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WOOD CULTURE 21

CONSTRUCTION EXPERTISE FOR ARCHITECTS, DESIGNERS AND BUILDING OWNERS

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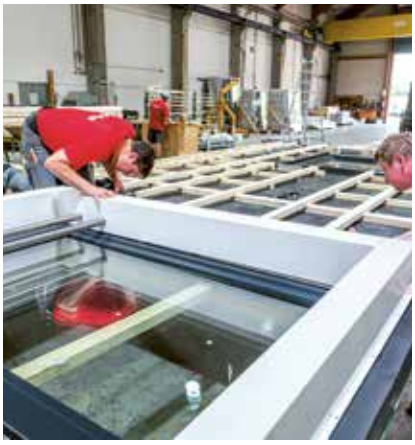


EDITORIAL

21ST CENTURY CONSTRUCTION MATERIAL

Ever since, wood has been a material that has been used for building purposes. Wherever available on earth, mankind has worked with this material. Today, it is not the question whether to use timber in building design or not, rather it is the question of how timber can most suitably be used in building design.

It is clearly justified to say that timber is a true all-rounder connecting nature and technique and that it is considered today to be the biogenic trendsetting building material of the future. No wonder - timber not only displays positive healthy properties in our living environments, but it also has lots of technical advantages to offer compared to traditional building materials. Due to its cellular structure with specialised cell wall architectures, timber has hollow structures, which are differently shaped depending on the type of wood that is used. This means that timber offers perfect conditions to be used as construction material. Despite its low density (200-2,000 kg/m^3), timber offers great stability and strength properties, which, with regard to its mass, are higher than the stability and strength of steel. Any vacant spaces both in public and private areas can be rapidly closed by using timber. The high rate of pre-fabrication considerably reduces construction periods. If additional floors are to be added to a building in urban sectors, timber is the perfect material to use since it is much lighter than steel or concrete.

Today, we live in a time where environmental issues determine the relationship with our planet. Climate change, which becomes increasingly visible and perceptibly in our world, will undoubtedly force us to change the way we live on this earth and the way we treat our planet. A fundamental change in architecture and urban construction is urgently needed. Energy-saving building methods and ecological indicators are continuously increasing in the building sector: What is the energy input we need to erect a building? To which extent does the construction of a building impact our environment - from the first groundbreaking to the moment of moving into the building? These questions will be gaining more and more importance in the future on our way to sustainable management. Bearing all these issues in mind and considering the positive ecological assessment of timber, there is no doubt at all that the importance of timber as construction material will continue to increase. Timber, the 21st century construction material.

Yours truly,

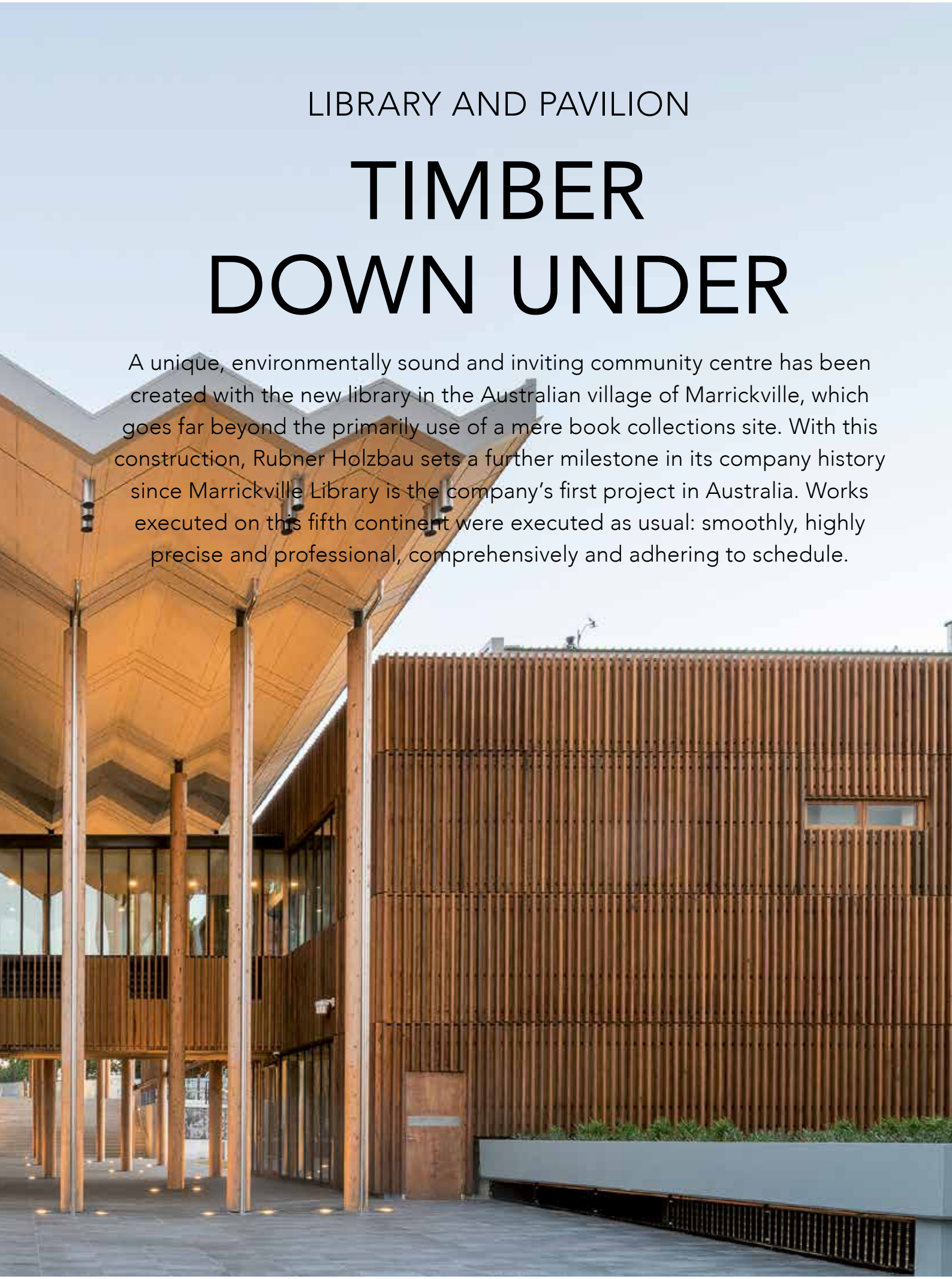
Peter Rubner

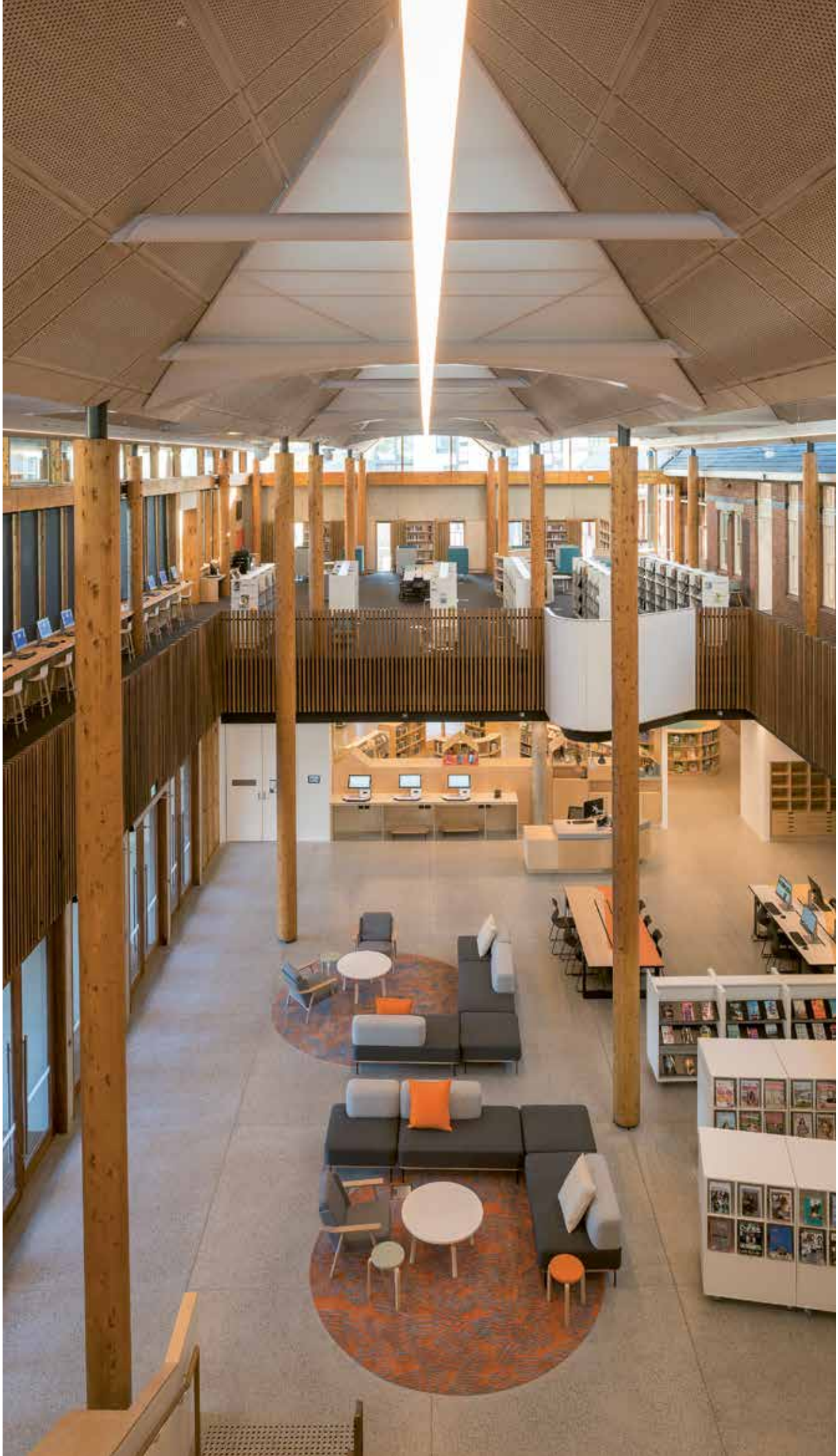
President of the Rubner Group

LIBRARY AND PAVILION

TIMBER DOWN UNDER

A unique, environmentally sound and inviting community centre has been created with the new library in the Australian village of Marrickville, which goes far beyond the primarily use of a mere book collections site. With this construction, Rubner Holzbau sets a further milestone in its company history since Marrickville Library is the company's first project in Australia. Works executed on this fifth continent were executed as usual: smoothly, highly precise and professional, comprehensively and adhering to schedule.





Librarians agree in one aspect: their workplace is far more than just a catalogued storage site of knowledge filled with thousands of books. Libraries are places, which invite the visitors to learn and to live, there are a meeting point for different cultures of any age. In the Australian suburb of Marrickville, the listed building of the former hospital was preserved and restored to now form part of the newly built library. This newly created library has been defined as multi-purpose community facility whose innovative design combines the most state-of-the-art technologies and sustainability.

To be able to execute this project, 54 round columns had to be built with different lengths reaching from 3 to 9.3 metres. Trimmed and round milled on a CNC-controlled machine installed in the Rubner factory, some 90% of these timber columns support the roof structure of the building - an oversized floating canopy roof inspired on the old hospital roof. Five additional timber columns simultaneously bear the load of one part of the roof and of the façade including the railings. These columns provide an open space feeling since the library's main atrium, which allows to take a glance at the major areas in the newly installed three-storey building, hardly has any suspended ceilings. Before timber construction works started, the Rubner Holzbau construction office prepared the design draft in the scope of a workshop, which took place in Brixen. The design had been elaborated by a local Australian engineering office. This meeting was also attended by the project manager of the building owner as European know-how is highly demanded by Australian construction industry. All column footing joints, and all column head elements required tailor-made designs and individual production. This millimetric precision had to be applied to the steel components as well, which serve to support the façade's and rails' fastening devices to the columns. This was all the more important considering the fact that the individual elements, which were shipped to Australia were supposed to perfectly fit on the construction site during assembly.

Besides the round columns, Rubner Holzbau also furnished the complex hybrid solution made of steel and timber as well as the entire façade composed of straight and arched tailored glued laminated timber posts. Detailed and workshop design, factory prefabrication of all timber and steel elements and the preliminary assembly of elements were part of the scope of services, which also included on-schedule transport, customs clearance in the port of Sydney and the entire, smooth execution of all tasks to be executed in close coordination with local authorities.

Pre-assembly of all elements was essential and considerably facilitated on-site erection since it allowed to position the timber columns before the steel roof construction was delivered to the construction site. In addition, the pre-assembled columns accelerated on-site erection works, which resulted in a period of less than six months for timber construction works.

Increased attention was also paid to the topic of sustainability. Not only because of the adaptive conversion of the former hospital building but also and above all because of the distinctive design features, which characterise the building. Natural and mixed ventilation systems, raised floors, controlled solar radiation by means of roof overhangs, several rainwater collection tanks and outside sun protection systems are only some of the features. In addition, some 27,000 recycled tiles were used as construction material. Given this long list of sustainable elements, the timber used in this project was expected to be on a par. Being classified as FSC-certified timber, the material originates from environmentally sustainable forests characterised by efficient resource usage and it bears quality seals guaranteeing economic and ecologic sustainability.

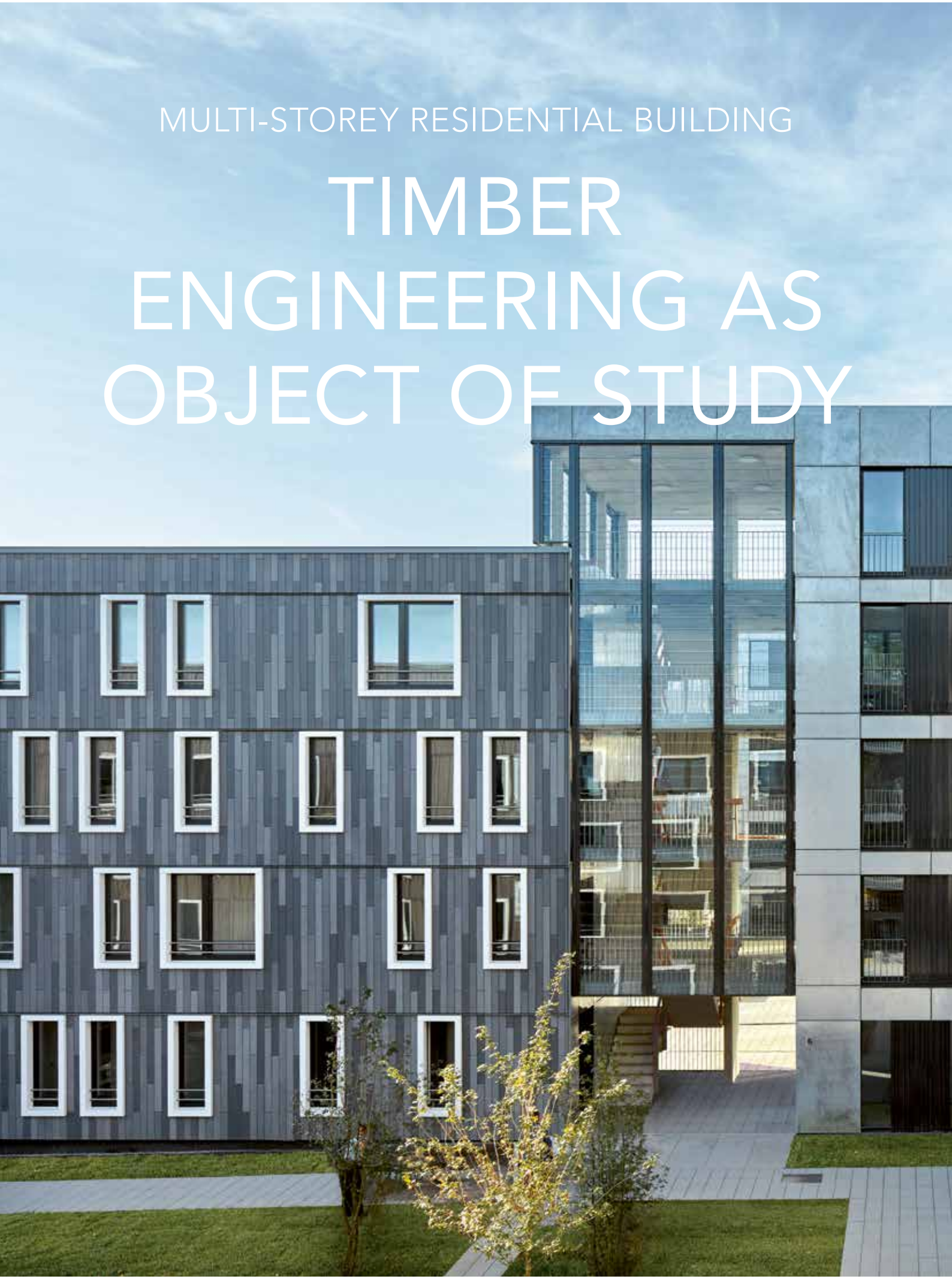
Completion: 2019
Execution timber engineering works: 03/2018 - 08/2018
Building owner: CD Construction Group, Sydney (AUS)
Architects: Architecture BVN, Sydney (AUS)
Technical office for timber structure: TTW, St Leonards (AUS)
Timber engineering: Rubner Holzbau, Bressanone (IT)
Size: 3,600 m^2 of total floor area, 1,200 m^2 of garden area,
100 m^2 children's playground
Glued laminated timber: 33 m^3 columns, 36 m^3 posts
Steel: 6,4 t
Pictures: The Moment It Clicks – Phil Noller

The library in Marrickville opened its doors in August 2019 and the visitors are welcomed by spacious areas, which are generously illuminated by natural light. In these areas, the users are invited to sit, read, work or simply meet. Oversized, floor to ceiling windows create unique views from the inside looking out to the green lawn decorated with publicly accessible artworks.

Curved balconies provide a view into the heart of the library with its thousands of books and connect numerous reading and learning areas. Single floors connect to the old hospital building via suspended glazed walkways and offer numerous spaces to socialise. And somewhere in this building you might certainly find one or two readers who are taking an intensive and closer look on those books dealing with timber engineering.

MULTI-STOREY RESIDENTIAL BUILDING

TIMBER ENGINEERING AS OBJECT OF STUDY



The new student's residence complex in Bochum has been designed as adequate and up-to-date response to pending questions in terms of housing shortage and rapid residential construction. The new construction of three residential buildings with prefabricated building façade in timber frame construction has been funded by the Federal Ministry of Construction in Bonn with a total of 3.3 million Euro, since the buildings meet the German passive house standard. In November 2019 the residential units were handed over to be occupied by 258 students.

The demand for housing space in urban agglomerations, such as the Ruhr area, increases as much as the number of students. The influx of students and trainees into these areas does not particularly alleviate the tense housing situation. Newly built residential buildings must consider several aspects: on the one hand income levels of young professionals are mostly low - yet housing must be affordable - and on the other hand residential buildings must be erected within very short construction periods.

When it came to decide on the construction of a new student's residence complex in the Laerheide Street in Bochum, located in the immediate vicinity of the Ruhr University of Bochum, the Akademische Förderungswerk of Bochum (a student's support organisation) acting as the contracting authority, opted for a building in hybrid construction with maximum level of prefabrication. The ACMS-Architects office designed a combination of prefabricated components made of reinforced concrete and a façade made of prefabricated timber panel elements and presented three identical, multi-storey buildings in passive house standard, which were able to offer accommodation to a total of 258 students.

The complex is composed of three L-shaped buildings whose head buildings overtop with its five floors the buildings' sides, which have only four floors. Since the complex has been built on a former mining site, ground stabilisation measures were required prior to revitalisation by partially backfilling the localised coal layers. A complicated initial situation where timber constructions can display their inherent advantages since these buildings score with reduced weight.

Within a period of only six months, we were able to build 1-room, 2-room and 4-room apartments, partially furnished, with common and utility rooms in the ground floor. In the outdoor areas, particular care was taken to preserve the stock of trees and to profit from the topography of the site for natural rainwater management.

The very short construction period, which in the Bochum project could be reduced by 10 months compared to other residential building projects where constructions are built by conventional building methods, was secured by the buildings' shell construction with prefabricated concrete elements and the façade executed as timber frame construction. To do so, 5,500 m^2 of façade elements were fabricated in the Austrian Rubner factory in Ober-Grafendorf with three different types of surfaces (prematurely greyed larch cladding, glass fibre reinfoced concrete panels and galvanised sheet metal elements), which were then delivered on time to the construction site ready for assembly. The 444 windows including fall protection devices and reveals were also pre-installed in the factory.

A reinforced concrete, hollow core slab system installed on steel main beams is provided as unsupported ceiling in the rooms. The gable walls in these multi-storey buildings were executed as bracing walls and then filled on site as semi-finished elements. No major structural work will be required to flexibly modify, at a later stage, the floor plans of the buildings thus allowing to transform in a future scenario the student's residence into a type of shared assisted living apartments with nursing services, or to integrate office facilities, basically because the entire complex provides barrier-free access already.

The assembly of the building shell was made without any scaffold at all, only with the help of lifting platforms. To do so, special fitting elements had to be installed in the joint areas since prefabricated façade elements themselves had a well-designed joint formation. Thanks to the entire prefabrication process, up to 450 m^2 of façade elements could be assembled per day. Each of the three buildings was therefore erected within a period of only three weeks and provided with a weatherproof building shell. The galvanised metal sheet façade elements were installed on Rubner external wall elements in the factory already.

Besides the flexible use of the building, the modular construction system of the student's residential complex also scored with extremely short construction periods and top execution quality. The high level of architectonic detailed engineering, prefabrication of system components and the use of pre-assembled bathroom modules contributed to the success of this building complex, even in terms of economic aspects.

For buildings, which are erected in compliance with passive house standards, where primary energy demand must not exceed a value of 40 kWh/m², external wall elements in timber frame construction are a space-saving and highly heat-insulating alternative, which, of course, also meets all requirements in terms of sound and fire protection made in the field of multi-storey building construction.

„All of the experts involved in project execution, i.e. designers, manufacturers and assemblers, were ruled by the idea of high prefabrication rates. That was just perfect and amazing! It is a very good example of how fast a finished building shell can be erected."

Marc André Leja, Project Manager
Rubner Holzbau Augsburg

Completion: 2019
Building owner: Akademisches Förderungswerk, public agency, Bochum (GER)
Architects: ACMS Architekten, Wuppertal (GER)
Timber engineering: Rubner Holzbau, Augsburg (GER)
Façade: 5,500 m² of prefabricated façade elements, out of which 1,680 m² of timber façade cladding and 1,730 m² of fibre concrete façade cladding
Windows: 1,600 m² for 444 units, 2,030 linear metres of sheet metal
Pictures: Sigurd Steinprinz

MAXIMUM PRECISION

PREFABRICATION AS QUALITY FEATURE

Smooth production regardless of any adverse weather condition, reliable timetables and schedules as well as high cost-transparency – prefabrication provides many advantages and is nowadays considered to be the most efficient solution in terms of economic aspects. In the realisation of the student's residence complex in Bochum, maximum level of prefabrication was used for façade elements.

The timber engineering works, which were to be executed for the new student's residence complex in Bochum, seemed to be a pretty easy task. Assembly of prefabricated timber panel elements for the façades of the three identical multi-storey buildings was carried out without any scaffold at all only with the help of lifting platforms. Every day, assemblers were able to install - in a noise-reduced manner - up to 450 m^2 of façade elements. Each of the three individual buildings was therefore erected and provided with a weatherproof shell within a construction period only three weeks.

The fact that this project could be executed so smoothly and without any delay in the schedule was clearly owed to the high level of prefabrication, to the perfect coordination of all experts involved in the project, and to the very high processing quality of individual building elements. Even before the first machine in the Ober-Grafendorf production halls was started, plans were discussed in detail with the architects. In addition, all other trades involved in project execution were also integrated in this preliminary planning process.

"Previous communication is extraordinarily important. Only if all parties involved in the project have the same perception of the works that need to be executed and are able to identify eventually arising problems beforehand will it be possible to guarantee that all processes are smoothly executed. This highly demanding student's residence complex in Bochum is a prime example for timber engineering projects, since all requirements from the different trades were coordinated and brought together

under our company's roof", explains Andreas Fischer, CEO of Rubner Holzbau in Germany from his own experience.

Today, modular construction offers large freedom of design without any limitations whatsoever, provided, however, that all details have already been exactly discussed in a preliminary project stage: Which technical installations must be taken into account in façade elements? Where should ventilation shafts be installed in the buildings? or: Where shall integrated sun protection systems be installed and from how many points shall these systems be controllable? This project is a particularly good example to show the manifold advantages of high-level factory prefabrication. Optimum fabrication conditions in weatherproof and dry production halls allow detailed and exact design, which also includes logistics and transport periods. This secures on-time project execution with maximum adherence to time and process schedules as well as cost transparency.

The distinctive feature of this specific project certainly was the high level of prefabrication, which led to full completion of outside façade elements in the Austrian factory of Rubner Holzbau in Ober-Grafendorf. The entire 5,500 m^2 of façade elements were manufactured in the factory with three different surface designs - prematurely greyed larch cladding, glass fibre reinforced concrete panels and galvanised sheet metal elements. In addition, all 444 window elements, including window glazing and technical components, were also inserted in the factory. Cutting the glass fibre reinforced concrete panels was a special and unusual challenge that our company had to master, since the manufacturer did not offer any formatting of its products. Therefore, we had to develop and install special machines to process this material.

Although this high level of prefabrication required adequate transport protection, it allowed to considerably reduce actual assembly periods on site. Compared to other residential buildings erected by using traditional building methods, time required for assembly was reduced by ten months.

„All parties involved in the project had the same understanding of factory prefabrication. Detailed architecture design was the key factor to achieve this economic solution."

Andreas Fischer, CEO
Rubner Holzbau Augsburg

TIMBER – WHAT A WONDERFUL MATERIAL

AT THE MANOR'S HOUSE

With its impressive timber roof construction and with its very cosy atmosphere, the newly built traditional Austrian wine tavern (Heuriger) of winemaker Michael Bauer from Mitterstockstall underlines the quality of his wines. Wine connoisseurs describe them as enjoying a holiday in a glass and as experiencing a moment of pleasure.

As soon as autumn starts to invade the 40 metres high, elongated terrace of the Wangram wine region, thousands of grapevines start preparing for the season. First of all, they start by changing the colours of their leaves and finally they end-up dropping all of their leaves. By the beginning of October, the moment has come for the regional winemakers to start harvesting their grapes in order to obtain their natural product from the vineyards. This process is repeated by winemakers every year and also by Michael Bauer from Mitterstockstall (AT), who recently decided to have erected a small, yet modern designed traditional wine tavern at his family-owned manor's house to offer the possibility to taste family-cultivated wines. It was architect Laurenz Vogel, who was also born in this beautiful wine region, who had the idea of building this new wine tavern.

"I do not execute a project just because it is a State-of-the-Art project – I am rather interested in analysing the interaction of a particular place with its history", reveals architect Laurenz Vogel in an interview he gave to the Wood Magazine. It was therefore not surprising at all that the new wine tavern with its tasting room was aligned in parallel to the former barn and that the architect, who also is a trained master carpenter, decided to execute the building by using timber as construction material. Structural conditions on site as well as the surrounding landscape served as source of inspiration.

„Thanks to the excellent cooperation between statics, construction, project management and fabrication we were able to fulfil all the ideas and requirements set by the client and the architect. This is one of our main strengths."

Albert Winter, Project Manager
Rubner Holzbau Ober-Grafendorf

The entire ridged roof construction, a freestanding, unsupported roof truss with roof beams and double tie joints is made of timber. This structure is not visible from the outside since the roof with its tile covering has been designed as steep sloped roof to provide as much shadow as possible during the summer months. Therefore, the visitor of this wine tavern is welcomed by an open and bright interior design. A 21 metres long, spanned ridge roof beam is supported by inclined rafters traversing the entire room. The thus resulting load on the wall plate is transferred onto the glued laminated timber tension rods.

All prefabricated wall elements have been inserted into the rib system as wooden frame construction with a closed timber façade right in front of it. External walls have been designed with a curtain-type board cladding and windows are made in timber and aluminium. "Usually, I prefer to work with small and regional carpenters but in this particular case the perfect choice was to cooperate with a large and experienced timber engineering company such as Rubner Holzbau", explains architect Laurenz Vogel who highly praises the cooperation with our company.

Completion: 2018
Building owner: Michael Bauer, Mitterstockstall (AT)
Architect & structural designer: Laurenz Vogel Architekten, Kirchberg am Wagram (AT)
Statics & structural physics: Rubner Holzbau, Ober-Grafendorf (AT)
Timber engineering: Rubner Holzbau, Ober-Grafendorf (AT)
Construction: 32 m^3 of glued laminated timber construction in spruce with beam cross-section Roof beams 16/32 cm x 21 m, 280 m^2 of prefabricated roof elements with dimension 2.9 x 21 m (plain edged formwork), 85 m^2 of prefabricated wall elements with dimension 4 x 4 m (frame construction made of solid structural timber with intermediate insulation), wall cladding at the windows
Pictures: Leonhard Hilzensauer

Rubner Holzbau was charged with the realisation of all structural engineering and design works. The glued laminated timber structural frame as well as all roof and wall elements were prefabricated in the Ober-Grafendorf factory, transported to the construction site and assembled. The company was also responsible for the execution of all roofing and plumbing works.

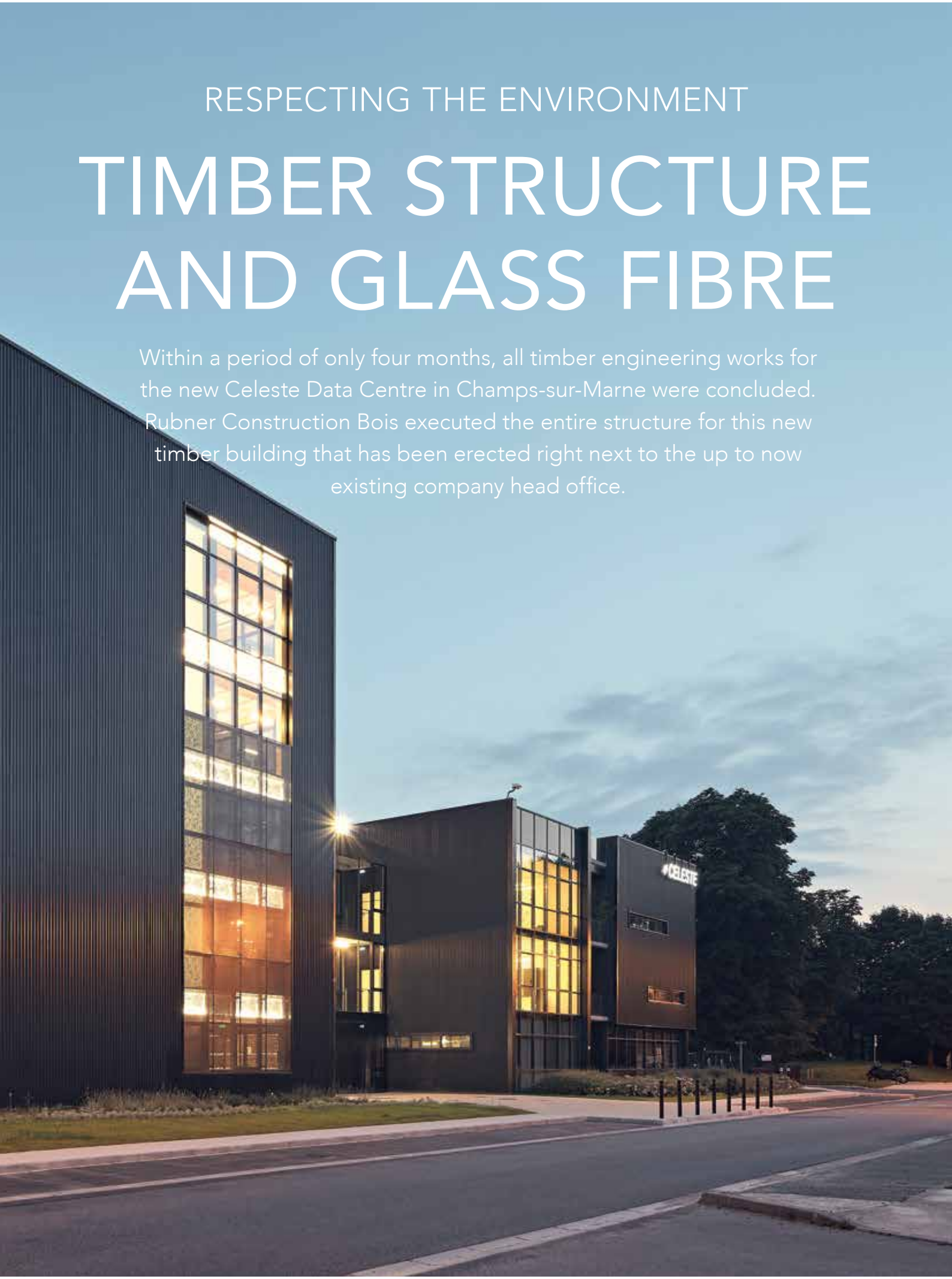
„Timber is a wonderful material because it allows rapid and efficient construction – if we had not used timber as construction material for this traditional tavern, we would never have been able to finish this project so quickly."

Laurenz Vogel, Architect

RESPECTING THE ENVIRONMENT

TIMBER STRUCTURE AND GLASS FIBRE

Within a period of only four months, all timber engineering works for the new Celeste Data Centre in Champs-sur-Marne were concluded. Rubner Construction Bois executed the entire structure for this new timber building that has been erected right next to the up to now existing company head office.



The economic success and achievements of the Celeste Data Centre in Champs-sur-Marne are not clearly visible in public: within the first six months of the year 2019, the company installed as many glass fibre cables as in the entire year of 2018. Some 4.000 clients throughout France rely on the services of this company, among others, hundreds of fire stations in Paris, which need rapid, secure and well-functioning connections to the cable network. What, however, has become increasingly visible for everyone in the last few years was the lack of space in the company head office, which finally ended up in the urgent need of additional office space and a second data centre with additional server rooms. When it came to decide on the new construction of the data centre, which was to be erected on the neighbouring

premises of the already existing company head office, the persons in charge of the project decided to choose timber as natural construction material, since it was considered to best represents the company's own values, which are basically ruled by environmental responsibility and respect as well as sustainable development. All these values are perfectly guaranteed by using timber as construction material which, apart from being a renewable raw material, is also able to store CO2. In addition, this strategic decision offered some more advantages due to the inherent properties of timber: noise generation on construction site was considerably reduced and the same applied to the level of soiling. In addition, ongoing operations in the neighbouring building were hardly affected by construction works. The five-storey building was built around a concrete core that has been provided to accommodate staircases and lift shafts. Rubner delivered the entire timber structure for the building. Glulam beams were mainly used as well as CLT-panels, which - apart from its high static loading capacity allow to implement new dimensions in terms of architecture and design. The crosswise laminated timber panels allow a bi-axial load transfer, which up to now, had been exclusively achieved by steel concrete constructions. The inherent rigidity and stability of the panels has an additional positive effect on the building bracing.

„CLT, glued laminated posts and beams and wooden timber frame walls, the mix and complementarity of the wooden solutions produced by Rubner Group is a real key to efficient projects and effective sitework."

Alexis Duhameau, Directeur commercial
Rubner Construction Bois

Thanks to the installed and prefabricated timber frame panels for the outside walls the rapid execution of construction works could be secured, and timber construction period was limited to only four months. The fact that time was considered a decisive parameter in the very early preliminary project stage was owed to digitalisation. In order to optimise data transfer and to offer higher data transfer speed in the information exchange with the parties involved in the project, i.e. design office, responsible architects and executing building

companies, digital tools were installed for this data centre construction site.

More than 30 new jobs are offered in this second, 19 metres high and box-shaped building of the ecological Celeste Data Centre, which is linked to the existing building on the neighbouring premise by a continuously glazed metal sidewalk. The CLT panels were also used in this sidewalk since they support cantilevered, point-supported constructions and allow the implementation of this type of structures.

The entire timber construction of the building was covered by a dark black metal cladding to be identical with the already existing company building. By using this exterior building design, the company complex enters into a dialogue with the neighbouring forest strip, which separates the building from the adjacent motorway and almost hides the Celeste building.

Once the execution design had been completed by Rubner construction bois, the employees started with the production of the timber elements, delivered them to the Celeste head office premises and assembled the individual elements on site. Nicolas Aubé, the founder of the Celeste company, was highly pleased to observe the largely clean timber construction works since he does not want to be part of the polluting industry.

Completion: 2019
Project owner: Celeste, Champs-sur-Marne (FR)
Architects: ENIA Architectes, Montreuil (FR)
Technical office: S2T, Sèvres (FR)
Timber engineering works: Rubner construction bois, Chassieu (FR)
Façade: 1,050 m^2 of prefabricated façade elements
Cross laminated timber: 200 m^2
Glued laminated timber construction: 110 m^3
Pictures: Epaillard+Machado Photographie

RESEARCH CENTRE

HEALTH AND ENVIRONMENT

The main target that is pursued by the Helmholtz Centre located in the North of Munich is to develop personalised medical approaches for the diagnostic analysis, therapy and prevention of major and widely spread common diseases, such as diabetes. Working in close cooperation with designers and architects, and supported by the employees of several handicraft businesses, Rubner Holzbau developed state-of-the-art building solutions for this new research centre.

"Some eight years ago, the Helmholtz Centre in Munich decided to place its strategic focus on the research of diabetes. It was almost exactly one year ago, when we gathered here at this point to lay the foundation stone, and today the building shell has been completed and we are glad to see how construction is rapidly and successfully progressing", explains Dr. Alfons Enhsen, Managing Director at the Research Centre in charge of the scientific-technical infrastructure, on the occasion of the topping out ceremony in May 2016.

The newly built Diabetes Research Institute is undisputedly a very important milestone for the infrastructure of this centre and for the approximately 400 employees. With a total of some six million diagnosed diabetes cases in Germany alone, diabetes is considered a widespread common disease. However, the estimated number of unreported cases, i.e. people living with this disease without knowing that they suffer from it, is supposed to be as high as the number of diagnosed cases. This new, four-storey multidisciplinary, bio-scientific research centre in Neuherberg was built with the aim to be able to control this diabetes epidemic. During the design phase of this building, interaction and communication among scientists of the different institutes and workgroups was particularly valued. To translate increased transparency in research work into the building language,

„Working with different façade materials was a highly interesting task that we had to handle in the interfaces of building geometry."

Andreas Paus, Project Manager
Rubner Holzbau Augsburg

Rubner Holzbau executed in this new building a large-scale post and beam façade. This façade is a double façade in the form of a timber-glass construction with solar protection glazing and a curtain-type steel-glass façade with single glazing. Whereas the outside layer serves as protective layer against emerging environmental impacts, such as solar radiation, wind or rainfall, the inside façade provides for thermal insulation. A further advantage of this double façade is the air-conditioning effect that is achieved in the building since in the case of extreme temperatures, outside air adapts to inside temperature before entering the building.

Light penetration to the building's inside is increased even more by skylights that are inserted into the glass roof construction. These skylights are a quiet modern lighting design for a building. In addition, full glass railings were installed as anti-fall glazing devices. A special timber post and beam add-on construction was developed for the existing pitched roof area, and an additional add-on-construction with a weight of more than 40 tons has been installed along the vertical solar protection glazing.

This construction also contains the horizontal blinds, which serve as solar protection device and which can be operated electrically. Two aluminium porch roofs and one windscreen construction, which offer additional protection against wind and cold, complete the modern design of this new Diabetes Research Centre.

All timber-aluminium post and beam façades as well as all aluminium façade elements were factory designed and manufactured by Rubner Holzbau. Following on-time delivery of building elements on the construction site, Rubner was also responsible for the assembly of the elements and for the coordination of timber and steel façade construction works. Besides the plumbing works involved in this project, Rubner experts were also charged with the execution of the glass roof construction and the full glass railings.

"In the design of the new Diabetes Research Centre we were ruled by the idea of combining the function and the form of the building. Form follows function, this is how the Architect and the CEO of HDR, Dipl.-Ing. Guido Meßthaler, summarises his approach for this specific project. "With this newly installed building, cutting-edge research in the field of diabetes is supported in many aspects. It not only combines communication spaces with laboratory landscapes, but it also links this new research centre to other institutes, which are located on this campus, thus allowing the scientists to develop common solutions."

„Project implementation was successfully and outstandingly achieved. All technical designers and workmen have carried out excellent work."

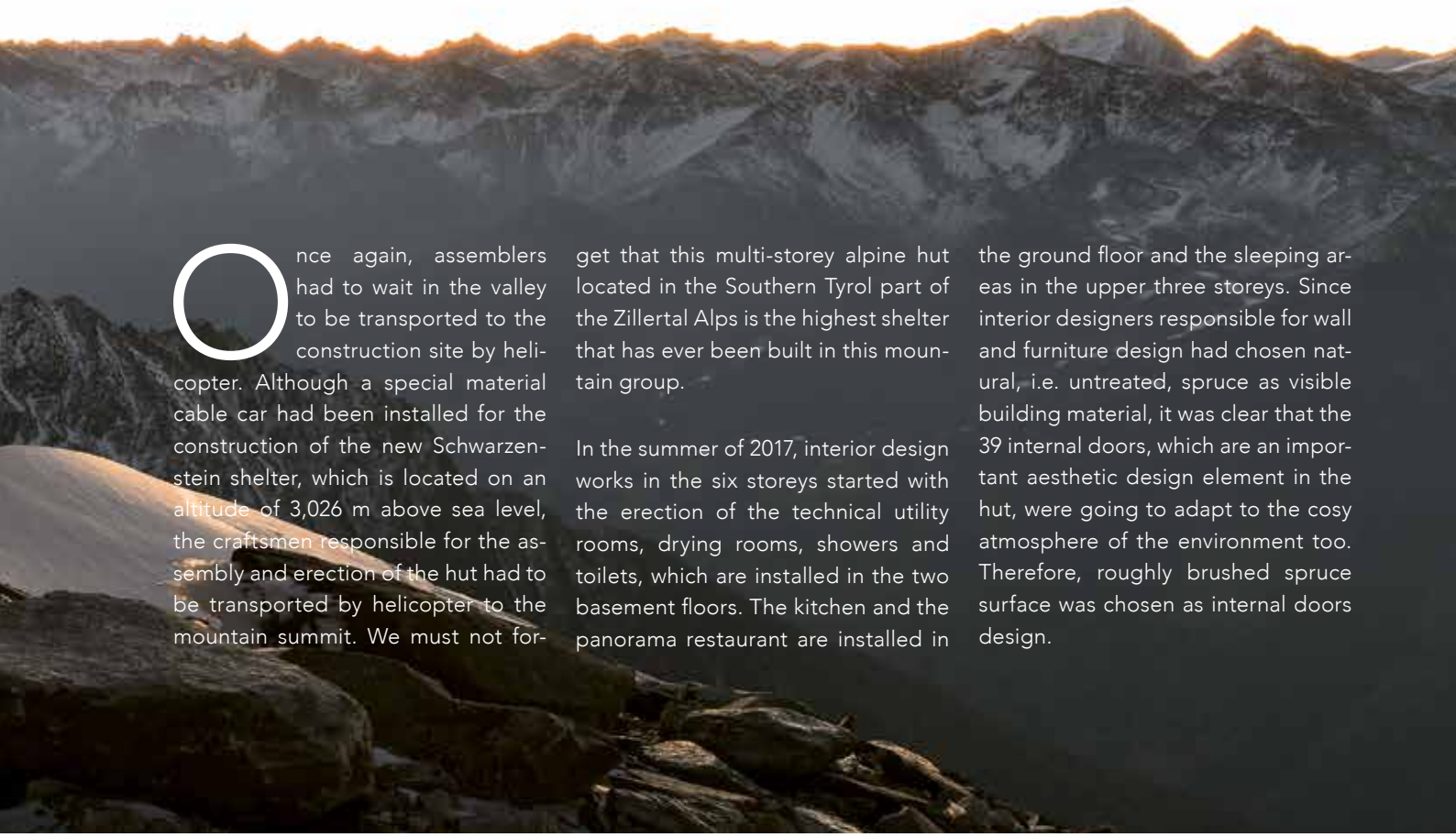
Dipl.-Ing. Guido Meßthaler,
CEO of HDR

Completion: 2019
Building owner: Helmholtz Zentrum München Deutsches Forschungszentrum für Gesundheit und Umwelt (German Research Centre for Health and Environment), Neuherberg (GER)
Architect: HDR, Düsseldorf (GER)
Timber and façade construction: Rubner Holzbau, Augsburg (GER)
Façade: 5,115 m² of façade surface,
1,160 m² of aluminium post and beam façade with solar protection system,
1,420 m² of timber-aluminium post and beam façade with solar protection glazing,
1,800 m² of steel post and beam façade with single glazing system,
41 t of steel supporting structure for vertical glazing and pitched roof area,
360 m² of post and beam add-on construction with vertical solar protection glazing,
375 m² of post and beam add-on construction of pitched roof area with solar protection glazing,
1,639 m² of horizontal aluminium blinds as solar protection device,
250 linear metres of full glass railings
Pictures: HGEsch

SCHWARZENSTEINHÜTTE

SOLID TIMBER BEYOND THE TREE LIMIT

The interior design of the newly built high alpine hut, the Schwarzensteinhütte in the Zillertaler Alps, is decorated with 39 internal doors designed and manufactured by Rubner Türen. These doors, which score with their manifold quality features, such as durability, optimum sound insultation, increased fire protection classification and spruce surfaces, create a distinctive and cosy atmosphere in this shelter built in the Austrian mountains.



Once again, assemblers had to wait in the valley to be transported to the construction site by helicopter. Although a special material cable car had been installed for the construction of the new Schwarzenstein shelter, which is located on an altitude of 3,026 m above sea level, the craftsmen responsible for the assembly and erection of the hut had to be transported by helicopter to the mountain summit. We must not forget that this multi-storey alpine hut located in the Southern Tyrol part of the Zillertal Alps is the highest shelter that has ever been built in this mountain group.

In the summer of 2017, interior design works in the six storeys started with the erection of the technical utility rooms, drying rooms, showers and toilets, which are installed in the two basement floors. The kitchen and the panorama restaurant are installed in the ground floor and the sleeping areas in the upper three storeys. Since interior designers responsible for wall and furniture design had chosen natural, i.e. untreated, spruce as visible building material, it was clear that the 39 internal doors, which are an important aesthetic design element in the hut, were going to adapt to the cosy atmosphere of the environment too. Therefore, roughly brushed spruce surface was chosen as internal doors design.

Completion: 2018
Building owner: Autonomous Province of Southern Tyrol (IT)
General Constructor, Solid Construction: Burgerbau, St. Magdalena/Gsies (IT), Oberlechner & Messner, Rasen-Antholz (IT)
Architect: Stifter + Bachmann, Pfalzen (IT)
Structural engineering: Ing. Stefano Brunelli, Bruneck (IT)
Doors: Rubner Türen, Kiens (IT)
Services provided: 39 internal doors with spruce surface (roughly brushed), 10 internal doors with fire protection classification REI 30, 15 internal doors with fire protection classification REI 60, 3 internal doors with fire protection classification REI 60 with side elements
Pictures: Oliver Jaist

Flush-mounted internal doors were installed and act as space-saving design element. However, precise preliminary planning activities were required since due to the remoteness of the building site it was very difficult to carry out all measuring activities during the very short construction period in the summer months. The built-in door frames were installed in a way that carpenters merely had to insert the partially very large door elements that had been transported to the top of the mountain. This was a precision and millimetric challenge, above all in the case of the floor-to-ceiling doors and of the doors with side elements.

Technical requirements made on the internal doors in the Schwarzenstein shelter do not considerably differ from the technical requirements made on internal doors installed in lower regions. Durability is an important aspect and the same applies to optimum sound insulation features, above all in the floors were the sleeping areas have been installed. These areas have been dimensioned to accommodate two to ten persons. In order to secure increased fire protection, different protection classifications were used, which guarantee a fire inhibition time from 30 and/or 60 minutes. This was the first time that we installed a flush-mounted version of our internal door REI 60.

Detailed project design and logistic services for material and staff transport strongly contributed to the fact that construction of the Schwarzenstein shelter was carried out without any delay and always adhering to the set schedules. Even in this high-alpine terrain, the precision doors manufactured by Rubner Türen display their artisanal and technically perfect quality standards. Project managers involved in the implementation of this project were full of praise for the "extraordinary collaboration" since each of the different trades involved in project execution behaved like one part of a well-coordinated rope team where team members can blindly trust one another.

ZELUBA® OF THE FRAUNHOFER WKI

LIGHTWEIGHT AND ENVIRONMENTALLY COMPATIBLE

With a ground-breaking new construction and an earthquake testing station, the Frauenhofer Wilhelm Klauditz Institute (WKI) will extend its research capacities. The newly installed building, with an overall usable area of some 1,700 m^2, will house the ZELUBA® Department, the centre for lightweight and environmentally compatible buildings.

New concepts designed in terms of modular, hybrid building systems for lightweight and environmentally compatible structures will be developed in future in this building of the Technical University of Braunschweig in cooperation with the Frauenhofer WKI. To be able to develop building solutions against the background of climate changes, population growth and large migration flows, the contracting authorities decided to test - with the building itself - different and highly promising construction methods. A hall that is built following the traditional method of glued laminated timber structure with an axis spacing of 2.80 m and a span width of 19.20 m. The ridged roof beams, mounted on columns, house - among other installations, an earthquake testing station. Sensitive laboratory equipment is operated in the first floor of the 46 m long and three storeys high office and laboratory section. To secure that these highly sensitive measuring instruments do not start oscillating by walking-around persons, the ceiling above the ground floor had to be provided as extremely heavy structure, which was achieved by a timber-concrete hybrid construction with filigree concrete ceiling on timber beams. The same construction was used for the ceiling on top of the upper floor but with reduced dimensions. The ceiling of the second floor has been executed as timber beam construction. Factory pre-fabricated outside wall elements in timber frame construction with a length of ten metres and with completed wall structure and inserted windows allowed to rapidly complete the building shell and secured construction progress in compliance with the set schedule. The home of this new competence centre is therefore, at the same time, the first practical implementation of this approach: to use timber in combination with hybrid and largely pre-fabricated sustainable construction systems as viable and future-orientated building material.

Completion timber engineering works: 2019
Scheduled commissioning of the building: end of 2020
Client: Fraunhofer-Gesellschaft
zur Förderung der angewandten Forschung e.V., München (GER)
Architects: Company Association ZELUBA of DGI Bauwerk | schneider+schumacher
Hall: 123 m^3 of glued laminated timber, 1,590 m^2 of Kerto laminated veneer lumber, 737 m^2 elements
Riegel: 119 m^3 of glued laminated timber structural frame, 840 m^2 of timber-concrete hybrid ceiling, 868 m^2 of wall elements with inserted windows, 1,114 m^2 of cladding elements.
Bilder: Fraunhofer WKI/Stefan Thiele

1. Ridged roof beams mounted on glued laminated timber columns as traditionally built hall frame structure with a span width of 19.20 m.

2. Pre-fabrication of outside wall modules with a length of 10 m. Factory installed windows, insulation and exterior cladding.

3. The mass of the heavy timber-concrete hybrid ceiling reduces oscillations in the laboratory section.

4. The hall columns are provided with the required notches, which serve as support for the crane track.

5. Research hall and three-storey office and laboratory section are connected by an intermediate structure.

GERMANY

The new Children's Museum of the Berlin Jewish Museum will open its doors in May 2020. Under the roof of the former Central Flower Market right opposite the museum's main building in Berlin-Kreuzberg, the new children's museum is presently being built on a surface of 2,700 m^2. This museum is intended to be a place where children aged between three and ten years can meet to discover, explore or just play. With a height of seven metres, the impressive circular timber construction built by Rubner Holzbau Augsburg reminds us of an historic ark but also looks a little bit like a spaceship. This structure "combines the past and the future and inspires us to newly interpret the story of the Deluge and the saving ark against the background of present social and ecologic questions", explains the museum representative.

AUSTRALIA

The "Chadstone Link", a stylish and weather-protected walkway, is presently built in Melbourne and links the Chadstone Shopping-Center to the new office tower "Tower 1" and to the new MGallery of the Sofitel-Hotel Group. On a length of 110 metres, the spaciously designed and multi-purpose area in one of the largest shopping centres of the southern hemisphere provides manifold possibilities for exhibitions and many other events. The 31 differently dimensioned and individually formed timber arches made of glued laminated timber elements by Rubner Holzbau Brixen harmonically connect to the arched glass roof of the adjoining building complex and reach, at their highest point, a height of 15 metres. A highly translucent PTFE-cloth positioned on top of the glued laminated timber structure provides for lots of natural light.

UNDER CONSTRUCTION AND COMPLETED PREVIEW

AUSTRIA

With the Technical College and Research Centre for Agriculture and Food as well as Food Technology and Biotechnology (HBLFA - Höhere Bundeslehr- und Forschungsanstalt für Landwirtschaft und Ernährung sowie Lebensmittel- und Biotechnologie Tyrol), which is presently being built on a surface of some 20.000 m^2, a new and unique agricultural research and educational centre will be created in Rotholz, Austria, with classrooms, practical training rooms and laboratory areas, including a model plant for milk processing and a boarding home. The entire building complex with a total of 6,800 m^2 of factory prefabricated elements and 870 m^3 of glued laminated timber from PEFC-certified boards is built by Rubner Holzbau Villach in accordance with the climate active gold building standard, an Austrian standard, which is a synonym for energy efficiency, climate protection and resource efficiency.

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