

World-Record Building Move by Mammoet

by Gino J. Koster, Structural Mover European Correspondent

The most efficient way of creating room for a new high-efficiency waste-to-energy plant was applied in Amsterdam, The Netherlands. In just 2 days the existing factory building occupying the land, weighing 6,900 tonnes, was moved almost 1,000m to its new location at the other side of the plant. Self propelled modular transporters (SPMTs) played a vital role in this ultimate example of recycling: moving the heaviest building on wheels. Structural Mover European Correspondent Gino Koster was on site to witness setting a new world record and record it photographically.

As part of Amsterdam Eco-Port, the municipality of the city started recycling urban waste to heat and electricity in a so-called waste-to-energy (WTE) plant in 1993. By incinerating 800,000 tonnes of waste per year over a period of 10 years the plant delivered energy with an efficiency of 23%. In order to cope with the increasing supply of garbage, plans were made to build a second, and even more efficient, plant with an annual capacity of 530,000 tonnes. When starting production in 2006 this so called Waste Fired Power

Plant (WFPP) will reach an efficiency of even more than 30%.

Efficiency of another order required the new WFPP to be build at the location of the existing slag reprocessing plant (SOI). While this plant plays a vital role in the overall recycling process, it would require a new SOI to be build at the other side of the existing plant. If it was not for the idea to investigate the possibilities of also recycling the existing building, by moving it in one piece, construction of a new building would be well under way by now, while the old building would face demolition. Based on the idea of moving offshore modules by SPMTs Mammoet was invited to discuss the possibilities of moving the building. A preliminary investigation and survey by Mammoet proved the feasibility of the idea. However, the complexity of the concrete building, measuring 50m long, 32m wide and 20m high, required the expertise of a specialised contractor in the field of structural moving and foundations. Mammoet introduced Bresser/van 't Wout, located in Waddinxveen, The Netherlands. Both companies teamed up together on



Early Saturday morning the building was lifted free from the remaining foundation piles. Keeping all wheels on the plates and keeping the SPMTs from not interfering with the remaining piles required keeping a close eye on all trailers.



Despite drainage and weight spreading steel plates the enormous impact of the weight became clearly visible as the ground water came up.

more than 15 projects before and successfully moved large and small houses and buildings. But, never as big as the SOI. A more in depth analysis of the building, using a method devised by Bresser/van et Wout, learned the building, weighing an estimated 6,600 tonnes, would require temporary steel supports in a number of locations to guarantee the structural integrity during movement. Especially a shredder, weighing 100 tonnes, located in the middle of the building on a separate 10 x 12m concrete floor weighing another 400 tonnes, would require complicated supporting in order not to overload both the building and the SPMTs during movement. Finally the analysis proved both the technical and economical feasi-

bility of the project, based on the combined expertise of both contractors. They were given the order, and just 6 months to prove themselves.

Extensive preparations

Although the plant is located in the industrial port area of Amsterdam, the local road infrastructure could not handle a 32m wide load. A feasible route was set, using both existing roads and wasteland. Following that a detailed survey, taking about a month, was carried out in to underground cables, pipes, sewer systems, etc. They should withstand axle load pressures of up to 30 tonnes. An alternative route, via the



Once the building had reached the top of the 1% slope a short official starting ceremony was held witnessed by hundreds of guests and on-lookers.

harbour facing the plant and using a ro/ro pontoon, was also available but was less attractive. The steel required for the temporary supports was ordered some 4 months prior to the operation.

The actual preparations on site, consisting of building and transport related work, started 2 months before the move. By that time the SOI was shut down and slag was stored at the new location for the time being. In order to allow the SPMTs to load the building, resting on 143 concrete piles, the foundation had to be cleared. Some 2m of soil were removed after which a 1m thick layer of sand, covered with steel plates, was put back in place. The high level of ground water further complicated the operation requiring continuous drainage. Not all 143 piles were positioned according to the original construction plan. Those not had to be removed, in addition to the ones already planned to be taken out, to allow positioning of the SPMTs. A 70cm thick reinforced concrete floor, in combination with the additional steel supports, gave the building sufficient strength. Then each pile was injected with a piece of round steel capable of supporting its part of the building while the surrounding concrete and steel reinforcement was cut away. This would ease and minimise the required work when the SPMTs would finally lift the building from its foundation.

The 50m long building, requiring up to 38 axle line long SPMTs, needed a gentle slope of 1% from the pit to street level. Only than the maximum 60cm stroke of the pendulum axles would be sufficient to support the full length of the building when passing the critical spot at the end of the slope on to the street, where it also had to make a 90-degree left turn.

Because the surrounding roads play a vital role in the continuous supply of garbage to the main



A 90-degree turn was successfully rounded guided by the linked-up computers of all seven transporters, steering the axles in the correct radius.



In walking pace the recycling plant moved forward passing by the main building with its futuristic control room built around the smoke stack.

plant, closing off those roads, which had to be crossed, would only be allowed during the weekend of the move between Friday 8PM and Monday 5AM. The week prior to the move was used to prepare the rest of the route. It was completely levelled and covered with a 28m wide path of steel plates, totalling some 30,000 square meters, the equivalent of 130 truckloads. Furthermore 6 locations required additional load spreading because of underground pipes etc. using some 300 wooden mats. The mats were dug in and also covered by plates.

On Monday, parallel to the

preparations of the route, Mammoet started mobilizing a total of ...

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