

National Asset Delivery Technical Surveys and Testing

Works Information for 570135 M5 J19- 20 Structures Steelwork and Paint Testing surveys

CONTENTS AMENDMENT SHEET

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1 DESCRIPTION OF THE WORKS

1.1 Project Objectives

1.1.1 The principal objective of the project is to undertake steel testing works on 5 structures located across the Gordano Valley, between Junctions 19 and 20. The findings will inform the Value Management process. The following specification sets out the testing scope for the following structures:

- (1) Clapton Footbridge (1769)
- (2) Clapton Road (1766)
- (3) Naish Hill (1767)
- (4) Wynhol Viaduct Northbound (11071)
- (5) Wynhol Viaduct Southbound (1770)

1.1.2 The specification that applies to the *Works* is included in Section 3.

1.1.3 The requirements contained in GG 101 shall be followed in respect of activities covered by this document.

1.2 Scope of works

To determine the appropriate level of information, the *Contractor* shall perform the following investigations:

- 1) Testing to the parapet steel and structural steel elements of structures as detailed in Section 3;
- 2) Ultrasonic thickness testing to the parapets and structural steel elements.
- 3) The number of tests to be undertaken per structure are shown in Table 1, below. The proposed testing locations are shown in the work information package.

Structure	Pull-off tests	Paint sample locations	Ultrasonic thickness tests	Dry film thickness test	Coating identification
Naish Hill (1767)	12	6	12	12	2
Clapton Footbridge (1769)	10	7	13	10	2
Clapton Road (1766)	8	3	12	8	2
Wynhol Viaduct Northbound (11071)	8	4	8	8	1
Wynhol Viaduct Southbound (1770)	8	4	8	8	1

Table 1 - Steel Test types and numbers of tests

1.2.1 Testing to the parapet and structural steel coatings

The scope of this survey is as follows:

- 1) Determine whether and to what extent maintenance painting of the protective coating is required i.e. localised paint repairs or full repainting of structure elements;
- 2) Determine the condition of the protective coating to a structure and categorise it in accordance with the categories of failure given in ISO 4628;
- 3) Determine pull-off adhesion and dry film thickness values of the protective coating;
- 4) Determine the nature and composition of the protective coating, including whether it is convertible or non-convertible;
- 5) Determine the presence of any toxic element content including lead, cadmium, chromium, arsenic, aluminium and zinc;
- 6) Determine the resin type of the paint coats;
- 7) Establish the extent, intensity and methods of surface preparation that will be required to ensure the satisfactory performance of a maintenance paint system;
- 8) Recommend a Highways England approved maintenance painting specification;
- 9) Recommend measures to deal with any health and safety risks and risks to the environment;

- 10) Recommend measures to deal with waste including any hazardous waste;
- 11) Gather the information necessary to develop an accurate bill of quantities for the maintenance painting works;
 - a. Number and dimensions of localised areas of paint deterioration and damage that would need to be repaired;
 - b. Dimensions including the area of painted elements.

1.2.2 Ultrasonic thickness gauge testing to the parapets and structural steel

The scope of this survey is as follows:

- 1) Determine the thickness of elements at the areas tested;
- 2) Confirm record information;
- 3) Determine whether and to what extent steel deterioration and section loss has occurred;
- 4) Gather the information necessary to develop an accurate bill of quantities for the Value Management works;
 - a. Dimensions of areas of deterioration and section loss to the steel;
 - b. Identify appropriate repair methodology e.g. over-plating.

1.2.3 Dry film thickness testing to the parapets and structural steel

The scope of this survey is as follows:

- 1) Determine the thickness of the coating at the areas tested;
- 2) Confirm record information.

1.2.4 Paint and Steel Defect Survey

A visual survey shall be undertaken to the entirety of the bridges listed in Section 1.1.1, including the steel and steel coatings of any structural steel elements and parapets. The type, make and containment of the parapet should also be recorded as part of the visual survey. Full extents of the steel defects and areas of deterioration are to be recorded and catalogued with a referenced photograph.

All information gathered from site shall be retained for reporting purposes. Deliverables are defined in Section 1.3.

1.3 Deliverables

The *Contractor* is required to produce the following deliverables:

1.3.1 The *Contractor* is required to present the findings of the site surveys in a detailed testing report. The report shall be issued in PDF format and Microsoft Word format. All deliverables shall be provided in a timely manner. There are to be 4 No. separate reports per structure, the reports are to be as follows;

- a) Paint sampling test findings
- b) Ultrasonic thickness test findings
- c) Dry Film thickness test findings
- d) Paint and Steel Defect survey

1.3.2 The Paint sampling test report is to contain the following information:

- a) Date, temperature, weather conditions and test locations;
- b) Location and description of the components under investigation;
- c) Description of the apparatus used for pull-off testing;
- d) A summary table of pull-off testing readings, condition and description of the sample pulled off and mode of failure. Any results that have exhibited glue failure should be repeated until a different mode of failure is recorded i.e. adhesive or cohesive;
- e) Place and date of the laboratory analysis;
- f) Toxic element content in paint samples as % by sample tested. The summary shall record whether the toxic element content is deemed to be low / intermediate / high as applicable;
- g) Copies of the laboratory testing results for each of the paint samples tested;
- h) Copies of the UKAS accreditation for any testing laboratories used;
- i) Photographic record at each location, before, during and after the paint testing works;
- j) A photographic record of the survey with at least one photograph per test location, and any defects noted during the inspection;
- k) Date and place of sampling and other relevant details supplied with the sample. This shall be in the form of a series of sketches showing the location of each sample;
- l) Sketches showing the extent and position of any deterioration of the steel adjacent or on the test areas and measurement of any section loss.

1.3.3 The Ultrasonic thickness testing report shall cover all relevant aspects in Section 1.3.2. The reporting of defects shall include:

- a) Date, temperature, weather conditions and test locations;
- b) Location and description of the components under investigation;
- c) Description of the apparatus used for ultrasonic thickness testing;
- d) A summary table of ultrasonic thickness measurements and condition of the steel at the sample area;
- e) A photographic record of each test location with at least one photograph per test location, and any defects noted during the inspection;
- f) Sketches showing the extent and position of any deterioration of the steel adjacent or on the test areas and measurement of any section loss.

1.3.4 The Dry Film thickness testing report shall include the following information:

- a) Date, temperature, weather conditions and test locations;
- b) Location and description of the components under investigation;
- c) Description of the apparatus used for pull-off testing;
- d) A summary table of coating thickness measurement, in microns and any coating defects noted in the surrounding area;
- e) A photographic record of each test location with at least one photograph per test location, and any defects noted during the inspection.

1.3.5 The Paint and Steel Defect Survey report shall contain details on visual condition of steel, extents of deterioration and dimensional survey of defects to bridge deck, piers and parapets. The type, make and containment of the parapet should also be recorded. Each noted defect shall have a unique identification reference used on all produced documentation. The report is to include defect mapping with location and extents of all steel defects shown on drawings. The order of stating dimensions shall be consistent and generally in the sequence of length, width and depth. The report shall also include close-up views of any steel defects found, and photographs of any exposed steel and/or corroded areas.

2 CONSTRAINTS ON HOW THE CONTRACTOR PROVIDES THE WORKS

2.1 General

- 2.1.1 The *Contractor* Provides the Works in such manner as to minimise the risk of damage or disturbance to or destruction of third party property.
- 2.1.2 The *Contractor* complies with the constraints and meets with the requirements outlined in drawings accompanying the Works Information package.
- 2.1.3 The *Contractor* submits information detailing how the *Contractor* will provide the Works to the *Employer* prior to the mobilisation. This information will include any lifting plans, risk assessments, method statements, the *Contractor's* staff training information and any other relevant Health and Safety requirements.

2.2 Working hours & site specific constraints

- 2.2.1 Any required lane closures on the M5 shall be deemed as taking place during night-time hours. Any lane closures on non-trunk roads shall be deemed to take place during daylight hours.
- 2.2.2 The *Employer* is to provide all traffic management. The *Contractor* must specify what closures are required. Full road closure will not be allowed under this contract, unless it is deemed critical for the completion of the *Works*.
- 2.2.3 The Traffic management is to be off peak lane closures. Night time working windows shall be assumed as Monday to Friday between the hours of 23:00hrs and 05:00 hrs (but will be subject to actual traffic conditions).
- 2.2.4 Bats have been recorded roosting in the Wynhol Viaduct Lower Northbound and Upper Southbound structures. These include the Lesser Horseshoe Bat (*Rhinolophus Hipposideros*). This is a major colony with upwards of 100 bats observed. It is anticipated that works will adopt a precautionary approach, be restricted to avoid maternal and hibernating seasons and specific working hours with the following constraints:
 - a) Highways England will obtain any Natural England licenses required for works in close proximity to bat roosts. The *Contractor* is to work in accordance with the Natural England requirements and constraints.
- 2.2.5 Pipes associated with the structure are predominantly asbestos cement pipes. These pipes are not to be interfered with as part of these works. The *Contractor* will be provided with all asbestos information prior to the commencement of the *Works*.

2.3 Health, Safety and Environment & Risk Management

Health and Safety requirements

- 2.3.1 In Providing the Works the *Contractor* meets the requirements of Annex 2 of the supplementary constraints in relation to health and safety duties.
- 2.3.2 When implemented, the *Contractor* shall comply with the requirements of the *Employer's* safety passport scheme and ensure that all employees, and any of their subcontractor's, are registered in accordance with the implementation of the scheme.
- 2.3.3 For details of the CDM duty holders, refer below:

Client – Highways England (*Employer*)

Principal Contractor – To be appointed by the *Employer*.

Contractor - *Contractor*

Principal Designer – Highways England (*Employer*)

Before commencing the construction phase of the *works*, the *Contractor* confirms to the *Employer* that adequate welfare facilities are in place.

Environmental requirements

- 2.3.4 In Providing the Works the *Contractor* meets the requirements of Annex 2 of the supplementary constraints in relation to environmental duties.

Risk Management

- 2.3.5 The *Contractor* identifies, manages and mitigates risks in accordance with the principles of ISO 31000.
- 2.3.6 The *Contractor* submits a risk register, which captures all risks associated with the delivery of the *works* including those identified by the *Employer*, with their tender and maintains it for the contract period.

3 SPECIFICATION FOR THE WORKS

The *Contractor* shall undertake the works in accordance with:

- 3.1.1 All works shall be undertaken in accordance with CS 450 Inspection of Highway Structures and CS 464 Non-destructive testing of highways structures;
- 3.1.2 All sampling and testing should be carried out by specialist testing firms or laboratories approved by the UK's Accreditation Service (UKAS) Body for laboratory testing to ISO/IEC 17025;
- 3.1.3 Pull-off testing should be carried out in accordance with ASTM D4541-17 and ISO 4624;
- 3.1.4 Ultrasonic thickness testing should be carried out in accordance with BS EN ISO 16809;
- 3.1.5 The Dry Film thickness testing should be carried out in accordance with ISO 19840;
- 3.1.6 A minimum representative sample of 5 grams should be collected from the areas identified in the drawings accompanying this submission, to be tested for toxic elements content;
- 3.1.7 The Paint and Steel Defect Survey is to comprise an inspection of the general condition of the steel and any steel coatings to all steel elements, within touching distance.