

Name of Project: Potsdam Wastewater Treatment Works Settling tanks  
WW12/2007

Location: Potsdam Wastewater Treatment Works – Koeberg Road

Project Team

- Owner: City of Cape Town
- Consultant: ANA Engineering Consultants
- Project Manager: Chris Little
- Main Contractor: Inenzo Water
- Hot Dip Galvanizer: Galvatech

Type of Steel: Mild steel

Tones of Steel: ±10 000kg/Bridge (4-off)

Project Inception Date: Jan 2008

Project Value: R6 600 000-00

Brief Description of Project: Duplex coating applied to steelwork for protection against extremely harsh environment.

Coating Specs: Articles exposed to direct contact with sewage.  
Hot Dip Galvanising to ISO 1461 / SANS 121  
Light Sweep Blast  
2 x Coats Carbomastic 200 (400 microns)

Other articles  
Hot Dip Galvanising to ISO 1461 / SANS 121  
Light Sweep Blast  
3 x Coats Carbogard 890 (350 microns)  
1 x Coat Carbothane 134 (50 microns)

The Works are for the design, supply, delivery, installation, testing, commissioning and upholding during the trial Operation Period and Defects Notification Period of the following items at the Potsdam Wastewater Treatment Works.

Mechanical equipment as scheduled below:

1. New equipment for the two new 33m diameter primary settling tanks. This includes full bridges, drives, inlet riser pipes, stilling well, scum baffles, and vee notch weirs.
2. New equipment for the two new 35m diameter secondary settling tanks. This includes full bridges, drives, inlet riser pipes, stilling well and vee notch weirs.
3. Two new peristaltic pumps with the associated pipes and valves.

4. Two telescopic valves for the existing RAS pump station.
5. Modifications to the scraper support system and scum draw off system of the existing 33m diameter primary settling tank.

## Introduction

The project consisted of designing new bridges for the Potsdam Wastewater Treatment Works and providing a protective coating in an **extremely harsh corrosive environment**. A duplex coating system consisting of hot dip galvanising and a suitable painting system was specified to be applied.



**Extremely harsh environments at the Potsdam Water Treatment Works in Milnerton. (Left) Bridges will be exposed to sewage water when in operation. (Right)**

Galvatech and Inenzo Water held meetings during the fabrication stages to ensure the minimizing of unnecessary delays during the hot dip galvanising process. Adjustments were made to the components with regards to venting and draining holes, their sizes and positioning of these holes. (See pictures below)



The proactive discussions between the galvaniser and the client as well as the components complying with SANS 14713 ensured a quality hot dip galvanised coating

to SANS 121 (ISO 1461). The quality of the fabrication allowed Galvatech to enforce a quick turnaround time for the hot dip galvanised components. Although SANS 121 specifies a local coating thickness of 75 microns and mean coating thickness of 85 microns, readings of between 100 and 150 microns were measured. These reading were consistent throughout the project.



**(Left and Right) Components were cleaned with grinders fixed with flexible discs.**

Before applying the paint coating zinc ash, zinc runs, and excessive coating roughness was removed by means of grinders fixed with flexible discs. After the cleaning operations the components were measured again to ensure that the coating thickness still complied with SANS 121. Items were then moved to the blasting booths to be lightly sweep blasted in accordance with the Code of Practice for Surface Preparation and Application of Organic Coatings HDGASA01-1990. This is of extreme importance as adhering to this code reduces the chance of a damaged galvanised coating and ensures a profile for good adhesion of the paint coating to the substrate.

Quality control documents were completed before and after applying all coatings.



All painting commenced under the instructions of the paint manufacturers' data sheets on all applied paint products. This included temperature and humidity checks as well as coating thickness measurements.

Once cured the components were collected and moved to the Potsdam Site. The bridges were lifted by an overhead crane onto trucks with slings and not by forklift to ensure reduced coating damage. Inenzo Water then assembled and installed the bridges.



### **Innovation and Promotion of Benefits**

These coated bridges are difficult to maintain as they are partly immersed in the settling tanks and in operation for long periods of time. Therefore, a coating with the longest life expectancy and little or no maintenance at all until the next service was needed. A duplex coating system consisting of hot dip galvanizing and painting was used for this project. In comparison with multi-coat paint systems the duplex coating is a little more expensive, but more beneficial when taking all aspects in consideration. Durability, resistance to abrasion and mechanical damage, ease of inspection for coating quality and low maintenance made hot dip galvanising the best option to utilize as a base coat. The fact that under film corrosion creep is impossible also contributed to the superiority of hot dip galvanising as a base coat. Furthermore the use of a paint system on the hot dip galvanised zinc coating not only added to the coatings overall corrosion protection properties, but also improved the aesthetical appeal of the bridges.

### **Promote Professionalism and Provide Service**

This project improved the ongoing relationship between the galvaniser (Galvatech) and the fabricator (Inenzo Water) in numerous ways. The pre-fabrication site visits enabled Galvatech to hot dip galvanise components without delay and delivering a service with quick turn around time. Apart from Galvatech's own internal inspections, quality control was performed by a third party inspector at different stages of the application ensuring a good quality product. This was favorable for both the galvaniser and the fabricator as quality plays an important role when deciding which fabricator will be involved in future projects. Communication between Galvatech and Inenzo Water increased and slight adjustments to the administration process improved smooth operation of this system. Drawings complete with orders were sent to the galvaniser on all components to ensure that instructions were correctly performed. This eliminated wasting time on having to re-galvanise or re-paint components. The Potsdam Bridge Project proves to be a good advertisement for hot dip galvanising and duplex coatings as well as galvanisers and fabricators where quality, speedy turn-around times and teamwork were trademarks thereof.

## **Celebration of Superiority**



These big hot dip galvanised and painted pipe bridges spent 3-4 weeks at the plant per system application over a period of 3 months.

The physical size of the components, many of that just about fit into the galvanising kettle, made other steelwork contractors visiting the plant curious. Upon explaining duplex coatings and their benefits as well as design for hot dip galvanising to these contractors, client knowledge was improved.

## **Dissemination of Knowledge**

This project enabled a transfer of knowledge between Galvatech and Inenzo Water with regards to the design criteria and also to other steel contractors visiting the galvanising plant. On-going in house training enabled Galvatech to provide products of superior quality as was needed for such a high profile project. Existing blasters “grew” as they gained more experience sweeping and adjusting blast pressures to avoid coating damage. New employees (painters) from our galvanising plant learned more about surface preparation, stripe coating and applying uniform coatings.

## **Market Growth**

Inenzo Water as well as Galvatech ensured that The City of Cape Town or other contractors will award future projects to them by delivering outstanding service with a good quality product. Once a client is comforted by trusting his subcontractors, he will very seldom change the chain of supply. Similar projects are currently underway as the upgrading of Fisantekraal Water Treatment Works Project just started. Inenzo, Galvatech and other contractors are involved.

## **Sustainable Resources**

The paint coating covering the hot dip galvanizing increase the zinc coatings life expectancy because the zinc only starts to deteriorate once it is exposed to the surrounding environment. This extended life of the zinc coating prevents frequent maintenance and therefore reduces expenditure as there is no extra expense on labor or paint. Additionally, the benefit of painting also adds to the aesthetics as the light grey paint color blends in well with the galvanised handrails of the bridge.

