Hot Dip Galvanized Case Study No. 3
Mitchelsplein transport interchange

The Application

Many parts of the Cape flats are considered aggressive to hot dip galvanizing on its own. In this evaluation and case study hot dip galvanized coatings have performed remarkably well and have led to further specifying of the coating to protect the structural steelwork at the new Mitchelsplein Transport Interchange in Cape Town.

Photo 1

General view of the Mitchelsplein Transport Interchange

Environmental Conditions

The environmental conditions of the Mitchelsplein Train Station are off the False Bay coastline, approximately 3km from the sea. The area is subjected to the prevailing winds being the south easterly. Steel structures exposed to these conditions are therefore subjected to high levels of coastal saline atmospheres.

The Site

In terms of ISO 9223 specification the site would be generally described as an outdoor atmospheric environment with a corrosivity category of C4.

The general description of a temperate, subtropical to topical, low to high pollution (SO_2 30 • • • • • • • • • • • • • •• • • • • • • • • • ••• • • • • • • • • • • • • • • •• • • kilometres of the ocean or within one hundred metres of sheltered coastal areas and outside the splash zone of salt water.

In terms of this corrosivity category, the corrosion rate of zinc is given as between 2.1 • • • • • • • • • •• •• •• • •

Assuming a hot dip galvanized coating in excess of 90µm, the calculated "estimated" service life would be between 20 to 40 years.

Prevailing winds around the Cape Peninsula

Dry SE winds bring sea salts and no rain. Corrosion is severe

NW & W winds bring the same sea salts, but also the rain to wash the corrosion products off the structures and hence corrosion is less severe

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Site Investigation and Findings

Photo 2

Hot dip galvanized mast appears to be corroding with indications of rust staining

Photo3

An area is cleaned and measured with an Elcometer indicating a coating thickness of 95µm

Photo 2 indicates the same surface before cleaning with photo 3 indicating a zinc coating thickness of 95µm once cleaned.

SANS 121 (ISO 1461:2009) requires a mean coating thickness of 70µm for material thicknesses greater than (>) 3mm to equal and less than (• • • •• • •• • • • • • exceeding 6mm the specified mean coating thickness is given as 85µm.

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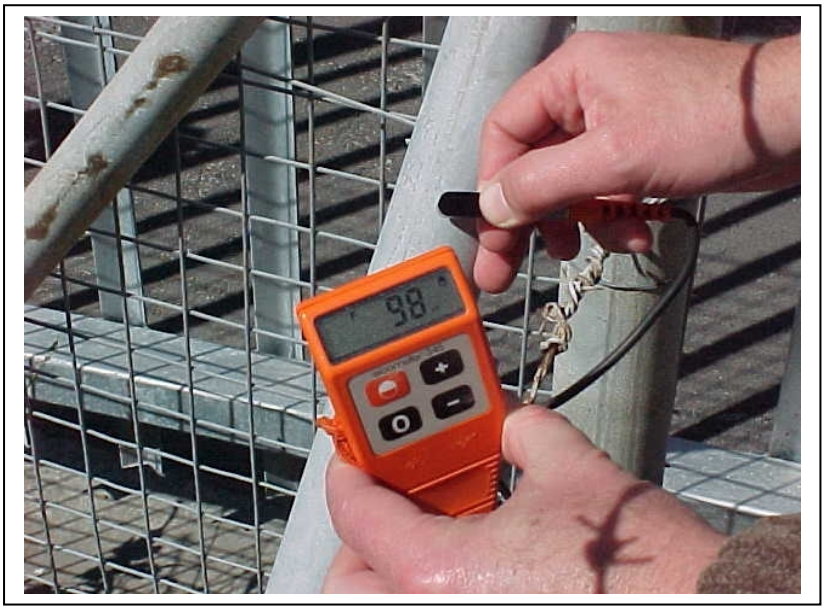

Photos 4 & 5

Examination of an existing fence installation hot dip galvanized coating measurements recorded exceeded 90µm

After approximately 26 years of service, the hot dip galvanized coatings on the light poles (photos 2 & 3) and fence supports (phots 4 &5) installed at Mitchelsplein Train Station, will continue to provide adequate and effective corrosion control for at least another 25 years.

Conclusion

There is little doubt that hot dip galvanizing can and does provide cost effective solutions to the often vexed question of corrosion control in areas adjacent to the coast.

Due to the performance of the hot dip galvanized coating in this instance it was decided that the coating on its own be specified for the corrosion control of all the steelwork in all the phases of the Transport Interchange constructed adjacent to this site.

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