROP and 9,000 PEP props will be used over the course of the project. In a world first, TRIO TRS 120 columns will be used on the construction site. These columns will be used alongside the TRS 90 columns, enabling the construction company to meet column size requirements.

PERI GmbH
Formwork Scaffolding Engineering

Contact person
Tanja Häuptle
Tel. +49 (0) 7309 950 1173
Fax +49 (0) 7309 951 1173
Tanja.haeuptle@peri.de

https://www.peri.com/en/company/press.html

Atypical building structure with varying storey heights

The first stage of the build, which was completed in June 2019, comprised the construction of the five-storey underground garage, which covers a total area of around 100,000 m^2 and consists of a total concrete volume of 68,000 m^3. The characteristic feature of the parking area is its complex structure with storey heights that range from 3.5 m to 7 m. The PERI engineers used SKYDECK slab formwork to achieve this. The lightweight components allowed the site personnel to conserve energy during the construction process. At the same time, it was possible to keep shuttering times to a minimum. The drophead system facilitated early striking, meaning that elements could be removed after a comparatively short period of time and re-used for other concreting sections.

For the above-ground section of the building, over 400 assembly and overview drawings have been produced in collaboration with the client in order to develop the most complex SKYTABLE project structure ever implemented: A total of 247 slab tables consisting of 218 different designs are being used for the Calgary Cancer Centre construction project. On account of the limited assembly space on site, these are being pre-assembled and delivered just-in-time. They will then be connected to the pre-assembled girders on site.

Just like the planning phase, the design of the VRB solutions is one of the many challenges posed by this project. A total of 36 22 m-long VRB girders will be assembled to form 18 truss girder packages with platform units. The cantilever begins on level 4 and extends from the building by around 9 m to enable casting of the slab above. By carrying out structural calculations, it is possible to prevent system overload caused by tensile, compressive and bending forces, meaning that another challenge could be successfully overcome.

BIM – creating reality from virtual reality

The planning phase of this enormous project was time-consuming: For about a year, PERI engineers worked meticulously to establish the optimum approach to coordination, implementation and logistics to maximise the efficiency of the construction site procedures. With the aid of BIM (BIM = Building Information Modelling), a 3D model was created. In this way, the individual assembly steps, particularly with regard to the VRB solution, can be presented to the construction workers in a visual and comprehensible manner. It is also possible to use the 3D model to calculate the optimal area covered by the VRB truss girder packages during disassembly at the constricted construction site. The team can also make use of the 4D timetable, an additional tool that provides support with sequence

PERI GmbH
Formwork Scaffolding Engineering

Contact person
Tanja Häuptle
Tel. +49 (0) 7309 950 1173
Fax +49 (0) 7309 951 1173
Tanja.haeuptle@peri.de

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planning at the construction site and clarifies the assembly and disassembly processes for the VRB truss girder packages.



Image 1
A total of 14 different, perfectly coordinated PERI system solutions are in use at the construction site of the Calgary Cancer Centre, providing support to the construction workers on site.
(Photo: PERI GmbH)



Image 2
The different storey heights, ranging from around 4 to 7 m, posed a significant challenge to the planning and design team.
(Photo: PERI GmbH)



Image 3
Over the course of this large project, a total of more than 15,000 m² of slab formwork will be used – including the SKYDECK system for construction of the underground garage.
(Photo: PERI GmbH)



Image 4
In around 400 assembly and overview drawings, 218 different SKYTABLE designs have been created and tailored to the specific requirements of the construction site.
(Photo: PERI GmbH)

PERI GmbH
Formwork Scaffolding Engineering

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Image 5
Due to the sheer size of the slab tables and the restricted space at the construction site, the SKYTABLE slab tables were assembled off site and delivered just-in-time – not only did this cut costs, it also cut down on the amount of space that was required.
(Photo: PERI GmbH)



Image 6
The state-of-the-art VRB solution can be found at two locations on the construction site and is the culmination of the planning phase carried out conjointly by PERI and PCL Construction.
(Photo: PERI GmbH)



Image 7
The VRB heavy-duty truss girders are assembled to create truss girder packages with platform units and extend from the building by around 9 m from level 4 upwards.
(Photo: PERI GmbH)



Image 8
Another achievement: This project marks the first time that TRIO TRS 120 columns have been sold. As such, they have now been used successfully in the field since 2018.
(Photo: PERI GmbH)

Contractor
PCL Construction Management Inc.
Project coordination
PERI Canada

PERI GmbH
Formwork Scaffolding Engineering

Contact person
Tanja Häuptle
Tel. +49 (0) 7309 950 1173
Fax +49 (0) 7309 951 1173
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