

**National Asset Delivery
Technical Surveys and Testing**

**Works Information for A40 Over Deck
Concrete Testing**

Scheme PIN: 603635

	Name	Signed	Date
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CONTENTS AMENDMENT SHEET

Amend. No.	Revision No.	Amendments	Initials	Date
0	0	Original version issued with tender	MD	05/10/20
1	1	Revision to proposed traffic management	MD	16/10/20
2	2	Added Scheme Pin to front page	MD	28/10/20

TABLE OF CONTENTS

1	Description of the works	4
1.1	Project objectives.....	4
1.2	Scope of works	4
1.3	Deliverables	4
2	Existing INFORMATION	5
3	Constraints on how the Contractor Provides the Works	6
3.1	General	6
3.2	Working hours & site specific constraints	6
3.3	Health, Safety and Environment & Risk Management.....	6
4	Requirements for the programme	8
5	Services and other things provided by the <i>Employer</i>	9
6	Specification for the works	10

LIST OF ANNEXES

Appendix 1 Supplementary Constraints

1 DESCRIPTION OF THE WORKS

1.1 Project objectives

1.1.1 The principle objective of this project is to undertake a visual inspection of the deck top surface and to undertake concrete testing on the A40 Over Bridge deck to determine the extent of concrete repairs to top surface of the deck. The results to be provided in the format as detailed in the specification.

1.1.2 The specification that applies to the *works* is included in Section 6

1.2 Scope of works

1.2.1 The *works* to be provided under this contract are:

- (1) Visual Inspection of the exposed deck surface and completion of concrete testing in Trial Pits 1 to 7.

1.3 Deliverables

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

- (1) Concrete testing Report including photos
- (2) Programme
- (3) Risk Assessments and Method Statements

2 EXISTING INFORMATION

2.1.1 The A40 Over Bridge carries the A40 over the River Severn adjacent to the village of Over in Gloucestershire towards the roundabout joining Over Causeway, the A40 and the A417. The carriageway at this location comprises a dual two-lane carriageway.

OSGR: 381593E, 219641N (EB); 381597E, 219621N (WB).

2.1.2 An Asbestos Action Plan for the deck exists dated April 2007 following a survey and testing carried out in March 2007 in which no asbestos containing materials were located. A survey was also carried out in May 2017 in which testing reported no asbestos containing materials. Concrete from central reservation, UPVC ducting and piping including mastic, waterproofing, expansion joint sealant, joint filler, cement at street light base plates and mechanical joint material were tested. No ACMs present or presumed to be present in areas or elements where work is planned .

2.1.3 Trial Pits were previously completed on the structure late 2016 and in 2017. The logs of which are supplied with this document.

2.1.4 The Drawings and documents listed below apply to this contract. Refer to the site information for details of existing site conditions including ground conditions, limitation on access, position of existing structures etc.

Drawing/Document Number	Title	Revision / Date
HE603635-KIER-SBR-A40_BR_6710-DR-CB-010001	Location Plan	P1
HE603635-KIER-SBR-A40_BR_6710-DR-CB-010002	Statutory Undertakers Information	P1
HE603635-KIER-SBR-A40_BR_6710-DR-CB-010003	Trial Pit Location Plan	P2
MNV.STR.1048.018.P1	2007 Initial Asbestos Report	P1

3 CONSTRAINTS ON HOW THE CONTRACTOR PROVIDES THE WORKS

3.1 General

3.1.1 The *Contractor* Provides the Works in such manner as to minimise the risk of damage or disturbance to or destruction of third party property.

3.1.2 The *Contractor* complies with the constraints and meets with the requirements outlined in Appendix 1.

3.1.3 The *Contractor* submits information detailing how the *Contractor* will provide the Works to the *Employer* prior to the *works* commencing. 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.

3.2 Working hours & site specific constraints

3.2.1 The Consultant's working hours for site works shall be 21:00 – 05:00.

3.3 Health, Safety and Environment & Risk Management

Health and Safety requirements

3.3.1 In Providing the Works the *Contractor* meets the requirements of Annex 2 of the supplementary constraints in relation to health and safety duties.

3.3.2 When implemented, the *Contractor* shall comply with the requirements of Highways England's safety passport scheme and ensure that all of his employees, and any of his subcontractor's, are registered in accordance with the implementation of the scheme.

3.3.3 For details of the CDM duty holders, refer to the pre-construction information HE603635-KIER-SBR-A40_BR_6710-CDM-CB-0001 supplied with this document. This should be read in conjunction with 'HE603635-KIER-SBR-A40_BR_6710-CDM-CB-0002'.

3.3.4 Before commencing the construction phase of the *works*, the *Contractor* confirms to the *Employer* that adequate welfare facilities are in place. Where the facilities detailed in section 5 are not deemed adequate, the *Contractor* provides all necessary facilities to Provide the Works and to comply with the minimum requirements set out in HSE guidance document L153.

Environmental requirements

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

Risk Management

- 3.3.6 The *Contractor* identifies, manages and mitigates risks in accordance with the principles of ISO31000.
- 3.3.7 The *Contractor* submits a risk register, which captures all risks associated with the delivery of the *works* including those identified by the *Employer*, with his tender and maintains it for the contract period.

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DO NOT COMPLETE AT THIS STAGE

4 REQUIREMENTS FOR THE PROGRAMME

- 4.1.1 The *Contractor* submits programme to the *Employer* with his tender.
- 4.1.2 The *Contractor* Provides the Works taking into account the following programme constraints:
- (i) The estimated *starting date* (11/01/2021) and estimated *completion date* (26/02/2021), any post site works, reporting and review period
 - (ii) The services and other things provided by *Employer* (see Section 5)
 - (iii) The timing of the works will be subject to the availability of road space, traffic management and any site-specific environmental constraints.
 - (iv) The survey report should be available within two weeks of the completion of the fieldwork.
- 4.1.3 The programme should be in the form of an activity and time related bar chart, produced as a result of a critical path analysis.
- 4.1.4 The programme should preferably be provided in either a PDF or MS Excel format and cover the full contract period including post site activities. Activities should be clearly defined and named, and the programme should detail the following:
- (i) Dates and times associated with the project, including the *starting date*, *completion date* & *Contractor's* planned completion, and any other dates or times that will specifically impact the delivery of the project.
 - (ii) For each activity, the proposed resources (plant & labour) expected to deliver each activity should be shown on the programme.
 - (iii) Review periods for any reporting requirements.
 - (iv) Key dates for the Client to provide 'services and other things.
 - (v) Key dates for co-ordination with Others.
- 4.1.5 The *Contractor* updates the programme every week. The *Contractor* submits an updated programme to the *Employer* upon request.

5 SERVICES AND OTHER THINGS PROVIDED BY THE *EMPLOYER*

5.1.1 The following temporary traffic management will be provided by the *Employer* to allow the *Contractor* to Provide the Works:

- (1) Actual Traffic Management arrangement are not confirmed at this stage; the proposed layouts are as follows
 - Trial Pit P1, TP3, TP4 and TP6 to be completed under closure of Westbound Lane 1 and Slip Road.
 - Trial Pit TP5 and TP8 to be completed under closure of Westbound Lane 2.
 - Trial Pits TP2 and TP7 to be completed under closure of Eastbound Lane 1.

5.1.2 The traffic management provider will act as the Principal Contractor.

5.1.3 The other things that will be provided by the *Employer* are as follows:

- (1) Welfare facilities will be provided by the Principal Contractor.

6 SPECIFICATION FOR THE WORKS

6.1.1 The *Contractor* shall undertake the works in accordance as follows:

Requirements for concrete investigation including:

1) Physical Surveys:

The extent and type of repair to be undertaken shall be confirmed on site following inspection of the exposed concrete with the Overseeing Organisation. This may include the following surveys which shall be conducted by a competent person with a representative from the Overseeing Organisation.

2) Visual Inspection & Hammer Tap Survey

The visual inspection and hammer tap survey shall be completed at each trial pit and cover all exposed concrete. The extent and nature of defects found shall be recorded, including delamination, crack widths and spalling. The contractor shall record the size and location of each defect and provide a copy to the Overseeing Organisation on completion of works.

3) Covermeter Survey

All covermeter surveys shall be carried out using an accurate meter and in accordance with BS1881-204. The survey grid shall cover the whole area of the exposed concrete in the trial pit (for more information see (V4) Series NG 5700 Clause 5706 – Contractor Investigation). It shall be marked out on the test surfaces and provided with a set of arbitrary grid coordinates. The covermeter shall be calibrated by measuring the cover at a location where the reinforcement is exposed, or by limited breakout and exposure of reinforcement.

4) Half-cell Electro-potential test (to be confirmed following visual inspection & hammer tap survey)

- Half Cell potential testing to be undertaken in accordance with ASTM C876-09, Concrete Society Technical Report 60 and ASTM C876-15 “Standard Test Method for Corrosion Potentials of uncoated reinforcing steel in concrete”.
- The test apparatus shall comprise of a voltmeter and either a copper-copper sulphate half-cell reference electrode or a silver-silver chloride half-cell reference electrode. The dimension of the survey grid shall be 300 x 300 with electrical connection, with electrical connection to the reinforcement at either the exposed area or the broken-out area made for the covermeter survey. The Contractor shall make a written record of the survey results for each test area and shall record the survey

results of the testing in tabular format using the grid coordinates and as contour plots.

- 5) Chloride-ion content test (to be confirmed following visual inspection & hammer tap survey)
- In-situ testing for Carbonation to be undertaken in accordance with BSEN 14630.
 - In-situ testing for Chlorides to be undertaken in accordance with BSEN 14629.
 - Concrete dust samples shall be taken from each trial pit. Samples to be taken from original construction concrete.
 - The concrete dust samples shall be taken at positions which coincide with the grid used for the half-cell test. Sample positions should take into account the General Arrangement shown on contract drawings, with the samples being taken in those areas with the most negative electro-potential.
 - The positions, for a maximum number of 6 samples per trial pit to be taken, shall be agreed with the Overseeing Organisation.
 - Dust samples shall be taken at depth increments of 5mm to 25mm, 25mm to 50mm and 50mm to 75mm, with an additional deep drilling to 100mm depth for measurement of the background chloride.
 - The chloride-ion content results shall be stated in comparison to the mass of cement.
 - The testing laboratory shall hold appropriate UKAS accreditation for testing of the chloride-ion content in accordance with BS 1881: Part 124.
- 6) Cement Content Test (to be confirmed following visual inspection & hammer tap survey)
- Concrete dust samples shall only be taken from each trial pit. Samples to be taken from original construction concrete.
 - The testing laboratory shall hold appropriate UKAS accreditation for testing of the cement content in accordance with BS 1881: Part 124.
- 7) Concrete Resistivity Test (to be confirmed following visual inspection & hammer tap survey)
- Concrete resistivity shall be measured on site as a non-destructive test e.g. four-probe method/ two-probe method.

- A minimum of five readings of resistivity should be taken at each test location.
- In areas of concrete with high reinforcement probes should be positioned at right angles to the reinforcement.
- The testing laboratory shall hold appropriate UKAS accreditation for testing of concrete resistivity in accordance with BS 1881: Part 201 "Guide to the use of non-destructive methods of test for hardened concrete".
- These may not be necessary as normally only used to confirm any intact but excessively contaminated concrete to be removed in addition to the delaminated concrete. It isn't necessary to remove intact but contaminated concrete, if galvanic anodes are used within repairs.

8) Requirements for reporting.

Where a concrete investigation is required, the contractor shall supply the Overseeing Organisation with a copy of the report on concrete condition for each structure.

Test	Location	Total Quantity
Visual and Hammer Tap Survey	1 per trial pit	7
Covermeter Survey	1 per trial pit	7
Half Cell Test	1 grid per trial pit	7
Chloride Ion Test	6 per trial pit	42
Cement Content Test	1 per trial pit	7
Resistivity Test	5 per trial pit	35