

11-15 Kneuterdijk, The Hague,
The Netherlands
GVB Architecten, Leiden

Kværnerbyen, Oslo, Norway
Arcasa Arkitekter, Oslo

BUGA 2019 Garden Show,
Heilbronn, Germany
Architektur 6H, Stuttgart

Parken³

04



English
Version

Bauwelt Special

04

‘The future of urban mobility lies in interconnecting transport networks – that’s where parking system providers really come into their own.’

Reginald Eckhoff, Architektur 6H, Stuttgart

Parken³

A cooperation between
WÖHR Autoparksysteme GmbH
and Bauwelt

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Photos (from top to bottom): Esspe Studios, WÖHR Autoparksysteme GmbH, Eirik Evjen, Bundesgartenschau Heilbronn 2019 GmbH, Klaus Mellenthin, WÖHR Autoparksysteme GmbH

Cover photo: Esspe Studios, WÖHR Autoparksysteme GmbH

All photos of parking systems in this edition: WÖHR Autoparksysteme GmbH

Confidence in the future

Every company has to prove its future viability in order to remain successful and competitive. Otto Wöhr, known as WÖHR Autoparksysteme GmbH since 2017, has been pursuing such a strategy for years. In 2018 WÖHR had a state-of-the-art small parts warehouse assembled at its Frielzheim headquarter. The automated modular container system by AutoStore enables rack-free, space-saving and flexible storage. Within seconds, the required items can be made available on site for the assembly of parking systems or sent directly to the construction site.

WÖHR also started making BIM-capable data of its parking systems available for download in 2018. With the help of Building Information Modelling (BIM), digital building models can be created which greatly improve the exchange of information among all planning participants. The BIM-enabled, scalable 3D models of the WÖHR parking systems complement the already available conventional 2D plans. Architects and engineers can easily insert these into a 3D model and then scale them accordingly.

Further future-oriented ideas can also be found in the projects that are presented in this issue: In 2018, GVB Architecten convincingly and sensitively transformed a former bank building in The Hague – consisting of several listed building parts – into a new ensemble of offices, residential units and restaurants. In the course of the redesign, the architects had to create numerous parking spaces. They fulfilled this requirement with an above-ground parking system by WÖHR that is visible from the outside.

In a former industrial area in Oslo, Arcasa Arkitekter are providing fascinating insights into visionary urban planning and architecture. The Kvæernerbyen quarter in the east will be completed by 2020 but has already achieved key goals for the Norwegian capital, including attractive transport links to the city centre, a high standard of living and a reflective approach to individual traffic. And hidden away beneath the district lies a state-of-the-art WÖHR car parking system.

Meanwhile, the German horticultural show Bundesgartenschau Heilbronn 2019 (BUGA) is the first to include the topics of urban development and housing construction. Architektur 6H created one of the 23 houses of the urban exhibition, the so-called Stadthaus am Neckarbogen. In addition, the firm was also given the task of planning a total of 230 parking spaces for the quarter, which are distributed across two underground garages. We warmly recommend visiting the BUGA, which opens on 17 April 2019. We're sure you'll find it truly inspiring, just like this edition of Parken³.

Sincerely,

Boris Schade-Bünsow, Editor-in-chief, Bauwelt

The making of: BIM

Author **Rebekka Bude**

Drawings **WÖHR Autoparksysteme GmbH**



WÖHR is building up a comprehensive BIM library of all its parking systems.

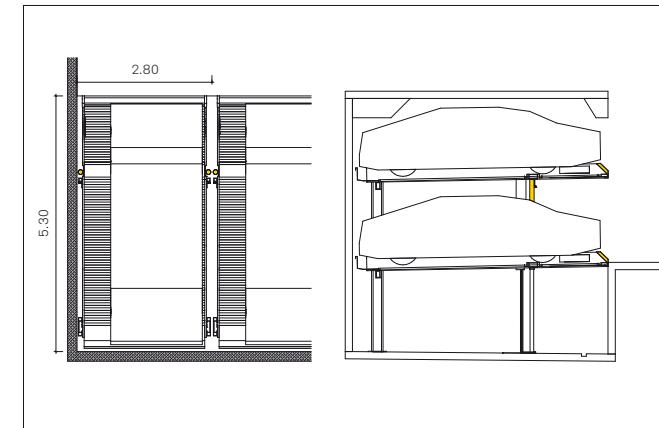
Building Information Modelling (BIM) is a planning method for depicting buildings with all their relevant information over their entire life cycle using a consistent, digital building model. This improved exchange of information between all parties involved in the planning process helps to achieve relevant objectives more quickly and accurately. Since 2018, WÖHR Autoparksysteme GmbH has – in addition to customary 2D drawings – been providing BIM-enabled, scalable 3D models of its parking systems for download, which can be integrated directly into the planning process.

The impetus came from the more advanced BIM countries of Norway, the Netherlands and Great Britain, where this method is already an integral part of all planning activities. In Germany, public-sector projects usually require the use of BIM. This is where WÖHR Autoparksysteme GmbH was also responding to its customers' wish for a modern planning tool which allows architects and planners to insert a parking system into a 3D building model at the touch of a button. By implementing the concept of BIM within the company, WÖHR has taken a major step into the digital future. In early 2018, WÖHR decided to develop these models together with DREICAD, and launched a

joint pilot project. DREICAD converted the supplied data into BIM-capable REVIT data, which is now handled by a responsible employee at WÖHR. The first models available are the Parklifts 450 and 405, and the Combilifts 551, 552, 542 and 543. These are the most popular models of mechanical and semi-automatic parking systems. In future, the data will be available for download on an exchange platform. Until then, a download is possible on the website. Architects who take advantage of this will have a model complete with parameters which can display all the possible configurations. The Parklift 450 alone can be configured in 188 different ways. The model is fully scalable without entering any additional data. It also contains a vehicle profile for

By implementing BIM, WÖHR has taken a major step into the future.

performing collision checks. Planners can view the parking system's technical data immediately in the BIM model. BIM has many benefits: rather than gathering new information when planning each individual building project, as with conventional methods, the data is constantly expanded throughout the project life cycle. This provides clear added value for revisions, calculations and collision checks in particular. Specialists benefit from the information which their project partners have already gathered, removing the need for them to re-enter or duplicate it. BIM also noticeably reduces the possibility of manual errors during data entry. The data is handled within a central building model, which is continuously updated during the planning process. Thus all parties in the project can make informed decisions on the basis of the same, sound data.



Ground plan and section of the Parklift 450 by WÖHR.



The former bank building in the centre of The Hague was converted into a complex comprising offices, residential units and restaurant. A new, glazed car park was added.

Right-hand picture: Hans Götz, GVB Architecten, Leiden.

A coherent ensemble

Author **Brita Köhler**
Photos **Espe Studios, Maasstede**

Project report with
**GVB Architecten,
Leiden**





The new landscaped roof terrace is sheltered from curious eyes.

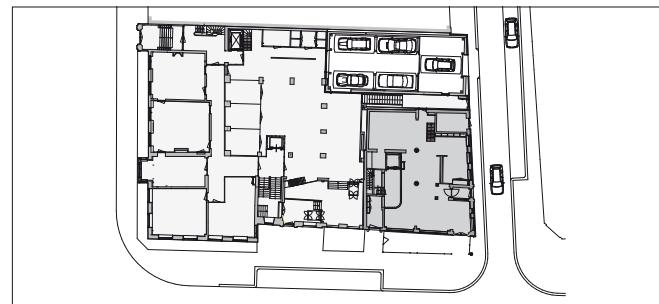
In The Hague, the Netherlands' seat of government, different architectural styles jostle with one another in a productive symbiosis. In 2018, GVB Architecten convincingly and sensitively redesigned a former bank building – consisting of several listed building parts – into a new complex of office space, residential units and restaurant in the historic centre of the city, as well as adding a fully automatic above-ground parking system visible from the outside.

Property developers Maasstede bought a group of historic townhouses in 2011, not far from the pedestrianised centre of The Hague. This perimeter block development situated between three streets surrounds two atriums in a U shape. The oldest building dates back to the 17th century, and besides residential units also houses a private Van Gogh Museum. Over the past century, this and its neighbouring 18th- and 19th-century townhouses were used by a bank. There were also numerous other banks in the neighbourhood. Today, the area is mainly characterised by office buildings, while the retail trade is only scarcely represented.

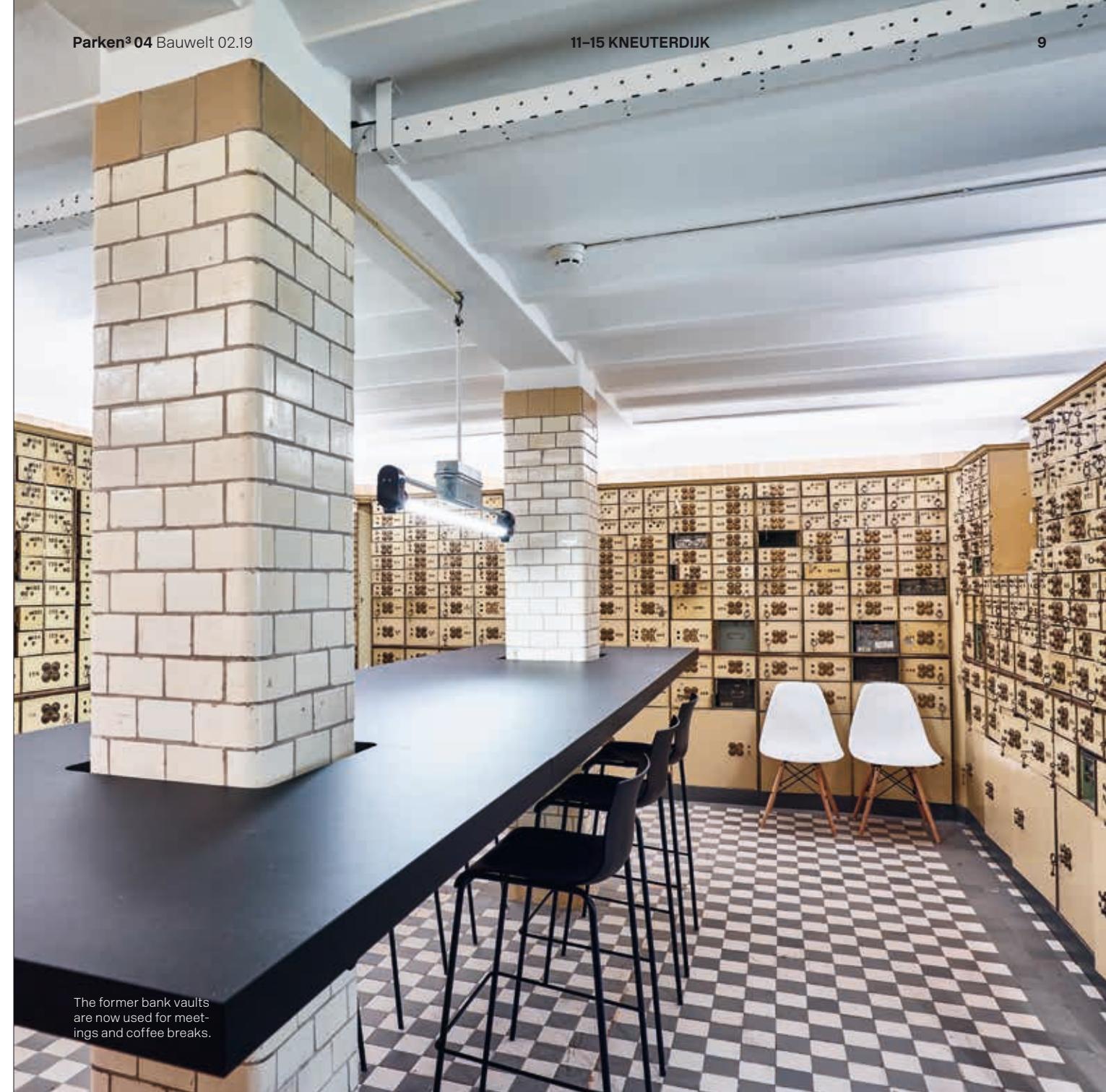
As the redesign began, the building owner and GVB Architecten had to deal with complex regulations on listed buildings and restrictions on building use, which ultimately extended the

planning and implementation period to six years. Due to the change in use, the same demanding requirements applied to the historic building as to a new building. The original concept involved multiple residential units, but the demand for office space grew. Then the financial crisis hit, necessitating cost reductions and changes to the plan. Today the complex has five generous office units, a luxury duplex apartment and an elegant ground floor restaurant. A glazed atrium physically connects these different building areas. The planted roof terrace provides a calm, sheltered space for relaxation, with a magnificent view of the old town. The complex has three addresses and three separate entrances, which give tenants the flexibility to develop and partition it. The owner's request for fine dining was fulfilled with the restaurant, which provides a lively addition to the streetscape and offers office occupants a local option for a business lunch with clients.

Despite the different ages of the buildings, the three townhouses now form a harmonious ensemble after the renovation in 2018. GVB Architecten's design intentionally retained traces of the architecture and period of each original house: the differences in windows and doors in the façade look back to the styles from each period. The clinker brick façade was partially restored. During the renovation, the interior character of the building was restored to the time before it was used as a bank.



The plan for the ground floor of the complex, with WÖHR's Parksafe shown top right, the office space in light grey and the restaurant in dark grey.



The former bank vaults are now used for meetings and coffee breaks.



The local authority helped optimise traffic flow for access to the parking system.

The architects had no plans or documentation from that time, but they used their knowledge, skills and feel for historic building stock to produce an impressive outcome. Concrete elements and suspended ceilings were removed, while old wooden and steel load-bearing structures and concrete supports were exposed for aesthetic effect. The new windows and internal doors were given black steel/aluminium frames. The windows to the street side remained largely as they were, but with improved insulation. The architects introduced sensory materials and unusual details, which heightened and enlivened the interplay of old and new: they retained a 1960s marble stairwell used in the bank and added structural steel banisters, while marble slabs and stone floors formed an elegant floorscape. The heavy doors and safe-deposit boxes from the bank vaults were lovingly restored in detail, and the vaults now house meetings and coffee breaks. In order to accommodate a generous modern workspace, the building's partitioning into small rooms was removed and communicating spaces were created. GVB Architekten designed the office space in a very differentiated way - the spectrum ranges from a classic office interior to a rough, industrial look. Only the restaurant was designed by an external designer.

The bank had no parking spaces in the past. The new planning included the requirement to create a sufficient number of car parking spaces in accordance with current regulations. A 1960s office block on the side street Hoge Nieuwstraat was demolished and a multi-storey car park built in its place.

The way I see it, not much will change the fact that people want to drive cars, and the demand for parking spaces will remain strong. We grasped this opportunity to create a clever, space-saving parking system and integrate it into a transparent, modern piece of architecture. The innovative parking system also works as a valuable marketing tool for us, which could gain us new customers.

The client Tim Nederlof, Maasstede, The Hague



This is where a modern parking system (right) meets the existing built environment (left), a historic ensemble now mainly used as office space.

The existing foundations prevented further work underground, so the fully automatic parking system Parksafe 583 from WÖHR Autoparksysteme GmbH was built above ground, in a compact, vertical format. With 52 parking spaces, this car park now exceeds the city's original requirement. The architects convinced the authorities to accept a building that is taller than initially permitted as an urbanistic counterpart to the theatre tower nearby. This meant the development maximised the number of parking spaces and thus helped offset its investment costs. The building owner and architect chose a transparent, timeless glass façade which provides a view of the cars parked and being parked within the system. It is also possible to view the car park from the office space: the owner's vintage car is always parked in the same place within the system, so it is visible from the office through a pane of glass. Coloured LED strips light up the façade at night.

Almost all the parking spaces are used by people working in the offices, some are offered to local clients of the owner. A space in the car park costs €3,000 a year, which is certainly expensive for The Hague. However, this fully automatic parking system is very convenient and secure, and removes the time spent searching for a city-centre parking space. Users access the

This fully automatic parking system is easy and convenient. Vehicles are ready for users to collect in the transfer area in approx. 100 seconds.

Designing this overground parking system was a pilot project for us. We faced many restrictions and needed to change the flow within the building and the flow of traffic outside in order to implement the car park the way we wanted it. We convinced the city authorities to let us exceed the original building height, as this makes sense in city planning terms and provides ample parking spaces. The next challenge was to build the car park into such a tight space. We are really pleased with the result, thank you to all parties involved! In terms of transport, the Netherlands embodies a contradiction – it has many cyclists on the one hand, but also still has plenty of drivers. It will take a long time for people to change their habits and accept alternatives. Electric vehicles could be the future in the Netherlands, as driving distances here are short enough.

Hans Götz, GVB Architecten, Leiden



GVB Architecten consciously created connections between the restored interior and the WÖHR Parksafe.

entrance area using a RFID chip. From here the vehicle is transported quickly, safely and automatically onto an elevated pallet and from there into a free rack. When users come to collect their vehicles, these are then made available in the transfer area within only approx. 100 seconds.

The Netherlands are ideally suited for electric vehicle (EV) use, as the short distances involved in travel combine well with the limitations of EV range. The Dutch government supports EVs in a variety of ways, particularly for commercial operators like taxi drivers. The Netherlands has the second-highest number of EVs in Europe. The new parking system at 11-15 Kneuterdijk can be retrofitted with charging columns as and when required.



High density: approx. 135 m² of parking space on a tight site.

Architects

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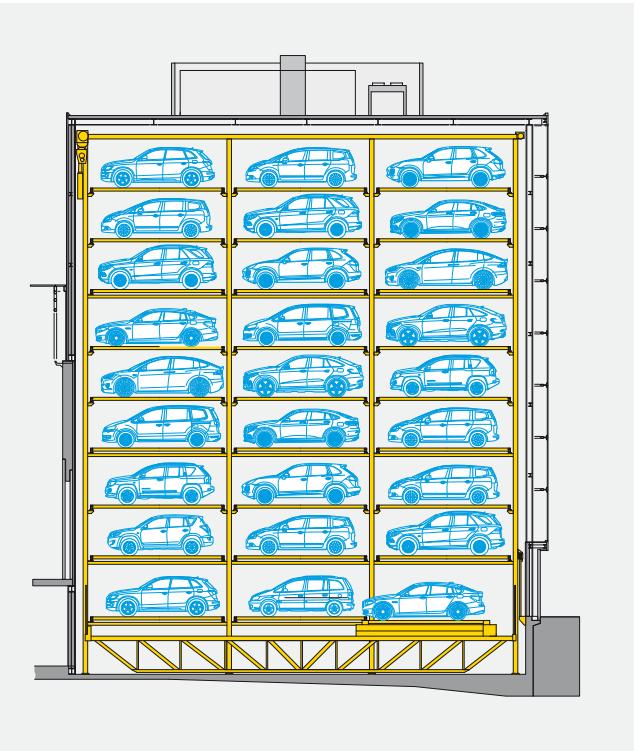
Projects (selected)

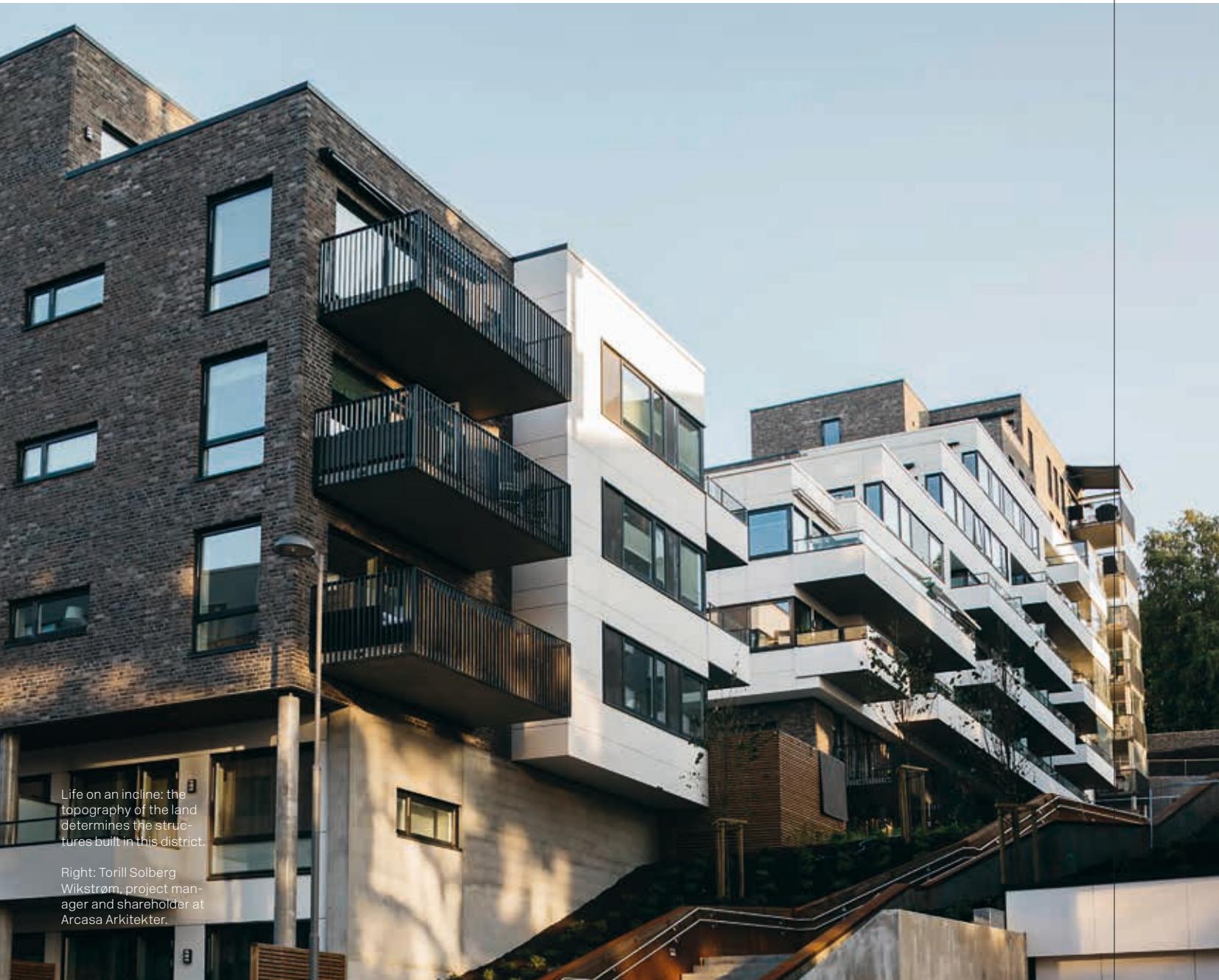
2018 Huygenshof restoration, Voorburg
2017 Colijn restoration, Voorhout
2016 Klaver new build, Benningbroek village
2015 Casella restoration, Hilversum
2014 Vredenoord restoration, The Hague

Product information

WÖHR Parksafe 583 with 52 parking spaces

Fully automatic parking system with parking on 9 levels above ground, max. vehicle weight 2.5 t, max. vehicle width 2.20 m, max. vehicle length 5.2 m, max. vehicle height 1.90 m, min. ground clearance 10 cm, parking area approx. 135 m², area per parking space approx. 2.60 m², parking volume approx. 2,939 m³, volume per parking space approx. 56 m³, average access time approx. 100 sec.





Life on an incline: the topography of the land determines the structures built in this district.

Right: Torill Solberg Wikström, project manager and shareholder at Arcasa Arkitekter.

Project report with Arcasa Arkitekter, Oslo



On the slopes

Author **Michael Kasiske**
Photos **Eirik Evjen**

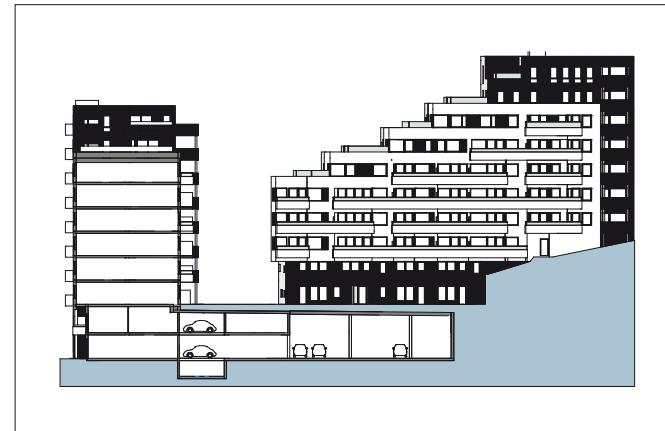


A lively neighbourhood has been created here, with 1,700 apartments.

Oslø's solution to its steady population growth lies in dense building concepts. This is also true for Kværnerbyen in the east of the city. But the newly created quarter also provides other important aspects for the Norwegian capital such as attractive connections to the city centre, a high standard of living and a reflective approach to individual traffic. However, the real challenge lay in the topographical situation of the site.

To the east of Oslo city centre, the residential district of Kværnerbyen has been under construction since 2007. The name provides a link to the past: the former Kværner factory took its name in turn from the estate for which it began producing foundry furnaces in 1853, moving on to produce turbines and other machinery for energy generation. It generated its own energy from the fast-flowing river Alna, where many factories were once situated.

In Kværnerbyen today, only a few relics such as steel support pillars and turbine elements remain to illustrate this industrial past. Production ceased in 1999, whereupon the city of Oslo decided to redevelop the 12 ha area. Two years later, OBOS



Section through the underground car park.

bought half of the real estate. The project developer held an urban design competition, which was won by Arcasa Arkitekter. The experienced studio submitted a 'regulatory plan', which was approved by the city council in 2005, establishing the extent and outline of construction, as well as the four old buildings which were to be listed.

OBOS was launched as a cooperative housing and savings society. Until the housing market was deregulated, it was

The forests surrounding Oslo are one of the city's most appealing features. They filter the air and accommodate many leisure activities, making a major contribution to quality of life here. In order to keep them close at hand, the increasing demand for homes must be met using high-density housing, as in Kværnerbyen. We planned the position and shape of the buildings to ensure each apartment has adequate light and ventilation. Since this district is like an island, the nature of the public areas is very important to residents' everyday lives: that's why almost all car parking is within the buildings. We use System Metrisk by WÖHR to accommodate motor vehicles as efficiently as possible in all respects.

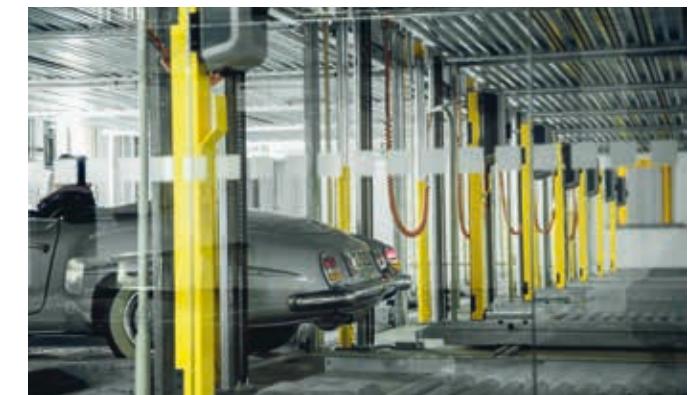
Per Erik Martinussen, Torill Solberg Wikstrøm,
Arcasa Arkitekter, Oslo

responsible for all social housing construction in Oslo. After deregulation, it joined forces with other cooperatives, became a successful project developer, and with over 200,000 apartments still remains Norway's largest residential construction organisation. OBOS continues to offer apartments to members of the cooperative, but also sells apartments on condition that buyers move in and do not sublet them.

In order to find an architectural solution for the topographical situation, and in particular the hill to the south and the opening to the west, the pairs of buildings numbered B3 to B5 were placed at right angles to the slope.

The design challenge for Arcasa lay in connecting the future residential district with its surroundings. For almost 150 years, industrial development at the site had only looked inwards, leaving the area like an island between three steep, green slopes. In the west, the express roads and the lower-lying railway premises also contributed to the isolation, and led to the Alna being laid underground in pipes in 1922. The architects sought to make connections with the neighbourhoods on the other three sides. The main square is oriented towards the Valarenga church to the north; it stands on a hill and its uniform sandstone is an imposing landmark in this varied environment.

To the south, a dense development of steps and ramps zigzags its way up the steep slope and connects Kværnerbyen to the district of Ekeberg. The main square itself showcases the former industrial influence on one of its longer sides in the form of an old assembly building which now contains retail and office space, and also shields the area from the noise of traffic on the



Up to three vehicles can be stored above one another in this parking system, which includes charging columns.

far side. Opposite this, behind a broad arcade walkway, there are shops and a café.

The square was built in 2007. The banking crisis put the development on hold for five years, but since 2013 the district has once again been moving towards completion. Besides the urban planning, Arcasa is responsible for the design of an office block and the townhouses which are currently under construction, as well as the ten recently occupied residential buildings by the steps, which occupy the steep slope up to Ekeberg.



The sliding door can be closed by sending an automatically issued numeric code from your smartphone.

In order to find an architectural solution for the topographical situation, and in particular the hill to the south and the opening to the west, three pairs of buildings numbered B3 to B5 were placed at right angles to the slope and each connected to the district's main street Freserveien using a block parallel to it. The individual buildings reflect the slope in that they rise up by five floors, each a terraced step, plus up to three floors underneath, meaning the tallest are eight storeys high. This staggering of the storeys allows more sun to reach down between the buildings, which is a particularly key issue in Norway.

All the large, horizontal balconies face west. They are clad in light, white cement board which contrasts with the dark brick body of the buildings. The heavy brick provides a visual show of strength in opposition to the steep slopes and retaining walls which are partially over two storeys high. The rear, east-facing wall is a uniform punctuated façade, interspersed with a few small balconies. You can see into the stairwells, and their various strong colours really make them stand out.

The terraces on the roofs are exceptionally inviting, and one per house is reserved for the house community. They are surrounded by green roofs, so the high housing density is not immediately obvious, even from a bird's eye view. In total, including the angle at the eastern end, Arcasa has created around 450 units with two to four rooms each. All apartments are generally wheelchair-friendly, including bathrooms, in accordance with Norwegian regulations. In a concession to the major demand for housing, only apartments under 50 m² in floor space may have bathrooms which are half the regulation size – this also reduces the minimum size for one-bed apartments from 45 to 35 m².

Residents' cars can be parked in the basement. The WÖHR Combilift System used here stacks up to three cars above one another. Almost all the parking space platforms are equipped with charging stations for electric vehicles, as around half of all cars permitted to drive in urban areas are now electric. This type of parking system seems to have been tailor made for a city which prohibits the entry of diesel vehicles between 6 a.m. and 10 p.m., and which has declared its intention to be partly car-free by 2019.

The district with a total of 1,700 apartments will be completed by 2020, after some 14 years of construction. A lively neighbourhood of its own has long since formed here. In winter, ice skating even takes place on the artificial watercourse in its middle, which is reminiscent of the Alna river, now flowing underground. A bus line, which will begin scheduled services



Four of the six terraced buildings on the slope.

once the construction work has been completed, connects the quarter to the town centre in less than 15 minutes. If the current construction activities continue, the city will surely continue to grow towards Kværnerbyen.

Architects

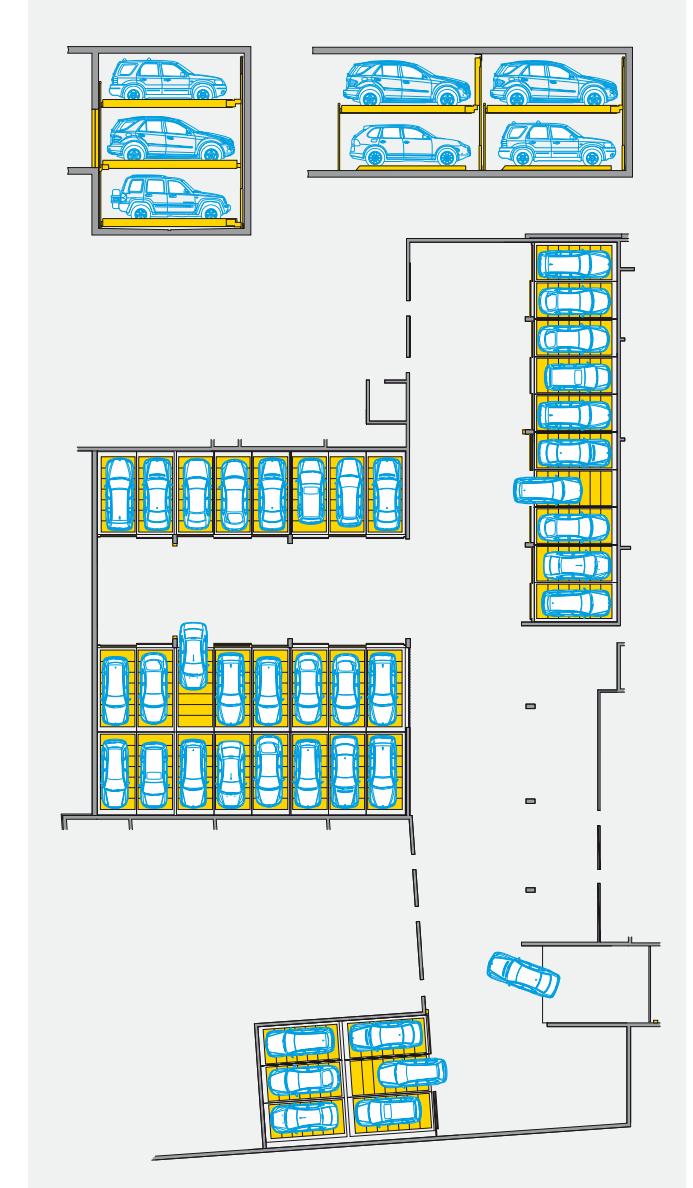
Arcasa Arkitekter, Oslo, Norway
www.arcasa.no

Projects (selected)

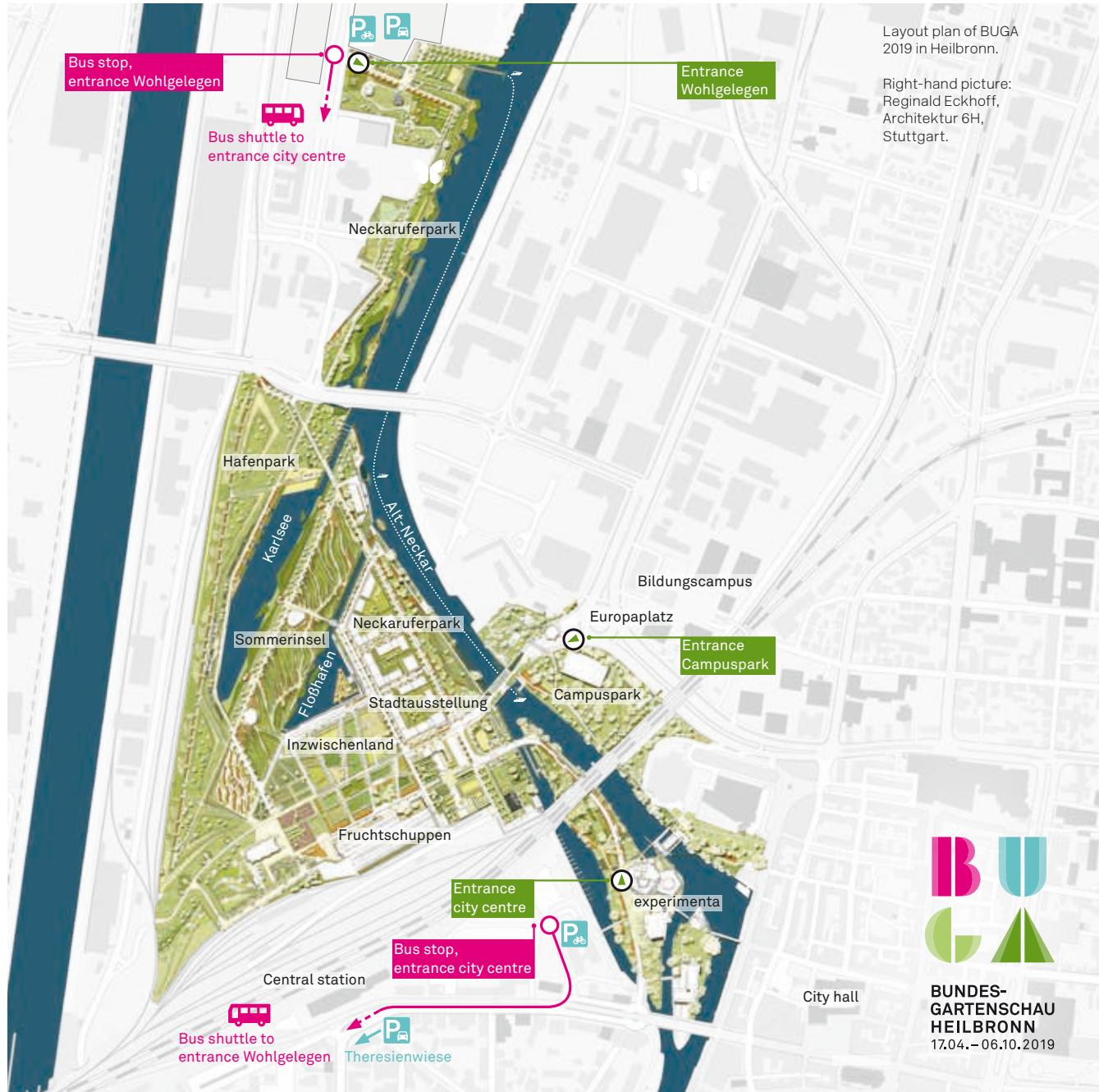
2017 Eufemias Hage residential and commercial build, Oslo
2013 Karenslyst office and commercial build, Oslo 2008 Rolfsbukta residential build, Farnebu
2003 Lilleborg residential build, Oslo
1999 Storebrand Vika office build, Oslo

Product information

WÖHR Combilift 543-435/230 (top left, 3 parking levels), Combilift 551-440 and Combilift 552-440 (top right, 2 parking levels) for 100 parking spaces
Semi-automatic parking system, with some double rows of Combilift systems, max. vehicle weight 2.6t, electric sliding doors with galvanised steel mesh, vehicle selection at the car park door, Combilift parking spaces and opening and closing the electric sliding doors via the WÖHR Smart-Parking-App, universal posts allow wall boxes for electric charging to be fitted on site.



The Combilift systems are arranged in the most compact way to maximise the number of parking spaces.



From industrial area to garden suburb

Author **Jochen Paul**

Photos **Bundesgartenschau Heilbronn 2019 GmbH, Architektur 6H**



Project report with
Architektur 6H,
Stuttgart

When the German horticultural show BUGA opens its doors on 17 April 2019, this classic garden exhibition will for the first time in its 65-year history be supplemented by the themes of urban development and housing. The “City Exhibition” will also make a significant contribution to financing the overall project.

The three building plots included in this year’s BUGA form an integral and important part of the show, as illustrated by their labels H, I and J. In Heilbronn, the BUGA will lay the foundations for a new, centrally located waterfront district, which will be densely populated, with mixed use and green spaces throughout. By 2030 the district will encompass a total of 17 plots. Some 3,500 people will eventually live in this ‘Neckarbogen’ area on a bend in the river, and up to 1,000 people will work here. The 23 buildings in the urban exhibition will be ready for use and occupation by the time the BUGA opens.

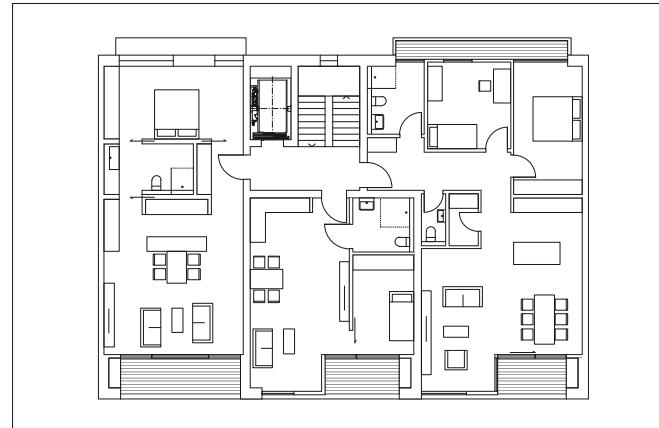


The townhouse ‘am Neckarbogen’ by Architektur 6H.

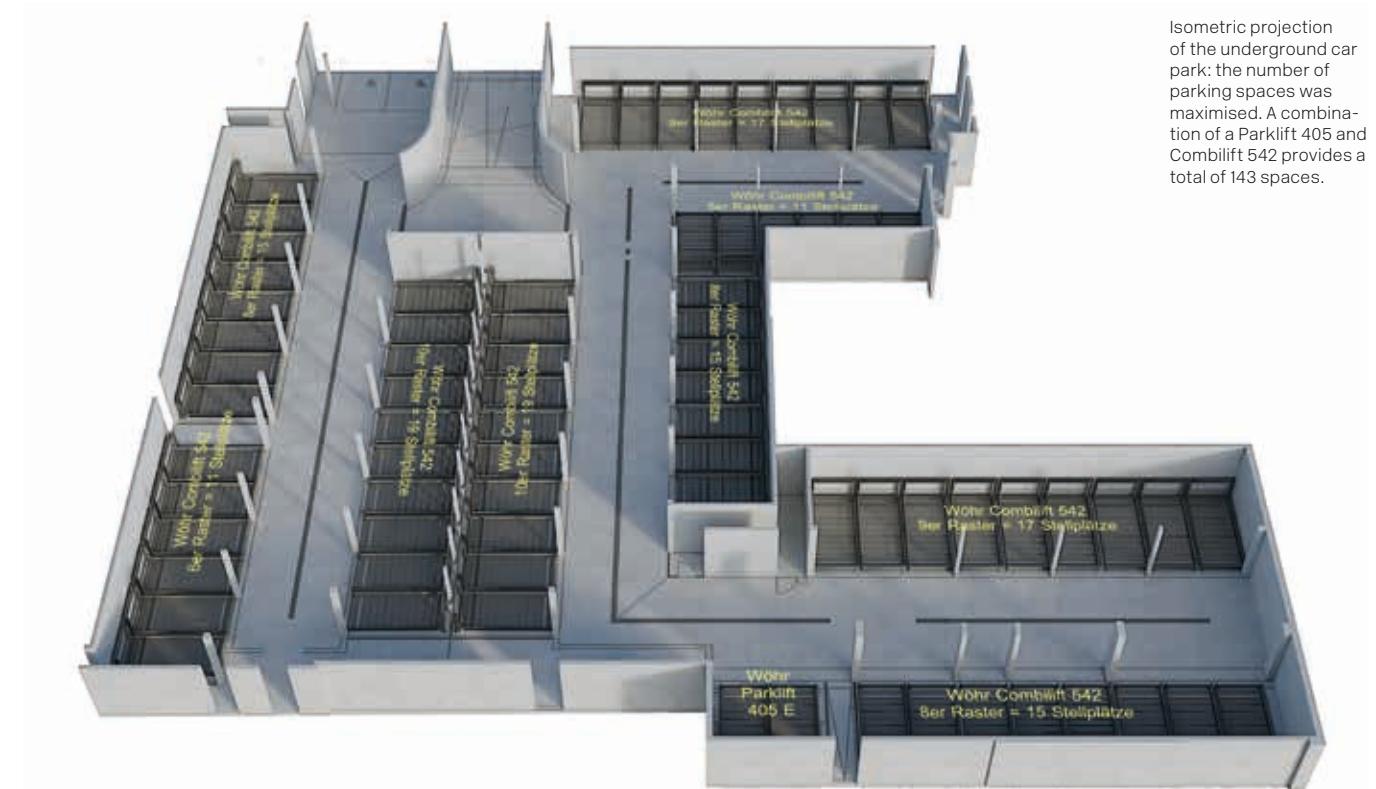
The idea and concept seem so ingeniously simple that one wonders why it hasn’t long been customary to combine horticulture shows and urban planning. It also makes you ponder how desolate it must have looked on the site of the former fruit warehouse on the Neckar Canal that no one had previously recognized the immense potential of the area in the prime inner-city location directly behind the main railway station. A total of €145 million have been made available for its revitalisation.

One reason why this may not have been attempted in the past is that this project is exponentially more complex in terms of planning, ownership and authorisation processes, and requires a longer preparation phase than a conventional garden show. All parties – the clients, authorities, consultants and planners – need to be prepared for this. Heilbronn was nominated as the location for BUGA 2019 way back in 2007; Munich-based Steidle & Partner won the urban design competition for the concept in 2008; the Berlin studio SINAI won the planning implementation competition for the open spaces in 2011.

In addition to the one-third mix of city, landscape and water, a balanced ratio of rented and owner-occupied flats, the broadest



Architektur 6H designed floor plans for intergenerational living.



Isometric projection of the underground car park: the number of parking spaces was maximised. A combination of a Parklift 405 and Combilift 542 provides a total of 143 spaces.

possible spectrum of housing sizes and an adequate mix of uses, income and generations were important to the clients. From the very beginning, BUGA Heilbronn 2019 GmbH and the city planning authority helped select investors and developed a quality assurance process which continues to be overseen by BUGA and a construction committee acting as an expert board. The plots were sold at a fixed price, rather than as before to the highest bidder, to ensure that the quality of the prize-winning designs was actually implemented on the ground. The competition winners included Baumschlagler Hutter Partners, weinbrenner.single.arabzadeh, Kauffmann Theilig & Partner, Fink + Jocher and Kaden + Lager.

In another first for German garden shows, a major road used by 30,000 vehicles per day needed to be moved in order for the ‘waterfront suburb’ to be built. Two new lakes were created in the former dock area.

This required all parties to liaise closely, and to approve the open-space planning by studios AG Freiraum (Freiburg), Dupper Landschaftsarchitekten (Bad Friedrichshall), îlot für Landschaftsarchitektur (Munich) and Pfrommer + Roeder (Stuttgart), as well as the overall energy concept, site logistics and underground car park construction.



Section through the site showing the WÖHR parking system on plot J.

From our point of view, the urban mobility concept of the future will consist of a closely coordinated network of various transport systems – such as classic public transport, car sharing, (collective) taxis, offers like the ‘stella’ e-scooters provided by the Stadtwerke Stuttgart, rental bicycles and others. We see a clear trend towards using vehicles instead of owning them. However, because the availability of vehicles close at hand is key to people accepting transport provision, parking system providers remain very important. Planners from WÖHR Autoparksysteme GmbH provided us with expert, comprehensive advice when we were planning the urban exhibition. This allowed us to test, with an open-ended approach, which system was best suited for the location on the BUGA site and its specific requirements, and then have the feasibility of our planning checked again.

Reginald Eckhoff, Architektur 6H, Stuttgart

As the mobility concept of the BUGA included not only shared space and a modal split (distribution of the transport volume among different means of transport) of 30% motorised individual traffic to 70% pedestrian, cycle and local public transport, but also the renunciation of above-ground parking spaces, the underground car park played a central role. The building project would ordinarily have posed few challenges, but was made more difficult by the high water table in the former dock area. Architektur 6H, under director Reginald Eckhoff, were tasked

with planning a total of 230 parking spaces for the whole district, split between two underground car parks. The studio also built the seven-storey townhouse ‘am Neckarbogen’, with its refined elegance, on plot J2. This is designed to accommodate intergenerational living, with 17 residential units of up to 4.5 rooms overall, some with windows on both sides, plus service areas on the ground floor.

On plot H, the 76 underground parking spaces were accommodated conventionally on a single level, without a sprinkler system; on plot J however, the number of parking spaces required was too large for that. Because a two-storey underground car park would have required significant water pumping on the Neckar side and a second ramp, Architektur 6H decided on a Combilift System. The floor slab is anchored to the substrate with screw-in tie bolts to prevent it from lifting.

The WÖHR Autoparksysteme GmbH system deployed here, the Combilift 542 Comfort type, assigns each owner a personal, horizontal parking space. Once selected, a parking space on the lower car park level is raised up as soon as the free space in the upper level is available above it. The cars are safely stored behind metal mesh doors, which can only be opened once the

parking space manoeuvres are complete – using an RFID chip, or operated by remote control, or using a smartphone with WÖHR’s own Smart-Parking-App. This system allows two layers of cars to be parked one above the other, even where the clearance height is low. In this case, the pit is 2.00 m deep, providing a maximum vehicle height of 1.75 m on the upper level and 2.00 m on the lower level. The space available can therefore accommodate saloon and estate cars, SUVs and vans.

The advantage compared to a conventional duplex unit (Parklift) lies in the greater headroom and ease of getting into and out of the car. To move the individual parking spaces horizontally, however, the upper level requires a “gap” and can therefore only provide one parking space less than the lower level. A universal post ensures every parking space can be retrofitted with an on-site charging station for EVs.

Architektur 6H developed a colour concept to guide users along their chosen route, as well as adding bright touches to the restrained silver and grey tones of the galvanised steel and

Architects

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Projects

2018 City exhibition, Haus J2, BUGA 2019, Heilbronn
2017 Terraced houses, Rutesheim
2015 Intergenerational living, Korntal
2014 MetroPolis joint building ventures: Lisbon and Milan buildings, Berlin
2012 Lounge at the Siedlungswerk, Stuttgart

Product information

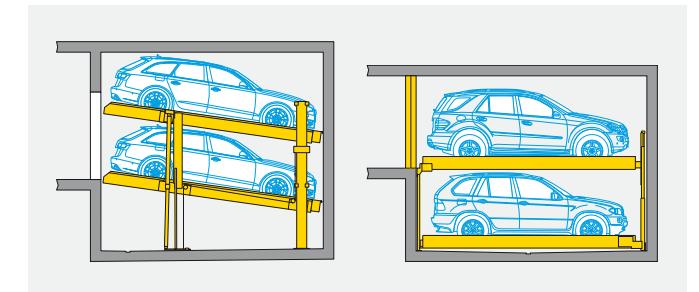
WÖHR Combilift 542-200/220 (right) and Parklift 405-170/165 E (left) for 143 parking spaces

Semi-automatic parking system, max. vehicle weight 2.6 t, generous parking space widths of up to 2.50m or 2.70m, parking space platforms with classic profile, electric sliding doors with galvanised steel mesh, vehicle selection at the car park door, the WÖHR Smart-Parking-App operates the Combilift parking spaces and opens and closes the electric sliding doors, universal posts allow wall boxes for electric charging to be fitted on site.

exposed concrete of the car park. It would be more accurate to describe this as a colour and light concept, as the coloured areas constantly interact with light, whether artificial or natural. Reds and oranges identify the fire escape stairwells, while blues and greens mark the three light wells which let daylight from the green courtyard above filter through to the underground car park, and thus enhance its connection with the outdoor area.



Exclusive light and colour concept for the car park by 6H Architektur.



AutoStore

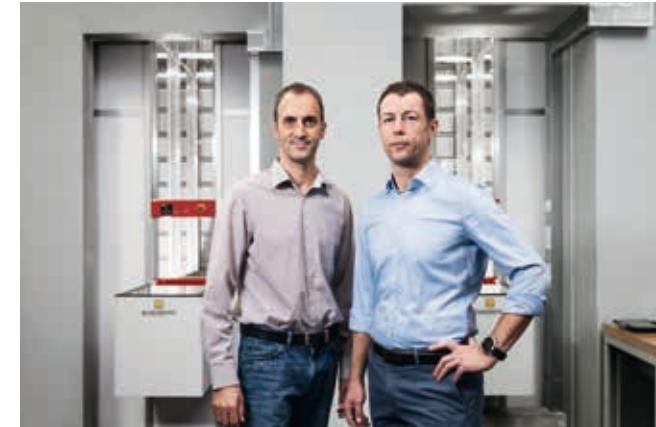
Author **Caroline Klein**
Photos **Klaus Mellenthin, WÖHR Autoparksysteme GmbH**

In today's digital age, high-bay warehousing is increasingly used to store small items as part of an automatic storage and retrieval system. New stock control software provides new possibilities for logistics processes. Transport and handling costs can be kept to a minimum by optimising material flows in warehouses and in stock picking. WÖHR Autoparksysteme GmbH introduced a new warehouse system in 2018 – the AutoStore.

This highly efficient, modular storage system improves in-house logistics.



Optimising cycle times means the relevant parts can be handed over to order pickers quickly, straight from the system itself.



Industrial Engineer Heiko Schrader (left) and Production Manager Jörg Stahlkopf brought in the AutoStore at WÖHR.

As a manufacturer of innovative parking solutions, WÖHR has an extensive product portfolio: Parking systems are sold according to customer-specific adaptations and orders are generated in the project business. The variety of articles in order picking and assembly is correspondingly large. As the number of different components is growing steadily, and peaks in orders to assemble these within a few days occur quite frequently, the company has been employing an AutoStore since 2018 to make optimal use of its warehouse space. This uses a modular container system for the shelf-free, space-saving, flexible storage of small parts. The level of space utilisation in WÖHR's warehouse has increased eightfold. The warehouse is operated by robots, which access the individual item and supply this to the relevant order picking workstation. Small parts include prefabricated parts, which may be no more than 580 mm long

and 380 mm wide and weigh no more than 30 kg. They can be used directly on the construction site without further processing.

The basic AutoStore structure is made from aluminium: a modular grid structure made of rectangular cells. The height and shape of this grid can be chosen to fit each individual warehouse situation. Bins, the basic transport unit for goods in the warehouse, are stacked above one another without any gaps, in slots in the grid (max. length: 15 slots / max. height: 21 slots). Rails fitted to the structural grid accommodate battery-operated robots, which work independently and are energy-efficient. They are controlled and coordinated using routing software. Communication between the robots and the control system is routed via a wireless LAN, with no cables required. The robots use lifting equipment to take the items from the bins, and then unload them at the relevant handover ports. At WÖHR, the goods are clustered, provided with specific order picking identification and stored according to article properties. Prefabricated parts for building car parks are either sent straight to the construction site or combined with other parts in the assembly department. The time taken for each cycle is optimised, and workspaces are adapted flexibly to order pickers, which means the relevant parts can be handed to an order picker quickly at one of the system's retrieval ports. This reduces the need to walk long distances. Installation time for an automated warehouse system depends on the particular project. The deciding factors are the size of the system, the structural design of the existing buildings, and the infrastructure (servers, software, fire prevention, etc.). Fitting the system itself usually only takes a few days. Depending on the warehouse area, it may be possible to adapt and extend the system. If demand at WÖHR increases, additional AutoStore systems can be built and connected with one another using materials handling technology.

Since its foundation in 1975, **GVB Architekten** has built up a comprehensive range of experience in the fields of architecture, renovation and building history. With a preference for historical buildings and facilities, it is always an exciting challenge for the office to combine the old with the new.

Each task motivates and inspires planning in which the old is valued and logically and elegantly combined with the new. GVB's projects are diverse and range from small to large construction projects, from new construction to the renovation of listed buildings – whether in the form of residential houses, villas, country houses, churches or industrial heritage.

Arcasa Arkitekter was founded in 1986 by the architects Per Erik Martinussen and Per Einar Knutsen, who over the past decade have gradually strengthened their partnership with five partners, including Torill Solberg Wikstrøm. The architectural office currently has around 70 employees, made up of a group of experienced architects and younger junior staff. This ensures consistent quality, which always receives fresh impulses. The range of tasks extends from urban planning, which requires lengthy coordination, to buildings of the most varied sizes, to interior design. In their self-image as architects, the office partners see themselves as service providers who provide competent solutions within the framework of building law and finances.

Co-founded by Reginald Eckhoff in 1994, **Architektur 6H** has since planned and realised numerous buildings throughout Germany. The focus of the company's work is on carefully designed high-quality residential buildings and interior design. Architektur 6H has received several awards for its work, including the Fritz-Höger-Preis 2011 and the Hugo Häring Award of the BDA 2011. Architektur 6H's 2017 competition "Quartier Lange Gasse – Bücherei und Wohnen in der Ortsmitte" in Bondorf expands the spectrum of its work to include public cultural buildings.

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