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National Asset Delivery
Technical Surveys and Testing

Works Information for 570122
M5 J26 – 27 SB 227 – 229.5 RS
Core, DCP & PAK Surveys

CONTENTS AMENDMENT SHEET

Amend. No.	Revision No.	Amendments	Initials	Date
0	0	Original version issued with tender	CC	25/05/21

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LIST OF ANNEXES

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1 DESCRIPTION OF THE WORKS

1.1 Project objectives

1.1.1 The principle objective of this project is to undertake pavement investigations consisting of 150mm diameter cores, DCP & PAK tests at the locations specified on drawings 526-M5 26 – 27 SB 227 – 229.5-RS-101-103 and provide subsequent report in accordance with 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) Undertake 38no. 150mm diameter cores within the pavement at the locations specified on drawings 526-M5 26 – 27 SB 227 – 229.5 RS-101-103 and 526-M5 26 – 27 SB 227 – 229.5 RS-Additional Core Schedule

(2) Undertake 12no. DCP tests at the locations specified on drawings 526-M5 26 – 27 SB 227 – 229.5 RS-101-105 and 526-M5 26 – 27 SB 227 – 229.5 RS-Additional Core Schedule

(3) Undertake PAK tests on 150mm diameter cores to determine the presence of tar bound materials (TBM)

1.3 Deliverables

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

(1) Provide subsequent report in accordance with the specification in section 6

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2 EXISTING INFORMATION

2.1.1 For information about the site refer to document 526-M5 26 – 27 SB 227 – 229.5 RS Site Information

2.1.2 For statutory undertaker's apparatus information refer to provided C2 returns in Pre-Construction Information Pack

2.1.3 The Drawings 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 Number	Title	Revision / Date
526-M5 26 – 27 SB 227 – 229.5 RS-101	Core Location Plan Sheet 1	C1 / 21/05/21
526-M5 26 – 27 SB 227 – 229.5 RS-102	Core Location Plan Sheet 2	C1 / 21/05/21
526-M5 26 – 27 SB 227 – 229.5 RS-103	Core Location Plan Sheet 3	C1 / 21/05/21

2.1.4 For photographic information of core locations refer to Appendix 2 - 526-M5 26 – 27 SB 227 – 229.5 RS – Additional Photos

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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.

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3.2 Working hours & site specific constraints

3.2.1 Access to the site for undertaking works will not be possible without the provision of traffic management (TM) – This will be provided by *the Employer* through the CWF

3.2.2 The *Contractor's* working hours for site works are 22:00 hrs to 04:00 hrs and subject to the installation and removal of TM

3.2.3 Due to the requirement for (TM) and specialist access, it is envisaged that the works will be restricted to night-time shifts. TM shall not be implemented prior to the hour of 20:00 hrs nor removed later than 06:00 hrs. Late installation / early removal of TM or alteration to the length of closure may occur subject to the recorded on-site traffic flow. It is anticipated that in most cased, TM removal will commence at 04:00 hrs to allow sufficient time for removal

3.2.4 TM layout to be lane closures with single lane running and to be in accordance with Traffic Signs Manual (TSM) Chapter 8

3.2.5 Survey to be undertaken concurrently with other surveys to minimise traffic management requirements and disruption to public.

3.2.6 Any site and task specific lighting shall be directed away from dense vegetation and shall be positioned such that it does not cause a hazard to on-coming road users.

3.3 Health, Safety and Environment & Risk Management

<u>Health and Safety requirements</u>

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 which can be found here:

(1) 526-M5 J26 – 27 SB MP 227-229.5 RS Combined PCI

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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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 *starting date* and *completion date* and any post site works, reporting and review period

(ii) The services and other things provided by *Employer* (see Section 5)

(iii) Survey to be undertaken concurrently with other surveys to minimise traffic management requirements and disruption to public. The programme is to take this into account.

(iv) Survey results and report to be made available 2 weeks after completion of works on site

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) The starting date, completion date & Contractor's planned completion
(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 Employer to provide 'services and other things'
(v) Key dates for co-ordination with Others
(vi) 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
(vii) Activities associated with delivering the project

4.1.5 The *Contractor* updates the programme every week. The *Contractor* submits an updated programme to the *Employer* upon request.

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5 SERVICES AND OTHER THINGS PROVIDED BY THE *EMPLOYER*

5.1.1 The following temporary traffic management will be provided by the *CWF TM contractor who is* Principle *Contractor* to Provide the Works:

(1) Lane closures on the southbound carriageway leading up to and beyond works extent between Marker Posts 227.0-229.5. Works to take place at night.

5.1.2 Principal contractor will provide welfare facilities

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6 SPECIFICATION FOR THE WORKS

6.1 General

6.1.1 The *Contractor* shall undertake the works in accordance with: DMRB: CS229 Data for pavement assessment

6.1.2 Core and DCP locations are referenced against the Highways England Network Referencing system

6.1.3 Core and DCP testing are shown on drawings 526-M5 26 – 27 SB 227 – 229.5 RS-101-103 & Appendix 1 - 526-M5 26 – 27 SB 227 – 229.5 RS Additional Core Schedule.

6.1.4 Any additional requirements and the locations where DCP tests are required are also shown in Appendix 1 - 526-M5 J14-15 SB MP 125 - 129.5 RS - Additional Core Schedule. For coring requirements refer to 6.2. For DCP testing refer to 6.3.

6.1.5 For photographic information of core locations refer to Appendix 2 - 526-M5 J14-15 SB MP 125 - 129.5 RS - Additional Core Photos.

6.2 Pavement Core and PAK Requirements

6.2.1 150mm cores are to be taken in the pavement at the locations specified at the locations specified on drawings 526-M5 26 – 27 SB 227 – 229.5 RS-101-103 and in Appendix 1 - 526-M5 26 – 27 SB 227 – 229.5 RS - Additional Core Schedule.

6.2.2 Core locations are to be recorded and referenced against the network sections to an accuracy of ±1m longitudinally and ±0.1m transversely from the nearside lane edge

6.2.3 GPS co-ordinates shall be recorded using a device capable of sub-metre accuracy.

6.2.4 Services to be located using cable detection devices by a trained and competent operator prior to coring taking place

6.2.5 Where rut profiles are required the following procedure shall be followed:

1) Three transverse locations are marked out across the rut at a spacing of approximately 0.5m
2) Manual rut depth measurements are undertaken using a minimum 2m long, type 2 straight edge using the method descried in BS 8420 [Ref 9.N]
3) The surface of the core is marked to preserve orientation
4) A core is extracted at each location
5) The thickness of each later is measured in each core
6) The layer thicknesses from the three cores are used to identify which layer(s) have thinned

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6.2.6 For each core, a full record of the core details must be made in the form of a core log. The core logs must include photographs including the following:

a) Where a defect is apparent in the core, the face with the defect shall be shown in the photograph
b) Where the defect obscures other details of the core then an additional photograph of another side of the core
c) Where a later is missing from a core because it was disintegrated, the photograph shall show the intact layers of the core with a gap left for the missing layer
d) A photograph showing the material from any disintegrated layers
e) Photographs of the pavement surface prior to coring, down the core hole and of the core shortly after extraction
f) The reinstated core hole

6.2.7 The following reference information must be stated on the log sheet for each core:

a) Unique core reference
b) Section reference and chainage
c) GPS coordinates
d) Traffic direction
e) Lane and offset (and datum used e.g. nearside lane edge)
f) Coring date and time
g) Pavement condition at core location including presence of cracks and their orientation and rut depth
h) The reason the core was extracted

6.2.8 The following details must be stated on the log sheet for each core:

a) Thickness of each bound layer
b) Any missing layers
c) For each layer as appropriate:
    i. Type of material present
    ii. Possible presence of tar bound layer (from PAK test)
    iii. Condition of the material
    iv. Stripping of binder from aggregate (if present)
    v. Condition of bonding layers
    vi. Presence of detritus where there is a lack of bond between layers
    vii. Voiding and segregation (if present)
    viii. Crack depth and severity, soft or otherwise, deleterious aggregate, bleeding and other peculiarities
d) The total depth of cracking (if present)
e) The nature of the material at the bottom of the core hole (e.g. crushed stone)

6.2.9 Cores shall be retained for a minimum of three months after the reporting of the core log

6.2.10 Cores to be cleaned and then tested with PAK marker spray to determine if there are any Polycyclic Aromatic Hydrocarbons present within each construction layer. Results of PAK testing to be included on the core log sheet.

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6.3 DCP Test Requirements

6.3.1 DCP testing is to be undertaken in the core locations specified in Appendix 1 – 526-M5 26 – 27 SB 227 – 229.5 RS Core Schedule & in drawings 526-M5 26 – 27 SB 227 – 229.5 RS-101-103. DCP testing to be undertaken following completion of coring.

6.3.2 The DCP equipment shall be as described in ORN18 [Ref 1.N]

6.3.3 The cone shall be inspected before use and shall be replaced if there are signs of visible damage or if its diameter has been reduced by 10%

6.3.4 The depth of penetration shall be recorded at approximately 10mm increments

6.3.5 The results (blows against depth shall be recorded on a DCP test log

6.3.6 The following reference information for the DCP test is to be recorded and linked to the reference information at the core hole the test was undertaken in :

a) Unique DCP reference number
b) Core hole number
c) Core hole depth
d) Zero error
e) Section reference and chainage
f) Traffic direction
g) Lane and offset (and datum used)
h) GPS coordinates
i) Date and time of test

6.3.7 The data should be plotted as the cumulative number of blows (positive x axis) against depth of penetration relative to the pavement surface (negative y axis).

6.3.8 Changes in the slope of the plotted data indicates a change in strength and/or material type. The thickness of different strength layers are usually determined by inspection and the average penetration rate, in mm per blow calculated for each.

6.3.9 The average penetration for each material layer is to be calculated and used in the following formula to compute CBR values

$$CBR = 10^{(2.48-1.057\times Log_{10}P)}$$

Where P is the average penetration rate for each layer (mm per blow)

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Appendix 1 - 526-M5 26 – 27 SB 227 – 229.5 RS Additional Core Schedule

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