

CONNECTIONS

Peikko guides you towards a faster, safer, and more sustainable way to design and build.

2*2022

Wood, steel and concrete

– A match made in Peikko



Something about
Circular Economy



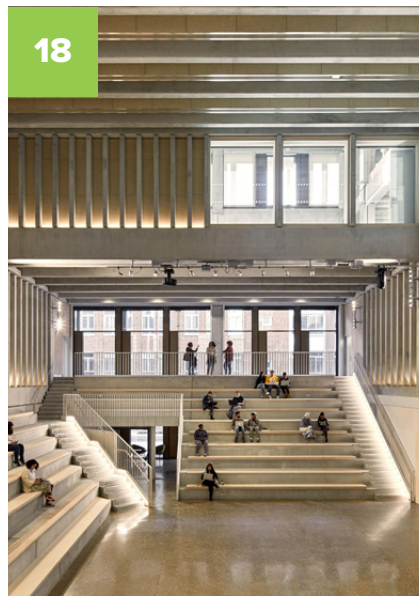
Peikko plays a part in
RIBA prize-winning
**Kingston
University Town
House project**

PEIKKO
**WHITE
PAPER**

**Deepen your know-how
– read a White Paper**

We asked the authors why you should

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CONNECTIONS

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OFFSET:

Lehtisepät Oy
ISSN-L 2489-4516
ISSN 2489-4516 (Print)
ISSN 2489-4524 (Online)

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DESIGN:

Peikko Group Corporation

ON THE COVER:

Hybrid construction - combining steel, timber and concrete in the building's frame - opens up new possibilities and enables optimal outcomes. Read more on page 4.



The war in Ukraine – Unexpected situations require agile operations

The Russian aggression in Ukraine in 2022 has sparked many changes that impact the construction industry and Peikko as well.

Firstly, there are the rising costs of energy and the associated inflation. How can we decrease price volatility – the increase and decrease of the prices of our products? How can we ensure price stability for our customers? How can we secure the availability of our products?

We need to work on concrete things, things that we can influence. A prime example of this are the solar panels which we have installed on our factory roofs over the last 12 months in Germany, Slovakia, and Lithuania to counter the rising electricity costs. We have also ensured that factories can function even with energy shortages.

Secondly, the rising costs of logistics impact the supply chains.

To be on top of this, a number of things have been done. We have shifted some manufacturing from Asia to Europe and started new manufacturing facilities in

the UK. We have invested in production technologies to make sure that almost all of our products can be manufactured at more than one site – the best way to cut the logistics costs and to improve availability is to make the products as close to you as possible.

Thirdly, the rise of defence and energy related investments mean that we need to develop new competences and technologies. Peikko is already involved in many of these projects as we speak. We are ready to innovate together.

A new era has begun. We are doing our very best to adjust to the changed market requirements as fast as possible.

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Wood, steel and concrete – A match made in Peikko

PUUCO® Timber Connections is Peikko's new product family for connecting wood-and-concrete hybrid structures. Four out of five of the new PUUCO® products – a beam shoe, a column shoe, a corbel and a wall shoe – are based on existing Peikko solutions. The product family also includes a wood-concrete composite slab connector, which is a novelty in Peikko's product portfolio.

An industry forerunner, it is in Peikko's DNA to develop new and improved solutions that make connection technology safer, faster and more efficient. Hybrid structures are rapidly growing in size and popularity. To offer a complete ecosystem of products that support each other, it was time to create a new range of standardized connections that enable connecting timber and concrete in large and heavy structures, seamlessly and reliably.

CORRECT CONNECTIONS SUPPORT THE DELTABEAM® ECOSYSTEM

The idea of hybrid connections emerged in Austria ten years ago, when a Peikko

customer expressed their wish to use DELTABEAM® Composite Beam in a wooden hybrid structure. Responding to the customers' challenges is our way of operating. As we are always happy to find new ways to use our existing solutions, a seed was sown then and there.

"We have a great solution in DELTABEAM® and want it to have an ecosystem for all kinds of building materials. Choosing DELTABEAM® Frame should never depend on not having the correct, high-quality connections. After 50 years in the business, we were confident we would find the right solutions for connecting timber and concrete with steel." – says **Petri Suur-Askola**, Business Director for Connections.

MEET PUUCO® TIMBER CONNECTIONS FAMILY

The hard work is now bearing fruit, as we are ready to introduce the new connections family for wood-and-concrete structures – PUUCO® timber connections. The product family members, RAMCO® Corbel, FORCO® Beam Shoe, TICCO® Wall Shoe and ROOCO® Column Shoe, are based on our existing, tried and trusted products – PCs® Corbel, PC® Beam Shoe, SUMO® Wall Shoe and HPKM® Column Shoe.

In addition, we are presenting a completely new kind of solution in our product portfolio, the NILCO® Wood-Concrete Composite Slab Connector, which is a successful adaptation for composite slabs based on a solution the timber industry has used for a long time.

STANDARDIZED CONNECTIONS ARE BENEFICIAL TO EVERYONE INVOLVED

In the construction industry, the game is yet to be defined for standardized wood-concrete connections. Peikko is ready to step to the plate with the customers' advantage in mind. "Our goal is to solve the key problems our customers have. For example, the choice of structure with the correct connections has a huge impact on the end-result of a construction project and all the benefits that are accrued over time, such as increasing ROI and reducing CO₂ emissions." – says **Simo Hakkarainen**, Business Director for DELTABEAM® Frame.

"But there's more. For designers, we offer peace of mind through standardized connections, and for the construction site, we enable speed and efficiency – connections must click together seamlessly. End-users get to enjoy safe, efficient and spacious buildings." – Hakkarainen continues. "Standardized connections will also help to speed up the manufacturing of the timber parts of the project." – adds Suur-Askola. With the complete DELTABEAM® ecosystem, everybody wins.

A NEW ERA FOR WOOD-CONCRETE CONSTRUCTION IS BEGINNING

Peikko's references already consist of several projects employing timber slabs in different structures and an educational building concept that is based on using DELTABEAM® Slim Floor Structure with timber slabs.

Launching the PUUCO® product family marks a new, exciting era for wood-concrete construction and new chances for co-operation. Wood, steel and concrete is a match made in Peikko. This is only the beginning.

Get in touch – let's talk PUUCO®! ●



An educational building concept that is based on using DELTABEAM® Slim Floor Structure with timber slabs.



Peikko's references already consist of several projects employing timber slabs in different structures.

DELTABEAM® with timber floors – a winning combination

As the popularity of hybrid structures rapidly increases, more studies on the behavior and benefits of concrete, steel and timber are required. Peikko has initiated a research program on DELTABEAM® Composite Beam with timber floor solutions to gather evidence and to provide reliable information for our customers.

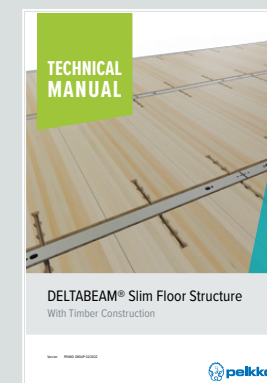
The recently published Peikko White Paper by R&D Engineer, PhD Elena Camnasio from Peikko Group, presents the first phase of the research program that focuses on the load transfer capacity of DELTABEAM® floor joint. Test results confirm that DELTABEAM® can be safely used with both timber and timber composite slabs, and design recommendations are drawn accordingly. Read more in the white paper.



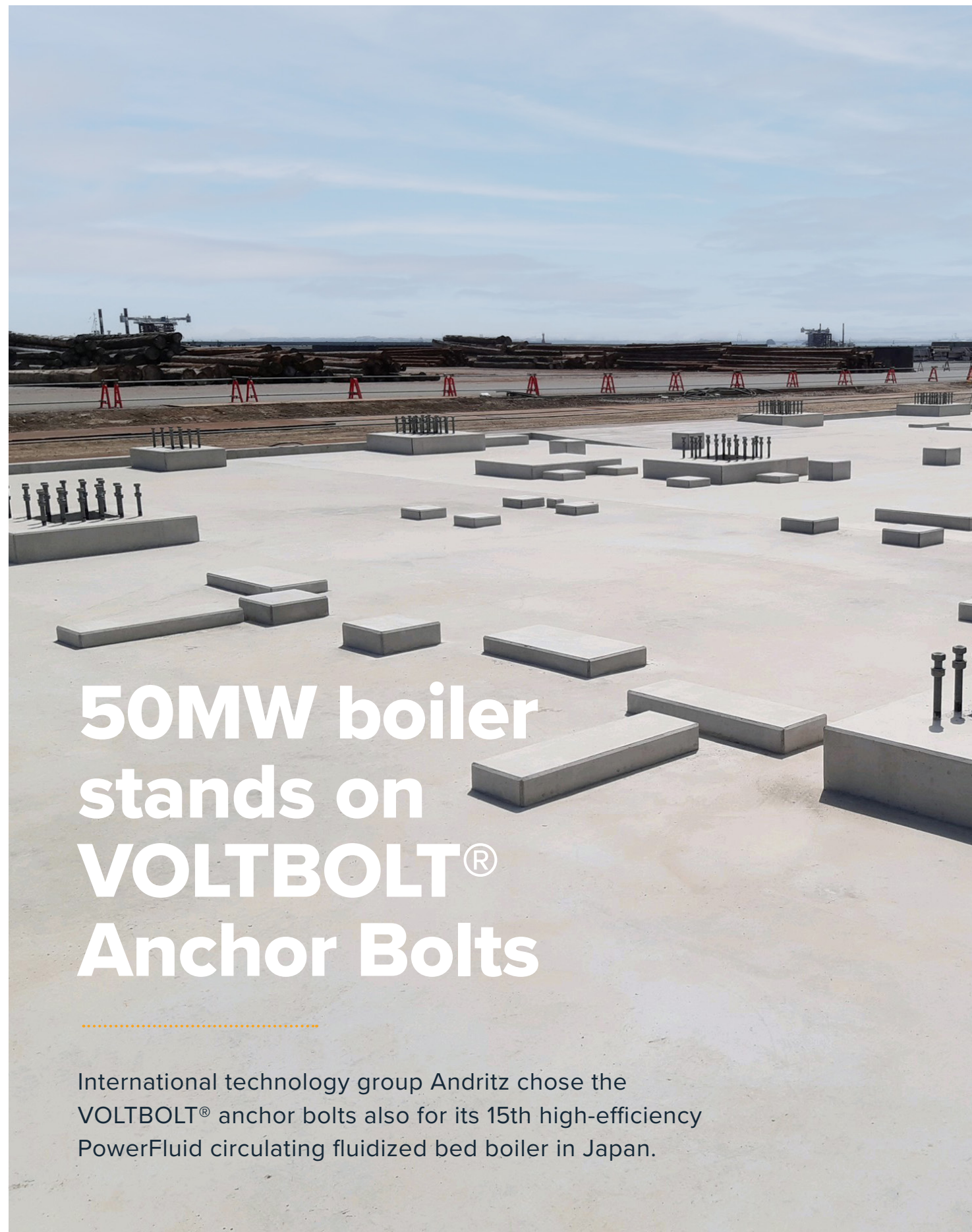
Read the White Paper from peikko.com/whitepapers:

DELTABEAM® Slim Floor Structure with timber construction – technical manual

Published in February 2022, the DELTABEAM® Slim Floor Structure with timber construction technical manual provides a detailed explanation on the many benefits of employing DELTABEAM® Slim Floor Structure in timber construction. From structural behavior to application conditions, recommendations and test results, the technical manual is the hybrid construction extension of the DELTABEAM® Composite Beams Technical Manual. Including the design process and installation instructions, the manual also assists designers and offers inspiration on the possibilities of using DELTABEAM® Slim Floor Structure in timber construction.



Read the manual from peikko.com/whitepapers:



50MW boiler stands on VOLT BOLT® Anchor Bolts

International technology group Andritz chose the VOLT BOLT® anchor bolts also for its 15th high-efficiency PowerFluid circulating fluidized bed boiler in Japan.

Located close to Gobo City, Wakayama prefecture, the structural designers of the Gobo Biomass Power Generation Plant had to take the possibility of earthquakes into account.

– We had quite high seismic loads to the anchors fixing the steel structures to the foundations, Robert Pichler from Andritz Power Boiler division explains.

The space was also limited.
– The lack of space meant that we could not enlarge the base plate as much as we wanted.

Even though there were other technical alternatives, the Andritz team chose VOLT BOLT® already in the early phases of design – as they had already done in the previous 14 boiler projects.

– Having cooperated with Peikko earlier, we knew that VOLT BOLT® would work as it should, the structural engineering manager Pichler says.

HIGH DEMANDS FOR QUALITY

For a project as so far away, Andritz

wanted to use a familiar and trustworthy supplier. The Japanese customer also had very high demands for both quality and documentation.

– We have to offer detailed data of all the suppliers. It's easier when you have a standardised product with the needed certificates like the ETA.

According to Pichler, using a local supplier would have resulted in more work.

– Quality control and inspection would have been much more difficult. With Peikko, we could be certain of the load bearing capacity as well as the geometric tolerances of the cage.

DELIVERY ACCURACY A MUST

The anchor bolts and cages are a crucial part of the foundation. If there is a delay in delivery, the project is going to stand still until the anchoring is finished.

The VOLT BOLT® cages were pre-assembled and delivered as a complete, easy to install package to the site.

– Although Peikko solutions are not the

cheapest, they save time and effort – both of which are valuable. Using standardized products with approvals such as CE and ETA will make your life quite easy. ●

PROJECT FACTS

- Customer: Andritz AG
- Project size: 176 pieces of VOLT BOLT® assembled in 31 anchor cages
- Delivery year: 2022
- Year of completion: 2022



Car parks can be user-friendly

– Our solutions for less columns, more space

We have the solutions for building spacious and user-friendly parking spaces – in a more flexible, sustainable and safer way.

THE FUTURE HAS PARKED ON SAFETY AND SUSTAINABILITY

There's nothing more frustrating than a badly designed car park. With urbanization rapidly growing, we are in dire need of better and bigger parking solutions that fit the needs of various different users.

The solution? Sustainably, well-built multi-story car parks with large numbers of parking spaces – that will stand the test of time without harming the environment.

DELTABEAM® – PERFECT SOLUTION FOR PARKING CONSTRUCTION

So, how do we build these spacious, sustainable car parks? Peikko is a forerunner

in creating solutions for effective and user-friendly parking construction, in an environmentally safe way.

We offer several high-performing product solutions that complement and support a faster, safer, and more efficient construction of parking spaces. Perhaps the most impressive of these are the DELTABEAM® Slim Floor Structures.

DELTABEAM® is a flexible solution tailored for every customer's needs. Enabling slender and light structural solutions, DELTABEAM®'s composite action between steel and concrete makes it perfect for large open spaces – like car parks.

DELTABEAM® can also be combined with all the common slab systems, and it can be

connected to concrete, steel, or composite columns by using Peikko's innovative solutions.

To take sustainability even further, we have also developed DELTABEAM® Green. The slim floor structure, made from over 90 % of recycled materials, has a much lower environmental impact compared to conventional steel structures and it reduces CO₂ emissions by up to 50%.

MAXIMIZE THE OPEN SPACE WITH DELTABEAM® FRAME

To make building open spaces easier and even more effective, Peikko Solutions also include the DELTABEAM® Frame. It consists of the DELTABEAM® composite beams,

ATLANT® composite columns and steel structures. The DELTABEAM® Frame maximizes the available space in two ways.

Number one, the floors are slim, so you'll get more room height or more floors for a given building height. Number two, the solid core ATLANT® composite columns are slimmer than the traditional ones, taking up very little space.

This results in actually creating the very much needed, functional car parks with enough space for everyone to find a parking spot and to easily get in and out of their cars.

PROVED SAVINGS IN PARKING CONSTRUCTION'S SPACE, COSTS, AND SAFETY

DELTABEAM® and DELTABEAM® Green bring savings to parking construction not only in terms of volume and costs, but also in quality and safety.

Cost-effectiveness comes from the best possible floor to usable space ratio. We also focus on meeting the fire protection requirements, reducing maintenance costs, and increasing the safety of users.

Sustainability is achieved with lightweight, effective cross sections that keep the material consumption to a minimum with environmentally friendly composite beams and columns.

Flexibility with Peikko Solutions comes with individually designed architecture, size, facade, and ground plan of the car park.

Easiness of use is one of the most important features of any car park. Peikko Solutions ensures this with the minimum number of slim composite or precast reinforced concrete columns.

MAKING UP MORE SPACE FOR YOUR INVESTMENT

Our parking solutions can be utilized for underground car parks, parking structures on the top of residential buildings and offices, and for parking decks near existing buildings.

Along with DELTABEAM®, we also offer other solutions for fluent parking construction with; SUMO® Wall Shoe, PVL® Connection Loops, PSB® and PSB PLUS® Punching Reinforcements, the PCs® Corbel System for supporting beams, and other anchor lifting and mounting systems.

Peikko invests more in research than the industry average, so we can offer you innovative solutions to make your parking construction process faster, more effective and more environmentally friendly.

That's what we aim to do. To give your parking solutions more space – so you can get more value for your investment. ●

DELTABEAM® installation is easier than ever

At Peikko we also constantly focus on providing better solutions for our customers to increase safety on the building sites.

This past year we launched a campaign to update our technical manuals and DELTABEAM® slim floor installation instructions.

Our goal is to provide instructions with updated graphs and pictures to make the installation process easier to understand – even with a quick glance. Especially during critical phases like lifting, moving and assembling floor units.

INSTALLATION INSTRUCTIONS IN OVER 20 LANGUAGES

Our instructions can be found in PDF format from our website on the DELTABEAM® slim floor solution product page – just click the “on site” tab and scroll down.

Peikko Solutions can be found around the world, so we believe it is a necessity to make our technical documentation available in as many languages as possible.

DELTABEAM® installation instructions have now been translated into over 20 languages and can be easily accessed on building sites by scanning the QR code on the sticker every DELTABEAM® has. The instructions are also included in the DELTABEAM® technical manuals.

After all, improving our customers' safety is always the most important thing on our minds when developing our solutions further.



DELTABEAM® IS THE SOLUTION FOR YOUR PARKING PROBLEMS

- Long spans
- Flexible open space
- Additional room height
- Easy and space-saving HVAC installations
- Integrated fireproofing
- Suitable for all slab and column types

Latest product launches

At Peikko, we are always seeking ways to offer more value for our customers. This year, we have introduced the following new products – for a faster, safer, and more efficient way to design and build.

VOLTBOLT® brings strong anchoring to demanding applications

As an anchor bolt or as heavy structural reinforcement, high-strength VOLTBOLT® steel threaded bar is increasingly popular for standard and more challenging anchoring applications.

VOLTBOLT® brings high load-bearing capacity to new and existing structures in worldwide construction projects. It can be used as an anchor bolt for example to attach steel to concrete, concrete to concrete and steel to masonry, or as a longitudinal or transverse structural reinforcement. Applications include warehouses, halls, bridges, dams, culverts, retaining walls, power plants, and wind turbine foundations.

VOLTBOLT® is readily available with steel grade 8.8 or 10.9, standard diameters of M30 to M60, and lengths up to 11,900 mm, making it ideal for many loading conditions and applications. The standard thread length is 350 mm on each end of the bolt – other thread lengths can be specified.

VOLTBOLT® is preassembled with washers and nuts and in accordance with the relevant standards. Options include plastic thread- and water-protection caps, debonding sleeves, and installation templates.

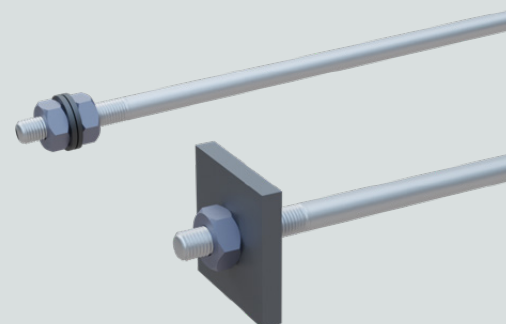
Intended to carry static loads, VOLTBOLT® resists tension, shear, and compression. It can be preloaded to restrict structural movement, to achieve post-tensioning in a structural element, or to apply compression force in a structural



element for repair and strengthening purposes.

Various optional coatings can enhance protection against abrasion, impact, corrosion, and extreme temperatures. Surface treatments include hot-dip galvanizing, zinc ECO galvanizing, Xylan, and epoxy powder. Using coupler nuts, VOLTBOLT® is easily extended.

As with all Peikko products, VOLTBOLT® is designed for fast and safe installation.



PUUCO® – Peikko's timber-based hybrid construction enabler

ROOCO® Column Shoe for glue-laminated timber columns is a modular connection to keep the cross-sections.

TICCO® Wall Shoe connects CLT walls to foundations or to lower floors.

RAMCO® Hidden Corbel enables connecting DELTABEAM® Composite Beam to tall, multi-story columns.

BRAMCO® Beam Shoe is a beam shoe for glue-laminated beams.

NILCO® Wood-Concrete Composite Slab Connector transmits forces between a CLT slab and topping concrete.



WAVEJOINT® smooths the way for vehicles on industrial floors

Peikko's WAVEJOINT® free-movement heavy-duty joint system enables forklifts and other vehicles to move around smoothly and quietly.

WAVEJOINT® a prefabricated, quick-to-install, leave-in-place joint system suitable for large-area construction methods. It suits all ground-bearing and pile-supported flat and super flat concrete floors, including high wheeled traffic and high loading environments.

The system transfers vertical loads between adjacent floor slabs and minimizes vertical displacement of the slabs. Load transfer and resistances are guaranteed for joints with openings of up to 30 mm. It is suitable for slab depths from 100 mm to 300 mm, and for slab sizes of up to 50 by 50 meters.

WAVEJOINT® features 40 mm x 6 mm cold drawn undulating steel rails (flat bars),

which provide extremely durable armoring of the slab arises. These are connected by yieldable plastic bolts, while the rails are fixed into the slab using welded anchors. One of the rails is welded onto the steel divider plate, where the load-transfer dowels are positioned. Rebars on each side are welded to anchors and add further stiffness to the joint.

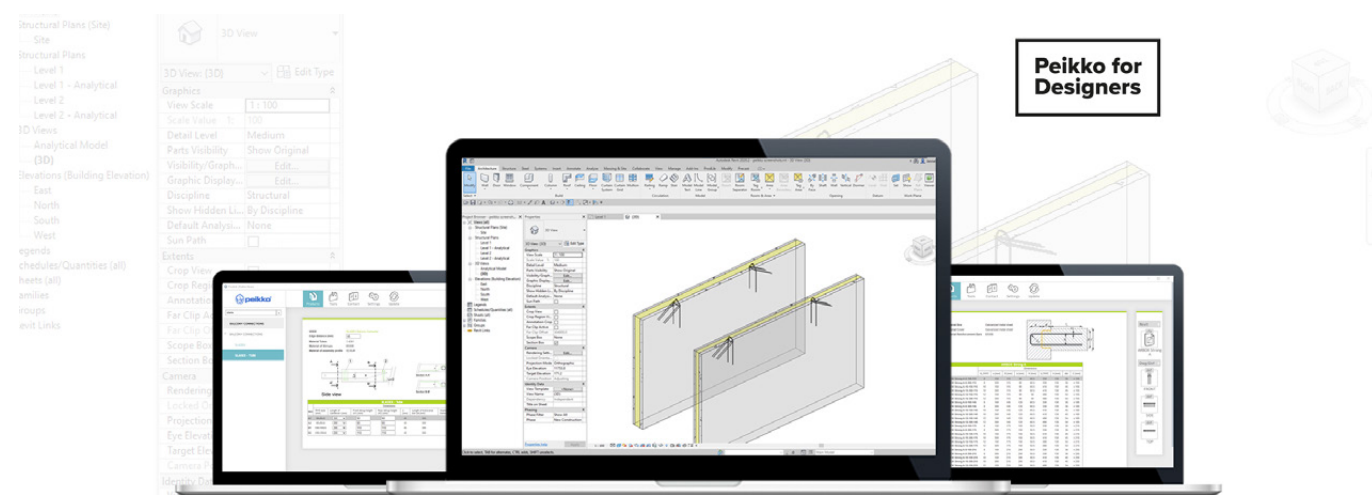
The system is compatible with Peikko TERAJOINT® in terms of slab thicknesses and loads. Project specific load transfer and resistances can be verified by using the free Peikko Designer® Floor Joint tool. All are 100% recyclable.

The product is in 2022 already available in Nordic and Baltic countries.



Peikko for Designers

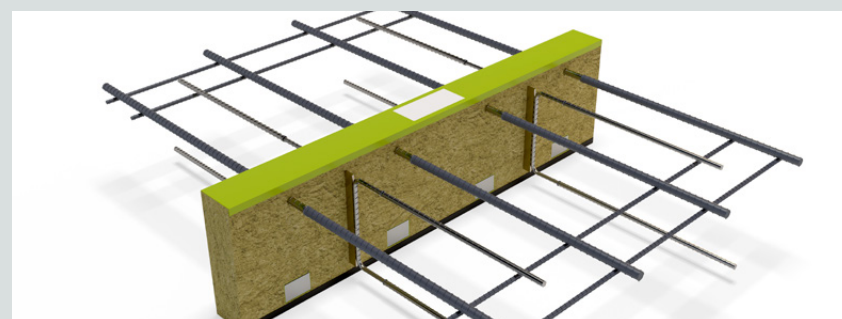
Your journey to faster, safer, and more efficient design starts with the free Peikko Designer®. Use the software to select the most suitable Peikko products for your structures. Want to complete your design with Peikko Products? Use our 2D and 3D detailing components to complete your design. Read more: www.peikko.com/for-designers



A brand-new design application for balcony connections using EBEA Balcony Connectors

Peikko Designer® EBEA Balcony Designer is a free web-based application that assists Structural Engineers with balcony design using EBEA® Balcony Connectors. The tool tests all product sets to find the best connection for your balcony. As a result, you will have a solid solution for the entire balcony within minutes. Less time spent on repetitive tasks means more time for you to decide on the best fit for your balcony.

First define the overall design criteria, such as building category, balcony deflection limit, and connector use, then define the structure and support elements, and, finally, add loads to the static system. After defining your design parameters,



click "calculate" to see which EBEA® Balcony Connectors match your balcony connection design.

Log in to Peikko Designer® and download a design report in PDF format. The report

will display your initial information, the design basis, design results, as well as the layout of the connectors.

Find the EBEA Balcony Designer at ebeabalcony.peikkodesigner.com!

WILJA® plug-in introduced into the Tekla Warehouse

WILJA® is a CE marked insert for lifting and transporting precast sandwich wall elements. Available as an independent lifting component plug-in under the Peikko category, WILJA® plug-in is used to model the WILJA® Lifting Inserts into the sandwich wall panels.

The PNLF Lifting Insert, which is well-known in Finland, will be phased out. As a result, the PNLF plug-in for BEC tools will gradually become obsolete. The PNLF plug-in is still available, but BEC tool users will see that it bears a "discontinued" mark. With backwards compatibility in mind, we made sure that when projects designed with PNLF lifting inserts are opened, their functionality is not corrupted. The WILJA® plug-in will also be available under the Lifting Component list for BEC tools, although its usability will not be as good as our independent plug-in. For example, the capacity check and related fields in BEC Lifting Inserts are not easily controlled. As a result, we recommend that users design and model WILJA® Lifting Inserts using Peikko's native plug-in.

The WILJA® plug-in functions similarly to the PNLF plug-in where the user can



only place one insert at a time. The WILJA® Lifting Insert type can either be selected automatically, or manually by the user. During automatic selection, the user must define the inclination angle, dynamic factor, and load share (weight share of the element) for one Lifting Insert as a percentage, as these will affect the background calculations. The choice of inclination angle will also ensure that the user receives additional diagonal reinforcement in the wall, as needed.

The WILJA® Lifting Insert is defined by 4 points in a 3-D space. The 1st and 2nd points denote the inner and outer layers of the panel, the 3rd is the insulation, and the

4th determines the rotation angle. The user must assess the location of the insert inside the wall element – if the centre line of the WILJA® deviates from the centre of gravity (COG) of the wall element, this will cause unacceptable tilting of the panel during the lifting process, and the user will be asked to contact Peikko for an alternative solution.

The inserts can be anchored either straight or bent, with the latter option being used when the WILJA® is placed over the opening.

Find WILJA® modeling tool on the product page under For Designer tab.

GRIP plug-in introduced to Tekla Warehouse

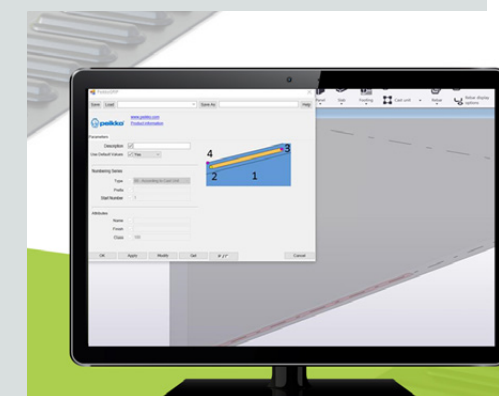
Tekla users can now use the new GRIP plug-in to add a GRIP Recess Plate into precast wall designs together with SUMO® Wall Shoes, or into any other joint that requires improved shear resistance. The GRIP Recess Plate ensures a rough concrete surface in accordance with EN 1992-1-1 (section 6.2.5).

The plug-in is straightforward and generates the GRIP Recess Plate as a single piece or a continuous line on a single structural element.

The GRIP is defined in a 3D space using four points. The first point marks the part

(structural element) to which the GRIP should be attached. Points 2 and 3 are the beginning and end of the GRIP line, resulting in 1-meter-long GRIP pieces between those two points, or one single piece of any length required. The fourth point determines the rotation angle.

The GRIP Recess Plate is introduced into the model as a steel plate with no embossments. If you have any suggestions for improvements, please email design.components@peikko.com.



Gravity7 is a cost-effective foundation solution for future energy needs

Wind power is one of the most promising energy forms of the future if it remains economically viable. As the steel price is volatile and unpredictably, the real future problem solvers are the solutions that yet remain profitable and competitive. The Gravity7 foundation developed by Peikko optimizes the materials used and offers an economically balanced and sustainable solution for future energy needs.

COST EFFICIENCY AND ENVIRONMENTAL FRIENDLINESS ARE THE KEY REQUIREMENTS

Changes in the price of steel have been an issue for material procurement in the manufacturing industry for years already, and the recent geopolitical developments between Russia and Ukraine resulted in steel price levels not seen before. Even if steel prices have come down and hit a plateau, cost- and material-effective solutions will be required going forward.

Another hot topic is climate change. By increasing the use of renewable energy, we can fight climate change. Mankind desperately needs ways to increase the production of renewable energy. This needs to be done cost-effectively and sustainably, and Peikko's Gravity7 foundation designs meet that requirement, lowering the use of concrete and steel reinforcement.

Wind power is seen as one of the most promising forms of renewable energy

in Europe in the coming years and wind power projects are strongly supported in the European Union. As per the European Commission's Green Deal goals, the use of wind power in Europe should increase annually by more than 30 GW by 2030 to meet the minimum target share of 40% of the EU's renewable energy. In practice, this means an average of 5,000 new turbines annually, most of them onshore.

It is therefore easy to see that there will be considerable demand for onshore wind turbine foundations in the coming years, and their environmental friendliness and cost-effectiveness are essential.

GRAVITY7 IS A FOUNDATION SOLUTION FOR TODAY AND FOR TOMORROW

"The future perspective plays a central role in Peikko's product development too", said Baptiest Mol, Business Director of Wind Energy Applications.

"Sustainable development and cost-effectiveness in the case of wind turbine foundations arise from the efficient use of materials - components, reinforcement and concrete - and faster installation and construction work phases on the site. Thanks to our in-house developed design tools and strong professional expertise, the foundations are customized on a case-by-case basis and their material needs are minimized".

A good example of this is the Gravity7 foundation solution; its construction phase causes 30% less emissions than traditional solutions.

Gravity7 foundations are very well suited for wind range of soil conditions, and are suitable for the entire European region. Since the first projects in 2011, the development of gravity foundations has been continuous. Increasing hub heights and megawatts as well as stricter environmental requirements have directed the solution

” Sustainable development and costeffectiveness in the case of wind turbine foundations arise from the efficient use of materials and faster installation and construction work.



” Peikko's Gravity7 foundation solution uses less steel and concrete than traditional methods.

to meet and even anticipate current trends. The seventh-generation level of development – Gravity7 – is the result of long work and considerable investments, and it contributes to the cost-effective introduction of renewable energy.

OPTIMIZED DESIGN GUARANTEES THE BEST STRUCTURES

"The most significant changes in the new generation are in its design", described Mol.

When designing wind turbine foundations, Peikko uses its own software, which is the result of several years of development. Automated and optimized software with 3D FEM modeling enables extremely accurate design calculation and takes many additional variables into account, which guarantees the safety of the foundation. At the same time, the nonlinear FE soil simulation provides realistic soil behavior and improved precision compared to traditional methods. The new software also checks the load-bearing capacity of structures more comprehensively than previous versions.

Thanks to these improvements, Peikko's Gravity7 foundation solution uses less steel and concrete than traditional methods, making it a significantly lower-emission and more cost-effective way to build wind turbine foundations.

The optimized design makes the new Gravity7 a smaller foundation solution for even larger turbines - safely and in an environmentally friendly way.

"Gravity7 is just another step forward - Peikko's product development work and its impact on the market will continue in the future", said Baptiest Mol. "We at Peikko are proud to be forerunners, and it is a position that needs be maintained and earned again and again. A forerunner is a careful listener and in tune with the development of the industry." ●

Soidinmäki wind park is built on Peikko's foundations

The Soidinmäki wind park being built on Saarijärvi, Finland, is showcasing the Gravity7 foundation. The wind park will be completed by the end of 2022, and its foundations were designed and delivered by Peikko.

The first plans for the Soidinmäki wind park were made already in 2014, and construction started in August 2021. Peikko's component deliveries started in spring 2022. The owner of the wind park is Tuulivoimayhtiö Pohjoistuuli Oy, and the project's seven 5.5–158_141mHH turbines were supplied by General Electric Renewable Energy. Altogether, Soidinmäki wind park covers an area of approximately 800 hectares.

Peikko has designed and manufactured the site's two Gravity7 foundations and five Cage Rock foundations. The delivery of the park's main contractor, Enersense International Oyj, includes the construction of the park's roads and assembly areas, the foundations, the park's internal network and the power station as a turnkey solution.

"The reinforcements and other components for the foundations were delivered to the site according to the schedule previously agreed, and the cooperation with Enersense was smooth all the way from design to assembly", said Peikko's project manager Vuokko Pussinen.

Scheduled delivery of materials facilitates site planning and resourcing. The fast assembly is one of Peikko's undeniable advantages; the entire Gravity foundation is completed in a week, and the Cage Rock foundation even in less.



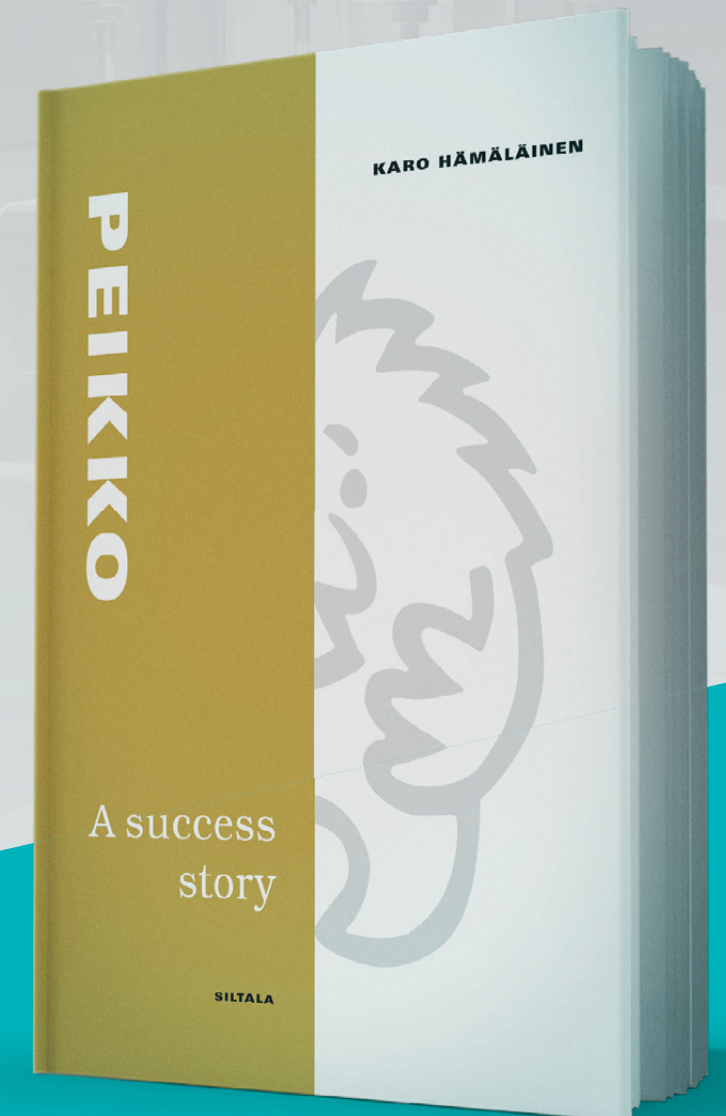
PEIKKO

A success story

” First and foremost, this book is about the people of Peikko. It's about how we've worked together to build such an amazing company. Whether it is by chance, skill or luck, we've done it together.

Entrepreneur and Peikko's CEO Topi Paananen

The book by a Finnish author Karo Hämäläinen describes Peikko as a company and reveals both breakthroughs and failures along its success story. Whether your interests lie in construction industry, entrepreneurship, or perhaps just life itself, this book will be a source of inspiration and insight for you.



The book will be available in audio book form, at major audio book providers in October 2022

Peikko plays a part in RIBA prize-winning **Kingston University Town House project**

The Royal Institute of British Architects has awarded Kingston University's Town House, (KUTH), its Stirling Prize for 2021. The most prestigious of its kind in the UK, RIBA's Stirling Prize is presented to 'the architects of the building that has made the greatest contribution to the evolution of architecture in the past year'.





Located in Kingston upon Thames in south-west London, the rectilinear, six-storey, 10,000m² Kingston University Town House was built in 40 weeks and opened to students, staff, and the local community in January 2020.

WELL DESIGNED

KUTH features include a three-storey library, atriums, dance studios, two cafes, theatre, covered internal courtyard, external balconies and walkways, and a rooftop garden.

Large, open spaces allow people, light and air to flow naturally through the building, which also uses advanced design and an embedded pipework system to reduce energy consumption and avoid the need for extensive HVAC (heating, ventilation, and air conditioning).

KUTH uses many precast elements including: internal columns supporting gravity loads from the superstructure; colonnade columns supporting gravity loads

externally; wall units; hollow-core flooring, and 200 double-T ribbed floor units, to maximize structural and material efficiency, capacity, internal space flexibility, and to optimize aesthetics and services integration.

PEIKKO'S KEY ROLE

Of the more than 300 offsite manufactured beam and column sections used in the KUTH construction, 38 are DELTABEAM® Composite beams, chosen for their cost-effective long-span capabilities, some in excess of 15 metres, and in line with the overall architectural vision. DELTABEAM® also importantly enabled a flat soffit solution to aid services integration.

Peikko's proven Column Shoes and Anchor Bolts helped to accelerate construction and enhance site safety.

Mike Scott, Sales Manager of DELTABEAM® Products in the UK, says: "Peikko is proud to be associated with the Kingston University Town House project, working closely with specialist structural frame design and build contractor PCE Ltd to incorporate our DELTABEAM®s and connection solutions into the offsite design and construction. We are also proud to help Grafton Architects successfully deliver this



architecturally challenging scheme and secure the RIBA Stirling Prize 2021."

Peikko has long experience of working with PCE. Its Town House project involvement included assisting PCE with re-engineering the previous in-situ scheme into an offsite 'HybridFMA' (design for manufacture and assembly) solution.

More than 2,150 offsite-manufactured structural components arrived at the site on a planned 'just in time' basis. This sped up the build and gave environmental benefits including minimized onsite vehicle movements, personnel, disturbance, and construction waste, on what was a constrained site next to other university buildings and the busy Penrhyn Road.

PROJECT SUCCESS

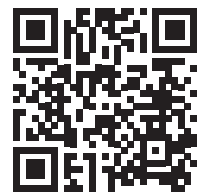
Nickie Brown, Managing Director of PCE Ltd, commented: "All our supply chain partners, including Peikko, provided a first-class service in manufacturing the precast concrete and structural steel components to our designs and specifications ensuring our clients structural and architectural requirements were achieved. This project was initially designed as a traditional in-situ concrete frame, and for it to be converted into a successful DfMA solution is a testament to everyone involved – thank you."



Peikko's Mike Scott says: "We have been supplying innovative solutions for many years and this high-profile award further demonstrates to the market what is achievable by using alternative methods of construction."

Among its other awards, Town House has gained BREEAM (Building Research Establishment Environmental Assessment Method) 'Excellent' certification for its environmental sustainability. ●

Video on Youtube: Construction of Town House at Kingston University



Open office space for people

The 10-storey high Kvartetten focuses on well-being and the environment in Malmö, Sweden. Open spaces are created with the DELTABEAM® Green.

The Kvartetten has four distinct facades, each representing a different area in the region. Indoors, the architecture emphasizes natural light and great views on the Öresund – the narrow straits that separate Malmö from Denmark.

Open interior space translates into a tetris-like flexibility, meaning that the companies located there can grow or become more compact in terms of the office space needed.

CERTIFIED TO THE MAX

The building will boast three certifications – WELL, Miljöbyggnad Guld and NollCO2.

WELL is a certification awarded to buildings that advance human health and well-being, while Miljöbyggnad is a Swedish system for environmental certifications, Guld being the most ambitious level. Also Swedish, NollCO2 certification aims for a zero CO₂ emissions by encouraging low CO₂ materials and building techniques to be used. The remaining emissions are compensated to reach a zero CO₂ emission building.

– The choice of the frame plays a big role in the certifications, especially when it comes to NollCO2. That's why we chose DELTABEAM® Green for the project. It really

made it easier to get the certification, says project manager Rickard Berlin of Wihlborgs Fastigheter, the developer.

90% of the DELTABEAM® Green is made of recycled steel. Renewable energy is used in production and the beams are transported by means that run on biodiesel or in other environmentally compensated fuel. This lowers the CO₂ emissions by 50%.

HIGH LOAD BEARING REQUIREMENTS

As there will be a garden on the roof, the load bearing capacity of the frame had to be taken into account.

– The DELTABEAM® Frame can handle these extra loads with ease, Marcus Ringstrand of Peikko Sweden points out.

The precaster Starka is no stranger to Peikko solutions.

– We've worked with Peikko on several projects and frequently use their solutions. The cooperation and dialogue have been good, Martin Asp, Starka project manager adds.

In addition to the DELTABEAM® Green, composite columns and bolted connections, CE marked WELDA® Anchor Plates and COPRA® Anchoring Couplers are used in the project. ●



PROJECT FACTS

- Project size: 16,000 m²
- Floors: 10
- Developer: Wihlborgs Fastigheter
- Construction Company: PEAB
- Structural Designer: Sweco
- Architect: Krook & Tjäder
- Precaster: Starka Betongelement AB
- Delivery year: 2021
- Completion year: 2023





Bringing speed and safety to a gigantic harbor project

The cargo volumes are on the rise in the Port of Rotterdam. To serve the largest vessels in the world, 1825 meters of new quay wall is being built in the Prinses Amaliahaven.



Constructed in 20 meter pieces, new quay walls are huge, U-shaped and cast in situ structures with a lot of reinforcement.

– On one side there is the sea and on the other side there is the foundation for the quay and the harbor cranes, Wim Zwaan of Peikko Benelux explains.

The old fashioned way to take care of the shear loads is to use stirrups as reinforcement.

– In a project like this they are problematic as you might end up with no room for concrete at all.

The traditional stirrups are also difficult to install in the existing main reinforcement.

– There isn't too much room for the workers either.

The only way to use stirrups would be to place a U-shaped stirrup in the bottom with all the rebars pointing up and to place another one from the top to form a complete stirrup.

– It is a lot of work and there is a big safety risk with sharp rebars pointing to the sky.

ENTER PEIKKO PSB®-J

PSB®-J is a headed anchor with a forged head at one end and a bent hook at the other end.

– The hook makes it really easy to install as you just drop the anchor in place.

According to the main site manager, installing shear reinforcement is 2 to 3 times faster with PSB®-J than with stirrups. And it's much safer, too.

Another great application for PSB®-J is in the high rise foundation shear reinforcement.

– We have an on-going project in Amsterdam, with a foundation that is 4 meters thick.

In a large-scale infrastructure project such as Amaliahaven, the ability to supply large volumes accurately is paramount.

– By the end of 2023, Peikko will have delivered a total of 91,000 pieces of PSB®s in its various versions, Zwaan concludes. ●



” Installing shear reinforcement is 2 to 3 times faster with PSB®-J than with stirrups.

PROJECT FACTS

- Contractor: Combinatie Amaliahaven (HOCHTIEF Nederland, Ballast Nedamz, Van Oord)
- Structural designer: CI-Engineers
- Year of delivery: 2022/2023
- Year of completion: 2023



A trail blazing hybrid project in Australia

Interest towards hybrid structures is rising – the new Innovation Hub in Sydney combines wood, concrete and steel.

Traditionally a cast-in-situ market, Australia is beginning to see the benefits of combining different materials.

– There is a trend towards more sustainable materials in construction, but for taller commercial buildings a hybrid approach brings together the best of all materials, says **Nick Hewson**, Chief Design Officer & Head of Product Development at the Viridi Group.

Offering contemporary learning spaces designed for modern ways of learning, the Oakhill College Innovation Hub is a prime example of this. The 4,200 m² Passivhaus

project is an inspirational hybrid design that celebrates timber in all its forms and utilises composite timber, steel and concrete.

SIMPLIFIED RUNNING OF SERVICES

The central section of the building has a large number of services running through it – that's why the large downstand glulam beams that were specified for other parts of the structure weren't ideal.

– We had developed Strongfloor, our own unique timber-concrete composite floor system and had seen the DELTABEAM® used in conjunction with similar systems in Europe.

According to Hewson, with DELTABEAM® the structural soffit is kept flat to allow freedom of services reticulation around the building.

– DELTABEAM® works well with low head height and big services requirements, structural engineer Matthew Burke of Northrop Consulting Engineers says.

ROBUST AND HIGH-PERFORMING SOLUTION

– DELTABEAM® integrates perfectly with our Strongfloor system – a huge bonus as the structural depths required are very similar. The combination provides a very robust and high-performing solution, Hewson adds.

” DELTABEAM® works well with low head height and big services requirements.



Peikko worked directly with the Viridi project engineers, assisting with the design and certification, as well as providing fire test reports and data to the fire engineer to show how the systems work together.

– The level of engagement from Peikko was very high through the BIM design and detailing process with their models integrating well into our master model, Nick Hewson concludes.

Northrop's Matthew Burke thinks the same.

– The local Peikko experts are great

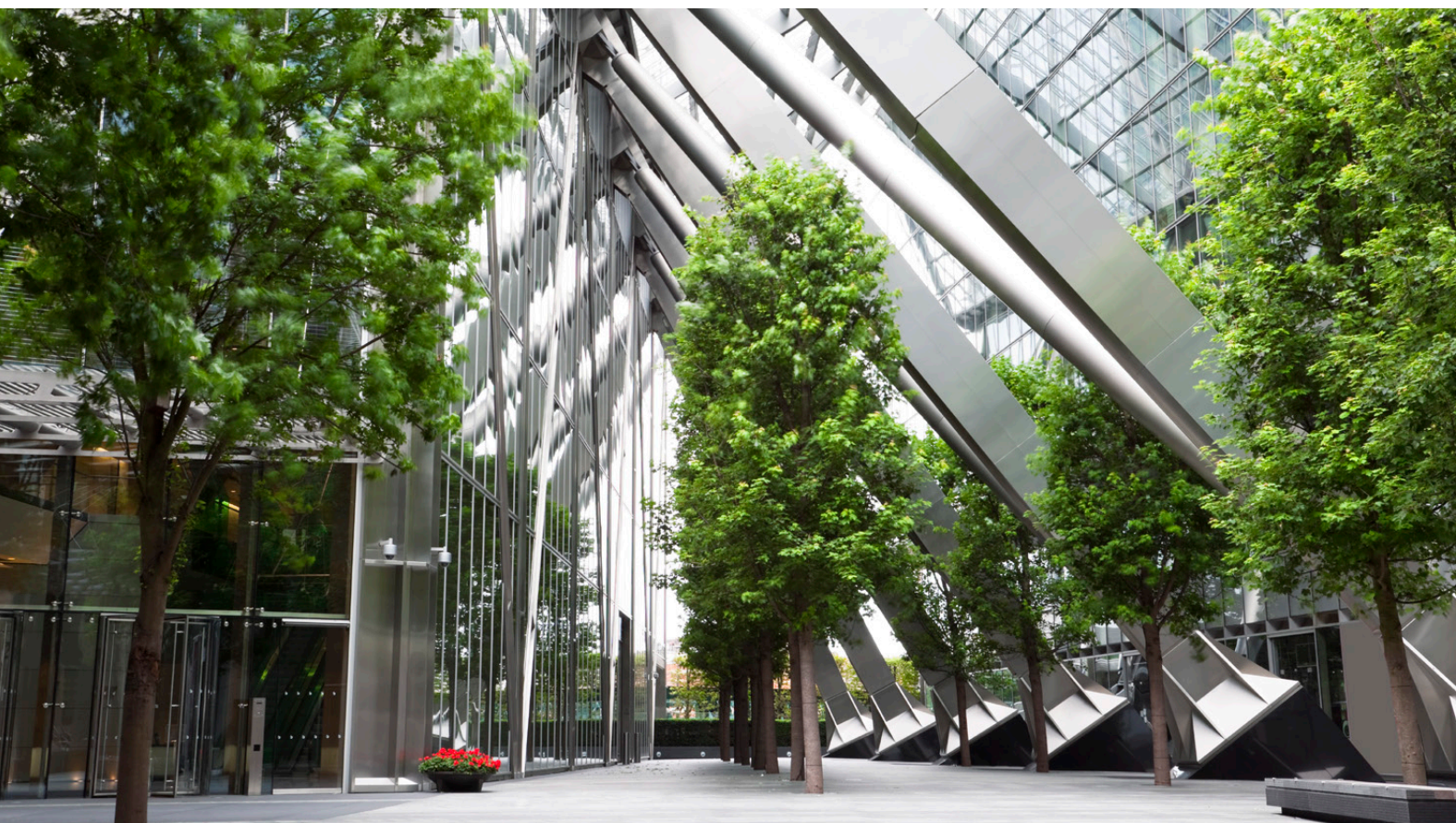
to cooperate with. Initially we used the DELTABEAM® Select tool – which is pretty good – but contacted Peikko early on to give them a bit of a rundown on loadings. That's how we came up with sizes and geometries to test if it works with the floor system.

The timber structure used in the project includes glulam beams and columns, CLT walls, steel framing, Strongfloor, DELTABEAM®, lightweight pre-clad walls and roof trusses. ●

PROJECT FACTS

- Project size: 4,200 m²
- Floors: 4
- Construction Company: FDC Construction & Fitout
- Structural Designer: Northrop Consulting Engineers
- Architect: Architecture BVN
- Precaster: Viridi Group
- Delivery year: 2022





Circular Economy

– Be part of the solution, not the problem

Full circularity is the construction industry's opportunity of a lifetime for a better tomorrow. Now we must take it.

CHANGING THE INDUSTRY FOR THE BETTER

The building industry is responsible for major societal impact to nature, with 40% of total energy use and 30% of the global amount of waste. Moreover, the concrete business is a major source of excess material. Finite raw materials are claimed, made into products and at the end, disposed of as waste in landfills.

With no signs of the demand for global construction slowing down, the industry has no choice but to move to a more sustainable

direction. As an industry forerunner, Peikko is determined to be the needed change solving the problem that is affecting all construction.

MOVING FROM LINEAR TO CIRCULAR ECONOMY

For a long time, the construction industry's economy has been linear. It has followed the traditional "take-make-dispose" plan, where raw materials are collected, transformed into products, and then discarded as waste when they have served their

purpose. In conclusion, the linear economy focuses more on profitability than the consequences of its own actions.

A circular economy is a closed-loop resource system with no waste. By designing, maintaining, reusing, remanufacturing, refurbishing, and recycling in the right way, all the materials used in construction can later be utilized as inputs for new products.

Construction materials retain their value, resources are maintained and zero landfill is produced. We must go round and round from recycling to manufacturing, to

construction and use, and from use back to recycling again and again. Nature wastes nothing, so why should we?

SOLVING PROBLEMS WITH PEIKKO CIRCULAR SOLUTIONS

We are converting our products and the company strategy for the better with Peikko Circular Solutions. These circular solution projects include both products and processes that enable dismantling and reusing. In addition to retaining their value, the product information of Peikko components is preserved throughout the product's life-cycle.

In time, led by our R&D department, we aim to establish a fully circular product portfolio and a building system that enables reusing building materials several times over.

Many of our solutions are already compatible with circular economy principles, and our designs can be modified for circularity with minor adjustments. Our bolted connections for precast structures, DELTABEAM®, DELTABEAM® Green and PETRA® Green, enable full circularity and exceed the set requirements without compromising performance.

The HPKM® and BOLDA® Column Shoes and SUMO® Wall Shoe for disassembly, provide ease and speed to the erection of bolted column connections – in a circular, economy friendly way. The bolted connections have a robust release system to ensure building, dismantling, and re-building several times.

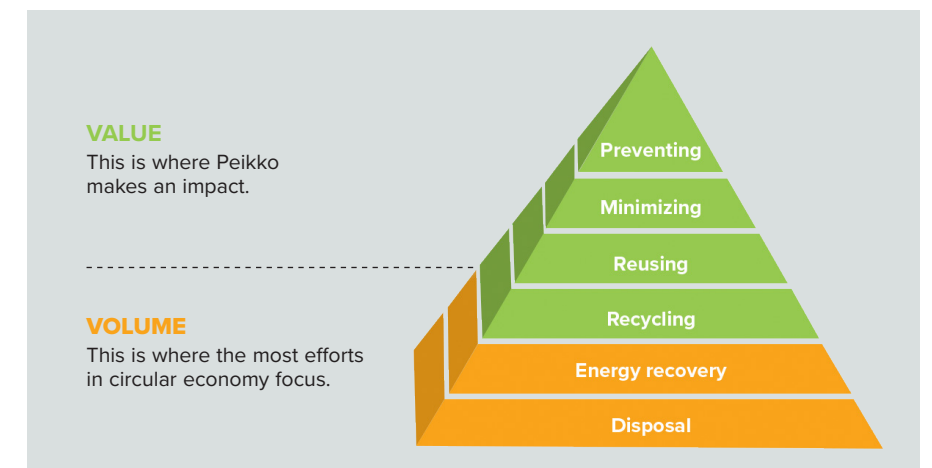
PEIKKO IS THE PROVEN FORERUNNER FOR CIRCULARITY

Circular economy can be challenging in the building industry. There are changing factors such as variable sizes or low repetition of building projects, complicated investor structures, and the voice of end-consumers hidden in the value chain.

Even though the transition from linear to a fully circular economy might take more effort, we must be in the center of change. "Being in the front is not ambitious enough," says Topi Paananen, CEO, Peikko Group Corporation.

We believe you shouldn't have to choose between efficiency and the environment. That's why we have become a proven forerunner in circular solutions.

” We aim to establish a fully circular product portfolio and a building system that enables reusing building materials several times over.



Peikko's solutions add value to circular economy projects.



” We believe you shouldn’t have to choose between efficiency and the environment.

We are a part of a transparent value chain with verified third-party testing and certified ratings from LEED, BREEAM, EPD and DEKRA. Our circular products are also compliant to the required CE and ISO14001 standards.

PROVING THINGS RIGHT WITH CERTIFIED TESTING

Extensive testing has shown that our bolted connections can be the needed change in making the construction industry more sustainable and circular. We are no strangers to testing the quality and full potential of our products ourselves either.

We carried out smaller dismantling tests in 2019 with great success. At the end of 2021 we went further and implemented a pilot project of installing, dismantling, and reinstalling a load-bearing frame of concrete elements consisting of precast elements and DELTABEAM® Green composite beams.

The aim was to prove that the connection technology between structures enables the easy dismantling and reassembly of concrete elements – and to address any negative industry views about the reusability of concrete elements.

The results? Crystal clear. Applying dismant and reuse to the pilot frame

can reduce the building costs by 35% and embodied carbon releases by 50%.

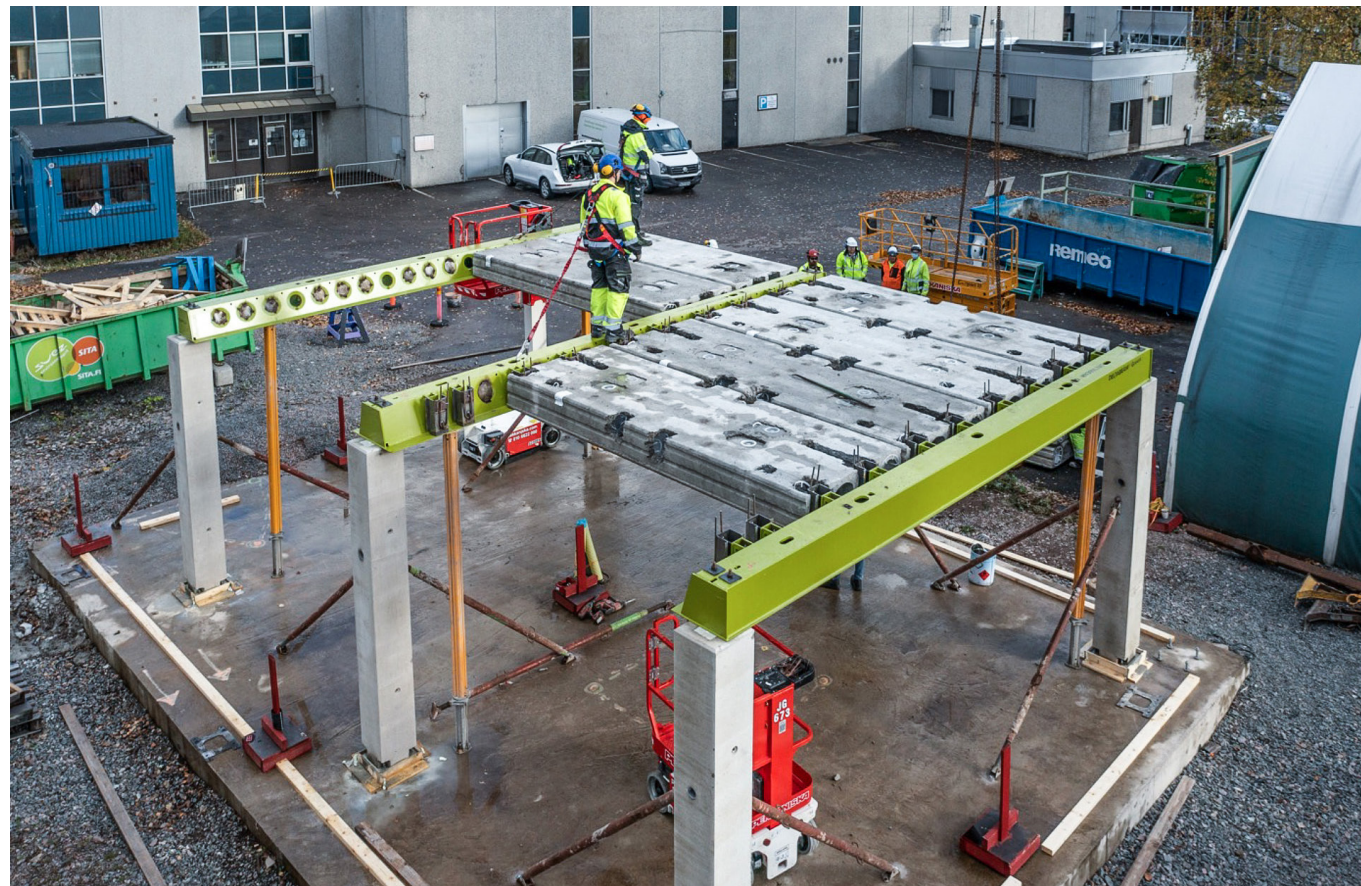
The latest tests also go hand in hand with the new Design-for-Disassembly (DfD) principle and building process, which got an overview in the international standard ISO 20887. The principle focuses on the easy recovery and reuse of components and materials when a building is deconstructed.

FOLLOWING ALL THE STEPS FOR A BETTER TOMORROW

With the results of latest tests, the reuse of concrete elements is closer to becoming common practice. “Modern connection technology already allows the dismant and reuse of concrete elements. Due to their reversibility, bolted connections are the key for reusing precast structures – they are quick, safe, efficient and effective,” says Jaakko Yrjölä, Senior Manager Sustainability & Research at Peikko.

At Peikko, we are not only focusing on the disposal and energy recovery of manufacturing, doing the minimum to compensate for our emissions. We strive to make a bigger impact by taking every needed step – prevent, minimize, reuse, and recycle. ●

The environmental-friendly DELTABEAM® Green composite beams were used in the pilot project of dismant and reuse.



Company news in brief

The President of the Republic of Finland has granted the Internationalization Award for Peikko

The President of the Republic of Finland Sauli Niinistö has granted Internationalization Awards for the year of 2021. The annually granted Award is a significant recognition to internationally successful Finnish companies. The evaluation criteria focused on international success, profitable growth, promotion of Finnish expertise, and a company’s ethical operations.

“The award from the President of the Republic of Finland was a remarkable honor for the entire Peikko community of over two thousand people working in 34 countries. The long-term work for growth,



internationalization and especially for our customers will continue full steam ahead”,

says Topi Paananen, CEO, and entrepreneur of Peikko Group Corporation.

Finnish Constructional Steelwork Association appointed Jalo Paananen as an honorary member

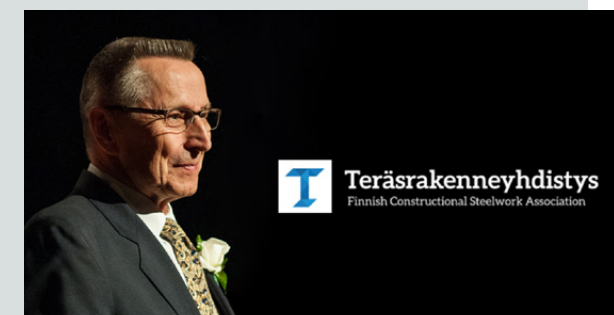
Peikko’s founder, Jalo Paananen has been appointed as an honorary member of the Finnish Constructional Steelwork Association as of the 24th of November 2021. The appointment respects Paananen’s long-term work in innovative development of steel and slim floor structures as well as internationalization of the industry. Paananen has made a remarkable, life-time career by promoting steel construction and entrepreneurship.

Jalo Paananen founded Peikko in 1965 to better serve customers’ needs. Not available at that time, he developed diagonal ties for sandwich panels. Since then, Peikko’s offering has expanded to include DELTABEAM® composite beams and concrete connections for precast and cast-in-situ construction.

“The passion for creating customer benefitting solutions has guided our work ever since. Peikko’s development is built based on customer needs. When developing our business, we have always considered whether this is something new that will surprise our customers in a positive way and benefit them through our partnership. My advice is, do not make a product that someone else already has unless you have a superior concept. If this is the case, it will also benefit us”, says Jalo Paananen in an interview made by Teräsrakenne magazine.

Understanding customer needs, strong focus in product development and importance of

sales have always contributed to Peikko’s international success. In order to highlight the significance of sales, Jalo Paananen and his wife Anja donated 100.000 EUR to LUT University in Finland for establishing a professorship in sales and customer encounters.



Peikko acquired a corbel patent from ZECH as part of the extended cooperation

Peikko has acquired the product rights of a corbel system from ZECH Hochbau AG. The purchase included patent, product documentation, calculations, and the knowhow. Peikko is now the manufacturer for the solution and the exclusive supplier to ZECH for the next three years. The parties have agreed to cooperate in the future not only in this product area but also on other business matters.

This corbel system, now called Peikko STAIRPOD®, is used in stairway shafts to connect precast stairs into the shaft. Construction companies have already been using this system for several years as it improves speed, efficiency, and safety on site. Peikko manufactures STAIRPOD® corbel systems in its factory in Germany.

“We are proud to cooperate with one of the fastest growing German-based building



companies. We believe that this partnership will be significantly expanded in the coming years. The corbel is a well-thought product, and we see good opportunities for it in a wide number of countries”, says Topi Paananen, CEO of Peikko Group Corporation.

“We are pleased to cooperate with Peikko, and we believe that this product

can be developed further with Peikko’s strong knowhow on connections”, says Bernd Stadelmaier, who was responsible for the development of the product. “We are also confident that this cooperation will bring clear benefits for both companies”, comments Markus Netzker, Head of Engineering, ZECH Hochbau AG.

Peikko boosts engineering services to Chinese clients by becoming a majority shareholder of a Chinese structural design company

Peikko has signed an agreement with Chinese structural design company Shanghai Shucko Construction Technology Co., Ltd. to become a majority stakeholder of the company with 51% ownership. The transaction consisted of a share purchase from a single shareholder, and additional share capital issued to Peikko. The two remaining shareholders, Mr. Huang Hua and Mr. Wang Chen, continue to run the business as before.

Focusing on structural engineering and detailing services of precast frames, Shucko has offices in the cities of Shanghai and Hefei. Shucko’s 16 engineers help both precasters and construction companies with their precast design. The future cooperation between the Shucko and Peikko teams in

China will provide benefits for customers via improved detailing services and technical customer support. Shucko remains as an independent entity from other activities of Peikko China, which has a factory in the city of Zhangjiagang (north of Shanghai) and sales teams in several locations.

“We are very happy to join forces with the competent structural design team at Shucko. The use of precast construction is increasing rapidly in China, and we are confident that the teams within Shucko and Peikko China, together will be able to grow the business rapidly in the coming years”, says Topi Paananen, CEO of Peikko Group Corporation.

“We have cooperated with Peikko China since early 2021 and are excited



to join forces. With Shucko’s design & detailing competence and Peikko’s product competence, customers are able to use the most efficient systems in the marketplace”, comments Mr. Huang Hua and Mr. Wang Chen, Peikko’s partners at Shucko.

Significant system approval for Peikko by German DIBt – DELTABEAM® Composite Beams with Hollow-Core Slabs in the Event of Fire

Peikko has received German national technical approval from DIBt for its DELTABEAM® Composite Beams to be used with hollow-core slabs in situations of fire. The Deutsches Institut für Bautechnik is a technical authority and a service provider for the German construction sector.

In cooperation with its research partners, Peikko executed an extensive testing and research program on DELTABEAM® Composite Beams supporting prestressed hollow-core slabs in slim floor structures. Based on this experience, it was possible to provide new information on German national design specifications concerning load transfer and flexible support of beams in the event of fire.

The new DIBt approval guarantees DELTABEAM® and hollow-core units a full acceptance for fire design by construction authorities, without delay or further investigation. In terms of safety and fire



design, Peikko’s DELTABEAM® Composite Beams provide a reliability level superior to any other beam type, including reinforced concrete, steel, and other composite beams.

“With this new approval, we can provide our customers with the necessary confidence and reassurance in the planning process of their building projects. Design of the DELTABEAM® Slim Floor Structure, including integrated fire protection, used

with hollow-core slabs has been assessed and approved by the German approval body. It gives us and our partners in the hollow-core industry a unique advantage over other slim floor systems as there are no comparable approvals in the market. The approval will also play an important role in some areas outside Germany due to the reputation of DIBt”, says Topi Paananen, CEO of Peikko Group Corporation.

Peikko invests in efficiency and product quality by acquiring a welding automation technology provider

In the beginning of 2022, Peikko has acquired 100% ownership of Kemecweld Oy, a Finnish company providing manufacturing technology and various welding automation solutions. Peikko and Kemecweld have cooperated since the early 1990s, and Peikko has ordered several machinery set-ups from Kemecweld every year during the last ten years. All 5 Kemecweld’s employees continued working at Peikko.

Peikko aims to increase its in-house know-how on automation and welding

technologies. The goal is to build a Peikko Technology Center, which will be responsible for developing state-of-the-art manufacturing machinery and modernizing existing machinery at Peikko. The new Peikko Technology Center will not provide its know-how to third parties, as all capacities will be used for Peikko’s investments. During 2022-2023, the team will move to build-to-purpose premises next to Peikko Finland’s factories in Lahti.



Deepen your know-how – read a White Paper

We asked the authors why you should



FROM DEMOLITION TO REUSING – THE SHIFT IS ABOUT TO HAPPEN

When a building is declared obsolete, the building components are mostly still in great shape and the reuse of components as such should be considered.

In order to make the building industry more sustainable, CO₂ emissions need to be cut, construction and demolition waste has to be reduced and resource efficiency improved.

– For example, in the EU all new buildings, infrastructure and renovations must have zero embodied carbon by 2050. Reuse of components is one potential way of achieving this, says **Jaakko Yrjölä**.

– The challenge is that deconstruction and salvaging of components is perceived as both labor-intensive and costly. The technical data is also often missing, as is quality assurance, **Patience Wanjala** adds.

Indeed, the current lack of standards and legislation is making for slow progress. This leads to uncertainty on what should be done to the design and how to fit tailor-made building components into the new constructions.

– Designs, sizes, and quality checks should all be standardized, Yrjölä points out.

To create an established market, trust and awareness has to be built. Designers need access to information on actual and potential components that can be incorporated in their circular designs. Developers and owners are looking for a proof of concept. Precasters value guidance on how to make products that can be reused.

– Successful cases of dismantling and reusing of structural components, with practical and measurable benefits and drawbacks, are instrumental in making the market shift happen, Patience Wanjala emphasizes.

The upcoming change in thoughts and actions benefits the whole industry.

– Developers will gain economically as reused components are cheaper than new. Contractors will enjoy time savings and less wasted construction materials. Society in general will see substantial environmental benefits, Wanjala says.

Designers will have to alter their way of working somewhat as they need to check the performance of dismantled components against the new load case.

– But I’m sure the overall benefits will outweigh this by far, Jaakko Yrjölä concludes.

Read the White Paper from peikko.com/whitepapers:



ABOUT THE AUTHORS



The paper is authored by Jaakko Yrjölä and Patience Wanjala. Jaakko is one motivated team leader with a background of a structural engineer. His personal and professional life often share the same interests, and he feels just as comfortable in the office as on the couch at home.



Patience is a construction project manager with a passion for sustainability. She thinks of herself as an upcoming environmental heroine, destined to save the world from environmental degradation.

HYBRID TIMBER FLOOR – A SMART WAY TO CONSTRUCT AND BUILD

Designers benefit from optimized structural concept, architects from flexibility in shapes and spaces, construction companies from ease and speed of installation and building engineers from reduced environmental footprint of the structures.

In alignment with the sustainability trend, there are more and more timber projects going on. However, full standard timber structures may set some limitations in the design of a building.

According to R&D engineer **Elena Camnasio**, the structural grid might be limited by deflection or vibration requirements, or timber beams might protrude from the soffit.

“That’s one of the reasons why nowadays hybrid timber structures are a cross-cutting topic in the construction industry. With timber composite floors one can benefit from the strength of concrete and steel and from the lightness of timber. The construction materials are used in the most efficient way in hybrids,” Camnasio points out.

DELTA BEAM® hybrid timber floors help to overcome frequent design challenges.

– “From a structural point of view, DELTA BEAM® slim floor beams can reduce the floor depth between 10 to 30 percent compared to timber beams, and longer spans can be achieved, too.”

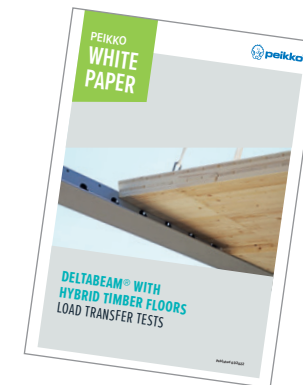
This means significant building height savings and flexible open spaces. Moreover, having slender structures affects the building’s environmental sustainability positively.

“On the one hand, material consumption for both horizontal and vertical building components is reduced, and on the other hand the heating and associated energy requirements are lowered by a more compact building design and a minimized thermal exchange with the exterior environment,” Camnasio says.

The load transfer tests have proved the safety and reliability of DELTA BEAM® hybrid timber structures.

“This was needed as the solution is innovative and currently not covered by the standards comprehensively. Test results showed that the load acting on the floors can be effectively transferred to DELTA BEAM®. In particular, joint reinforcement and the inclined web of DELTA BEAM® are key elements in the load transfer mechanism through timber-concrete floor joint. Based on experimental evidence, the design method is validated,” says Camnasio says.

Read the White Paper from peikko.com/whitepapers:



ABOUT THE AUTHOR



The paper is authored by Elena Camnasio – a building engineer with structural engineering as her passion. Her world is a pursuit of equilibrium between forces and resistances! She joined Peikko after doing a PhD in structural and seismic engineering.



**Hybrid
solutions**

NEW POSSIBILITIES **OPTIMAL OUTCOMES**

As an industry forerunner we are always working to find solutions for future needs. We believe in combining different materials, components and structural frame systems in an optimal way to create buildings that are sustainable and beneficial for the society and climate.

As hybrid structures keep growing in size and popularity, we aim to create an entire ecosystem of products that support each other for the optimal, hybrid outcome.

For more information:
peikko.com/hybrid-solutions

