



SAVED MILLIONS

– by renovating
instead of demolishing

Henriksdal's Waste Water Plant is the largest in the Stockholm area and also the worlds largest Waste Water Plant under ground (built in the mountain of Henriksdal). At the same time as the primary sedimentation basin was rebuilt, a tunnel made for drainwater was renovated – and this saved millions.

THE SWEDISH CEMENT & CONCRETE RESEARCH INSTITUTE (CBI), had made an analyse on the concrete from 1930-1940. The Institute found that the concrete was "rotten" caused by Carbonation. They decided to demolish the roof and to cast a new. There also came a suggestion from another direction; to demolish the walls down as well. But Olle Wiklund, from Stockholm Water, had a much more cheaper solution. He had participated at a seminar, arranged by Swedish Industry Development (SIU) in Gränna. The company there uses a relatively new method in Sweden, to renovate concrete.

- The seminar took part in April and the company demonstrated their methods and materials. During the Autumn when we analysed the concrete, I rang Jan Hellstedt at SIU up, and asked if he had a solution on the hard carbonated concrete problem.

SINCE PRETTY HEAVY CONSULTANTS had the suggestion to demolish the walls in the tunnel, more tests were demanded before taking the decision; to use Swedish Industry Development's (SIU) method.

THE FIRST MEASURE was to water jet the carbonated concrete. The limit was found by mechanical and chemical tests. Next step was to protect the existing reinforcement with a high alkaline product (MSS 470 V, diluted).

– We then watered the surface and applicated a high performance polymer strengthened concrete by hand, says Torbjörn Claesson at SIU.

– It was a harsh job. Since the concrete was so damaged we had to build spreaders to be able to straighten the walls. The damages could be up to 70-80 mm deep. When the concrete surfaces were recovered, they were treated with one of our crystallisation products (MSS 400 ProCon WP), which prevent future corrosion of the reinforcement bars.



The walls of the tunnel, were cleaned from carbonated concrete by the water jet method, the reinforcement bars were protected before a new surface was built with high performance polymer concrete. The last stage to protect the concrete from moisture, was to crystallise.

CRYSTALLISATION of concrete means that you treat the surface with a substance which force itself into the concrete because of the capillary force in pores and cracks. Within the concrete's small hollow spaces the chemicals are crystallised (they are non toxic and allowed for drinking water), plugs the voids and prevent moisture to spread within the concrete.

The costs for renovating of this part was approx. 3,5 miljoner SEK.

– But we have definitely saved additional millions by renovating instead of tearing down and rebuild. The method has shown itself to work quite excellent and we will continue with more stages of the same extent, Olle Wiklund says to us.

HENRIKSDAL'S Waste Water Plant is located between Nacka and Stockholm and is part of a waste water system with Plants also in Bromma and Loudden. Together these Waste Water Plants serve all of Stockholm, the bigger part of Huddinge, parts of Haninge, Tyresö, Nacka, Sundbyberg, the bigger part of Järfälla and smaller parts of Ekerö.

Henriksdal is the world's biggest under ground Waste Water Plant. The first nine basins were built in 1941, thereafter 26 basins were built until 1971. The drain water comes via a pressure line from Karl XII:s square built in

1935-1940. The pipe goes down under Värmdövägen and through a slurry separator for 13 primary sedimentation basin, each 70-100 m². The cleaning continues in eleven secondary sedimentation basins and eleven air basins, thereafter the clean water is let out in Saltsjön.

The capacity is 370 000 m³ per 24 hours. The tunnel, which is now being renovated in stages with the new method used by Swedish Industry Development is 180 meter long and the height of the walls is approx. 2,20 meter.

This is a gigantic object of renovation. But the bill for building a new tunnel would have been bigger and so far, Olle Wiklund & company are fully satisfied with SIU's method; to renovate and protect the concrete against carbonation.

