Written on behalf of MG Duff Limited

Inspection Report

This report concerns the Dry Film Thickness readings taken on the Zinga coatings that were applied onto the steel beams during the works being carried out below the pavement at 120 Oxford Street, Central London.
The readings were taken by the contractor.

Personnel Present		
Name	**Title**	**Company**
John Butcher	Site Management Engineer	City Remedial
Lee Threadgo	Site Operations Engineer	City Remedial

Customer address:
City Remedial
CP House, Otterspool Way,
Watford
WD25 8HR

Date: 23-03-21	**Your ref:** John Butcher	**Inspection date:** 18-03-21	**Account no: N/A**	**Ref**: 21-057

CONTRACTORS PHOTOGRAPHS

Inspection of DFT's:

This inspection of the dry film thickness of the Zinga layer on the beams beng renovated below Oxford Street in London was carried out by the contractor who has purchased a new DFT gauge. As several of the readings appear to be in excess of 300µm DFT, it raises some concerns. We requested some photographs of the beams taken before the Zinga application in order to verify their surface-condition before the coating application.
They have not yet been received, and it is difficult for us to understand the surface topography of the steel beams.

If they were old beams, then the random high values would be acceptable, as many of the old beams displayed surface corrosion, and in some cases "scalloping' where the surface was showing some elongated 'dips' in the surface, as opposed to pits in the surface. 'Scalloping' can account for an additional 50 or 60µm DFT, and in some cases even over 100µm DFT on some areas. However, there were also some new beams installed where the surfaces would be have been completely true before any blast-cleaning and coating was commenced.

We sent some metallic wet-film thickness gauges (aka 'paint combs') to City Remedial and informed them that if the Zinga was diluted at 5% and applied at 150 µm WFT, then normally it will always dry around 90µm DFT.
With these gauges and the DFT gauge, the coatings can be monitored in both wet and dry states, and so providing greater accuracy for the painters. I do have some concerns that un-trained or un-certified painters may not set-up the gauge correctly before each use (using the shims supplied) and they may not realise the importance of the sue of wet-film gauges.

The use of of wet-film gauges is covered by standards such as ASTM D4414A, ISO 2808-1A and several others, and this highlights the importance of the correct use of these gauges. The DFT gauges are comprehensively covered by the SSPC-PA2 Standard (I sent a photograph showing the grouping of gauge-readings to obtain 'spot' readings, which are very accurate and will weed-out any odd or onerous readings) and it also shows the upper and lower threshold limits for coating systems.
This data is not within the scope of written project specifications, as industrial coaters are expected to have a good background knowledge of these things, and a lack of this knowledge can potentially lead to complications on site.

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1. This reading shows 333µm DFT, and this is excessive. Where 180 µm DFT has been specified, we work to SSPC-PA2 like thousands of other people in the industry, and the upper threshold limit that we work to is always 120% of the specified figure. In this case it is 180 x 120% = 216 (220 rounded-up). This beam looks like a new installation, so without seeing the 'before' photos it looks very high.

2. This fgure of 287µm DFT could be a very high reading, or there could be surface undulations or ‘scalloping’over a small area. This is the reason that coating inspectors take spot-readings ie three readings taken within the size of a hand. If two are showing, for example, 220 and one is showing 300 µm DFT then the chances are that it is an errneous reading.

3. This reading is showing a value of 306µm DFT and the beam looks like a new one, so without any ‘before’ photographs we have to assume that the reading is very high. If it is a new beam with hih readings, then the coating must be checked carefully for micro-cracking on inside corners where the film-build tends to be higher.

4. This reading is lower than the others but still very high.

5. This reading is within the specified range.

6. This reading is well within range.

7. This reading is right on the threshold and so totally acceptable.

8. This reading was taken over an old beam, so surface corrosion defects could account for this high reading.

Conclusions

1. Not all of the photographed readings are shown above, but the ones shown give a good general idea of the range of values being recorded.

2. The high readings indcate that the specified minimum 180µm DFT has been achieved on all beams, but several exceed the normal upper threshold-limit of 220µm DFT according to SSPC-PA2.

3. The danger in having high values could mean that the inside angles of beams and any welded or bolted cluster-joints would have an excess of the recorded value due to overlapping brush-strokes in these areas, and this can result in values exceeding 400µm DFT or more, with a danger of micro-cracking.

4. As stated within the Technical Data Sheets for Zinga, the maximum upper threshold limit for a Zinga coating is always 250µm DFT.

END