

Job story at Rotterdam in Holland

Amendments/additions

Rotterdam Central – a mega construction project takes shape

Old sections of the underground dismantled as passenger travel continues

Against the backdrop of a dominating skyline of tower blocks, the online video clip presents Rotterdam's new inner-city transport interchange, Centraal, as an unusual mix of ultra-modern and practical glass architecture and masses of green spaces – by 2012, today's still fictitious images will become reality: with an underground station, a new train station, parking for both cars and bicycles, bus lanes, car lanes, taxi lanes and interchangeable boulevards; the daily number of travellers and visitors, already reaching 110,000, will no longer have to squeeze past the ugly building site barriers. And by 2025, when the HSL-South high-speed track starts running from the new train station into the European network, the city, which experienced a massive boom mainly from its gigantic oil and container port, is expected to see around 320,000 people pass through this intersection every day in some form or another. The cost of the entire project was calculated at around 370 million Euros in 2008 – one example of taking a fraction of the recent billions wasted around the world and turning it into something of significantly more use and purpose.

However, this is still a mega construction site – above street-level but particularly underground. If you wanted to describe in more detail the engineering ideas and peculiarities devised and implemented here by architects, engineers, machinists and specialists, it would take up thousands of pages – the planners alone would need that many. Unlike most construction projects in this country's interior – away from the coast – every technician working on this high-rise, subterranean, canal and tunnel build has been in close collaboration with hydraulic engineers – a specialist area in which the Dutch have the best reputation in the world; not least because they are aware of their vulnerability.

Most streets in the Dutch delta city are below sea level and the excavators need dig only half way in to almost reach ground water. And yet, the delta branches of the Rhine – old and new Meuse, Lek and many more, including the IJssel – are traversed by a total of eleven railway and road tunnels.

The lowest levels of the underground stations and inner-city underground tunnels lie in depths of up to 23 metres. Foundations are secured with tie rods of over 40 metres in length to protect them against flooding; large underground lobbies stand in caisson-type structures protected from water penetration and if that does not work, the subsoil water is tricked with freezing method; even caves of alluvial sand do not form any great obstacles.

Demolition point one metre away from running underground trains

On 25th September 2009 almost half of the new, spaciouly designed and light-flooded metro stations were approved. Before reconstruction can start, the old 1960's section, an area of 15,000 m³ with around 8,000 t of reinforced concrete steel B50s (a steel component of around 700 t), must be demolished.

Having the best knowledge of the local conditions, the demolition specialist, Struijk-Groep, from nearby Krimpen aan de Lek, was commissioned with this task – the company had already performed other demolition jobs for the mega project when it was started. In November 2009, work started on the final section of the Centraal. It is expected to finish by the end of January 2010.



45t excavator on the extended booms of two Demag AC 500-2 and AC700 telescopicmobile cranes (photo from Struijk)

"First we had to break into the upper layer – up to 1.30 m thick in parts – so we could use two telescopic mobile cranes to drop our demolition machines and tools down onto the flat work surface, 35 m underground. When using the excavator-controlled hydraulic hammer for demolition work, and when crane-lifting the excavator, we had to work very closely against the large, horizontal, steel pipe wall supports which were up to 52 m in length. The construction site is particularly demanding when it comes to moving freely in a very tight working area and, because we are dealing with high levels of public traffic, trying to reduce dust effectively. We also had to expect a high level of concentration from our excavator drivers who were working with an operational underground line – the excavator and boom tools were often less than one metre away from the running trains", says Allard Struijk, one of the two managing directors, explaining the construction situation.

The Struijk site is divided into two working areas: The main machine working on the lower base level is a Komatsu PC450 (45 t / 257 kW) crawler excavator with quick-coupler as standard. The main tool is a free-rotating, 6.4 t OKADA TSW 1800 VFR concrete cutter. TSW1800V is the biggest concrete crusher being fit on 45ton class in the world.

Moreover, it can be fit on much larger excavator to 100 ton.

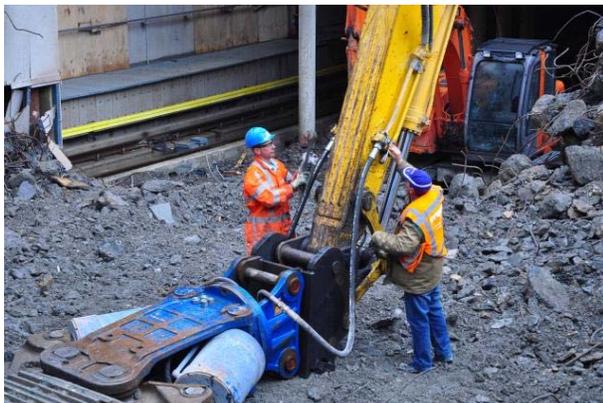
Primary crusher TSW1800V is specialized in demolishing huge amounts of concretes at extremely spacious area. Longer jaw length and depth creates more disposal volume. Jaw and Frame is made using cast steel of high tensile strength and wear resistant to make light weight and high rigidity. Jaw is designed and shaped like "sharp wedge" in order to penetrate the material. This job site is exactly the one for TSW1800V. PC450 also uses a silenced, 4,000 kg, G 100 City rammer hydraulic hammer, a 2.5 m³ demolition backhoe and sorting grab.



Excavator in the pit – making progress.



Demolition with a wide mouth and strong jaws – on the boom of the Komatsu PC 450 LC 8 crawler excavator are the free-rotating, 6.4 t OKADA TSW 1800 VFR concrete crushers – the crushers have a quick-entry valve for accelerated work speed.



It takes just minutes to change tools thanks to the quick-coupler

Meanwhile, in the lower sections: A Fiat-Hitachi 135 crawler excavator, a zero tail version, alternating with a silenced OKADA TOP 100A hydraulic hammer, a 1,400 kg OKADA TSW 950 VFR concrete crusher; a 28 mini excavator from Fiat-Hitachi, equipped with an ACDE DMS 330 hydraulic hammer – silenced and weighing 270 kg – and a T 175 Bobcat with shovel loader.

The demolished material, broken roughly into smaller pieces, is lifted from the pit in certified 5 m³ containers by a Fiat-Hitachi GH 180 crawler cable excavator. A mobile spray machine controls the dust effectively.



Demolition in the boundary zones with a Fiat-Hitachi IHI 28 mini excavator.

The material is stockpiled in the upper area of the building site; a Fiat-Hitachi KH 150 crawler excavator takes care of the container work; a Fiat-Hitachi 350 crawler excavator (a Liebherr 914 crawler excavator was rented in the short term) uses a 2,800 kg OKADA OSC 100 V Euro concrete crusher (the "V" stands for overdrive valve) to break up the chunks and separate the concrete from the steel. The reinforcement steel is separated with an electromagnet on the boom of a 14 t Fiat-Hitachi 135 excavator and dumped into the containers. There are also two T175 and 561 Bobcats and two 50VX and two Fiat-Hitachi 50VX and 45 mini excavators.



The loaded 5 m³ containers sway in front of the skyscrapers to the top of the material stockpile

The demolition material and steel are taken to local specialist firms; 15 to 20 Struijk employees are working in two shifts, seven days a week. The demolition work will be completed at the end of January or early February 2010.



Excavators on the stockpile-this is where the demolition material is reduced to recyclable sizes and the reinforcement steel separated by magnet.

Brief profile on Struijk

The foundation stone of today's company specializing in demolitions and asbestos sanitations was laid in 1938 by Marinus Johannes Struijk as an agricultural service firm. After the turmoil of war which hit the city of Rotterdam and surrounding areas particularly hard, J.M. Struijk and his fledgling company began removing the rubble and breaking down the debris; he spent a good ten years freeing a number of stretches along the Dutch coast from their ugly concrete bunker past.

In 1974 the two sons, Johannes and Marinus Johannes jnr., took over the firm and added the two new branches of asbestos and ground sanitation. In 2001, with Edward (47) and Allard (43) Struijk – both machine construction engineers – the third generation stepped into the managing roles of the now highly specialist business. The company can now look back on a long history of successfully completed demolition projects: The train stations at Dordrecht, The Hague, Leiden and Amsterdam; 22 bridges were demolished to make way for the new, 169 km-long Betuweroute railway line, which was laid from 2000 to 2005 to carry freight from Rotterdam Port into the German network, and the high-speed HSL-South track (98 km, construction started in March 2000).

The squeaky clean firm is now situated just a few miles from Rotterdam's inner city, in Krimpen aan der Lek – one of the many lakes in the Rhine delta – over a surface area of 25,000 m²; this is where the modern, three-story company headquarters and a technically well equipped workshop were built; plenty of room for machines and devices. The Struijk Group employs a total of 45 people, including 16 machinists. The demolition expert's core machines include ten excavators with an operational weight of 0.6 to 65 t from the makers Komatsu, Fiat-Hitachi and Komatsu, a 0.384 t Brokk demolition robot, a 6 t Ahlmann earthmover and three Bobcats.

All the machines – apart from the 65 t hydraulic excavator, the 40 t cable excavator, the Brokk and the earthmover – are designed for use with hydraulic demolition cutters, hydraulic hammers and concrete crushers. Struijk sources most of its specialist demolition tools from the service company ACDE Europe B.V. from Duiven, with whom they have worked closely for many years. The ACDE range in the Struijk machine pool consists of OKADA SPAC 80-3 (1,800 kg) concrete crushers and cutters, OSC 100V Euro concrete crushers (2,800 kg), and the TSW range is represented by the models 350 FR (240 kg), 950 VFR (1,400 kg) and TSW 1350VHR Euro (3,960 kg).

The silenced hydraulic hammers are from OKADA (the 1,000 kg TOP 100 a) and from ACDE (the 270 kg DMS 270 and 330 kg DMS 330; four rammer City range hammers, types S 23 N (325 kg), E 64 (1,000 kg), E 68 (1,850 kg) and G 100 (4,000kg) complete the range of tools, all of which are also silenced.