

**National Asset Delivery
Technical Surveys and Testing**

570122

**M5 26 – 27 SB 227 – 229.5 RS
Core, DCP & Tar Testing Surveys**

CONTENTS AMENDMENT SHEET

Amend. No.	Revision No.	Amendments	Initials	Date
0	0	Original version issued with tender	ET	20/04/20

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LIST OF ANNEXES

Appendix 1 Supplementary Constraints

FOR INFORMATION ONLY

1 DESCRIPTION OF THE WORKS

1.1 Project objectives

- 1.1.1 The principle objective of this project is to undertake 150mm diameter cores at the locations specified on drawings 526-M5 26 – 27 SB 227 – 229.5-001, 526-M5 26 – 27 SB 227 – 229.5-002 & 526-M5 26 – 27 SB 227 – 229.5-003 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 33no. 150mm diameter cores within the pavement at the locations specified on drawing 526-M5 26 – 27 SB 227 – 229.5-001, 526-M5 26 – 27 SB 227 – 229.5-002 & 526-M5 26 – 27 SB 227 – 229.5-003 & table 6.1
 - (2) Undertake 17no. DCP tests at the locations specified in table 6.1
 - (3) Undertake PAK and PAH testing on cores to determine presence of tar bound materials (TBM)

1.3 Deliverables

- 1.3.1 The *Contractor* is required to produce the following deliverables:
- (1) Provide core logs showing depth of pavement construction layers, results of the DCP testing and results of PAK testing (and further testing as required) in accordance with the specification in section 6

2 EXISTING INFORMATION

- 2.1.1 For information about the site refer to document 526-M5 26 – 27 SB 227 – 229.5 RS-006 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 – 229.5-001	Defect and Treatment Plan Sheet 1	C1 / 18/03/2020
526-M5 26 – 27 SB 227 – 229.5-002	Defect and Treatment Plan Sheet 2	C1 / 18/03/2020
526-M5 26 – 27 SB 227 – 229.5-003	Defect and Treatment Plan Sheet 3	C1 / 18/03/2020
526-M5 26 – 27 SB 227 – 229.5-004	Core location photos	-
526-M5 26 – 27 SB 227 – 229.5-005	Core location photos	-

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 Access to the site for undertaking works will not be possible without the provision of traffic management – This will be provided by the *Employer*
- 3.2.2 Due to the requirement for Traffic Management (TM) and specialist access, it is envisaged that works will be restricted to night-time shifts. Temporary Traffic Management (TTM) shall not be implemented prior to the hour of 20:00 hrs nor removed later than 06:00 hrs. Late installation / early removal of Traffic Management or alteration to the length of closure may occur subject to the recorded on-site traffic flow. It is anticipated that in most cases, Traffic Management removal will commence at 04:00 hrs to allow sufficient time for removal.
- 3.2.3 Traffic Management layout to be confirmed and to be in accordance with Traffic Signs Manual (TSM) Chapter 8.
- 3.2.4 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.
- 3.2.5 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

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 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. Details on the scheme can be found here:

<http://www.highwaysafetyhub.com/safety-passport.html>

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 227-229.5-011 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.

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)
- 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.

5 SERVICES AND OTHER THINGS PROVIDED BY THE *EMPLOYER*

5.1.1 The following temporary traffic management is anticipated being provided by the *Employer* to allow the *Contractor* to Provide the Works:

- (1) Full closure of the south bound carriageway

5.1.2 Welfare Facilities (to be provided by the *Principle Contractor*)

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6 SPECIFICATION FOR THE WORKS

6.1.1 The Contractor shall Undertake the Works in accordance with: HD29/08

6.2 General

6.2.1 Chainage 0 for the works is taken from node marker 3300M5/680

6.2.2 Table 6.1 below shows the location of cores to be taken, in addition to the locations where DCP tests are required. For core requirements refer to 6.2. For DCP requirements refer to 6.3

Core Reference	Section	Lane	Chainage	Position	DCP Required	Photo Ref
1	3300M5/680	HS	107.5	Centre of lane	Yes	3
2	3300M5/680	HS	195	Centre of lane	No	5
3	3300M5/680	HS	235	Right Wheel Track	Yes	6
4	3300M5/680	HS	250	Centre of Lane	Yes	7
5	3300M5/680	HS	250	Adjacent to HS/L1 Joint	Yes	7
6	3300M5/680	L1	105	Right Wheel Track	No	2
7	3300M5/680	L1	250	Left Wheel Track	Yes	4
8	3300M5/680	L1	250	Right Wheel Track	Yes	4
9	3300M5/680	L1	310	Adjacent to L2/L3 Joint	No	9
10	3300M5/680	L1	345	Adjacent to L2/L3 Joint	Yes	10
11	3300M5/680	L1	440	Left Wheel Track	No	-
12	3300M5/680	L2	185	Left Wheel Track	No	-
13	3300M5/680	L3	250	Adjacent to HS/L1 Joint	Yes	11
14	3300M5/680	HS	592.5	Adjacent to HS/L1 Joint	No	-
15	3300M5/680	HS	655	Adjacent to HS/L1 Joint	Yes	12
16	3300M5/680	HS	900	Left Wheel Track	No	13
17	3300M5/680	HS	932.5	Left Wheel Track	Yes	14
18	3300M5/680	L1	690	Adjacent to L1/L2 Joint	No	11
19	3300M5/680	L2	750	Left Wheel Track	Yes	-
20	3300M5/680	L3	900	Right Wheel Track	Yes	-
21	3300M5/685	HS	1225	Centre of Lane	Yes	19
22	3300M5/685	HS	1475	Right Wheel Track	No	21
23	3300M5/685	L1	1280	Left Wheel Track	No	-
24	3300M5/685	L2	1315	Left Wheel Track	No	-
25	3300M5/685	L3	1335	Left Wheel Track	Yes	-
26	3300M5/685	L1	1720	Left Wheel Track	No	-
27	3300M5/685	L1	1940	Centre of Lane	Yes	26
28	3300M5/685	L2	1560	Centre of Lane	No	-
29	3300M5/685	L2	1705	Right Wheel Track	Yes	-
30	3300M5/685	L3	1565	Left Wheel Track	No	30
31	3300M5/690	L1	2165	Left Wheel Track	Yes	-
32	3300M5/690	L2	2170	Left Wheel Track	No	-

33	3300M5/690	L3	2110	Left Wheel Track	No	-
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Table 6.1 Core Location & DCP Schedule

6.2.3 Core locations are also shown on drawings 526-M5 26 – 27 SB 227 – 229.5-004 – 005 Core locations photos sheets 1 & 2

Pavement Cores

6.2.4 150mm diameter cores are to be taken in the pavement at the locations specified on drawings 526-001, 526-002 & 526-003 and below in table 6.1

6.2.5 Core locations are to be recorded and referenced against the network sections to an accuracy of $\pm 1\text{m}$ longitudinally and $\pm 0.1\text{m}$ transversely from the nearest lane edge

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

6.2.7 For each core, a full record of the core details must be made in the form of a core log. The log must include a good quality photograph with a scale strip and the core reference clearly visible

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

- a) Core reference
- b) Section reference and chainage
- c) Traffic direction
- d) Lane and offset
- e) OS Grid reference
- f) Coring date
- g) Pavement condition at core location including presence of cracks and their orientation

6.2.9 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. Condition of the material
 - iii. Stripping of binder from aggregate (if present)
 - iv. Condition of bonding layers
 - v. Presence of detritus where there is a lack of bond between layers
 - vi. Voiding and segregation (if present)
 - vii. Crack depth and severity, soft or otherwise, deleterious aggregate, bleeding and other peculiarities

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.

- 6.2.11 If PAK testing returns positive result, a detailed analysis of the effected layers is to be undertaken by PAH testing and phenol analysis.

6.3 DCP test requirements

- 6.3.1 DCP testing is to be undertaken in the core locations specified in table 6.1. DCP testing to be undertaken following completion of coring.

- 6.3.2 The following reference information for the DCP test is to be recorded:

- a) Core reference
- b) OS grid reference
- c) Test date

- 6.3.3 The following data from the DCP test is to be recorded:

- a) Number of blows required to penetrate 10mm
- b) Cumulative number of blows
- c) Penetration depth

- 6.3.4 The average penetration for each material later 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

- 6.3.5 CBR values (+ve x axis) to be plotted against depth below ground (-ve y axis) with layer thickness and median CBR values stated for each layer