HOT DIPPED GALVANISED STEEL LIGHTING COLUMN ROOT PROTECTION

"PROTECTING THE VULNERABLE ROOT"

Scope

To provide up to date guidance on root protection of galvanised lighting columns in the light of changes in available paint systems. It was recognised that most root protection was by applied paint or bitumen systems but that Thermoplastic coatings are also available and have been in use for some time.

Introduction

Over the years changes have taken place to the design of steel lighting columns. Improvements were made to designing out known problem areas for trapping and retaining moisture, particularly around the swage and bracket fixing areas, which contributed to corrosion cells forming.

Some 40 years ago steel lighting columns would probably have been primed in a variety of single pack materials and usually finished painted on site with single pack paint, often alkyd type finishes.

Additional root protection would have come from the application of a Bitumen solution. However, lighting columns were manufactured from the structural sections available and this would generally result in the column having a high residual strength.

The early 70's saw the introduction of the Metal Spray System being applied to the external surfaces of steel lighting columns.

This method of application required the surface to be cleaned by mechanical abrasion, which was a major step forward in surface preparation. While it would be fair to say the aluminium or zinc used in the metal spray process would have improved root protection externally, it did not address the internal corrosion concerns for lighting columns.

At this time it was still common practice to apply a Bitumen solution to the internal surface of the column and externally to the root as additional protection.

In the early 80's, with the introduction of BS5649, cold-formed sections were being offered with a wider range of thicknesses.
This resulted in thinner columns with less additional residual strength being supplied as compared with those designed to BS1840.

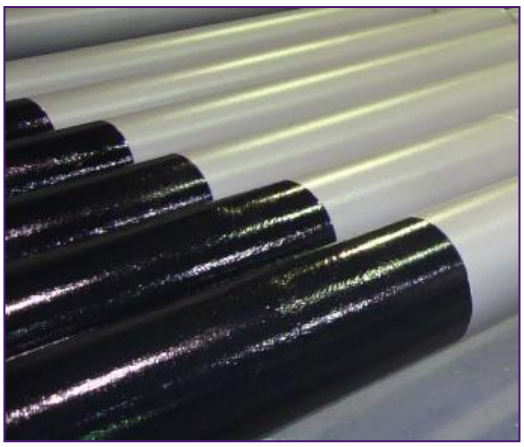
However, root protection did not appear to be high on the agenda in the discussions taking place on the protection of galvanised lighting columns.

By the early 90's the Highway Agency Series 1900, Protection of Steelwork Against Corrosion, was being readily used and made some significant changes to the way galvanised lighting columns were to be protected. In particular, the introduction of Epoxy Primers and Pitch Epoxy or Coal Tar Free Epoxy as the additional root treatment was designed to offer improved performance and durability extending the life of galvanised and metal-sprayed lighting columns.

Paint Systems

Bitumen

This type of root treatment has been around for a very long time and is predominantly used on traffic poles and signposts. There is a view that it offers very little in the way of root protection in aggressive ground conditions. Should a low cost option be required then a Vinyl Copolymer MIO/ Sheen finish would be a more suitable alternative. However, bitumen protection should not be ruled out completely as it has performed well in many areas.



Vinyl Copolymer

Customer requirements for single pack high performance bespoke paint specifications have seen the introduction of Vinyl Copolymer resin type paint systems. Vinyl Copolymer root treatments complement the paint system incorporating Micaceous Iron Oxide (MIO) or Glass Reinforcement, designed to offer excellent barrier protection, durability and performance.

Moisture Cured Urethane

This type of single pack high build finish can also be used for the protection of root treatments. It will provide an abrasion resistance finish and offers low temperature curing properties.

Highway Agency G1, G2a, G2b

The latest version of Highway Agency Series 1900 makes use of the latest type of Epoxy Micaceous Iron Oxide (MIO) for the Additional Root Treatment Primer (Item 121).

There are two optional root finishes in the current HA G1, G2a, G2b systems; Two Pack Coal Tar Free Epoxy Polyamide Cured Black (Item 151), which is suitable for sprayed application in works, and Two Pack Pitch Epoxy (Item 150) suitable for brush application.

Epoxy MIO/Glass Reinforced Epoxy

With the introduction of the latest Epoxy resins and laminar filler pigmentations, improved lighting column root protection is now available. Excellent adhesion and barrier protection can be found from the Two Pack Extended Cure Epoxy MIO (Item 121).

Additional barrier protection from the Glass Reinforced Epoxy will provide a hard, durable coating designed to withstand weed control chemicals, soil contamination and dog urine.

Thermoplastic Coatings

Modified thermoplastic coating systems are now applied to lighting column roots and have been used for the corrosion protection of steel and galvanised metal in adverse environments for over 20 years.

They are usually supplied in powder form and can be applied by a variety of techniques including fluid-bed dipping, electrostatic spraying and flock spraying in thicknesses from 200-600 microns.

Root Back Filling

Whichever root protection system is adopted it should be recognised that careless and inappropriate back filling can damage the system and reduce its effectiveness. Coarse, irregular aggregates in the backfill, be it natural or concrete, should be avoided.

Conclusion

When choosing a root protection system the specifier should take into account the need to prevent corrosion, resist mechanical abrasion and also attack from electrolytes in the ground water that can cause the material of the root to be conducted onto surrounding objects by electrolytic action, these factors may vary from site to site.

By choosing the correct root treatment, applied in accordance with the manufacturer's product data sheets, the expected life of galvanised lighting columns can be assured.

For paint systems there is strong support for a root protection system comprising Two Pack Extended Cure Epoxy MIO (Item 121) applied at 100 microns dry film thickness and Two Pack Glass Reinforced Epoxy applied at 200 microns dry film thickness, giving a total dry film thickness of 300 microns which will offer a superior root protection.
It will also complement a high performance paint system for galvanised lighting columns comprising Two Pack Polysiloxane, Two Pack Urethane, or Two Pack Acrylic for the upper sections offering customers a much better paint system than many current but out dated specifications.

However, acid modified thermoplastic coatings should also require very little maintenance and can be repaired on site.

Considered and approved by
The Lighting Column Technical Forum
assisted by
Alan Wakelin MI CORR (LCTF)
Senior Field Sales Manager for Dacrylate Paints Ltd.