

Stephansdom – Prater ferriswheel – Gasometer: these three man-made landmarks of Vienna have, for the past four decades, been prominently visible from afar. The UN City and the Millennium Tower have transported the Danube metropolis' skyline into modern times. The four gigantic Gasometers in the eastern section called Simmering, are being turned into living quarters and commercial centers.

"How well our grandfathers were in the position of building and surveying with incredible accuracy, was manifested at the start of the revitalization work, while re-measuring the Gasometers." says Hans-Peter Blaha, surveying expert at Porr: "The maximum deviation within the enormous Gasometer circular structure of 63 metre in diameter and 60 metres in height was a meager 1,5 centimetres."

Europe's largest gas power plant

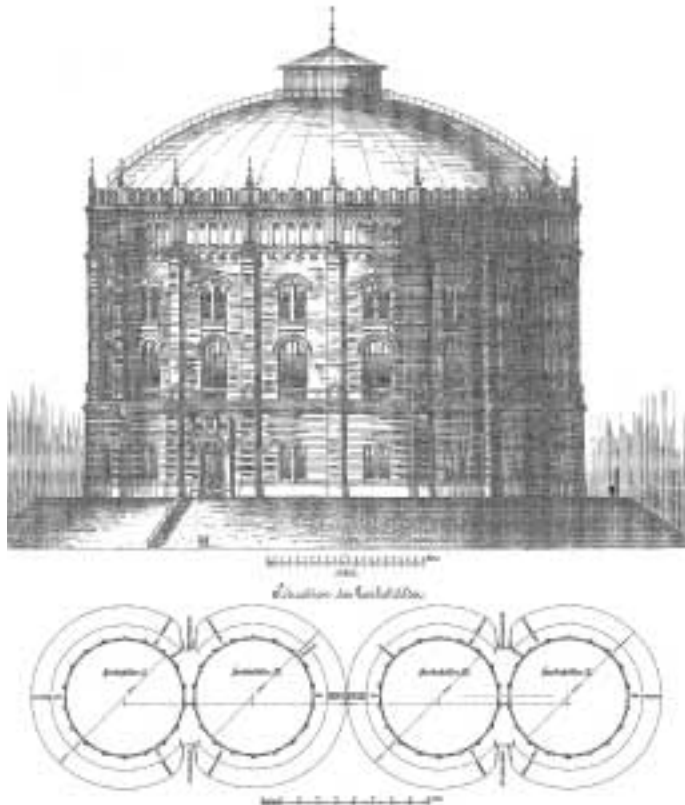
The old Imperial City of Vienna does not only consist of history and culture, even if those traits have been nurtured more consciously than in other cities. Though "Jugendstil" had it's origins here, there are a lot of original modern designs to be seen. Where else for instance, can one find such impressive

gas light and power supply as can still be found at Vienna's four Gasometers? In 1986 after converting to other power sources they weren't just razed to the ground but preserved as trademarks of a culture of industry-based settlements and as a history of energy



Above: The Viennese Secession-building is as old as the Gasometers but even today still seems modern.

Below: The architectural plans shows industrial architecture shortly before the Modern Age. Vienna's Gasometer containers were representatively protected by a tiled wall.



High-rises out





Left: The 160 ton steel dome structures were renovated. With a central scaffolding the pressure ring was placed underneath. Photo: Porr/Gruna

supply, in a way even beneficial to the people of today and tomorrow.

A common concept – four individual ideas

Four renown architects were tasked with coming up with a solution, based on common infrastructure, to turn the four former Gasometers into living quarters, business and office centers. In the summer of 2001 the four Gasometers (A-D), will be filled with urban life in accordance with the ideas of the architectural offices of Nouvel (A), Coop-Himmelblau (B), Wehdom (C) and Holzbauer (D).

City center and airport equidistant.

Inside of Gasometers C-D the designated workgroup in which Porr Project and Hochbau AG participate, a 34 storey building with about 90'000 squaremetres of floor area, 235 apartments, 20'000 square metres of garage area, 18'000 square metres of city archives, 10'500 square metres shopping-/business area and 5000 square metres of offices is being erected. The Gasometers will be transformed into "Castelli Gaselli", so to speak "Living and business castles" with high class infrastructure and it's very own subway station. From here one can reach the Stephansdom in the center of the city in ten minutes and in about the same time reach the airport "Wien-Schwechat" on the outskirts of town.

New buildings inside the Gasometer walls

Intra muros – within the walls of each cylinder – a high-rise will be built, above which the sky will remain open. After removing the steel tank, only the steel rods with a light-house foundation remains. In order to let light in, 15 metre diameter holes will be drilled into the tiled walls. Three new strong concrete rings will stabilise and stiffen the old walls and at the same time serve as connection between the Gasometers fortification pillar and the core of the new building. Each of the four Gasometers will receive individual interior architecture according to the builder's concepts and architectural plans. Hans-Peter Blaha, who along with his assistant Stefan Götz is responsible for the surveying of Gasometers C and D: "Our primary task is, starting off with the local surveying data, drawing survey points through the two objects to create stable points for detailed surveys."

Between pressure rings

The 160 ton dome structure was more problematic. The so-called "lantern" alone weighs 18 tons, and the entire structure had to be preserved, which is why a profound revision was needed. The pressure rings and the 36 main steel girders had to be removed, revised while suspended in mid air by five cranes of 60 metre span and 82 metre lift and then re-inserted. A central girder was erected below the pressure rings. Hans-Peter Blaha: "During removal and reconstruction of these structures, the different forces had to be considered. Measuring and monitoring with the reflectorless Leica TCRA1105 was the obvious way to go as it delivered wonderful results. Based on our measurements, the office of static's FCP could retrace the pressure rings original positions. Simultaneously multiple holes were cut into the

of the cylinder



Photo far left: Stefan Götz measures the dome structure with the LEICA TCRA1105 in automatic reflectorless sensor ranging mode. Left: Gasometer C and D at different stages of renovation. Photo: Porr/Rappersberger



High-rises are being built in the cylinders of the largest Gasometer compound in Europe.



Coop Himmelblau ventures to set a control point outside of Gasometer B.

dome. The upper surface shows the tension and the inner the set coordinates."

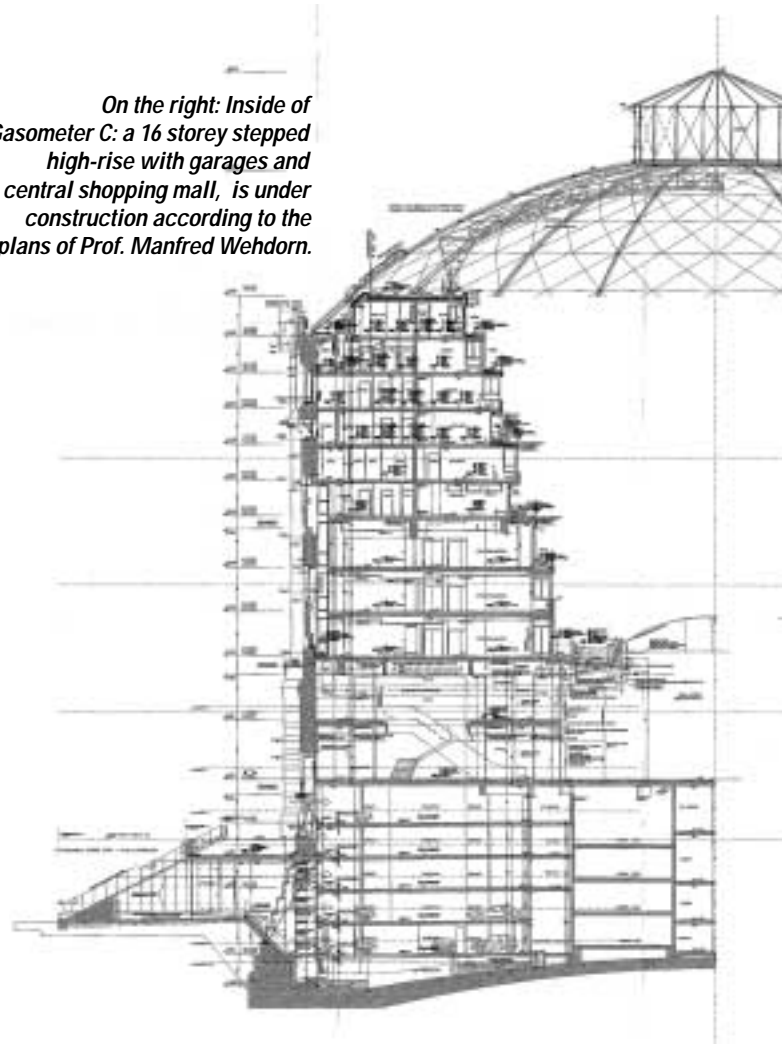
Method of choice:

reflectorless measuring!

Speed, accuracy and safety were also needed when it came to building a pedestrian bridge between the two buildings, connecting old walls and adjusting the new heights of the concrete levels. The LEICA TCRA1105, with automatic reflectorless measuring and visible measuring points rendered the best of services. Stefan Götz; "Despite of walls without sharply defined edges the LEICA TCRA1105 gave remarkably accurate results. I could directly process the data on the PC and supply exact plans for the statisticians and constructors." Technology of the new millennium in Vienna!.

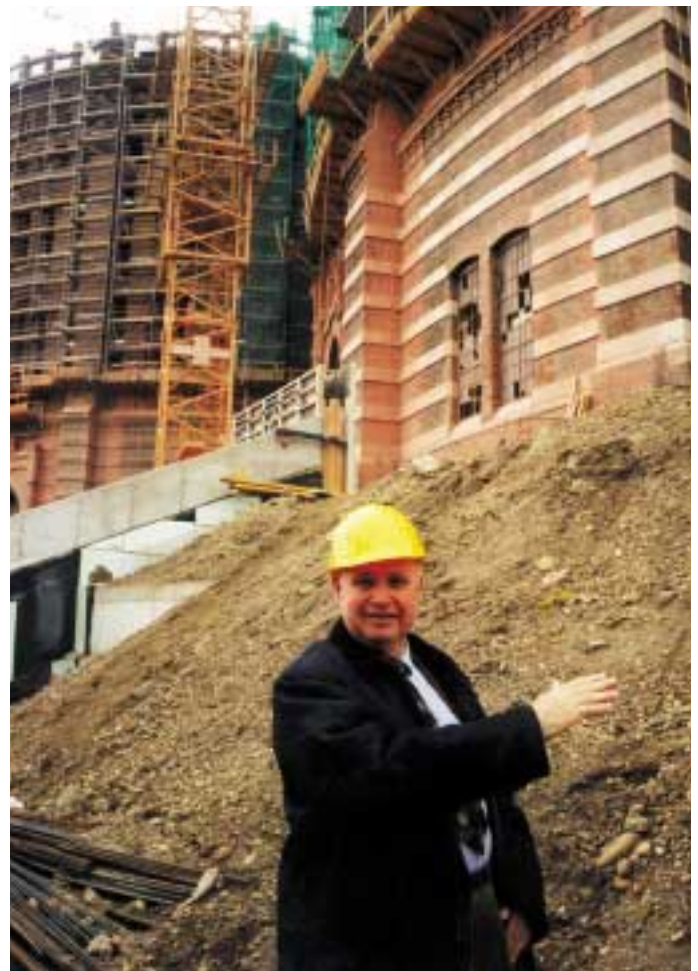
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On the right: Inside of Gasometer C: a 16 storey stepped high-rise with garages and central shopping mall, is under construction according to the plans of Prof. Manfred Wehdorn.



Highly skilled and experienced in customer relations

"These Gasometers supplied the metropolis of the Danube monarchy, Vienna and her two million inhabitants with electricity for eight decades" says Peter Schlögl (on the right). His grandfather, Rudolf Rost, had constructed in his own workshop surveying instruments for the Gasometers, which were filled for the first time in 1899. Peter Schlögl: "I spent my youth here myself, for my father was a chemist in the then largest gas power plant in Europe." Today, Peter Schlögl has returned to the area after a long time. He is visiting the enormous site along with his daughter, Dr. Michaela Schlögl, Rost Directress, his customers the two surveying experts, Hans-Peter Blaha and Stefan Götz from "A. Porr, Technobau und Umwelt AG." By order of the Porr Project Manager, Martin Schilling, the two surveying experts were recently able to solve a critical problem with reflectorless measurement. The R+A Rost Company, with Peter Schlögl as manager, was able to supply the most powerful surveying instrument, as they were a hundred years ago – this time the LEICA TCRA1105 total station. R+A Rost are representatives for Leica Geosystems in Austria for many years. "Long lasting customer relations are not as unusual in Vienna as in other places" Hans-Peter Blaha explains. That is true, Porr Construction was founded 130 years ago.





On the left: Porr's leading surveyor Hans-Peter Blaha, using the quick, contactless and reflectorless way of measuring the Gasometers structure. All the way down: Porr's Surveying Engineer Stefan Götz checking

old and new structures with the LEICA TCRA1105. Below; In the "Castelli Gaselli" C (picture) and D alone, 235 apartments are being built in the inner walls.

Various surveying tasks at Porr

The surveying department of "Porr Technobau und Umwelt AG", led by Hans-Peter Blaha is not only responsible for challenging tasks in surveying, but it is also responsible for maintaining and recalibrating all instruments used by the Porr Company. "We have about 200 levels, as well as 100 theodolites and total stations. Among other new Leica Geosystems instruments, we also have numerous "Wild and Kern" instruments, that are even today up the task where precision and high quality is concerned."

The newest and smallest instrument available to the Porr surveyors is the laserimeter DISTO by Leica Geosystems. "With this instrument we can quickly determine all ceiling heights i.e. at highway underpasses. We also solve trigonometric problems easily by combing the DISTO measurements with angle measurements from the theodolite.

To determine the slant of a road, we always need it's width. On a road with much traffic there is no faster, simpler way than with this small handy thing," says Hans-Peter Blaha.

