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CEO Karl-Heinz Strauss, MBA



CEO Karl-Heinz Strauss Image: PORR AG

Dear Readers, esteemed Business Partners,

You are holding in your hands the brand new winter issue of our World of PORR viewing it in high definition on your digital screen. No matter how you are reading it: I once again invite you to follow us into our company's dynamic and varied world. Our journey will take us through our home markets via Norway all the way to Qatar. But please see for yourself and turn page after page, jumping from project to project and country to country. Almost 100 pages of professionally prepared information and thrilling photographic material await you.

Lean back and accompany PORR on its path for a little while. For instance, to Germany. Our Berlin branch has decided to build a new location: From the very beginning, the Arena Boulevard construction scheme was characterised by excellent cross-departmental and cross-company cooperation with-in the PORR Group. From planning to construction – our packed know-how proved a significant factor of success in all the project's phases. In the municipality of Ramsau in Berchtesgaden, the first mountaineering village in Germany, TEERAG-ASDAG AG's Salzburg branch has significantly contributed to the construction of a debris barrier to protect the municipality. Taking a look at Austria, it becomes evident that we are active in all areas: From a feel-well house for seniors in Innsbruck to a new face for Mariahilferstraße, Vienna's largest pedestrian zone to the rehabilitation of the Prater junction. Our Czech colleagues' achievements are no less impressive: In a mere 23 months, they have managed to erect a unique office building with LEED gold certification. In the far north, we have officially opened the prestigious Tresfjord Bridge, our first Norwegian bridge construction project and the order for 127km of slab tracks for Qatar's entire underground system ranks among our highlights in the Middle East.

As you can see, we have set many important milestones for our PORR's future in recent months. The key performance figures for the third quarter prove that. When compared to the previous year, we have not only increased our production output but could also report a significant rise in order inflow, without taking into account one-time effects. We are particularly pleased about that.

Now, an eventful and exciting year comes to a close. Speaking for everybody at PORR, I wish you and your loved ones a peaceful end of the year, a happy new year and much happiness and health for the new year. I am looking forward to an exciting and successful 2016 with you accompanying us on our path.

Best wishes,

Karl-Heinz Strauss CEO

Arena Boulevard construction scheme

Construction of new PORR branch in Berlin

André Richter



Original Arena Boulevard visualisation Image: gbp Architekten



Arena Boulevard in summer 2015 after completion Image: PORR AG



Advertising slogan at the entrance to PORR's reception area Image: PORR AG

Project data

Client	Arena Boulevard GmbH & Co. KG
Contractor	PORR Deutschland GmbH, Berlin branch, Building Construction Division
Type of building	Office building

Start of construction work	26 June 2014
End of construction	24 July 2015 (general areas and area rented by PORR) 30 September 2015 (area rented by Zalando)
Gross floor space	8,700m², above ground 1,550m², below ground
Floors	Basement floor, ground floor, 1st to 6th floor, attic floor
Parking spaces in the underground car park	36

General information

After PORR Germany had started the year 2015 with ambitious plans and had already recorded 13 new building construction orders in its books by late July 2015, Berlin branch decided to build a new headquarters for itself in best inner-city location.

On order from Arena Boulevard GmbH & Co. KG, the building construction department of PORR Deutschland GmbH's central Berlin branch, in its function as general contractor, has erected the new office and business building called Arena Boulevard in a central location in Berlin's Friedrichshain neighbourhood opposite the Spree River, the East Side Gallery and the Mercedes-Benz-Arena (called O2-World until August 2015). The client is a project company belonging to Münchner Immobilien Bauträger GmbH (formerly Strauss & Co. Development GmbH). Several companies and departments of the PORR Group were involved in the project's implementation which meant the corporation's entire know-how could be utilised during planning and construction.

The new location is located in Anschutz Entertainment Group's development area on a corner plot located at the crossroads of Valeska-Gert-Straße and Mariane-von-Rantzau-Straße. The scheduled construction of a shopping centre, cinema, theatre, offices and flats makes this area one of the most important development sites in Berlin's inner city. With the railway stations Ostbahnhof (offering long-distance as well as regional connections) and the rapid transit and underground station Warschauer Straße, both of which are located in walking distance, the new location is exceptionally well connected to the public transport system.

PORR Germany, with its divisions for building construction, infrastructure and civil engineering as well as the subsidiary Stump which specialises in foundation engineering, have moved into floors 1 to 3 as tenants on 24 July 2015. Apart from the future rental area of PORR Design & Engineering GmbH, the ground floor houses a conference area with six meeting rooms. The remaining rentable area (4th to 6th floor) has been let to the online mail-order firm Zalando SE.

Project description

The almost completely built-up Arena Boulevard plot encompasses a ground area of some 1,700m². From the 1st to the 6th floor, the building tapers to a ground area of some 1,200m². Following regulatory requests, the 6th floor features a façade offset of some 1.5 m on both sides.

The building's ground plan is trapezoidal, with an interior atrium which rises up from the ground floor and is spanned on top of the 6th floor by a glass roof. Together, the atrium and glass roof encompass a ground area of some 16m x 5m to 8.5m.

The main entrance as well as the staff entrance leading to the area rented by PORR are located at Valeska-Gert-Straße. Located at

Mariane-von-Rantzau-Straße are the underground car park access ramp, a back entrance leading to the ground floor's rented area as well as the entrances leading into the auxiliary staircase.

Three lifts as well as two staircases give access to the individual floors. The area leased out to PORR is additionally equipped with an internal staircase with representative steel stairs connecting the reception and conference area on the ground floor with the individual floors.

All office floors are divided into three separate areas measuring 400m² of ground area each. In terms of fire protection, the three areas are divided by means of F90 walls. Should the client decide later on to implement the optionally tendered installation of one or several bridge structures in the atrium area, the effected floors can be let to three individual tenants.

Air conditioning in the offices is taken care of by heating and cooling ceilings in the form of metal sails. Work spaces are supplied with power and connected to the data network through a cavity floor and its integrated floor boxes. The location of the floor boxes, room control units and the control system for the exterior blinds was precisely tailored to tenant planning and the respective ground plans.

Many fit-out standard specifications in the areas leased out to PORR were defined via the "neue arbeitswelt" ("new working world"). Apart from office space, the rental areas feature kitchenettes and so-called coffee corners, storage, cleaning equipment and server rooms as well as sanitary facilities.

The basement floor houses the utility and storage rooms as well as an underground car park with 36 parking spaces of which two have been designed as spaces for electric cars and two as disabled parking spaces. Hidden behind a screening wall made from aluminium fins, the roof's rear area houses the five central ventilation systems as well as the cooling unit. Also located on the roof and connected to the staircases are two utility rooms in which the sub-distributors for cooling and the buffer storage system have been installed. The front roof area facing Valeska-Gert-Straße features a spacious roof terrace available to all tenants which offers magnificent views of Berlin's inner city and Spree River.

The building's outer area offers 32 bicycle holders for 64 bicycles, installed on two side of the building.

Furthermore, Arena Boulevard has been designed as a sustainable building and has been certified in accordance with DGNB (silver) as well as LEED (gold).

"neue arbeitswelt" ("new workingworld")

Arena Boulevard, Berlin branch's new location, is the first PORR project in Germany in which the company's new workingworld was implemented. In the course of the new workingworld, the PORR Corporation relies on open structures and transparency to facilitate communication and teamwork when it comes to the design of offices and branches.

In cooperation with PORR Design & Engineering and in tune with the corporate architecture, all locations are equipped with premium architecture.

The scheme's key elements include glass walls, white furniture, green carpet floor, so-called coffee corners serving as central meeting zones, the installation of a cooling system, quiet rooms and one-to-one rooms for smaller meetings and serving as retreats as well as modern meeting room equipment, allowing all locations to hold video conferences.



Arena Boulevard exterior view from Valeska-Gert-Straße Image: PORR AG



View of the main entrance to the building and PORR's reception area Image: PORR AG



Atrium Image: PORR AG



Internal stairwell in PORR's rental area Image: PORR AG

Planning

Arena Boulevard was designed by the architectural office gdp Generalplanung GmbH & Co. KG. PORR Design & Engineering GmbH in Vienna was in charge of the HVACR system in performance phase 3 while Weiske & Partner were responsible for the structural planning draft and structural engineering.

Based on this, PORR Design & Engineering has subsequently assumed general planning of performance phase 5. While the colleagues in Vienna remained in charge of architectural and structural planning, the HVACR system was planned by the colleagues in Berlin and Dresden.

Specialist planning, consulting services regarding the façade, building physics and fire protection were outsourced to external contractors.

Execution of construction work

PORR Deutschland GmbH's central Berlin branch was commissioned with the turn-key-ready construction of Arena Boulevard on 12 June 2014.

Construction pit

Construction work began on 26 June 2014 with the excavation of the construction pit. This work was carried out by the consdidated company Stump. Due to the fact that the area had been used as a car park that had been built below street level, excavation work could be completed in as little as approx. two weeks. The low ground water table and ample space allowed for the construction pit to be created with slopes on three sides. The one remaining side facing Marine-von-Rantzau-Straße was secured by means of a soldier pile wall. A temporary dewatering system had to be installed for a short time to complete concreting work on the three deep segments (lift core box, transformer station and crane foundations). The water was diverted into the adjoining combined waste water sewer.



Development site in June 2014 prior to start of construction Image: PORR AG



Development site in July 2014 shortly after start of structural work Image: PORR AG



View from Mariane-von-Rantzau-Straße Image: PORR AG

Shell

Main work on the building shell was carried out from mid-July to late November 2014. Two building construction cranes were used for the purpose. The building shell, a reinforced steel skeleton structure, was mainly built using in-situ concrete, supplemented by semi-finished parts for the ceilings.

Façade

Once the structural work had been completed, the shell was handed over to the group company ALUSOMMER for the installation of the stacked façade and the atrium windows on the floors 1 to 6. Fully according to schedule, the façade's tightness was established by the end of January 2015. The post-and-beam construction on the ground floor was installed at the same time as the stacked façade. The exterior sun protection system was integrated into the façade elements in the factory. The baseboards featuring the façade's decorating elements were subsequently suspended in spring and adorned with facing clinker on location. The glass roof had already been installed earlier, in February 2015.



Structural work Image: PORR AG



Bird's eye view of Arena Boulevard from the crane Image: PORR AG



Façade view Image: PORR AG

Interior fit-out

Starting on the basement floor, the interior fit-out process started at the same time as façade work, in January 2015. Initially, only the public areas and the area rented by PORR were finished. These areas were handed over earlier than scheduled, on 24 July 2015. The contract had stipulated a completion in mid-September 2015.

The fit-out of the area leased out to Zalando on the floors 4 to 6 was requested by the client in early June 2015 and was completed in accordance with the contract on 30 September 2015. In certain points, the fit-out of this area differs from the standards used on the PORR floors. The ceilings, for instance, were left unfinished while the system partition walls mostly feature opaque elements and the

ceiling sails were suspended lower. Additional forced-air cooling equipment was installed in the heating and cooling sails' area to divert peak loads.



PORR's rental area, office area prior to furnishing Image: PORR AG



PORR's rental area, office area prior to furnishing Image: PORR AG



PORR's rental area, office area prior to furnishing Image: PORR AG



Zalando's rental area, office area Image: PORR AG



Zalando's rental area, office area Image: PORR AG



Zalando's rental area, meeting room Image: PORR AG



Zalando's rental area, large kitchen Image: PORR AG

Interior work on the remaining ground floor area is currently being planned for PORR Design & Engineering. These rooms' completion is scheduled for February 2016.



PORR's reception area on the ground floor Image: PORR AG



PORR conference area, Vienna section Image: PORR AG



PORR conference area, Berlin section Image: PORR AG



PORR's rental area, Coffee Corner and project room Image: PORR AG



PORR's rental area, office area Image: PORR AG

Debris barrier at Freidinggraben in Ramsau

Barrier structure protecting the Municipality of Ramsau in Berchtesgaden

Mitterlehner Siegfried



Completed barrier including descent ramp Image: PORR AG

General information

In November 2014, the municipality of Ramsau in financial cooperation with the water management office of Traunstein commissioned TEERAG-ASDAG's Salzburg branch with the construction of a debris barrier in the area of Freidinggraben in Ramsau in Berchtesgaden. Aquasoli Ingenieurbüro Inh. Bernhard Unterreitmeier from Traunstein was responsible for planning and, subsequently, for construction monitoring. Structural calculations and dimensioning were taken care of by Dipl.-Ing. Bernd Gebauer Ingenieur GmbH, also from Traunstein.

Location

The Municipality of Ramsau, the first mountaineering village in Germany, is located in the middle of the Alps in Berchtesgaden National Park. With its Mount Watzmann and Lake Königssee, it attracts many summer and winter sport enthusiasts as it offers numerous options for sporting activities and relaxation.

Freidinggraben forms a left-hand tributary of Ramsauer Ache River and has its source north of the village of Ramsau. It runs in north-south direction in a valley cut and features a steep longitudinal gradient with a great number of drops. That's why, in case of storms, it takes large volumes of wood and debris with it to the valley.

Severe floods in the area of Ramsauer Ache River in the past which had been frequently caused by debris jams, made it obvious to the Municipality of Ramsau that a flood protection structure had to be erected in the area of Freidinggraben.



Construction area prior start of construction Image: PORR AG

The development site

In the construction area, Freidinggraben features a depth of some 13.5m measured from the surface and a width of 24.5m. Prior to actual construction work, the surrounding rock flanks had to be cleared of loose material in order to minimise the risk of rockfall in the construction site area. The only way to access the future barrier structure's area was a narrow, steep footpath which needed to be widened in stages before construction proper could start. For this purpose, the existing uphill slope was cut into and secured by means of 62 DN40/20 Ischebeck injection bore anchors 5m in length and a 20 cm thick reinforced shotcrete shell measuring 165m².

A reinforced concrete anchor beam with a total length of 30.0m, supported on 45 DN40/20 lschebeck injection bore anchors 3.5 to 4.5m in length, was built on the downhill side.



Reinforced concrete anchor beam plan, cross-section Image: PORR AG

Due to spatial restrictions on location, the construction site equipment had to be placed on the B305's carriageway and on the inside of the bend.



Construction site equipment and barrier structure Image: PORR AG

The debris barrier



Debris barrier plan, ground plan Image: PORR AG



Debris barrier plan, cross-section Image: PORR AG



Debris barrier plan, view Image: PORR AG

The solid reinforced concrete structure was anchored to the rock by means of 100 DN52/26 Ischebeck injection bore anchors 5.5m in length in the foundation area and 46 DN40/16 Ischebeck injection bore anchors 2.3 to 7.2m in length in the flank area.

The reinforced concrete segments were planned and commissioned in accordance with the specifications stipulated in the additional technical contract terms regarding hydraulic engineering (ZTV-W). Due to their dimensions, they had to be categorised as bulky parts. This necessitated special care concerning the preparation of the concrete mix and furthermore required that a precise concreting plan was to be created and followed. Another significant requirement of the ZTV-W regarded the

concrete parts' after-treatment time: the rising parts had to be after-treated for a total of 28 days in accordance with exposure class XM2 (mechanical stress).

In as little as 87 work days and fully according to specifications, 49.7 tons of reinforcing steel, 410m³ of ready-mixed concrete of grade C35/45/XC4/XD3/XF3/XA3/XM2/GK32 as well as 2.2 tons of hot-dip galvanised steel components were used for the barrier structure and some 1000m³ of material were excavated.

Construction time

As specified by the client, construction work had to be carried out between January and late May 2015.

Thanks to the outstanding dedication of the entire TEERAG-ASDAG team and excellent collaboration with the client and the construction monitoring, the construction scheme could be completed on schedule and in the familiar high quality to the full satisfaction of all those involved.



View of barrier / view direction: downstream Image: PORR AG



View of barrier / view direction: upstream Image: PORR AG

Hard Turm Park residential and business building, development site A2

Modern apartment complex in the trendy neighbourhood of Zurich-West

Andreas Schennach, Ivica Ivkić

General information

On 17 October 2012, PORR SUISSE AG was awarded a contract by Halter AG Entwicklungen, one of the largest project developers in Switzerland.

Being a part of the construction scheme Hard Turm Park, PORR SUISSE implemented development site A2 in the trendy neighbourhood of Zurich-West in the context of a full-service general contractor agreement.

The project included the planning of a mixed-use building that would house both flats and service space under consideration of and adherence to the respective official requirements as well as its turn-key-ready construction and the structure's ready-to-operate handover including its outside facilities to the client.

Construction began on 1 June 2013. The building including its outside facilities was completed on 13 July 2015.



Park façade (northern façade) and a part of Hard Turm Park Image: PORR AG

Project development

The construction scheme Hard Turm Park is processed in stages and divided into four development sites (A1, A2, B and C). It is planned as a building offering multiple types of usage such as living, working, shopping and relaxing. Our particular development site saw the construction of a residential and office part including an underground car park. Below ground, all four development sites are linked by means of a common underground car park.

Above ground, the development sites are accessed on foot, among others through Hard Turm Park, which also gave the project its name.



From left to right: Development site A1 (currently in shell construction phase), A2, B, C, Toni-Areal Image: PORR AG

Development site A2

The architectural office Theo Hotz Partner AG provided the project draft which it created under consideration of the design plan and the official requirements regarding the overall concept.

The plans included a total of nine storeys (basement floor, ground floor, 7 upper floors) erected on a trapezoidal ground plan.



Ground plan Image: Synaxis AG

The building's different types of usage are thereby clearly separated into a residential and a service area.

The office and business areas are located in the south wing, stretching from the ground floor to the 4th floor. The northern, eastern and western wings are dedicated to residential use. The flats offering 2.5 to 4.5 rooms are oriented to both the generous courtyard and the park

which greatly reduces their exposure to the noise coming from busy Pfingstweidstraße. Maisonettes that score points with a higher equipment level are located on the southern wing's 6th and 7th floor.

Apart from the legally required number of car parking spaces, the basement floor houses all utility rooms, the flats' cellar compartments and the storage areas assigned to the service areas.



Usage diagram cross-section Image: PORR AG

Location and access

The service areas are accessed on foot directly from Pfingstweidstraße via a dedicated staircase. Seven staircases give access to the flats.

By car, one can get to development site A2 via Pfingstweidstraße and the underground car park ramp it shares with development site B. The underground car park is used by the tenants and as a public car park. Automated pay stations have been installed for its public use.

Lorry deliveries go through the neighbouring development site B's access ramp which is also used for this purpose by all other development sites. A logistics channel links all development sites to allow for the goods' distribution.

Thanks to the extension of tramway line 4, its Toni-Areal and Sportweg stops on Pfingstweidstraße are available immediately in front of Hard Turm Park. Various bus lines and the conveniently located rapid transit railway stations Hardbrücke and Altstetten round off the location's public transportation connections and ensure Hard Turm Park's excellent accessibility.

This construction scheme's highlights are the pool deck which is lined with timber-polymer barefoot floor boards and equipped with a swimming pool as well as its green, functional courtyard.



The pool deck Image: PORR AG



The courtyard at night Image: PORR AG

Construction site access and process planning

In order to allow access to the construction site and establish cross-site construction site logistics, the client also included the Förrlibuckstraße underground car park access ramp into development site A2's scope of services into its order. There were two construction logistics phases: In phase 1, the construction site was accessed via the neighbouring development site A1 until the access ramp to Förrlibuckstraße's underground car park and development site A1's underground car park portion had been completed. In phase 2 the construction site was accessed via the access ramp built in phase 1.



Phase 1 Image: Halter AG





Building shell

Ground water and dewatering system

The project area is located in Zurich's Limmat Valley. A mighty lake sediment layer are located deep underground. On top of this lies a tight gravel layer with good load-bearing characteristics (the so-called Limmat Valley gravel) up to 25m thick. Various layers of flood sediments and artificial fillings which were not suitable as a foundation layer and therefore removed were found on top of the Limmat Valley gravel.

Furthermore, the plot is situated in the Limmat Valley ground water stream. The ground water table highly depends on the water level of the Limmat, the nearest river, as well as on the operations of the Hardhof ground water works. Since drinking water is also extracted in this area, particular attention was paid to ground water protection during construction work. Official project requirements such as the maintenance of flow capacity in case of flooding necessitated the installation of highly permeable strip drains (gravelly-sandy material). Simultaneously, the ground water table needed to be lowered in certain sections and large volumes of water needed to be diverted into the Limmat River during construction.

Construction pit

Due to the fact that the project was added on to the existing buildings of development site B and that unwanted cracks and building deformation on the existing structures were to be avoided, the existing outer walls had to be secured by means of underpinning in the course of construction pit excavation.

Furthermore, the public combined waste water sewer on Pfingstweidstraße which runs along the property line and which is only 40cm away from the building shell was to be taken into account. This resulted in a construction pit open on one side only.

Unexpected soil contamination caused by a petrol station that had been operated on the site in the past, was found in the course of excavation work. This delayed the start of construction by some 6 months. Rehabilitation work was carried out by the client.

Structural concept

All vertical loads as well as the forces created by horizontal stresses are diverted into the subsoil by means of a bottom slab with foundation depressions. The lift cores and staircases reach down to foundation level.

Due to its extensive span lengths, the underground car park's ceiling was executed in a partially pre-stressed way. The ceiling is additionally supported by C50/60-type pre-cast columns.

The office wing's (southern wing) support structure was planned as a skeleton construction and consists of floor ceilings, core walls and columns made from reinforced concrete or steel. The load-bearing grid's size is 5.2m. The projecting storeys' load is underpinned via the uppermost storey using diagonal ties.

All the residential area's flat-separating walls and ceilings are made from reinforced concrete. An adequate number of shear walls and cores, together with the ceiling disks guarantee spatial reinforcement and the longitudinal and transverse transfer of the individual building elements' loads.

Separating walls and shafts (except the shafts in the cores) are non-supporting and were built from gypsum baseboards.

With the exception of the pre-cast staircases and loggias at the building's corners and some pre-cast columns, all reinforced concrete structures were made from in-situ concrete.

The façade

The majority of the façade space was executed as a full thermal protection façade with façade tiles. Apart from wood-aluminium windows, aluminium windows, post-and-beam façade elements as well as back-ventilated profiled glass and metal façades were used as design elements.



Eastern passageway Image: PORR AG

In the part housing the service areas, the façade consists of a two-storey post-and-beam construction while the projecting building part spanning from the 2nd to the 4th floor is covered in tiled façade strips and window strips with protruding impact panes. The façade tile strips between the continuous window strips clearly divide the storeys and make the façade as if it protruded or floated.



View of southern façade running along Pfingstweidstraße Image: PORR AG

In the two-storey atria, the maisonettes located on the southern wing's upper floors were equipped with diagonal post-and-beam constructions.

Shading systems such as louvre blinds, vertical and articulated-arm awnings provide adequate sun protection. The use of the most diverse façade types and the corresponding connection points posed great challenges for the project management.

Fit-out

During the fit-out phase, workforce and material were transported vertically by means of externally mounted work platforms. Temporary openings in the flat-separating walls allowed for the horizontal transport of material on the individual floors. This yielded the benefit of full freedom of movement between the floors and the staircases alike.

Interior work in the service area has been divided into basic fit-out and tenant fit-out: Areas with basic fit-out

feature no surface layers and separating walls but are only equipped with wet units and common areas. Tenant fit-out work followed the future users' requests. This guarantees flexible office design (from open-plan offices to cellular offices).

The residential areas feature full fit-out. The sample flats which were to be created at an early stage played a central role in this process. These were used as a basis for all required approvals regarding surfaces, materials, functions etc.



Atrium flats Image: PORR AG

Building technology

A transmission station on the basement floor links the building to the district heating grid. One heating group each is responsible for room heating in the flats. It guides the heating water which is controlled depending on the weather controlled into the floor heating distributor via installation shafts by means of steel pipes. A floor heating distributor including an integrated heat metre was positioned in every single flat.

Heat is dissipated through a floor heating in the subfloor, whereby a room thermostat and an electrically operated control valve allows for the individual adjustment of the temperature in every room.

When it comes to the service areas, radiators have been installed for purposes of heat dissipation. Every radiator is equipped with a thermostat valve. Supply temperature is controlled at the heating group, depending on the weather conditions.

The flats were equipped with controllable flat ventilation systems. Air processing is taken care of by central ventilation units. The outside air is filtered and pre-heated by means of a heat recovery system. An additional air heater is responsible for post-heating.

The office and sales areas are partially air-conditioned by means of a mechanical ventilation system. The air processing units were positioned in the HVAC room. The fan drives are infinitely variable.

Heating demand is optimised through the combination of

excellent insulation and targeted influx of light. A controlled ventilation system with heat recovery and wall-mounted radiators complement the concept. All measures optimise the building's energy consumption and have a positive effect on the running costs.

The HVAC rooms are located on the basement floor and the attic floor

digitalSTROM

One of this project's special features is the so-called digitalSTROM ("digitalPOWER"). Instead of the usual electrical installations, digitalSTROM was installed in all flats upon the client's request.

digitalSTROM uses the existing power lines (to power small microchips and as data lines) to remote control almost all electrical devices in the building. First, all devices in the building – from desk and ceiling lamps to all switches and devices with electrical drives – are linked and automated. The system's centrepieces are highly integrated micro computers which are, for instance, installed in lustre terminals. They are supplied with power in a highly efficient way from the power grid and use the existing power lines to transfer data. All data is fed into a dedicated digitalSTROM server in the fuse box. The system is linked, programmed, automated and configured via apps and web interfaces.

Finally, everything can be controlled via light switches, smart phones or tablets. The system's outstanding advantage is the fact that all linked devices in the building can be comfortably operated via switches or smart phones regardless of the user's location. This technology offers previously unheard of possibilities of luxurious residential comfort.



digitalSTROM illustration Image: PORR AG

Completion of construction work

The building was completed in early July 2015 after a construction time of 24 months. In late July 2015, the flats were handed over to the tenants.

Project data

Gross floor area	some 23,350m² (not including outdoor facilities)
Flats	96 flats on total residential floor area of 11,225m ²

Service area	5 storeys, total area 5,825m ²
Outdoor facilities	5,620m ² (920m ² of which is courtyard area)
Basement floor	168 car parking spaces on 6,300m ² of underground car park area
Special features	digitalSTROM in all flats, pool deck
Start of construction work	July 2013
Construction time	24 months
Building shell construction time	12 months
Completion	July 2015

Rehabilitation of Prater junction

Main construction measures in the framework of the conversion of one of the most important traffic junctions in the Austrian road network

Dominik Rabl

Introduction

Linking the A23 Südosttangente motorway and the A4 Ost Autobahn motorway, Prater junction is one of the most important traffic junctions in the primary Austrian road network. Some 200,000 vehicles per day cross Erdberg Bridge alone.

After being in service for some 40 years, Erdberg Bridge, built between 1970 and 1972, has now reached the end of its service life. It is to be removed completely and replaced by a new bridge. In autumn 2013, ASFINAG commissioned PORR, operating as part of a joint venture, with the demolition of Erdberg Bridge and the comprehensive redesign of the traffic junction. The contract volume amounts to approx. EUR 50 million.

Special features

Due to the junction's high traffic load, all lanes remain open during all construction phases. Adding to the challenge of keeping traffic running as usual, the need to establish various interfaces and installations further increase the project's complexity.

Among others, Wiener Linien's Erdberg station, the Erdberg International Bus Terminal, Austro Control (Aviation Safety Agency), the left and right main collector, the A4 motorway, the Danube Canal, ship traffic and countless subterranean installations are all located in the construction area. The bus terminal, the underground station and ship traffic, too, are to be kept fully operational during the entire construction time.

Brief section description

For the duration of construction work, two permanent diversion structures (B205.1 and B205.2) are erected next to the existing Erdberg Bridge. Once reconstruction work has been completed, these structures will continue to unburden the situation in the diversion area.

Finally, three lanes will run across the new Erdberg Bridge in every direction, supported by the superstructure.

The access ramps running off the A4 motorway in the direction of the A23 southbound and the A23 northbound will run as separate lanes on the carriageways of the new Erdberg Bridge.

The diversion structures will feature the exit ramps towards the A4 in the direction of the city centre and to the A4 in the direction of Schwechat, coming from the A23. One continuous lane each for the carriageways running in the direction of Hirschstetten and Altmannsdorf remain in operation. They will finally contribute significantly to unburdening the traffic load.



Overview Prater junction Image: ASFINAG

Project

The project aims at improving the overall traffic situation at Prater junction. Through the erection of diversion structures, traffic jam formation in the interconnection areas is supposed to be prevented, while the Prater junction will be updated to the latest state of the art and traffic safety for all road users will be increased.

While traffic is kept running as usual, a total of four bridges are removed and eight support walls as well as six ramps are built in 15 traffic stages to meet the aforementioned goals.

Furthermore and adding to the newly erected structures, existing ramps are partly removed and widened to allow for the traffic stages and the extensive traffic load.

The entire drainage and EM network is renewed. The project furthermore includes: water protection systems, sign gantries and the entire lighting system on the A23 and A4.



Structure overview Image: ASFINAG

The contract in detail

Main construction phase 1, March 2014 to March 2015

The bridge structures B345 and B343 spanning the underground line, the international bus terminal as well as Erdberger Straße were built in the course of main construction phase 1.

This phase also saw the erection of eight support walls and the demolition of the bridge A4 R4 and the new construction of the diversion structures B0205.1 and B0205.2 crossing the Danube Canal.

Structure B343

Instead of widening the existing one by means of a single steel box girder incorporated into the existing "old" pre-stressed concrete structure, the client opted for the contractual alternative of erecting a composite bridge. The superstructure is 97m long and 16m wide.

The demolition of the old one and the erection of the new bridge were divided into seven phases:

When it came to the demolition, the team had to work out a demolition concept that would minimise the risk for the railway and traffic routes running below. On the basis of the chosen option and depending on the bridge's cross-section, elements weighing some 17 tons were detached by means of a rope saw and removed.



Superstructure demolition Image: ARGE Umbau Knoten Prater



Box girder 2 is lifted into position Image: ARGE Umbau Knoten Prater

Structure B345

This bridge's superstructure is approx. 112m long and some 9.5m wide. It was designed and erected as a three-bay pre-stressed concrete superstructure with box girder cross-section.

Located immediately underneath the bridge is U3 underground line's Erdberg station. Due to the small gap between the station's upper and the superstructure's lower edge, a 33m long superstructure section was built using latticed heavy-duty girders positioned above the superstructure. The form work construction was thereby suspended from the heavy-duty girders by means of tension rods.



Superstructure B345 form work Image: ARGE Umbau Knoten Prater

Structures B205.1 and B205.2

The bridge structures B205.1 and 2 were designed and built as multi-bay pre-stressed concrete bridges.

One of the greatest challenges during the bridges' construction was posed by the v-pillars which were used to reduce the span length of the main bay spanning the Danube Canal.



Structure B205.2 Image: PORR AG



Pillars on structures B205.1 and B205.2 Image: ARGE Umbau Knoten Prater



Pillars on structures B205.1 and B205.2 Image: ARGE Umbau Knoten Prater



Scaffolding on B205.2 Image: Dipl.-Ing. Michael Horschinegg



Form work on superstructure of B205.1 Image: PORR AG

Support walls 1 to 8

The support walls consist of 39 blocks measuring 598m in length.

They were built as cantilever support walls with both deep foundations and shallow foundations. Additional vibrating tamper seals were installed under the support walls erected on shallow foundations for purposes of soil stabilisation.



Support wall 5 reinforcement Image: ARGE Umbau Knoten Prater

Excavation and road work

When it came to excavation and road work, the complexity of the construction scheme posed the greatest challenges. The 1st main construction phase included some 36 separate construction sites that were worked on simultaneously. These sites were mostly located on traffic-free islands between the operational ramps which placed high demands on construction site logistics. Divided into 25 construction stages, the 1st main construction phase included excavation work for the E&M line as well as for the traffic junction's new drainage system. Furthermore, six ramps were newly constructed and eight existing ones were reconstructed, rehabilitated and widened.

Due to the minimal covering of the existing connection tunnel of the underground line running underneath the A23 R1 ramp and Vienna's main collector, the ramp was built using 10,000m³ of glass foam granules while control measurements were taken regularly. Thus, the loads on the existing structures could be reduced to a minimum.



Filling of glass foam granules Image: ARGE Umbau Knoten Prater



Filling of glass foam granules Image: ARGE Umbau Knoten Prater



Filling of glass foam granules Image: ARGE Umbau Knoten Prater



Filling at Danube Canal Image: ARGE Umbau Knoten Prater



Earthwork at the road maintenance reversing structure Image: Dipl.- Ing. Michael Horschinegg

Main construction phase 2, March 2015 to late 2016

This construction phase's main focus is on the demolition of the old and erection of the new Erdberg Bridge.

Demolition of carriageway towards Hirschstetten

Using an optimised removal variant, the construction time in the original tender could be shortened by 10 months. Employing the new variant, the section spanning the Danube Canal was removed by means of a demolition ship. The original plans had stipulated the erection of removal scaffolding whereby the bridge elements would have been cut and lifted out of place. During a weekend traffic closure and with the help of a correspondingly large array of machinery, the bays above the A4 motorway were removed, placed on a ballast cushion and subsequently transported off.



Erdberg Bridge demolition work Image: ARGE Umbau Knoten Prater



Erdberg Bridge demolition work Image: ARGE Umbau Knoten Prater



Erdberg Bridge demolition work Image: ARGE Umbau Knoten Prater

Construction of new B205 carriageway towards Hirschstetten

The superstructure was designed and built as a three-bay pre-stressed concrete structure.

From the bridge's centre axis, a three-web tee-beam runs continuously into three v-pillars and creates the appearance of a disc. In the direction of the abutment, the v-pillars end in a haunched solid cross-section single slab which narrows towards the abutment.



Visualisation of structure B205 Image: ASFINAG

The bridge's span is 139m, the superstructure's width is 19.7m.

The high demands towards the architectural concept and its aesthetically appealing implementation resulted in demanding tasks during construction.

A scaffolding system with high structural requirements and a weight of 1,115 tons was used.

Due to its span of 34m, the Danube Canal was

superstructed using 18 interconnected heavy-duty girders. The areas above the A4 motorway and in the pillar area were built using rolled profile girders of sizes between HEB 300 and 800. Work in the area of the A4 motorway could only be carried out during the night from 10 p.m. to 5 a.m. due to the required traffic closures.

The slim building elements including a vast amounts of tendons and reinforcing steel as well as the necessity of installing a high number of special form work at ever-changing building element thicknesses and inclines posed additional challenges the construction site team had to face.



Scaffolding, form work, reinforcement v-pillars axis 20 Image: ARGE Umbau Knoten Prater



Scaffolding work on superstructure BA3 Image: ARGE Umbau Knoten Prater



Scaffolding work on superstructure axis 10 Image: ARGE Umbau Knoten Prater



Form work on superstructure BA3 Image: ARGE Umbau Knoten Prater



Reinforcement superstructure BA3 Image: ARGE Umbau Knoten Prater



Concreting BA3 1,400m³ Image: ARGE Umbau Knoten Prater



Overview form work on superstructure Image: ARGE Umbau Knoten Prater

Project outlook 2016

The scheduled second demolition operation, this time concerning the carriageway leading to Altmannsdorf, will be tackled once traffic has been re-opened on the carriageway towards Hirschstetten. This carriageway is scheduled to be re-opened to traffic in August 2016. Once re-opened, the entire traffic junction will be submitted to large-scale road surface rehabilitation work, divided into short phases.

After the dismantling of the construction site equipment and the reconstruction of the Danube Canal bicycle path, one of the most important traffic junctions in Austria will, if everything goes according to plan, be handed over to the client in late 2016 in an extensively reconstructed and rehabilitated state.



Overview Prater junction, March 2015 Image: PORR AG

Project data

Client	ASFINAG Baumanagement Gmbh
Contractor	Consortium for the reconstruction of Prater junction ("ARGE Knoten Prater")
Technical Management	PORR Bau Gmbh
Start of construction work	March 2014
End of construction	December 2016
Bridge surface	13,000m ²
Concrete	40,000m³
Reinforcements	3,500t
Form work	37,900m²
Pre-stressed steel	450t
Filling material	40,000m³
Glass foam granules	10,000m³
Bituminous pavement	90,000m²
Bored piles	5,200m
GEWI piles	3,400m

Monte Laa: Specialist civil engineering at building sites 3 and 5

Josef-Dieter Deix

Project description

A building complex consisting of a 33-storey office tower as well as two housing towers with 33 and 20 storeys, respectively, with two six-storey flat areas located in between and on the sides, respectively, is being built on a property at Laaer-Berg-Straße 47. The two housing complexes are built at the moment whereas the office tower's construction is scheduled for 2016. Three basement floors are created underneath the entire area except for the office tower which is partially located on top of motorway A23.



Construction pit ground plan Image: PORR AG



Construction pit overview Image: michael novy

Due to its depth and in-situ ground water, the temporary building pit supporting system is executed using diaphragm walls 60cm thick. Two covers located above the third and first basement floor, respectively, were used to reinforce the retaining wall. These covers are themselves supported by pre-manufactured auxiliary supports 75cm in diameter. Building loads are transferred via combined pile and raft foundations. The bottom slabs are between 100cm and 150cm thick. A total of 250 foundation piles 120cm in diameter were sunken up to a depth of 25m below the bottom slab, depending on structural requirements. At a maximum depth of 25m, the total of diaphragm wall surface adds up to some 6,500m².

Subsurface conditions

The development site is located in an area characterised by marl clay, sand, clay and local quartz gravel.

In the course of preliminary surveying of the near-surface ground zone, five exploration boreholes were sunken to a maximum depth of 35m. A slightly to highly clayey silt layer partially consisting of fine sand which is interspersed by silty strips of fine sand some 2.7m thick is located below artificial backfill measuring up to 6.4m in thickness.

Ground and sedimentary water was found in depths between 12.9 and 19.7m during exploration boring. The examined water samples showed a slight sulphate attack. The entire diaphragm wall and the foundation piles are therefore executed using C3A-free concrete.

Production process

Due to the cut-and-cover construction method described above, the foundation piles have to be constructed from the level of the first cover. The piles' top edge is thus located three storeys or some 13m below ground level. Due to the embedding depth of up to 25m, this results in a drilling depth of up to 40m. The bore piles are sunken by means of the Kelly drilling method using two type BG36 rotary drilling machines. Once the foundation piles are completed, one rotary drilling machine is converted and used to produce the auxiliary support piles.



Bore pile production Image: PORR AG

The diaphragm wall enclosure and drilling work was executed at the same time. An LH875 cable excavator with

a 16-ton diaphragm wall grab was used for excavation. The following concrete work is executed with an LH853 auxiliary device. The wells required for the dewatering system are equally drilled using the cable excavator. The ground water level lowering system is operated at the same time as the ongoing excavation work and remains in operation until the structure's buoyancy safety is guaranteed.

Once the specialist civil engineering work is done, the first excavation phase will reach the first cover's lower edge. Using splice bars 27cm thick, the cover is connected to the diaphragm wall and the auxiliary support piles. In the area of the descent ramps along the diaphragm wall, the concrete cover is replaced by temporary steel strips. The rebar connection of the future load-bearing supports and girders to the cover is executed using screw sockets. Concreting is carried out from above via concreting openings made beforehand.

The construction pit is completed by the bottom slab which is equally connected to the diaphragm wall by means of splice bars. Injection hoses are additionally installed to guarantee tightness.

Concrete used

The foundation piles and diaphragm wall which represent permanent measures are built from C25/30 B11 XC3 XD2 XF1 XA1L UB2 F59 GK32 CEM II 42.5 N grade concrete of which some 13,000m³ are installed. The temporary auxiliary support piles used to transfer the cover loads are made from C25/30 B9 XC3 UB2 F59 GK32 CEM II 42.5 N grade concrete. Of this, some 800m³ are used. A total of approx. 14,000m³ of concrete are thus installed. The reinforcement covers are made from C30/37 grade concrete, the bottom slab from C25/30 BS 1D grade concrete.



Cross Section Image: PORR AG



Bore pile concrete installation Image: PORR AG



Pile construction Image: michael novy

Concrete installation

Foundation and auxiliary support piles

In principle, piped bore piles can be produced using the grab drilling method as shown in fig. 1 or using the rotary drilling method which was employed in this case. The process is divided into the following steps:

- Excavation using the grab or the auger drill, protected by the boring pipe. This means that the boring pipe is pre-driven for approx. 0.5 to 1m after which the drilling material inside the pre-piping is retrieved and conveyed using the grab or the auger drill. Using this method, the bore hole wall is always protected.
- Insertion of the reinforcement cage.
- Insertion of pile concrete according to contractor procedure. In this process, concrete is injected via a tight pilot tube consisting of 3-meter-long parts which is inserted to a depth just slightly above the bore hole's bottom. As the concrete column in the bore hole rises, the pilot tube is gradually removed and its parts knocked off in accordance with the concreting progress. Thereby, one must always ensure that the pilot tube reaches at least 1m into the concrete to prevent inclusions. The topmost, inhomogeneous mixing zone is thus gradually pushed upwards. Once the bore piles are exposed, this area which is approx. 0.3m to 0.5m thick is cut off manually.
- Pulling of the boring pipe Similar to the pilot tubes, the cylindrical pipe sections are removed as the concreting process progresses.
- In case of small pipe diameters in firm ground, boring can be carried out without bore hole supports. As an alternative to the boring pipe, a support suspension system can be used for support purposes.



Figure 1: Bore pile construction Image: PORR AG

Diaphragm wall



Reinforcement cage diaphragm wall Image: PORR AG



Diaphragm wall concrete installation Image: PORR AG

Diaphragm walls can be constructed using the grab or trench cutting method. Using the grab method, the material is loosened by means of grab shells which are pressed towards the bottom through the base body mass. Instead of the grab, the trench cutter is equipped with milling wheels which continuously break up the material and convey it to the surface via rising mains. To be precise, the diaphragm wall production is divided into the following steps as depicted in fig. 2.

- Construction of guidance walls to support the topmost floor area and to guide the grab.
- Excavation of the diaphragm elements using the grab or trench cutter. In the course of construction,

the diaphragm walls are supported by means of a bentonite suspension system. The excavation's verticality is constantly monitored via a measuring system installed on the grab.

- Installation of formwork elements and pre-manufactured elements and the reinforcement cage after reaching the final depth.
- Concrete injection according to contractor method while suspension is simultaneously pumped off.



Figure 2: Diaphragm wall construction Image: PORR AG



Diaphragm wall construction Image: PORR AG

Summary

The construction pit concept described above consisting of diaphragm wall combined with reinforcement covers has significant advantages, especially in inner-city developments.

Deep construction pits can thus be built without using adjoining property for purposes of anchoring. Deformation can be reduced to a minimum whereby the risks for adjoining structures are kept as low as possible. The fact that the covers are constructed directly on in-situ ground makes the construction of ceiling formwork obsolete. The diaphragm wall simultaneously serves as the underground car park's outer wall. This saves costs for an inner shell and opens up more ground area for the garage.

Project data

Structual and general planning	PORR Design & Engineering GmbH
General contractor	PORR Bau GmbH
Architectural planning	Neumann und Partner ZT GmbH
Site area	building site 5: 3,120 m² building 3: 2,470 m²

Building site	building site 5: 28,500 m ² above surface + 12,400 m ² below surface building site 3: 34,400 m ² above surface + 5,900m ² below surface
ML 5 Client	Wohnbauvereinigung für Privatangestellte Gemeinnützige Gesellschaft mit Beschränkter Haftung, Werdertorgasse 9, 1010 Wien
	"My Sky" Verwertungs GmbH Co Floridsdorfer Hauptstraße 1, 1210 Wien
ML 3	Erste Immobilien Alpha Monte Laa GmbH & Co. KG Windmühlgasse 22 – 24 1060 Wien

Santander Nordpark

Construction of a second location for SCB in Mönchengladbach

Cornel Kraus

Project data

Location	Am Nordpark 50 D-41069 Mönchengladbach
Client	WPC REIT Sant 5 B. V Amsterdam
Execution of construction work	PORR Deutschland GmbH Düsseldorf branch & Department for Large-Scale Building Construction Projects
Construction period	02 May 2014 – 28 August 2015
Plot size	18,000m²
Gross floors areas	24,486m ²
Usable office space	22,450m ²
Gross room volume	100,150m³
Amount of concrete	13,000m³
Amount of steel	1,600 t
Working places	1,500
Parking spaces	468
Number of storeys	3

General information

PORR Deutschland GmbH's central Düsseldorf branch was commissioned with the turn-key-ready construction of an office building for Santander Consumer Bank (SCB) in April 2014.

Besides the main central branch at Santander-Platz, this marks SCB's second location in Mönchengladbach. The structure was erected on a plot 17,880m² in size in the immediate vicinity of the Nordpark Stadium on Madrider Straße and serves as an administration building for the subsidiaries (BANs) of SCB. Construction took 16 months.



Project visualisation Image: AECOM

Santander uses this building as a tenant. The investor and immediate client of PORR is WPC REIT Sant 5 B.V. - Amsterdam, a real estate fund located in The Netherlands

that finances the construction costs through SCB. This new building is the first structure to be built in the developing new Business Park II which is supposed to further strengthen Mönchengladbach as a business location. On a gross floor area of 24,486m², the building provides work space for 1,500 employees.

Project description

The BAN Building complex consists of a basement floor (partial basement), a ground floor connecting all building elements as well as four additional three-storey office wings which are accessed via two connecting structures. The lifts which are available to the staff in two sets of three are located in these connecting structures.



Lifts in the connecting structures Image: PORR AG

Additionally, two cargo lifts running between the ground floor and basement floor as well as a mail lift were installed.

A spacious entrance area in building 1 equipped with revolving doors that lead to the reception area provides access to the ground floor.

Besides the reception desk, this is also where the cafeteria is located.



Reception area with reception desk Image: PORR AG

The wide hall area on the ground floor which ends at the

PORR Projects

end of the building in the canteen located opposite connects the four building parts. The canteen features its own kitchen and provides space for 350 employees. Kitchen and canteen were ordered as a supplement by SCB and handed over to the client on schedule by PORR. Additional functional rooms such as training and meeting rooms as well as facility rooms are located on the ground floor.

At a usable office space of some 22,450m², the upper floors provide work places for 1,500 staff designed following the open space principle.

The central zones house the meeting and telephone areas and the work places are grouped around those. System partition walls were used to form the rooms.

Technical building equipment

The control rooms providing heat, cold, ventilation and power to the building are located on the roof.

Heating/cooling ceilings are used to control the temperature in the building. All technical building equipment functions such as the installed burglar alarm system, access control system and the controls for the entire lighting system can be controlled via the central building control system.

Outer area

The outer area features two separate car parks that offer 468 car parking spaces and are protected by means of barriers. These car parks were mostly built in the context of an additional contract awarded to PORR and also handed over on schedule.



Hall area on the ground floor Image: PORR AG



Office rooms Image: PORR AG



Façade design Image: PORR AG

Execution of construction work Building shell

On 2 May 2014, PORR took over the development site including the finished construction pit from the client and began with structural work and with installing the construction site equipment. The shell consists of a reinforced concrete skeleton structure with pre-manufactured parapet parts and was erected with four cranes and, at times, up to 70 workers, three foremen and two construction managers. Some 13,000m³ of concrete and 1,600 tons of reinforcing steel were installed.

Foundations consist of separate foundations connected to a bottom slab 20cm thick. Since no pressing or ground water was found, bituminous sealing of the basement floor was adequate.

The walls in the entire building were formed using PERI's MAXIMO form work. In order to achieve the desired surface quality, the round columns were built with cardboard form work.

The ceilings were executed using Skydeck form work. Thanks to work cycles defined in collaboration with PERI, the individual building elements' storeys could be built in 3-week cycles.

Scaffolding was only required once façade construction started and as safety scaffolding for roof sealing work as a

mixed construction method using pre-manufactured railing elements as well as ceilings produced on location were employed.



Shell Image: PORR AG



Topping-out ceremony Image: Detlef Ilgner

The topping-out ceremony attended by 120 guests was alebretad on 7 November 2014, exactly 205 days after the contract had been awarded to PORR Deutschland GmbH.

Due to the fact that the remaining construction time until 28 August 2015 was very short indeed, finishing work and façade work were pushed forward at full steam after the shell had been approved.

Fit-out

Due to a tight schedule, dry lining work on the cooling ceilings needed to be carried out on the basis of theoretical dimensions. The active elements were then inserted at intervals. Due to the fact that all work was carried out with meticulous precision, the ceilings could be taken into service without any problems and on schedule.

Fit-out work on the kitchen which had been additionally commissioned began in February 2015. All space-creating lightweight construction walls are made of "Aquapaneel" and come with the corresponding corrosion class C3 stud frames. Sealing work was carried out with great accuracy by a specialist company using a PU material. The system is not only excellently suited for areas subjected to extensive stress but additionally positively influences the construction progress as it is walkable and loadable after a very short period of time. The fit-out phase lasted from December 2014 to August 2015.

Façade

The upper-floor façade is characterised by elongated window strips whereas the ground floor is enveloped by a post and beam façade. The façade cladding is made from ceramic elements, aluminium covers and, in certain areas, from ETICS.

Some of the building's highlights are, without a doubt, the partial areas coated in "Santander Red" as well as Santander's logo, the "Santander Flame" on the face side of building 1.

Final remark

In spite of additional performances worth some 6 million Euros, the final completion deadline could be met thanks to the outstanding dedication of all those involved in the construction project. Thus, the building could be handed over to the client in the agreed-upon quality and on schedule on 28 August 2015. The keys were handed over to the client in the course of an event attended by 250 guests on 30 October 2015.

O-Dorf retirement home

A feel-well house for all generations

Johannes Scherl

General information

On order from the Municipality of Innsbruck and Innsbrucker Soziale Dienste (ISD), StadtBau GmbH from Innsbruck built a residential care home for the elderly at Innsbruck's An-der-Lan-Straße. The new residential care home for the elderly with the house number of An-der-Lan-Straße 26a was on a newly established lot between the former SPAR super market and the boardwalk.

The project which had been preceded by a competition was implemented on a plot that had been declared a special zone in the zoning plan. The newly created layout plan stipulated a special construction method. Thus, the building which had been designed as a care home for the elderly was built in accordance with building class 5 as laid down by the OIB guidelines. A dedicated fire protection concept was therefore strictly required.

In August 2013, the consortium Wohnheim O-Dorf, with considerable support from PORR Bau GmbH, was commissioned with master builder work.



Common wing / retirement home west view Image: ARTEC



Retirement home / chapel north/east view Image: ARTEC

Location

The construction schemes is situated in a pretty location, directly at the Inn River boardwalk in Innsbruck's Olympic Village neighbourhood. Located at the Inn River, the new residential home not only provides the city with a new architectural jewel but also exemplifies the successful incorporation of urban environments into life in the home.



Retirement home south view Image: ARTEC


Roof terrace of common wing ground floor + dementia garden Image: ARTEC

Project data

Client	Innsbrucker Stadtbau GmbH
Contractor	Consortium Wohnheim O-Dorf
Architects	ARTEC Architekten, Bettina Götz, Richard Manahl
Type of project	Residential care home
Start of construction work	August 2013
End of construction	March 2015
Temporary construction pit system	200m ² shotcrete securing 110 IBO R32N injection drill anchors
	1,200m ³ underpinning and deep foundation pillars – high pressure soil stabilisation 1,700m of ductile cast iron piles, concrete grouted
Concrete	7,600m³
Reinforcement	825t
Concrete ceiling hollow bodies	14,000
Structural steel	30t
Spun concrete columns	17
Scaffolding	7,000m ² façade scaffolding 2,000m ² surface scaffolding
Interior plaster	7,500m²
Parking spaces in the underground car park	19 (neighbourhood car park) + 23 (residential home car park)
Care rooms	118

Project description

The building extends from An-der-Laa-Straße across the boardwalk close to the Inn River and consists of a basement floor, a partially two-storied ground floor and five upper floors. The basement floor houses the underground car park with 23 car parking spaces as well as various auxiliary rooms. The underground car park is connected to the neighbouring plot which features a neighbourhood car park with an additional 19 car parking spaces and further auxiliary rooms. Both car parks are accessed from An-der-Lan-Straße 26 through the neighbourhood car park via a closed ramp with a slope of 18%.

Located on the building's ground floor are a café, administration rooms, offices and common rooms. The wards with a total of 118 rooms, various supply and common rooms as well as the access areas are located on the floors 1 to 5. Four visitors' parking spaces for the residential home were built at ground level in the delivery area on An-der-Lan-Straße. Bicycle parking facilities are likewise situated in the delivery area as well as at the café on the park side.



Courtyard inside view - elevated structure Image: ARTEC



Width of corridor areas retirement home 1st floor Image: ARTEC

Architecture

Deviating widely from the usual typology of a residential home, this particular home was developed with the full incorporation of the requirements on location. The home's unique location in a park necessitated the creation of added value for the neighbourhood and its residents.

First of all, the park was to remain fully passable and secondly, slim wings that would maximise the view of the open sky had to be implemented. Furthermore, the residential home's two public rooms, the café and the chapel, were to be styled in such a way that they could also be used by the neighbourhood's residents. In order to incorporate the home into its environment in the best possible way, the city administration's design order awarded to the landscape architects Auböck + Karasz was defined in deliberately wide terms, extending in both directions. For one, a new central common area at the Inn River was to be created to benefit all groups of people: a playscape for the children and workout possibilities for the elderly, sandy lagoons directly at the water, lounging areas on the lawn and sports facilities.

The building itself benefits from the chosen shape and offers spacious terraces between the trees and neighbouring buildings as well as views of the green landscape from the rooms. The corridors feature manifold seating arrangements such as so-called house benches in front of every room. At the building's ends, the corridors lead to the open common areas featuring private "parlours" and magnificent views.

The varied goings-on in the park and at the river as well as the mighty mountains in the north and south can be viewed from all residential floors. In addition to building planning, the architects developed the home's entire equipment in cooperation with Innsbrucker Soziale Dienste which provides the building with additional individual touches and utility value regarding its interior design.



Courtyard inside view with preserved tree Image: ARTEC



Retirement home roof terrace on 3rd floor Image: ARTEC



Corridor area common wing on ground floor Image: ARTEC

Construction procedure Construction pit and building shell

Once the existing car park structure with its approx. 5,500m³ of enclosed space had been demolished, clearing and construction pit excavation work could begin. For purposes of site clearing, some 80 trees and 8,000m² of plot area had to be cleared or brought up to the specified height. Since Grünbachpromenade's existing foot and bicycle path was located on the area of the new residential home, traffic on the path needed to be diverted during the entire construction phase. In the north, along An-der-Lan-Straße the underground car park's construction pit had to be secured by means of shotcrete and injection bore anchors due to insufficient work space towards the existing pavement. Since the underground car park was entirely built up to the existing Sternhochhaus building in the west, the adjoining building had to be underpinned using high pressure soil stabilisation columns.



Form work underground car park ceiling neighbourhood car park Image: PORR AG

In the course of structural work for the underground car park, non-load bearing soil was found in the southern construction pit area. This resulted in comprehensive soil replacement of an anti-frost layer some 60cm thick as well as an additional 100 ductile cast iron piles which needed to be grouted with concrete.

Superstructing the existing city canal which has a diameter

of 2m and needed to remain in operation during the entire construction time posed another challenge.

In the southern construction site area, the entire building was put on stilts which resulted in falsework heights of up to 10m. In order to perform this structural masterstroke, 33 jet grouted columns some 9m in length were used which were drilled into the soil at various points on the ground plan. Concreted at the heads of these concrete columns were single foundations using some 10m³ of concrete each as well as steel inserts that were also set in concrete. Finally, spun concrete columns with a diameter of up to 60cm and buckling lengths of up to 9.5m were placed on the foundations in order to safely guide the massive loads created by the elevated superstructure into the soil. Special support scaffolding and slab tables supplied by form work specialists were used to complete form work on the high ceilings. These needed to be placed on full-surface concrete paving to withstand the pressure from above. Due to the structural curing phases, the ceilings needed to remain supported for a prolonged period of time, which created problems during the structural work phase. To reduce the ceiling's weight and the general loads, hollow bodies made from PE-HD recycled material were installed in certain ceiling areas.



Slab form work system with PERI Multiprop support frame Image: PORR AG

The chapel

One of this project's highlights was the construction of a chapel and its integration into the south-east part of the ground floor. To achieve this feat, some 85m of curved concrete walls in facing concrete quality with radii of up to 8m and heights of up to 6m needed to be installed. On the outside, the walls were equipped with pre-manufactured facing form work which transported the facing concrete look to the exterior. The chapel was built as a closed sacral and visibly stand-alone edifice.



Western exterior view of chapel Image: ARTEC



Inside view of facing concrete chapel Image: ARTEC

Structural engineering and fire protection

In order to meet the structural requirements all the way up to the 5th floor, an elaborate steel construction concept with flat steel hangers stretching across several floors was needed. Furthermore, a multitude of composite columns made from steel, profiled pipes as well as composite supports in ceilings and beams were installed. The fire-protection specifications required that all the structure's exposed construction steel parts were to be coated with R90 intumescent paint.



General 3D overview of steel construction development plan Image: Statikplanauszug St20 ZSZ Ingenieure



Courtyard with woodland garden Image: PORR AG

Landscaping

Once structural work had been completed as early as mid-May 2014 after 10 months, work on the elaborate landscaping measures began in September 2014. The foot and bicycle path that had been diverted during the entire construction time was reinstalled in its new location and now partially runs underneath the residential home's elevated superstructure. The neighbouring Sternhochhaus building's fire brigade access road was re-established, the public path leading from An-der-Lan-Straße to the boardwalk was paved and all remaining outer areas were correspondingly landscaped.

The outer area's true gems, however, are the large square underneath the residential home and the inviting inner courtyard with forest garden and a total size of some 3,000m².

Following the landscape architects' design, the spacious area was divided by means of several steel belts into which were placed beautifully shaped quarry stones that had previously been selected for the purpose in a quarry two thirds of which now protrude from the ground. The remaining space was covered with dark basalt chips which makes the stones look as if they "grew" out of the ground. As a special feature, the entire square was equipped with a coloured asphalt overlay. Furthermore, an adequate number of seating furniture, waste bins, tree beds and bicycle racks were integrated into the outer area. The southern end of the common wing is where the café is located. It serves as a communication hub with an indoor and an outdoor dining area.



Café on common wing's ground floor Image: ARTEC

Final remark

In conclusion, it can be said that, despite the difficult and, above all, elaborate work and the rather short construction time of 18 months in total, the modern residential care home built in accordance with high quality standards could be put into operation on schedule. Thanks to excellent collaborations with our client and the consortium partners and to the full satisfaction of all those present, the home's operator Innsbrucker Soziale Dienste was able to stage an open house day on 22 September 2015. With its varied know-how, PORR for its part could significantly contribute to the project's highly successful implementation.

Project WQA "Wohnquartier am Alexanderplatz"

Another PORR project in the heart of Berlin

Christian Schlegel

General information

Encompassing 190 flats as well as commercial and office areas on the ground floor as well as the first floor, project WQA is part of a building ensemble that offers an additional 400 student flats, a super market and a day-care centre.

In 2013, PORR Deutschland GmbH's central Berlin branch had been commissioned with the building's turn-key-ready construction including the entire execution planning concerning architectural services, HVAC system, structural engineering and outer facilities, following the HOAI (schedule of services and fees for architects and engineers). The project was implemented roughly at the same time as the ensemble's second section called Studio B, which is handled by a different general contractor.



Visualisation of project WQA (front view) and Studio B Image: Collignon

Location

The structure was erected in a central location in Berlin's Mitte district and is situated conveniently, in close vicinity of Alexanderplatz.

Due to the adjoining buildings, especially a structure dating back to the previous century and adorned with dark-red clinkers, urban architecture considerations had to be incorporated into the façade design.

Project description

The project is divided into two elements, featuring a basement floor, nine upper floors and two stacked floors. At sizes ranging from approx. 40m² to more than 70m², the two- to three-room flats feature spacious balconies and window space. The flats located on the stacked floors are equipped with generous terraces that offer magnificent views of the city. All flats come with floor heating, genuine wood parquet flooring, kitchens, guest toilets, storage

rooms and high-quality bathrooms.



Sample room with kitchen Image: PORR AG



Bathroom Image: PORR AG

The courtyards have been designed to be used as community spaces. Green spaces adorned with trees, shrubs, lawns, play equipment and places to sit down turn them into a cosy outdoor common area that neatly connects to a public green area on the building's outside area.

All utility rooms and a spacious underground car park with 71 car parking spaces as well as plenty of bicycle parking can be found on the basement floor.

World of PORR 167/2015



Underground car park Image: PORR AG

The ground floor and first floor have been designed to house business premises and offices.

Planning

Early on, in the approval planning phase, employees belonging to PORR's future project team supported the planners with their expertise. Together with all those involved in planning, they thus laid the foundation stone for the project's architecturally appealing design under consideration of the special conditions of a high-rise building and the demands placed on the façade design. Execution planning, phase 5 of the HOAI, was subsequently carried by the offices GFB (architecture) and HTPS (structural engineering, structure planning) and employing internal PORR know-how in collaboration with PORR Design & Engineering (HVACR system).

The pressure ventilation system for the fireman lifts and escape staircases, the flat design featuring generous window space and appealing ground plans, adherence to the specifications of the energy saving regulations as well as the fire and noise protection regulations were the main focal points during planning.

Execution of construction work

The construction pit

A multi-storey car park with a transformer station and a cold storage warehouse dating back to the 1970s had been located on the building plot. Construction work began in February 2014 with the demolition of these existing structures. Archaeological finds such as tombs belonging to an ancient graveyard and the remains of structures from the Middle Ages were unearthed in the process. During the excavation of the construction pit and in the course of construction work, the team therefore had to respect the archaeological team's excavations and the recording and recovery of the finds.



The Dressler excavation team at work Image: PORR AG



The Dressler excavation team at work Image: PORR AG

Thanks to excellent collaborations with the Dressler excavation team, excavation work could be carried out without impeding structural work on the building. Witnessing the excavations and learning interesting facts about Berlin's history from the finds was a great experience for everybody.



Unearthed remains of past structures Image: PORR AG



Archaeological finds Image: PORR AG



Middle-Age brick with "fir tree" embossment Image: PORR AG

Building shell

Structural work started in April 2014. Employing numerous optimisation measures such as the use of filigree ceilings, non-supporting brickwork walls, pre-manufactured parts and semi-finished parts during the execution phase, the team utilised all options to reduce construction time. Additionally, they developed and thoroughly implemented a stringent logistics concept regarding all deliveries, from pre-manufactured parts, form work and scaffolding material to building stones, concrete and reinforcements. Thus, the team managed to finish the building shell's last floor in December 2014, a full month ahead of schedule.



Construction pit with structural work on the basement floor Image: $\ensuremath{\mathsf{PORR}}\xspace$ AG



Completed building shell Image: PORR AG

The offset balconies posed a special challenge. The load transfer method by means of heavy-duty supports that is conventionally utilised for balconies made from pre-manufactured parts could not be used in this case. A practical and cost-efficient solution was finally found in collaboration with a scaffolding company: The balconies made from pre-manufactured parts were supported on a temporary truss construction incorporated into the façade scaffolding. Once the concrete had set and reached its required strength, the truss construction was repositioned on the next floor.

Planned on the basis of the energy saving regulations' specifications and the noise protection regulations, dual-colour plastic windows with triple glazing and window

ventilators were installed as early as during structural work. Thus, the entire building was wind-proof shortly after structural work had been completed, allowing fit-out work to start shortly afterwards.

Aluminium glass windows and doors equipped with transom windows were used on the ground floor.

The utilised disposal concept provided valuable experiences regarding a clean and safe construction site. A disposal company particularly commissioned for the purpose was put in charge of continuous site cleaning, disposing of residual and packing material as well as operating the goods lifts.



Façade view with offset balconies Image: PORR AG

Façade

Great attention was paid to the façade's technical aspects and the respective sampling process. A façade expert was recruited to assist in the planning and monitoring of the execution details of the façade which included a system solution in the form of a thermal insulation system with glued-on facing clinkers, always adhering to the high-rise building regulations. Things that needed to be considered during the sampling of the facing clinkers included the ideas of the architect, the client, Berlin Senate as well as technical regulations. Finally, a split clinker that allowed an attractive surface design in connection with the balconies' white colour concept, was chosen.



Façade view with dark facing clinkers and balconies Image: PORR AG

Interior work

Due to the building's ground plan, many different flat and bathroom ground plans had been specified. All bathrooms and guest toilets had therefore to be executed using conventional methods. Thanks to well-organised construction process planning including extensive time and quality controls of all crafts, interior work too could be finished ahead of schedule. As early as one day after acceptance in September 2015, the first tenants moved into their new flats.

Final remark

At the same high quality standards as ever, PORR successfully implemented another project in the centre of Berlin with this residential and business building.

Project data

Company	PORR Deutschland GmbH Berlin branch Building Construction Department
Client	SONUS City GmbH & Co. KG
Type of project	Residential and business building, new construction
Demolition of old building	February 2014
Start of construction work	April 2014
End of construction	September 2015
Gross floor area	approx. 25,500m ²
Office space	approx. 1,700m ²
Business/commercial premises	approx. 1,500m ²
Residential units	190
Parking spaces in the underground car park	71

Redesign of Mariahilferstraße pedestrian zone

Vienna's largest pedestrian zone was given a new face

Johannes Blieweis

Introduction

In October 2013, Vienna's Mariahilferstraße was declared a shared space between Getreidemarkt and Westbahnhof train station and a pedestrian zone between Andreasgasse and Stiftgasse in the framework of a 7-month test phase. Immediately after a survey had been held among the residents of the 6th and 7th district in March 2014, a call for tenders was issued for structural redesign measures.

A bidder consortium under the technical lead management of TEERAG ASDAG AG was able to land the redesign contract in April 2014.



Bundesländerplatz Image: Bureau B+B / Ricky Rijkenberg

Mariahilferstraße's development into a highly frequented shopping street right on the border dividing Vienna's 6th and 7th districts required a reorganisation of the traffic concept. Its excellent connection to the public transport network led to a significant rise in pedestrians. Bicycle traffic likewise saw a noticeable increase. The importance of motorised private transport in the shopping street, on the other hand, fell into a steady decline.

One had to react to the fact that the road space had been pushed to the limits of its capacity regarding pedestrian and bicycle traffic. Changes to the road user structure formed the starting point for the considerations regarding the traffic space's complete reorganisation.

The redesign's key points

- Traffic calming measures regarding motorised private transport through the establishment of a pedestrian zone between Andreasgasse and Kirchengasse as well as a shared space between Gürtel ring road and Andreasgasse and between Kirchengasse and Getreidemarkt.
- Support of the new traffic concept by means of design solutions. The choice of materials used for surface design supports the visual perception of the different traffic areas.

Shared space foot paths	concrete slabs of various formats from 20/8/40 to 40/8/60.
Shared space road surface	concrete stones 20/10/30
Pedestrian zone	granite slabs of different formats and types: Syenit from Hartberg, Herschenberg and Gebharts formats from 32/14/32 to 32/14/60



Pedestrian zone granite paving Image: Franz Groyer

- Handicapped accessibility at all crossings, branches and entrances was consistently implemented under consideration of the framework conditions.
- A continuously conceptualised tactile paving system was installed.
- Reduced signposting to maximise the traffic space's clarity and orderliness.
- Street furniture elements to upgrade the traffic space.
- "Schanigarten" (pavement café) concept to guide pedestrian traffic in an unimpeded way along the shop fronts.
- Improved lighting concept in the pedestrian traffic areas.



Street furniture elements Image: Bureau B+B / Ricky Rijkenberg

Structural details

The redesign concept stipulated the reuse of as many of the existing concrete and granite paving slabs as possible. For this purpose, the paving slabs were carefully removed and cleaned. Prior to being transported to a storage area that had been created in the construction area, the slabs were sorted by format, stacked on pallets and foiled.

Only new granite slabs 14cm thick were used in the pedestrian zone between Andreasgasse and Kirchgasse. The concrete slabs extracted in this area were used to create the pavement surface in the shared spaces. Due to the concrete slabs' good condition and the team's careful approach, a re-utilisation ratio of approx. 70% was achieved in the re-installation process.



Development site Bundesländerplatz/pedestrian zone Image: Franz Groyer

The shared spaces' road surface was built using new concrete slabs 10cm thick. Due to their thickness, the existing slabs were not suited to withstand the traffic loads in this area.

Accommodating for its extensive use, bus line 13A's new route running from Capistrangasse to Kirchengasse was created using a dedicated construction. Large, 18cm thick granite stones of the format 20/30 were used there.

All paved surfaces were built by means of the unbound construction method, whereby the drivable areas were

equipped with a base layer made from paving drain concrete.

Standard build-up

Pedestrian zone	14cm granite paving slabs 3cm sand bed 20cm paving drain concrete
Shared space pavement	8cm concrete paving slabs 3cm sand bed partially 20cm paving drain concrete
Shared space road surface	10cm composite concrete slabs 3cm sand bed 20cm paving drain concrete
Shared space pavement	18cm granite paving 3cm sand bed 30cm paving drain concrete

Construction progress

Mariahilferstraße was divided into two construction sections:

 One section ran from Kaiserstraße to Kirchengasse.
The other extended between Kirchengasse and Getreidemarkt.

The redesign of the section from Kaiserstraße to Kirchengasse began in May 2014. In order to ensure unimpeded delivery vehicle access to the local businesses, work was only performed at every second block at a time. Apart from a few exceptions, the development sites were closed to private transport. The area between the development sites was utilised employing a large-scale traffic concept in order to keep Mariahilferstraße accessible for drivers, regardless whether they were residents or visitors.

The availability of access and exit possibilities for fire engines needed to be guaranteed in all areas and at all times. A corridor 3.5m wide was kept free allowing access to every structure on Mariahilferstraße in case of emergencies. Guaranteeing the safety of pedestrians on such a highly frequented shopping street, on the one hand, and providing quick access for emergency vehicles, on the other hand, posed great challenges. All workers on the construction site had to handle their equipment with utmost care to master this feat. Lorries, wheel loaders and dumpers needed to be accompanied by banksmen at all times, excavators and self-propelled laying machines had to be operated very cautiously to minimise the endangerment of pedestrian traffic.

We owe it to the diligence of the more than 100-strong construction site team that, despite the vast number of work hours, not a single accident connected to their work was reported.

The first half of this first construction section could be completed as early as August 2014. Traffic was redirected

to the newly created areas, pedestrians and bicycle riders could for the first time enjoy the benefits of the new, barrier-free Mariahilferstraße.

This first major step significantly increased the acceptance of this project and the corresponding construction work. In practice, passers-by, residents and the local business people liked the new Mariahilferstraße. We noticed, for instance, a clear shift in the content of the talks we had to hold on location. Whereas previously, the talks had been dominated by construction site emissions and scepticism towards the project, they were now characterised by the pedestrian zone's beautiful granite surface, its attractive street furniture and the newly gained space for pedestrians and bicycle riders. We also saw a significant increase in the interest passers-by showed in the work steps that were required to create this new paved surface.

We employed almost all the machines available on the market to lay the paving slabs: from manual laying by means of slab grippers to manually operated laying units with vacuum cups (running on petrol or batteries) to stationary and self-propelled laying units. It is thus not surprising that we attracted a large number of technically interested repeat visitors of all ages in the course of the construction time.



Manual paving by means of vacuum cups Image: Franz Groyer



Mechanical paving by means of vacuum cups Image: Franz Groyer

The first construction section could be completed in

November 2014, just in time for the start of the Christmas season which is of high importance to shopping streets. The redesign of Mariahilferstraße from Gürtel ring road to Kirchengasse had been completed. The shared space between Gürtel ring road and Andreasgasse was taken into operation and convinced with trouble-free traffic handling.

In February 2015, the team started tackling the shared space's remaining part extending between Kirchengasse and Getreidemarkt. Despite tremendous time pressure, this section could also be completed on schedule in July 2015.

Project data

Construction time	11 months
Total area	42,000m²
Block paving blocks	22,000m²
Granite paving blocks	20,000m²
Paving drain concrete	6,000m³

Project Südgürtel ("southern beltway") Graz

Construction of a subsurface route in the south of the provincial capital of Graz

Michael Metz

General information

Due to the traffic situation in the south of Graz which will likely become impossible to handle in the future, the Office of the Provincial Government of Styria's Department 16, responsible for traffic and provincial building construction projects, has tendered a construction scheme including the relocation of the B67A Grazer Ringstraße, the closing of the gap between the districts of Puntigam and St. Peter in the form of new structure 2,000m, in length consisting of a 1,442m long, dual-tube subsurface route underpassing the Liebenau district road network.

A consortium consisting of TEERAG-ASDAG, Granit and PORR, the so-called consortium southern beltway Graz, was commissioned with the project in December 2013. Construction started in January 2014.

Location

The construction scheme is located on the left shore of the Mur River in the south of Graz, between Puntigam Bridge and Liebenau beltway which subsequently connects to the Raaba motorway access ramp.

The development site is located on the 9km wide valley floor which is characterised by a granulate soil filling. The Plabutsch-Buchkogel range, the mountains belonging to the hilly region of the East-Styrian Basin and a gorge in the region of Wildon form the area's boundaries in the west, east and south, respectively.

The deeper portions of the fluvio-glacial gravel represent the aquifer which is used in many ways, for instance by municipal organisations such as Grazer Stadtwerke ("Graz Municipal Utilities"), Wasserverband Umland Graz ("Water Board of Graz' Surrounding Areas"), Wasserverband Grazer Feld Südost ("Water Board of the South-Eastern Grazer Feld Area") as well as for the extraction of process water for agricultural and commercial use. The construction site is thus situated in the middle of a ground water lake filled with "gravel" as well as in a water protection area whose ground water table, on the one hand, highly depends on the amount of precipitation and, on the other hand, on the water level of the Mur River which bypasses the construction scheme close by.



Development site overview from a helicopter's perspective Image: PORR AG

Project description

The "southern beltway" road section measures 2,000m in length. In the course of this expansion project, a covered subsurface route with ramp sections connecting to the former at both ends was built as a "white tub" construction with support walls on both sides.

The entire subsurface route and the ramps are located in curved sections, most blocks measure 24m in length while their widths are variable.

Representing a variant of the tendered project, the consortium has decided to execute the standard cross-sections by means of form work carriages whereas the rest of the tunnel's parts were formed in the conventional way.

In addition to the "white tub", the concrete parts lying below the ground water table are enveloped with a "brown tub" construction. In the open-air section, the tunnel's top slabs are sealed using tunnel film while bitumen sealing supplied by IAT GmbH is used in the overbuilt area.

Project data

Client	The Office of the Provincial Government of Styria Department 16, Traffic and Provincial Building Construction Projects
Contractor	ARGE Südgürtel Graz (Consortium southern beltway Graz)
Start of construction work	January 2014
Overall completion	September 2017
Material moved (excavated earth)	650,000m³
Concrete	100,000m³

PORR Projects

Reinforcements	11,000t
Concrete slabs	10,000m³
Asphalt mix	19,000t
Slit drainage gutters	3,000m
Internal coating	25,000m ²
Operations buildings	1
Power consumption (ground water drainage)	4,000MWh

Preperation works

In order to implement this project in the first place, sewers, water lines, district heating lines, gas lines and a myriad of cables needed to be relocated in the course of previous construction schemes (TEERAG-ASDAG AG – projects Liebenauer Hauptstraße sewer relocation and southern beltway site clearing). Some 30 structures likewise had to make way for the development site and were removed.

Structures in the close vicinity of the development site's edge were secured by means of jet grouted columns. This work was successfully completed by the foundation engineering department of PORR's infrastructure division.



Anchored jet grouted wall securing a 7-storey residential building Image: PORR AG



Erosion protection on the 45-degree slopes Image: PORR AG



Anchored jet grouted wall securing a single family home Image: PORR AG



Temporary water line bridge for the main supply line of Graz/St. Peter district

Image: PR-Trummler / Fotostudio Puchernegg

Execution of construction work

As a result of the environmental restrictions laid down by the environmental authorities, the entire excavated material had to be processed in order to produce the concrete needed on location as well as to produce the gravel required for road construction. The rest was used for backfilling and as cover filling.

We were permitted to only transport off those materials that could by no means be used on the construction site. These measures, on the one hand, helped reducing the number of lorry transports from the development site as well as concrete supply transports to the site from outside. On the other hand, this method posed a huge logistical challenge due to spatial restrictions at the development site.



Concrete mixing plant Image: PORR AG

Gravel processing Image: PORR AG

Concrete is produced by the gravel and concrete works of Karl Schwarzl Betriebsges.m.b.H. The mobile mixing plant was erected shortly after the start of construction and has been running perfectly ever since. The plant's design allows it to supply the construction site with 1,000m³ of concrete daily at regular working hours. A well particularly dug for this construction scheme provides the water required for concrete production. A sophisticated irrigation system was installed for purposes of keeping the intermediary gravel storages and the roads in the area of the gravel processing/concrete mixing plants dust-free as well as to make life "on" the construction site as pleasant as possible for the area's residents.



Electronically controlled irrigation system; the individual lines run to sports field sprinklers Image: PORR AG

In certain areas, the construction pit was executed with sloping sides. Most parts, however, were secured by means of PU28 steel sheet piles 14m in length which were run into and anchored to the ground. Large areas were secured using slope reinforcements consisting of anchored, reinforced shotcrete.



Anchored shotcrete wall featuring a tilt of 1/5 Image: PORR AG

Subsurface route – standard cross-section and execution



in length.

Spanning approx. 700m, the standard cross-section is a double rectangular cross-section with a clear span of 12.5m each and an height of 5.6m.

Using the form work carriage (DOKA - CC), the walls and ceilings were built in a single pour half way up the block (12m) in weekly cycles.

Due to the fact that the entire tunnel describes a curve, the form work carriage needed to be adjusted continuously during the individual cycles.



Straight parts of the subsurface route Image: PR-Trumler/Fotostudio Pachernegg

the tunnel entrance areas and their covered ramps, as well as the ventilation cross-sections, walls and ceilings were built using the several drifts method.

Standard cross-section Image: PORR AG



Standard cross-section at block 17 Image: PR-Trummler / Fotostudio Puchernegg

The bottom slab and the walls are executed as a "white tub" with an additional outer bentonite sealing layer. To improve fire resistance, fire protection fibres were mixed into the concrete used for walls and ceilings. All working and expansion joints are equipped with outer and inner joint tapes with additional injection hoses.

The tunnel is divided into 63 blocks measuring some 24m



Entrance and exit area of east portal, separated tunnel cross-section built using the several drifts method with exit to roundabout Liebenauer Hauptstraße in the centre Image: PORR AG

Six individual ceiling form work carriages (DOKA SL1) were used to build the ceilings. Due to construction progress, these carriages had to be lifted out after the entrance ramp of the eastern portal had been completed. Subsequently, they were transported to the western portal and lifted into place there once again.



Form work carriage SL1 "on tour" Image: PORR AG

The tunnels' inner walls and, in parts, the ceiling soffits, are equipped with tunnel coating.

An average of some 1,500m³ of concrete are installed weekly.

Even in the summer months, the concrete could be prepared in accordance with the specifications of a "white tub" regarding the fresh concrete temperature thanks to the use of a nitrogen cement cooling system and freshly prepared concreting gravel.

Ground water

Surrounding ground water was directed into a total of 6 central wells by means of drainage systems and guided into the Mur River via pressure lines and ground water drainage canals specifically built for the purpose. A dedicated power supply unit consisting of a 1,000kW transformer station, electrical distributors as well as emergency power generators and a sophisticated redundant system allow construction work being carried out in a dry construction pit.



Central dewatering well Image: PORR AG

Final remark By the end of 2015, 50% of consortium southern beltway Graz' construction work will be completed to the full satisfaction of all those involved.

The consortium's team is looking forward to the project's joint completion and would like to take this opportunity to thank the client, the specialist planners, the construction supervisors and subcontractors for excellent collaborations.

The subsurface route will be opened for traffic in spring 2017. This will mark a major event, not only for the consortium. It will also be an unforgettable day for the vast number of road users.

"The green line Kačerov" in Prague

Construction of a modern office building in record time

Robert Kunft

Project data

Client	Centrum Kačerov s.r.o., member of the Karimpol Group
Construction time	07/2013 – 06/2015
Number of storeys	4 basement floors, 8 upper floors
Parking spaces	236
Gross floor area	31,000m ²
Rentable area	13,500m²



Exterior view – view of northern façade Image: Tomáš Malý

Project description

The office building with its four basement floors and eight upper floors is located directly at the main exit road leading from Prague towards Brno and in the immediate vicinity of Kačerov underground station.

For most parts, the unit's ground plan was determined by the property's gradient and is reminiscent of a drop measuring 28m at its widest and 8.5m at its narrowest end. The adjacent, interlinked building elements naturally connect towards the south to the dominant element in the west which is shaped like a cylinder.

The building's architectural concept is supposed to bring to mind a solid, conservative style referring to Bohemian architecture from the 1930s. The entire unit is intermittently broken up by green patches. Thus, mobile containers with shrubs have been placed all around the building. Plans for the future include greening on the roofs and terraces.

Construction progress

The contract with the client had been concluded in April 2013. Construction work started in July 2013 after the construction permit for the construction site equipment had been obtained.

Before construction work could begin, however, a 6m high noise protection wall enclosing the site towards the adjacent road had to be erected in a first step. This was followed by the excavation of the construction pit which was up to 12m deep and secured by means of Berlin type pit lining. The fact that the construction pit directly bordered an adjacent road under which were located a DN500 water pipe as well as a large, underground sewer, foundation work posed a real challenge. The underground lines had to be circumvented by means of anchors which were therefore installed at a larger angle than usual. These conditions made it necessary to continuously and meticulously check settling in the construction pit's area.

Step by step, the reinforced concrete foundation slab was installed during the excavation phase. It forms the base for the four basement floors of the underground car park which was built as a white tub construction and the monolithic eight-storey reinforced concrete construction rising on top.

Structural work could be completed in August 2014. Additional work included façade and roof formation installation, lift shafts, sanitary units and stairwells as well as finishing work in the car park and lobby areas. The rest of the area was finished in the framework of tenant fit-out.

Façade design

On the one hand, the façade solution is based on the unit's unique position and on the other hand, on the southern and northern façades' different designs made necessary by the high traffic volumes of the adjacent motorway exit.

Parts of the northern façade which faces the adjacent, high-traffic Prague motorway exit leading in the direction of Brno were executed with special noise protection measures.

The construction permit specified that the noise on the opposite side of the road may only rise by 1dB which posed a great challenge. Based on several acoustic surveys, the façade was therefore designed in a structured way and consists of large areas of specially developed and tested noise protection panels. The unfavourable acoustic reflections of traffic noise from the opposite side of the road are eliminated by means of a special grid.

The unit's impressive cylinder-shaped face side is enveloped in fully glazed façade. The southern façade is divided into three complexes. The office building's main entrance is located in the central part.

The façade areas are alternately clad in large-sized light-coloured plates clear glass panels. The metal parts consisting of dividers and slats are coated in white.



Northern façade Image: Tomáš Malý



Underground car park entrance and exit Image: Tomáš Malý



The "cylinder's" glazed façade Image: Tomáš Malý



Façade on the face and southern sides Image: Tomáš Malý

Special features

One of the project's special features is the fact that the six-lane motorway leading to Brno actually leads directly into and out of the office building. This tremendously alleviates the traffic congestion in the surrounding residential areas. Such a construction of a motorway going in and coming out of an office building is a first in Prague.

The fact that the building itself functions as an acoustic barrier yields yet another pleasant side effect for the surrounding residential buildings whose residents had been subjected to acoustic smog. Overall, the project had been planned in such a way that it not only provides benefits for its tenants but also for its surrounding and the environment – a feat proven by the successful LEED GOLD certification. The unit meets A+ standards and offers an entire range of innovative technologies. It goes without saying that it features fully air-conditioned rooms, built-in fan coil units as well as double floors.



Meeting room Image: Tomáš Malý



Lobby Image: Tomáš Malý



Cafeteria Image: Tomáš Malý

Summary

"The Green Line Kačerov" was completed within the specified budget and was handed over on schedule in the usual PORR quality in June 2015. Once again, we were able to fully satisfy our client, the Austrian Karimpol Group with whom PORR has been cooperating for some time now which makes us hope to be commissioned with further joint projects in the future.

ÖBB freight train bypass St. Pölten

An overview of PORR's contract sections

Franz Hofmarcher, Herbert Beran

Introduction

The project is being implemented in the context of the four-track expansion of the Westbahn route and is part of the Transeuropean Network ad is co-financed by the European Union.

The gap close between St. Pölten and Loosdorf 24.7km in length, a freight train bypass (GZU), is a new dual-track route with a design speed of 120km/h. The freight train bypass's new route bypasses St. Pölten's city centre in the south, thus relieving St. Pölten's main station of freight and through traffic.

Retrospection

Planning for this undertaking began in 1991. Once the environmental risk assessment had been completed successfully and the railway authorities' construction permit had been obtained, construction started in 1999. In 2000, the project's construction was postponed since an increased demand in capacity was expected only once the new route between Vienna and St. Pölten was finished. Further funding made available by the economic stimulus package allowed for the continuation of construction on the gap closure between St. Pölten and Loosdorf (GZU). Since the ground-breaking ceremony in 2009, construction on the dual-track bypass has been going at full steam. The freight train bypass will be taken into service in 2017.

Objectives of the freight train bypass

- Increase in capacity on the Danube axis, especially when it comes to freight transport
- Operational relief of St. Pölten main station from freight transport thus,
- establishment of the requirements for an attractive passenger transport offer
- More connections and faster travelling in passenger transport as well as more reliable just-in-time deliveries in freight transport are prerequisites for the transfer of traffic from the road onto the track
- Increased quality of life and alleviating the noise pollution for city centre residents

Division into construction sections

The 24.7km long route was divided into four sections:



Route diagram of freight train bypass Image: ÖBB

Wagram junction (3.2km)

At Wagram junction, the new dual-track Westbahn route (Vienna – Tullnerfeld – St. Pölten) connects to the old dual-track Westbahn line. Furthermore, the dual-track freight train bypass branches off in southerly direction at this point.

Central section (Crossing the city of St. Pölten; 12.2km)

This section starts right after Wagram junction, runs in parallel to the S33 in southerly direction, describes a 90° bend parallel to the A1 motorway, crosses the city of St. Pölten in westerly direction and runs into the 3.5km long single-tube and dual-track Pummersdorf Tunnel after the St. Pölten Süd motorway exit.

Western section (9.3km)

From the western tunnel portal, the line runs in parallel to the A1 Westautobahn motorway all the way to the portal of Radleitn Tunnel.

Rohr junction

At this intersection structure right before Loosdorf, the lines of the existing 3-track Westbahn route merge with the dual-track freight train bypass into the 4-track section of the Westbahn section between Vienna and Salzburg.

PORR's contract sections

PORR is/was working on the following construction sections:

Wagram junction	in a consortium; technical leadership: PORR Railway Construction
Central section:	Dopartment

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GUM4 – above-ground route	in a consortium; technical leadership: PORR Railway Construction Department
GUM6.2 – slab track	in a consortium; technical leadership: PORR Railway Construction Department
Western section:	
GUW2 – above-ground route	in a consortium; technical leadership: PORR Railway Construction Department
GUW4 – operations building	in a joint venture between PORR Railway Construction Department and PORR Bau GmbH's Lower Austria branch

Wagram junction

A consortium under the leadership of PORR built Wagram junction between 1999 and 2004.



Aerial shot of Wagram junction, north-easterly view direction Image: PORR AG

Freight train bypass western section, contract section 2 (GUW2)

A consortium with significant input by PORR's Railway Construction Department was commissioned with the contract for contract section GUW2 in spring 2013.



Heavy earthwork Image: PORR AG



Frost protection installation on railway line Image: PORR AG



Aerial shot of railway line; easterly view direction Image: PORR AG

PORR Bau GmbH's Krems branch carried out the dewatering, noise protection wall installation and asphalt laying work.



Installation of the bituminous base layer at the beginning of the contract section Image: PORR AG



Finished bituminous base layer railway bed Image: PORR AG



Outlet pipe crossing Image: PORR AG

Project data GUW2

Client	ÖBB Infrastruktur Bau AG
Construction time	2 April 2013 to 30 June 2015
Order volume	EUR 8.1 million
Length	5.3km (15.800 to 21.125)
Volumes:	
Soil removal and excavation	580,000m³
Subgrade level	130,000m ²
Frost protection	55,000m³
Stabilisation	50,000m³
Pitched stonework	35,000m³
Bituminous base layer railway	70,000m²
Noise protection wall posts	3,600m
Foundations for catenary masts	600m³
Landscaping	135,000m ³

Construction procedure

The contract section was implemented in two construction phases:

• Construction phase 1:

Construction phase 1 covers the route section from the western tunnel portal of Pummersdorf Tunnel to the cut area.



Frost protection installation Image: PORR AG



Construction of noise protection walls Image: PORR AG



Finished ground water basin Image: PORR AG

Construction phase 2:

Construction phase 2 covers the route section "cut" to the tunnel portal of Radleitn Tunnel.



Stone pitching construction in cut area Image: PORR AG



Heavy earthwork using 50 ton excavator Image: PORR AG



Installation of bituminous base layer railway in cut area Image: PORR AG

In the case of both sections, the subgrade layer was stabilised by means of base layer binders instead of using soil exchange.



Subgrade level stabilisation Image: PORR AG



Subsoil stabilisation Image: PORR AG

Freight train bypass western section, contract section 4 (GUW4)

A joint venture between PORR's Railway Construction Department and PORR's Lower Austria branch was commissioned with the contract for contract section GUW4 in spring 2014.

The contract section covers the turn-key-ready construction of eight operations buildings, a safety exit at the Bründlkappelle Tunnel and the new operations building at the Rohr substation.

Project data GUW4

Client	ÖBB Infrastruktur Bau AG
Construction time	01 July 2014 – 31 December 2015
Order volume	EUR 2.8 million
TG 5050 – km 16.140	14m²
TG 5051 – km 18.055	21m ²
TG 5052 – km 19.847	27m²
TG 5053 – km 21.235	78m²
TG 5054 – km 21.650	26m²
TG 5055 – km 22.480	63m²
TG 5071 – km 24.394	192m ² (safety exit at Bründlkapellen Tunnel)

TG 5072 – km 23.330	26m²
TG 5073 – km 24.394	74m²
TG 5081 – km 76.105	194m² (Operations building substation, 110KV outdoor switchboard plant)



Aerial shot of operations building TG 5053 Image: PORR AG



View of operations building TG 5071 Image: PORR AG



View of 110KV Rohr substation Image: PORR AG

The operations buildings have been designed to house all technical facilities. Depending on their equipment, they house, among others, the battery rooms, telecommunication rooms, the low-voltage compartments, transformer rooms, some of them also sanitary rooms and wet cells.

In case of TG 5081, we furthermore carry out excavation work, install the outside facilities as well as the foundations of the 110KV outdoor switchboard plant. We also take care of adapting the track connection (road bed and track work).

Freight train bypass central section, contract section 4 (GUM4)

Following the bankruptcy of Alpine Bau, Bemo Tunneling was looking for a new partner to complete the above-ground section. In the course of negotiations in summer 2013, the consortium ARGE ÖBB GUW2 landed the contract.

Project data GUM4

Client	BEMO Tunneling, Innsbruck
Construction time	September 2013 to May 2015
Order volume	EUR 21.1 million
Volumes:	
Soil removal and excavation	260,000m³
Dam body tipping	110,000m ³
Frost protection	70,000m ³
Subgrade level	60,000m ²
Track ballast	20,000m ³
Landscaping	120,000m ²
Concrete	12,000m ³
Reinforcements	900t
Noise protection wall	25,000m ²
Steel	280t
Bituminous base layer railway	115,000m ²
Asphalt laying on accompanying paths	40,000m ²
Cable ducts	8,000m



GUM 4 Traisen Bridge interior view Image: PORR AG



GUM 4 shot of basin Image: PORR AG

PORR's Krems branch carried out asphalt laying work.

Construction procedure

The contract section was divided into three construction sections:

• Section 1, Wagram junction to Wagram edge

Describing a slight cut, the route runs in parallel to the S33 / A1 motorway in this area. The route continues below various overpasses such as the eastern motorway exit and the dirt road overpass. Dewatering measures in the form of settling and seepage basins run in parallel. In order to meet the legal noise emission requirements, noise protection measures were installed on both sides. These consist in parts of poured noise protection dams from excess material left over from the construction of Pummersdorf Tunnel, the rest of the noise protection walls were made from aluminium.



Noise protection wall profiling Image: PORR AG



Bituminous base layer railway in the area crossing the city Image: PORR AG



Panoramic shot of asphalt laying work on bituminous base layer railway Image: PORR AG



Installation of piling pipe foundations for noise protection walls Image: PORR AG

• Section 2, area crossing the city

Starting at Wagram edge, this section crosses the city of St. Pölten in parallel to the A1 motorway and ends at the eastern tunnel portal of Pummersdorf Tunnel. The line runs on top of a dam up to 13m in height and contains massive noise protection measures in the form of 6m high noise protection walls made from concrete and aluminium.



Aerial shot, easterly view direction Image: PORR AG



Pre-ballasting of line Image: PORR AG



Bridge crossing the B20 – post installation Image: PORR AG



Maintenance stairs dam Image: PORR AG



6 m high noise protection walls in the area crossing the city Image: PORR AG



Concrete noise protection wall shell (interior view) Image: PORR AG



Installation of aluminium panels for noise protection walls Image: PORR AG



Bent noise protection walls on bridge superstructure Image: PORR AG

The bridge structures Traisen Bridge, the bridge crossing the B20 and several bridges in the city area whose shells had been built in the framework of previous contract sections are outfitted and completed in the course of this contract.



Traisen Bridge – north view Image: PORR AG



Traisen Bridge – steel arch installation Image: PORR AG



Traisen Bridge – aerial shot Image: PORR AG

• Section 3, eastern and western tunnel portals (Pummersdorf Tunnel)





Traisen Bridge – track view Image: PORR AG

Pummersdorf Tunnel – western portal area Image: PORR AG



Pummersdorf Tunnel – western portal, subgrade level work Image: PORR AG



Pummersdorf Tunnel – western portal, fit-out work Image: PORR AG



Pummersdorf Tunnel – eastern portal, aerial shot Image: PORR AG

Accompanying measures

Various retaining and seepage basins were installed off the line to drain surface water.



Finished line and basin Image: PORR AG



Installation of a basin Image: PORR AG



Foil laying in a basin Image: PORR AG



Edge of basin covered in coconut mats Image: PORR AG

Freight train bypass central section, contract section 6.2 (GUM6.2) Slab track Pummersdorf Tunnel

The joint venture FF GUM 6.2 in which PORR assumed the role of leading partner installed both tracks in Pummersdorf Tunnel in the form of slab tracks by means of the tried and tested method "ÖBB-PORR elastically supported track supporting layer". To allow emergency vehicles access, the tracks are furthermore equipped with drivable pre-manufactured reinforced concrete plates and the gaps between the tracks are filled with filter concrete. A surface that, should it be required, can be driven on is thus created. The contract awarded by ÖBB Infrastruktur AG additionally includes the construction of pipelines for fire-extinguishing water in the tunnel and the emergency exits as well as a mass-spring system to reduce vibration in the area adjacent to the town of Pummersdorf.

Project data GUM 6.2

Client////////////////////////////////////		
Construction time	1 March 2015 to 31 March 2016	
Order volume	₩₩₩₩₩₩₩₩₩₩₩₩₩ ₩₩₩₩₩₩₩₩₩₩₩	

PORR Projects

Length	3.767km (10.671 to 14.438)
ÖBB-PORR slab track	7,400m
Concrete	9,700m³
Reinforcements	250t
Pipeline for fire-extinguishing water	4,200m
Drivable pre-manufactured reinforced concrete plates	11,000m²



Eastern portal view Image: PORR AG



Transport of the 120m long-welded rails by means of special transport Image: PORR AG



Laying of track supporting plates Image: PORR AG



Completely concreted right track, left track under construction Image: $\ensuremath{\mathsf{PORR}}\xspace$ AG

PORR SUISSE realises new landmark in centre of Zurich

PORR Suisse has secured a major order in Zurich. The Swiss Federal Railways SBB have awarded PORR Suisse the tender for a project divided into four lots on the Europaallee near the main station in the centre of Zurich. The first phase of the project involves the construction of offices and commercial facilities, an underground public bicycle garage with space for almost 1,800 bikes and a passageway from underneath Zurich central station to the Europaplatz square. The second phase of construction will see another office building erected. The tender is worth around EUR 180m. The Europaallee passage and the bicycle garage are set for completion in 2017; the office buildings in 2019 and 2020.

PORR Suisse will realise the two office buildings as a design-build contractor to the plans of Stücheli Architekten and Wiel Arets Architects. The properties will blend in with the new city quarter and the im- pressive facade will define the start of the Europaallee. Google has been confirmed as one of the future tenants and will set up its largest research centre outside the USA here in Zurich.

"This tender underlines the esteem which PORR's building construction expertise enjoys in Switzerland. I am particularly delighted that the PORR Suisse team has succeeded in acquiring one of the largest companies on the Swiss real estate market as a customer with this SBB order", said Karl-Heinz Strauss, CEO of PORR AG, congratulating his Swiss colleagues on the new tender.

The foundation stone was laid in mid-June.



The project's first construction phase involves building offices and commercial facilities. Image: Stücheli Architekten; Wiel Arets Architects



An additional office building will follow in 2020 in the second construction phase.

Image: Stücheli Architekten; Wiel Arets Architects



Prominent representatives at the laying of the foundation stone for the SBB project Europaallee in Zurich; from left: Wiel Arets, architect lot D; Hubert Seifert, PORR Suisse; Christof Glaus, Stücheli architects lot B; André Odermatt, Zurich city council; Filippo Leutenegger, Zurich city council Image: PORR AG

SMART CAMPUS – copping-out ceremony at world's largest passive house

A mere nine months after the laying of the foundation stone, the project's participants celebrated the topping-out ceremony at the new headquarters of Wiener Netze called Smart Campus in Vienna's Simmering district on 25 June 2015.

Architect Egon Türmer, Managing Director Peter Weinelt and Chief Executive Officer Martin Krajcsir of Wiener Netze as well as the District Leader Eva-Maria Hatzl, PORR's CEO Karl-Heinz Strauss and the future users and staff representatives from Wiener Netze were happy to see the building shell erected so quickly and about the already noticeable progress on the the façade and finishing work.

After the official part of the topping-out ceremony, Karl-Heinz Strauss took the opportunity to express his thanks to the assembled team. The day was brought to a pleasant close at a cosy get-together with enjoyable talks involving many colleagues from the headquarters who contributed to the preparations and supported the construction scheme's implementation.

An internal joint venture between the department for large-scale building construction and Vienna Building Construction branch, New Construction 1, carried out the master builder and finishing work. Elin, Ortner and Bacon are jointly responsible for the installation of building technology and the façade is erected by ALUSOMMER.

The building measuring some 100,000m² GFA has been designed for 1,400 employees including workshops and storage rooms and is distinguished by exemplary energy efficiency. The release of every investment was decided on the basis of production costs but also on life-cycle costs. It goes without saying that water-saving fittings, LED lighting systems and thermal activation of building structures were used for the world's largest passive house.



Image: PORR AG

PORR builds Mitte energy control centre at Salzburg airport

PORR Bau GmbH's Salzburg branch has been working on the construction of the new Mitte energy control centre at Salzburg airport.

The subterranean structure provides power to Wolfgang Amadeus Mozart Airport, everything clustered in a single building. This order's greatest challenges were the safety precautions and construction site logistics. The construction pit secured by means of jet grouted bodies was located halfway between the terminal and the operations building. This necessitated highly considerate construction site operation in full consideration of airport activity.

Internal coordination between PORR Bau GmbH's Salzburg branch and PORR's foundation engineering department took place by the shortest paths possible and to the full satisfaction of the client.

Work on the energy control centre were completed by mid-October due to the airport's winter operation schedule and the correspondingly high traffic expected.



Image: PORR AG

Laying of the foundation stone at Quartier Belvedere Central – QBC5

Blessed with brilliant sunshine, the 16th of July 2015 saw the laying of the foundation stone for the first building section (QBC 5) of the project Quartier Belvedere Central in Vienna. The complex which will rise to 62m in the future and will house a 3*** Ibis hotel as well as a 4**** NOVOTEL hotel run by the ACCOR Hotels Group with a total of 577 beds, a fitness area and a ballroom.

Claus Stadler (COO of UBM Development AG), Josef Kaindl, Deputy District Leader for the 10th district, as well as Christian Giraud (Vice President of Development & Franchise at ACCOR Central Europe) welcomed the party's guests and held speeches. The concluding remarks before the actual laying of the foundation stone began were given by PORR's Chief Executive Officer, Karl-Heinz Strauss.

The speakers reported on the creation of the overall project as well as the hotels and elaborated on the project's significance for its participants and the district. All project participants were happy that now – after years of preparation – the starting signal could finally be given and stressed the excellent collaborations.

PORR Bau GmbH was commissioned as a general contractor and implements the project in the framework of an internal joint venture formed by the departments for large-scale building construction projects and the Vienna Building Construction branch / New Construction 1.

Project QBC

In the framework of project Quartier Belvedere Central which is being developed by STRAUSS & PARTNER Development GmbH next to Vienna's new main station, six building sections with a total gross floor area of some 130,000m² will be built on a ground area of 25,000m² over the next years. The buildings measuring between 35m and 62m in height will in the future house hotels, offices, flats, restaurants and business premises.



Claus Stadler (UBM), Christian Giraud (ACCOR), Josef Kaindl (10th district), Karl-Heinz Strauss (CEO PORR) Image: PORR AG



Image: ZOOMVP

PORR Carinthia: Plenty of news from the south

PORR steps up its activities in Carinthia and capitalises on an economic upturn in the construction industry. PORR's presence in the region is currently being strengthened: The ground-breaking ceremony on 17 July marked the starting signal for a new, modern and energy-efficient office building for up to 60 staff at the Klagenfurt location. The planned investment volume for the new PORR headquarters in Carinthia which has been designed as a passive energy house amounts to 3 million Euros.

With its Klagenfurt branch and numerous construction offices, PORR ranks among the leading construction companies in Carinthia and East Tyrol. 400 staff and a production output of 85 million Euros make PORR/TEERAG-ASDAG an important employer in the region, where the company is represented with its entire spectrum of services: PORR Bau GmbH processes building construction projects while the group company TEERAG-ASDAG AG is responsible for civil engineering and road construction. Shareholdings in three asphalt mixing plants as well as in Lavanttaler Bauschuttrecycling in St. Andrä round off the service portfolio and make PORR a highly successful full-service provider.

"The construction business is a local one. Thanks to the fact that were are extensively networked in all regions of the province, we understand the local clients' challenges very well and are able to process orders quickly and flexibly. Our customers appreciate this market proximity. This is also impressively reflected by our business performance: In a mere three years, we have doubled our turnover and workforce," Paul Lamprechter and Michael Kotomisky, Managing Directors of Carinthia/East Tyrol branch comment on the company's secrets of success. "Furthermore, with a current order backlog of some 60 million Euros, PORR/TEERAG-ASDAG and its employees in Carinthia can rest assured when it comes to their future," the two managing directors elaborate.

An attractive employer and apprentice training company

To maintain its high quality in terms of project planning and implementation, PORR/TEERAG-ASDAG Carinthia commits to sustainable staff development. The company puts its trust in dedicated and well-trained skilled workers and makes a significant contribution to this effect by currently being Carinthia's largest apprentice training company in the construction industry. "19 commercial apprentices are currently completing their training in our company. Following the motto 'building blocks for life' our future specialists receive, apart from the standard apprenticeship training, additional personality coaching and, if required, individual spelling and arithmetic training. We aim at building solid foundations for their future careers together with our young colleagues," Lamprecht and Kotomisky point out.

A "plus energy house" as PORR's new headquarters in Klagenfurt

In the course of the "neue arbeitswelt" (new workingworld), the PORR Corporation relies on open structures and transparency to facilitate communication and teamwork when it comes to the design of offices and branches. Among others, it thereby focusses on the buildings' energy efficiency. The new office building in Klagenfurt which will provide space for up to 60 employees of PORR/TEERAG-ASDAG, remains true to these values and sets new benchmarks both in terms of ecology and transparency.

Its energy supply comes from a photovoltaic system and heating / cooling system based on a water-to-water heat pump. A prominent display indicating energy consumption on its façade documents the energy balance. But this in-house project is also important for the region when it comes to economic efficiency. Not just the PORR Corporation will benefit from the new location but so will local partners such as planners, suppliers and sub-contractors. Construction work starts with the ground-breaking ceremony and its completion is scheduled for summer 2016.

"This new office building's concept reflects the same innovative power our Carinthian team has already displayed in the past," PORR's CEO Karl-Heinz Strauss stresses. "We believe in Carinthia and will continue to operate successfully thanks to our focussed forward-looking strategy," Strauss expresses confidently. According to Strauss, politics could provide significant impulse: "Through construction measures, the public authorities have the power to quickly stimulate the economy for every Euro that goes into building construction yields 8 Euros for the regional economy. In the field of civil engineering, the value creation reaches a ratio of 1:4."

Governor Peter Kaiser who accompanied the celebratory ground-breaking ceremony, welcomes PORR's dedication: "We appreciate PORR's significant importance of the province of Carinthia. PORR is more than just a reliable and strong contractor that has already implemented pioneering projects but also an important employer in our region and the largest apprentice training company in the construction industry. Investing in a new location highlights the company's long-term commitment.



Celebrity participants in the ground-breaking ceremony for PORR's new headquarters in Klagenfurt: (from left to right) Michael Kotomisky and Paul Lamprecht (Managing Directors of PORR/TEERAG-ASDAG Carinthia/East Tyrol branch), Ursula Heitzer (Vice President of the Carinthian Chamber of Labour), Ruth Feistritzer (City Councillor), Peter Kaiser (Governor), Karl-Heinz Strauss (CEO of PORR AG), Otmar Petschnig (Vice President of the Carinthian Chamber of Commerce) Image: PORR AG

PORR Railway Construction: Topping-out ceremony at U1/14 Neulaa station

After structural work on Neulaa underground station had been completed, the topping-out ceremony was staged on 7 July 2015. The client Wiener Linien and all those involved in the project were in attendance. Apart from numerous subordinate building segments such as support walls and sewer pipe relocation, a roof rehabilitation hall 140m in length, two storage halls 140m and 240m long, respectively, an operations building and the Neulaa station building with five station accesses were built in a construction time of just 18 months on a construction section 1,200m in length.

Wiener Linien's director, DI Günter Steinbauer, welcomed the party guests. He expressed his thanks for the project's on-schedule completion and praised the excellent collaborations between all those involved in the project.

District Leader Hermine Mospointner was equally excited with the construction progress and also thanked all participants.

Prior to the end of the official part of the topping-out ceremony, the reciting of the traditional topping-out poem by our youngest, Project Leader Herbert Beran expressed his appreciation for the entire team's outstanding performance. He particularly highlighted the cooperative and trouble-free handling of the project together with the client's representatives.

A lavish buffet and cold drinks brought the evening to a close.

Project data

Order volume	approx. EUR 32 million
Length of construction section	1,190m
Construction time	January 2014 to October 2016
Volumes:	
In-situ concrete	49,000m³
Formwork	70,000m²
Falsework	34,000m³
Reinforcement	4,400t
Tread channels	290m
Noise protection	4,700m²
Ballast tracks	3,900m
Concrete superstructure	1,400m



Aerial shot 12/2014, project U1/14 Image: Luftbildservice Redl
Seestadt Aspern: Celebratory handing over at building site D12

For 213 tenants, the dream of living in a "tree house" became a reality on 9 July 2015. After a construction time of just 22 months, the housing complex at Seestadt Aspern was completed as one of the last projects in the first construction phase.

The residential building consists of a concrete skeleton structure with a curtained wooden façade which simultaneously serves as a tight building envelope. It represents one of the most ecological structures at Seestadt. This is made possible not only by the wooden façade but also by Wien Energie's heat pumps which render a connection to the district heating network obsolete.

Both the tenants and representatives from domestic politics attended the hand-over ceremony, which was staged by the developer, in large numbers. A few brief speeches by master builder Pagler (Chairman of EBG) and the city's Councilor for Housing Dr. Ludwig were followed by the party's cosy part. At many bistro tables and sitting on numerous benches, the tenants enjoyed the luxurious barbecue buffet and reported on their first impressions of their new flats.

With building site D12, PORR could complete yet another challenging project which was happily received by EBG and, above all, by its tenants.



Image: PORR AG



Image: PORR AG



Image: PORR AG



Image: PORR AG

Official start of tunnelling at Albula Tunnel II

Some 14 months after the ground-breaking ceremony, a further milestone in construction of the new Albula Tunnel was achieved with the celebratory start of tunnelling on 31 August 2015. Guests from regional and national Swiss politics, employees of Rhätische Bahn as well as the project joint venture NAT II involving PORR Suisse AG, Walo Bertschinger and Condotte, were invited to this momentous occasion.

This project concerns the construction of a tunnel some 6km long located at 1,800m above sea level. The project aims at replacing the existing Albula Tunnel, a structure that had made history more than 100 years ago as a milestone, with a new tunnel which will meet all requirements towards a modern and safe infrastructure facility. Once the new tunnel has been put into operation, the existing one will be used as a safety tunnel. Tunnelling work, which was begun in August 2015, is expected to be completed in late 2017.

Once the inner shell and subsequent finishing work is complete, the project's overall completion is scheduled for 2021. This will establish modern and winter-safe connections between the Albula Valley and the Engadin region.



Celebratory start of tunnelling at new Albula Tunnel II Image: swiss-image.ch



Image: swiss-image.ch

St. Pölten train station's multi-storey car park offers 750 parking spaces for commuters

31 August 2015 saw the celebratory opening of the ÖBB car park in St. Pölten. The car park is located in the immediate vicinity of St. Pölten main station and provides direct access to platform 1. The 5-storey car park is a split-level construction. 170m long and 28m wide, the building offers a total of 748 new car parking spaces.

The building was erected by a joint venture between PORR's railway construction department and the Lower Austrian branch's department for building construction. A total of 16,000m³ of concrete and 1,900 tons of reinforcements were installed. To shape the concrete, some 40,000m² of ceiling, wall and column formwork were installed and later disassembled. It has to be noted, not without a certain pride, that the entire formwork and concrete work was performed by PORR's own personnel.

An average of 35 company tradesmen working for some 60,000 hours were employed during the building shell construction time.



Multi-storey car park Image: Toni Rappersberger



Multi-storey car park Image: Toni Rappersberger



Multi-storey car park Image: Toni Rappersberger

PORR to build ETHOS retail and office complex in Warsaw

The ETHOS retail and office complex will be built on Warsaw's historic Royal Route by September 2016 – with Kulczyk Silverstein Properties ("KSP") as the investor and developer. PORR Polska Construction will be the general contractor for this seven-storey building boasting over $17,000 \text{ m}^2$ of leasing space in a top central location.

"Our client has been clearly committed to a cooperative approach with us on this project. Right from the start all of the decisions have been made together and we have held joint negotiations with the subcontractors", said Karl-Heinz Strauss, CEO of PORR AG, on the benefits of this approach. "Mutual trust is a prerequisite for the open-book method and ensures great transparency with regard to costs". PORR has already won over an array of companies with this trailblazing partnership model – including Warimpex, the Von der Heyden Group, Vastint, AIG and UBM.

Unique dimensions and breathtaking views

Kulczyk Silverstein Properties is relying on the acclaimed expertise of PORR Polska Construction for the comprehensive refurbishment and extension of the ETHOS retail and office complex. From July 2015 to September 2016 and just 100m from the Warsaw Stock Exchange and the Sheraton Hotel - two projects which were also realised by PORR – a new building will emerge, standing out with its unique dimensions. The building will offer leasing space of 17,000 m² across two underground and five overground storeys, whereby offices will account for a total of 13,000 m^2 – with individual floors measuring around 3,000 m². PORR will build a 1,000 m² terrace on the fifth floor, offering spectacular views of the River Vistula and the national stadium. The plot of the former "Holland Park" office building has been generously expanded for the construction project and has been upgraded to meet the standards of energy category A+ and the criteria of the BREEAM certification (excellent) for sustainable building and subsequent use.

Elegant architecture in top central location

The project stands out for its unusual architecture, which fits in perfectly with the sumptuous flair of the Royal Route. The architectural concept by a consortium of MAAS Projekt and Chapman Taylor is remarkable for its 8m-high glazed shop front which underlines the distinctive character of the shopping area on the ground floor. Visitors have easy access to restaurants, cafés and boutiques via an elegant inner courtyard which is protected by a glass roof. The underground garage offers 90 parking spaces for customers and guests. The new office and retail complex is located on the banks of Warsaw's Vistula, directly on the Royal Route, one of the best spots in the city. The Polish Parliament, various embassies, luxury boutiques and popular restaurants and cafés are all in the immediate vicinity. The proximity of various green areas and parks also help to make the location of ETHOS especially appealing.

Property services company SAVILLS will handle the letting of office space, while BNP PARIBAS will be responsible for leasing the retail space.



The heart of ETHOS is the inner courtyard with a glass roof. Image: Kulczyk Silverstein Properties Sp. z o. o.



The elegant building fits in perfectly with the top location on the Royal Route.

Image: Kulczyk Silverstein Properties Sp. z o. o.

PORR is awarded contract for the construction of luxury flats in Döbling district

PORR Bau GmbH managed to convince BUWOG to award it the general contractor agreement for the turn-key-ready construction of a luxury residential complex close to Vienna's vineyards in the city's 19th district (Pfarrwiesengasse).

Work on this extraordinary residential project housing 85 premium freehold units started in August 2015. The project involves the construction of flats, maisonettes and urban villas offering between two and six rooms, terraces, balconies, loggias or their own gardens.

In addition to the units' upmarket equipment, the complex features its own spa and fitness area as well as an outdoor pool.

Seats in the in-house cinema can be reserved directly from the flats by means of touch displays. Tenants can store noble wine in the facility's wine cellar

and check their quality in the adjoining tasting room.

The future tenants will additionally be served by a concierge in the entrance area.

After a construction time of some 21 months, the complex will be handed over in April 2017.



Entrance area Image: HNParchitects ZT GmbH



Exterior view Image: HNParchitects ZT GmbH



Swimming pool Image: HNParchitects ZT GmbH

Monte Laa: Urban development area approaching final phase with start of construction on MySky

Clients, architects, investors and project partners gathered on 14 September to celebrate the laying of the foundation stone of the MySky housing project. The completion of PORR's striking high-rise building in 1999 marked the first milestone at Monte Laa quarter. For more than 15 years, Monte Laa has been growing and today represents a popular office and residential location.

In mid-September, STRAUSS & PARTNER Development GmbH, the Austrian subsidiary of UBM Development AG and Wohnbauvereinigung für Privatangestellte Gemeinnützige GmbH, laid the foundation stone for the jointly developed housing project MySky. The clients thus initiated the final phase of the urban development area Monte Laa. Apart from the UBM executives Heribert Smolé and Claus Stadler, the event was attended by many celebrities, including WBV-GPA's Managing Director Michael Gehbauer, PORR's Chief Executive Officer Karl-Heinz Strauss as well as District Leader Hermine Mospointner and her deputy Josef Kaindl.

A vibrant quarter

Multi-faceted – flexible – contemporary: This is the architectural concept behind MySky. Located next to FH Campus Vienna, the building, which will be erected by PORR, offers residential space for some 180 young people and students. Furthermore, approx. 100 subsidised rental flats were erected.

Completion scheduled for spring 2017

"All those involved in the project are united by the objective to build a future-oriented project at highest levels of quality in the shortest period of time possible. High-level professionalism, lots of experience and mutual trust guarantee trouble-free collaborations," Karl-Heinz Strauss summarises in closing.



Claus Stadler (COO UMB Development AG), Hermine Mospointner (distric Gender), Michael Gehbauer (WBV-GPA), Karl-Heinz Strauss (CEO PORR AG) Image: PORR AG

General rehabilitation on the A4 Ostautobahn motorway

This year, the A4 motorway was completely rehabilitated on a length of some 9km in the area of the Neusiedl/See and Gols/Weiden junctions including the Gols/Weiden motorway approach road. A joint venture between STRABAG AG and TEERAG-ASDAG was awarded the contract for this undertaking. ASFINAG invests 24 million Euros in this rehabilitation project.

General rehabilitation was begun after the Easter holidays. Carriageway features such as crash barriers were renewed and the road surfacing was comprehensively restored in the course of four extensive construction phases. The construction efforts aimed at increasing traffic safety and driving comfort.

The construction efforts included the rehabilitation of the pavement of the A4 Ostautobahn motorway (both carriageways) from kilometre 44.000 to kilometre 52.500 including the ramps of the Gols/Weiden junction and the approach road of the Gols/Weiden junction towards the B 51 which were located in the construction area.

The main carriageways' cross section 11.50m wide (12.50m at the new Neusiedl/business park junction) was left unchanged. Due to the required pavement reinforcements, the vertical alignment had to be raised 5cm above the existing one.

Only the bridge structures directly driven on were excepted from this measure. Since the edge beams in these areas were not renewed, the height of the existing surface could be maintained.

The existing drainage systems on the central strip were adapted in the course of reinforcing the central strip. Due to low longitudinal incline, the lateral inclination had to be reversed in partial segments by means of ridge twisting.

Furthermore, all bridge structures and green bridges were renovated in the course of the general rehabilitation efforts. The measures mostly concerned concrete rehabilitation, the application of surface protection and the renewal of the superstructures' drainage systems.

Most traffic signs including their foundations and poles were renewed. Two sign gantries were erected at the Neusiedl/See junction, and an additional two sign gantries and two cantilever arms were installed at the Gols/Weiden junction.

On order from ABEG, the section between kilometre 43.8 and kilometre 45.0 was equipped with standard motorway lights as a sub-project. This project furthermore included the business park exit's four ramps and the two ramps in the direction of Vienna at the NeusiedI am See exit leading to the B50 which were both equipped with masts and high pressure sodium vapour lamps 9m high. The main carriageway was likewise equipped with masts and high pressure sodium vapour lamps, this time 12m high.

Outside of the stated general rehabilitation area of the A4 Ostautobahn motorway, two sign gantries and two cantilever arms were built in the area of the Parndorf junction.

The road equipment of the A4, the Gols/Weiden and the access road were renewed. The existing crash barriers were partially re-used. Work was completed in November 2015.



Surface layer installation Image: PORR AG



Surface layer installation Image: PORR AG



Surface layer installation Image: PORR AG



Surface layer installation Image: PORR AG

Rapid growth in building construction for PORR Deutschland

New orders in H1 2015: around EUR 300m

PORR Deutschland kicked off 2015 with ambitious plans – to increase production output from around EUR 600m in 2014 to EUR 1 bn in the coming years. The German subsidiary of Austrian PORR AG has achieved strong interim results in the first seven months, with order bookings of around EUR 300m in building construction alone.

PORR Deutschland added 13 new orders to its books from January to the end of July 2015 in building construction coming from across the entire country. These include beacon projects such as Bavaria Towers, one of Munich's most spectacular urban development projects in recent years, awarded by the Von der Heyden Group. Or the world's largest Hampton by Hilton in Berlin with gross floor space of 19,500m². The tender was signed just a few days ago with the developer, the Lambert Group Regensburg. Or the Campus Futura in the heart of Hamburg's hip Hafen-City: a major project which involves a JUFA city hotel with adjacent freehold apartments, awarded by Campus Futura GmbH & Co KG. The list of orders also includes three properties for the "Freiraum-Living" project in Freiburg for Revitalis Real Estate AG - two hotels and an apartment building - and two large-scale residential projects in Berlin with volumes of around EUR 30m. PORR Deutschland has also enjoyed success this year in industrial construction with the tender from BMW AG to build a new paintshop in the main Munich facility.

"We are delighted with PORR Deutschland's progress in building construction tenders in the first half of the year. We are active across the whole of Germany for the first time: from Hamburg to Frankfurt, Freiburg and Munich right through to Berlin. With the Von der Heyden Gruppe, the Lambert group, Revitalis and BMW, internationally renowned investors and developers are banking on our expertise", said Udo Sauter, Managing Director of PORR Deutschland GmbH.

Karl-Heinz Strauss, CEO of PORR AG, expressed pride in his team and his optimism for the future: "After Austria, Germany is the second most important market for the PORR Group with its market volumes in building construction and civil engineering. We have a strong team in both sectors in Germany, a team which is clearly committed to our intelligent growth strategy. Doing business with a focus on quality, earnings and safety is a top priority. When I look at the impressive track record in new building construction tenders this year, the only thing I can say is this: we are on the right course with our 'one-stop shop' approach. Our local expertise and the close cooperation across the entire Group between international experts from the divisions Planning with PORR Design & Engineering, Large- scale Projects and Environmental Engineering is increasingly proving to be a key competitive advantage".

PORR Deutschland Berlin branch is awarded contract for world's largest Hampton by Hilton Hotel in Berlin

The general contractor agreement for the largest Hampton by Hilton in Berlin was signed on 31 July 2015. Lambert Wohnbau GmbH commissioned PORR Deutschland GmbH's Berlin branch with the turn-key-ready construction of 344 hotel rooms and 40 flats. The gross floor area encompasses 19,500m².

The construction scheme follows the model high-rise directive and poses great challenges in relation with the fire protection requirements and Hilton's own fire life safety code.

Apart from the completed Parkside and the living quarters at Alexanderplatz, it already marks the third large-scale construction scheme built by PORR Germany in Berlin's Mitte district, not far from Alexanderplatz.

The project's construction started in September 2015. Completion is scheduled for late March 2017.



Visualization Image: PORR AG

Freiraum-Living – PORR Deutschland is awarded contract for the construction of two new hotels and a residential building in Freiburg in the Breisgau region

In late June, Revitalis Real Estate AG commissioned PORR Deutschland GmbH with the turn-key-ready implementation of the construction scheme worth some 35 million Euros. The project is processed by an internal joint venture between Frankfurt branch's department for large-scale building construction and Düsseldorf branch under the leadership of the former. The three units are part of project Freiraum-Living in Freiburg. They will be erected on three lots measuring 11,660m² in total and are part of the 390,000m² "old freight yard" area on which a living and working quarter will be created in the future. The area is located a mere 2km away from Freiburg's centre and its main station.

Following the property line, the five-storey hotel's longitudinal shape runs along the building zone of Isfahanallee and in the north connects to the newly erected Hampton by Hilton hotel which forms the block perimeter along Kantinenstraße. The two hotels share a driveway on the block's inside accessed via Zita-Kaiser-Straße. An underground car park offering some 98 parking spaces to the guests of the two hotels stretches out below parts of the property. The underground car park is accessed via the Hampton by Hilton hotel.

GS Star GmbH is the lessor and operator of the Super 8 Hotel. The franchisee Wyndham Hotel Group runs the 2** economy category hotel with a total of 205 rooms. At a height of some 17.11m and a GFA of approx. 4,500m², the building perfectly blends in with its hotel neighbour, the Hampton by Hilton, when it comes to façade design. The façade, equipped with a thermal insulation system, features a design using irregularities in the shape of contrasting, open and closed spaces and elegantly fits in with the city landscape. This impression is strengthened by the two hotels' generous, floor-to-ceiling glazing on the ground floor.

In the near future, the 3*** Hampton by Hilton hotel's economy category, too, will be run by the franchisee of the Hilton Hotels Group. Instar GmbH will serve as the unit's lessor. At a height of 20.1m, the six-storey hotel offering 175 rooms on a GFA of some 8,000m² forms the head unit of development site A2. The hotel's completion is scheduled for the first quarter of 2017.

100 rental flats, divided among three individual buildings as well as two individual houses connected via the ground floor are built along Quartierstraße running southwards. The residential buildings are between five and six storeys high and feature a joint underground car park offering some 135 parking spaces. In total, the complex boasts a GFA of approx. 18,425m². The individual buildings' arrangement creates a green courtyard used as a common area. Shops and a day nursery on the ground floor increase the quality of living they offer. The ground floor flats are additionally equipped with balconies or terraces, respectively, the ones on the staggered storeys with roof terraces.

In the spirit of sustainability, the residential buildings are erected in accordance with the energy standard of the Freiburg efficiency house 55. The hotel buildings will meet the requirements of the Freiburg efficiency house 70.

The construction scheme's overall construction time adds up to approx. 20 months.



Hampton by Hilton Image: Flb, MPP Meding Plan + Projek GmbH



Super 8 Hotel Image: Flb, MPP Meding Plan + Projek GmbH

Hafen City Hamburg – PORR Deutschland is awarded contract for project Campus Futura

Until late 2017, a new JUFA city hotel with adjoining block of freehold flats will be built in the middle of Hamburg's central Hafen City district. The client, Campus Futura GmbH & Co.KG, awarded PORR Deutschland GmbH's branch for large-scale building construction projects with the construction of the ensemble designed by KBNK Architects worth some 30 million Euros in late July.

In the north, the building site measuring 4,400m² in size is enclosed by Versmannstraße and in the south by the promenade at Baakenhafen. The department for large-scale projects at Frankfurt branch needs to bring all its know-how to the playing field: The "knoll" and basement floors, for instance, are located in Elbe River's flood area which necessitates structural measures meeting flood protection regulations. To make matters worse, an underground station located in the north of the lot needs to be integrated into the planned hotel's construction and arched, respectively.

Apart from 220 rooms, suites, seminar and event rooms, the seven-storey youth and family hotel offers a restaurant including a roof terrace on the 1st floor as well as additional family-friendly highlights such as an indoor adventure area. The adjoining structure will offer 22 lavishly equipped freehold flats in prime waterfront location as well as 13 business premises on the ground and "knoll" floor. The flats measuring between some 50 and 140m² feature either a private balcony or roof terrace. The hotel and the residential building share a two-storey underground car park with some 116 parking spaces. Every storey of the underground car park offers an access ramp to the neighbouring development site's (development site 81b) underground car park. Both underground car parks are accessed from Versmannstraße via a joint access ramp.

The projections and set-offs, the projecting loggias and tilted support constructions on the ground floor underpinning the upper floors above the underground station give the unit its required lightness, complemented by the 1st floor's roof terrace running right through the building complex.

In typical Hanseatic fashion, the façade itself is equipped with a thermal insulation system and facing clinker. Parts of the ground and mezzanine floor feature natural stone façades, interrupted by aluminium beam-and-post façade elements.

In the spirit of sustainability, the residential building is erected in accordance with the energy standard of the Hamburg efficiency house 55. Furthermore, the construction scheme will meet the requirements of the ecolabel GOLD for sustainable building at Hafencity.

The total construction time of the project which has been designed to encompass approx. 22,500m² GFA amounts to 21 months.



South-west side view Image: bloomimages; KBNK Architekten GmbH

TEERAG-ASDAG closes the gap in Upper Bavaria's cycle path network

Cyclists are pleased to see one gap in Upper Bavaria's cycle path network closed.

Construction work on the state road 2077 between Elbach and Streitwies have been completed in as little as six weeks.

The now direct link between Elbach and Fischbachau provides increased traffic safety as cyclists no longer need to ride on the main road.

During the inauguration of the new walking and cycle path, Fischbachau's mayor Josef Lechner thanked the Rosenheim State Construction Department and TEERAG-ASDAG who have implemented the project in collaboration with the municipality. Christian Rehm, the construction department's director of construction explains that "what we have here is a so-called dependent cycle path." This means that "it runs parallel to the state road."

The path is 6,000m long and 2.5m wide and part of the Bavarian government's cycle path programme which runs from 2015 to 2019. The project in Fischbachau was the first one to be implemented in the programme's framework. Until 2019, Bavaria wants to invest some 200 million Euros in the extension of cycle paths along state and federal roads.



The blue and white ribbon has been cut: The mayor of Fischbachau, Josef Lechner (front, centre) declares the cycle path between Elbach and Streitwies open. Celebrating with him are Wolfram Wurdinger (I.), Area Construction Manager with TEERAG-ASDAG and Christian Rehm (r.), Director of Construction at the Rosenheim State Construction Department. Image: PORR AG

Ceremonious ground-breaking ceremony for Scharnitz bypass



From left to right: Michael Pichler (TEERAG-ASDAG), Günter Guglberger (Tunnel and Bridge Construction Section), Herbert Winderl and Werner Huber (Innsbruck's building authority), Christian Molzer (Department of Traffic and Roads), Deputy Governor Josef Geisler, Mayor Isabella Blaha, Thomas Schnabl (Gebr. Haider), Markus Morianz (Marti). Image: PORR AG

On 24 October 2015, Mayor Isabella Blaha, Deputy Governor Josef Geisler and Christian Molzer, Head of the Department of Traffic and Roads, have given the starting signal for construction work on Scharnitz bypass with the ground-breaking ceremony.

The bypass branches off the B177 south of its entrance into the town of Scharnitz, runs over the Gießenbach, past the sports field and into the Porta Claudia Tunnel. After 100 m of running above ground, the road reconnects to the existing Seefelder Straße B177 via a new bridge crossing the Isar River directly at the border with Bavaria.

"Once the Scharnitz bypass has been completed, only a fourth of the traffic load we see today will roll through the town centre. This project yields a sustainable improvement of the quality of living as well as huge opportunities for the rural and touristic development of Scharnitz," Deputy Governor and Roadworks Officer Josef Geisler said in the framework of the bypass' celebratory ground-breaking ceremony.

At construction costs of EUR 34 million, Scharnitz bypass currently represents the province's largest road construction project and is being implemented by a consortium consisting of Marti Tunnelbau GmbH, Gebrüder Haider Erdbau and TEERAG-ASDAG Tyrol providing technical leadership.

Project data

Overall costs	EUR 34 million
Overall length	2,180m

Length of tunnel	960m
Length of above-ground section	1,220m
Volume of excavated soil and rock	130,000m³
Concrete	27.000m ³
Steel	1.800t

LEED Platinum certificate for Business Garden Poznań

Business Garden Poznań is a modern office complex boasting rental space of some 80,000m². Divided into nine A-class office buildings, the complex is located on a lot in Poznań measuring some 6 hectare. PORR (POLSKA) S.A. had been commissioned as a general contractor for the 1st stage of this investment and erected four office buildings with a total rental space of 38,000m², offering space for offices, business premises and their own conference area. The investor, Vastint Poland Sp. z o.o., is already planning further investment stages.

Every single one of the buildings erected in the 1st building phase of Business Garden Poznań was awarded the LEED Platinum for Core and Shell certificate by the non-profit organisation USGBC (U.S. Green Building Council). The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System[™] is a voluntary certification programme aimed at supporting and promoting high performance in sustainable construction.

In the course of the execution of construction work, the certification level required was raised from the contractual GOLD level (60 points) to the highest achievable level of PLATINUM (88 points). This was made possible through PORR Polska's experience and the excellent collaborations between the investor and PORR.

The unit's certification is based on the following categories:

- Sustainable construction site
- Water efficiency
- · Energy and atmosphere
- · Materials and resources
- · Air quality in the building
- · Innovation and design process

The awarding of the top LEED certificate (platinum) was made possible by the sum of points gathered during the building's assessment which is why the project Business Garden Poznań assumes a special status on developer investment office market.



Image: PORR AG



Image: PORR AG

PORR drwas on local experts for its growth path in Poland

"Know your market, know your customers": renowned construction company PORR has been using this approach to realise its intelligent growth strategy for the past five years, achieving international success. PORR has been active in Poland since 1987 and its local subsidiary PORR Polska S.A. is one of the country's leading experts in building construction and railway engineering. Therefore it's hardly surprising that PORR expressed an interest when Bilfinger Infrastructure S.A. was put up for sale.

"Bilfinger Infrastructure S.A. enjoys an exceptional reputation on the Polish and Norwegian infrastructure market and is well-positioned in both countries. The takeover represents an important milestone for PORR on our third-largest home market. In future PORR Polska Construction S.A. and PORR Polska Infrastructure S.A. will sustainably consolidate PORR's market position as a full service provider as two independent local companies which complement each other perfectly", said Karl-Heinz Strauss, PORR CEO, on the successful conclusion of the purchase on 14 August 2015.

The purchase price for Bilfinger Infrastructure S.A. – which generated production output of EUR 166m in 2014 with around 800 employees – was EUR 21.5m.

Two strong local players form foundation for further growth

PORR Polska Infrastructure, with its subsidiary in Norway, will be responsible for the business areas road and bridge construction, civil engineering, and energy construction in Poland and Norway. The team boasts around 700 employees in Poland and almost 100 in Norway, who all embody maximum expertise in engineering and service quality. Particularly in road and power plant construction, as well as hydraulic and civil engineering and bridge construction, the company has garnered international acclaim for its technological expertise and setting new global standards as a technological leader. The most spectacular infrastructure projects of PORR Polska Infrastructure include the Southern Bypass of Gdansk S7, the Rzeszów Bridge and the railway line to Chopin Airport.

"The entire management of PORR Polska Infrastructure and our team are pleased that after a year of uncertainty we now know where our journey will lead us. Right from the takeover negotiations we felt PORR's appreciation for our achievements and for our team. The PORR Group Executive Board and our board members see great potential for growing our company. Together we have set the goal of increasing our production output to well over EUR 200m in the medium term. I am confident that we will achieve this target as part of the PORR Group", said Piotr Kledzik, CEO of PORR Polska Infrastructure, expressing optimism on the future. With an order backlog of EUR 162m as of 1 January 2015 and a current order pipeline of around EUR 180m, there are strong grounds for optimism. Furthermore, PORR Polska Infrastructure sees interesting growth opportunities in the coming years initiated by EU-funded projects in large-scale infrastructure.

PORR Polska Construction, which currently employs about 500 staff, will continue to focus on its well-established fields of building construction and railway engineering projects in Poland. With a market presence stretching back over 25 years, the company has made a key contribution to Warsaw's skyline through its building construction projects. One of the most striking PORR buildings in Warsaw is the Intercontinental Hotel, right beside the Palace of Culture and the Warsaw Financial Centre, which was also built by PORR. PORR Polska Construction recently succeeded yet again with its expertise in railway construction, winning three tenders to modernise parts of the 272, 273 and 131 lines.

"One of the declared goals of our growth strategy was to expand our market presence in Poland. It was also clear from the start: we will only make a move when an attractive opportunity presents itself. The chance to take over Bilfinger Infrastructure S.A. was precisely this window of opportunity. We are now not only represented by a top infrastructure expert in Poland, but also in Norway - a market which holds exceptional appeal for infrastructure and in which we started to prepare for market entry some time ago. The three ongoing bridge construction projects Tresfjord, Harpe Bru and Farrisbrua have facilitated a PORR presence through three large-scale initiatives and this will certainly make it much easier for us to cultivate this market in the future", said Hans Wenkenbach, PORR COO on the takeover's role in PORR's international market presence.

When one plus one equals three

"It is not just PORR which will benefit from this new constellation in Poland and Norway; our customers will reap the greatest benefits. With more than 146 years' experience, PORR is a pioneer of the modern construction industry. PORRians in every country are able to build on this expertise. Exchanging knowhow across the Group is one of our key success factors and offers direct value added for our customers. Furthermore, our clients appreciate our "one-stop-shop" concept, as we are able to stick to budgets and offer predictable value. This makes it clear that with the takeover of Bilfinger Infrastructure S.A. the whole is more than the sum of its parts and the equation "1+1=3" actually applies", said CEO Strauss, summing up the deal.



From left: Jakub Chojnacki (CFO PORR Polska Infrastructure), Karl-Heinz Strauss (CEO PORR AG), Piotr Kledzik (CEO PORR Polska Infrastructure), Hans Wenkenbach (COO PORR AG) Image: PORR

TEERAG-ASDAG: Grand opening of new Arlbergstrasse

Wednesday 21 October 2015 saw the opening of the new routing of the L197 road above Stuben on Mount Arlberg. Following a construction time of one and a half years, the new 1.3 km access road to the Arlberg and Flexen Passes was opened for traffic.

The new route which was built by a consortium involving TEERAG-ASDAG AG branches takes off from the old road above the town of Stuben and runs up the north-eastern slope to the Flexen gallery via five corners interspersed with long bends and a short straight. In front of the road gallery, a new crossroads was installed. For the time being, the connection between Rauz and St. Christoph am Arlberg was expanded on a length of some 60 m. "The completion of this project significantly increases traffic safety," Deputy Governor Karlheinz Rüdisser said during the opening ceremony. Following the new road's completion, the old L197 route which had to be rehabilitated repeatedly due to rock fall, rockslides and slope instabilities is planned to be closed and recultivated.



Klösterle's Mayor Morscher; Governor Dr. Wallner; Deputy Governor Rüdisser; Lech's Mayor Muxel; Director Pichler, TEERAG-ASDAG; DI Schnabel, Gebrüder Haider; Helmut Haider, Gebrüder Haider Image: PORR AG



Shot of the construction site taken from Stuben in autumn of 2015 Image: PORR AG

Significantly improved infrastructure

In his speech, the Governor highlighted that the improved infrastructure will benefit both the residents and the town's guests as well as open up new development perspectives for the region. "The new route meets requirements regarding safety needs as well as high levels of mobility in individual transportation," Wallner declared. The next project phase, which will be completed in 2022, will see partial realignment of the Flexen gallery crossroads area as well as the comprehensive renewal of the Flexen gallery. The province will additionally invest some EUR 30 million Euros in the realignment and the gallery.

Wallner and Rüdisser thanked the executing companies and their staff for their

"outstanding performance under difficult conditions".

Trackworks for the Qatar integrated railway project/metro phase 1. Áystem awarded to PORR by Mitsubishi Heavy Industries Ltd.

PORR wins third major tender in Qatar

While PORR is driving ahead with the construction of the Green Line of the Doha Metro, with works proceeding according to plan and to the satisfaction of its client, Qatar Railways Company, PORR has now also been entrusted with laying the Slab Track Austria System in the state of Qatar. The client is a consortium led by Mitsubishi Heavy Industries Ltd., which has been charged with implementing the system technology by the Qatar Railway Company.

The works, on a Manufacture, Supply and Install basis, comprise the track slabs for the Green, Red and Gold Lines. The project will be realised by PORR Bau GmbH in cooperation with its local subsidiary PORR Qatar Construction W.L.L.

The track will be laid in total as part of the Doha project for the individual metro lines. The contract works will be executed in two main stages, the preparation & production of the slab track elements and the installation of the track bed. In order to achieve the construction period, it will be necessary for multiple teams working in shifts to install the prefabricated superstructure for the main tracks including the turnouts.

Karl-Heinz Strauss, CEO of PORR, is delighted that the clients in Qatar are convinced about this unique technology for track works: "The PORR Slab Track System is perfect to meet the demand also on Long Distance and Freight railway projects in Qatar, Oman, UAE and KSA where PORR has established offices. Further on PORR Slab Track has many advantages for the challenging conditions experienced in the region and is easy to maintain."

Since 1989 PORR has produced and installed the Slab Track System successfully and has an impressive track record in Europe.



With a product life of at least 60 years, PORR's Slab Track Austria technology – developed in collaboration with the Austrian Federal Railways – offers unique benefits. Image: PORR AG

PORR with new infrastructure projects in Poland and Norway

Total order volume: around EUR 220m

PORR has acquired three exciting new tenders within a very short time frame: Poland's General Directorate for National Roads and Motorways has once again opted for the construction company's expertise and has charged the local subsidiary PORR Polska Infrastructure S.A. with building new sections on the S6 and S17 expressways. The Norwegian team has acquired another bridge construction project in Norway for their order book. The order value for the three new projects totals around EUR 220m.

"The latest business developments in Poland and Norway show that our intelligent growth strategy is paying off step by step. We are pursuing a considered, risk-optimised expansion in line with the motto "Know your market, know your customers". The purchase of Bilfinger Infrastructure S.A. this summer is a prime example of this: the market knowledge and expertise of our new colleagues backed up by the competencies and flexibility of PORR as the parent company are opening up new opportunities for our clients as well as for us as a construction company. The fact that we have won three new construction projects in Poland and Norway, in the space of just a few weeks, shows that we are on the right track", said Karl-Heinz Strauss, CEO of PORR AG.

At the beginning of November 2015 PORR was awarded a tender by Poland's General Directorate for National Roads and Motorways to build a section of the S17 with a length of more than 20 km. The expressway will link Warsaw and the Ukrainian border via Lublin. The tender awarded to PORR relates to the section from the Skrudki intersection to the border between the two Voivodeships of Masovian and Lublin. Construction will begin as early as December 2015 and is expected to take 34 months to complete; the tender is worth around EUR 120m (PLN 495m).

The section Kołobrzeg-West – Ustronie Morskie of the S6 expressway in Poland is another tender acquired by PORR. With a value of EUR 66m (PLN 279m), the order involves building a section of the S6 with a length of around 15 km and a dual-carriageway bypass of around 1.9 km from Kołobrzeg, as well as two intersections, service roads and green bridges. Construction is also set to start in December this year and the project should be completed within 37 months.

In mid-November PORR signed a contract in Norway to build what is now the company's fourth bridge in the northern kingdom. The works will involve removing the ageing Loftesnes-bridge in Sogndal and building a new bridge with access roads, a junction and a roundabout. The construction project will be realised in cooperation with a local Norwegian partner and is worth around EUR 28m (PLN 105m).

The project was submitted under the name Bilfinger Infrastructure S.A. and the name is set to be changed to PORR Norge Infrastructure in the coming weeks.

PORR announced the expansion of its presence in Poland and Norway in August this year. The acquisition of Bilfinger Infrastructure in Poland also allowed the Group to acquire the subsidiary in Norway, along with three existing bridge projects there, which have now been joined by a fourth. The opening of the Tresfjord Bridge – a joint project of PORR and Implenia – at the end of October marked the completion of the first of these projects.



After the successful construction of expressways in Poland Polska Infrastructure S.A. will realize two further exciting projects: S6 and S17. Image: PORR Polska

Opening party of Neunkirchen Provincial Clinic

The responsible provincial councillor, Mag. Karl Wilfing, declared the new Neunkirchen Provincial Clinic open on 3 November 2015. In his speech, he noted that this project saw the construction of Lower Austria's most modern hospital.

Apart from high-positioned politicians, numerous guests and employees attended the festivities. Following the building's blessing, the attending guests enjoyed a lavish buffet.

The new building complex had been built in a total construction time of a little more than two years. Its overall costs amounted to 160 million Euros.

Porr Bau GmbH/BU 1 (Lower Austria branch & Department for Large-Scale Building Construction Projects) has been commissioned with demolition and structural work as well as the installation of sewer and French drain systems, all together worth 19 million Euros.

The new clinic is divided into six departments with 367 beds and five operating theatres and focusses on orthopaedics and psychiatry.

The new Neunkirchen Provincial Clinic will be fully operational from 9 November 2015. Remaining tasks such as the creation of a loading yard, visitors' parking spaces and a park will be carried out once the existing building has been demolished in 2016.



Landesklinikum Neunkirchen Image: Landesklinikum Neunkirchen

PORR wins attractive civil engineering tenders in Austria

Whether it's roads, tunnels or infrastructure – PORR's technical knowhow is in demand

The latest four civil engineering tenders awarded to PORR prove yet again that the Group's competencies are not only the subject of international acclaim, but also appreciated on the home market of Austria. The most significant project in terms of volume is the expansion of the A5 motorway, which happens to be the largest infrastructure project at present of ASFINAG, Austria's state-owned Autobahn agency. Here a consortium was awarded the tender for lot 3 of the A5 Nord/Weinviertel Autobahn; the lot involves building around 10 km of motorway between junctions Schrick and Wilfersdorf Nord, as well as a traffic control checkpoint. The contract is worth around EUR 66.4m and has a three-year construction period.

"Sophisticated civil engineering has long been one of PORR's core competencies", said Karl-Heinz Strauss, CEO of PORR AG. "Different departments from within the company are successfully collaborating on every one of our four new projects so that the client receives an all-in-one service package. What's more, internally this leads to an efficient pooling of experience – ensuring that we can make the most of synergies long-term. In particular, the technical skills and experience in road construction of our subsidiary TEERAG-ASDAG are often a decisive advantage in tender processes".

Another order, also from ASFINAG, relates to refurbishment measures and avalanche protection on the A10 Tauernautobahn in the area of Pongau – Reitdamm. Here the TEERAG-ASDAG AG Salzburg branch office secured another tender for a PORR company. With an order volume of around EUR 16.6m, this project is one of the biggest infrastructure initiatives in the Salzburg region. Construction is already underway and completion is set for spring 2017.

PORR will also be working on the A23/S2: as part of the general overhaul of the A23 – Vienna's busiest road – the company will be refurbishing the Stadlau/Hirschstetten Tunnel. PORR had already been awarded two major orders on this construction project as part of a consortium and Hirschstetten Tunnel is now the third in a row. The approx. EUR 36.0m tender will also be realised in a consortium, whereby PORR is responsible for the technical management during the planned construction period of February 2016 to September 2017.

In addition, work at Vienna International Airport has been underway since July to broaden the fillets and overhaul the 11/29 runway system, with PORR making a significant contribution. Construction work is subject to the stringent safety regulations of Vienna airport, as well as the requirements of EASA, the European Aviation Safety Agency, and is being realised in stages day and night so that flight traffic is not disrupted.



PORR has civil engineering experience dating back decades – the S1 Vienna Express Ring Road is one of many examples. Image: PORR AG

Tresfjord Bridge – opening of one of the region's most spectacular bridge projects

PORR news from Norway

The first of PORR's Norwegian bridge projects – the prestigious Tresfjord Bridge on the Norwegian Sea – saw its official opening on the 24 October 2015. With the acquisition of Bilfinger Infrastructure in Poland in August of this year, the Group also took over the Norwegian subsidiary along with the three existing bridge construction projects. The first of these – the Tresfjord Bridge – has now been completed. The 19-pillar bridge over the fjord is a joint project with Implenia. The developer is Statens Vegvesen, a public investor from Norway and the tender is worth around EUR 75m.

"It is only recently that we announced the expansion of our presence in Poland and Norway. In one fell swoop we gained three Norwegian bridge construction projects and a great local team. Today's opening of the first completed bridge is an important milestone for PORR in Norway", beamed Karl- Heinz Strauss, CEO of PORR AG.

The Tresfjord Bridge, situated on Norway's west coast near Molde, links the two banks of Remmem (Vestens) and Vikebukt over the Tresfjord and reduces travel time between the towns of Ålesund and Dombas. It counts as one of the region's most spectacular bridge projects. The bridge has a total length of 1,290m and rests on five different types of foundation. Construction began in November 2012 and goes to depths of as much as 100m in some places in the waters of the fjord.

PORR's two other bridge projects in Norway are also being realised in a consortium with Implenia: one of them involves building a 320 m-long extradosed bridge in Vinstra (Harpe Bru) by mid-2016. The other should see a 570 m-long cable-stayed bridge erected by approximately November 2017 in Farris as part of a larger project in which the E18 expressway between Bommestad and Sky will be built in the Larvik region. The orders have a value of around EUR 84m for the project in Vinstra and around EUR 18m for the bridge and expressway in Farris.

You can get some impressions of the Tresfjord Bridge in the following video: youtu.be/v5UnR_eEMw4



Tresfjord Bridge Image: PORR AG

Contact

Distributor and publisher PORR AG Absberggasse 47 A-1100 Vienna

Managing editor Sandra C. Bauer T +43 (0)50 626-3338 communications@porr.at

Technical editor Business unit 1: Uwe Gattermayr

Editor-in-chief Eva Schedl

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www.porr-group.com | wop@porr.at

PORR AG Absberggasse 47, A-1100 Vienna T +43 (0)50 626-0 F +43 (0)50 626-1111 www.porr-group.com

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