


# CONCRETE CONNECTIONS

2/2016



## DELTABEAM® SLIM FLOOR STRUCTURE

BENEFITS FOR ALL STAKEHOLDERS

IN FOCUS: PAGES 12-21

### ARMATA

- THE FIRST REBAR PUNCHING  
PREVENTION SYSTEM  
IN NORTH AMERICA

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COLIFT MOUNTING  
SYSTEM ENSURING  
FAST AND EASY  
ASSEMBLY

PAGE 4

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**ON THE COVER:**

Peikko's DELTABEAM® Slim Floor Structure was used in the shopping centre Valkea in Oulu, Finland. This issue of Concrete Connections features our DELTABEAM® Slim Floor Structure, read more on pages 12-21.

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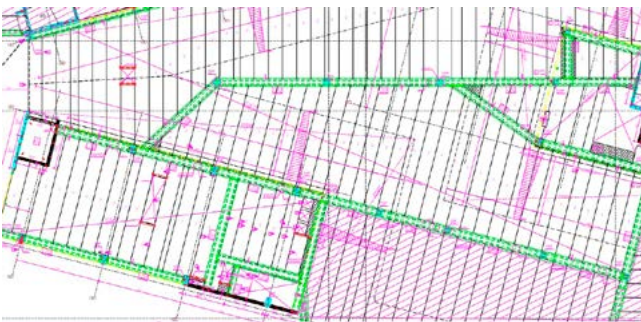


# DELTABEAM®

## - 25 YEARS OF BOOSTING FLEXIBILITY AND PRODUCTIVITY OF PRE-FABRICATED CONSTRUCTION

This autumn, I had a chance to visit a building site where nothing was really square. I was visiting the campus of a university, and the construction of the complex was based on a concept that had won an architectural competition. At this point, I guess, all structural designers have stopped reading this editorial, or at least are raising their eyebrows. Architectural competitions typically offer difficult, if not impossible, challenges for structural designers.

**Y**et this building was being constructed by using a precast building method, a method which typically limits architectural freedom. Why were typical hollow-core floor elements used there? Because the use of Peikko's DELTABEAM® Slim Floor Structure enabled the use of precast also in this building:



Peikko Group continues its work to boost prefabricated construction sector, also by developing its DELTABEAM® applications. You can read more about our DELTABEAM® projects and concepts on pages 12-21.

We also continue to co-operate with precast companies, both by participating in international associations of hollow-core manufacturers like IPHA, and by co-operating with various construction sector companies around the world.

In our view, pre-fabrication and an efficient use of 3D modeling are the key drivers of improved productivity in building sites.

We also believe that the 25 years' history DELTABEAM® has with over 10,000 global references, is a good proof that Peikko's solutions can make a real difference. ■

Sincerely,

Topi Paananen  
CEO, Peikko Group Corp.  
[topi.paananen@peikko.com](mailto:topi.paananen@peikko.com)

# COLIFT ENSURING FAST AND EASY ASSEMBLY

## OF THE LOGISTICS FACILITY FOR AUDI

Car manufacturing giant Audi is expanding production capacity in its logistics and goods transport center in Ingolstadt, Germany, by adding a two-story logistics building known as Hall B. The building has around 30,000 square meters of floor space and two truck lifts, and a construction period of only a few months is envisaged.

Text: Heike Laue



COLIFT Mounting System.

The multi-million-euro project will be taken into use in early 2017 after construction began at the end of December 2015. Around 800 employees will supply parts for rear axles and cockpit modules to Audi's production facilities next door. Peikko's CE-marked COLIFT Mounting System is being used for rapid and safe installation of precast

columns. pbb Planung + Projektsteuerung GmbH was commissioned by the investor and owner, IFG Ingolstadt, to conceive and design this sophisticated building.

"For this building, we produced extremely large parts – up to 100 tons," says **Christian Lehmeier**, Site Manager of the construction company, Klebl



The COLIFT mounting shaft is inserted into the column.



COLIFT is suitable for precast elements up to 120 tons.



The huge precast columns were erected within an hour with COLIFT.

GmbH. Klebl built Hall T in 2013 on the same site with column connections by Peikko. Today, the CE-marked COLIFT Mounting System is being used to mount all heavy rod-shaped precast concrete elements at Klebl. **Matthias Wölfel**, Sales Engineer at Peikko Germany explains, "Some of the precast columns for Hall B have column connections at about 22 meters and a total height of 30 meters. The main beams weigh up to 87 tons. The demands on the capacity and safety of the lifting systems are correspondingly high." In addition to COLIFT, more than 1,500 Column Shoes and Anchor Bolts were used, as well as Installation Templates and Anchor Plates.

## LOAD CAPACITIES UP TO 120 TONS

Four assembly crews, each equipped with a COLIFT Mounting System, installed the precast columns for the new building. COLIFT enables easy and time-saving mounting of rod-shaped precast concrete elements, such as columns. It consists of a mounting shaft with a slip guard and a rope strut and serves as a mounting device for lifting, moving and erecting precast concrete elements of up to 120 tons. Peikko offers four different mounting shafts from 1.20 to 2.00 meters in length and the corresponding slip guards (frogs) to match the precast elements. Rope struts are available and approved for all four types of mounting shaft in three different sizes from 625 to 1,800 mm. Thus a suitable COLIFT Mounting System is available for each load to be transported.

## COLIFT MOUNTING SYSTEM FACTS

- CE-marked, manufactured under strict quality control
- Standardized mounting system for many load levels
- 5.8 to 42 tons with 30 cm corbel
- 15.8 to 120 tons without corbels
- Complete system
- Minimum need for maintenance





Adjusting the columns is fast and easy with Peikko's bolted column connections.



The mounting device is removed by remote triggering and ready for the next column.

## COLUMN ERECTION WITHIN AN HOUR

As the construction site offers little storage space, Klebl organized delivery of precast elements "just in time", so the columns had to be mounted immediately. On average, the full assembly of each column with COLIFT, from unloading the truck up to the final grouting, was executed within an hour. The mounting system is easy to use and requires little maintenance. To lift a concrete element, the COLIFT mounting shaft and rope strut are attached onto the load cables of the crane and the assembly shaft is inserted into the precast element. Then the slip guard is attached and the concrete element can be lifted and transported. As soon as it is adjusted and fixed into its final position, the slip guard is detached by remote triggering and the mounting shaft removed. This makes for easy and secure mounting of concrete elements using the CE-marked COLIFT. The positive customer feedback Peikko receives shows how well the system proves itself in everyday use. Site Manager Christian Lehmeier on COLIFT: "The system is easy to use and simplifies our work tremendously."

## PEIKKO'S COLUMN CONNECTIONS IN HALL T

During 2013, Peikko's solutions had proven themselves effective in the construction of the adjacent building, Hall T, which was also designed by pbb. Thanks to the use of column

connections in the precast elements, the 70,000-square-meter, two-story Hall T was built in just nine months. The frame construction is stiffened by multiple fire walls and the shafts of three impressive truck lifts. The precast elements were manufactured in the plant and connected on-site. Due to wide spans and tremendous loads, the dimensions of the columns were required to be up to 100/90 cm. To connect the columns to their foundations efficiently, the structural designers chose column connections by Peikko.

The precast elements are delivered "just in time" and equipped with Column Shoes and Anchor Bolts (image) for a fast connection.



"Peikko's Column Shoes and Anchor Bolts do not just securely connect a column to its foundation – two or more columns can also be connected, one above the other. This enables the length and weight of the items to be reduced to transportable dimensions while meeting all architectural and structural demands," **Ottmar Walter** of Peikko Germany explains.

Thanks to efficient organization of the construction process by Klebl, the COLIFT Mounting System has contributed to the fact that the assembly of Hall B is also completely on schedule. ■



© Sami Karppinen

## NEW-GENERATION BIOPRODUCT MILL BUILT WITH **NEW-GENERATION BOLTED CONNECTIONS**

Text: Reeta Paakkinen

In late 2017, a new bioproduct mill will start operating in Äänekoski, Central Finland. Peikko's new COPRA Anchoring Couplers and BECO Beam Shoes are being used for the first time in the construction of Metsä Fibre's new mill, which is the largest investment in the history of Finnish forest industry.



**M**etsä Fibre's mill at Äänekoski is the first next-generation bioproduct mill in the world.

In addition to high-quality pulp, it will produce a broad range of bioproducts, such as tall oil, turpentine, lignin products, bioelectricity and wood fuel. The concrete element manufacturer of the project is Parma Oy and constructor Jari Kupiainen Oy. Design of the mill was done by Sweco.

The mill, which is the largest investment in the history of forest industry in Finland, totalling EUR 1.2 billion, is expected to be up-and-running by the third quarter of 2017. It will replace part of the existing mill in an area totalling 40 hectares and have an annual pulp production capacity of 1.3 million tonnes. The mill is expected to create more than 2,500 jobs throughout the value chain in Finland. Of these jobs some 1,500 are new vacancies, which will provide a much-needed boost for the local economy.

## NEW MILL, NEW BOLTED CONNECTIONS

The Äänekoski mill is the first project where Peikko's new products BECO Beam Shoe and COPRA Anchoring Coupler have been used. Representing a new generation of bolted connections, the BECO Beam Shoe and COPRA Anchoring Coupler simplify heavy industrial structures where extra stiffening is



needed. BECO-COPRA is all about rapid on-site installation that swiftly creates a moment-resisting connection between precast columns and beams.

Following erection on a corbel, the beam is connected to COPRA Anchoring Couplers using threaded bars and nuts included in the delivery. COPRA anchors the axial forces from the beam shoe to the precast column. Designed to carry tensile forces, the BECO-COPRA connection provides full load transfer capacity as soon as the nuts are tight.

Vertical reactions of the beam are usually transferred to the column through separate supporting systems such as steel or concrete corbels. Non-shrink grout transfers compression from beam to column. Hidden PCs Corbel connections can also be used in large cross sections for aesthetic reasons.

**Jukka Honkavuori**, who oversaw the project at Parma Oy, noted installation of the premises using COPRA Anchoring Couplers and BECO Beam Shoes went smoothly at Äänekoski.



© Sami Karppinen



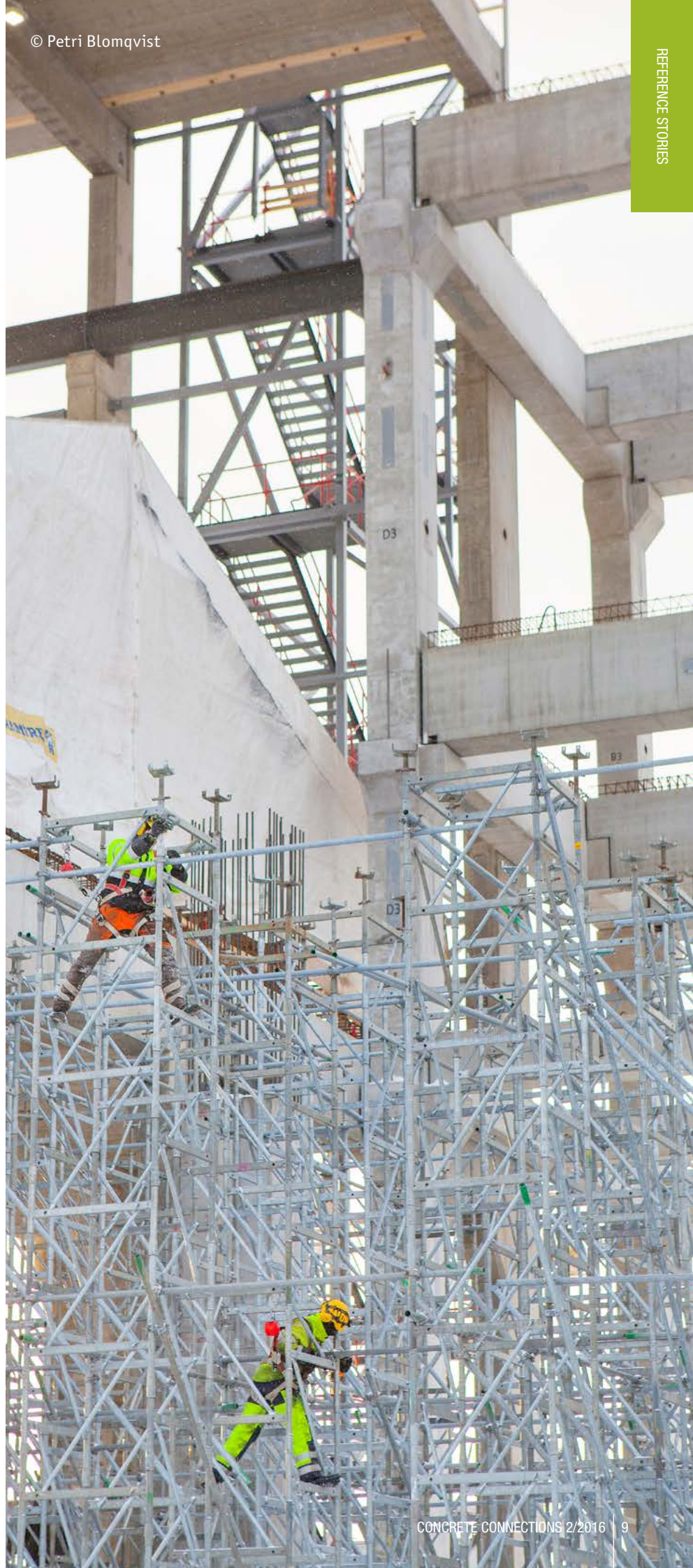
© Petri Blomqvist

"Use of Peikko's new products was relatively easy, and we would use the product again of course," Honkavuori commented. "There were some challenges in the reinforcement process and we had to re-arrange the rebars inside the cross-section," Honkavuori added.

**Jari Kupiainen**, whose company constructed the Äänekoski factory, agreed. "For us the project is a routine one, which has progressed just fine although some of the elements are sizeable. Cooperation with all parties has been really good actually and we would, of course, happily work together on further projects in the future," Kupiainen said.

**Petri Suur-Askola**, Business Director of Concrete Connections at Peikko Group, noted the new products are also safer to transport. "This new product comes with fewer risks of getting damaged during transport or assembly. COPRA Anchoring Couplers have no protruding threads, so fewer parts can be broken. The same BECO Beam Shoe is used in all corners of the beam, compared to old system where left and right were different," he said.

"In my opinion, the customer made a right decision when choosing BECO-COPRA system even though it is a brand new product. It is great that Peikko has succeeded in developing a connection where user benefits are visible already from illustrations. The Äänekoski project is an ideal reference for Peikko," Suur-Askola concluded. ■



# CONCRETE CONNECTIONS

## IN THE KINGDOM OF SAUDI ARABIA

Text: Anu Rousku

What is the most important aspect of a business relationship? Many would name TRUST. When Mr. Mikael Karlsson, Executive General Manager of AlRashid Abetong Company (ARA), describes the business relationship between his company and Peikko, he immediately acknowledges that there is TRUST.

**P**eikko Group's subsidiary in Saudi-Arabia is a joint venture established in 2008 and formed between Peikko Group Corporation and Rashed Abdul Rahman Al Rashed & Sons Group, a dynamic, local leading trading and industrial conglomerate. The joint venture consists of two sales offices in the Middle East: Al Rashed Peikko LLC in Dammam, Saudi Arabia, and Peikko Gulf LLC in Ras Al Khaimah, United Arab Emirates, which also has an on-site production unit.

ARA, a Saudi-Swedish Company, was established in 1977 and has grown rapidly to become one of the largest and most successful precast concrete companies in Saudi Arabia. The company has a full range of precast concrete products. Appropriate buildings are created in close cooperation with the customers from the initial contact until the project is completed.

ARA has five large factories located in Riyadh and one in Jizan. Its main office is in Riyadh and it has two branch offices

in Jeddah and Al Khobar. ARA's projects include all kinds of precast construction projects ranging from housing projects and enormous shopping malls to universities and hospitals. Regardless of what ARA constructs, it uses Peikko's products. Why is that?

### FASTER

The business history of ARA and Peikko began in 2008, and the two companies currently have an exceptional way of collaborating. Most of the Peikko products used by ARA are custom-made. They are manufactured in the United Arab Emirates, and kept in constant stock in Saudi Arabia. These products represent most of Peikko's product range such as column shoes, anchor bolts, and fastening and lifting items. Based on the sales quantity agreements made annually, Peikko is able to perform accurate production planning and optimise its stock balance. Over the course of the

business relationship, ARA has even replaced some of its own designs with Peikko's products; column shoes being a good example.

This stock-based collaboration mode has many advantages to both parties: of course deliveries are fast, which creates competitive advantages, production capacity is easily controlled and sales are secured. The products are standardized according to ARA requirements, and do not need a separate approval for each project. "It is important to have a reliable supplier that is able to deliver in time, like Peikko" says **Mikael Karlsson**.

ARA and Peikko have professionally collaborated in construction of various projects. The reference list is impressive and includes projects such as the construction of Ministry of Higher Education headquarters in Riyadh - the first governmental smart building in Saudi Arabia, the King Khalid University in Al Abha, and an 800 housing villa project in Jubail, to name just a few.

ARA and Peikko have professionally collaborated in construction of various projects. The reference list is impressive and includes projects such as the construction of Ministry of Higher Education headquarters in Riyadh - the first governmental smart building in Saudi Arabia, the King Khalid University in Al Abha, and an 800 housing villa project in Jubail, to name just a few.





## EASIER

The designs of the ARA projects are made by its own design team, but ARA nevertheless highly appreciates the technical support and availability that Peikko provides. ARA's Technical Manager, **Håkan Johansson**, finds that Peikko team is always prepared to come up with solutions for different customer needs. Furthermore, Johansson also highly appreciates the production flexibility. **Vijay Sankaran**, Purchase Manager at ARA, agrees: "Peikko is a professional supplier able to meet our standards and delivery terms. Quality, a professional approach and price competitiveness are the cornerstones of our collaboration."

On the construction site, the use of Peikko products proceeds smoothly. The ease of use is important as the local construction team traditionally has members from different backgrounds, nationalities and language bases. Peikko solutions are easily adopted, even over language barriers.

"It is important to have a reliable supplier that is able to deliver in time, like Peikko", Mikael Karlsson says.



## MORE RELIABLE

Mikael Karlsson has watched the development over the years, and is very satisfied with the current business relationship. According to Karlsson, the fundamentals of this relationship are mutual trust, open-mindedness and productive discussions – even through harsh times and during both ups and downs, the openness of the relation has remained. Both companies know each other's situation and are able freely to discuss and support each other – just as good old friends do it.

However, business is not only about good talks and easy-to-use products. High quality counts – in the Middle Eastern market several product approvals are often required for projects, and the standards for these products are very strict. Alterations are not easily accepted and can often cause delays. And when delays are involved, this costs money.

The Quality & Safety Manager at ARA, **Abdulrazzak Kuraizem**, notes that the high quality of products is one of the reasons ARA prefers Peikko to other suppliers. He also highlights Peikko's professional working approach and fast input in terms of technical support and documentary needs.

## DRIVE FOR MORE

However, ARA is obviously not the only party satisfied with this mutual business partnership. **Paulius Bulota**, Managing Director of Al Rashed Peikko LLC, views ARA as more of a partner than simply a customer. Besides being professional and committed, he also describes ARA as demanding: a company with

requirements that drives Peikko to better serve them. At the same time, Bulota is extremely satisfied that ARA believes in Peikko's products and expertise. It is important for Peikko to have ARA's trust and see it reflected in their daily behaviour and communication in terms of sharing, asking and committing. "It is invaluable for us to see that our partner appreciates our opinions and expertise, and to be confident that we can contribute by helping them overcome their challenges", Bulota adds.

Moreover, Bulota notes that customer satisfaction is one of the key factors for a successful long-term business relationship. Peikko's goal is not only to satisfy its customers, but also to exceed customer expectations – particularly in terms of deliveries, solutions, development and technical support, as well as in other areas.

## LIKE FATHER, LIKE SON

The roots of Peikko trace back in 1965 in Finland. It all started with few experts in their field – young fellows visiting customers and listening to them in order to find new solutions to make their building process faster, easier and more reliable. Now, just as before, Mikael Karlsson thanks Peikko for still being on site instead of simply at the office and for listening to customers – even though the importance of listening can never be emphasized enough. When Karlsson is asked to describe Peikko in three words, he answers without hesitation: KNOWLEDGE IN PRECAST. Maybe some things – in fact the most important ones – have not changed much since 1965 after all. ■

# DELTABEAM® SLIM FLOOR STRUCTURE BENEFITS FOR ALL STAKEHOLDERS

Text: Timo Vennonen

The DELTABEAM® Slim Floor Structure allows you to build open spaces – even with architecturally demanding shapes. Compatible with precast and cast-in-situ slabs as well as all types of column, DELTABEAM® makes your construction process faster and more efficient.

## WHAT IS A SLIM-FLOOR STRUCTURE?

The heart of a Slim-Floor Structure is DELTABEAM®, a load-bearing steel beam with a delta-shaped cross section and web holes for casting. It enables slender and light structural solutions for savings in volume and costs, and can be connected to concrete, steel or composite columns with Peikko's innovative PCs Corbels, Anchor Bolts or WELDA® Anchoring Plates.

DELTABEAM® is compatible with various slab types, such as hollow-core, filigran, composite steel decking, trapezoidal steel decking and cast-in-situ concrete slabs. It can also be supplied installed as a turn-key DELTABEAM® frame solution.

The possibility to add formwork with customized shapes to the beams adds to the architectural possibilities, while still staying within the design brief that demands an efficient building, both during the building phase and in everyday use.





## DELTABEAM® BENEFITS FOR INVESTORS, ARCHITECTS, STRUCTURAL DESIGNERS AND CONTRACTORS

With 25 years on the market, the DELTABEAM® Slim Floor Structure has proven itself in thousands of projects. Let's take a look what it can do for you:

1.

It allows for a shallower floor structure than with competing solutions. From the investor's point of view, it means that more floors can be built for a given building height. Or alternatively, more room height can be specified. Either way, DELTABEAM® makes for a more profitable building for the investor.



2.

For the architect, a DELTABEAM® Slim Floor Structure means more architectural freedom and wide open, flexible spaces thanks to its maximum frame grid of 12 x 12 meters or 8 x 16 meters – something that will surely please investors, too.

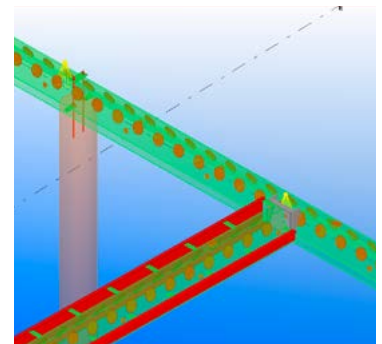
The possibility to add formwork with customized shapes to the beams adds to the architectural possibilities, while still staying within the design brief that demands an efficient building, both during the building phase and in everyday use.



3.

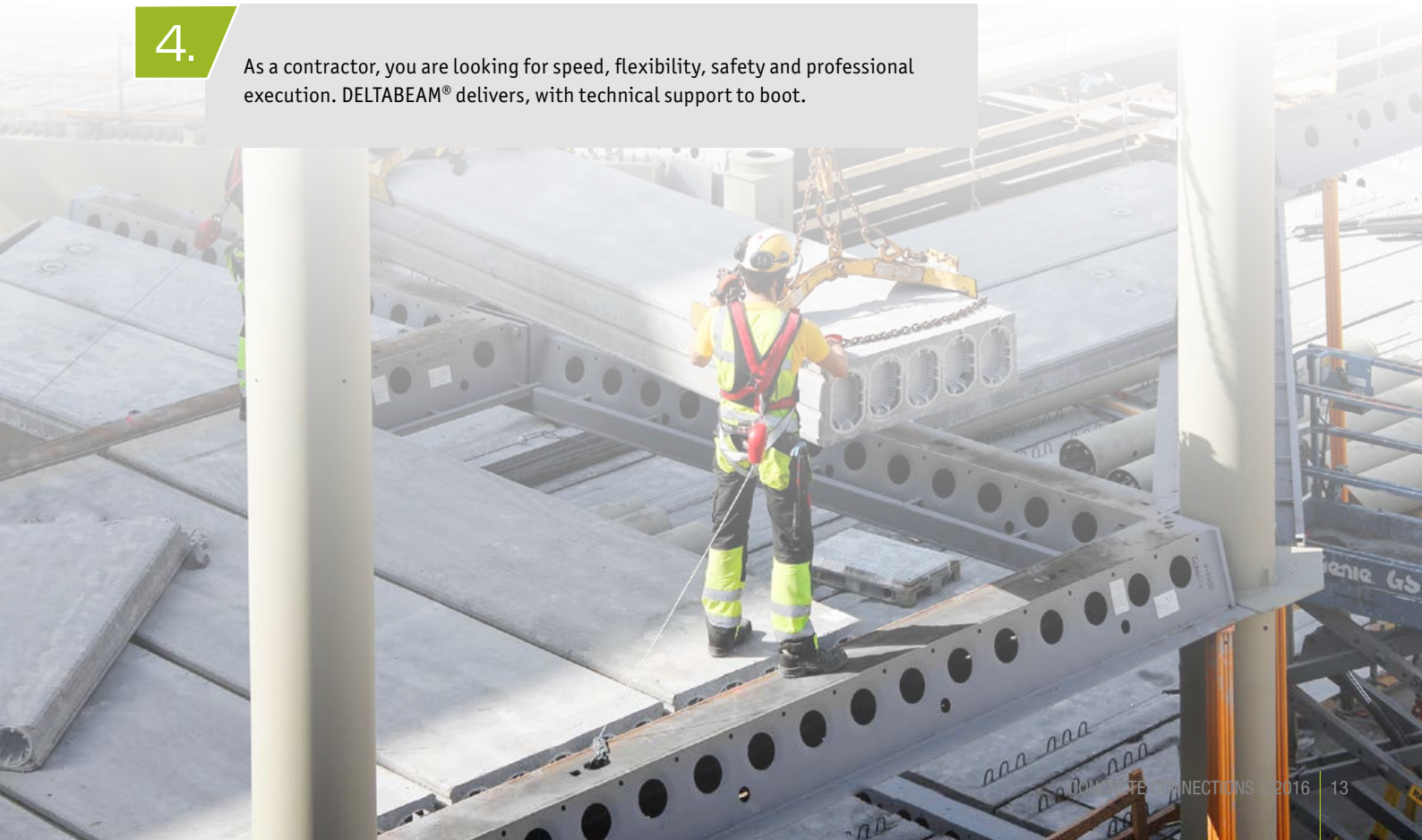
DELTABEAM® relieves the pressure on the structural designer from the architect and the contractor. The architect wants to make sure that architectonic ideas do not get diluted in the structural design phase. The investor and the contractor are keen to see designs that are fast and economical to construct.

With DELTABEAM®, the structural designer can keep everyone happy, while tapping into Peikko's design tools, support, integral fire-proofing and long experience in building with precast. The size of the project is not a limiting factor as the longest and heaviest beams to date have been 23 meters long.



4.

As a contractor, you are looking for speed, flexibility, safety and professional execution. DELTABEAM® delivers, with technical support to boot.





© Fraport AG

## “WHY ON EARTH HAVEN’T I BEEN TOLD ABOUT THIS PRODUCT BEFORE?”

That’s exactly what many FinnBuild trade show visitors said back in 1990 on seeing the DELTABEAM® prototypes. **Christian Gerke**, the Managing Director of Peikko Deutschland GmbH, can relate to the story even today.

“The building market tends to be pretty conservative and new products gain traction slowly. But once you get the DELTABEAM® message across, the response is more or less the same as it was back in the day in Finland. From the German

perspective, flexibility in design, low overall weight of the structure, in-built fire protection and, of course, the overall savings are among the top benefits,” Gerke says.

The Squire was a project that really got DELTABEAM® going in Germany. A bold architectonic statement built over the Frankfurt AirRail terminal, the 660-meter structure was completed in 2011 with 11 kilometers of DELTABEAM® inside. “Because of its slim-floor structure, DELTABEAM® allowed one additional floor to be built, while still keeping the same total height of the building,” adds Christian Gerke. ■



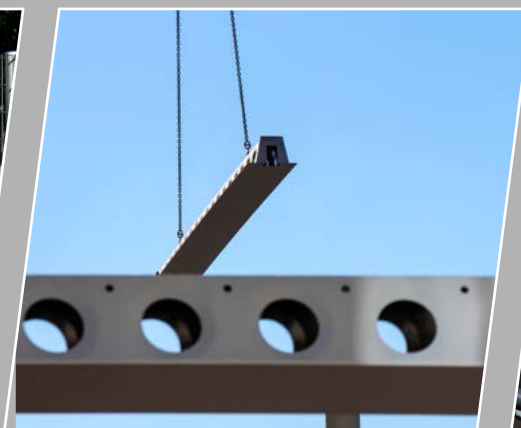
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## DELTABEAM ON SITE

EASY TO STORE IN PILES



EASY TO LIFT AND MOVE WITH ORDINARY LIFTING EQUIPMENT



EASY, FAST AND SAFE TO INSTALL



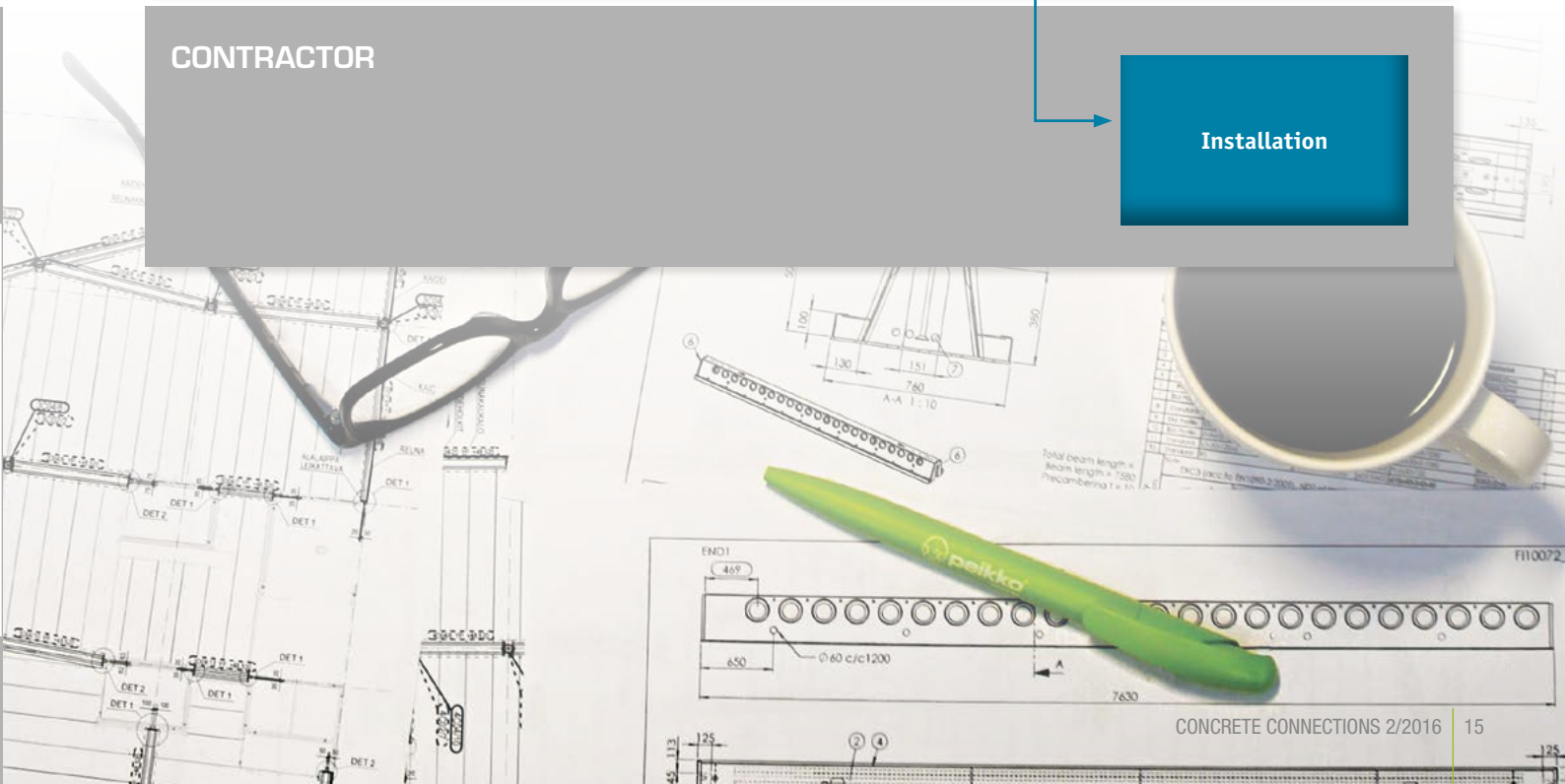
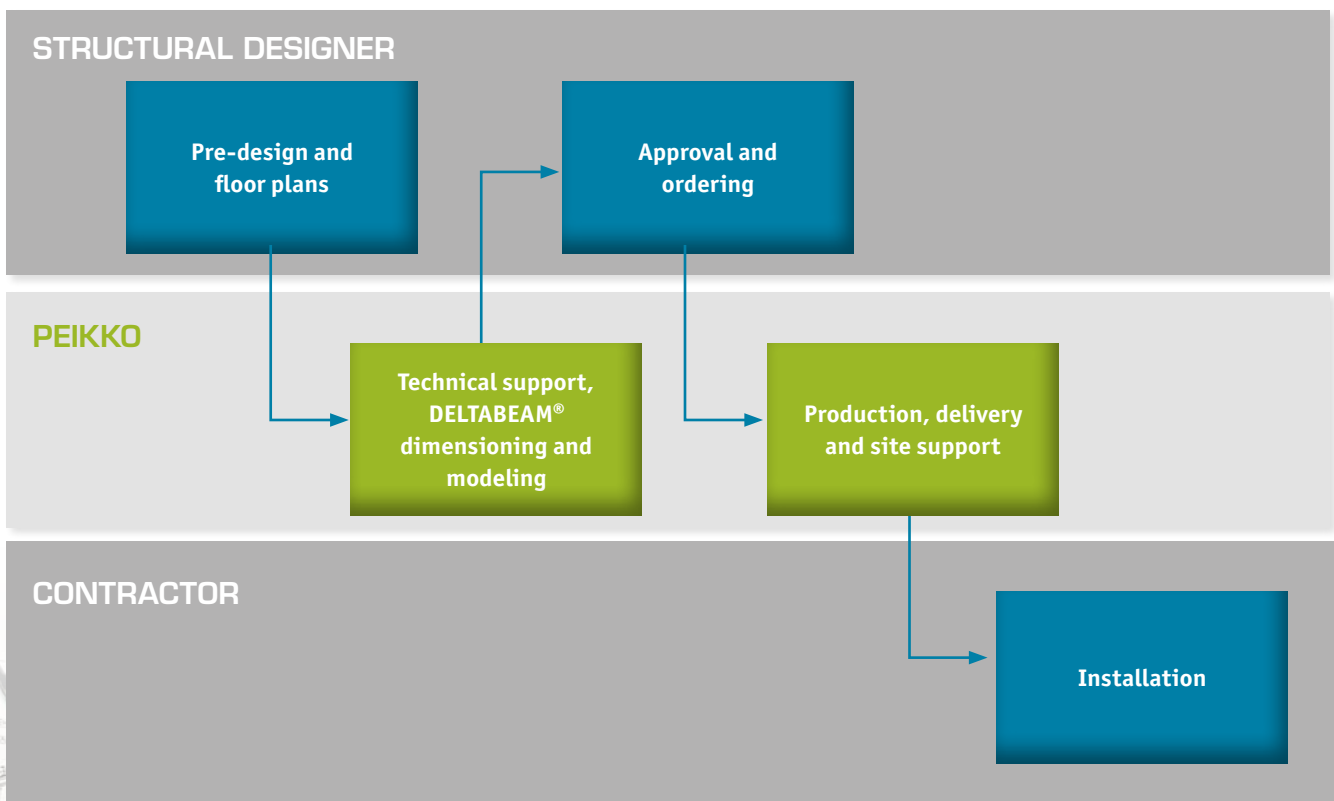


# FULL DESIGN SERVICE BY PEIKKO

The DELTABEAM® Slim Floor Structure always includes a full design service by Peikko – structural design calculations, structural drawings of the beams and instructions for connection detailing – to be approved by you.

Peikko offers software tools and design components for fast, optimized structural designs. All downloads are free – all you need to do is provide your contact details. You will then receive download links by email. This helps us to develop our service and send you information on updates.

Peikko supports you in all phases of design and installation. This is what the process looks like.





# THE NEW CHILDREN'S HOSPITAL NEEDED SPACE AND FLEXIBILITY

– THE DELTABEAM® FRAME DELIVERED

HEALTH  
CARE  
PROJECT

Focusing on the care of severely ill children from all over Finland, the new children's hospital in Helsinki aims to be the best possible hospital for children and their carers.

"Modern hospitals require a fair amount of space below the floor slab for demanding technical installations. The composite structure formed by the DELTABEAM® frame and a solid slab was the slimmest precast type solution for this building. It is comparable to an in-situ structure, but also offers flexibility in the layout, which is required in the patient rooms on floors 4 to 8," states **Olli Aho**, Design Manager at SRV Construction Ltd.

The building will have a basement and 8 stories and a total floor area of 50,000 m<sup>2</sup>. The basement and floors 1 to 3 will be made in-situ. The frame for floors 4 to 8 will be made using a DELTABEAM® frame solution combined with solid slabs.

The order included 4.7 kilometers of DELTABEAM® Composite Beams and around 530 tons of Composite Columns and other steel structures. The deliveries began in November 2015 and ended in summer 2016. ■

## PROJECT FACTS

**Developer:** Kiinteistö Oy Uusi Lastensairaala

**Architect:** Sarc Architects Ltd and Architect Group Reino Koivula Inc.

**Structural design:** Ramboll Finland Oy

**Contractor:** SRV Construction Ltd

**Project size:** 50,000 m<sup>2</sup>

© Arkkitehtitoimisto SARC Oy





# DELTABEAM® FRAME SHINES IN QUEBEC RESIDENTIAL DEVELOPMENT

RESIDENTIAL  
BUILDING  
PROJECT

Fast construction and flexible design were the key requirements in the Luxembourg project.

“Our primary objective was to have a system that would go up quickly,” explains **Jean-Simon Généreux**, Project Manager for the project builder Logisbourg. “With the DELTABEAM® frame, we were able to build at a rate of one floor, or 12,000 square feet, (1,189 m<sup>2</sup>), every 3 to 4 days,” says Mr. Généreux.

The Luxembourg project comprises 148 apartment units divided into three buildings.

## CHALLENGES SOLVED BY SLIM-FLOOR STRUCTURE AND LONG SPANS

“Peikko solved many of our design challenges,” explains Claude Fugère of Fugère architecte. “The first was floor depth as we were limited in height and needed a shallow floor assembly. Thanks to DELTABEAM®, we were able to work with a 10” (250 mm) slab and beam assembly with a typical bay size of 26’ x 36’ (8 x 11 m).”

The long spans allowed for 4 parking places between each column while the slim-floor structure enables minimum building height.

“Another challenge was column size,” says Mr. Fugère. “To minimize the impact on our interiors, we wanted the smallest possible fire-rated columns. Peikko Composite Columns varied in size from Ø 16” (400 mm) to 11” (273 mm), making them smaller than concrete columns or dry walled steel columns.”

As with any multi-family residential project, the balconies also posed a challenge. Logisbourg was looking for large balconies that would cantilever outside of the building so the tenants would have a full 180-degree view. The DELTABEAM® frame was able to accommodate all the developer’s requests by utilizing a T-shaped solid prestressed slab.

## PEIKKO PRODUCTS WIDELY IN USE

Logisbourg has used the DELTABEAM® frame in all three phases of the Luxembourg development. Other Peikko products include SUMO Wall Shoes, Column Shoes and PCs Corbels. Additionally, Logisbourg has several other DELTABEAM®-framed projects. ■

## PROJECT FACTS

**Developer:** Logisbourg  
**Architect:** Fugère Architectes  
**Structural design:** Équipe  
**Constructor:** Logisbourg & Pelco  
**Project Size:** 90,000 ft<sup>2</sup> / 8,400 m<sup>2</sup>





# BOND STREET OSD FRAME TO WITHSTAND FORCES OF A TWO 10-TON GANTRY CRANES

The Bond Street Over Site Development (OSD) is a 6-story retail and residential structure, which is a part of the new underground station currently being built at Bond Street in central London.

During the construction of the new station, the OSD will act as a crane hall for the tunnelling operations and contain a two 10-ton gantry cranes. Due to the forces involved, a conventional precast frame solution was not possible.

“The challenge our design team had was to deal with the very high forces in the frame, while still being able to build the structure within the Design for Manufacture and Assembly (DFMA) philosophy of the joint venture partner

Laing O’Rourke. All parties worked closely together to resolve a very complex design,” says **John Metcalfe**, the managing director of Peikko UK.

To make a moment-stiff precast frame, a DELTABEAM® slim-floor structure was used along with Peikko encast Fastening Plates. Peikko’s delivery also included Column Shoes and Anchor Bolts. Additionally, the slim-floor structure enabled optimised floor space. ■

RETAIL  
BUILDING  
PROJECT

RESIDENTIAL  
BUILDING  
PROJECT

## PROJECT FACTS

**Developer:** CoLOR (Costain Laing O’Rourke Joint Venture)

**Architect:** Fletcher Priest Architects

**Structural design:** Halcrow Atkins JV

**Contractor:** Expanded

**Project size:** Approx 1,400 m<sup>2</sup>

**Planned completion:** 2019





OPP KALVEBOD BRYGGE

# “INVISIBLE” STRUCTURE GIVES ARCHITECTURAL FREEDOM

OFFICE  
BUILDING  
PROJECT

Images: Arkitema Architects

A visual landmark at the entrance to central Copenhagen, OPP Kalvebod Brygge is a new office complex that will house various Danish public agencies by fall 2018.

The building will be divided by a green ramp cutting through it on the first floor. “The area under the ramp would have been hard to solve in a satisfying way with traditional, prefabricated concrete beams,” says **Torben Lodberg** of Arkitema Architects.

“We wanted a smooth and straight ceiling with no recesses for technical installations. That’s why an invisible beam solution that is integrated in the floor was the way to go. Because the overall height of the floor structure is low, we can also reduce the height of the whole building and increase its energy efficiency as the lower façade also means lower heat transmission.”

Even though Arkitema was not able to influence the choice of construction systems or products, the architects wanted to safeguard their design.

“From the architectural point of view, we are happy with DELTABEAM®. It gives a large degree of freedom in the interior design and optimizes the overall height, not only in the parking areas but also in the office area,” Lodberg notes. ■



## PROJECT FACTS:

**Project:** OPP Kalvebod Brygge  
**Contractor:** A. Enggaard  
**Architect:** Arkitema Architects  
**Structural engineering:** MOE Engineers  
**Project size:** 43,000 m<sup>2</sup> office area and 19,000 m<sup>2</sup> of parking





## SERIOUS BOOST FOR DELTABEAM® PRODUCTION CAPACITY

With the highest DELTABEAM® order book ever, Peikko is investing EUR 9 million into a new DELTABEAM® factory.

Using the best practices and accumulated know-how from its previous projects, Peikko is building a new DELTABEAM® factory in Kaunas, Lithuania. With a planned production capacity of 250 beams per week, the factory will cover a floor area of 6,000 m<sup>2</sup>. Production is expected to start in September 2017.

In order to meet the high demand for DELTABEAM®s, Peikko will also add project management and 3D modeling resources in Lithuania.

“Lithuania is logistically ideally located to effectively serve our current main DELTABEAM® markets in the area around the Baltic Sea. Together with the passion and energy of our team in Peikko Group and Peikko Lithuania, we will create an efficient factory for a much-needed boost in DELTABEAM® production capacity,” says **Andrius Surantas**, Vice President of Operations at Peikko Group.

Peikko’s DELTABEAM® manufacturing processes are based on modern production lines and the latest technologies – most of the manufacturing steps in the factories are automated.

“With its integrated product design and information sharing systems, Peikko can be very efficient and stand above its competitors,” states Surantas.

Peikko Finland's production in Lahti, Finland.





## SLIM-FLOOR STRUCTURE IS GAINING GROUND

In recent years, DELTABEAM® and Peikko's Slim-Floor Structures have become recognized around the world.

"We have many reasons to believe that 2017 will be our breakthrough year, especially in Australia and South Korea," says **Michal Horak**, Vice President, Asia Pacific (APAC).

With design and R&D support from Europe, Peikko has served the APAC region since 2014 through manufacturing units in the United Arab Emirates and China.

"As an excellent example of a Peikko's international project execution, we are working on a huge project in India. The static frame design is done by Peikko Slovakia and manufacturing and deliveries are entrusted to Peikko UAE," Surantas says. "For deliveries in North America, we have with care chosen contract manufacturing partners who can meet Peikko's high standards."

## RAMPING UP DELTABEAM® PRODUCTION

1990-1991	DELTABEAM® production started, Lahti, Finland
2002	Lahti factory expansion, Finland
2005	Kralova nad Vahom factory, Slovakia
2006	Acquisition of a steel structures factory, Kaunas, Lithuania. Start of composite column manufacturing.
2007-2008	New DELTABEAM® factory, Kralova nad Vahom, Slovakia
2011	DELTABEAM® manufacturing in North America through contract manufacturing
2014	New steel and composite structures factory, Kaunas, Lithuania
2015	Start of DELTABEAM® manufacturing in Peikko's Zhangjiagang factory, China
2016	Start of larger-scale DELTABEAM® manufacturing in Peikko's factory in Ras Al Khaimah, UAE
2017	New DELTABEAM® factory, Kaunas, Lithuania

## PEIKKO STRICTLY ADHERES TO QUALITY REQUIREMENTS

Quality, Environmental and Safety Management Systems	ISO 9001, ISO 14001 and OHSAS 18001
Production in the main production units	ISO 3834-2 and EN 1090-1, 2





## THE FIRST REBAR PUNCHING PREVENTION SYSTEM IN NORTH AMERICA

# ARMATA FOR ADDED STRENGTH AND LOWER COSTS

A welcome change, the ASTM (American Society for Testing and Materials) standard now allows the use of double-headed rebar studs for flat slab punching reinforcement.

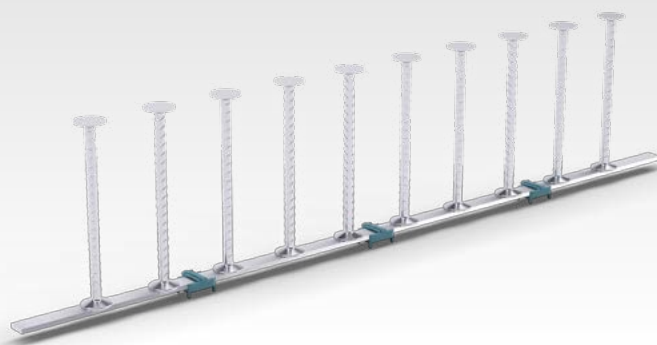
A recent revision of A 1044/A1044M-16a allows the use of double-headed studs produced from deformed bars. Seeing the opportunity to offer our North American customers more strength and lower costs, Peikko is proud to present you with ARMATA, the first punching prevention system utilizing rebar studs.

### WHAT'S NEW?

Before the change, the ASTM standard limited the yield strength of the studs to 51,000 psi and specified a smooth surface bar only. Now that the use of deformed bars is allowed, ARMATA can offer you higher yield strength of 60,000 psi, meaning that punching reinforcement can be designed with a lower number of studs. Rebar also makes for a better bond between the studs and concrete.

### ARMATA BENEFITS

- Higher yield strength of 60,000 psi
- Minimize amount of studs needed
- Better bond



Comparison of the amount of studs needed per column.

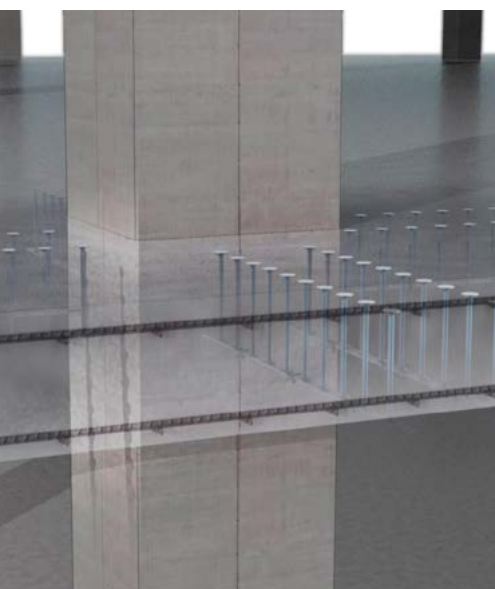
Thickness of the slab	Column dimension	Load			Diameter of the stud	Smooth studs needed	ARMATA studs needed	Difference
		$V_{Ed}$	$M_{u0x}$	$M_{u0y}$				
["]	["]	[kips]	[kip-ft]	[kip-ft]	["]	[pcs]	[pcs]	[pcs]
12	10x25	365	98	50	5/8	96	80	-16
10	14x14	245	30	25	1/2	100	80	-20
15	16x16	458	28	36	3/4	50	40	-10
10	10x10	205	15	22	1/2	80	64	-16
22	14x18	879	98	152	1	50	40	-10

# PEIKKO'S PUNCHING PREVENTION SYSTEMS IN NORTH AMERICA

Used to increase the resistance and ductility of flat slabs, headed studs make for the most efficient reinforcement system against punching shear failures. Peikko has more than 10 years of experience in developing and producing headed studs.

## 2010: DSA DOUBLE-HEADED STUD RAILS BY PEIKKO

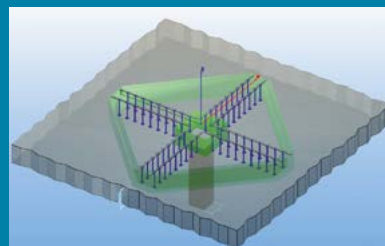
Peikko introduced a double-headed smooth bar stud rail system known as DSA in North America. In comparison with stud rail systems used until then, DSA studs have heads on both ends, flat bar was no longer a structural component of the rail, so structural welds and extensive welding quality inspections were unnecessary. DSA stud rails can be placed either directly on the formwork or hanging from the top reinforcement with no spacers.



## 2016: ARMATA REBAR PUNCHING PREVENTION SYSTEM

For more strength and lower costs, Peikko unveils ARMATA. The new punching prevention system has all the benefits of previous generations as well as higher yield strength, reduced number of studs and better bonding thanks to use of rebar. ■

Coming soon:  
Design ARMATA with Peikko Designer®



Download software at  
[peikko.com/designtools](http://peikko.com/designtools)

# NEW AND UPDATED PEIKKO DESIGN TOOLS

Peikko Design Tools is Peikko's toolbox for structural designers to make their work faster, easier, and more reliable. The toolbox includes design software, 3D components for modeling programs and technical manuals of Peikko's products.

## PEIKKO DESIGNER® COLUMN CONNECTION LINK TO TEKLA

Now it is easy and reliable to export your Peikko Designer® Column Connection design to Tekla:

1. Make your design in Peikko Designer® Column Connection.
2. Click Export Selected Case(s) in Cases Overview window
3. Save file
4. Open plugin in Tekla
5. Select file location in dropdowns and click Apply
6. Click footing and column in your Tekla model, and click two points showing x-direction

You will have Anchor Bolts and Column Shoes with needed supplementary reinforcement and grouting into your model according to design case.

You can have several design cases in one file. The selection of which of the cases is applicable to the model, can be selected in plugin.

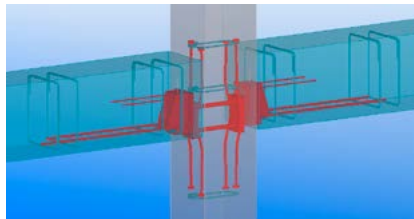
Plugin includes tutorial video.

## FASTENING PLATES ARE NOW ANCHOR PLATES

Peikko has updated product hierarchy and Fastening Plates are now called Anchor Plates. Therefore also Peikko Designer® Fastening Plate and Tekla, Revit and AutoCAD tools will be renamed as Anchor Plates.

## PC BEAM SHOE PLUGIN RELEASED FOR TEKLA

In Tekla you can create connection between concrete column and beam using PCs Corbels and PC Beam Shoes. Peikko offers PC Beam Shoe product plugin and plugins for one- and multi-sided connections. All plugins include needed supplementary reinforcement.

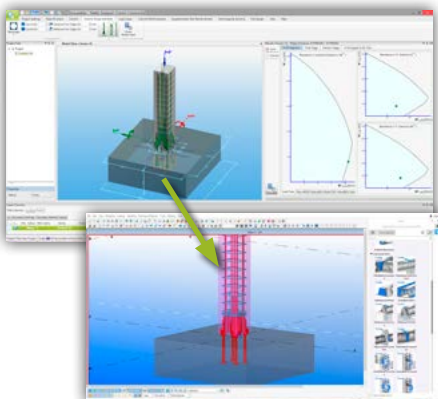


## BECO BEAM SHOES AND COPRA ANCHORING COUPLERS FOR REVIT AND AUTOCAD

Peikko offers BECO Beam Shoes and COPRA Anchoring Couplers as Revit families and AutoCAD blocks. The bolted connection is moment-resisting instantly after the installation.

## THREADED LIFTING SYSTEM JENKA AVAILABLE FOR REVIT AND AUTOCAD

Selection of Peikko's Lifting and Transportation products is renewed with full selection of JENKA Inserts and Lifting Keys. Revit families, and later on AutoCAD blocks, include also needed supplementary reinforcement for different load directions.■



## FREE DESIGN TOOLS TO OPTIMIZE STRUCTURAL DESIGNS

Use our powerful software every day to make your work faster, easier and more reliable. Peikko design tools include design software, 3D components for modeling programs, installation instructions, technical manuals and product approvals of Peikko's products.



Software download center:  
[peikko.com/designtools](http://peikko.com/designtools)



# WELDA<sup>®</sup> ANCHOR PLATE FAMILY EXPANDS

To cover all needs for welded connections even with high loads or large connections WELDA<sup>®</sup> Anchor Plate family will be expanded with new type of anchor plates in spring 2017.

WELDA<sup>®</sup> Anchor Plates make design process of welded connections and installation of anchor plates faster, safer and more efficient  
- in the future also regardless of the size of the connection.

# PEIKKO'S PROJECTS FROM AROUND THE WORLD

**Peikko Sweden** has received a substantial order for the composite frame of a project named ICON situated in Växjö, southern Sweden. The order comprises 5 kilometers of DELTABEAM® Composite Beams and 720 tons of Composite Columns and other steel structures needed in the building's frame. The deliveries start in August 2016 and end in March 2017. Peikko is responsible of the design of the frame elements as well as the total stability of the building.



© SMAQ-ARTEC



**Peikko Austria** has received a substantial order for 3 kilometers of DELTABEAM® Composite Beams to be delivered to a large residential project in Sankt Pölten, some 60 kilometers outside of the Austrian capital Vienna. The order contains also various kinds of concrete connection items. The deliveries are scheduled between April and year-end 2016.

**Peikko Gulf** delivered HPKM® Column Shoes and HPM Anchor Bolts to the Manar Mall in RAK. It is the first and largest shopping mall in Ras Al Khaimah, UAE. Manar Mall is undergoing an expansion of approximately 30,000 m² which will almost double its leasable area. The mall is planned to be completed by the end of 2016.





**Peikko Finland** has received a substantial order for 4.2 kilometers of DELTABEAM® Composite Beams to the D wing extension of Tampere University Hospital. The deliveries have started in April 2016 and will continue until spring 2017. In addition to the beams, Peikko delivers large amounts of connection items to the concrete constructions. The D wing will be taken into use in January 2020.




**Peikko UK** has received a substantial order for delivering concrete flooring solutions to Jaguar Land Rover's new car engine manufacturing plant in Wolverhampton, UK. The new plant currently being constructed alongside the existing plant will double the size of the engine manufacturing premises. Peikko delivers OPTIMAJOINT Free Movement Joints and METAFORM DUO Free Movement Joints for the ground-bearing slabs of the project. Altogether Peikko will deliver several kilometers of floor joints to the project. The new plant is planned to be finished this year.




**Peikko Norway** has received a substantial order for the university extension in Tromsø, Norway. The order comprises 2.4 kilometers of DELTABEAM® Composite Beams. The deliveries are scheduled for autumn 2016. The expansion comprises 19,000 m<sup>2</sup> new space for the School of Medicine and Healthcare.


Find Peikko references at  
[www.peikko.com/references](http://www.peikko.com/references)



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A concretely faster, safer, and more efficient way to design and construct.





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A faster, more efficient, and reliable way of construction means huge gains for all stakeholders.


**Work smarter**  
Dedicated design tools and industrial, easy-to-install components make for a smart construction process.



**Gain reliability and safety**  
Our concrete connections, slim-floor structures, and other solutions are primed to boost the performance of your precast and cast-in-situ projects.

**In focus**

The DELTABEAM® Slim Floor Structure allows you to build open spaces – even with architecturally demanding shapes →




Bolted Column Connections for ease of design and speed of erection, and safety →




**Check out our renewed website**  
**[www.peikko.com](http://www.peikko.com)**

**From the blog**




Peikko's Reinforcement Systems in residential construction →



Peikko's target is to deliver high-quality products and to operate in an environmentally sound way →

**Quality, environment and safety**


**Reference highlight**



Luxemburg 8 & 9, Quebec City, Canada →

**Peikko Design Tools**

With Peikko Design Tools, designing efficient structures is a breeze →



#### Products

Precast Products  
Concrete Floor Products  
Reinforcement Systems  
DELTADEK® Slim Floor Structure  
Orbital Weld Ties  
Bolted Column Connections

#### Applications

Precast Structures  
Cast-In-Situ Structures  
Ground Fixing Concrete Floors  
Bolted Column Connections  
DELTADEK® Slim Floor Structure  
Orbital Weld Ties / Foundations

#### Design Tools

#### References

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