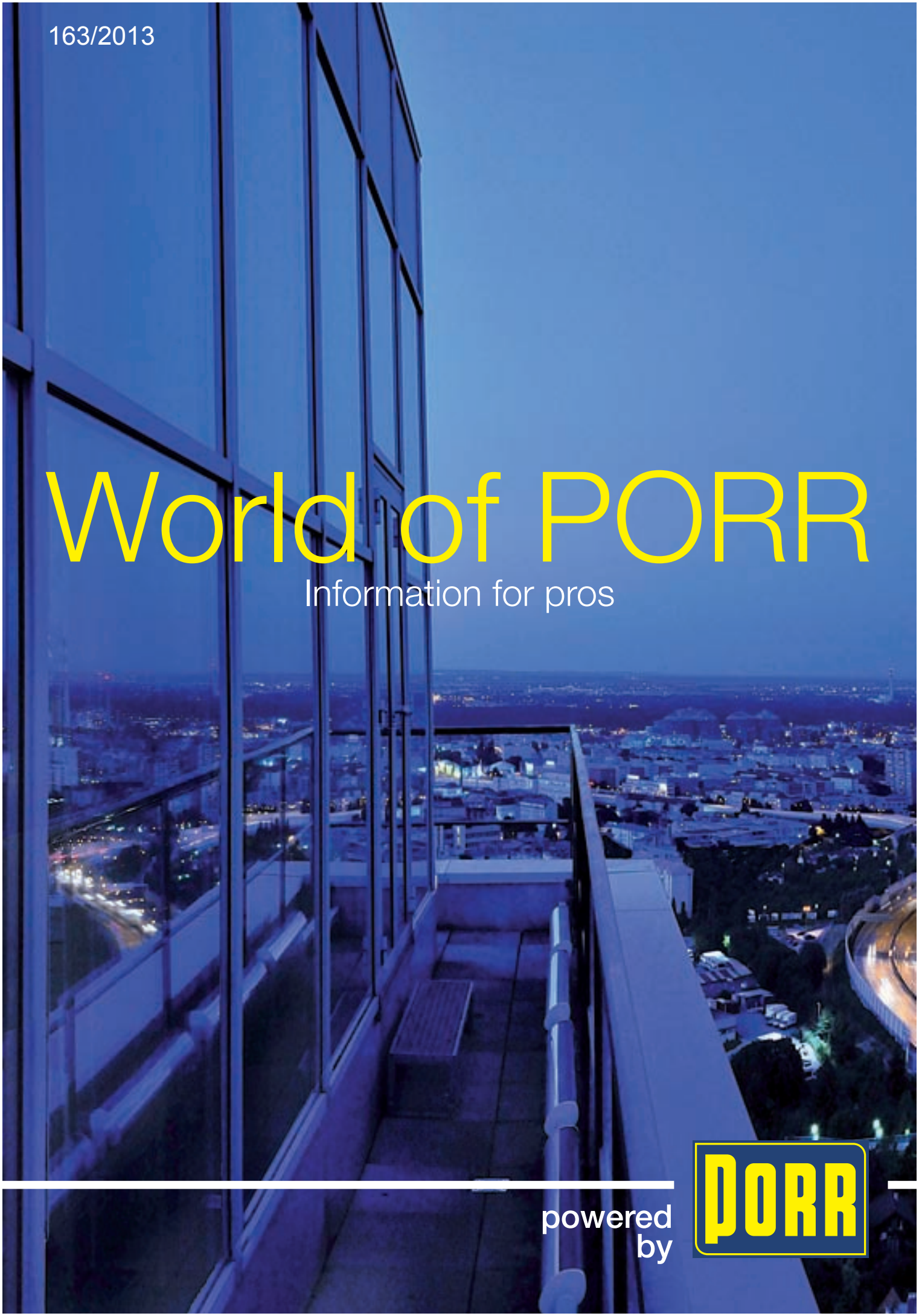
163/2013

World of PORR

Information for pros



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CEO Karl-Heinz Strauss

CEO Karl-Heinz Strauss
Image: PORR

Ladies and gentleman,
Dear business partners,

Welcome to the latest issue of our trade publication “World of PORR”. I am delighted at your interest in the innovative construction solutions offered by our company, and look forward to presenting to you in this issue a particularly wide range of different projects.

This issue focuses on a number of specialist articles on the currently largest road construction site of PORR, the S 10 in Upper Austria. PORR is involved in this project in three construction lots. In addition to the lots 3 (Kefermarkt) and 4.1 (Freistadt bypass) the Götschka tunnel construction lot represents a special engineering challenge. In this issue, the PORR specialists report on the status of all three lots in the accustomed high quality.

In addition to the S 10, this issue of “World of PORR” is also devoted to the performance capability of PORR in terms of environmental technology. As the market leader in Austria, “Porr Umwelttechnik GmbH” can draw on extensive experience in the clearance of old contamination, demolition and decontamination work. With the expert dismantling of the Voitsberg power plant in Steiermark, PORR is carrying out the currently largest demolition project in Austria. In this issue, you can learn more about the innovative demolition concept of a 100 m high cooling tower and the work on the remediation of the “Bärenbatterie” factory in Kärnten.

In the building construction field, we can this time present an interesting report on the progress of the North Hospital in Vienna. PORR has been commissioned with the shell construction work for this project, and is using its own concrete plant for the production of the materials. In addition to the hospital project, you will also find in this issue a specialist article on the renovation of two terminals at Vienna International Airport, and an update on the HOTEL + OFFICE CAMPUS at the O2 Arena in Berlin, one of the many civil engineering projects currently being realised by PORR in the German capital.

As the year 2013 nears its end, PORR continues to work with every effort on numerous projects both at home and abroad. I would like to take this opportunity to wish you and your family a Merry Christmas, a relaxing holiday and a good start into the New Year.

Sincerely,

Karl-Heinz Strauss
CEO and Chairman of the Board

Renovation and extension of attic floor, Zirkusgasse 47

Barrier-free building in new dimensions

Alexander Krepella

Visualisation: courtyard
Image: silberpfeil - architekten

Courtyard
Image: silberpfeil - architekten

History and renovation concept

The building on which a plinth renovation with attic extension was carried out, was built over the years 1950 to 1952 on the foundations of a residential complex from the period of industrialisation. The five- and six-storey building contains 191 apartments arranged around eight stairwells.

In February 2010, Porr Bau Gmbh, Renovation Department, was commissioned with the construction management work.
The following measures were carried out:

- After demolition of the existing stairwells, new barrier-free access was created consisting of nine single flights of stairs and lifts on the inner front sides facing the courtyard.
- In combination with the new access, a steel construction was erected on the inner front sides containing integral loggias and balconies.
- 67 existing apartments were renovated, reorganised and provided with new building equipment.
- 31 new attic apartments with roof terraces were built in the roof.
- Forced ventilation was installed throughout the complete building, and thermal renovation including window replacement was carried out to the existing building.
- The monotonous and barracks-like existing perforated facade towards the street was enhanced by a simple and cost-effective measure.
- Several window elements were combined in a varying sequence, while the fields between the window elements were produced in anthracite, with the reveals between these fields were coloured gold.

This produced a multi-coloured, rhythmic appearance which enlivened the look of the street.

View of the Zirkusgasse / Novaragasse before the conversion
Image: silberpfeil - architekten

Visualisation Zirkusgasse
Image: silberpfeil - architekten

Barrier-free building

In the renovation of old buildings in particular, pioneering ideas and innovations are required to achieve this “freedom from barriers” due to the structural conditions involved.

The main objective was full accessibility for all people. To achieve this, the existing twin-flight stairwells were demolished during ongoing operation and replaced by a single flight stairwell.

By means of through-lifts on the inner courtyard side and reorganisation of the stairwells, all apartments can now be reached barrier-free from these stairwells.

Since the existing apartments were occupied during the entire construction period and access to the escape routes had to be ensured, the construction process required some complex measures and various detailed logistical solutions.

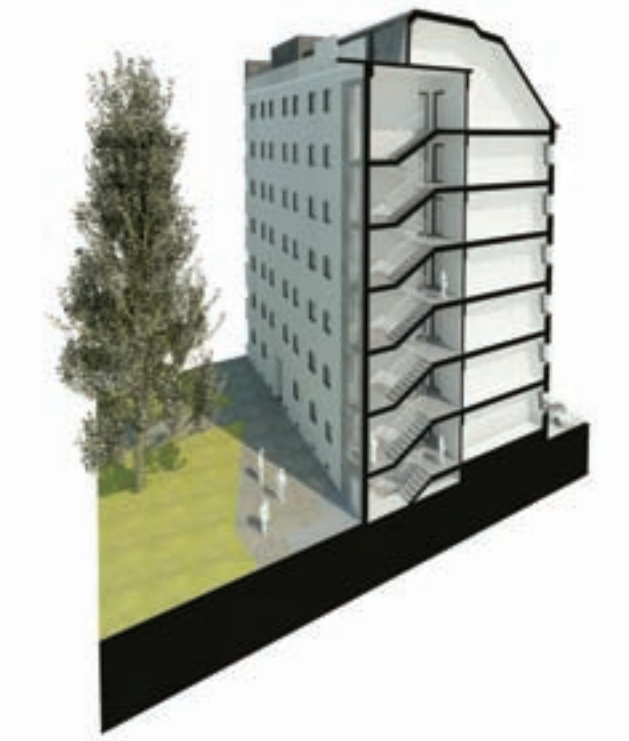
Construction measures and sequence

The new construction of the stairwells required partial demolition of the existing twin-flight stairwells in sections and corresponding construction of the new stairwells.

The construction process was broken down into sections floor by floor, working from top to bottom, and demolition and new construction by floors. The demolition and replacement of the next floor could only start after the new stairwell on the respective floor was usable again:

- Step 1: Production of the working level on the top floor as a protection for the demolition of the top stairwell. Dust walls protected the stairwell from excessive exposure to dust during the construction process.
- Step 2: Production of a scaffolding stairwell tower in the courtyard as an escape route and for access to the apartments during the construction phase.
- Step 3: Demolition of the top stairwell; partial demolition on the relevant floor of the external stairwell wall.
- Step 4: Dismantling of the working level, followed by production of the formwork for the new stairwell and new landing.
- Step 5: Concreting of the stairwell.
- Step 6: Completion of the stairwell as an escape route (upwards to the attic floor and from there into the adjoining stairwell) for the apartments concerned.

The next stairwells below this level were then constructed following the same steps 1 to 5.



Stairwell in the existing building
Image: silberpfeil - architekten

Stairwell in the existing building
Image: silberpfeil - architekten

Stairwell during the conversion work
Image: silberpfeil - architekten

Stairwell in the existing building
Image: silberpfeil - architekten

Stairwell during the conversion work
Image: silberpfeil - architekten

Stairwell during the conversion work
Image: silberpfeil - architekten

Stairwell during the conversion work
Image: silberpfeil - architekten

Stairwell after the shell construction work
Image: silberpfeil - architekten

Stairwell after the shell construction work
Image: silberpfeil - architekten

Stairwell after the shell construction work
Image: silberpfeil - architekten

Temporary stairwell as escape stairwell tower
Image: silberpfeil - architekten

Since most of the apartments remained occupied during the construction activities, the access to all apartments as well as an escape possibility from the apartments into the open had to be ensured at all times during the demolition and reconstruction of the stairwells.

The escape lead on the one hand – as usual – down via the not yet renovated part of the stairwell, or upward, via the already completed stairwells, into the attic floor and then into the open via the neighbouring stairwell.

In addition, and for reasons of convenience, an open, temporary scaffolding stairwell tower was constructed in front of every building stairwell for the safe use of residents.

Completed stairwell tower after shell construction of the neighbouring stairwell
Image: silberpfeil - architekten

Courtyard layout and façades

The courtyard with its decades-old stock of trees is the centre, distributor and green lung of the project.

This area not only provides access to all stairwells, but also offers residents space for recreation and communication.

Loggias and balconies inset into a steel framework construction, together with the lift towers, form a design unit which enlivens the courtyard façade.

The series of loggias and balconies in combination with the

alternating glazed and opaque elements of the lift towers form the main design element of the courtyard façades. The elegant colouring of gold and anthracite tones further enhances the facade.

Inner courtyard during the construction phase
Image: silberpfeil - architekten

The completed courtyard façades, lift towers and loggias
Image: silberpfeil - architekten

Street façade on the Novaragasse
Image: silberpfeil - architekten

Street façade on the Zirkusgasse
Image: silberpfeil - architekten

After nearly three years construction time, the entire residential complex was accepted by our client, the WBG Wohnen und Bauen GmbH, to their full satisfaction in the spring of this year. Through intensive logistical coordination meetings with the planning team and the supply of information to all tenants about the planned construction processes, this project produced the desired success for everyone involved.

Further confirmation of the successful completion of the project is also reflected in the award of the 2013 Vienna Urban Renewal Prize, where the building won 3rd place for PORR from amongst the 28 projects submitted. (More information can be obtained from the PORR Updates.)

The S 10 Mühlviertel Expressway

New construction Unterweitersdorf – Freistadt Nord

Franz Hrebik

The S 10 Mühlviertel Expressway is an important transport infrastructure project of regional, national and international importance and runs from Unterweitersdorf (A 7) via Freistadt to the national border at Wullowitz. As a section of the Linz-Prague corridor it is part of the trans-European transport network and is therefore built as a motorway with four lanes, hard shoulders and central barriers.

The first construction started 2009 in the southern section at Unterweitersdorf. The entire, approximately 22 km long stretch is now under construction, with work proceeding at the moment on the section from Unterweitersdorf to Freistadt North.

Due to the daily congestion at the end of the A 7 Mühlkreis motorway, this section was constructed as a matter of urgency and opened to traffic in the autumn of 2012. A further partial opening for the Freistadt bypass is planned for 2014. The overall completion of the S 10 is intended for end of 2015.

Stretch
Image: Asfinag

Route description

The route of the S 10 swings from the current end point, the A 7 Mühlkreis motorway, in a right-hand bend towards the east and bridges the Kleine Gusen to the north of the existing road. The existing B 310 is given up in this area. In the following course the road runs parallel to the existing road in the cutting as far as the Unterweitersdorf (B 310 / B 124) junction. The S 10 then swings in a left-hand bend to the north and again runs parallel to the B 310 to the south entrance of the approx. 4.4 km long Götschka Tunnel. Due to the topographical conditions, it is constructed as a “rising tunnel” with a longitudinal gradient of 3.6 %, while the Prague carriageway consists of three lanes.

From the north tunnel entrance of the Götschka Tunnel north-west of Matzelsdorf, the road runs as an open construction as far as the Neumarkt junction and the south entrance of the Neumarkt Tunnel. The Neumarkt junction is constructed as a semi-junction in the direction of Linz (exit possibility of carriageway Prague and merging in the direction of Linz).

In the course of the S 10 extension, the second tunnel pipe in the direction of Prague will be reconstructed, and the existing tunnel pipe of the Neumarkt Tunnel extended to the lane tunnel in the direction of Linz. To the south and north of the Neumarkt Tunnel, both tunnel pipes will be extended as underground stretches over a length of around 80 m to the south and 550 m to the north for the protection of the local settlement areas.

The existing B 310, to the north of Neumarkt, will be led in a partial section over the underground stretch of the S 10. In the further course, the S 10 and B 310 run parallel as far as the current crossing area of the B 310 with the Lammer Bezirksstraße. The three objects in this area were modified because of the course of the S 10. The Expressway departs here from the existing national highway and bypasses Pernau in a right-hand bend as far as the Pernau underground section (L=260 m). In the further course, the S 10 returns to the parallel track in the area of the Kefermarkt junction.

The existing national highway B 310 is connected to the S 10 at the Kefermarkt junction. From the crossing of the B 310, the course of the S 10 runs parallel to the existing national highway. A 545 m long underground section and wildlife crossing point is planned in the area of the village of Lest. At the crossing of the Summerauerbahn the course then runs alternately on an embankment and cutting in company with the B 310. A 275 m long underground section is situated in the area of the Gangl settlement. In the further course, the road runs largely parallel to the existing B 310 to the north as far as the Freistadt South junction, where the course of the road

swings away slightly eastwards from the crossing of a service road.

The Freistadt bypass begins at the Freistadt South junction, which is located to the north of Galgenau between the existing B 310 and the Feldaist Valley.

The junction with the existing road takes the form of a feeder road, which is connected by means of a roundabout. After the junction, the course of the S 10 swings away to the north-east and crosses the Feldaist Valley to the north of the Panholzmühle by 174 m and 158 m long viaducts, and in the further course after a cutting area with the 800 m long Walchshof underground section, the L 1476 Walchshofer Straße.

From the north entrance to the Walchshof underground section, the course swings slightly, following the terrain, to the north in the direction of Manzenreith, where a mined tunnel will be constructed with a length of 290 m respectively 295 m in the area of the Satzinger settlement. In the “Brandstätter” area, the weekend settlement located here will be screened by a noise protection embankment alongside the Prague lane. The gutter trenches will be spanned with a bridge and housing of the carriageway Prague. In the area of this gutter bridge, the course swings away to the north-west and descends into the 665 m respectively 765 m long Manzenreith Tunnel.

As far as the Grünbach / Sandl junction (B 38), the S 10 runs in a cutting on both sides or with a valley-side embankment with noise protection wall. The Grünbach / Sandl junction (B 38) is connected by a feeder road to the existing B 38.

After the Grünbach / Sandl junction (B 38) the course crosses the Feldaist Valley by a 257 m long viaduct. The S 10 then swings away to the north-west to the Freistadt North junction, which forms the end of the bypass. A total of six junctions are planned for the connection of the S 10 to the remaining road network: The Unterweitersdorf junction serves to connect the communities of Unterweitersdorf, Wartberg and Hagenberg and in the further course the town of Pregarten.

This is the crossing point of the heavily used state roads B 310 and B 124. The Neumarkt community is connected in the south by the Neumarkt semi-junction. The Kefermarkt community is connected by the Kefermarkt junction, which is located in the area of the crossing of the S 10 with the B 310 near Lest. The Freistadt South junction, the Grünbach / Sandl (B 38) junction and the Freistadt North junction are all located in the Freistadt area. These junctions will significantly increase the congestion-relief effect of the S 10 for the town of Freistadt. The Grünbach / Sandl (B 38) junction serves in particular to connect the heavily used state road B 38 from the direction of Grünbach / Sandl / Gmünd – NÖ

Project data

Client	ASFINAG Bau Management GmbH
Total costs	Around € 718 million
Region: Austria	Upper Austria
Construction time	2009 – 2015

Construction sections

Construction section 1	End of the A7 – Unterweitersdorf junction (Habau – Porr Bau GmbH – Gebr. Haider)
Construction lot 2.1	Götschka Tunnel (Porr Bau GmbH)
Construction lot 2.2	Götschka Tunnel North – Neumarkt / Kefermarkt communal boundary
Construction section 3	Neumarkt / Kefermarkt communal boundary – Freistadt South junction (Porr Bau GmbH – Habau)
Construction lot 4.1	Freistadt junction – Manzenreith Tunnel (Porr Bau GmbH)
Construction lot 4.2	B 38 junction

Construction sections map
Image: PORR

Construction section 2.2
Image: www.helipix.at

Construction section 3
Image: www.helipix.at

Construction section 4.1
Image: www.helipix.at

Construction section 4.2
Image: www.helipix.at

S 10 Mühlviertel Expressway

Construction section 1, Unterweitersdorf, Construction phase 1 to 4 – km 0.00 – 2.50

Benedikt Schaumberger

General

In mid-October 2010, PORR received from ASFINAG in a consortium the order for the 1st section of the S 10 Mühlviertel Expressway. The order volume for the 2.5 km long construction section 1 in the municipality of Unterweitersdorf (Upper Austria) is € 24.5 million net. The order covers all road construction, earthworks, eleven structures, asphalting work, traffic diversions, detail planning of the objects, demolition work, line relocations, noise protection structures, construction of the CN.as-line, as well as accompanying ecological measures.

Complete shell construction
Image: PORR

Course
Image: PORR

Construction phases – Construction time

The difficulty of this construction section was that here, the new route is located at a traffic bottleneck. The construction works and the many stages of construction had to be designed to avoid road closures on the busy road sections of the A 7, B 310, B 125 and B 124, and to minimise interference with traffic.

An essential role in the construction process was played here by the construction site logistics. Due to the busy roads, several temporary chicanes had to be constructed for the traffic, in order to construct the course of the S 10 as planned.

This required 4 construction phases:

Construction phase 1-2

In Phase 1 and 2, a large proportion of the structures located outside the existing motorway (A 7) and the state roads (B124, B125, B310) were constructed. Two existing state road structures were removed. The earthworks and drainage measures were also completed in these areas. The relocation of existing installations and streams, as well as the construction of the water protection systems were also components of these phases. These phases were completed with the production of the road layout construction and the vehicle restraint systems. Part of the S 10 could therefore be opened for temporary use, and enabled access to the construction site where public roads previously ran.

Water protection systems
Image: PORR

Construction phase 3-4

Phases 3 and 4 included the production of previously unreachable objects as well as the completion of objects not fully completed in Phase 1-2. An existing motorway bridge, as well as an agricultural structure and a single-family house were completely demolished. The cutting and embankment filling areas were completed. In the course of the renaturation work, the existing road courses, which were no longer required by the new line, were removed and recultivated.

The construction work started on 02.11.2010. The A 7 and the S 10 were opened to traffic on 30.09.2012. The B 310 was opened to traffic on 15.10.2012. The overall

completion including site clearance was contractually fixed for 31.03.2013. The shell construction work was completed after nine months.

Construction ground

Construction section 1 is located in the area of the basin of Unterweitersdorf. The terrain drops away slightly from the existing area towards the Kleine Gusen. From there it rises again slightly in a southern direction. The area is cut by numerous small areas of surface water.

The rock types relevant to construction section 1 and their typical extents are summarized in the following table:

Type of rock	Designation	Description	Typical depth
A 1	Backfill	Artificial backfill for drilling platform	1-5m
A 2	Topsoil	Humus, topsoil	≤ 1m
A 3	Intermediate soil	Organogen intermediate soils	≤ 1m
Q 1	Alluvial valley sediments	Sands, gravels, partly silty	2.5-6m
Q 2		Silts, sandy, clay-like, with fine gravel layers	2-7.5m
T 2	Tertiary sediments	Tertiary sands, silty, gravelly	> 15m
T 3		Tertiary silts & clays	1-5m, >15m
F 1	Soil-like weathered granitoid rocks	Sands, gravels, silty	1->5m
F 2		Gravels, clays	2.5-7, >5m

The types most widespread in the construction section are the organic intermediate soils, as well as the sandy, gravelly silt sediments, which were found in the numerous streams and rivers.

As a result of the available undersurface, preparatory construction measures were brought forward to 2009, which included among other things preload fillings of five structures, and partly also on the free section.

In the area of the free section, soil stabilization measures (lime cement mixture) also had to be carried out in cutting areas for the achievement of the necessary requirements for the sub-structure planum.

Civil engineering structures

A total of eleven structures are located on the 2.5 km long course. These consist of the following:

- 3 stream culverts with spans of 3.40 m each
- 4 frame structures for the S 10 and state road with spans of 11.80 m / 36.22 m / 11.80 m / 6.52 m
- 1 integral 3-field bridge with two supporting structures across a river for the S 10 with a total span of 60.90 m each
- 2 integral 2-field bridges for the ramps of the S 10 with a total span of 58 m and 53.20 m
- 1 integral 2-field bridge for the state road over the S 10 with a total span of 83 m

Ramp construction works and crossings
Image: PORR

Planning and implementation

The scope of the order, as well as the alternative offer of the consortium commissioned by the client also included the detailed planning of the structures. Through the cooperation of the consortium with the commissioned Civil Engineering Bureau KMP ZT for Planning & Structural Work and MPT Engineering for geotechnical measures in the quotation and execution phase, the structures could be planned so as to dispense with the storage and carriageway crossing constructions envisaged in the official plan. The structures were planned and built instead as low-maintenance integral bridges.

In addition, the foundation of two frame structures was changed from drilling pile to flat foundations.

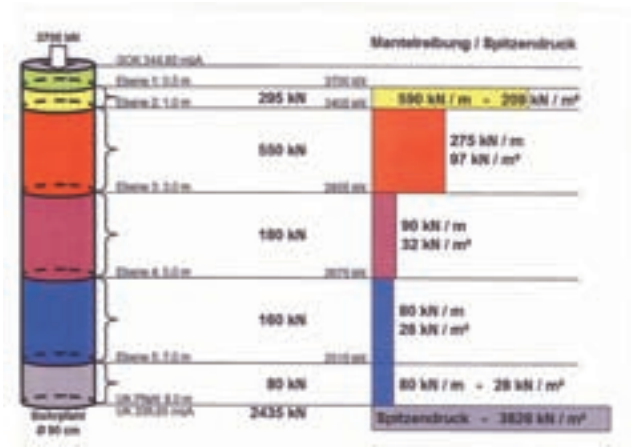
In the further course of the detailed planning, a hollow box cross-section planned in the official design was replanned by means of a value engineering process as an integral plate cross-section.

The integral bridge constructions, as well as two frame structures, were constructed on the basis of the above subsoil conditions on pile foundations (DN88 cm and DN118 cm).

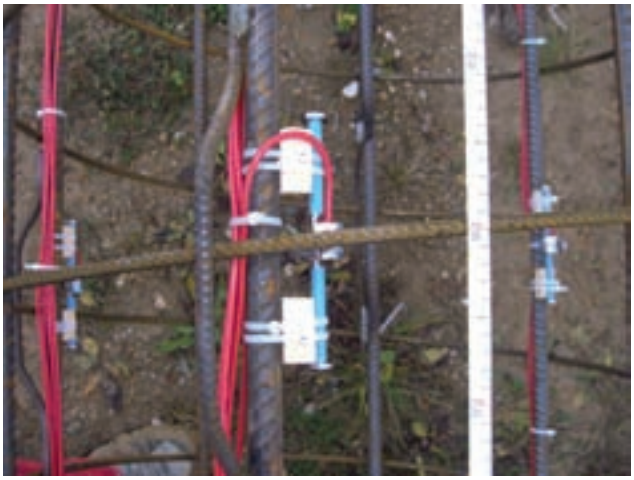
For the verification of the assumed soil parameters during the planning, a measurement programme was developed, consisting of two dynamic pile test loads and two static pile test loads according to DIN 1054 or EA piles.

Immediately after construction began, two lost test piles (DN900 mm) were produced for the static test pile loads. The location on the construction site, as well as technical instrumentation of the test piles was chosen so that geo-technical conclusions could be drawn for the further planning for all representative soil layers.

Static test load
Image: PORR



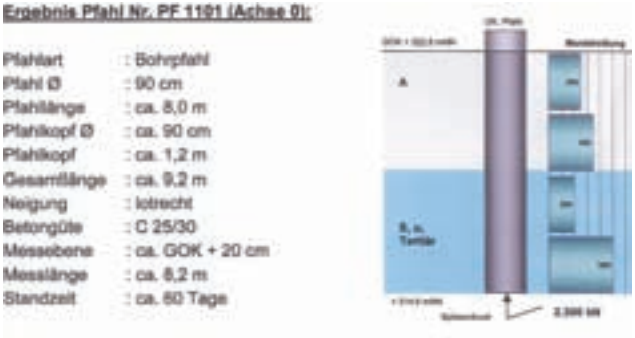
Result of static test load
Image: PORR



Instrumentation of static test pile
Image: PORR

The dynamic test loads were conducted five months after the static test load each on a none-lost construction pile.

Dynamic test load
Image: PORR



Result of dynamic test load
Image: PORR

All other construction works were produced with flat foundations on a baseplate. In parts of the flat foundations, soil replacement had to be carried out to depths of approx. 3 m.

In terms of groundwater conditions of the structures, all excavation pits except for two bridge pile axes could be constructed with open drainage. A tight sheet piling box was constructed for the listed rows of piles located immediately next to a river bed.

An identical system in principle was selected for the production of the integral structures. Special attention was paid to the production of a low-maintenance construction. After producing the large drill piles, the abutment walls were placed directly at pile head level. During the drilling pile reinforcement, a connecting reinforcement projecting up to 2.70 m long had already been provided for the

abutment plates.

Abutment plate with connection to the drill pile
Image: PORR

The pile plates and central supports were placed on a pile head plate. The supports were integrated rigidly into the supporting structure.

Pile plate
Image: PORR

The structural cross section is a loosely reinforced plate with heights of from 1.10 m to 2 m. The connection is rigid in both axes. The structural widths vary from 6 m to 10.85 m together with collar plates on both sides, which are between 1.45 m and 1.60 m long. The structural dimensions result in concrete volumes of from 600 to 1,300 m³ per structure. The concreting of the structures was carried out in the night or morning hours. For the purpose of reducing the concrete temperatures in the course of the setting process, the strength class was related to the regulations for “waterproof concrete” constructions for all types of structural concrete to a concrete age of 56 days, requiring the admixture of fly ash. HS cement was also used for the structural concrete qualities C35/45 and C40/50 in order to comply with heat development class W55.

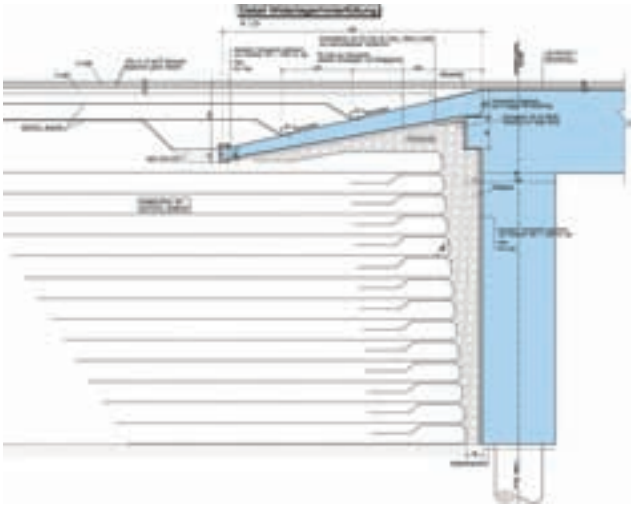
Concreting of supporting structure
Image: PORR

Integral shell construction works
Image: PORR

2-field integral construction
Image: PORR

To ensure the longitudinal displacement of the structure, the backfill in the area of the abutment plates was carried out with the system of “reinforced earth” and additional elastic separating layers. The areas between the backfill with a geotextile-reinforcement and the draining separating layer were filled with filter concrete, in order to reliably prevent sagging in the event of movements away from the

backfill. The transition to the free stretch was produced by means of 5 m long approach slabs, which were drawn down deeper because of the greater longitudinal movements of the structure compared to conventional designs. The road construction of the subsequent free section was also modified at the immediate transition point, with geotextile reinforcements used both in the underneath structure and the covering.



Cross-section of abutment, integral structure with backfill, “reinforced earth” system
Image: PORR

The design of the culverts used a flat foundation. Rising walls were placed on the baseplates and designed with the structural framework.

Formwork of the12 m high abutment walls
Image: PORR

Rough framework construction
Image: PORR

Instead of the concreted wing walls, a steep slope was constructed in some cases using the “reinforced earth” system.

Structure with steep slope
Image: PORR

The construction work was accompanied during the entire construction period by numerous water, nature protection and environmental measures, which were laid down in an environmental impact assessment process.

These included for example the relaying of the course of streams, afforestation, separation and partial special storage of different types of soil, marking of building plot boundaries, production of water protection systems, etc.

Accompanying ecological measures
Image: PORR

Stream layout
Image: PORR

Summary

Through the constructive cooperation of all involved, the project was completed on schedule and to the required quality. Shortly after being opened to traffic, motorists already enjoyed the congestion relief provided by the 2.5 km-long section in the area of Unterweitersdorf.

Quantities – Construction section 1

Asphalt removal	approx. 7,500 m³
Humus removal	approx.116,000 m³
Removal	approx. 388,000 m³
Filling	approx. 350,000 m³
Lower supporting layer	approx. 40,500 m³
Upper supporting layer	approx. 89,500 m²
Ground stabilisation	approx. 348.000 m²
Drainage	approx. 7,800 m²
Noise protection walls	approx. 6,000 m²
Rock layering	approx. 1,500 m³
Asphalt layers	approx. 280,000 m²
Concrete guide walls	approx. 2,500 m
CN.as	approx. 5,500 m
Concrete	approx. 20,000 m³
Reinforcing steel	approx. 1,500 t
Formwork	approx. 10,000 m²
Drill piles DN 90–120	approx. 1,500 m
Bridge area	approx. 6,000 m²

S 10 Mühlviertel Expressway

Construction section 3

Franz Hrebik

On 20.12.2012, the bidders' consortium of PORR, Alpine and Gebr. Haider received the order for the construction of Lot S 10 of the Mühlviertel Clearway, construction section 3. Construction section 3 is located in between the lots S 10 BA 2.2, Swietelsky-Hoch Tief and construction section S 10 BA 4.1, Porr Bau GmbH. The order volume of Lot 3 amounts to approx. € 58.8 million net and is approx. 4.5 km long. The start of construction took place on 15.01.2013, and completion is planned for December 2015. Following the bankruptcy of Alpine, the consortium now consists of Porr Bau GmbH and Gebr. Haider.

The Mühlviertel Expressway begins at the end of the A7 and extends to the north of Freistadt, in Reinbach, and therefore provides major relief for the overloaded and accident-prone B 310.

Work in construction section 3 included:

Road construction

- Construction of the S 10 incl. main and ancillary facilities in the area between S 10 - km 11.425 and S 10 - km 16.100
- Terrain modelling Lest I and filling of the Stadler terrain modelling
- Designated intermediate storage areas in the relevant road section

Objects

Bridges

The bridges F19, F22 and F24 are planned as integral bridges. Their clearance widths are 15-25 m in the centre and are designed conventionally as double supporting constructions with wing walls and approach slabs.

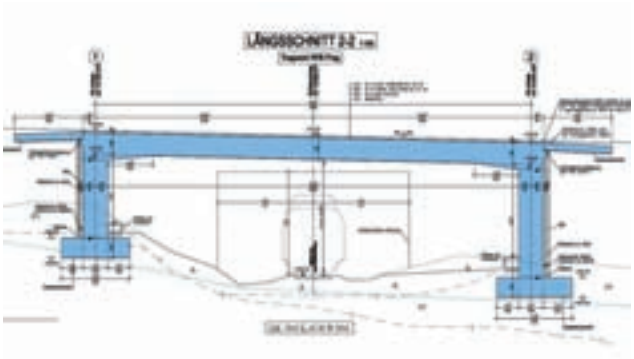


Image: PORR

The bridge B125.017 is a single-field frame bridge, which will be installed on the existing B 310 in the course of construction of the S 10, and will be used as a service road, gutter passage and wildlife crossing.

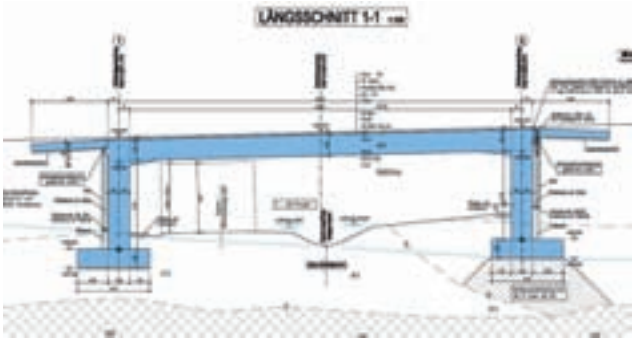


Image: PORR

Two overpasses, objects F27 and F29, will also be produced. These will consist of single-field frames with inclined frame stanchions and parallel wings arranged on both sides, on a common foundation with the supporting structure, to carry the service roads, while the wing walls will be made of rough board planking.

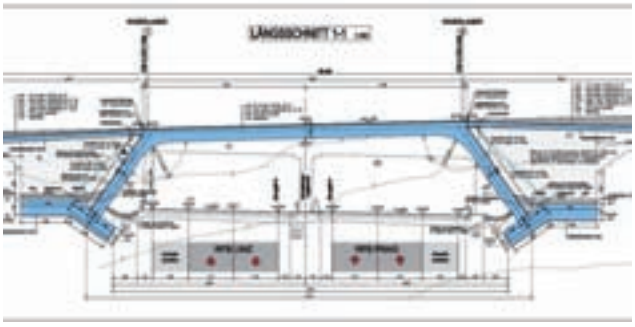


Image: PORR

As required for the construction process, three auxiliary bridges will be constructed on the site, and two steel bridges over the B 310.

Gutter passages

The gutter passages B125.014D, F17, F23 and F28, which will be constructed as single-field reinforced concrete frames, will be constructed to ensure the crossing of water.

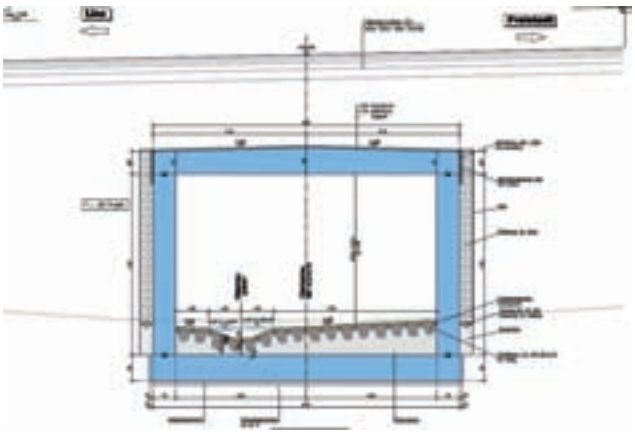


Image: PORR

Underground stretches (UFT)

Object F16 UFT Pernau l=260 m

The housing will be designed with a regular section as a twin-cell reinforced concrete frame with horseshoe cross-section open towards the bottom. Block joints will be arranged every 25 m. The wall thickness will be 80 cm (concrete quality C35/45(56)B5/FaB/BBG).

We have decided on the following construction variants:

- Construction of the strip foundations in 25 m blocks
- Construction of the arch (13.20 m width clearance and 7.47 m high) of the carriageway Linz incl. central wall in 12.5 m sections
- Construction of the ¾ arch of the Prague lane (see YouTube "object F 16")
- This will be followed by double-layer sealing and covering.

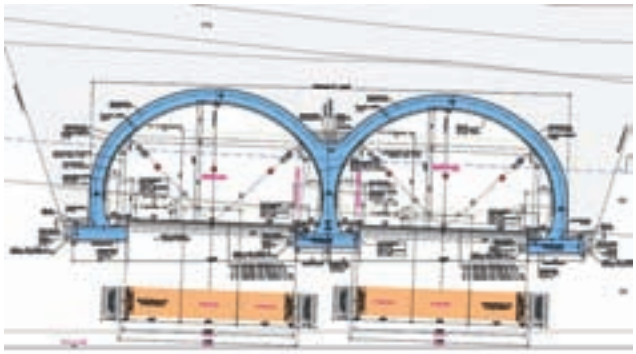


Image: PORR

wwww.helipix.at
Image: PORR

Objects UFT F18, UFT F20 and UFT F25

These underground sections have a rectangular cross-section, while the UFT 18 (l=75m), at the Kefermarkt junction has a three-lane section and the UFTs 20 (l=545m) and 25 (l=275m) have a two-lane section with block lengths of 25 m.

The UFTs 20 and 25 will be produced by formwork carriages in 12.5 m sections. This production method has proven to be economical, although only one section can be produced per week because of the setting times of the concrete.

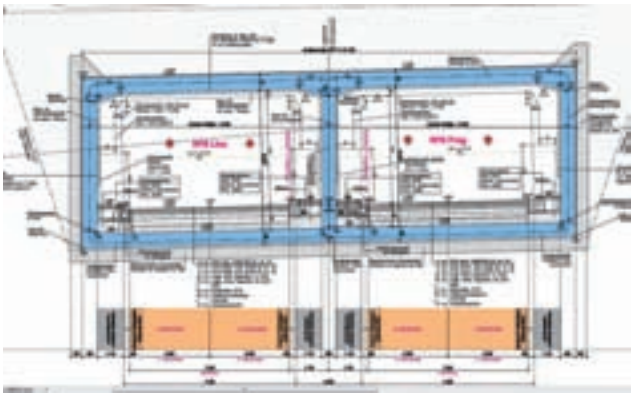


Image: PORR

Object UFT 25 (in the foreground)
Image: www.helipix.at

Overview (UFT F25 in the background)
Image: www.helipix.at

Landscaping

The following construction measures were carried out during the course of the landscaping:

- Clearance of the construction site (obtaining material for structuring measures, habitat relocation) and construction site boundaries
- Terrain modelling (GM) Lest and Stadler filling incl. construction site clearance work such as logging, woodland clearance and drainage works
- Planting and maintenance works
- Creation of habitat for amphibians and waterway routing
- Walkway routing

CN.as line

- Production of a sleeve pipe system for the CN.as line and infrastructure section of the ASFiNAG over

the complete free stretch and in / on objects of the current construction lot
- Construction of foundations, shaft and sleeve pipe systems for all technical operating and safety facilities in the approach areas of tunnel systems
- Construction of cable trenches and road crossings pre-fitted with pipes for the 20 kV MSP cabling (cable laying by MSP contractor)
- Construction of foundations, shaft and sleeve pipe systems for technical operating and safety facilities of the free stretch

Building construction

- Construction of three operating stations situated in the approach area of the underground stretches Pernau North F16, Lest North F20 and the Gangl settlement North F25.

Extinguishing and washing water supply

- The extinguishing and washing water supply was constructed for the underground stretches Pernau (Object F16), Lest (Object) F20 and the Gangl settlement (Object F25).

Tunnel washing water transport line (dirty water)

- The transport line serves to transport the waste water resulting from the washing of the tunnel to the water treatment plant at the southern entrance of the UFT Walchshof (GSA Walchshof).

Overview of the main weights and measures

Topsoil removal	approx. 210,000 m³
BKL 3-5 removal	approx. 610,000 m³
BKL 6-7 removal	approx. 200,000 m³
Embankment contact area	approx. 180,000 m²
Filling	approx. 810,000 m³
Lower supporting layer	approx. 72,000 m³
Upper supporting layer	approx. 138,000 m²
Cover with topsoil	approx. 185,000 m³
Noise protection wall	approx. 5,200 m²
Drainage piping length	approx. 41,000 m
CN.as	approx. 8,500 m
Concrete	approx. 75,500 m³ (incl. approx. 32.000 m³ of fibre concrete)
Reinforcement	approx. 7,740 t
Sealing	approx. 51,150 m²

S 10 Mühlviertel Expressway

Construction lot 4.1, Freistadt bypass section

Ernst Enengl

Project data

Construction time	2011 – 2014
Net order volume	approx. € 84 million
Concrete volume	130,000 m³
Reinforcing steel	8,000 t
Earth movement	1,200,000 m³

Project

The complete construction section S 10 was divided for award purposes into several construction lots. Porr Bau GmbH, as an internal consortium of the departments of Tunnel Construction, Engineering and the Upper Austria branch, was awarded the construction lots 4.1 – Freistadt bypass – as the best bidder on 10.10.2011. The net order volume amounted to approx. € 84 million.

The project consists essentially of the construction of six bridges, two culverts, the production of an underground course and a gallery, the construction of two bored tunnels, the construction of temporary bridges, the completion of two bridges as pre-construction lots and the earthworks and road construction of a 4.5 km long construction site section.

Geology

The complete project lies in the Bohemian Massif and is made up of granites and granodiorites of the South Bohemian pluton. The predominating Freistadt granodiorite is present in partly massive to coarse block form. Weathering into flinz can be found close to the surface and repeatedly in underground strata. A strong relief has been formed at the emergent areas in the tunnel stretches and at the base of the earthworks sections due to the geological, structural conditions caused by the large separating area spacings. This lead during the construction process to the additional consumption of spray and infill concrete, difficulties in breaking up and removing the material, increased wear to tools and equipment and an increased time requirement for cleaning the contact areas.

Tunnel construction

The 4.5 km long construction site was divided into a southern and northern section by the Satzinger Siedlung Tunnel. In order to create a closed construction site as quickly as possible and carry out all internal mass transport on construction roads, the tunnel work was undertaken as the first task. The two tunnel pipes, each with a length of approx. 250 m, were started on 14th March 2012. The tunnels were driven forward in “stop and go” operation with a leading calotte and following stope. Due to the short tunnel lengths, both tunnel pipes were constructed simultaneously using a reinforced team and an equipment outfit. Due to this driving method, both pipes were broken out in three months construction time, and the driving work was switched in mid-June to the Manzenreith Tunnel, with two pipes each of approx. 650 m. The driving work was carried out on the basis of the New Austrian Tunnel Construction Method in the area of the compact rock using blasting, and in weathering zones as excavator or mixed-face drive. The variable construction measures allowed the stabilisation work to be adapted to the local circumstances. Both tunnels were fully broken out without any notable problems by mid-January 2013.

While one of the two tunnel pipes had to be available at all times for the construction site traffic, the internal work could be started in the second pipe. As usual in Austria, the internal lining was provided with a plastic sealing and an unreinforced 25 cm thick internal shell. The installation was carried out using two tunnel formwork carts with a block length of 12.5 m.

Drilling rig during drilling of the open face
Image: PORR

Concreting sections of the bored tunnel construction
Image: PORR

Arch formwork cart in bored tunnel construction
Image: PORR

Tunnel entrance view
Image: PORR

Satzinger Siedlung Tunnel entrance view
Image: PORR

Engineering construction

Due to the large number of objects, these were divided into several groups.
The first group consisted of three bridges each with two supporting constructions for every carriageway lane. The first object, gallery bridge F41, is a 3-field bridge construction with separate supporting structures, a length of approx. 95 m and spans of up to 37 m. A pre-stressed slab with rounded underside and cantilever slabs was installed as the cross-section. The production of both supporting structures was carried out on centring scaffolding in one operation, requiring the installation of approx. 1,400 m³ of concrete. The other two bridges F37 and F38 were each separate 3-field supporting structures with a length of approx. 55 m and a span of up to 22 m. Loosely reinforced slabs with integral cantilever slabs on both sides were installed as the cross-section.

The second group consisted of two culverts F30 and F35 and two bridges F31 and F32. The work began on the culverts for a service road and a stream as a closed, single-line cross-section. Parallel wings were installed at the entrances for stabilisation of the embankment. Work was then started on the construction of the bridges F32, which were produced as two separate canted frameworks with spans of 22 and 32 m. The cross-section is a slab supporting structure with cantilever arms on both sides. The supporting structure is loosely reinforced with voutes on both sides. Bridge F31 was produced as a 5-field supporting structure with a length of 135 m and spans of up to 32 m. The cross-section is a pre-stressed slab with cantilever arms on both sides. Due to the length, the supporting structure was divided into two concreting sections.

The two remaining objects were subject to intermediate time penalties, and therefore had to be constructed simultaneously with the other objects as separate construction tasks.
The underground course F34 with a length of approx. 800 m was produced in open construction as a two-lane tunnel. The foundations and the three walls were constructed in advance with a block length of 25 m. The ceilings were then concreted in weekly shifts using a ceiling formwork cart. The walls and ceiling were fibre-reinforced for fire safety and sealed on the outside with a bituminous sealant.

The Brandstätter Gallery F40/42 was planned as an open reinforced concrete framework with a horseshoe cross-section and a block length of 25 m. The structure is approx. 480 m long, interrupted by the bridge F41, for which the gallery in steel construction has been put out to tender. The foundations and plinth element were concreted in advance. The supports and the arch were then constructed in two 12.5 m-long blocks using the tunnel formwork carts. Finally, a spur was constructed on the arch for noise reduction of the second lane, and the construction back-filled on one side. The arch was fibre-reinforced to a depth of 60 cm and planned with a reinforced working joint as a “waterproof concrete” construction. The back-filling area was also provided with sheet film sealing.

The construction of the operating buildings and pipeline collectors for the water protection systems for the operating phase an the entrances of the tunnel stretches was carried out as a separate group.

Bridge F37
Image: PORR

Brandstätter gallery entrance
Image: PORR

Brandstätter gallery concreting sections
Image: PORR

Gallery bridge F41
Image: PORR

Bridge F39 above gallery entrance
Image: PORR

Service road gallery and bridge
Image: PORR

Bridge F31 exit ramp
Image: PORR

Excavation of underground course F34 Earthworks and engineering construction
Image: PORR

Overview of underground course F34
Image: PORR

Pre-cutting of underground course UFT34
Image: PORR

Earthworks and road construction

In accordance with the tender, the complete excavated material remains with the client, and is to be used, depending on suitability, for insulating back-filling, road construction or terrain landscaping. At the beginning of the construction site, a continuous construction road had to be laid to provide access to the individual objects. The topsoil was then separated and removed and stored on separate storage area for the duration of construction work. The removal of the ground layers was carried out to approx. BKL 6 with hydraulic excavators of between 30 t and 75 t. In BKL 7, blasting operations were carried out over large stretches to loosen the surface. The excavated material was sorted, stored and prepared for the relevant later use with mobile treatment systems. Continual preparation work also had to be carried out, such as the preparation of the undersurface planum for the foundations and follow-up back-filling work in step with the actual construction.

Construction time

Many dependencies in the construction process resulted from the preliminary and follow-up work for every object and the tight penalty deadlines in autumn 2013 for handover of the objects for final finishing. Continual coordination of the works and optimisation of the construction process were essential requirements in order to meet the specified deadlines.

Construction site setup / clearance

As the central construction site facility for the complete site management and the workshops, and due to the restricted space conditions on the site, a separate area was rented for the setup of a portacabin village. Small facilities for the individual objects were also used for the teams and materials.

The construction works were started on 02.11.2011, and with nine intermediate penalty deadlines, will be completed on 30.08.2014.

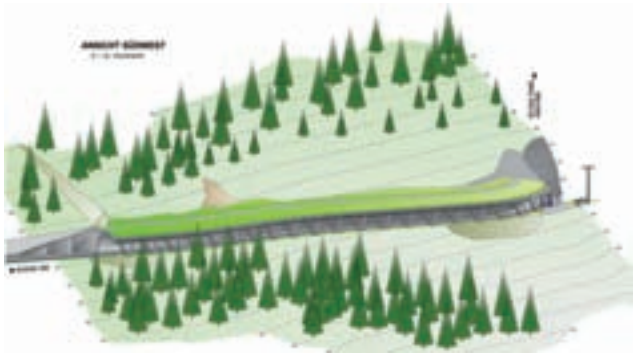
L 348 Spisser Straße

New construction of the Celleswald Avalanche Protection Gallery

Florian Sterner

Introduction

The L 348 Spisser Landesstraße is only about 30 years old in its current form. Previously, the residents of Spiss had to pass two border controls over Swiss territory in order to reach the Tyrolean Inn Valley. Since then however, the Anna Tunnel and other galleries have been constructed. These will now be joined by another important structure: the Celleswald Gallery, which connects directly with the Anna Tunnel. Avalanches and rock falls repeatedly occur in this area. The State of Tyrol, the “Wildbach- und Lawinenverbauung” and the municipalities of Spiss and Samnaun have therefore decided to construct an over 200 m long Gallery. The residents, suppliers, commuters and tourists should in the future be able to travel even more safely to Spiss or into the Samnaun on this road which is used by up to 4,000 vehicles per day.



Visualisation of Celleswald Gallery
Image: State of Tyrol

Order

The TEERAG-ASDAG AG, Tyrol Branch, received the order for the construction of the 206.7 m long gallery in September 2012 from the office of the Tyrolean State Government, Traffic and Roads, SG Bridge and Tunnel Construction. The subject of the order is the new construction of the Celleswald Gallery along the course of the L 348 Spisser Straße, from km 6.9 to km 7.2, following the Gstalda and Anna Tunnel. In addition to the new gallery construction and the associated roadworks, a “pre-stressed networked anchor wall” (VVA) and the “reinforced earth” system are also planned as valley-side supporting constructions. An avalanche deflection embankment, a “Cyclopean” wall, a cantilever retaining wall at the Spiss entrance, an electrical sub-station and extensive rock stabilisation works will also be constructed.

Project

The Celleswald Gallery has a length of around 207 m and was constructed in 21 block sections of 10 m each. The gallery was constructed as a vaulted supporting structure (tunnel profile) with a vault thickness of 60 cm. On the valley side, the V-shaped supports with a cross-section of 60/80 cm were set on individual foundations, whose bases lie up to 5 m below the road level. On the mountain side a 3.60 m wide strip foundation was installed. Due to the existing underground outcrops, the valley-side foundations were installed at two different heights. In the Spiss entrance area (blocks 11 to 21), deep foundations by means of micro-piles were required due to the low-lying rock line. In this portal area, on the mountain side, an approximately 30 m long cantilever retaining wall was built as a transition to the outside area.

The preliminary work was started in autumn 2012. The main work (gallery including road construction) was completed and the road opened to traffic in November 2013. Residual and recultivation work remains to be carried out in the year 2014.

Removal work, earthworks and rock stabilisation work

The construction project presented major technical and logistical challenges for the staff of TEERAG-ASDAG. The implementation of the project required extensive mountain-side removal work and slope stabilisation measures prior to the actual construction. Following the relocation of the telecom and power cables, the mountain-side removal work was able to be started at the beginning of October 2012. The rock removal was carried out by blasting, while an anchored, shotcrete wall was erected in the area of the loose material. The embankment heights were over 12 m in some cases, while the removal width was only 4 m. The work had to be carried out while maintaining the traffic flow (single lane controlled by traffic lights). Only short-term road closures were approved by the authorities, during the blasting operations and the subsequent rock clearance work. The mountain-side removal work was largely completed by December 2012.

Rock removal work with slope stabilisation measures
Image: PORR

Rock removal work with slope stabilisation measures
Image: PORR

Anchoring work - Shotcrete work
Image: PORR

Vaulted supporting structure concrete work

After the planned 2012/2013 winter break, the main work started in April. The gallery construction was carried out as a vaulted supporting structure (tunnel profile) with valley-side V-shaped supports.

Following the completion of the mountain-side excavation and the production of the mountain-side strip foundations, work started on the construction of the valley-side support foundations. Due to the steepness of the terrain, these foundation bases are up to 5 m below the road level and are secured horizontally by three approx. 10 m long (diam. 63.5 mm) blocked permanent anchors. Individual foundations which could not be grounded on rock were secured by up to eight micro-piles (pressure piles, diam. 63.5 mm) per foundation. Work was then started on the construction of the valley-side V-supports. The supports are inclined 70° towards the carriageway, and were produced without working joints in one single casting.

Production of the valley-side support foundations
Image: PORR

Production of the valley-side V-supports
Image: PORR

After the back-filling of the valley-side foundations, the construction of the gallery formwork carriage was started in mid-May 2013. Following the construction and assembly of the formwork carriage (approx. 14 working days), the first of the total of 21 blocks was concreted in at the beginning of June. Two blocks were then usually produced per week, until completion of this work in September.

Due to the very tight schedule, the mountain – and valley-side foundations, the V-supports and the vaulted supporting structure all had to be constructed at the same time. Since the traffic also had to be guided through the construction site area below the formwork carriage, it was a great challenge to make optimum use of the very limited

room for intermediate storage areas. Due to the extreme steepness of the terrain, there were no storage areas available either above or below the gallery. A large part of the formwork material and reinforcement therefore had to be stored temporarily in the adjoining Anna Tunnel. Only the construction material needed for immediate use could be delivered direct to the relevant point of installation.

Production of the mountain-side strip foundations
Image: PORR

Reinforcement work – Arch supporting works
Image: PORR

Cross-section of gallery construction – Movement area
Image: PORR

Gallery roof – Sealing work
Image: PORR

At the same time as the production of the gallery construction, the mountain-side cleaning niches and the drainage pipes for the drainage of the slope water were also installed. The sealing of the gallery was also completed. Following completion of the gallery construction, a 30 m long cantilever retaining wall and the 200 m long edge balcony were erected on the valley-side gallery cantilever arm.

Back-filling work / road construction

Following the concreting and sealing work, the back-filling of the gallery was started in October 2013. This was only possible from the Spiss entrance, since the gallery connects directly to the Anna Tunnel. For protection of the sealing, a 50 cm thick coarse ballast layer of GK 80 mm had to be installed on the vault. The layered back-filling could then be applied. Only excavated material from the construction work was used for the back-filling. This was stored temporarily in the immediate area of the gallery, prepared for back-filling and then installed, in order to avoid the delivery and removal of unnecessary earth material.

The drainage and road construction work in the carriageway area followed, with the traffic flow being maintained on alternating lanes. A longitudinal drainage system was constructed, including road inlets for the road water, which empty into a retention basin. The mountain-side slope water is collected separately and allowed to seep away.

At the same time as the drainage work, the road construction was carried out, including the valley-side slope stabilisation measures. This covered the construction, amongst other things, of a “pre-stressed networked anchor wall” (VVA), the “reinforced earth” system, and a “Cyclopean” wall 150 m long and up to 12 m high.

After the frost protection filling and the kerbstone lying, the unbounded and bonded supporting courses were applied. This was followed in November 2013 by the completion of the main work, and the gallery was able to be opened to

traffic. The remaining work will be carried out in spring after the 2013/14 winter break. This includes the completion of the edge balcony, the production of the supporting top course, recultivation work etc.

Construction status of Celleswald Gallery in mid- Sept. 2013
Image: PORR

Start of block production by formwork cart
Image: PORR

Concluding remarks

Thanks to the excellent cooperation between all those involved in the project – from the client to the local building supervisor, the authorities and residents – the work proceeded to the complete satisfaction of all concerned. The works were completed and opened to traffic in November 2013. The major challenges for TEERAG-ASDAG AG and all those involved in the project were the maintenance of the road traffic in the construction site areas, the changeable weather conditions in the summer and winter, the local conditions (space availability) and the topographically difficult location of the construction site in the alpine terrain. The TEERAG-ASDAG AG as a major member of the PORR Group, was once again able to demonstrate its experience and expertise in infrastructure and road construction, as it has done in previous major Tyrolean gallery projects over past years.

Project data

Start of construction	October 2012
Final completion date	July 2014
Project length	300 m
Road area	2,300 m²
Excavation/earth movement	13,000 m³
Frost protection	2,200 m³
Mixed materials	700 t
Tunnel/gallery works	206 m
Concrete volume	4,000 m³
Reinforcing steel	420 t
Shotcrete surface	2,000 m²
IBO anchors	900
Micro-piles	700 m

Complete renovation of the Lucerne City Ring

A logistical and organisational masterpiece

Thomas Engelmann

The motorway section of the A2 motorway between the Emmen and Kriens junctions was in dire need of renovation after nearly 40 years of intensive use, weather and growing traffic loads. In the course of the renovation, the heavily-used north-south transit axis of the Swiss motorway network was brought up to the latest standard. This involved a major logistical and organisational challenge for all those involved.

Project overview

The City Ring project was divided into two tunnel lots and three external lots. Viewed from the north, the construction site began with the 1 km long Reussegg-Lochhof section running along the Reuss. This section contained the 350 m long Lehnen Viaduct, which would also have to be renovated. These are joined further on in a southerly direction by the 600 m long Reussport Tunnel (RPTU), the five Senti bridges with the city junction and the 1.5 km long Sonnenberg Tunnel (SBTU). The main work was divided into 5 construction phases. In Phases 1 and 2 the work was carried out in the tunnel pipes and in the external lots in the northerly travel direction. In 2012 the work to the south was carried out in the same way as in 2011 (Phases 3 and 4). Phase 5 in the year 2013 included various remaining works in the external and tunnel lots and the clearance of the works yard specially established for this construction site.

Overview
Image: Orthofoto: 2010, Mapplus AG, Luzern

Initial situation

The difficult initial situation of up to 90,000 vehicles using this section daily, no available diversion routes in the Lucerne region, high traffic peaks of holiday and weekend traffic and to a certain extent an inner-city construction site presented the clients and the project planners with an apparently insoluble task from the very beginning. In advance of the final project definition, many possible construction variants were examined, taking into account the population and the economy of the Lucerne conurbation area. Instead of closing the City Ring completely for a whole year, the best option was determined to be the closure and renovation of the road over two years at night-time and on 25 selected weekends per year, while maintaining the main traffic flow. The weekday traffic in the local network or in the metropolitan area of Lucerne was hardly impeded at all during the day by the additional volume of traffic and congestion, since the traffic was largely able to pass the “closed” construction site without restriction. From 2007 to 2010, extensive preparatory work was carried out without hindering traffic, in order to ensure the safety of road-users and construction workers during the renovation. A cable tunnel was driven in each of the Reussport and Sonnenberg Tunnels, which were used for the laying of all necessary supply cables to the safety facilities (e.g. fire-alarm systems in continual operation, video surveillance, traffic routing system) in the tunnel. The construction work was therefore able to proceed unhindered. It was also necessary to create an additional lane in front of the northern entrance of the Reussport Tunnel so that the traffic could run in two sets of three lanes in this area during the construction period. The extensive preparatory work was completed on schedule by mid-2010, so that the City Ring consortium together with PORR Suisse AG were able to start the renovation work at the end of 2010.

Traffic direction
Image: PORR

Works cable gallery
Image: PORR

Night closure exit
Image: PORR

Night shift procedure

Due to the restricted space available, there was no possibility of setting up the machinery park in the tunnel, or having any room for the intermediate storage of equipment or construction material. The construction site therefore had to be set up and cleared again every single day. For this purpose, all the companies gathered each day from 19:30 with their up to 80 semi-trailers, delivery and transport trucks and other vehicles at the specified installation points, in order to take up a position in the column corresponding to the place of work in the tunnel. This ensured that after closure to traffic and from the release of the motorway section to the construction site (towards 20:30), vehicles could enter the tunnel construction site without excessive manoeuvring or loss of time. Anyone who thereby missed their unloading point blocked the following construction site traffic, and sometimes had to bypass the complete construction site and enter the tunnel again after turning round in the city. While one part of the team was busy with the unloading of the equipment, the other part had to secure the construction site in the RPTU on a daily basis with miniguards for their own safety, because one lane in the RPTU was usually left open for individual vehicles. Each team then set up its work area, while time was pressing every night, since the construction site had to be cleared again by 05:00 every morning. Nothing was allowed to be left in the tunnel. Open areas on the carriageway or the hard shoulders (which serve as escape routes during the day) had to be covered, so that commuter and holiday traffic could again pass through the tunnel pipes safely and without hindrance from 06:00. Before the opening of the tunnel to traffic, all safety facilities were thoroughly cleaned and checked.

A further challenge was ensuring the availability of necessary construction materials also during the night. Thanks to its own works yard, the construction site had access to required materials and reserve machines at all times. Plenty of roll-off buckets loaded with material were always available to be transported into the tunnel as required. The concrete and asphalt delivery works also put in night-time or weekend shifts whenever necessary, so that work in the tunnels could carry on without interruption.

Waiting at the entrance to the construction site
Image: PORR

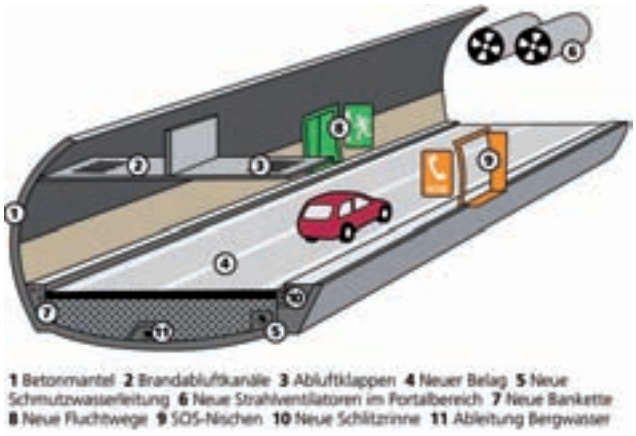
Miniguard relocation RPTU
Image: PORR

Renovation work

Reussport Tunnel and Sonnenberg Tunnel

The comprehensive renovation of the total four tunnel pipes was one of the main works of the Lucerne City Ring project, and included the following measures:

In all the pipes, the road salt had damaged the concrete structure in parts, so that all the walls would need to be renovated. In both tunnels, cracks and ruts also necessitated the replacement of the carriageway surface. In order to improve safety in the tunnels, new SOS niches were constructed and the cross-connections between the pipes were extended to serve as escape routes.



The most important work in the tunnel
Image: PORR

During the renovation of the tunnel walls
Image: PORR

The smoke extraction ducts in the SBTU were brought up to the latest standard. All safety facilities (fire-alarm system, jet fans, etc.) were replaced by a sub-contractor. In the RPTU, mountain meltwater was backing up due to calcified vault drainage lines and penetrating through leaks into the carriageway. In the SBTU, meltwater was also penetrating into the tunnel vault, so that the drainage system in both tunnels had to be redesigned. All cable pipe systems were also replaced. In order to improve noise protection for the local residents in the area of the north entrance of the RPTU, the tunnel was lengthened by 130 m using the cut-and-cover technique. Due to the redimensioning of the previously largest civilian protection shelter in the SBTU, it was necessary, in the area of the extending North Armoured Gate, to replace the approx. 60 m long suspended ceiling in the north and south pipes.

Construction of SOS niches
Image: PORR

Condition before the renovation
Image: PORR

Hard shoulder concrete SBTU
Image: PORR

Spray concreting work
Image: PORR

After the renovation
Image: PORR

During the renovation
Image: PORR

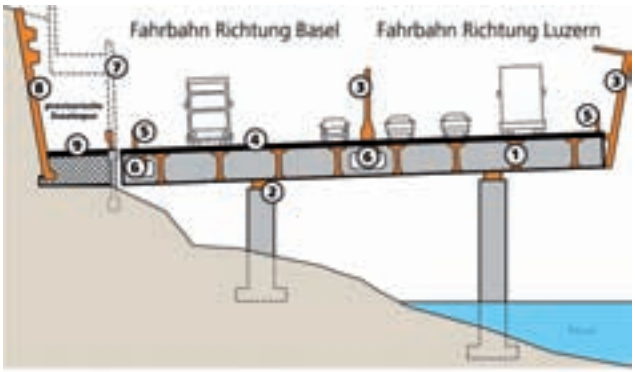
Missing intermediate covering in the SBTU
Image: PORR

Concreted SBTU intermediate covering
Image: PORR

Only one weekend closure was available for this purpose, from Friday 20:00 to Monday 05:00, together with the experience gained from one previous, realistic preliminary attempt. During this closure, the complete 60 m long ceiling section would have to be encased in formwork, reinforced, concreted and cleared of formwork again, so that the traffic would be able to flow again from Monday at 06:00. This extraordinary performance was only possible through the use of sophisticated logistics (“just in time” deliveries of sufficient replacement equipment – e.g. concrete pumps), our motivated employees and the use of quick-setting concrete, which attains its compressive strength within 10 hours, and can only be worked for three hours from the start of mixing. The concreting time was chosen so as not to cause any traffic hindrances as a result of the closure of the City Ring, while still leaving sufficient time for the setting process. For safety reasons, police escorts were organised for the concrete deliveries, which in the event of a traffic jam on the access roads to the construction site would have made sure that the deliveries got through on time.

Reussegg–Lochhof

In order to withstand the steadily growing volume of traffic and the higher loads, the load-carrying capacity of the Lehnen Viaduct had to be improved. The bridge bearings were over-stressed in places, or damaged, and therefore had to be replaced. The bridge abutment had suffered noticeable settlement. The sealing and drainage points were leaking in places, and the carriageway surface was worn. The barriers had reached the end of their service life and no longer complied with current guidelines. They were therefore replaced. New noise protection walls were also installed over the whole area.



1 Quer- und Längsträger **2** Brückenlager **3** Neue Lärmschutzwände **4** Neue Strassenbeläge **5** Ersatz Leitschranken **6** Erneuerung Entwässerungsleitungen **7** Alte Stützmauer **8** Neue Stützmauer **9** Provisorische Zusatzspur

The most important work on the Lehen Viaduct
Image: PORR

Reinforcement and renovation of the Lehen Viaduct
Image: PORR

Senti Bridges
Between the SBTU and the RPTU, the A2 crosses the Reuss via three bridges. Two further bridges serve as exits from the city. The five bridges were constructed in 1972 and 1973. After various construction modifications in the 1980's and 1990's, the bridges were showing typical signs of ageing. The bridge casements in particular had been severely affected by road salt. Untight carriageway transition points had also lead to the detachment of concrete and corrosion on the abutments. In the course of the Lucerne City Ring project, the bridges were repaired and the noise protection extended.

Renovation of the Senti bridges
Image: PORR

City connection
This section included the actual city connection, the city tunnel with gallery, various banks walls with footpath along the Reuss and the pumping station with the "Geissmatt" oil retention basin. The basin, bank walls and pumping station had been constructed up to 1973, and were showing damage typical for their age. Road salts had clogged and contaminated the concrete constructions, while the steel constructions of the noise protection measures also showed corrosion damage. In the course of the complete renovation, the drainage system was also replaced and overall pigeon protection installed.

Work in the city environment

The construction site lay partly in the city environment of Lucerne. There are residential districts above the tunnels and close to the tunnel entrances. It was therefore essential to reduce to a minimum the construction noise caused by demolition or HDW work. The demolition work for the new SOS niches in the tunnels in particular caused structure-borne noise, which could be heard in the buildings above the tunnels. Since such structure-borne noise can hardly be reduced by technical means, noise-intensive work could only be carried out during the specified time window from 21:00 to 24:00, out of consideration for the local residents. Noise-intensive work was also a problem in the entrance area of the tunnels and on the Senti bridges. The noise level of HDW work was able to be reduced with the aid of temporary housings. In order to avoid cross-loading and additional works traffic in the entrance areas, the demolition material was loaded into buckets directly in the tunnels and transported away.

Structure-borne noise
Image: PORR

Hard conditions for the personnel

During the complete construction time, the personnel employed were subject to heavy stress due to the continual night shifts and the irregular working hours at the weekends. Night after night, up to 150 people were at work in the tunnels. On closure weekends, even as many as 250 people were working in six shifts from Friday evening at 20:00 until 06:00 on Monday morning. The large personnel requirement and the unusual working hours demanded complex shift planning. This challenge stressed all workers and caused a lot of overtime. But the work did not end after the shift for the senior construction supervisors, foremen and construction managers, who had to make sure that the results of the last shift were documented and passed on.

Concluding remarks

Despite the special challenges, and with the dedicated application of all those involved, the City Ring project was completed successfully on schedule and on cost at the end of June 2013. Although temporary long traffic jams on the motorway at weekends or as a result of accidents – which were fortunately never serious – could not be avoided entirely, the feared widespread gridlock in the Lucerne conurbation never actually happened.

Even though this extensive project was successfully completed, the prescribed renovation model also shows in retrospect that the construction site personnel were pushed to the limits of their endurance, and that future projects can be realised only after thorough examination and with the dedicated commitment of all employees.

In this renovation project, PORR Suisse AG repeatedly demonstrated its competence in the technical and personnel field for logistically and organisationally challenging construction projects.

Project data

Client	ASTRA, Federal department of Roads, Zofingen Branch
Project planners	Ernst Basler+Partner

Local construction supervision	Emch+Berger WSB AG and Amberg Engineering AG
Contractor	City Ring consortium
Consortium companies involved	PORR SUISSE AG Anliker AG Implenia Bau AG Walo Bertschinger AG Marti Bau AG Frutiger Bau AG
Construction time	Nov. 2010 – June 2013
Costs	approx. CHF 400 million / € 320 million
Hard shoulder demolition	9,850 m
Concrete removal	14,250 m²
Top course demolition	62,550 m²
Carriageway milling	76,000 m²
Composite anchors	16,400
Locally-poured concrete	13,970 m³
Re-profiling	1,910 t
OS	104,400 m²
Trench excavation	24,650 m³
Drainage pipes	12,240 m
Locally-poured concrete formwork	30,680 m²
Reinforcement	1,172 t
Asphalt	51,350 t
Carriageway sealing	20,520 m²
New construction of noise protection walls	6,420 m²
Noise protection panelling	11,820 m²
Pre-stressing cables	2,500 m
Concrete supports (FT)	52
Concrete boards (FT)	4,885 m²
Drill piles	2,220 m
Carriageway transitions	385 m

Vienna International Airport – Renovation of Check-in 1 & Check-in 2

The comprehensive renovation of the suspended roof constructions, the check-in counters and ticket sales areas as well as the renovation of the entire building equipment, while maintaining full operations in check-in halls 1 and 2.

Bianca Rüf

Introduction and historical review

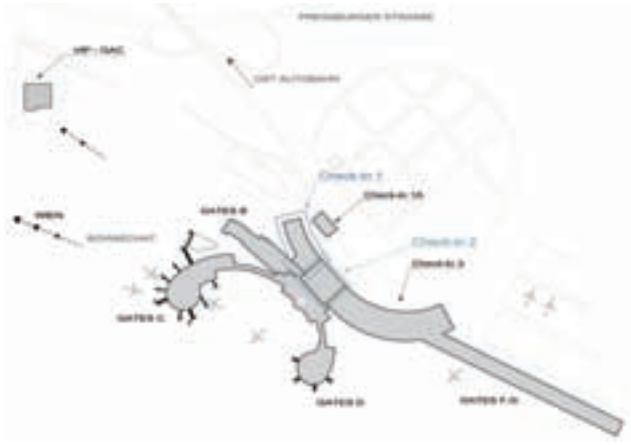
Vienna Airport, the largest airport in Austria, is located in Schwechat, south-east of Vienna.

It was brought into operation in 1938 as a military airbase of the German Air Force. Parts of the airport were used in 1944 as a concentration camp for prisoners. Today, three hangars from this time have been preserved on the apron.

In the year 1954, the newly formed “Wiener Flughafenbetriebsgesellschaft” (“Vienna Airport operating company”) took over management and flight clearance, and constructed the first terminal building, which is still preserved as a striking construction with its control tower. (See: de.wikipedia.org/wiki/Flughafen_Wien)

Vienna-Schwechat Airport is still today the only airport serving Vienna, and is divided into four interconnected check-in areas:
Check-in 1, 1A, 2 and Check-in 3.

The VIP-GAC Terminal located further to the west and Check-in 1A were also built by PORR over the years 2005-2006.



Overview plan of Vienna Airport Check-in areas
Image: PORR

Construction of Terminal 1 & Terminal 2 (today Check-in 1 & Check-in 2)

Check-in 2 was completed in 1960 and was the only Departure Hall of Vienna Airport until the construction of Check-in 1 in the year 1992. Spacious terraces were laid out in front of the building, although these had to be successively removed on the construction of the East Pier and West Pier. The uppermost row of windows is still visible today from the sloping façade in the direction of the approach. Although the check-in counters not have changed location since their initial construction, numerous conversions and extensions have lent a new character to the Departure Hall.

Viewed from the approach, the architectural design of Check-in 1 is reminiscent of the previously built Check-in. Internally however, the two buildings demonstrate mostly different characteristics. (See: de.wikipedia.org/wiki/Flughafen_Wien)

Construction of Terminals 1+2
Image: PORR

Construction of Terminals 1+2
Image: PORR

Construction of Terminals 1+2
Image: PORR

VIE renovation of Check-in 2

The conversion work of the first area – the renovation of Check-in 2 VIE, began in the year 2010. The main renovation measures consisted of the following:

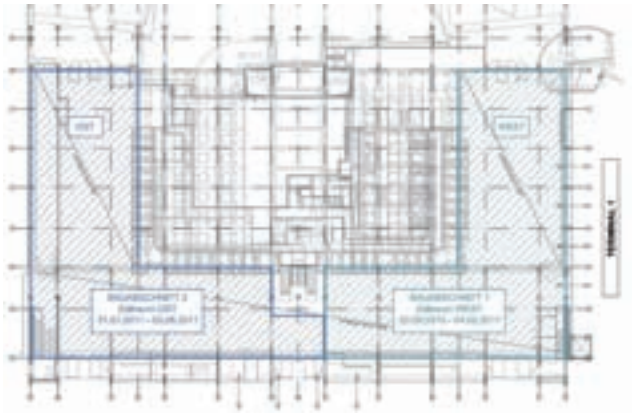
- Renewal or replacement of the north and south façade
- Cable bracing, together with associated steel construction as support for the existing suspended roof to maintain the load-bearing capability
- Complete renovation or renewal of the roof – incl. damp sealing and heat insulation

Project data

Scope of services	General contractor renovation and repair services
Start of construction	26th July 2010
Completion	26th August 2011
Gross floor area	~3,500 m²
Client	VIE Flughafen Wien AG
General planner	Schwaighofer + Partner Architektur ZT GmbH
Electrical installations & planning	VAI Maintenance GmbH
HKLS installations & planning	Lessiak Heizungstechnik GmbH

The particular difficulty of the renovation lay in carrying out all work while maintaining airport operations at the full level of 100%.

In order to achieve this, the construction project was divided into 2 construction stages, and a platform was erected first on the right and then on the left side. These had to be assembled and removed at night, so as not to obstruct the passenger area.



Overview of construction stage work platforms WEST/NORTH & EAST/SOUTH
Image: PORR

It would be necessary to build a complete steel construction of steel beams and trapezoid plate as the sub-construction. The steel supports were panelled with wood in the passenger area and painted white. The load-bearing structure and the roof were painted light grey.

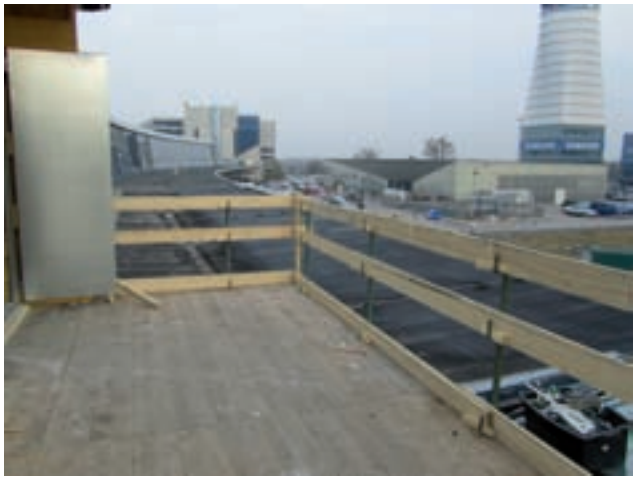
A clear room height of 4 m was guaranteed below the roofs. On the West & East platforms, work continued for half a year in parallel with the passenger traffic. The platforms were then removed overnight.

Platform, Construction section 2
Image: PORR

Underneath view of platform, Construction section 2
Image: PORR

Working area above the platform
Image: PORR

Since the material transport could not be carried out with the aid of a crane, a further challenge lay in the construction of a ramp, including a lift, in the area of the approach. This would be the only way to handle the construction site logistics. For this purpose, the canopy roof was strengthened by means of a steel construction.



Ramp for construction site logistics – Access to Terminal 2
Image: PORR

Ramp for construction site logistics
Image: PORR

Via this new ramp, it was possible to renovate both the façade and the entire roof surfaces. The existing pre-stressed concrete ceiling of the suspended roof structure over the East & West Hall areas was only around 6 cm thick. It was therefore necessary to strengthen the load-bearing capacity in this area. The forces were transmitted into the steel columns with the aid of horizontal steel ribs. Steel cables were stretched between the individual steel ribs for bracing.

Steel cables stretched over the roof
Image: PORR

Steel cables under the new heat insulation layer
Image: PORR

New metal cassette ceiling
Image: PORR

The project Renovation of Check-in 2 was completed after one year's construction time. In the course of the demolition of the former arrival area and in preparation for the extension of the old baggage centre and construction of the new South passenger gangway, the check-in counters were temporarily closed in early 2013.

Check-in 2 2013
Image: PORR

VIE renovation of Check-in 1

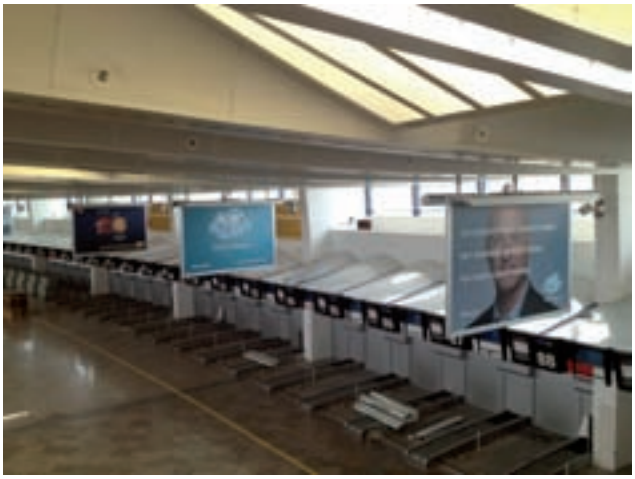
For the renovation of the Check-in 1 area, the hall area on level O1, the connecting areas to Terminal 2 and the flat roof of the complete Terminal 1 Hall as far as Parking Garage 3 were renovated in a very short construction time, without interfering with the maintenance of airport operations.

Overview of renovation measures – Check-in 1 Hall
Image: PORR

Overview

- Demolition of the check-in counters and ticket sales counters and the large luggage counter towards Terminal 2
- Construction of new counter areas incl. back-office areas
- Demolition of a total of 18 light pyramids
- Roof renovation incl. lightning protection system and emergency overflows
- Creation of an additional escape route in the direction of the approach (East vestibule)
- Demolition of the existing ceiling construction and installation of a new panel ceiling over the complete Terminal 1 Hall
- Renovation of the HKLS (heating / air-conditioning / ventilation) and electrical installations
- Installation of a fire/smoke extraction system for the hall and the baggage transport system behind it
- Modification of the fire protection and installation of a fire-alarm system

Terminal 1 before 2012 conversion – View in direction of the Arcade
Image: PORR



Terminal 1 before 2012 conversion – Counter roofing
Image: PORR

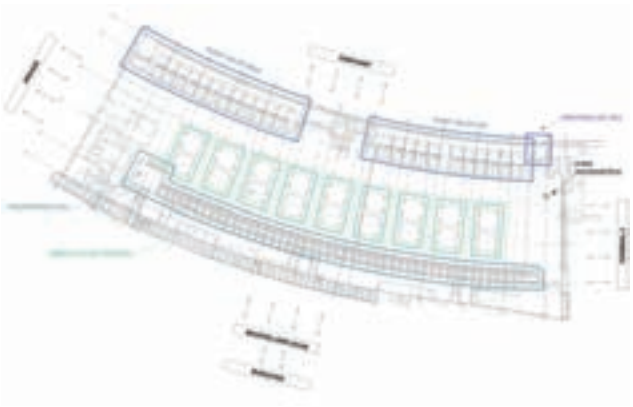
Project data

Scope of services	General contractor services for the renovation of Terminal 1
Start of construction	23rd July 2012
Completion	20th December 2012
Gross floor area	~4,200 m²
Client	VIE Flughafen Wien AG
General planner	Schwaighofer + Partner Architektur ZT GmbH
Electrical installations	Alpine Energie
HKLS installations and planning	Ortner Ges.m.b.H

In the VIE renovation of Check-in 1, it had to be ensured once again that airport operations could be maintained to the level of 100%.

This was achieved by dividing again the work into two construction sections. The areas were separated by means of newly developed mobile dust walls. Due to the

shaped tubular construction and sliding bearings, these dust walls were particularly mobile, so that the passenger traffic was shielded from the construction site at all times. This also ensured continual access to the large baggage collection area.



Installation of dust walls in Construction phase 1+2 with passenger traffic route
Image: PORR

All construction measures in the area of the check-in counters and the hall were carried out in Construction section 1. This included

- the complete demolition of the counters,
- their reconstruction,
- the removal of the baggage transport system behind the check-in counter,
- the demolition of the glass pyramids and
- the demolition of the ceiling construction and
- the installation of a new panel ceiling.

The ticket sales counters were renovated in the course of Construction section 2. This included

- the demolition of the existing counters,
- the construction of new back-office areas incl. floors and ceiling constructions and
- the replacement of the shop LED advertising boards.

The existing tunnel-shaped, arched metal cassette ceiling was dismantled with the aid of scissor-lift and trailer work platforms transported onto the site.

The ceiling directly above the passenger traffic had to be renovated during the night, in order to ensure the maintenance of airport operations.

Dismantling of the existing ceiling with the aid of scissor-lift work platforms
Image: PORR

Dismantling of the existing ceiling on the night shift (Links: Dust protection wall, Construction section 1, Right: Dust protection wall, Construction section 2)
Image: PORR

Demolition of the glass pyramids with the aid of a mini ramp crane
Image: PORR

The infrastructure of the construction site was set up in the interior loading yard, which involved long transport routes over the conveyor bridge recently constructed by us, making the construction site logistics correspondingly more difficult.

The removal of the dismantled counters, which due to their bullet-proof design weighed several tonnes, was a particular challenge. The counters were transported in the direction of the approach with the aid of palettes. Since a load limit of 7.5 t had to be observed over the ramp, direct removal of the counters was not possible.

The counters therefore had to be drawn over the parking deck and then taken away by truck crane.

Removal of the dismantled check-in counters
Image: PORR

After only just five months construction time, the renovation of Check-in 1 was handed over successfully.

Check-in 1 2013
Image: PORR

CCPP Knapsack 2

Gas and steam turbine power plant

Per Huhn

Introduction

The combined gas and steam turbine power plant is located to the south-west of Köln Hürth on a former coke dump in the Knapsack Industrial Park. It supplements the gas and steam turbine power plant Knapsack 1 already completed in the year 2007 with a capacity of 800 megawatts (MW). Siemens built the complete power plant ready for operation and supplied the main components such as the gas turbine, steam turbine, generator and heat recovery steam generators. The end-customer and operator is the Statkraft Markets GmbH in Düsseldorf.

The main works were tendered by Siemens AG in three lots. In February 2011, Porr Deutschland GmbH, Infrastructure, foundation engineering, received the order for the special civil engineering works. In June 2011, Porr Deutschland GmbH, Civil Engineering, then succeeded in obtaining the order for the power plant shell construction, the so-called “Main Civil Works”. The third lot, the cooling tower with pumping works, was awarded to a third company.

Project description

The Knapsack 2 power plant is a single-shaft plant, in which the gas and steam turbine are arranged on one shaft and drive the same generator. With a capacity of 430 megawatts (MW) and an efficiency level of 59.2%, the plant is one of the most modern and environmentally-friendly of its type in Europe.

The plant consists essentially of a machinery building with attached transformer array and switchgear, the boiler house, the feed water pumping station, the cooling tower with pump building and various ancillary outbuildings – including the gas reduction station, the full desalination plant, the fire-extinguishing pump station and the cooling tower water treatment.

Special civil engineering and drill pile works

The entire plant was founded on 540 in-situ concrete drill piles with a diameter of 880 mm and lengths of up to 35 m. The total of 15,500 m of drill piles was produced using the part-encased Kelly method. A comprehensive pile test programme, such as static pile tests, dynamic pile tests, static lateral tests and integrity tests also formed part of the scope of services.

Static pile test
Image: PORR

In the area of the flat-foundation outbuildings, ground improvements were carried out by vibro-compaction with compaction depths up to 20 m and a grid of 1.75 m. The south side of the site received a sheet pile wall construction with "Totmann"-anchoring as embankment protection. To meet the tight schedule, the client decided to construct the condensate pit in the machinery building in a sheet pile wall excavation with steel bracing, in order to be able to carry out the concrete work on the turbine foundation at the same time.

Production of the drill piles
Image: PORR

Condensate pit with turbine foundation and turbine platform
Image: PORR

Boiler-house baseplate
Image: PORR

Concrete construction

Only eight weeks after placement of the order for the concrete work, the central element of the power plant – the turbine foundation – was concreted into place. With a volume of 1,200 m³, the 55 m long, 3 m high and up to 7 m wide foundation was produced as a single-piece monolith. Special requirements were here placed on the concrete technology. In order to limit the crack widths the temperature in the core could not rise too high, and the temperature difference to the outside could not exceed 20 °C. The temperature development was therefore monitored for several weeks with built-in temperature sensors.

Turbine foundation and machinery building baseplate
Image: PORR

Despite the many changes and delays, all the concrete construction work was able to be completed on schedule.

Infrastructure

Under extremely confined space conditions, extensive infrastructure measures such as pipeline and road construction work were carried out simultaneously on the power plant site.

Summary

Porr Deutschland GmbH had in the past already proven itself to be a reliable partner of Siemens AG in the course of power plant projects in Germany and the Netherlands. These outstanding performances were decisive in the final award of the order. The experience of the PORR experts could be applied in many ways for the optimisation of the planning provided, resulting in a more efficient construction process. By this means, this project too was completed to the satisfaction of the client in accordance with the required quality and schedule, and was handed over to the end-customer six weeks earlier than planned.

Project data

End-customer	Statkraft Markets GmbH, Düsseldorf
Client/planning	Siemens AG Energy Sector, Erlangen, Germany
Contractor	Porr Deutschland GmbH, Munich
Special civil engineering	February 2011 to August 2011
Concrete construction	July 2011 to April 2012
Commissioning	May 2013
Drill piles D=880	15,500 m
Vibro-columns	9,500 m
Sheet pile wall	1,800 m²
Concrete	10,036 m³
Reinforcing steel	1,135 t
Formwork	7,040 m²
Installed components	75 t
Road construction	7,900 m²
Coating	5,780 m²

Top and base course renovation and shoulder improvement of Runway 16/34 at Vienna International Airport

Peter Hanak

Enormous time pressure and demanding safety regulations – these were the essential conditions for the renovation of Runway 16/34 at Vienna International Airport. In the night-time work on the runway, exact planning and a professional team played the main role.

Introduction

The air traffic at Vienna International Airport is handled by two runways - Runway 11/29 and Runway 16/34. Runway 16/34 was built in 1976 and has since been renovated thoroughly only once. This was in 1993, when the top course was replaced. Now the top and base course, and the shoulders of the complete runway, had to be completely replaced over an area of around 220,000 m². The forces that the runway surface must withstand are enormous: the landing of an aircraft exerts forces of several hundred tonnes on the runway surface. The lack of these renovation measures would have serious safety consequences for aircraft when taking off and landing. If the surface is not renewed regularly, it can become cracked and throw up stones which can cause serious damage to aircraft. Approx. 270 aircraft land on Runway 16/34 every day.

Order and scope

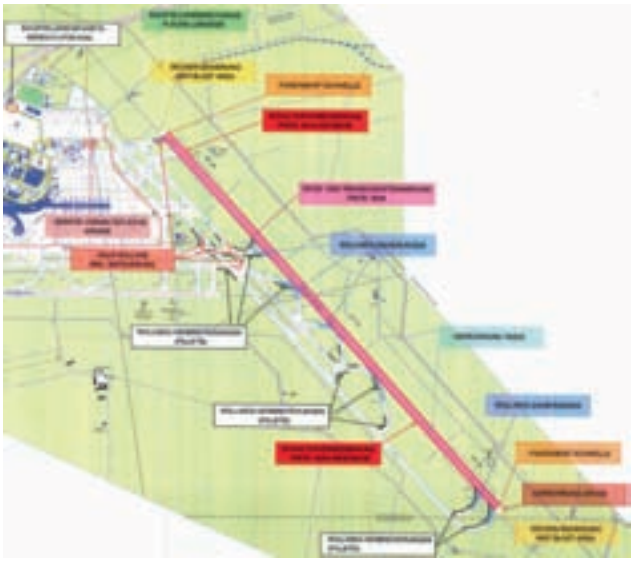
The construction project was put out to tender throughout Europe in two stages. The most economic bidder was chosen from amongst those offering the best quality. The award procedure also took into account construction companies with the necessary experience and know-how of airport construction.

In January 2013, a consortium consisting of the companies of Alpine, TEERAG-ASDAG AG and Pittel+Brausewetter, received the order from the Flughafen Wien AG for the renovation of Runway 16/34 at Vienna International Airport, for a total order volume of € 20 million.

The implementation of the construction measures was planned for the period from April 2013 to the end of May 2013. The project incorporated the following measures:

- Top and base course renovation of Runway 16/34
- Shoulder improvement of Runway 16/34
- Top and base course renovation of individual taxiways
- Widening of individual taxiways of runway system 16/34
- Replacement of the runway cabling
- Improvement of the lighting facilities

The construction work was to be carried out over 25 nights between 21:00 and 07:00, and on four to five weekends from Friday 21:00 to Sunday 16:00. The quality specification demanded a seamless runway surface.



Overview of construction measures
Image: PORR

Description of Runway 16/34

Runway 16/34 has a length of 3,600 m and a width of 45 m. Both shoulders are 7.5 m wide. The runway has a cambered profile, meaning that the area of the runway centreline constitutes the highest point of the runway in the transverse direction. The surface slopes away from the centreline in both directions with a gradient of 1.5 %. In addition, grooves 1 cm deep and approximately 5 mm wide are milled in the transverse direction along the entire length of the runway. This ensures optimum water drainage.

General technical description

The construction project was implemented in stages. For this purpose, Runway 16/34 was closed at nights and at the weekends, with normal flight operations going on between these times. In 25 nights and two weekends, from 8th April to 24th May 2013, over 220,000 m² of surface was completely replaced. Over 80,000 t of asphalt were removed and re-installed. In total, 12 cm of asphalt had to be milled off and replaced. More than 500 people and up to 480 construction machines were at work every night.

The hot mixed asphalt was brought onto the site by up to six mixing systems at a time.

The existing 45 m wide runway surface was milled off in partial lengths of approx. 200 m during the night, with even 600 m being removed at the weekend, to a depth of 12 cm. After high-pressure cleaning and the application of the bitumen emulsion preliminary agent, the new 8 cm thick bonding course was laid during the same night.

The daily procedure

Every day at 15:00, the representatives of the consortium and the Flughafen Wien AG met in order to check the weather situation for the coming night's work. By 16:00 the client decided whether the construction site could go into operation at 21:00. The weather reports and crosswind component were checked, because Runway 16/34 could only be closed if the flight traffic could be handled by Runway 11/29. If the crosswind component over Runway 11/29 was too high (over 25 knots) and Runway 16/34 had been closed because of the construction work, no aircraft would have been able to land at Vienna Airport.

If the Airport gave the "Go", an unbelievable machinery was set into motion. If it was a "No", work for that night could still be cancelled up to 21:00 at the latest, although this would have incurred major costs.
At these meetings, the work steps were also accurately documented and planned down to the last detail. Deployment plans were necessary so as to be able to act correctly even in emergency situations.

A carefully planned sequence of work then started:
At 19:00 the VIAS (Vienna International Airport Security Services) began securing the access area to the construction site in order to let the construction equipment in. This required the organisation of a convoy of vehicles up to 4 km long. At exactly 21:00, the teams swarmed out to close the runway and secure the site. Under the coordination of the airport operations management, groups were directed to the areas to be cordoned off. After only a few minutes, the runway was opened to the construction vehicles. The entry of the innumerable construction vehicles alone took around 30 minutes every day. From this point on, a sea of flashing orange lights dominated Runway 16/34 at Vienna Airport. After each shift the runway was cleaned and checked, so that it could be opened once again to air traffic.

Despite the long nights, a meeting was held daily, at which constructive suggestions for improvements for the next night were discussed.
In addition to the night shifts, work was also carried out at the weekends from Friday 21:00 to Sunday 16:00. To ensure the required high quality, the top course was applied in daylight.

Asphalt installation at night
Image: PORR

Vienna Airport runway renovation
Image: PORR

Vienna Airport runway renovation
Image: PORR

Professionalism and teamwork

The number of machines used was unique in Austria and in the history of road construction: On the first weekend, a total of 27 asphalt milling machines and just as many asphalt pavers were in use. At the same time, around 200 trucks were employed in bringing in the new asphalt and removing the old. By Whit weekend, everything was ready for the application of the top course. This was installed seamlessly over the complete width, including the shoulders. On this weekend alone, 22,000 t of asphalt top course were laid. 13 pavers were at work continuously in order to ensure seamless installation.

To spare inconvenience to residential areas and local residents, motorways and major roads were used primarily for the delivery and removal of the materials.

Vienna Airport runway renovation
Image: PORR

Vienna Airport runway renovation
Image: PORR

Quality control

To ensure the required quality, continuous quality control was carried out by the group's own laboratories, in addition to the prescribed acceptance tests of the asphalt mixture installation.

Final completion

The renovation work on the take-off and landing Runway 16/34 at Vienna International Airport was completed several days ahead of schedule on 24th May 2013.

Project data

Company	TEERAG-ASDAG AG, Lower Austria Branch
Client	Flughafen Wien AG, 1300 Vienna Airport
Project type	Top and base course renovation and shoulder improvements
Country/city	Austria/Vienna-Schwechat
Start of construction	08.04.2013
End of construction	24.05.2013
Asphalt milling material	80,000 m³
Asphalt	82,000 t
Excavated material	40,000 m³
Surface marking	17,000 m²
Line marking	12 km
Cable protection pipes	5 km
Cables	63 km
Lights	850
Construction time	25 nights and 2 weekends
Performance per night shift	max. length 398 m
Performance for top course installation	3,000 m and 22,000 t in 22 hours

Target and conditions of the client

The construction measures were aimed at bringing the runway system up to the current state of the technology. Thus, take-offs and landings of large aircraft such as the A380 were made possible in normal operation.

Great importance was also attached to maximum safety, the availability of the runway, an economical solution, short construction period, and the best possible quality.

Challenges

The great challenge for the consortium and all others involved in the project was the enormous time pressure, since the runway would have to be re-opened to traffic every day by 07:00. The daily and accurate allocation and deployment of machinery was also an enormous task.

The size of the project, the simultaneous nature of the work and the sheer quantity of materials also represented a great challenge for our company.

Concluding remarks

Thanks to the outstanding cooperation of all those involved in the project, beginning with the client and extending to the local construction supervision, the work was completed to the full satisfaction of all. We are very proud of the dedication and accuracy demonstrated by every individual.

Although the construction work was delayed by the wind and weather situation, the work was completed several days earlier than scheduled on 24th May 2013.

The TEERAG-ASDAG AG, Lower Austria Branch, was able once again to give a convincing demonstration of its experience and expertise.

Remadiation of old contamination at “K 28 / Bärenbatterie Jungfer”

Holger Trutschnig

Previous history

The old location of the “Jungfer Akkumulatorenfabrik” (“Jungfer Battery Factory”), with a total area of 49,000 m², had been used from the 16th century as a location for iron processing and subsequently for producing lead-acid batteries. In the course of industrial production, it was engaged in smelting, glazing, processing, storage and handling of metals and ores, as well as the use and storage of petroleum hydrocarbons.

Main building
Image: PORR

Overview of old contamination K28
Image: PORR

In the area of the entire old site, according to the risk assessment of the Federal Environmental Agency, the ground and the existing building substance are heavily contaminated. On the basis of investigation results of the protected resources, it was assumed that due to the topography and geology of the site, as well as the present contamination situation, significant pollution is occurring to the Feistritzbach adjoining the site and to the ground water. On 01.11.2010, the old contamination location “Jungfer Akkumulatorenfabrik”, listed up to this time as a suspected area, was officially included in the old contamination registry as “Old contamination K28” and assigned in the course of identification by the Federal Environmental Agency to Priority Class 2.

Clearance
Image: PORR

Basement of main building
Image: PORR

The firm of Erhard Mörtl Baugesellschaft m.b.H. in Wolfsberg, a 100 %-owned subsidiary of the TEERAG-ASDAG AG (merged with TEERAG-ASDAG AG in 2013), emerged as the best bidder in a multi-stage award process, and in December 2012 received the order for the sanitisation of the old contamination, with a value of € 6.88 million.

The project

A large part of the building on the site demonstrates significant contamination, both in the building substance as

well as by the presence of dangerous contaminants in the form of dust and loose materials. The present contamination arises primarily from the pollutant lead and other metals as well as hydrocarbon compounds. Since the buildings are partly in danger of collapse, and ingress of surface water repeatedly occurs due to progressive deterioration, resulting in the leaching of hazardous substances from the formerly dry halls and buildings, the decontamination and selective demolition of the halls and buildings appears to be essential. Since parts of the old site are still used or rented for commercial purposes, a sanitation concept was developed taking into account the current use of partial areas.

Acids and alkalis
Image: PORR

Decontamination
Image: PORR

The construction work

The officially approved sanitisation project envisaged in a first step the proper decontamination of the halls and buildings intended for demolition, so that this would not result in the release of hazardous materials or their spread into demolition material intended for recycling at the site in the course of the selective demolition. The complete decontamination, disposal and demolition work and the treatment of the various demolition products intended for recycling (such as brick, concrete and asphalt rubble) was carried out by PORR UMWELTTECHNIK (PUT). These materials were prepared by crushing and screening systems to corresponding particle sizes and examined for compliance with the requirements of the valid notification.

Due to the thoroughness of the decontamination carried out by PUT, nearly 100% of demolished materials could be installed again.

Demolition of the metalworking shop
Image: PORR

Recycling
Image: PORR

After the controlled demolition of the buildings and the recycling of the qualitatively suitable demolition materials for terrain modelling, the complete area will be profiled according to the surface water drainage concept and divided into usage levels by means of retaining wall works (reinforced concrete or stone courses laid in the concrete bed).

The existing surface and waste water channels on the site no longer corresponded to the status of the technology and therefore had to be replaced or renewed, including shaft and outlet structures. The ground surveys in the planning phase confirmed the problem materials found in the soil during the construction work. Large quantities of battery boxes and slag were found during the earthworks necessary for the construction of the channels. The proper sampling and classification according to dumping regulations revealed that these substances were predominantly contaminated with heavy metals. It was

therefore essential to dispose of the 6,000 t found.

Battery boxes and slag
Image: PORR

Battery boxes and slag
Image: PORR

Due to the poor overall condition and the ongoing infiltration of water into the soil of the contaminated site, the pressure pipe of the downstream power plant located on the site was shut off and partially demolished. The new pressure pipe with a total length of approx. 800 m was laid in a new course in the area of the escarpment to the Bärentalstraße.

Power plant pipeline
Image: PORR

Power plant pipeline
Image: PORR

In order to prevent penetration of surface water into the ground in the long term, and thereby prevent leaching and contamination by hazardous materials of the protected resource of the Feistritzbach and the adjoining ground water, all undeveloped areas were sealed with a surface sealant of the necessary quality.

Surface sealing
Image: PORR

Surface sealing
Image: PORR

Project data

Decontamination of total area	15,000 m²
Demolition and recycling of building substance	10,500 m³
Demolition of bituminous courses	30,000 m²
Disposal of bulk waste and construction site waste	360 t
Disposal of construction and demolition wood	345 t
Disposal of asbestos waste	23 t
Site clearance and earth movement	33,000 m³
Waste water and rainwater channels	3,000 m
Shaft constructions	90
Power plant line GFUP DN 1000	775 m
Stone courses	3,000 t
Reinforced concrete supporting walls	1,145 m³
Reinforcement	70 t
Road undersurface construction	34,000 m²
Asphalt	9,350 t
Route protection	745 m
Construction time	March 2013 – December 2013

Demolition of Voitsberg steam power plant, Blocks 1-3

Martin Taborsky

Porr Umwelttechnik GmbH (PUT) acquired the complete site of the Voitsberg power plant (power plant blocks 1-3 including real estate) from A-TEC Beteiligungs GmbH at the end of 2012, and is handling the dismantling and recycling together with its partner Scholz Rohstoffverwertung Austria. The old power plant site will therefore make way for a new building in the centre of Voitsberg. Approximately one and a half years have gone into the planning.

Over the last five years, PUT has become the market leader for complex demolition projects and industrial dismantling, and has extended its expertise in projects such as the area of the Vienna South Station, the Freight Station, the Post Office complex and the North Hospital in Vienna. The Voitsberg power plant is currently the largest industrial dismantling project (urban mining demolition project) in Austria.

PORR UMWELTTECHNIK led the project as the know-how provider with extensive expertise, flexibility and capacity in the areas of project development, demolition technology, construction management and urban mining.

Urban Mining

With this project, PORR UMWELTTECHNIK is impressively demonstrating its expertise throughout the entire chain of urban mining. Possible secondary raw materials are identified as such and quantified at an early stage. Cost-effectiveness assessments are produced on the basis of innovative, technical recovery variants (restoration, dismantling, demolition, renovation and recycling concepts) and the achievable results, and finally followed by recycling of the property.

Project data

Order total	approx. € 25 million
Project duration	18–30 months (scrapping / power plant relocation variant)
Industrial dismantling	of three power plant blocks (35 large power plant buildings)
Demolition of the chimney, height	180 m
Demolition of the boiler house	height 103 m
Demolition of the stairwell tower	height 103 m
Demolition of the cooling tower	height 100 m
Demolition of the bunker building	height 54 m
Recycling of the property	approx. 250,000 m²
Recycling of	approx. 200,000 t of reinforced concrete
Recycling of	approx. 40,000 t of old metals
Disposal of hazardous materials (asbestos)	

Location of the Voitsberg Power Plant
Image: PORR

After the official start of the project on 25th April, which took place at a ceremony attended by representatives of the town of Voitsberg, the surrounding communities and representatives of the companies involved – the Chairman of the Board Ing. Karl Heinz Strauss, MBA of PORR and Oliver Scholz of Scholz AG, work was begun on the main demolition measures for the industrial recycling of the Voitsberg power plant.

From left.: Karl Petinger, Ernst Meixner, Oliver Scholz and Karl-Heinz Strauss.
Image: PORR

The technical recycling of the 250,000 m² area constitutes a particular challenge for PORR UMWELTTECHNIK. 35

large power plant buildings have to be dismantled, four of them over 100 m in height – including the 180 m-high chimney. 200,000 t of reinforced concrete will be demolished, and 40,000 t of steel parts dismantled. Over 90 % of the materials will be recycled and reused. The objective is to demolish the complete plant in the shortest possible time, so that the cleared areas can undergo recycling and renovation.

Heavy demolition equipment is essential

The very high degree of reinforcement of the reinforced concrete also represents a major challenge for the demolition equipment used. For the demolition operations, PUT places particular emphasis on the fact that the in addition to high performance and low maintenance, the construction equipment must also have a certain range by means of long-front and long-reach equipment. The hydraulic power and engine performance must of course also be sufficient for the various attachments. In order to meet the tight demolition schedule and carry out the required services, the equipment being used includes demolition hammers weighing up to 6 t, demolition tongs and scrap shears. At peak times, up to 15 items of large machinery (excavators from 20 – 175 t) will be at work on the power plant site.

PORR has recently added to is equipment park in the shape of the currently largest demolition excavator in Austria: The Hitachi 870 with long-front equipment and an operating weight of 175 t stands out for its huge dismantling and demolition performance and the use of high-performance 5 t demolition tools even at a height of 52 m. Porr UMWELTTECHNIK thereby offers with such complex industrial dismantling a more economical and simultaneously safer conventional demolition method in comparison to blasting.

Demolition of power plant blocks I+II

Work on the demolition of the power plant blocks I+II (constructed in 1941) was started in February. This part of the power plant had already been completely demolished down to ground level.

Blocks I+II consisted essentially of three cooling towers up to 50 m high, the ash separator, the machinery building, two boiler houses with five boilers and numerous other massive power plant buildings.

Picture 4: Boiler dismantling within building shell
Image: PORR

Picture 5: Boiler dismantling within building shell
Image: PORR

The demolition of the boiler houses was carried out mainly within the building shell, in order to minimise the noise and dust emissions for the local residents. The technically demanding structure was Boiler House 5 with the chimney, with a height of 70 m. The boiler house consisted of a steel construction filled in with masonry, with a height of 41 m, and contained an approx. 4,000 t boiler with several elevated tanks and pressure vessels, which were anchored in the top ceiling level. Here the new Hitachi 870 excavator was able to demonstrate its impressive performance in comparison to blasting.

After removal of the outer walls, the boiler was removed in sections, until only the load-bearing steel structure and relevant structural parts of the boiler remained. This construction was brought down on schedule according to the demolition concept after deliberate weakening of the supports.

Hitachi 870 boiler dimantling
Image: PORR

Hitachi 870 boiler dimantling
Image: PORR

Hitachi 870 boiler dimantling
Image: PORR

Hitachi 870 boiler dimantling
Image: PORR

Hitachi 870 boiler dimantling
Image: PORR

Innovative demolition concept for the cooling tower (cable winch method)

For the demolition of the 100 m-high cooling tower, PORR UMWELTTECHNIK developed a revolutionary, innovative demolition concept – the cable winch method). In preparation for this work, the asbestos removal work first had to be completed by the gutting and disposal of over 2,500 t of asbestos-cement panels, either manually in elements with the aid of a mobile crane.

The previous demolition concepts for cooling towers involve blasting, weakening of the supporting construction and time- and cost-intensive dismantling by crane or duo-drive breaker systems. The basic idea of the new demolition concept was to weaken the cooling tower at the only 16 cm thick cooling tower jacket. In this process the cooling tower is weakened field-by-field in the lower area with the aid of the long-front demolition excavator (reach 20 m) by means of vertical slots. The remaining fields, which provide the stability of the cooling tower in the weakening phase, are cracked by two demolition excavators (operating weight 40 to 65 t) using a 200 m-long steel cable, and the weakened cooling tower then brought down accurately and under control. Prior to the demolition process, the results calculated in the structural

concept are compared with and confirmed by the actual forces occurring. This method causes the cooling tower to collapse and this demolition variant stands out above all for the resulting low spread of the collapsing material (max. 20 m from the cooling tower basin) and the low shocks and vibrations (max. 1.5 mm/s at 50 m distance with a limit value of 7 mm/s) in comparison with the demolition variant of blasting and weakening of the supporting construction. Under the prevailing circumstances, the cable winch method represents the safest, lowest vibration, fastest and most economical solution, even under restricted space conditions.

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Cooling tower demolition
Image: PORR

Demolition of power plant Block III

The dismantling and recycling work on the intact 330 MW power plant Block III, which was constructed in 1983 and shut down in 2006 will begin provisionally at the end of 2013. This will be carried out with the aim of recycling most

of the power plant equipment and components in the best possible way, with the intention of reuse (power plant relocation), before recycling of the plant components and subsequent scrapping. Power plant Block III will be maintained until then in conservative operation, in order to be able to ensure the reuse of the plant components for a future user at another location.

Following the innovative and efficient demolition technique applied for the first time for the cooling tower of Block III, further work will be carried out, in which PORR UMWELTTECHNIK will benefit from its existing experience. This will include the industrial dismantling of 30,000 t of steel construction and plant components, such as the 103 m-high boiler and the planned blasting of the 180 m-high chimney, the 103 m-high stairwell tower and loosening blasting of the turbine table. The resulting demolition material will be treated under quality assurance and will be recycled directly at the former power plant site for filling in the basement and other construction measures in accordance with the development plan to be produced. The resulting old metals, precious metals, electrical scrap and plant components will be completely recycled and partially reused.

Evaluation of the demolition work

Before the start of the demolition work, a demolition- and disposal concept was produced, to enable safe, environmentally-compatible, cost-efficient and on-schedule work to the status of the technology, and the proper separation, recycling and disposal of the demolition materials in accordance with the valid guidelines and standards. Following an inspection and assessment of the existing building substance, the demolition concept covered the structural analysis and planning of the individual, partial demolition operations. This included the systematic sequence of the demolition measures according to the load-bearing capacity of the various sections and the corresponding supporting and safety measures, and the specific definition of the equipment required. The stability of the demolition object had to be ensured at every phase. The investigation of the harmful material content of the structure according to ONR 192130 includes the identification and extent of the present hazardous and non-hazardous waste.

The main purpose of this project was defined as the recycling-based demolition in accordance with ÖNORM B2251, with the aim of also separating out mineral fractions (such as concrete and brick rubble) and putting them to the best possible recycling. The resulting additional cost is compensated for by the sale of reusable materials (e.g.: iron, copper, wood) and the reduced disposal costs. The remaining building materials are processed into the highest possible quality recycling construction materials in accordance with applicable standards (see “Güterschutzverband Recycling-Baustoffe”). The aim of the recycling-based demolition is the completion of material cycles in the construction industry, and to save valuable primary resources and final dumping volumes.

In the compilation of the health and safety plan and the corresponding documents, safety measures and instructions were evaluated and laid down with respect to work which poses particular risks to the health and safety of employees engaged in such projects. The “BauKG” is intended to improve the health and safety protection of employees on the construction site during coordination and performance of construction work. Preventive services in the area of work safety (safety specialists, safety advisors) and health protection (occupational medical specialists) are also covered.

Preservation of evidence and vibration measurements

The buildings adjoining the project site were analysed in advance in the course of an assessment (preservation of evidence) by an accredited engineering bureau and their condition assessed according to the traffic-light system. The surrounding area of the construction site was divided into three zones and categorised according to the possible vibration stress. Measuring devices were installed in the most sensitive zones and buildings for the permanent monitoring of the vibrations. If the limit value specified by the relevant standard is exceeded, an alarm system is activated, in order to be able to institute appropriate corrective measures immediately. These measurement values can be called up at any time by online monitoring.

Avoidance of dust and noise emissions

In order to keep all emissions as low as possible for local residents, various precautions were taken, such as precipitation of dust by water-spraying (snow cannons on lifting platforms), water curtains (10 m-high wall of water), fire hoses and a sprinkling attachment on the demolition or recycling equipment. These measures enable effective precipitation of dust both at specific points and over the complete area.

Dust precipitation
Image: PORR

The gutting of the building, the dismantling of the plant components and steel constructions (boilers etc.) and a large part of the demolition work was carried out within the

building shell. The crusher system is located 2 m below ground level in the cooling tower basin. These demolition concepts significantly minimise in particular the environmental effects such as dust and noise emissions.

PUT also uses exclusively low-noise construction machines and transport vehicles complying with exhaust gas standards. The clearly defined objective is low-noise and low-emission demolition according to the latest status of the technology.

Gutting work

The extent of the gutting work includes the dismantling of non-supporting building components, such as suspended ceilings, panelling, masonry partitions, non-supporting interior walls and floor installations. This is accompanied by the dismantling of the complete building equipment, such as heating, ventilation and sanitation systems, electrical installations, cooling systems etc. and the proper environmental recycling and disposal of the waste.

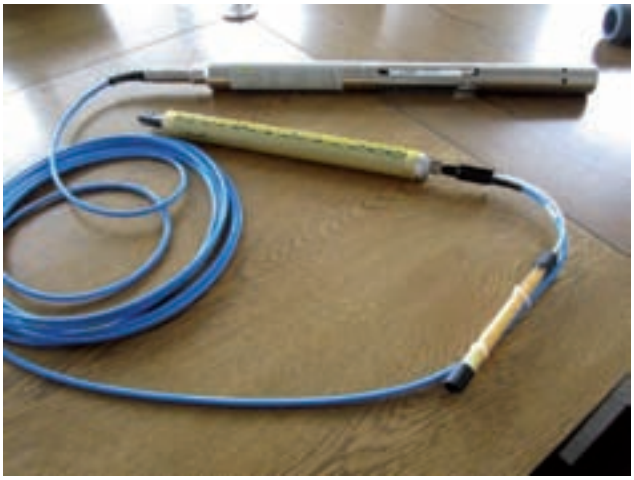
Quality-assured treatment of the demolition material

In order to guarantee the recycling and the quality assurance of the demolished fractions, a suitable place was sought out at the power plant location for a mobile recycling system. The location of the cooling tower basin of Block 3 proved to be the most suitable, since the noise emission is minimised by its location 2 m below ground level and the bulkheading of the 100 m-high boiler house, thereby enabling its use at a very short, but maximum possible distance from the neighbouring buildings (approx. 200 m) and the Voitsberg District Hospital (350 m). The demolition materials are screened into three fractions by a 50 t impact mill with following screening deck and prepared for back-filling. The system is also equipped with a belt scale, a magnetic separator for the separation of the reinforcement bars and sprinkling for dust minimisation. The resulting mineral construction rubble is processed into the highest possible quality recycling materials according to applicable standards (see “Güterschutzverband Recycling-Baustoffe”). The quality checking and assurance is carried out by self-monitoring by our accredited Environmental Technology Laboratory and external monitoring according to the quality testing manual and CE certification. The high quality recycling materials are used on the project site for construction measures required for the restoration of the property (back-filling of the basement and coal storage area) in accordance with the development plan.

Demolition in the ground water protection area

The hydro-geological conditions and the fresh water wells located close to the demolition area, which provide the fresh water supply for the town of Voitsberg represent a further challenge in the performance of the demolition and dismantling work. Most of the power plant building lies within the “extended water protection area”. The Municipal Works of Voitsberg take the fresh water for 10,000 people of the Voitsberg district from the immediate vicinity. Special care, corresponding safety precautions and trained and experienced personnel must therefore be used in the demolition work, particularly in this sensitive area.

In order to comply with the water regulations, a safety well system, a monitoring system (measurement probes) and a substitute water supply were installed for the protection of the fresh water system. The safety well system was planned and constructed on the basis of a ground water model prepared in advance. By means of the safety wells, the ground water level is lowered, and the contaminated water ducted into the rainwater drainage system, so that no contaminated water can penetrate into the water protection area. The monitoring system consists of four measurement probes, which hourly measure and record the parameters of pH-level, clouding, conductivity, temperature and water level. These data can be called up online.



Measurement probes
Image: PORR

Measurement probes
Image: PORR

By agreement with the responsible authorities, limit values were defined, which if exceeded activate the safety wells. These limit values were incorporated into the monitoring programme and coupled to an automatic warning system. Weekly water samples were also taken for chemical and bacteriological analysis in the laboratory. The results are assessed in order to be able to estimate at any time the

possible effects of the work on the quality of the ground water.

With this project, Porr Umwelttechnik GmbH was able to demonstrate its many years of expertise in complex demolition and recycling projects, gather additional know-how in this special market segment and obtain in the firm of Scholz Austria GmbH a very experienced partner for future projects.

Vienna North Hospital

Austria's largest building construction site in Vienna Floridsdorf

Hans Werner Steiner

In June 2012, Porr Bau GmbH, Major Civil Engineering Projects Department, received the order for the shell construction work on the new North Hospital at Brünner Straße 68 in the 21st Vienna District in the amount of around € 98 million from the "Wiener Krankenanstaltenverbund (KAV)" ("Vienna Hospitals Association").

Venus section entrance area
Image: KAV/Health Team KHN - Albert Wimmer ZT GmbH

At the time of placement of the order, the construction site had already been prepared, i.e. the old railway buildings and tracks had been demolished and removed, the preliminary excavation and the construction pit enclosure had been completed and the drainage was in operation.

At the time of construction site take-over
Image: PORR

Project description

As part of the Vienna Hospital Concept 2030, which is aimed at a future-oriented and economically viable supply plan, one of the most modern hospitals in Europe is being built here.

The Hospital Concept 2030 envisages a concentration of the range of services at seven locations by the reorganisation of the Vienna hospitals.

On an area of 111,000 m², a hospital is being built here which will offer a wide range of care and services, with a total of 785 beds in single- and two-bed rooms.

The expected annual capacity is 46,000 in-patient admissions, 250,000 out-patient visits and 17,000 operations. This immense number of patients will be cared for by a staff of approx. 2,500.

Planning and architecture

Architect Albert Wimmer and his KHN Health Team have many years of experience in hospital planning, and are responsible for the architecture and the submission and implementation planning. The technical building equipment has been planned by the ZFG Bureau and the Eipeldauer Bureau.

The architectural concept envisages a curved structure as the main entrance coming from the Brünner Straße, which also accommodates the shopping arcade, the administration and the company kindergarten.

Behind these are the main tracts arranged in the form of five fingers, which contain the Emergency Centre, the operating theatres, the out-patient areas and the wards with the bed tracts. Two helicopter landing pads are located on the highest point of the building. A garage will be built along the entire length of the railway arches, which will also offer additional noise protection.

Since the positive effect of influences from non-medical factors has already been demonstrated in numerous studies, emphasis will be placed on the positive effect of the landscape architecture, and a so-called "Healing Garden" with an area of approx. 47,000 m² is planned.

Overview
Image: KAV/Health Team KHN - Albert Wimmer ZT GmbH

Very tight construction period

The planned main shell construction time is 20 months. In this short construction time, the work to be completed includes the preliminary excavation of approx. 200,000 m³, ground improvement by means of vibration pressure and tamper compaction, the production of drill piles and sheet pile walls and slotted walls, and anchoring work. These services were largely awarded internally by PORR.

For the concrete and reinforced concrete work, a total of 220,000 m³ of concrete and 25,000 t of reinforcing steel will be installed, and numerous unforeseen challenges will have to be overcome.

Drill pile works
Image: PORR

Sounding for unexploded munitions
Image: PORR

Construction site logistics

An important aspect of such a large construction site is naturally the construction site logistics, with the delivery and removal of materials, and in this case in particular the concrete delivery. It was therefore decided at an early stage to set up a mixing system on site. On one hand it is thus largely independent of traffic on the single access road, the Brünner Straße, and on the other hand this also provides the necessary flexibility to be able to produce such large quantities in the short time available. As early as April 2013, i.e. nine months after construction began, celebrations were held to commemorate the first 100,000 m³ of concrete and by mid-2013, 160,000 m³ of concrete had been installed. The maximum weekly performance amounted to 7,000 m³.

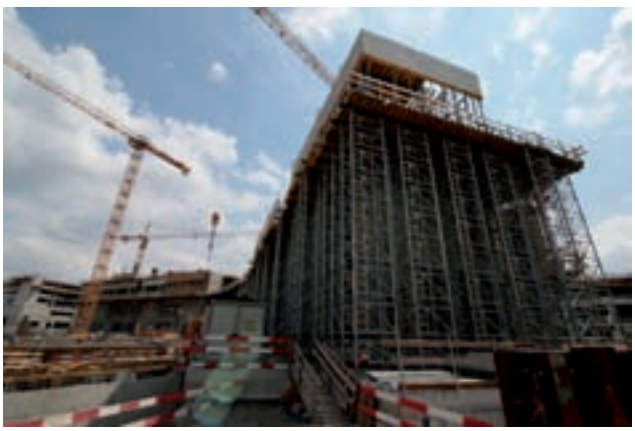
Special challenges:

- Highly complex baseplates with innumerable jumps on the lower and upper side with the resulting complicated laying of the reinforcement.

Highly complex baseplate BT 20
Image: PORR

- Baseplates over 3 m thick
- Heavy supports for overhangs with steel beams and staxo

Heavy supports
Image: PORR



Heavy supports
Image: PORR

- Components with high reinforcement content of approx. 500 kg/m³ concrete in the support level in the Venus section

High reinforcement content BT 10
Image: PORR

- Several bombs found, with resulting evacuation of the complete construction site and surrounding area

Unexploded bombs bring chaos

Two aircraft bombs were discovered today on the construction site for the North Hospital in Vienna-Floridsdorf. The "Wiener Linien" and ÖBB had to suspend operations, local houses and companies were evacuated. Many people were affected!

The first bomb was discovered towards 11:30, shortly followed by the second. The site on which the North Hospital has been under construction for two years was cordoned off and the Munitions Disposal Service alerted.

The Munitions Disposal Service recovered an American aircraft bomb. A relic from the war, the bomb weighed 250 kg and was still live. A few metres further on, a 100 kg bomb was discovered. This had been produced in the Soviet Union. Both bombs were defused and removed. Nobody was injured.

Photo/Graphic: Vienna Police

American bombs discovered

ORF report
Image: wien.orf.at

Soil replacement in the area of contaminated slag
Image: PORR

Protection work in the area of contaminated slag
Image: PORR

- Contaminated slag incl. soil replacement with lean concrete and heavy stiffening of the construction pit protection towards the Brünner Straße

Production of the external drainage with ductile steel pipes

The order also includes the production of the external drainage with ductile steel pipes up to a diameter of 800 mm, which lie largely in the groundwater area. It was therefore necessary to secure the areas by means of drill piles and anchored sheet pile walls and to drill wells for water drainage.

The pipes and the shafts had to be secured against lifting by means of concrete sheathing.

Laying of the drainage
Image: PORR

Screed and floor structure

When all finishing services had been tendered out separately by the KAV, we also succeeded in obtaining the order for the screed and floor structure in the amount of around € 16 million.

This includes the production of all floor constructions including screed, monolithic slabs, cavity floors, and the coatings.

Panorama
Image: PORR

Project data

Address	Brünner Straße 68, 1210 Wien
Site size	111,000 m²
Developed area	51,000 m²
Parking area	47,000 m²
Traffic areas	13,000 m²
Number of beds in single- and two-bed rooms	785

Project data, shell construction

Ground excavation	approx. 200,000 m³
Concrete volume	approx. 220,000 m³
Reinforcing steel	approx. 25,000 t
Vibration pressure compaction	approx. 54,000 m

Completion and commissioning

Approx. 85 % of the shell construction work is now completed. Partial commissioning will take place in 2015, and overall completion in June 2016.

Entrance area
Image: KAV/Health Team KHN - Albert Wimmer ZT GmbH

HOTEL + OFFICE CAMPUS BERLIN

Construction of a hotel building and new construction of an Office Campus in close proximity to the bank of the river Spree opposite the legendary East Side Gallery.

Andreas Kimling

In September 2012, Porr Deutschland GmbH, Berlin Branch, was commissioned with the turnkey construction of the HOTEL + OFFICE CAMPUS BERLIN.

In addition to the actual construction, the general contractor contract also includes the complete implementation planning.

Project data

Client	STRAUSS & CO. Development GmbH
Contractor	Porr Deutschland GmbH Berlin branch office
Start of construction	September 2012
Completion	March – May 2014
Hotel gross floor area (incl. basement)	9,400 m²
Office gross floor area (incl. basement)	34,080 m²
Office units	200 m² to 1,600 m² per floor
Hotel rooms	217
Concrete	21,000 m³
Reinforcement	3,200 t
Façade area	16,500 m²

Project description

The meander-shaped development of the site follows the guiding principle of creating a campus structure that allows a passageway through the area through leafy courtyards also for the public. The use of the campus will include a hotel, offices, shops and restaurants, just a few metres from the famous East Side Gallery.

In line with this idea, the new buildings are divided into three sections, each including a passageway connected to a cube-shaped building.

On the street side, the development is integrated into the planned and already partially existing Berlin block structure. The exterior areas offer the possibility of rest and relaxation to users and visitors alike.

The around 30 m high building sections are all have full basement floors to the boundaries of the property.

The natural stone façade with its bronze-coloured windows and the facades designed with deep intrados create a restful impression characterised by classical elegance. Their proportions are based on the historical commercial architecture which is today found along the Spree.

Visualisation
Image: STRAUSS & CO

Due to the fulfilment of the specifications for sustainable building, the project will demonstrate thoroughly positive energy efficiency.

The low management costs and the sustainable construction will be taken into account by the DGNB certification of the “Deutsche Gesellschaft für Nachhaltiges Bauen” in silver and the LEED certification in gold.

Construction excavation, water management

Within the framework of the implementation planning, the construction pit was optimised to allow the use of a combination of carrier beam construction and open drainage.

A total of 900,000 m³ of ground water was removed.

The trough construction of the excavation was avoided by the optimisation of the construction process and the water management/drainage concept.

Construction excavation
Image: PORR

Shell construction

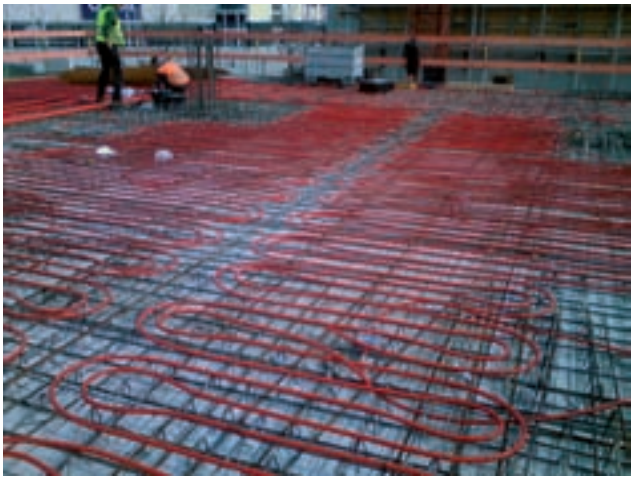
The level of prefabrication was maximised in order to ensure rapid construction progress. Full precast columns and walls were used in addition to filigree ceilings and walls.

The necessary lifting capacity was provided by six rotating tower cranes. Despite stoppages due to the weather in the winter, the shell construction was completed four weeks earlier than planned.

Shell construction
Image: PORR

Technical building equipment

The office buildings will be equipped with low-temperature heating. Concrete core temperature control will be installed centrally in the concrete ceiling for this purpose. This serves for the basic temperature control of the buildings. Thermal flukes will be used for individual control. They ensure an area-wise controllability of the internal temperature within the open-plan offices.



Concrete core temperature control
Image: PORR

A controlled air replacement to DIN 15252 is needed in order to comply with the high requirements of the DGNB and LEED certification systems. This air replacement will be carried out by means of central ventilation units positioned on the roofs of the individual buildings. Total air volume flows of approx. 175,000 m³/h will be circulated within the office buildings and the hotel.

For the supply of the complete complex with electrical power, two double transformer stations with four 630 kVA transformers will be installed in the basement by the energy supplier Vattenfall.

Façade

In the courtyard and on the street side, the office sections will be fitted with multi-part aluminium window elements with opening wings and narrow strips of natural stone in the balustrade and column area.

A major challenge for the whole project team consisted in the integration of 16,500 m² of façade surface within the short construction process. Together with the planners, a stacked facade with individual element sizes of 6 x 3 m was planned. The building shell was therefore able to be closed in only 10 weeks and before the winter.

Façade
Image: PORR

Façade
Image: PORR

Façade
Image: PORR

A specially-developed agraffe construction enabled the very fast installation of the natural stone elements in the area of the balustrade strips.

Agraffe construction
Image: PORR

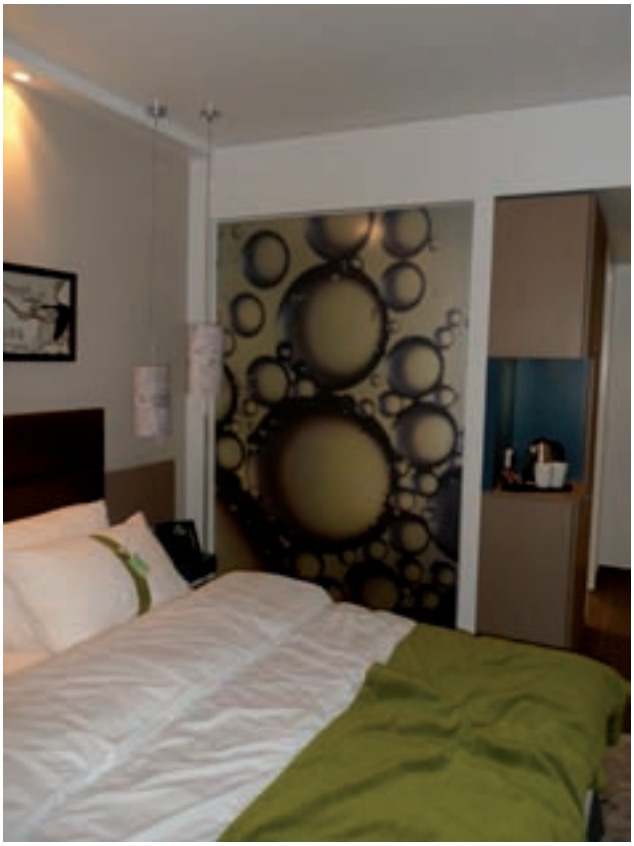
Agraffe construction
Image: PORR

Hotel

In order to ensure the optimum construction progress, the 217 hotel rooms will be equipped with prefabricated bathroom cells. These are produced in the works from sandwich elements made up of prefabricated individual elements, which are then tiled and partly finished. Following delivery to the construction site, these are then positioned on the relevant floors for further finishing and connected to the media supplies and drainage. This guarantees the highest level of quality assurance, in addition to rapid construction progress.

Prefabricated bathroom cell
Image: PORR

Hotel room
Image: PORR



Hotel room
Image: PORR

The topping-out ceremony

Just one year after the start of construction, the project “HOTEL + OFFICE CAMPUS BERLIN” celebrated a Beach Club topping-out ceremony with approx. 300 guests on a sunny 22.08.2013.

The topping-out ceremony
Image: PORR

The topping-out ceremony
Image: PORR

The topping-out ceremony
Image: PORR

A2 South Motorway

Renovation work for the construction lots Steinberg – Unterwald and Modriach – Packsattel

Stefan Hipfel

TEERAG-ASDAG AG carried out the renovation work for the construction lots A2 Steinberg – Unterwald Klagenfurt lane (Klagenfurt lane) and A2 Modriach – Packsattel Graz lane under an order from the ASFINAG. The total order value of both construction lots amounted to around € 11.8 million.

This was carried out from the construction areas of Frohnleiten (bridge renovation) and Frauental (road construction).

Construction lot Steinberg – Unterwald, lot 2, Klagenfurt lane

For the implementation of the required scope of services, the complete Klagenfurt lane was closed off and the traffic in the opposite direction carried 2+1 on the Graz lane.

The complete construction lot extended over a length of approx. 3.3 km and took place over the period from 22.04. to 12.09.2013.

Description of bridge construction

In this construction lot, the bridges P32 (length = 500 m) and P34 (length = 160 m) were renovated. For all bridge works, the bulkhead walls were set back, so that the ends of the supporting structure and the existing tensioning heads (rear side end cross girders) can be assessed during future bridge inspections.

The edge beams, carriageway transitions and bridge equipment were also removed and replaced. Collecting mains were constructed so that the surface water falling on the lane can be collected and ducted into the already existing water protection system.

In addition to the measures described above, bridge P34 was also reinforced with external and internal pre-stressing. In order to be able to carry out the tensioning process, eight anchor bolts first had to be installed at the main beam ends (both sides of the HT). These anchor bolts were first pre-stressed internally at right angles to the bridge axis. The external pre-stressing (from anchor bolt to anchor bolt) could then be produced in the bridge longitudinal axis for every main beam. Prior to the pre-stressing work, the girder ends (each approx. 20 m) had to be reinforced at the supporting structure surface by means of CFRP laminate.

Main bridge construction data A2 Steinberg – Unterwald, Klagenfurt lane

Edge beam removal and replacement	approx. 1,320 m
Sealing replacement	approx. 11,300 m²
New bulkhead wall installation	approx. 180 m³
New carriageway transition constructions	3
New railings	approx. 660 m
Modification / new production of retention system	approx. 1,400 m
External / internal pre-stressing	approx. 130 t
Reinforcement	approx. 14 t
Bridge drainage (DN70/150/250/300)	approx. 790 m

Description of road construction

In the already mentioned section, the existing concrete covering was completely removed and treated. The cement stabilisation below was milled off and restored by admixture of the treated concrete demolition material. All work had to carried out on one side only to allow access to the construction site traffic.

The asphalt top covering was produced in 3 layers. The drainage, shoulders and retention systems were also replaced.

Main road construction data A2 Steinberg – Unterwald, Klagenfurt lane

Concrete surface demolition	9,000 m³
Removal of cement stabilisation	38,000 m²
Production of new cement stabilisation	33,000 m²
Asphalt top cover	33,000 m²
AC 22 binder	7.5 cm
AC 22 binder	8.0 cm
SMA 11	3.0 cm
Shoulder	1,500 m³
Guide rails	2,400 m

Construction lot A2 Modriach – Packsattel (objects P43 – P46), Graz lane

For the implementation of the required scope of services, the complete Graz lane (with the exception of the tunnel)

was closed off and the traffic in the opposite direction carried 2+1 on the Klagenfurt lane.

The complete construction lot extended over a length of approx. 4.6 km and was to place over the period from 03.06. to 31.10.2013.

Description of bridge construction

General

In this construction lot, the bridges P43 (L=275m), P44 (L=261m), P45 (L=325m) and P46 (L= 354m) were renovated. Since the construction time allowed for this lot by the client was very tight, the main focus of the preparatory work was placed on the optimisation of working procedures. For example, the concrete covering and edge beams of all four bridges were removed within one week with the aid of eight 25 t chain excavators.

Top concrete layer

Due to structural requirements, all bridges were reinforced by means of a top concrete layer (thickness from approx. 10 – 25 cm). In order to meet the requirements of the ASFINAG for force transmission into the edge areas (cantilever slab), the cantilever slabs of objects P43, P44 and P45 were removed to a width of 50 – 100 cm over the complete length (internal and external) while preserving the existing reinforcement. These edge areas were concreted in one operation in the course of installation of the one-side top concrete layer.

Preparation for concreting of top cover P46
Image: PORR

Concreting top cover of P46
Image: PORR

Preparation for concreting of top cover P45
Image: PORR

Concreting top cover of P46
Image: PORR

Concreting top cover of P45
Image: PORR

P46 top cover laid on one lane
Image: PORR

Pre-stressing, P44

The object P44 was also reinforced by means of internal and external pre-stressing. For this purpose, the work and centring scaffolding was mounted on all pillars with the aid of an 18 m underneath viewing device.

For every bearing axis (total seven axes) the cantilever slab between the two main beams had to be removed, and the existing cross beams extended as far as the lower edge of the cantilever slab. In these newly installed cross beams, six pre-stressing strips were drawn in over the complete length, which were divided at axis 3 (middle pillar) and from there stressed in accordance with the stressing requirements.

Surface removal work, preparation for pre-stressing measures, P44 abutment Graz
Image: PORR

P44 External pre-stressing
Image: PORR

P44 Entrance openings – external pre-stressing
Image: PORR

Carriageway transition constructions

In addition, Austria's third-largest carriageway transition was also installed at the P44 abutment Graz.

For the other objects, the existing carriageway transitions were partly removed, renovated and re-installed.

P44 abutment Graz, installation of carriageway transition construction
Image: PORR

P44 abutment Graz, installation of carriageway transition construction
Image: PORR

Demolition of bulkhead wall P46, abutment Graz
Image: PORR

P46 Overview of construction progress
Image: PORR

Bridge equipment
For all bridges, new railings were installed, and the retention system partly replaced, or the existing system re-installed.

Asphalting
The asphalt cover on the bridges was produced in 3 layers (total 14 cm). These services were provided from the Frauental construction area.

Main bridge construction data A2 Modriach Packsattel, Graz lane

Edge beam removal and replacement	approx. 2,518 m
Sealing replacement	approx. 17,800 m²
Top concrete layer	approx. 3,190 m³
Top concrete layer plugs	approx. 28,000
New bulkhead wall installation	approx. 90 m³
New carriageway transition constructions	1
Carriageway transition construction renovation	6
New railings	approx. 1,700 m
Modification / new production of retention system	approx. 1,400 m
External / internal pre-stressing	approx. 32 t
Reinforcement	approx. 415 t
Bridge drainage (DN70/150/200/250)	approx. 1,120 m

P44 Overview
Image: PORR

We are proud of having carried out this technically difficult task during the very short construction time to the complete satisfaction of our client ASFINAG.

General renovation of the Motorway D1 in the Czech Republic

Restoration and repair work on over 160 km of motorway

Project description

The D1 is the oldest and longest motorway in the Czech Republic. Following its final completion, and with a total length of 376.5 km, it will provide a connection between the three largest cities of the Czech Republic – Prague, Brno and Ostrava.

The current length of the motorway is 352.5 km. Some sections were opened during the period 1950 to 1967, and are therefore more than 60 years old. The most recent sections were brought into service in 1980.

The long-exceeded service life of the motorway, the daily load of more than 100,000 vehicles and the lacking modern telecommunications systems on some sections make the renovation of the complete road a matter of urgency.

The client, the Motorway Directorate of the Czech Republic (Ředitelství silnic a dálnic / ŘSD), after many years of discussions and the search for financing, put out a tender procedure in the year 2012 for the urgent renovation and modernisation of the Mirošovice (km 21) – Kývalka (km 182) section of the Motorway D1. As a result of the renovation, the Motorway Directorate, the national administration and the public in general are hoping for an improvement in the technical condition of the motorway and a saving of costs for necessary maintenance work, which every year make the operation of the motorway more expensive.

Tender procedure

The project is being tendered by the client in a total of 21 sections. Every section will be awarded to the best bidder following a two-round tender procedure. The complete order volume for all 21 sections amounts to 14,000,000,000 CZK (around € 510 million), and is therefore unique in the history of public tenders in the Czech Republic.

The pre-qualification procedure for five sections (5, 9, 14, 21 and 22) was opened in April 2012. In a consortium with the firm of COLAS a.s., which operates an excellent park of asphalt preparation systems, PORR succeeded in obtaining two of the five sections under tender, with a length of 17 km.

Already renovated section
Image: PORR

Already renovated section
Image: PORR

Already renovated section
Image: PORR

Construction work

The start of construction on both motorway sections took place following takeover of the construction site in spring 2013 and the following preparatory measures, which lasted for one month.

Since the traffic flow has to be maintained during the complete construction time, the project was divided into several stages. Due to the weather and delays in the handover of the construction site, all work must be completed within a construction time of seven months. In addition to the widening and renovation of the carriageway in both directions, the following tasks must be carried out during this period:

- Renovation of the centre dividing strip
- Replacement of all lines and cabling
- Renovation of the central drainage pipe
- Replacement of all crash barriers
- Modernisation of existing emergency telephone systems and safety elements

Renovation of the centre dividing strip, replacement of all lines and cabling and renovation of the central drainage pipe
Image: PORR

Renovation of the centre dividing strip, replacement of all lines and cabling and renovation of the central drainage pipe
Image: PORR

The contract also includes the demolition and reconstruction if five motorway bridges and two underpasses. The demolition work will be carried out only at night during complete closure of the motorway.

Night-time bridge demolition
Image: PORR

Night-time bridge demolition
Image: PORR

Night-time bridge demolition
Image: PORR

The completion of both sections is planned for November 2014.

The challenges

In addition to the technical and organisational challenges, the great media interest represents a challenge for all those involved in the project. The two construction

companies and the client are continually in the public eye, and hardly a day goes by without coverage on television, the radio or Internet.

Concluding remarks

The total completion of the general renewal of the D1 motorway is planned for the year 2018 at the earliest. More tenders and award procedures for the remaining 16 motorway sections (total about 120 km) will follow in the near future. PORR hopes to acquire further construction lots, and thereby further consolidate its position as a competent, capable and reliable partner in the Czech market.

Project data

The tender was divided into 21 lots, and the planning work for five sections is currently in progress:

- Section 01, Šmejkalka Bridge
- Section 02, EXIT 21 Mirošovice – EXIT 29 Hvězdonice
- Section 03, EXIT 29 Hvězdonice – EXIT 34 Ostředek
- Section 04, EXIT 34 Ostředek – EXIT 41 Šternov
- **Section 05, EXIT 41 Šternov – EXIT 49 Psáře – 8 km**
- Section 06, EXIT 49 Psáře – EXIT 56 Soutice
- Section 07, EXIT 56 Soutice – EXIT 66 Loket
- **Section 09, EXIT 66 Loket – EXIT 75 Hořice – 9 km**
- Section 10, EXIT 75 Hořice – EXIT 81 Koberovice
- Section 11, EXIT 81 Koberovice – EXIT 90 Humpolec
- Section 12, EXIT 90 Humpolec – EXIT 104 Větrný Jeníkov
- **Section 14, EXIT 104 Větrný Jeníkov – EXIT 112 Jihlava – 8 km**
- Section 15, EXIT 112 Jihlava – EXIT 119 Velký Beranov
- Section 16, EXIT 119 Velký Beranov – EXIT 134 Měřín
- Section 18, EXIT 134 Měřín – EXIT 141 V. Meziříčí západ (West)
- Section 19, EXIT 141 V. Meziříčí západ (West) – EXIT 146 V. Meziříčí východ (East)
- Section 20, EXIT 146 V. Meziříčí východ (Ost) – EXIT 153 Lhotka
- **Section 21, EXIT 153 Lhotka – EXIT 162 Velká Bíteš – 9 km**
- **Section 22, EXIT 162 Velká Bíteš – EXIT 168 Devět křížů – 6 km**
- Section 23, EXIT 168 Devět křížů – EXIT 178 Ostrovačice
- Section 25, EXIT 178 Ostrovačice – EXIT 182 Kývalka

Total: 160.8 km

Section 9, EXIT 66 Loket – EXIT 75 Hořice

Contractor	PORR & Colas consortium (50:50)
Category	D28/120
Section length	9,600 m
Carriageway area	269,000 m²
Number of bridges on the motorway course	5
Number of bridges over the motorway course	3
Number of renovated bridges	1
Demolition and new bridge constructions	3
Number of constructions	26
Construction time	05/2013 – 12/2014

Section 14 EXIT 104 Větrný Jeníkov – EXIT 112 Jihlava

Contractor	PORR & Colas consortium (50:50)
Category	D28/120
Section length	8,500 m
Carriageway area	238,000 m²
Number of bridges on the motorway course	9
Number of bridges over the motorway course	2
Number of renovated bridges	7
Demolition and new bridge constructions	2
Number of constructions	23
Construction time	05/2013 – 12/2014

Development of railway construction in Poland

Siegfried Weindok

General

It is now four years since the Board of PORR AG, after thorough analysis of the Polish railway construction market, decided to extend the activities of the group in Poland also to this segment.

This strategic decision was based at the time on the following aspects:

- Excellent economic climate in Poland's construction industry as a whole
- Poland is the hub of the East-West rail traffic and has one of the longest railway networks in Europe at 19,300 km (in comparison to Austria: 5,800 km)
- A number of routes are in a dilapidated state and have to be modernised over the next few years, for which approx. € 1.2 billion is to be invested annually.

Continual presence in the country is essential for a successful entry into a new market, and local activities were therefore initiated in April 2010. True to the motto "Know your customer, know your market", the first few months involved the intensive analysis of the market and the development of customer and potential partner contacts.

After only three months, we were able to take part in tenders by the PKP PLK (network operator of the Polish Railways), whereby it was not necessarily the pricing which proved to be the greater challenge, but rather the sourcing and compilation of all the documentation required by the contracting authority.

The results of the first submissions showed that we can compete in terms of price levels and are on the right track. Still, it took a total of one and a half years until we were able to land the first order. This was achieved on 6th October 2011, when PORR signed its first railway construction contract in Poland (order value approx. € 3 million).

Modernisation of the Kostrzyn stretch on the Oder – Namyślin

PKP PLK Szczecin, 6th October 2011 - Signature of the first railway construction contract in Poland.
Image: PORR

We were commissioned with the modernisation of a 7.3 km section of track between Kostrzyn on the Oder and Namyślin on the rail line 273 Wrocław (Breslau) – Szczecin (Stettin). The complete surface construction and parts of the overhead lines had to be replaced in less than two months. By the use of the most modern rail construction machinery (partly provided by the German DB), round-the-clock working and the outstanding commitment of the construction management personnel, all work was completed on schedule, to the required quality and to the complete satisfaction of the client on 30th November 2011.

Use of the RM 801-2 bedding cleaning machine on Line 273
Image: PORR

Stargard Szczeciński Station

Only a short time later, we were able to celebrate the next successful acquisition: on 27.10.11, again from the PKP PLK Szczecin, we received the order for the renovation of 1,600 m of rails and two points on the Line 202 in the Stargard Szczeciński Station in north-western Poland (order value € 1 million). Work on this construction site also had to begin immediately, since contractual completion was planned for 30th December 2011. The

greatest challenges for us in this phase were the short-term organisation of two construction sites working in parallel, and in particular the recruiting of personnel, machinery disposition, material purchasing and the identification of reliable sub-contractors. A special feature on this construction site was the first use of PORR rail construction equipment in Poland, although the approval procedures proved to be not quite so simple. The start was made on 10th December 2011, when the UNIMAT 09-32/4S Dynamic rail and points tamping machine and the USP 2010 SWS ballast levelling machine were put to work at the Stargard Szczeciński Station. Since we also had good luck with the weather, the successful final acceptance of the work, including on the second construction site, took place on 27th December 2011.

The USP 2010 SWS on Line 202 in the Stargard Szczeciński Station
Image: PORR

Łódź – Renovation of railway line 540

In addition to the completion of the ongoing construction sites, acquisition could not be neglected, and we managed to take another first place with a submission which took place on 5th December 2011. In the major city of Łódź, 5,100 m of a closed track, including the overhead power lines, of Line 540 were to be renovated (order value approx. € 3.8 million).

Since the competition was this time unwilling to accept the intended award of the contract to us, and made difficulties in the form of objections to the Awards Committee, which we were however able to overcome successfully, the placement of the order was delayed. The construction contract was finally signed on 23rd March 2012. We had five months for the realisation of the project, which was of the “design and build” type. The completion date was met without any problem.

Łódź, Line 540, before renovation
Image: PORR

Łódź, Line 540, after renovation
Image: PORR

Modernisation of rail Line No. 18 between Toruń and Bydgoszcz

On 2nd August 2012, PORR (POLSKA) S.A. signed what was for us the largest and most prestigious project to date with the PKP PLK, in the presence of the Polish Railway Infrastructure Minister and the President of the “Wojewodschaft Kujawsko-Pomorskie”. We were commissioned with the modernisation of the double-track, electrified railway line No. 18 between the towns of Toruń and Bydgoszcz, at a contract price of approx. € 40 million.

Toruń, 2nd August 2012, signature of the construction contract for Line 18.
Image: PORR

For this project, of the “design and build“ type (Fidic yellow book), we have until April 2014 to renovate 95 km of rail and 54 points, modernise 18 railway crossings and modify signal systems and the overhead lines. The work is proceeding according to plan, and will be completed on schedule.

Line 18, overhead line modification by PKP Energetyka in Toruń
Image: PORR

Renovation of the stretch Zielona Góra – Czerwieńsk

In the year 2012, we succeeded in acquiring a further order. On the Zielona Góra – Czerwieńsk section of Line 273, from September – November, we replaced 11.5 km of rail and modernised five railway crossings, and reconstructed one railway platform (order value approx. € 5 million).

Ballast levelling machine of Austriarail in use on Line 273
Image: PORR

Modernisation of Line 132 Opole – Błotnica Strzelecka

The year 2013 began for us with another great success. On 28th January, our submission won a tender by the PKP PLK in Wroclaw (Breslau) (submission value: approx. € 43.5 million). After several weeks of nervous waiting, during which the tender documents were intensively reviewed by the client, and additions or explanations requested, we received the welcome news on 5th March of the intended award of the order to PORR (POLSKA) S.A. This time there were no objections from competitors, and so we were able to sign the construction contract on 10th May at the head office of the PKP PLK in Warsaw. We have 19 months available for the realisation of the project (design and build). During this time, a total of 70 km of track, 40 points and the complete overhead line system including foundations are to be replaced on the 35 km long section: Opole – Błotnica Strzelecka of Line 132 Wrocław (Breslau) – Gliwice (Gleiwitz). The contract also includes the modernisation of the control and safety equipment, the new construction of 10 platforms and the repair of several engineering works and railway crossings.

After the first weeks of intensive preparation and the planning phase, we began work on the construction site on 20th July. Approx. 30 % of the construction work will be completed by the end of 2013.

Line 132, UNIMAT 09-32/4S Dynamic tamping machine of Austriarail
Image: PORR

Further projects in the year 2013

In the year 2013, PORR (POLSKA) was able to complete three further orders:
On 26th March we were awarded the order for the renovation of 11.5 km of track and 11 points on the Line 131, Poddębice – Kłudna section (central Poland). The work was completed in October (order value approx. € 4.8 million).

This was followed by a further order on 25th April on Line 273 in western Poland. At the stations of Godków and Kowalów, rail and control and safety systems are to be renovated, and a railway overpass repaired by the end of November, at a cost of approx. € 3 million.

On 20th August, we were commissioned with the repair work on Line 351 Poznań (Posen) – Szczecin (Stettin). In this case, the sleepers have to be replaced, the bedding cleaned and the ballast refilled on three sections with a total length of 36 km by 6th December (order value approx. € 7.8 million).

Sleeper replacement on Line 351 with the aid of the conversion vehicle Matisa P93
Image: PORR

After € 4 million in the year 2011 and € 15 million in the year 2012, the total turnover for railway construction in Poland will amount to approx. € 60 million in the year 2013.

Outlook

The order book for next year also looks very healthy, since on 20th September we won the tender for the modernisation of Line 272 Katowice (Kattowitz) – Poznań (Posen), Kluczbork – Ostrzeszów section, to the value of approx. € 49 million. We expect the order for this project to be received by the end of November.

The personnel numbers have also increased in line with the turnover figures. Started in April as a one-man team, the railway Construction Department of PORR (POLSKA) S.A. comprised a staff of three by the end of 2011, increasing to 12 by the end of 2012. We have strengthened the team once again this year, which currently numbers over 30 dedicated employees, who have made a major contribution to this positive development of railway construction in Poland.

A further railway contract in Poland

Contract signature of the project “LK 132 Opole – Błotnica”.

On 10th May, the contract signature of the project “LK 132 Opole – Błotnica” took place at the PKP PLK (network operator of the Polish railways) in Warsaw.

After the “LK 18 Toruń – Bydgoszcz”, this is the second major revitalisation project acquired by PORR (POLSKA) S.A. which is jointly financed with EU funds.

The construction measures will take place on Line 132, which runs from Breslau via Opole to Upper Silesia. Over the 35 km long section, both tracks, 44 sets of points and the overhead cables will be replaced. This will be supplemented by LST work, the construction of 10 new platforms, the modernisation of 22 railway crossings and the renovation of several bridges and underpasses.

The order value of the project, for which 570 days are available for planning and implementation (until 09.12.2014) amounts to approx. € 43.5 million.

Contract signature of the project “LK 132 Opole – Błotnica”
Image: PORR

Laying of the foundation stone for the Nimbus office block

The exciting office block project by PORR in Warsaw.

The foundation stone for the Nimbus project was laid on 16th May 2013. During the celebrations at the construction site, the representatives of the IMMOFINANZ Group were joined by the general contractor PORR and the architects of the project Marek Tryzybowicz and Borys Juraszyński with the Team Bose International Planning and Architecture.

Image: PORR

Nimbus is the first office investment by the IMMOFINANZ Group in Warsaw. This high-class building will offer its customers great flexibility on a rental area of 19,000 m². The project itself was tailored to the demands of the future tenants. The construction work was started in December last year and the completion is planned for August 2014. The total volume of investment is estimated at approximately € 35 million.

“Currently, approximately 80 people are working on the construction of the Nimbus. Thanks to their commitment, the work is progressing on schedule, despite the long-lasting winter, which will allow us to complete the project in August 2014. PORR POLSKA is proud to be responsible for the construction of the third building in this prestigious location, and at the same time to be able to continue the good cooperation with IMMOFINANZ”, commented Franz Scheibenecker, Managing Director of Porr Bau GmbH.

Nimbus is being constructed in a well-known and dynamically developing business quarter in the Warsaw district of Ochota in Aleje Jerozolimskie. The flexible plans of the individual floors allow their interior design to be adapted to the individual expectations of the tenants. The office construction project has already been registered with LEED, with the aim of at obtaining the Golden Certificate.

Laying of the foundation stone by the Managing Director of Porr Bau GmbH Franz Scheibenecker
Image: PORR

Berlin: Last diaphragm wall for underground station at the “Rotes Rathaus” completed

PORR is working on the U5 underground line in the German capital.

The construction workers, engineers and technicians at PORR celebrated the completion of the last diaphragm wall on the construction site for the reconstruction of the underground station in front of the “Rotes Rathaus” with a small construction site festival on 19th September 2013. The on-schedule completion of approx. 11,000 m² of diaphragm wall was a welcome occasion for PORR to express their thanks to the client and all those involved in the project for the constructive cooperation at a construction site celebration.

The Chairman and Operations Director of the BVG, Dr. Sigrid Evelyn Nikutta, added her thanks to all the construction workers involved in this construction phase and emphatically praised the dedication and commitment of the company. “The on-schedule completion of this section creates the essential basis for the further construction to close the gap in the U5. Another important milestone has been reached! I would like to express my thanks for the accurate and on-schedule work, in particular also to the responsible part-project manager Maik Kopsch, and wish every success for the further work."

As the next step in this construction phase, preparatory work is now proceeding on the connection to the already existing tunnel between the “Rotes Rathaus” and “Alexanderplatz”.

Image: PA Berliner Verkehrsbetriebe

Laying of the foundation stone for the Poznań Business Garden

PORR is building the largest project of its type in Posen.

On 23rd May, the foundation stone was laid for the Poznań Business Garden project, a modern business park, which is at the crossroads of the Bułgarska and Marcelińska streets in Poznań. The ceremony represented a symbolic start for the building work of the first investment stage of the construction project planned in this region. The project is financed by SwedeCenter, a company which belongs to the Property Division in the Inter IKEA Group, which will also operate the new building in the future. The opening of the first stage of the project is planned for the beginning of 2015.

The concrete foundation stone weighing half a tonne was transported onto the site by a 30 m high tower crane, and installed in the corner of the garage hall of one of the four office buildings to be built in this investment stage, 7 m below street level.

In their speeches during the official part of the ceremony, the guests of honour gave their best wishes for a timely and accident-free realisation of the project, and also stressed the importance of the project. Within the next two years, nearly 200 people will be engaged in the project implementation with the general contractor for PORR.

Roger Andersson, the Managing Director of the SwedeCenter, said “Today is a very special day. We lay the symbolic foundation stone in the foundations of the first ecological business park in Poznań. The currently realised investment stage is part of an impressive building project that will significantly alter the size and standard of the available office space on the local real estate market and increase the attractiveness of the city for investments.”

Peter Hartmann, member of the Board of PORR (POLSKA) S.A. added: “After successfully completed projects in the centre of Poznan (Stary Browar, Andersia Business Centre), we begin the construction of a further investment, this time in the immediate vicinity of the Posen Ławica Airport. The Poznań Business Garden is the largest project of this type currently in implementation in Poznań. PORR POLSKA is making every effort to ensure that the new building meets all the expectations of our client.”

The Poznań Business Garden, one of three business parks being constructed under the name of Business Garden, is a top-class office centre with nine buildings and a planned area of 80,000 m². The first stage of the investment is scheduled to open in early 2015, and will provide 42,000 m² of rental space. In addition to offices, the site will also accommodate a restaurant and other business premises. The user-friendly development in a green area was designed according to modern and energy-saving technical solutions to the certification requirements for LEED (Gold).

Laying of the foundation stone with representatives of the client and PORR
Image: PORR

Image: PORR

EURO PLAZA Construction Phase 5 celebrates topping-out ceremony

The success story continues.

On 25th June 2013, the members of the project EURO PLAZA Construction Phase 5 and their guests celebrated the topping-out ceremony. With Construction Phase 5, Vienna's most modern Office Park will be extended by three new buildings. Completion will take place in steps between autumn 2013 and summer 2014. At the end of this year, the well-known company Philips will move into its new offices on the Wienerberg as the first tenant of Construction Phase 5.

Following completion, the three attractive buildings of Construction Phase 5 will offer a total of around 30,000 m² of rental area equipped to the very latest standard. "On the Vienna office market, you can only be successful today by offering quality. In this way, we have succeeded, even in a difficult environment, in attracting new tenants and successfully realising exciting projects", explains Eng. Claus Stadler, Managing Director of STRAUSS & PARTNER Development GmbH, which is developing and marketing the EURO PLAZA location for Kapsch Immobilien.

Parkland areas between the three new buildings will form a green oasis right in the centre of the Office Park, which can also be used by the existing tenants of the EURO PLAZA. To this end, the complete project has been certified with respect to environmental compatibility and sustainability by the "Österreichische Gesellschaft für Nachhaltige Immobilienwirtschaft" ("Austrian Society for Sustainable Property Management").

Mag. Elisabeth Kapsch, Managing Director of Kapsch Immobilien, explains: "Sustainability, top quality and flexibility are becoming increasingly decisive when looking for a location. Leading international companies in particular are concentrating more than ever on these criteria. A further decisive aspect is the top-company environment. I am especially proud that we can offer such an environment here in the EURO PLAZA."

In addition to Philips, the first tenants also include 3M Austria, which will occupy premises in the new construction phase of the EURO PLAZA. The technology group originally considered more than 50 properties as office locations. In the end, quality, location and infrastructure brought about the final decision in favour of the EURO PLAZA.

Around 8,100 m² have also been rented to two industry leaders in the technology and pharmaceutical sector.

PORR was commissioned with the construction work on the three new buildings. "The fact that the work on Construction Phase 5 is progressing so quickly is due, on the one hand, to the particular dedication of the whole project team. This is backed up by the many years of experience in civil engineering which we can call upon, and which enables us to combine top quality performance with rapid implementation", says PORR General Director Karl-Heinz Strauss.

Image: Toni Rappersberger

Laying of the foundation stone for the Gdynia Waterfront

On 9th September, the ceremonial laying of the foundation stone took place on the quay of the “President’s Basin” in Gdynia for the construction of the first investment stage – an office and hotel building – of the Gdynia Waterfront building complex. Together with the foundation stone, a time capsule was also walled in as tradition demands, containing a foundation document, a USB stick with the documentation and visualisations of the project, and a copy of the current edition of the local daily newspaper. The developer, the company SwedeCenter, plans to complete the first implementation stage by mid-2015.

At the ceremony, the Managing Director of the SwedeCenter, Roger Andersson, said: “I am convinced that the Gdynia Waterfront will be a future centre for business and services, as well as a meeting place for the residents of this city and the many tourists visiting this place. The prestigious location in the vicinity of Skwer Kościuszki, the modern architecture and the carefully planned public area with direct access to the water will create a unique climate for this place and make the complex a polychrome heart of the city, pulsating with life.”

Gdynia Waterfront is a multi-functional complex, which will be constructed in the most attractive location in Gdynia. The 90,000 m² of the building complex will be made up of residential buildings, business premises, service and cultural buildings.

In the course of the first investment stage, an office building will be constructed for the future headquarters of the Nordea Bank Polska and the Hotel Marriott Courtyard.

The investor and developer of the project is the company SwedeCenter, which belongs to the Inter IKEA Group, who will also manage the newly built complex of buildings in the future. The architectural project of the first investment stage originated in the design bureau of FORT, while PORR POLSKA was commissioned with the tasks of the general contractor.

Gdynia Waterfront. View from the side of Skwer Kościuszki. Visualisation of the 1st project stage
Image: PORR

From left to right: Archbishop Sławoj Leszek Głódź, Sławomir Żygowski – Chairman of the Board of Nordea Bank Polska, Roger Andersson – Managing Director of SwedeCenter, Peter Hartmann – Member of the Board of PORR (POLSKA) S.A., Herald Jacobsen – Chairman of the Board of Scandinavian Hospitality Management
Image: PORR

Topping-out ceremony at the new Leopoldsdorf Distribution and Service Centre

From left to right: DI Claus Stadler (Managing Director of STRAUSS & PARTNER), DI Alexandra Brandauer (Project Manager), Mayor Fritz Blasnek, Rudolf Riegler (Foreman), DI Iris Ortner, GD Karl-Heinz Strauss (PORR), Dr. Manfred Gutternigg (Managing Director of Hilti Austria) Image: PORR

On 7th August, the project participants and guests of honour celebrated the completion of the shell construction at the new Leopoldsdorf Distribution and Service Centre.

The Liechtenstein Hilti Group is one of the world's leading companies in the field of fastening and removal technology for the professional construction industry. STRAUSS & PARTNER is developing a new Distribution and Service Centre for Hilti in Leopoldsdorf, for which the Austrian market organisation of Hilti will be signing a long-term rental contract.

Mayor Fritz Blasnek: "I am very proud that an international concern such as the Hilti Group has chosen Leopoldsdorf as the location for its new business. Of course, I am aware that we offer good conditions here, and attracting such a well-known business also enhances the location of Leopoldsdorf."

The modern Centre will consist of a logistics hall with an area of about 8,000 m², a service hall of around 3,000 m² and an administrative and office area of approximately 1,000 m².

"With the Distribution and Logistics Centre, we can enhance and expand our site further. In the future, not only of the domestic market, but also the surrounding Eastern European markets will be served from Austria, creating new jobs", confirms Dipl.-Ing. Dr. Manfred Gutternigg, Managing Director of Hilti Austria Gesellschaft m.b.H.

"We are delighted that Hilti has chosen PORR and STRAUSS & PARTNER to create such a modern location in Austria," explains General Director Karl-Heinz Strauss. "I would particularly like to thank all those involved for their commitment on the construction site." The new Distribution and Service Centre will go into operation at the end of 2013.

Facts and figures on the Hilti Distribution and Service Centre

Start of construction	February 2013
Completion	October 2013
Site area	29,504 m²
Gross area, Service Centre	3,111 m²
Gross area, Distribution Hall	8,104 m²
Gross area, office and administration	1,070 m²

Handover of the Goldschlagstraße Residential Complex

Porr Bau GmbH, New Construction Department 2, was commissioned in June 2012 as the general contractor for the construction of the residential complex “Goldschlagstraße 54”, consisting of 29 residential units, as well as 23 car parking spaces. The owner and operator of the building is the Gemeinnützige Bau- und Siedlungsgesellschaft MIGRA GmbH.

General areas such as a bicycle storage room, a communal room and basement compartments are located on the ground floor. The total of 29 apartments is divided over four full storeys and two attic floors. The average size of the apartments (excluding the outer rooms) is about 66 m².

After a construction time of only 14 months, the project was handed over to the client on 24.09.2013, around one month earlier than planned, and then on to the tenants.

Image: PORR

Laying of the foundation stone for the apartment project “DC Living”

PORR is constructing nearly 300 freely-financed apartments in the Vienna 22nd District.

Representatives from business and politics gave the go-ahead for the project at the official laying of the foundation stone on 26th September. During Christiane Wassertheurer’s charming presentation, DI Thomas Jakoubek and Ing. Harald Butter, Managing Director of BAI, Norbert Scheed, District Chairman of the 22nd District, Dr. Erich Hampel, Chairman of Real Estate Private Foundation, Ing. Karl-Heinz Strauss, MBA, General Director of PORR AG, and the architect Prof. Carlo Baumschlager received the honour, after the successful signing of the foundation documents, of taking the spade in their own hands and personally laying the foundation stone.

From left to right: DI Thomas Jakoubek, Dr. Erich Hampel, Ing. Mag. Harald Butter, Norbert Scheed, GD Ing. Karl-Heinz Strauss and architect Prof. Carlo Baumschlager.
Image: RGE-Photo

As the general contractor, Porr Bau GmbH is building a residential complex in 1220 Vienna, Donau City Straße 12, consisting of two building sections and a continuous underground parking garage with three basement floors (from the level of the Donau City Straße to the Carl Auböck Promenade) according to the guidelines for construction impervious to water. Both building sections consist of 299 freely-financed apartments, three businesses, communal areas and a wellness area.

The building complex with a gross floor area of approx. 56,100 m² is divided into two separate parts (Section 1: eight floors, Section 2: 17 floors), which are separated by a courtyard. Section 2 is being built as a high-rise building (approx. 60 m above ground) according to the guidelines of high-rise buildings with appropriate fire protection and sprinkler systems. The garage (three floors) accommodates 413 parking spaces, 50 motorcycle parking spaces, adjoining equipment rooms and a party basement.

The deep foundations take the form of large-bore piles. The WHA DC Living is constructed as a conventional reinforced concrete construction with thermally-broken recessed balcony precast slabs and a pre-positioned sandblasted white cement precast concrete façade as a second façade layer.

Laying of the foundation stone for the Rudolfsheim Residential Care Home

The celebration with many prominent representatives from politics and business.

From left to right: Gerhard Zatlokal (District Chairman, 15th District), Maga, Sonja Wehsely (City Health Commissioner), Dr. Roland Paukner (KAV), Ing. Ewald Kirschner (General Director of GESIBA), Dr. Michael Ludwig (City Building Commissioner)
Image: PORR

On 11.9.2013, the laying of the foundation stone took place for the Rudolfsheim Residential Care Home in 1150 Vienna, a geriatric centre with 336 beds and adjoining kindergarten. The building replaces the former “Kaiserin Elisabeth Spital”, which was demolished from April to August.

An internal service community consisting of the Department of Major Civil Engineering Projects (commercial) and New Construction 2, Vienna branch (technical leadership) received the order for the provision of the general contractor work in June 2013 from the “Gemeinnützige Siedlungs- u Bau AG GESIBA”, comprising an order volume of approx. € 54 million. After the Leopoldstadt Geriatric Centre, which has been in operation since 2010, this is the second project of this type to be acquired.

The almost square building with its staggered height allows for the topography of the site. Four spacious garden courtyards are cut out of the compact body of the building. These are on different levels and are in some cases connected to each other. From all four sides, there are vistas from the street into the courtyards, and vice versa. The core features of the design are the large communal areas arranged around the courtyards.

On behalf of the Vienna City Government, Building Commissioner Dr. Michael Ludwig und City Health Commissioner Mag., Sonja Wehsely in particular praised the geriatrics concept of the city of Vienna, which envisages the construction of nine new geriatric centres by the end of 2015. District Chairman Gerhard Zatlokal emphasised the good cooperation with the district and the added value provided for the local population. General Director Ing. Ewald Kirschner expressed his thanks for the confidence of the Vienna Hospitals Association in being awarded the contract for the construction of the 2nd geriatric centre.

The handover of the complete turnkey project is planned for June 2015.

Laying of the foundation stone for the Hard Turm Park, Building Section A2, Zurich

On Tuesday 17.09.2013, the ceremonial laying of the foundation stone took place for the construction of the residential and commercial building “Hard Turm Park, Building Section A2” in Zurich, in the presence of the managing Director of Business Unit 1, Mr. Josef Pein, and the new Managing Director of PORR SUISSE AG, Mr. Hubert Seifert, together with many investors and representatives of the client.

By summer 2015, 96 rental apartments and around 6,000 m² of office and commercial space will be created in the 7-storey building designed by Theo Hotz Partner.

From left to right: Josef Pein/Managing Director of Porr Bau GmbH, Markus Mettler/CEO Halter AG, Ralph Thomas Honegger/CIO Helvetia Versicherungen
Image: PORR

The Koralm Tunnel powered by PORR

PORR is building the third section of the longest railway tunnel in Austria.

31.7.2013 - With the commissioning of PORR for the construction lot KAT 3 of the Koralm Tunnel, the ÖBB (Austrian Railways) has once again put its trust in Austrian tunnel construction know-how. PORR has established itself over the past decades as the Austrian tunnel construction specialist and has advanced the “New Austrian tunnel construction method” (Neue Österreichische Tunnelbaumethode (NÖT) with numerous innovations. Due to its high level of competence in managing major projects and its excellent reputation at home and abroad, PORR has been able to acquire contracts for many spectacular projects in recent years. These include two tunnels on the new Stuttgart-Ulm line (ALP ascent), tunnels for the project Stuttgart 21 (Ober- and Untertürkheim, Filder Tunnel) and an entire subway line for the Metro Doha in Qatar.

With the Koralm Tunnel, PORR will once again be realising a major project in Austria.

From the beginning of November, two tunnel pipes will be driven through the mountain. For the southern pipe, the existing 7.6 km long sounding tunnel will be widened to the full profile. In addition, a further 3.3 km of new tunnel will be built in the full profile. The northern pipe with a length of 12.6 km will be drilled out mainly by using a tunnel boring machine. The construction work will run until summer 2020, and the order total amounts to nearly € 300 million.

General Director Karl-Heinz Strauss is convinced of the importance of the project for the whole region: “The Koralm Tunnel is an essential component for the modern transport infrastructure of tomorrow. The project is also part of the trans-European network and therefore underscores the central role of our country in the heart of Europe. I am proud that PORR has been commissioned to apply its decades of skill and experience in the creation of this milestone for Austria.”

Neunkirchen State Clinic

The success story continues …

After the construction projects “West Salzburg Surgery”, “Vienna North Hospital” and “Vienna Private Clinic”, another major hospital building contract has recently been acquired.

In early August, Porr Bau GmbH (Department of Major Projects and Lower Austria branch) was commissioned by VAMED with the demolition, development and construction work for the construction of the new Neunkirchen State Clinic in Lower Austria.

The construction work will extend over a period of 36 months and include the production of a building divided into four sections, with two basements, four upper floors and a helipad on the roof.

In addition, the order may be extended by the coordination of the other works, which have been tendered and optionally commissioned by PORR.

The Department of Major Projects sees this order as confirmation of their know-how in the field of health and care and the confidence of the client, and looks forward to the forthcoming realisation.

Image: PORR

Muotatal / Switzerland: Road construction in the vertical rock face

PORR engineers master a demanding construction site in Switzerland with flying colours.

The main artery of the Muotatal is currently being widened in the area of the Gibelhorn to a continuous width of 8 to 8.5 m plus curve widening. Because it sometimes meanders through vertical rock walls, it must be extended for long stretches on the valley side, i.e. towards the Muota gorge.

The enormous difficulties remain hidden from road users, because they are located below road level in the Muota gorge. The route leads in part through vertical walls. Basically, there are only two possibilities: either to construct supporting walls on the mountain side or to widen the road towards the Muota gorge. For this purpose, scaffolding must be set partly into the vertical rock – a major challenge for planners and workers. The available space is also very restricted. The safety precautions are correspondingly complex, because the main connecting route into the Muota valley must be kept open for traffic.

Expressed in concrete figures, four mountain-side supporting walls up to 8 m high with a total length of 250 m are being constructed on the 900 m stretch, and four valley-side walls with a length of 380 m, carrying ten cantilevers totalling 520 m in length. Only a close-up view shows the challenges confronting the planners and workers. This was provided to a series of media representatives by the Construction Office on a guided tour of the construction site. “It is the most difficult construction site that the Canton has ever had to cope with”, confirms Senior Construction Manager Bruno Kälin, head of the Department of Engineering Structures at the Construction Office. Probably the greatest challenge is the scaffolding in the gorge, because the rock offers no points where the supports can be placed over long distances, and is sometimes even overhanging. Small ledges are therefore “milled” into the wall with a high-pressure water jet, while the scaffolding is also attached to the rock face.

Image: PORR

Le Palais Office Warsaw is the Polish “Building of the Year 2012”

The “Polnischer Verband für Bauingenieure und Techniker” (Polish Association of Construction Engineers and Technicians) also honours the Andersia Business Centre.

Le Palais Office Warsaw – the Polish “Building of the Year 2012”
Image: PORR

Andersia Business Centre
Image: Paweł Młodkowski

A great success for PORR in Poland. The Polish Association of Construction Engineers and Technicians, with the participation of the Minister of Infrastructure and the Main Office for Construction Supervision, has paid tribute to the consistently good performance of PORR with two high distinctions awarded on 25th June 2013.

PORR received 1st prize for the realisation of the project “Le Palais Office” in Warsaw, and with it the award for “Building of the Year 2012”. The tenement houses were built in the 19th century, originally in the neo-Renaissance style, by the architect Franciszek Brauman. Since the end of the 1990’s, they had been abandoned and gradually fell into ruin. Thanks to the reconstruction, development and rebuilding by PORR, two interconnected listed buildings were turned into an office building equipped with the latest technology within 18 months. Today the building is used by consulting, financial and law firms. The façades were carefully reconstructed during this process and restored to their former glory.

In addition to the main prize, the project managers were also delighted to receive a prize for the “Andersia Business Centre” project in Posen. The business centre is a community enterprise of the Von der Heyden Group and the city of Posen. As a modern office complex with five upper floors and two basement floors (140 parking spaces) and a floor space of approx. 14,000 m², the complex combines modern design with excellent user-friendliness. The Andersia Business Centre is also currently going through the awards procedure for the LEED Certificate, and therefore also sets an example in the area of sustainability.

Topping-out ceremony for the HOTEL + OFFICE CAMPUS BERLIN at O2 World

At the end of August – less than a year after the start of construction, the project members of the HOTEL + OFFICE CAMPUS BERLIN and their guests from business and politics celebrated the topping-out ceremony. The project on Mühlenstraße closes the gap between the Oberbaumbrücke and O2 World.

“We thoroughly welcome the project HOTEL + OFFICE CAMPUS BERLIN, because it will make a decisive contribution to the development of an attractive and vibrant neighbourhood around the O2 World and further strengthen the axis between the centre and the airport”, says Michael Müller, Senator for Urban Development and Environmental Protection Berlin, with satisfaction.

“We are proud to be able to participate in the development of the district. Our project, the HOTEL + OFFICE CAMPUS BERLIN, will offer attractive and flexible office space for innovative companies, in addition to leafy courtyards and infrastructure. We are thereby contributing significantly to the economic potential of the location.” explains Christian Berger, Managing Director of STRAUSS & CO. Development.

“Berlin is currently one of the most exciting metropolitan centres and is evolving constantly”, as Karl-Heinz Strauss, CEO of PORR AG, explains the involvement of the group in the capital. “Next to the Europacity, the area around the O2 World is the city’s largest and most exciting development area.”

The HOTEL + OFFICE CAMPUS BERLIN at the O2 World will include a hotel from the Holiday Inn chain with 217 rooms and three modern office buildings with around 22,000 m² of office space. We are aiming for certification from the DGNB in Silver, both for the hotel and for the office building, with an additional LEED certification in Gold for the office building.

Around 700 m² of shops and catering on the ground floor of the office building, as well as 155 PKW car parking spaces in the basement, will also contribute to the attractiveness of the district.

The completion of the HOTEL + OFFICE CAMPUS BERLIN at the O2 World is planned for the beginning of 2014. The hotel will open its doors immediately afterwards. The online trader Zalando, which has rented an office area of around 20,000 m², will then move into its premises in the 2nd quarter of 2014.

From left to right: Jan Kemper (CFO Zalando GmbH), Udo Sauter (PORR branch office Germany), Rubin Ritter (CEO Zalando GmbH), Karl-Heinz Strauss (CEO PORR AG), Michael Müller (Senator for Urban Development and Environmental Protection Berlin), Christian Berger (Managing Director of STRAUSS & CO. Development GmbH)
Image: PORR

Image: PORR

Aspern Vienna's Urban Lakeside powered by PORR

PORR is constructing over half of the 2,500 apartments in Construction Phase 1.

Location plan: Prominently represented; PORR in Europe's largest city expansion area
Image: PORR

The award of the general contractor orders for Construction Phase 1 of the largest European urban expansion area "Seestadt Aspern" in Vienna was completed in June. Construction Phase 1 includes the construction of around 2,500 homes.

Of these, 1,324 units as well as 1,067 garage parking spaces and 17 business premises are being built by Porr Bau GmbH, Civil Engineering Dept. in Vienna. Three construction sites (D5A, D5B, D12) for the builders Sozialbaugruppe WBV GPA and EBG will be set up by the area of New Construction 2, and five sites (J7, J8, J9, D8 und D9) for the builders Aphrodite, Sozialbaugruppe, EGW Heimstätte and bwsg by the area of New Construction 3.

The eight PORR construction sites will provide a total residential and business area of 88,500 m², with an order volume amounting to around € 128 million. All the construction sites of the "Seestadt Aspern" Construction Phase 1 powered by PORR are shown on the above location plan.

Stuttgart – Ulm Railway Project: Start of the construction ceremony

The project partners and contractors, together with representatives from politics, celebrated the symbolic start of the tunnel construction on the new Wendlingen-Ulm line.

The official starting signal for the tunnel construction along the new Wendlingen-Ulm line was given with a symbolic tunnel start at the Steinbühl Tunnel on 19th July 2013. “The start of tunnel construction on the Alp ascent is a milestone for the new construction of the Wendlingen-Ulm rail line. This route is part of a European highway which stretches from Paris to Stuttgart, Ulm, Augsburg and Munich, and on to Austria and Hungary. With the new line, the regions of Stuttgart and Ulm will be connected to the European high-speed network”, stressed Dr. Peter Ramsauer, Federal Minister for Transport, Building and Urban Development. Within the future 60 km long high-speed line, the Alp ascent will be the “engineering masterpiece” between Aichelberg and Hohenstadt in the Göppingen district – as accurately described by the Chairman of the Board of Deutsche Bahn AG, Dr. Rüdiger Grube.

In the presence of the Baden-Württemberg Minister for Transport and Infrastructure, Winfried Hermann, Chairman of the Board, Dr. Grube, said: “Together with Stuttgart 21, the new line enables the reorganisation of the most important railway node in Baden-Württemberg and thus lays the foundations for a sustainable transport infrastructure in the south-west.”

General Director Karl-Heinz Strauss praised the cooperation with the consortium partners in this ambitious tunnel construction. Following an ecumenical blessing, the Minister’s wife, Susanne Ramsauer, as patroness of the tunnel, performed the symbolic tunnel start together with the miners.

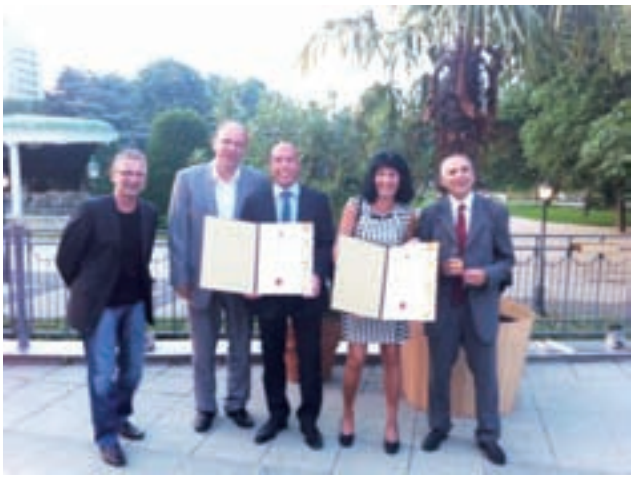
PORR honoured with the Vienna 2013 Urban Regeneration Prize

3rd place for the renovation of the property at Zirkusgasse 47 in the 2nd district.

A harmonious overall concept and a successful co-existence between old and new are important criteria that come into question when a construction project is being considered for the Vienna Urban Regeneration Prize. This year it was awarded for the 28th time. The construction projects carried out in Vienna focus on the preservation of the often historical building substance on the one hand, and the improvement of the living conditions of the residents on the other. The Zirkusgasse 47 project won 3rd place for PORR.

Since the subject of renewal and regeneration has an important role in the construction industry, particularly in Vienna, this award constitutes a special honour for the local builder. Whether it is a matter of the façade or the attic construction – various components and especially thermo-energetic factors figure prominently in the renewal of the building substance. Characteristic features include the high quality and the environmentally conscious use of materials – as more and more emphasis is placed on sustainability and the use of solar and eco-friendly heating systems. The Vienna Urban Regeneration Prize of € 11,000 was instituted in 1986 by the former Guild Master and Urban Planning Officer Werner Hutschinski. Since then more than 470 projects have applied for the prize. This year, a total of 28 projects were submitted.

The building at Zirkusgasse 47 was constructed from 1950 to 1952 and has now been completely redeveloped by PORR, barrier-free. The 67 existing apartments were completely renovated and refitted. In the course of the renovation, the 31 new attic apartments were also given roof terraces.



The pleasure of the project managers at taking 3rd place in the Urban Regeneration Prize
Image: PORR

Visit by Vorarlberg Governor Mag. Markus Wallner to Nägele Hoch- und Tiefbau GmbH in Röthis

Mag. Markus Wallner, accompanied by Mayor Norbert Mähr, recently visited the company Nägele Hoch- und Tiefbau GmbH in Röthis on the occasion of the company's open days. The Management – Michael Pichler, Herbert Gigler and Martin Keuschnigg – received the Vorarlberg politicians and in a relaxed atmosphere provided some interesting information about the well-known company, its future prospects and opportunities.

Governor Markus Wallner (centre) and Mayor Norbert Mähr (on the right) together with Nägele employees.
Image: PORR

A construction company needs willingness for innovation, as well as sound support from well-trained professionals, to maintain itself in the market. Apprentice training is therefore a key factor for the economic future of the country, but also for each individual business, all those present agreed. Nägele Hoch- und Tiefbau is very aware of this responsibility, and has this year again proven itself to be one of the outstanding training companies in the country.

As Dir. Michael Pichler and Dir. Herbert Gigler and Procurist Martin Keuschnigg of Governor Wallner learnt, the supreme maxim of the country in the future will be not only to maintain the existing framework conditions, but also to develop them further. In the Vorarlberg, 2,300 businesses are training over 8,000 apprentices, who will make up the specialists of the future.

Governor Wallner was convinced during this brief visit that the commercial challenges of any business can only be solved if everyone pulls together.

Governor Wallner, Mayor Mähr, Pichler, Gigler, Keuschnigg and the local management, Kühne, Preg and Lercher, jointly discussed important factors such as matters of workloads, order acquisition, personnel and skilled worker issues. In this context they also talked about the great increase in civil engineering which began last July.

During the subsequent tour of the company, the Governor obtained an exclusive insight into the working conditions at Nägele Hoch- und Tiefbau GmbH, and saw the efficiency of operations at first-hand. Governor Markus Wallner and Mayor Mähr also took advantage of this opportunity to talk with the staff and the trainees personally and to answer questions in detail.

Rauthweg Residential Complex, Kematen

Ceremonial handover on 20.6.2013.

On 24.11.2011, Porr Bau GmbH, Tirol Branch, received the order from the client Wohnungseigentum - Tiroler Gemeinnützige Wohnbaugesellschaft m.b.H. as the general contractor for the construction of a residential complex comprising 33 apartments, 15 terraced houses and an underground garage with 58 parking spaces. The apartments are accessed by three stairwells and consist of three above-ground floors and a basement. The construction time was 19 months.

The complex was constructed in massive construction (concrete) to the low-energy insulating standard of the Tyrol Housing Subsidy.

The complex is heated in accordance with the energy concept by pellets, while a solar system was installed for the supply of hot water. Comfort living-space ventilation completes the feeling of well-being.

The ceremonial handover of keys to the tenants took place following addresses by the Managing Director of the condominium Dipl-Ing. Krimbacher, Mayor Dipl.-Ing. (FH) Häusler, and a blessing by the pastor.

The handover celebration was rounded off by refreshments and drinks.

Image: PORR

Image: PORR

Albaufstieg

First tunnel breakthrough in Hohenstadt on 30th October 2013.

Not yet the great, but still a first small breakthrough: On Wednesday 30.10.2013 it was done. The construction workers of the ATA (Consortium Tunnel Albaufstieg) in the Steinbühl Tunnel broke through to make the link between the Pfaffenäcker intermediate heading near Hohenstadt and the tunnel entrance in the south-east.

A muffled rumbling sound, like a distant storm, first announced the historic moment. At 13:43 precisely, it was ready. The first rock crumbled through the sealed point at the tunnel entrance at Hohenstadt. The first thing to be seen through the cloud of dust was the large milling head of the excavator, followed shortly by the dirt-smeared faces of the broadly grinning miners. Within a few seconds, this first small hole became a wide passageway, the first significant stage in the construction of the express rail line between Stuttgart and Ulm.

The miners of the ATA took a little over two months to dig their way through the mountain from the excavation pit in the “Pfaffenäcker”, 430 m in the south-east direction, until they returned to the light of day on Tuesday at the Hohenstadt tunnel entrance. The ICE’s will in future cover this distance in just six seconds.
The workers in the two pipes from Pfaffenäcker in the direction of Stuttgart are a little deeper in the mountain. In one they have already tunnelled 540 m, and 504 m in the parallel gallery for opposing traffic.

The Albaufstieg of the express rail line between Aichelberg and Hohenstadt is in total 14.6 km long, 13.5 km of which run in two tunnels: the 8,806 m long Boßler Tunnel and the 4,847 m long Steinbühl Tunnel. Between these stands a 485 m long and up to 85 m high viaduct over the Filstal.

Image: STUTTGARTER-NACHRICHTEN.DE

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Opening of the PREMIUM PLAZA in Karlsbad

At the beginning of October, the project members and their guests of honour celebrated the opening of the PREMIUM PLAZA in Karlsbad.

At the end of 2010, STRAUSS & PARTNER decided to construct a seven-storey office building with two basement floors in the city centre of Karlovy Vary (Karlsbad), which would also accommodate an underground garage. PORR is acting as the general contractor, while our sister company UBM Bohemia has been commissioned with the technical building supervision.

The PREMIUM PLAZA completely redefines the property market in Karlsbad. Since there are hardly any newly built office buildings with flexible division of space in this location, the project assumes an unparalleled pioneering role. The Komercni banka, one of the largest banks in the Czech Republic, has therefore already decided in favour of the PREMIUM PLAZA.

The high-quality office building is located directly in the commercial and administrative centre of the city. The diverse infrastructure and excellent transport connections are characteristic features of the location.

Image: PORR

Facts and figures

Start of construction	February 2012
Completion	August 2013
Site	1,698 m²
Gross above-ground floor area	7,111 m²
Rental area	6,329.20 m²

Topping-out ceremony of the project WPK Health Service Center

On 6.11.2013, the topping-out ceremony took place on the construction site of the Vienna Private Clinic – Health Service Center at Lazarettgasse 25, 1090 Vienna. Porr Bau GmbH (Major Projects Department) has been commissioned as the general contractor of the project.

The representatives of the Vienna Private Clinic and the representatives of PORR praised the outstanding mutual cooperation during the course of this project. The traditional topping-out address was given by an apprentice mason. The importance of the project for the district was emphasised by Deputy District Superintendent Mag. Thomas Liebich.

On final completion, the Health Service Center now under construction will accommodate a Diagnosis Department with radiography facilities, computer tomograph and magnetic resonance tomograph, together with treatment rooms on four floors. An underground corridor connects the new construction with the existing building of the Vienna Private Clinic, through which the transport of beds into the Diagnosis Department will also be possible.

The eight-storey building has two underground floors constructed by means of the so-called top-down technique. The shell construction time was nine months.

From l. to r.: Jürgen Pendl DPKP, Sabrina Didschuns DGKS, Ing. Josef Pein, Univ.-Prof. Dr. Rainer Kotz, Mag. Thomas Liebich, Prim. Dr. Walter Ebm, Prok. Ing. Gottfried Prinz, Elfriede Tankovits DGKS, DI Gerhard Trubrich, Munksgaard Camilla, M.Sc.; KommR Dipl. KH-Bw. Robert Nikolaus Winkler, MBA, DI Arch. Andreas Schaller
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