Simonstown utility gantry

Chatting with Harry Dilley an ex Mayor of Simonstown, experienced sailor and multiple boat owner we find the following facts about this utility gantry.

The gantry was installed in about 1991 which makes it about 20 years old. The gantry was originally installed for fishermen to offload their catch of Broadbill Swordfish which because of their general mass of in excess of 300kg was difficult to do without such a gantry. Today the gantry which is used for offloading general items from the boats is still in excellent condition.

Simonstown because of its location is relatively protected from aggressive chloride carrying south easter winds, see location map and hence the hot dip galvanized coating has not generally deteriorated and will be able to protect the steel for many more years without any maintenance.

The only items that require maintenance on the gantry are the uncoated plate above the gantry and the zinc electroplated fasteners. Should this be carried out shortly, using a reputable repair material such as Zincfix or Galvpatch, the fasteners will not have to be replaced.

The exposure of hot dip galvanizing to marine conditions will inevitably

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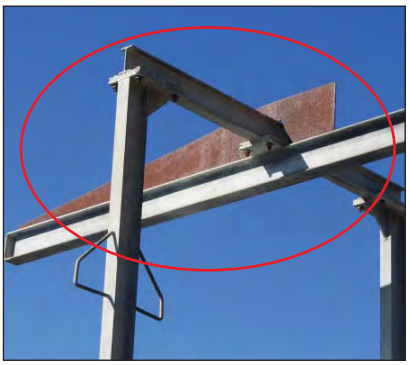
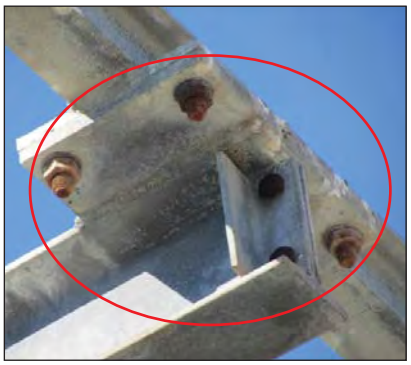
Simonstown is relatively protected by the landform from the aggressive south easterly chloride carrying winds. Gordons Bay and its surrounding area is similarly protected.





Photos above show the gantry with some uncoated carbon steel that has been added. This will in time tend to discolour the hot dip galvanizing when the former begins to rust. Photo right shows the inappropriately coated fasteners, which were most probably originally only zinc electroplated, requiring replacement or coating repair.

General photos of the gantry showing Simonstown Harbour and the yachts in the background.

Zinc chloride layer including the hot dip galvanized coating thickness of 308µm.

Zinc chloride layer including the hot dip galvanized coating thickness of 297µm.

Zinc chloride salts removed and the residual coating thickness measured - 144µm.

Zinc chloride salts removed and the residual coating thickness measured - 130µm.

Zinc chloride layer including the hot dip galvanized coating thickness of 518µm.

Zinc chloride layer including the hot dip galvanized coating thickness of 452µm.

Zinc chloride salts removed and the residual coating thickness measured - 176µm.

Zinc chloride salts removed and the residual coating thickness measured - 189µm.

Zinc chlorides salts almost non-existent due to the orientation of the web wrt the direction of the prevailing wind, coating thickness - 165µm.

result in a white zinc chloride salt formation on the surface facing the seaward side. Depending on the severity of the local conditions this white substance may only affect the structure aesthetically as in this case or may result in a more rapid demise of the hot dip galvanized coating. This atmospheric aggressiveness can locally be found east of and including Glencairn along the False Bay coast to the west of Somerset West.

General hot dip galvanized coating thickness readings taken on the gantry are shown in the table on the right.

	Overall coating thickness including zinc chloride and hot dip galvanizing (µm)	Residual hot dip galvanized coating thickness with zinc chloride salts removed (1) in (µm)	Residual hot dip galvanized coating thickness with zinc chloride salts removed (2) in (µm)
Mean	377.6	187.8	160.3
Max	645	573 – High spot	235
Min	199	141	118
No. of readings	48	71	33

General hot dip galvanized coating thickness readings taken on the gantry.

The minimum coating thickness required by SABS 763 for steel greater than 6mm thick which was relevant when this structure was hot dip galvanized, is 70µm local and a mean of 85µm. This is similar to the new standard which is SANS 121:2011 (ISO 1461:2009). See *Table* 3 taken from the standard.

Zinc chlorides salts almost non-existent due to the orientation of the web wrt the direction of the prevailing wind, coating thickness - 167µm.

Zinc chlorides salts almost non-existent due to the orientation of the web wrt the direction of the prevailing wind, coating thickness - 214µm.

Zinc chlorides salts almost non-existent due to the orientation of the web wrt the direction of the prevailing wind, coating thickness - 179µm.

Zinc chlorides salts almost non-existent on round bar climbing hoops, coating thickness - 158µm.

Zinc chlorides salts almost non-existent on round bar climbing hoops, coating thickness - 157µm.

Zinc chloride layer including the hot dip galvanized coating thickness of 469µm.

Zinc chloride salts removed and the residual coating thickness measured - 152µm.

NOTE 1

Hot dip galvanizing specifications state the minimum acceptable coating thickness and not average coating thicknesses. The thickness actually achieved, varies with steel composition and this can range from the minimum up to at least 50% greater. As life expectancy predictions are normally based on the minimum coating thickness, they are usually conservative.

Variance in coating thickness

A requirement for a thicker coating (25% greater than the standard in *Table* 4 (*see page* 22), can be requested for

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Zinc chloride salts removed and the residual coating thickness measured - 148µm.

Zinc chloride salts removed and the residual coating thickness measured - 125µm.

Zinc chloride salts removed.

Zinc chloride salts removed and the residual coating thickness measured - 125µm.

Zinc chloride salts removed and the residual coating thickness measured - 134µm.

Zinc chloride salts removed and the residual coating thickness measured - 150µm.

components not centrifuged, without affecting specification conformity).

NOTE 2

Where steel composition does not include moderate to high reactivity, thicker coatings are not always easily achieved.

Conclusion

Due to the relatively moderate environ-ment (most probably a C3 corrosion category in terms of ISO 9223) the hot dip galvanizing has stood the test of time and will most probably not require any maintenance for many, many years to come.

The mild steel plate should be protected against the elements and the fasteners over coated using something like Zincfix or Galvpatch which are reputable coating repair products recommended by the Association.

TABLE 3. MINIMUM COATING THICKNESS ON ARTICLES THAT ARE NOT CENRIFUGED – SANS 121:2011 (ISO 1461:2009)

Profiles	Local coating thickness min. µm*	Mean coating thickness, min. µm*
Steel >6mm	70	85
Steel >3mm to ≤6mm	55	70
Steel ≥1.5mm to ≤3mm	45	55
Steel <1.5mm	35	45

TABLE 4. MINIMUM COATING THICKNESS ON ARTICLES THAT ARE CENTRIFUGED TO SANS 121:2011 (ISO 1461:2009)

Diameter of the article	Local coating thickness min, µm*	Mean coating thickness min, µm*
≥6mm diameter	40	50
<6mm to <20mm diameter	20	25

See notes 1 and 2, including variance in coating thickness.