Schedule 2 – SCC Standard Base Specification

Explanatory Notes

1. This specification document will be used as a base to compile a scheme specific specification.
2. This specification document, while based on the Manual of Contract Documents for Highway Works and the Design Manual for Roads and Bridges, supersedes both for use in Staffordshire.
3. Always ensure that this is the most recent version of this document prior to commencing amendments.
4. Always review references to third party specifications. Unless otherwise specified, the latest release will always supersede outdated references.
5. This specification document must be considered in conjunction with the following documents when designing, maintaining or investigating schemes:

5.1 The Staffordshire Skid Resistance Strategy
5.2 The Staffordshire Residential Design Guide
5.3 Staffordshire Highway Inspectors Handbook
5.4 Staffordshire Highway Infrastructure Asset Management Plan
5.5 Staffordshire Highway Safety Inspection Code of Practice
5.6 The Specification for Reinstatement of Openings in the Highway (SROH v4, DfT)
5.7 The Traffic Signs Regulations and General Directions 2016 (TSRGD2016)

SCHEME WORKS ORDER

6. Any Scheme Works Order should be populated with project-specific texts where phrases such as "Scheme Specific' drawing(s)", "Scheme Specific' Site Information" etc. are present and those phrases should be deleted.

7. It should be supplemented by additional Appendices which are not included in this base document but are required for the scheme.

8. Any texts or Appendices which are not relevant to the scheme should be deleted.

Staffordshire County Council Highways Base Specification

Base Specification V2.4

January 2024

VERS -ION	STATUS	SECTIONS CHANGED	APPROVED BY	DATE
2.1	Superseded	Appendix 5/1 cl 3.2, 5.6, 5.7 and 5.8 added, 6.2 amended. Appendix 11/1 table 1.1.1 amended, footpath types 1 and 9 amended. Appendix 12/3 cl 1.9 added.	Digitally signed by Vale, Daniel (Place) Date: 2023.01.17 09:26:56 Z	17/01/2023
2.2	Superseded	Explanatory notes expanded. 971AR, 7/1 Schedule 5 SC3 and Note 5 amended. 974AR amended, Appendix 5/1 cl 8.1, 8.2, 8.3, 8.4. 7/1 Schedule 5 AAV references amended. 7/2 amended. Appendix 12/1 Cl 4.2.1 Table 26/1. Appendix 30/6 PD6691 and CD236 table references throughout.	Digitally signed by Vale, Daniel (E,I&S) Date: 2023.07.11 12:37:44 +01'00'	11/07/2023
2.3	Superseded	Amendment to appendix 7/1 schedule 6 – texture depth requirements	Digitally signed by Vale, Daniel (E,I&S) Date: 2023.09.04 10:07:56 +01'00'	24/08/2023
2.4	Live	971AR SMA sealing grit and definition 974AR overbanding. 5/1 amended or added clauses 1.3, 1.7, 9.1 and 16. 7/1 Cl 14 and 16. 11/1 kerb type K9	Digitally signed by Vale, Daniel (E,I&S) Date: 2024.01.10 16:23:59 Z	10/01/2024

PREAMBLE TO THE SPECIFICATION

1 The Specification shall be the 'Specification for Highway Works' published by The Stationery Office (formerly HMSO) as Volume 1 of the Manual of Contract Documents for Highway Works, as modified and extended by the following:

i) Appendix 0/1: Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures;

ii) Appendix 0/2: Contract-specific minor alterations to existing Clauses, Tables and Figures;

iii) The Numbered Appendices listed in Appendix 0/3;

iv) Appendix 0/5: Special national alterations of the Overseeing Organisation of Scotland, Wales or Northern Ireland.

v) Appendix 0/4 contains a list of the Drawings.

2 The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates.

3 An Additional Clause as indicated by a suffix 'A' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. An Additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is a Contract-specific alteration.

4 A Substitute Clause, as indicated by a suffix 'S' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. A Substitute Clause as indicated by a suffix 'SR' in Appendix 0/1 is a Contract-specific alteration.

5 A Cancelled Clause as indicated by a suffix 'C' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. A Cancelled Clause as indicated by a suffix 'CR' in Appendix 0/1 is a Contract-specific alteration.

6 Insofar as any of the Numbered Appendices may conflict or be inconsistent with any provision of the Specification for Highway Works the Numbered Appendices shall always prevail. Additionally, Numbered Appendices 0/1 and 0/2 shall take precedence over Numbered Appendix 0/5.

7 Any reference in the Contract to a Clause number or Appendix shall be deemed to refer to the corresponding Substitute Clause number or Appendix listed in Appendix 0/1, 0/2 or 0/5.

8 Where a Clause is altered any original Table/Figure referred to in the Clause shall apply unless the Table/Figure is also altered. Where a Table/Figure is altered any reference in a Clause to the original Table/Figure shall apply to the altered Table/Figure.

PREAMBLE TO THE SPECIFICATION (Continued)

9 Where a Clause in the Specification relates to work goods or materials which are not required for the Works it shall be deemed not to apply.

10 Any Appendix referred to in the Specification which is not used shall be deemed not to apply.

11 Where a Clause in the Specification is prefixed by an # this indicates that this particular Clause has a substitute National Alteration for one or more of the Overseeing Organisations of Scotland, Wales or Northern Ireland. Substitute or additional National Clauses shall be used within countries to which they specifically apply, and they are deemed to replace corresponding Clauses in the main text of the Specification as appropriate. The substitute National clauses are located at the end of the relevant Series together with the additional National Clauses of the Overseeing Organisations.

12 Other than where references to the Overseeing Organisation are made in the context of the Overseeing Organisation granting statutory or type approvals, the roles and functions of the Overseeing Organisation shall be undertaken by Staffordshire County Council or delegated organisation's representative.

Where the Specification requires the provision of documentation to the Overseeing Organisation for statutory or type approval such documentation shall be provided to Staffordshire County Council for approval.

13 If the Specification is used in conjunction with a Contract under which the Contractor is responsible for the design of any part of the Permanent Works, the delegation of the roles and functions of the Overseeing Organisation as stated in paragraph 12 above shall be amended as follows:

i) If any agreement, consent or approval required to be obtained from the Overseeing Organisation impacts on the health and safety of the general public, the environment or any property or equipment not owned or operated by the Contractor or the Design Build Finance and Operate concessionaire, such agreement, consent, approval shall be obtained from Staffordshire County Council.

ii) Where the Specification provides for the Overseeing Organisation to require a test, waive the requirement for a test or alter testing frequency, the person or party to whom the Overseeing Organisation's roles and functions have been ascribed by paragraph 12 above shall exercise such decisions.

14 Where Standards and other documents are incorporated into the Contract by reference the respective edition used shall be that which is current on the Contract Reference Document Date {please insert date} unless otherwise stated in the Specification. R –

15 All schemes shall be designed to incorporate the lowest possible carbon emissions both during construction and for the lifetime of the asset, utilising Highways Maintenance Efficiency Programme (HMEP) toolkits.

SPECIFICATION FOR HIGHWAY WORKS

SCHEDULE OF PAGES AND RELEVANT PUBLICATION DATES

Please insert the current Specification for Highway Works Volume 1, Series 0, Table 0/1

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract

List of additional clauses, tables and figures:

171AR	Preservation of Trees, Shrubs and the Like
172AR	Protection from Nuisance due to the Works
175AR	Damage to Property and the Highway
180AR	Contractor's Compounds and Temporary Accommodation
181AR	Parking of the Contractor's Vehicles
182AR	Control of Smoke, Dust and Mud on the Highways
183AR	Storage of Plant and Materials
184AR	The Use of New Bridges by Construction Plant
570AR	Closed Circuit TV in Specification of Drains and Sewers
674AR	Sterilisation of Surfaces
890AR	Fly Ash Bound Material
970AR	Air Void Content of Bituminous Mixtures
971AR	Stone Mastic Asphalt
972AR	Preventative Treatment: Design, Application and End Product Performance
973AR	Low Temperature Asphalt
974AR	Permanent Maintenance Pavement Guidance
1170AR	Footway Slurry Surfacing
2670AR	Health and Safety File
2671AR	Working in the Vicinity of Structures

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract

List of substitute clauses, tables and figures:
None

List of cancelled clauses, tables and figures:
None

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

171AR Preservation of Trees, Shrubs and the Like

1 The Contractor shall take full responsibility for the care and preservation of all trees shrubs and the like required by the Contract to be preserved. Any damage to trees and shrubs shall not be deemed to be an unavoidable result of the construction of the Works in accordance with the Contract.

2 Measures to preserve trees and shrubs shall include protective temporary fencing to enclose as much of the canopy of the tree as possible, whilst not obstructing established footways and rights of way and visibility for the highway user. Such measures shall not be limited to duration of site clearance works.

3 Limitations on the use of those parts of the Site in the vicinity of trees shrubs and the like shall be as described in Appendix 1/7.

4 Trenching and trenchless methods of excavation for, backfilling to, and the laying or removal of pipes ducts and cables close to trees and shrubs and beneath the canopy of trees, shall include such measures as necessary to avoid root damage and severance and to avoid damage to the canopy and foliage. Excavation of open trenches by machine is unacceptable within those precautionary areas shown on the Drawings. The Contractor shall comply with any further specific requirements for the construction of the Works in the vicinity of preserved trees and shrubs stated in Appendices, 5/1, 5/2, 6/7.

5 Construction in the proximity of existing trees shall be in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

172AR Protection from Nuisance due to the Works

Unless specified otherwise in the Scheme Specific Information the following shall apply:

1. Roads to be kept clean
   Roads and any new roads which are being used by traffic shall be kept clean of all dirt, mud or any other materials dropped from plant vehicles' tyres or tracks which are being used in connection with the Works. The Contractor shall provide, maintain and keep available at all times equipment incorporating a brush suction device and collection compartment and such other plant, labour and equipment necessary to keep the roads clean.

2. Nuisance from dust
   The Contractor shall take all necessary measures to prevent dust arising from the Works causing nuisance to traffic and property, and keep available at all times plants, labour and equipment necessary to keep the roads clean.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

175AR Damage to Property and the Highway

Unless specified otherwise in the Scheme Specific Information the following shall apply:

1. Before the commencement of any part of the Works the Contractor shall inspect the condition of existing buildings, road and footway surfaces and installations, kerbs, verges, fences, walls and street furniture etc. The Contractor shall prepare a schedule noting all existing defects, together with sketches or photographs where necessary. The schedule shall be agreed with the Overseeing Organisation. The Contractor on completion of the Works or at such earlier time as may be required shall make good to the satisfaction of the Overseeing Organisation and any owners or public authorities concerned all damage additional to that agreed in the schedule.

2. In the event of the Contractor failing to prepare and agree a schedule of condition, the property in question shall be deemed to have been undamaged prior to the execution of the Works.

3. If, in the opinion of the Overseeing Organisation, the Contractor has failed to repair and make good within a reasonable time, any damage attributed to their actions, or has likewise failed to arrange for the repairs to be carried out, the Overseeing Organisation may arrange for the repairs to be carried out and deduct the expenses incurred from money due to the Contractor under the Contract.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

180AR Contractor's Compounds and Temporary Accommodation

Unless specified otherwise in the Scheme Specific Information the following shall apply:

The Contractor shall take all necessary measures to provide a site for their temporary accommodation which shall be close to the works to the satisfaction of the Overseeing Organisation. The Contractor's compound shall provide adequate and sufficient parking space to enable full compliance with Clause 181AR.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

181AR Parking of the Contractor's Vehicles

Unless specified otherwise in the Scheme Specific Information the following shall apply:

> Parking of all Contractor's and Sub-Contractor's vehicles shall be restricted to the site compound areas. Parking on any length of the public highway (including hard shoulders), in public car parks and in lay-bys shall not be permitted unless agreed otherwise with the Overseeing Organisation.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

182AR Control of Smoke, Dust and Mud on Highways

Unless specified otherwise in the Scheme Specific Information the following shall apply:

1. Subject and without prejudice to the Conditions of Contract and the requirements of the Highway Authority the Contractor shall take all necessary steps to avoid creating a nuisance from fumes, dust and vibration. The Contractor shall ensure that the haul roads and the method of operation during earthworks are such that generation of dust is kept to a minimum. The haul road shall be sealed with bitumen to prevent generating dust or shall be sprayed with water to reduce dust. The water spraying shall be a controlled mechanism to achieve the dust control without saturating the ground. The spraying equipment shall be kept on site during the contract period and will be used immediately when the Overseeing Organisation informs the Contractor of the need to control the dust. The contractor shall ensure all roads, accesses, rights of way etc., are kept free from mud, slurry or other hazardous substances that are deposited through operations in connection with the works.

2. Wheel washing facilities shall be provided at all exits to highways from the site. The burning of materials resulting from site clearance operations is not permitted; therefore, such materials should be disposed of off-site.

3. The burning of trees, hedges, timbers, etc. will not be permitted on site. The Contractor shall either take them off site or shred them prior to disposal.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

183AR Storage of Plant and Materials

Unless specified otherwise in the Scheme Specific Information the following shall apply:

1. The site for storage of plant and materials shall be approved by the Overseeing Organisation.

2. There shall be no storage of any materials, including soil, within river floodplains during the construction of the works unless agreed with the Overseeing Organisation. The extent of any floodplains will be shown on Scheme Specific Information drawings.

3. All electrical plant and materials to be incorporated in permanent works shall be stored in weatherproof accommodation.

4. Lighting columns shall not be stored overnight on the highway unless they are within a secure compound.

5. The Contractor shall, to the satisfaction of the Overseeing Organisation, minimise the use of the highway for storing or mixing materials.

6. Any obstruction to traffic or pedestrians shall be properly signed and protected. Footways shall be kept clear unless the Overseeing Organisation agrees otherwise.

7. Materials shall be removed from the highway before darkness where possible, but if not, they shall be properly guarded with barriers, cones, signs and lamps.

8. Where there is no reasonable alternative to the use of the highway, boarding and/or heavy gauge plastic sheeting shall be used when mixing or depositing any material which is likely to stain or damage the highway. Similarly, the contractor shall take measures to ensure that no such material is allowed to enter any drain or sewer connected to the highway.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

184AR Use of New Bridges by Construction Plant

This clause has been withdrawn and all details for approval shall be defined in the Scheme Specific Appendix, in accordance with Eurocodes loading models.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

570AR Closed Circuit TV in Specification of Drains and Sewers

Unless specified otherwise in the scheme specific works information the following shall apply:

1. Prior to the commencement of a CCTV survey all gullies, drains and sewers shall be cleansed in accordance with Appendix 5/1.

2. Inspections of drains and sewers shall be by non-entry CCTV inspection methods, using monochrome or colour as required by scheme specific works information. There shall be facilities for the Overseeing Organisation's Representative and one other person nominated by the Overseeing Organisation to view the equipment monitor screen whilst the inspection is in operation.

3. Electronic video recording is required for all inspections and shall be provided to the overseeing organisation in a WMV, AVI or MPEG format, on a storage media to be agreed with the Supervisor. Where still images are required, they shall be not less than 89mm x 125mm and at a resolution of not less than one million pixels. Where images are required electronically, they shall be of JPEG format and provided on a storage media to be agreed with the Supervisor.

4. An inspection report shall be prepared as required by scheme specific works information. Unless otherwise described in the Contract, the Contractor shall include in the report colour photographs obtained from the electronic CCTV survey. The colour photographs in the report shall clearly show the internal condition of the drain or sewer and shall be representative of what is displayed on the monitor screen. All images shall be labelled with the date of exposure, identification reference, and a brief description of the purpose of the photograph. Any footage and images shall be delivered to the Overseeing Organisation at the same time as the report. When required by the Overseeing Organisation, the Contractor shall supply the report in sections relative to those completed inspections and the programming of the works. All outstanding reporting and other required data shall be submitted to the Overseeing Organisation within five days of completing the inspections.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

570AR Closed Circuit TV in Specification of Drains and Sewers (Continued)

5. Self-propelled or towed CCTV cameras shall be used depending upon entry availability for the drain or sewer to be inspected and shall be suitable for distances of up to 350 metres. The camera shall be positioned and shall maintain such a position to suit the particular inspected bore shape and to minimise picture distortion. Illumination shall be such that there is an even distribution around the bore without loss of picture contrast, flare out of picture or shadowing. The camera shall have remotely operated focus and iris adjustments and shall provide a minimum focal range from 150mm in front of the camera lens to infinity. There shall be a minimum distance along the drain or sewer in focus, equal to twice the vertical internal dimension of the drain or sewer, measured from the initial point of observation.

6. The extents of any proposed traffic management shall be agreed with the overseeing organisation before commencement on site.

7. Requirements for testing and demonstrating satisfactory performance of camera, linear measurement devices, recording apparatus, video recording and monitor shall be as described in scheme specific works information.

TABLE 5/70: CCTV Camera Speeds

Pipe Internal Diameter	Max Speed
Not exceeding 200mm	0.10 m/s
Exceeding 210mm but not exceeding 310mm	0.15 m/s
Exceeding 310mm	0.20 m/s

8. The recorded inspections shall be from agreed points of zero chainage of measurement and direction for each length inspected, with such chainage being automatically measured, displayed on the monitor screen and the videotape recording. The references to be used for location, chambers, pipes and the like shall be as scheduled in scheme specific works information. The required identification data added to the monitored inspection and the recording shall be positioned and repositioned as necessary so as to not be detrimental to the usefulness of the screened picture. The Contractor shall inform the Overseeing Organisation of their proposed means of linear measurement and shall supply the Overseeing Organisation with a copy of their measurement audit daily record on the same day.

9. The Contractor shall be responsible for testing for potentially hazardous environments and for demonstrating that plant and equipment to be used for the inspections is to an appropriate standard.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

674AR Sterilisation of Surfaces

1 Sterilisation of surfaces shall be in compliance with this Clause and Clause 124.

2 When described in Appendix 6/7 a surface shall be sterilised by the application of a weedkiller. In the case of completed formations the surface shall be sterilised prior to the laying of sub-base or base material. The selectivity and formulation of the weedkiller shall be as described in Appendix 6/7.

3 For each location to be treated the Contractor shall select either a non-residual herbicide, a persistent weedkiller, or a compound of both, and shall determine the rates and numbers of applications to suit the type of weedkiller, the environment and weather conditions, such as to endeavour to achieve a twelve months effective weed control (this may require repeat applications).

4 Equipment shall be approved by the Overseeing Organisation and be used by competent and NPTC certificated operatives. All products shall be approved under the Control of Pesticides Regulations 1986 (As amended 1997) and EU Biocides Regulation 528/2012 and shall be used in accordance with the manufacturers' instructions. Products which contain the triazine group of chemicals shall not be used.

5 The Contractor shall ensure that surfaces and vegetation beyond those surfaces to be sterilised do not receive weedkiller. Areas to be treated shall be suitably screened and shall receive measures to prevent animals entering onto treated surfaces, being in contact with or consuming treated vegetation. The Contractor shall not contaminate any watercourse with the use of weedkillers. The Contractor shall display and remove as necessary, appropriate notices to warn the public of hazards from their operations and the treated surfaces. If using herbicides near water, the Contractor shall refer to Environment Agency guidance notes for form AqHerb 01: Agreement to Use Herbicides in or near water.

6 Treated vegetation, part used materials and containers, shall be transported and disposed of by approved means off Site.

7 The Contractor shall take into account the recommendations contained in the HSE Code of Practice for Using Plant Protection Products.

8 The Contractor shall have their proposed solution approved by the Overseeing Organisation prior to the commencement of works.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

890AR Fly Ash Bound Material – 1 (FABM1)

1. **FABM – 1 mixture**
   FABM shall be mixed, in a calibrated batching plant, to the mix proportions agreed with Staffordshire Highways Laboratory as a result of prior development and testing, in accordance with MCHW clause 830. At design stage the mixture shall achieve a minimum immediate bearing index of 50 over the moisture range omc +/- 2%.

2. **Transporting material to site**
   FABM shall be transported to site in sheeted lorries.

3. **Laying, Compaction and Levelling**
   FABM shall be laid by paver except where agreed otherwise.
   Compaction shall be carried out in accordance with MCHW clause 813, preferably by pneumatic tyred roller (PTR), to achieve a mean in-situ wet density of not less than 95% of the mean laboratory determined wet density of the strength specimens manufactured to assess mechanical performance. No individual results shall be less than 92%. (Clause 870.9 and 870.10).
   Where a PTR is not available or when FABM is laid between 1st November and 31st March the compacted layer shall not be overlaid until it has achieved a minimum dynamic stiffness of 60Mpa when measured with a light drop-weight test device.

4. **Curing and protection**
   At no time after compaction shall the surface of the FABM be allowed to dry out. This will require either immediate overlay or a light spray of water or a bituminous emulsion prior to overlay.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

890AR Fly Ash Bound Material – 1 (FABM1) (Cont…)

Table 890AR – FABM mixture and control limits

Test / control / check	Test reference	Tolerance
Water content at mixing	BS EN 13286 - 1	± 2% (TRL611 – table A1.5)
Water content at final compaction	BS EN 13286 - 1	± 2% (TRL611 – table A1.5)
In-situ wet density Trial area	Sub-clause 870.5 Measured using a calibrated nuclear density gauge in the direct transmission mode and backscatter mode in accordance with BS1924-2. Each test to consist of 3 measurements at 120 degrees	Average in-situ wet density ɜ 95% average wet density of strength specimens (870.09) No individual result < 93% average wet density of strength specimens (TRL611- A1.12)
In-situ wet density Permanent works	Sub-clause 870.5 Measured using a calibrated nuclear density gauge in the backscatter mode in accordance with BS1924-2. Each test to consist of 3 measurements at 120 degrees	As above
Laboratory mechanical performance	Table 8/15 i.e. as BS EN 13286 – 41 for Rc,	Average =Rc with no individual result < 80% Rc (830)
Layer thickness		± 15mm (mean) ± 25mm (individual) (TRL611- table A1.5)
Grading	BS EN 14227 - 3	MCHW clause 820
In-Situ Dynamic Stiffness	Light drop-weight tester used in accordance with the manufacturer's instructions	Minimum mean dynamic stiffness of 60Mpa with no individual value below 50Mpa
Immediate Bearing Index		50 minimum, at design stage, over acceptable moisture range.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

970AR Air Void Contents of Bituminous Mixtures

1 In-situ air void content of compacted bituminous mixtures shall be determined following the principles set out in BS 594987.

2 The degree of compaction shall be assessed by extracting cores at a rate of 6 No cores per 1000 m^2. The maximum density shall be determined in accordance with EN 12697 – 5, procedure A, in water. The bulk density shall be determined in accordance with EN 12697 – 6 procedure C sealed specimen unless other methods are agreed in advance with the Staffordshire Highways Laboratory. The maximum density and core bulk density shall be used to determine air void content in accordance with EN 12697-8. Compliance shall be judged by comparison with the specified air void content shown in table 970AR. Core holes will be reinstated by the Contractor.

3 The acceptable state of compaction shall be within the appropriate range given in Table 970AR and cross referenced to Appendix 7/1.

	CARRIAGEWAY SPECIFICATION				FOOTWAY SPECIFICATION			
	SET OF 6		PAIR		SET OF 6		PAIR	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
AC base	2	8*	1	10*	N/A	N/A	N/A	N/A
AC bin	2	7*	1	9*	2	9	1	11
HRA surf/bin	2	6*	1	8*	2	7	1	9
SMA 14 surf	2	6*	1	7*	N/A	N/A	N/A	N/A
SMA 10 surf	2	6*	1	7*	N/A	N/A	N/A	N/A
SMA 6 surf	2	6*	1	7*	2	7	1	9
AC surf	N/A	N/A	N/A	N/A	2	9	1	10
NOTE : ALL figures marked * to be increased by 1% for hand-lay work								

Table 970AR

4 For schemes smaller than 1,000m2 in area, the number of cores to be cut shall be determined in agreement with the Staffordshire Highways Laboratory (SHL).

5 In case of dispute or extremely small areas of patching, Density Meter testing may be carried out with prior agreement of the SHL.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

971AR Stone Mastic Asphalt (SMA)

Policy for use of SMA on County Roads

1. Definition

This specification considers any carriageway bituminous surface course material designed for compliance with BS EN 13108-5 or MCHW cl. 942 to be an SMA material.

2. Material Selection

SMA 10 Surf or SMA 6 Surf should be specified to achieve one of the texture depth levels 1 to 3 appropriate to road speed as shown in Appendix 7/1, schedule 5 and below.

SMA shall be laid on a binder course that is new or in extremely good condition. Exploratory cores must be undertaken in order to determine the suitability of the existing binder course and all proposals agreed with the Staffordshire Highways Laboratory.

Tanker applied bond coats shall be applied in all circumstances where SMA is used. SMA joints shall be saw cut only, not hot rolled. An angled joint is strongly recommended where possible.

All SMA mixtures shall be transported, handled and laid in accordance with BS 594987.

3. Early Life Skid Resistance

The early life skid resistance of SMA is a cause for concern due to the presence of significant amounts of surface bitumen which may result in skid resistance values in dry conditions similar to those experienced on "run in" material in wet conditions.

As such, the use of sealing grit is a mandatory requirement on all carriageway SMA sites. If there is a desire not to use sealing grit on a specific location, a departure must be requested and approved in advance.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

971AR Stone Mastic Asphalt (SMA) (Continued)

4. Use of Sealing Grit

The application of coated sealing grit conforming to the requirements of BS 4987: Part 1, Clause 7.9, 0-4mm sealing grit, has been found to provide a significant improvement in early life skid resistance and therefore its use is specified on all carriageways where SMA is to be laid, unless agreed otherwise in advance.

The rate of spread of the sealing grit should be approximately 0.5 to 0.7 kg/sq.m.

The grit should be lightly coated, dry, free flowing and free from clumps and is to be applied to the still hot mat at the end of the compaction process, once the material has achieved refusal.

Mechanical means should be used to apply the grit to ensure an even rate of spread and to avoid the occurrence of excessive localized accumulations of material. Any excess loose grit should be swept prior to, or immediately upon, sites being opened to unrestricted traffic.

If the gritting application is omitted for site specific reasons, then the surface skid resistance shall then be measured after 72 hours of running traffic, and pole mounted "Slippery Road Signs" (TSRGD 2016 Schedule 13 Part 2, Item 6: Diag. 557 with 'For distance' supplementary plate.) shall be provided whenever the values fall below investigatory levels defined in the Staffordshire Skid Policy.

On sites where grit has not been applied and measured skid resistance is below Investigatory levels the Highways Laboratory shall be asked to test the skid resistance at the site after six months and prior to the removal of the signs to determine that an acceptable level of skid resistance exists.

On heavily trafficked sites skid resistance may exceed investigatory levels within a shorter period of time and a three-month skid test may be requested. This would have the advantage of avoiding an unnecessary proliferation of signs.

In all cases, the aim should be to avoid leaving signs in place after their usefulness has expired to avoid "familiarity breeding contempt".

On sites where grit has been applied "Slippery Road" signs will not normally be needed, and skid resistance tests will only be carried out where there is an accident related problem or where a previously high level of skid resistance has come to be relied upon by road users and needs to be achieved again.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

971AR Stone Mastic Asphalt (SMA) (Cont…)

STONE MASTIC ASPHALT SURFACE COURSE

1 General

1.1 Stone Mastic Asphalt shall comply with the requirements of BS EN 13108 Bituminous mixtures - Material Specifications Part 5, and PD 6691 Guidance on the use of BS EN 13108. Other than where amended or supplemented by this document Stone Mastic Asphalt shall be designed and manufactured to comply with the requirements of PD 6691 Annex D and shall be transported, handled and laid in accordance with the requirements of BS 594987.

Two different materials are specified:

1.1.1 SMA 10 surf. A SMA mixture for general use, on texture depth level 1, 2 or 3 sites, including high speed roads and roundabouts.

1.1.2 SMA 6 surf 40/60 or 100/150. Suitable for use on texture depth level 1 sites or heavily used footways.

2 Materials

2.1 Aggregate

2.1.1 Polished Stone Value - generally not less than 60 for carriageway surface course but as specified In Appendix 7/1 after reference to the Staffordshire Skid Resistance Policy, which amends CD236 table 3.3a. Minimum PSV for all footway surface course material shall be 45. Coarse aggregate greater than 4mm in size used in surface course mixtures shall be from a single geological source - the blending of different psv aggregates to achieve a specified value is not permitted, see Appendix 7/1.

2.1.2 Resistance to Fragmentation – Category $LA_{30,}$ or as specified in Appendix 7/1.
Aggregate abrasion Value – for carriageway material, not more than 12, or as specified in Appendix 7/1 after reference to the Staffordshire Skid Resistance Policy, which amends CD236 table 3.10.

2.1.3 Durability (Water Absorption) – Category WA_{24} 2 or as specified in Appendix 7/1.

2.1.4 When tested in accordance with the procedures in BSEN 13043, the fine aggregate shall comprise crushed rock or crushed slag fines, which may be blended with not more than 50 percent natural sand.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

971AR Stone Mastic Asphalt (SMA) (Cont…)

2.1.5 Particle shape - The flakiness category for the coarse aggregates shall be FL_{20}.

2.2 Filler

2.2.1 Added filler shall only be crushed limestone or other approved material in accordance with the requirements of BS EN 13043, 5.2.1.

3 Mixture

3.1 The target grading for the mixture shall fall within the limits given in PD 6691 table D1, unless agreed otherwise by Staffordshire Highways Laboratory (SHL).

3.2 The manufacturer shall carry out initial type testing in accordance with EN 13108 – 20 in order to demonstrate conformity with EN 13108 – 5 and PD 6691, as amended below.

3.3 Minimum binder contents shall be:

- 10mm $B_{min\ 6.4}$
- 6mm $B_{min\ 7.0}$

3.4 Void content shall be $V_{min1.5}$ and V_{max4} When tested in accordance with PD 6691 table 9 but with the amendment that BS EN 12697-6 procedure C, sealed specimen shall be used to determine specimen bulk density.

4 Compaction

4.1 Stone mastic asphalt shall be compacted to practical refusal following the general requirements of BS 594987 clause 9.

4.2 The degree of compaction shall be assessed as per 970AR.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

971AR Stone Mastic Asphalt (SMA) (Cont…)

5 Surface Texture

5.1 The minimum and maximum average texture depth shall be specified as one of the levels 1 to 3 appropriate to traffic speed as shown in Schedule 6 of appendix 7/1. No 50m length shall be less than 80% of the specified minimum value.

5.1.1 Texture depth measurement shall be in accordance with SHW Clause 921 and may be carried out at any time within 2 years of substantial completion.

6 Nominal Layer Thickness

6.1 Nominal compacted thickness shall be:

- 10mm 40mm.
- 6mm 30mm when used as surface course and 15 - 35mm when used as regulating layer

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

972AR – Preventative Treatment: Design, Application and End Product Performance

1. The design of the preventative treatment, choice of materials, techniques and processes shall be based on site and traffic data specified in Appendix 7/3 and the principles outlined in TRL Road Note 39. The supply and application of Surface Dressing to road surfaces shall comply with the National Highways Sector Scheme for Quality Management in Highway Works 13.

2. (i) The Design will achieve the performance requirements in terms of macrotexture and maximum levels of defects as set out in this Clause and in Appendix 7/3 ensuring that the preventative treatment has an initial stability such that it is capable of withstanding the normal traffic for the site when first opened.
(ii) A Quality Plan will be prepared which shall contain at least the information required by the National Sector Scheme described in Appendix A of the Sector Scheme.

The System

3. The proposed preventative treatment shall have been subject to a Type Approval Installation Trial (TAIT), which shall be self-certified within the quality management scheme described in Appendix A. The TAIT shall have been carried out on a site with similar characteristics and traffic category to that to be treated in the Contract.

Materials and Equipment - The Binder

4. Modified binders shall be either Intermediate-grade or Premium-grade polymer modified binder, having a British Board of Agrément HAPAS Roads and Bridges Certificate or similar equivalent. In the event that the binder does not have a certificate, it is expected that the supplier can demonstrate that approval is being sought.

5. The Design shall include a Binder Data Sheet giving details of the properties of each binder proposed. The data provided shall be not more than 6 months old and obtained on samples of binder representative of binder manufactured and supplied using the same source and processes as the proposed binder. Health and Safety information and a safe handling guide from the manufacturer shall be provided together with details of any weather restrictions placed upon use of the binder.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

972AR Preventative Treatment: Design, Application and End Product Performance (Continued)

6. The binder application shall be uniform and for motorways, trunk roads and heavily trafficked and highly stressed roads shall be of sufficient width to allow a full lane to be dressed in a single pass. Before spraying begins, a test certificate shall be provided showing test results for rate of spread and accuracy of spread of binder carried out in accordance with the test methods in BS EN 12272-1 and issued by an appropriate organisation.

Materials and Equipment - The Chippings

7. The chippings shall be crushed rock or slag complying with the general requirements of BS EN 13043. The resistance to polishing of coarse aggregate shall have a minimum declared PSV category specified in Appendix 7/3 in accordance with BS EN 13043, clause 4.2.3. The resistance to abrasion of the coarse aggregate shall comply with the AAV category specified in BS EN 13043, clause 4.2.4. as specified in Appendix 7/3 for each site. The Flakiness Index category of 6.3/10mm and 8/14mm chippings shall be FI20 and 2.8/6.3 shall be category FI30 and tested at the frequency specified in Appendix 1/6. The Design shall state the source and characteristics of chippings to be used and the coating, if any. A test certificate shall be provided, issued by an appropriate organisation, accredited in accordance with sub-Clauses 105.3 and 105.4 for those tests, not more than six months previously, showing conformity with these requirements.

8. Chipping spreaders shall have controlled metering and be capable of variable or fixed width application to match the binder sprayer. Before a spreader is used, a test certificate shall be provided showing test results for rate of spread and accuracy of spread of chippings carried out in accordance with the test methods in BS EN 12272-1, and issued by an appropriate organisation, accredited in accordance with sub-Clauses 105.3 and 105.4 for those tests, or tests carried out under a Quality Assurance Scheme, demonstrating that the chipping spreader has been tested, using chippings similar to those to be used in the Contract, prior to the commencement of the work, and that it complies with the requirements set out in Appendix 7/3.

Preparation

9. Any necessary remedial works to the road surface and structure shall be completed prior to preventative treatment and agreed as acceptable, following the guidelines set out in 974AR.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

972AR Preventative Treatment: Design, Application and End Product Performance (Continued)

10. Before binder is applied, street furniture shall be masked using self-adhesive masking material. Oil, sand or similar materials shall not be used. Any packed mud or other deposits on the road surface shall be removed, and the road surface shall be swept free of all loose material.

Traffic Safety and Management

11. Traffic Safety and Management for trunk roads and motorways shall be, as a minimum standard, in accordance with the requirements of Series 100 and the RSDA/CSS Code of Practice for signing at surface dressing sites. The traffic management layouts shown in Appendix 7/3 will be adhered to.

Application

12. Transverse joints shall be of binder overlap only and not wider than 100 mm. There shall be no ridges or bare strips. Longitudinal joints shall coincide with lane markings, unless otherwise agreed. Longitudinal joints shall be of binder overlap only, while ensuring that the proposed rate of spread is achieved across the joint, for quartering (using a part of the spray bar) the overlap may be extended to a maximum of 300 mm. There shall be no ridges or bare strips.

13. Tests for rates of spread and accuracy of application of binder and chippings shall be in accordance with the test methods in BS EN 12272-1 at the frequency specified in Appendix 1/6.

Aftercare

14. Masking shall be removed after the preventative treatment has been applied and before opening the road to unrestricted traffic. Surplus chippings shall be removed from the road by suction sweeping before it is opened to unrestricted traffic.

15. The preventative treatment shall be monitored closely for a minimum period of 2 hours, after the road is opened to traffic. Traffic safety and management procedures shall be re-instated or other such remedial action where necessary, such as dusting, if there are signs of distress, such as turning of the chippings, in order to prevent further damage to the preventative treatment.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

972AR Preventative Treatment: Design, Application and End Product Performance (Continued)

16. Further operations to remove subsequently loosened chippings shall be carried out over the next 7 days. The road, and adjacent side roads, footways and paved areas shall be kept substantially free of loose chippings for a period of 30 days after completion of the work.

17. Any remedial actions required shall be agreed with the Supervisor.

As Built Manual

18. A record of the progress of the work in the form of an As Built Manual shall be prepared incorporating all relevant information, including all test results, variations to the Design Proposal and those necessitated by localised site conditions, a record of traffic control carried out, weather information, unforeseen problems, a list of complaints, if any, from the general public or road users and any other information that the Overseeing Organisation may reasonably require to be included.

Performance Standards Surface Macrotexture

19. The surface macrotexture will be monitored for a period of two years. The definitive test is the volumetric patch technique measured in accordance with BS EN 13036-1 except that 10 individual measurements shall be made on the nearside (inside) wheel-track of the most heavily trafficked lane or for low traffic category sites the track carrying the most stress. The average macrotexture depth of each lane kilometre, or the complete carriageway lane where this is less than 1000 metres, shall be as specified in Appendix 7/3.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

973AR- Low Temperature Asphalt (LTA)

1 Staffordshire County Council considers LTA to be both warm mix asphalt and half warm mix asphalt in the temperature range of 70^0C to 130^0C; however upper temperature limits may vary between suppliers. All material laid as LTA should have the same performance and targets as conventional asphalt materials.

2 In all other respects the material must comply with the requirements set out in Appendix 7/1.

3 Low temperature asphalt will normally be the default material of choice between March and October but can be used at other times of year in consultation with the supplier and the SHL. Consultation should also be undertaken during cold periods between March and October to assess the environment on the day of laying.

4 As per conventional material, up to 50% recycled aggregate (RA) is permitted in the lower layers; **NO** RA is permitted in the surfacing course. See Appendix 7/1.

5 Further guidance can be found in the MHA document "Implementing Lower Temperature Asphalt".

6 Arrival and rolling temperatures are to be in accordance with the suppliers' guidance.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

974AR- Permanent Maintenance Pavement Guidance

			From BS 594987 - per layer				From Staffordshire Highways Specification Appendix 7/1			
Layer	Location	Material	Minimum layer thickness	Maximum layer thickness	Target Layer Thickness	Are multiple layers permitted	Speed Limit	Texture Depth Schedule 6	Material Reference Schedule 5	Notes
Surface course	Carriageway	HRA 55/10 F Surf 100/150 Des	40mm	40mm	40mm	No	<30mph only	0	SC1	Suitable for residential roads
Surface course	Carriageway	HRA 35/14 F Surf 40/60 Des & 14/20 Pre-coated chippings	45mm	50mm	50mm	No	Any	up to level 3	SC2	Preferred option for heavily trafficked or >30mph roads
Surface course	Carriageway	SMA 10 surf 40/60	40mm	50mm	40mm	No	Any	up to level 3	971AR & SC3	For use where SMA is existing, replace like with like
Surface course	Carriageway	HRA 45/10 F Surf 100/150	40mm	40mm	40mm	No	<30mph only	0	SC6	Small hand-lay repair areas and speed cushions only
Binder Course	Carriageway	AC 20 Dense Bin 100/150	50mm	100mm	60mm	Yes			BC1	
Base Course	Carriageway	AC 32 Dense Base 100/150	70mm	150mm	100mm (minimum)	Yes			B1	Target varies according to carriageway type
Surface course	Footway	AC 6 Dense Surf 160/220	20mm	30mm	20mm	No			SC 5	Default for footpaths
Surface course	Footway	SMA 6 Surf 100/150	20mm	40mm	40mm	No			971AR & SC4	Commercial access and agricultural crossings only
Binder Course	Footway	AC 20 Dense Bin 160/220	50mm	100mm	50mm	Yes			BC 1	60mm binder in commercial or agricultural crossings
Binder Course	Carriageway (Bridges)	HRA 50/20 F Bin 40/60 rec	45mm	80mm	Varies by total thickness	Yes			BC 5	Same material - multiple layers required. Use with HRA SC only
Base Course										

Overbanding shall be used with reference to the "Staffordshire Highways Maintenance Treatment Matrix" Type 1, 2, or 3 permanent repairs with saw cut vertical edges.
Overbanding is not required on treatment types 4 or 5 and/or volumetric patching or thermal repairs.
Overbanding must not be used in areas due to be surface dressed within 12 months from the date of repair.
Overbanding must not be used in lieu of saw cut edges or as a substitute for edge sealing.

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Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

1170AR – Footway Slurry Surfacing

Specification

1. General Description

1.1 This Specification deals with the provision and laying of slurry surfacing materials (6.0mm nominal layer thickness and over) on footway and other areas not subject to regular traffic other than private vehicular access.

2. Description of Works

2.1 The following processes are to be included and quantities recorded for items (c) and (j).

a) Preparatory sweeping and pressure jet washing;
b) Weedkilling and weed treatment;
c) Preliminary regulating of surfaces;
d) Protection and masking of ironwork and street furniture;
e) Applying surfacing including any bond coat if required by the process;
f) Rolling of surfaces if required by the process;
g) Protection of newly treated surface;
h) Sweeping of loose materials;
i) Provision of signs for carrying out traffic control, and informing frontagers;
j) Resetting of Ironwork.

3. Type of Binder

3.1 Materials manufactured with bitumen emulsion or modified bitumen emulsions complying with BS EN 13808 and BS 434.

4. Period of Work

4.1 It should be judged if weather conditions and other circumstances are suitable before carrying out the work. Work should not commence unless the temperature has met 5 degrees Celsius and rising on a thermometer.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

1170AR – Footway Slurry Surfacing (Continued)

5. Preparatory Sweeping and Cleaning

5.1 All vegetation within the surface to be covered shall be treated with an approved herbicide in accordance with 674AR not less than 14 days before the application of the surfacing.

5.2 Immediately before application of the surfacing all loose material from the surface to be covered shall be removed (this is to be accomplished by high pressure jet washing) and any remaining vegetation still growing moved, with any remaining root growth treated in accordance with 674AR.

Note: growth shall be treated after high pressure jet washing has taken place.

5.3 The removal of any foreign matter affecting the surface which is likely to prove detrimental to the finished product is also deemed to be included as part of the preparatory cleaning e.g. oil spillage or any substance likely to de-bond the layer to be applied.

6. Protection of Street Furniture

6.1 The full width and length of the area to be treated shall be covered without overlapping kerbs, channels and edgings for footways.

6.2 The material shall not be allowed to overlap on to boundary walls fences or any other structure adjoining the highway, nor any street furniture actually situated within the areas to be treated. All ironwork such as manhole covers, hydrants, gullies, catchpit covers, stop valves or similar shall be masked to give complete protection during the operation. Oils and/or sand or similar materials shall not be used.

7. Resetting Covers and Frames

7.1 Where practicable, gullies and manhole covers and frames, stop valves and all other covers shall be set to new levels before the final surfacing is laid.

7.2 When covers etc., are set to new levels after the surfacing is laid, the reinstatement of the area around the covers etc., shall be carried out in the same type of material as that used for the new surfacing. Covers shall be set to the new levels within two weeks of the completion of the surface.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

1170AR – Footway Slurry Surfacing (Continued)

7. Resetting Covers and Frames (Continued)

7.3 Manholes etc., shall be reset flush (± 3mm) with, and the gullies 6mm (± 3mm) below, the level of the new surface.

8. Joints

8.1 Longitudinal joints shall be feather lapped such that the joints do not exceed the nominal layer thickness, longitudinally or laterally. Joints with adjacent surfaces shall be feathered to neat regular shapes appropriate to the layout, and protective mats or paper should be used to achieve same. Wherever possible longitudinal joints between final applications shall coincide with 'lane lines'. In every case, surfacing of the highest part of the substrate due to crossfall or camber will always be treated last thereby ensuring that the upper layer of the feather lap at joints will be so formed to head water towards the lower section of surface.

9. Aggregates

9.1 The final surface shall consist of exposed rock aggregate with a minimum psv of 45.

10. Mixing and Laying

10.1 The material shall be properly proportioned and shall be mixed by a machine which shall be able to supply sufficient material to achieve the nominal layer thickness and surface regularity required.

10.2 The surfacing mixtures shall be spread uniformly by means of mechanical spreader or by hand.

10.3 All material discharged from the mixer shall be used without further addition.

10.4 Where more than one layer is necessary each successive layer shall be completed where possible within three days of completion of the previous layer. Where other than full machine width passes are necessary these shall not form the final part of the surfacing.

10.5 It is recognised that in some areas laying by mechanical means may not be possible.

10.6 All equipment shall be limited to weights which will not cause damage to substrates.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

1170AR – Footway Slurry Surfacing (Continued)

11. Finished Surface

11.1 The finished surfacing shall be of uniform surface texture and appearance throughout the work, without variations across the width of the paved area.

11.2 The finished surfacing shall be free from droppings, excess overlapping or badly aligned longitudinal or transverse joints, damage by rain or frost, or other defects. Any surfacing which does not comply with this Clause or is non-uniform in surface texture or appearance within 30 days of laying shall receive remedial actions which have first been agreed with the Supervisor.

11.3 If fresh material is superimposed any area so treated shall be not less than 5m long and the full width of the machine. The completed repair shall meet the overall requirements of this Specification and shall match the original material. In areas of restricted access hand work may be necessary but it is essential that a finish is achieved compatible with that of the mechanically laid material.

12. Performance Standards

12.1 Surface Regularity - No irregularity greater than 8mm under a 1m straight edge shall be measured at any location unless such a profile is required to accommodate features such as dropped kerbs, cambers and changing gradients.

12.2 Slip Resistance- The finished surface shall provide an average slip resistance of at least 0.35 Grip Number when measured in push mode over any 10m length with a Grip Tester currently manufactured by Findlay, Irvine Ltd., Penicuik, Midlothian.

12.3 Abrasion Loss- If the effects of normal traffic and/or weathering cause abrasion of the slurry surfacing so as to completely reveal the underlying original footway surface, this condition is defined as 'Total Abrasion Loss'. Remedial works shall be carried out to any single area of total abrasion loss when it exceeds 1.0m^2.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

1170AR – Footway Slurry Surfacing (Continued)

12. Performance Standards (Continued)

12.4 Penetration Resistance- The slurry surfacing shall, at all-natural ambient temperatures, be capable of supporting pedestrians wearing narrow heeled shoes without undue penetration of the surface. Objective assessment of any such defects shall be carried out as follows: the method of road surface hardness measurement published in Appendix C of TRL Road Note 39 'Design Guide for Road Surface Dressing' (1992) shall be used with the following modifications. The standard 4mm diameter tip shall be converted to a 15mm diameter flat-ended tip using a suitable converter. Measurements shall be made at a surface temperature of 30°C $\pm$2° without the use of correction factors or graphs. Slurry surfacing shall be regarded as unacceptably soft if the main probe penetration exceeds 10mm.

13. Protection of Newly Laid Surface

13.1 Traffic and pedestrians shall be kept off newly treated surfaces until material has set and will suffer to detrimental effect.

14. Notice to Carry Out Work

14.1 Clear and legible notices are to be posted in the road where work is to be carried out giving at least 24 hours' notice of working being carried out.

14.2 The owners/occupiers of all properties fronting the footway to be surfaced shall be notified 24 hours before works are due to commence, by means of the Staffordshire Highways information leaflet.

15. Traffic Safety Measures and Control

15.1 Traffic control shall be in accordance with the Code of Practice for Signing at Surface Dressing Sites (produced jointly by CSS and RSDA - CCS/RSDA /Eng/3/2000) and such other special requirements as described in the contract.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

2670AR – Health and Safety File

1.0 General

1.1 The contractor in their role as Principal Contractor shall provide particular information in the specified format(s) and at the timings indicated within this clause to the principal designer as appropriate to facilitate the production of the Health and Safety File as required by the CDM Regulations (2015).

2.0 Information Required

2.1 The Principal Contractor shall provide original copies of all drawings that relate to those aspects of the design for which they, or their sub-contractors and suppliers, have a direct responsibility. Such drawings shall be inclusive of all construction stage amendments introduced via approved changes and may include drawings initially produced by the Principal Contractor's sub-contractors and suppliers. Responsibility for the as-built version of all such drawings lies with the Principal Contractor.

2.2 The Principal Contractor shall provide copies of product data sheets and other technical literature relating to all materials that are approved for incorporation into the Works that have health and safety implications, including maintenance facilities. All such information shall bear the name, address and contact numbers of the manufacturer and/or supplier of these materials.

2.3 The Principal Contractor shall provide as-built information relating to all Statutory Undertaker's equipment that is exposed during, or affected by, the Works. This will exclude such work carried out in advance of the works contract by others (unless subsequently exposed during the works) but will include all existing supplies and services exposed during the works and all main service diversions required by these works whether carried out by others, the Principal Contractor or their sub-contractors.

2.4 The Principal Contractor shall provide copies of all approved Method Statements originated by the Principal Contractor or their sub-contractors that relate to the Works.

2.5 The Principal Contractor shall provide a duplicate set of Road Lighting and Traffic Signals Site Records as described in Specification Clause 1402.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

2670AR – Health and Safety File (Continued)

3.0 Formats Required

3.1 All documents and drawings must be submitted in an electronic format and must be able to be printed at the original intended document size; in the instance of drawings this must be to the intended indicated scale. Any drawings containing handwritten notes shall be scanned at 1:1 scale and submitted in PDF format.

3.2 All drawings submitted by the Principal Contractor in accordance with paragraph 2.1 above shall be paper originals, in colour if necessary, and on the appropriate standard sized sheets (A1, A3 and A4). Drawings submitted by the Principal Contractor in accordance with paragraph 2.5 shall be in the format(s) described in Specification Clause 1402. All drawings shall clearly indicate the Project Title, Drawing Title, Drawing Number, date of production, scale and initials of those persons responsible for the production and checking of the drawing. Each drawing shall be clearly marked as-built and identify the company responsible for the producing this drawing.

3.3 The as-built information required by paragraph 2.3 above will be in the form of electronic survey data compatible AutoCAD and shall be submitted to the Supervisor who shall arrange for the information so provided to be incorporated into the as-built service drawings. Equipment belonging to each Statutory Undertaker shall be clearly distinguishable from each other by colour, line style and by use of specific string labels. Precise formatting for each service type shall be agreed between the Principal Contractor and the Supervisor.

3.4 All information as defined by paragraphs 2.3 and 3.2 shall be submitted to the Supervisor at the site office at monthly intervals as the works progress. The survey information will be cumulative in content.

4.0 Timing of Submission

4.1 All information as defined by paragraphs 2.1, 2.2 and 3.1 shall be submitted to the Principal Designer within two months after completion of the Whole of the Works to the following address.
Staffordshire County Council
Number 1 Staffordshire Place
Tipping Street
Stafford
ST16 2DP
For the attention of ……(Principal Designer)

4.2 The Principal Designer shall check and submit the File to the Overseeing Organisation within one month of receipt.

Appendix 0/1: Contract- Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract (Continued)

Additional clauses, tables and figures:

2671AR - Working in the Vicinity of Structures

1. Works undertaken within 20m of a highway structure shall not commence without prior consultation and written consent of the Staffordshire County Council Highway Asset Management Team.

APPENDIX 0/2: CONTRACT-SPECIFIC MINOR ALTERATIONS TO EXISTING CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT

Alterations to be made

506.2	2nd line, after 'drain' insert the following: "and making alterations to existing chambers".
506.3	At end of sub-Clause insert the following additional sentence: "Disconnection of existing drains no longer required to be connected to existing chambers remaining in service, shall be carried out at the chambers to the requirements described in Appendix 5/1.".
508.1	3rd line, delete full stop and insert the following: "or such other Drawing as required by Appendix 5/1."
1401.2	Insert additional paragraph (vi) to follow paragraph (v) as follows:- "(vi) The term luminaire applies to all lighting units; the term 'lantern' is herewith defined as 'a luminaire designed for road lighting' and is used throughout BS 5489, hence 'lantern' is used in the Specification when only Road Lighting Units are referred to."

APPENDIX 0/2: CONTRACT-SPECIFIC MINOR ALTERATIONS TO EXISTING CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT

Appendix F	Alterations to be made
List 1	Page 24 Insert the following additional standard after BS EN 10296-2:- BS EN ISO 10319 Geosynthetics - Wide-width tensile test.
List 6	Page 43 Insert the additional publication :- (f) Highways – Advice Notes (i) LA120 Environmental Management Plans
List 8	Page 47 Insert the following:- The Control of Pesticides Regulations 1986 (as amended 1997)
List 10	Page 52 Insert the following items and additional publications: Plant Protection Products (Sustainable Use) Regulations 2012 E-on Energy Services acting for Lighting for Staffordshire County Council documents • Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018) • Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018) • Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018) Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code") – Approved version 2.1, May 2021, which replaces 'Sewers for Adoption'. Civil Engineering Specification for the Water Industry, 7th Edition. (CESWI) - March 2011.

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT

Appendix 0/3 is comprised of two lists, A and B, of numbered Appendices as follows:

List 'A' is a complete list of Numbered Appendices referred to in the Specification for Highway Works with those not adopted marked 'Not Used'. Those identified by the letter T or C shall be completed by the Tenderer or Contractor respectively, i.e. (T) Tenderer completes and returns with Tender, (C) Contractor completes and returns to Overseeing Organisation.

List 'B' gives the list of Contract-specific Numbered Appendices devised for the Contract.

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			INTRODUCTION
		0/1	Contract specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract.
		0/2	Contract specific Minor Alterations to existing Clauses, Tables and Figures Included in the Contract.
		0/3	List of Numbered Appendices Referred to in the Specification and Included in the Contract.
		0/4	List of Drawings Included in the Contract.
	Not Used	0/5	Special National Alterations of the Overseeing Department of Scotland/Wales/Northern Ireland.
			PRELIMINARIES
		1/1	Temporary Accommodation and Equipment for the Overseeing Organisation.
		1/2	Vehicles for the Overseeing Organisation.
	Not Used	1/3	Radio Communication System for the Overseeing Organisation.
		1/4	Working and Fabrication Drawings.
		1/5	Testing to be Carried Out by the Contractor.
		1/6	Supply and Delivery of Samples to the Overseeing Organisation.
		1/7	Site Extent and Limitations on Use.
	Not Used	1/8	Operatives for the Overseeing Organisation.
		1/9	Control of Noise and Vibration.
	Not Used	1/10	Permanent Works to be Designed by the Contractor.
	Not Used	1/11	Temporary Works Design.
	Not Used	1/12	Setting Out and Existing Ground Levels.
		1/13	Programme of Works.
	Not Used	1/14	Payment Applications.
	Not Used	1/15	Accommodation Works.

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			PRELIMINARIES (Continued)
		1/16	Privately and Publicly Owned Services and Supplies.
		1/17	Traffic Safety and Management.
	Not Used	1/18	Temporary Highways for Traffic.
		1/19	Routeing of Vehicles.
	Not Used	1/20	Recovery Vehicles for Breakdowns.
		1/21	Information Boards.
	Not Used	1/22	Progress Photographs
		1/23	Risks to Health and Safety from Materials or Substances.
	Not Used	1/24	Quality Management System
	Not Used	1/25	Temporary Closed-Circuit Television (CCTV) System for the Monitoring of Traffic
	Not Used	1/26	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)
	Not Used	1/27	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements
			SITE CLEARANCE
	Not Used	2/1	List of Buildings, etc. to be Demolished or Partially Demolished
		2/2	Filling of Trenches and Pipes
		2/3	Retention of Material Arising from Site Clearance
		2/4	Explosives and Blasting
		2/5	Hazardous Materials
	Not Used	2/6	Site Clearance Environmental Requirements

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			FENCING
	Not Used	3/1	Fencing, Gates and Stiles
			ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)
		4/1	Road Restraint Systems (Vehicle and Pedestrian)
		4/2	Information Required to Demonstrate Compliance of Transitions and Terminals to Clause 401
			DRAINAGE AND SERVICE DUCTS
		5/1	Drainage Requirements
		5/2	Service Duct Requirements
	Not Used	5/3	Surface Water Channels and Drainage Channel Blocks
	Not Used	5/4	Fin Drains and Narrow Filter Drains
		5/5	Combined Drainage and Kerb Systems
	Not Used	5/6	Linear Drainage Channel Systems
	Not Used	5/7	Thermoplastics Structural Wall Pipes and Fittings
			EARTHWORKS
		6/1	Requirements for Acceptability and Testing etc. of Earthworks Materials
		6/2	Requirements for Dealing with Class U1B and Class U2 Unacceptable Material
		6/3	Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)
	Not Used	6/4	Requirements for Class 3 Material

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			EARTHWORKS (Continued)
		6/5	Geotextiles Used to Separate Earthworks Materials
		6/6	Fill to Structures and Fill Above Structural Foundations
		6/7	Sub-formation and Capping and Preparation and Surface Treatment of Formation
		6/8	Topsoiling
		6/9	Earthworks Environmental Bunds, Landscape Areas, Strengthened Embankments
	Not Used	6/10	Ground Anchorages, Crib Walling and Gabions
	Not Used	6/11	Swallow Holes and Other Naturally Occurring Cavities and Disused Mine Workings
	Not Used	6/12	Instrumentation and Monitoring
	Not Used	6/13	Ground Improvement
	Not Used	6/14	Limiting Values for Pollution of Controlled Waters
	Not Used	6/15	Limiting Values for Harm to Human Health and the Environment
			ROAD PAVEMENTS – GENERAL
		7/1	Permitted Pavement Options (Schedules 1, 2, 3, 4 and 5)
		7/2	Excavation, Repair and Reinstatement of Existing Surfaces
		7/3	Surface Dressing Performance Specification (Sheets 1, 2 and 3)
		7/4	Bond Coats, Tack Coats and Other Bituminous Sprays (Sheets 1, 2 and Binder Data Sheet)
	Not Used	7/5	In-Situ Recycling: The Remix and Repave Process
		7/6	Breaking Up or Perforation of Existing Pavement
	Not Used	7/7	Slurry Surfacing Incorporating Microsurfacing (Sheets 1, 2 and 3)

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			ROAD PAVEMENTS – GENERAL (Continued)
	Not Used	7/8	Not Used
		7/9	Cold-Milling (Planing) of Bituminous Bound Flexible Pavement
	Not Used	7/10	Not Used
	Not Used	7/11	Overbanding and Inlaid Crack Sealing Systems
	Not Used	7/12	Arrester Beds
	Not Used	7/13	Saw-Cut and Seal Bituminous Overlays on Existing Concrete Pavements
	Not Used	7/14	Preparation of Jointed Concrete Pavements Prior to Overlaying and Saw Cutting and Seal of Bituminous Overlay
	Not Used	7/15	Saw-Cut, Crack and Seat Existing Jointed Concrete Pavements
	Not Used	7/16	Cracking and Seating of Existing Jointed Unreinforced Concrete Pavements and CBM Bases
	Not Used	7/17	Cracking Plant and Equipment Progress Record
		7/18	Site Specific Details and Requirements for Cold Recycled Bitumen Bound Material
	Not Used	7/19	Back Analysis of Falling Weight Deflectometer (FWD) Measurements Made on Concrete Pavements Treated by Fractured Slab Techniques
	Not Used	7/20	Site Specific Details and Requirements for Inducing Cracks
	Not Used	7/21	Surface Dressing – Recipe Specification (Sheets 1 and 2 and Binder Data Sheet)
		7/22	Repair to Potholes
			ROAD PAVEMENTS – CONCRETE AND CEMENT BOUND MATERIALS
	Not Used	10/1	Plant and Equipment for the Construction of Exposed Aggregate Concrete Surface

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			KERBS, FOOTWAYS AND PAVED AREAS
		11/1	Kerbs, Footways and Paved Areas
	Not Used	11/2	Access Steps
			TRAFFIC SIGNS
		12/1	Traffic Signs: General
	Not Used	12/2	Traffic Signs: Marker Posts
		12/3	Traffic Signs: Road Markings and Studs
	Not Used	12/4	Traffic Signs: Cones, Cylinders, FTD's and Other Traffic Delineators
		12/5	Traffic Signs: Traffic Signals
	Not Used	12/6	Traffic Signs: Special Sign Requirements on Gantries
			ROAD LIGHTING COLUMNS AND BRACKETS, CCTV MASTS AND CANTILEVER MASTS
	See Appendix 0/2	13/1	Information to be Provided When Specifying Lighting Columns and Brackets
		13/2	Typical Lighting Column and Bracket Data Sheets 1 and 2
		13/3	Instructions for Completion of Column and Bracket Data Sheets
		13/3	Information to be Provided When Specifying CCTV Masts
		13/5	Typical CCTV Mast Data Sheet
		13/6	Instructions for Completion of CCTV Mast Sheets
		13/7	Information to be Provided When Specifying Cantilever Masts
		13/8	Typical Cantilever Masts Data Sheets 1 and 2
		13/9	Instructions for Completion of Cantilever Masts Data Sheets

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS
	See Appendix 0/2	14/1	Site Records
		14/2	Location of Lighting Units and Feeder Pillars
		14/3	Temporary Lighting
		14/4	Electrical Equipment for Road Lighting
		14/5	Electrical Equipment for Traffic Signs
			MOTORWAY COMMUNICATIONS
	Not Used	15/1	Motorway Communications
	Not Used	15/2	Cable Duct Requirements
			PILING AND EMBEDDED RETAINING WALLS
	Not Used	16/1	General Requirements for Piling and Embedded Retaining Walls
	Not Used	16/2	Precast Reinforced and Prestressed Concrete Piles and Precast Reinforced Concrete Segmental Piles
	Not Used	16/3	Bored Cast-in Place Piles
	Not Used	16/4	Bored Piles Constructed using Continuous Flight Augers and Concrete or Grout Injection through Hollow Auger Stems
	Not Used	16/5	Driven Cast-in-Place Piles
	Not Used	16/6	Steel Bearing Piles
	Not Used	16/7	Reduction of Friction on Piles
	Not Used	16/8	Non-Destructive Methods for Testing Piles
	Not Used	16/9	Static Load Testing of Piles
	Not Used	16/10	Diaphragm Walls
	Not Used	16/11	Hard/Hard Secant Pile Walls
	Not Used	16/12	Hard/Soft Secant Pile Walls

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			PILING AND EMBEDDED RETAINING WALLS (Continued)
	Not Used	16/13	Contiguous Bored Pile Walls
	Not Used	16/14	King Post Walls
	Not Used	16/15	Steel Sheet Piles
	Not Used	16/16	Integrity Testing of Wall Elements
	Not Used	16/17	Instrumentation for Piles and Embedded Walls
	Not Used	16/18	Support Fluid
			STRUCTURAL CONCRETE
	Not Used	17/1	Schedule for the Specification of Designed Concrete
	Not Used	17/2	Concrete - Impregnation Schedule
	Not Used	17/3	Concrete - Surface Finishes
		17/4	Concrete - General
	Not Used	17/5	Buried Concrete
	Not Used	17/6	Grouting and Duct Systems for Post-Tensioned Tendons
			STRUCTURAL STEELWORK
	Not Used	18/1	Requirements for Structural Steelwork
			PROTECTION OF STEELWORK AGAINST CORROSION
	See Appendix 0/2	19/1	Form HA/P1 (New Works) Paint System Sheet
		19/2	Requirements for Other Works
		19/3	Form HA/P2 Paint Data Sheet
		19/4	Form HA/P3 Paint Sample Despatch List Sheets 1 and 2
		19/5	General Requirements

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			WATERPROOFING FOR STRUCTURES
	Not Used	20/1	Waterproofing for Concrete Structures
			BRIDGE BEARINGS
	Not Used	21/1	Bridge Bearing Schedule
	Not Used	22/1	Not Used
			BRIDGE EXPANSION JOINTS AND SEALING OF GAPS
	Not Used	23/1	Bridge Deck Expansion Joints Schedule
	Not Used	23/2	Sealing of Gaps Schedule (Other than in Bridge Deck Expansion Joints)
			BRICKWORK, BLOCKWORK AND STONEWORK
	Not Used	24/1	Brickwork, Blockwork and Stonework
			SPECIAL STRUCTURES
	Not Used	25/1	Requirements for Corrugated Steel Buried Structures
	Not Used	25/2	Requirements for Reinforced Soil and Anchored Earth Structures
	Not Used	25/3	Requirements for Pocket-Type and Grouted-Cavity Reinforced Brickwork Retaining Wall Structures
	Not Used	25/4	Environmental Barriers
	Not Used	25/5	Requirements for Buried Rigid Pipes for Drainage Structures

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)			
Volume No.	**Completed by**	**Appendix No.**	**Title**
			MISCELLANEOUS
		26/1	Ancillary Concrete
	Not Used	26/2	Bedding Mortar
	Not Used	26/3	Cored Thermoplastic Node Markers
			LANDSCAPE AND ECOLOGY
	Not Used	30/1	General, Sheets 1, 2 and 3
	Not Used	30/2	Weed Control
	Not Used	30/3	Control of Rabbits and Deer
	Not Used	30/4	Ground Preparation
		30/5	Grass Seeding, Wildflower Seeding and Turfing
		30/6	Planting
	Not Used	30/7	Grass, Bulbs and Wildflower Maintenance
	Not Used	30/8	Watering
	Not Used	30/9	Establishment Maintenance for Planting
	Not Used	30/10	Maintenance of Established Trees and Shrubs
	Not Used	30/11	Management of Waterbodies
	Not Used	30/12	Special Ecological Measures
			MAINTENANCE PAINTING OF STEELWORK
	Not Used	50/1	Form HA/P1 (Maintenance) Paint System Sheet
	Not Used	50/2	Requirements for Other Work
	Not Used	50/3	Form HA/P2 Paint Data Sheet
	Not Used	50/4	Form HA/P3 Paint Sample Despatch List: Sheets 1 and 2 General Requirements

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT (Continued)

List 'B' List of Contract specific Numbered Appendices devised for the Contract		
Volume No.	**Appendix No.**	**Appendix Title**
	7/70	Site Specific Material and Requirements for Recycled Cement Bound Materials

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

1 Contract-Specific Drawings Supplied to Each Tenderer

Drawing No.	Title	Volume No.
	As described in the Scheme Specific Works Information	

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)

2 Standard Drawings Supplied to Each Tenderer (Continued)

Drawing No	Title
HWD Series	
01.10	Preventative Surface Treatment Signs
03.06	Timber Pedestrian Barrier
03.07	Timber Post and Rail Fence
03.08	Rabbit Proof Mesh Fences
03.12	Stock Proof Mesh Fences
03.13	Erection of Plastic Snow Fencing
03.14	Temporary Fences Types 1 and 2
03.31	Timber Double Field Gate Type 2
03.51	Individual Tree Guard
04.01	Pedestrian Guardrail Type 1
04.02	Pedestrian Guardrail Type 2
04.03	High Visibility Pedestrian Guardrail
05.01	Carrier Drain Pipe Schedules - Specified Design Group
05.03	Carrier Drains Pipe Schedules - Particular Designs
05.05	Filter Drains Pipe Schedules - Specified Design Group
05.07	Filter Drain Pipe Schedules - Particular Designs
05.09	Fin and Narrow Filter Drains - Pipe Schedules
05.11	Manholes and Catchpits - Chamber Schedules
05.13	Street Gullies - Gully Schedules
05.21	Service Ducts - Schedules
05.23	Drawpits and Duct Chambers - Chamber Schedules
05.31	Small Headwall Outfall Types 1 and 2
05.32	Small Headwall Outfall Type 3
05.41	Type D1 Chamber (Brick or Insitu Concrete Drawpit)
05.42	Duct Chamber -Type D2
05.43	Duct Chamber-Type D3
05.52	Duct Trench and Bedding
05.53	Multi-way Duct Trench and Bedding
05.65	Brick Gully - Type 3
05.67	Precast Concrete Gully - Type 2
05.68	Insitu Concrete Gully - Type 4
05.70	Connecting to Existing Piped Drain with diameter equal to or less than 300mm
05.71	Connecting to Existing Piped Drain with diameter greater than 300mm
05.72	Gully Cover Reinstatement

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)

2 Standard Drawings Supplied to Each Tenderer (Continued)

Drawing No	Title
06.01	Watercourses - Intercepting Ditches
07.01	Regulating Courses for Tie-ins on Existing Carriageway
07.02	Flat Top Road Humps
07.05	Speed Cushions
07.08	Conversion of Existing Balanced Carriageway into Superelevated Carriageway
07.09	Carriageway Widening
07.10	Stepped Tie-ins on Existing Carriageway
11.01	Kerbing Detail with Dowel Bar
11.02	Kerbing Details
11.03	Precast Concrete Channels
11.04	Kerbing Details on Existing Foundation
11.05	Precast Concrete Kerbing - High Containment System
11.11	Precast Concrete Edging
11.21	Dressed Natural Stone Setts Carriageway Edge Applications
11.34	Hard Landscape Grassgrid and Deterrent Paving
11.35	Precast Concrete Tactile Paving Types
11.36	Precast Concrete Cycleway Tactile Paving
11.37	Precast Concrete Blister Tactile Blocks
11.41	Pedestrian and Vehicular Crossing in Kerbed Footways
11.43	Agricultural Vehicle Crossing in Kerbed Verges
11.45	Construction of Typical Domestic Access Crossing
11.46	Typical Access Crossing on a Classified Road
11.47-1	Standard Bus Stop Detail - Town Centre Location Bus Route Interchange
11.47-2	Standard Bus Stop Detail - High Streets, Near Shops, at Libraries and Schools
11.47-3	Standard Bus Stop Detail - Residential Areas
11.47-4	Standard Bus Stop Detail - Rural Locations
11.51	Refuge Types
11.55	Timber Edging Kerb
12.31	Plastic Edge Marker Posts
12.54.1	Post and Foundation Details-600
12.54.2	Post and Foundation Details-750
12.54.3	Post and Foundation Details-900
12.54.4	Post and Foundation Details-1200
30.01	Hedge Types
60.11	Permanent Ground Markers - Type1 and 2
60.12	Permanent Ground Markers - Type 3 and 4
60.15	Permanent Bench Marks

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)

2 Standard Drawings Supplied to Each Tenderer (Continued)

Drawing No	Title
TS Series	
TS/SD/01L	Standard Layout for Dual Pelican Crossing Two Lane Approach
02L	Standard Layout Single Pelican Crossing
03M	Standard Layout Dual Puffin Single Lane Approach
04P	Standard Layout Single Puffin Crossing
06F	Standard Drawing for Typical Traffic Signal Chamber
07G	Standard Detail Mains Supply Feeder Pillar
08D	Standard Detail Traffic Signal Controller Cabinet
09E	Standard Detail SA Detection Loop Positions
10E	Standard Detail SDE Detection Loop Positions
11N	Standard Layout Single Puffin Crossing with Pedestrian Refuge
12M	Standard Layout for Dual Toucan Crossing Single Lane Approach
13N	Standard Layout for Single Toucan Crossing
14G	Standard Layout for Single Toucan Crossing One Way Street
15I	Standard Layout for Single Puffin Crossing One Way Street
16H	Standard Layout for Dual Puffin Crossing Two Lane Approach
17H	Standard Layout for Dual Pelican Crossing Single Lane Approach
18H	Standard Layout for Dual Toucan Crossing Two Lane Approach
19F	Standard Layout for Single Toucan Crossing with Pedestrian Refuge
21	Standard Detail Traffic Signal Pole Installation

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)

3 Standard Drawings Inspected by Each Tenderer

The following drawings are made available for inspection by tenderers at:

Staffordshire County Council, No 1 Staffordshire Place, Tipping Street, Stafford, ST16 2LP.

Telephone: 0300 111 8000

between the following dates ..... and by appointment between the following times:
Mon. to Fri. 9.30am to 12 noon, 2.00pm to 4.00pm.

One copy will be supplied to the Contractor.

4 Standard Drawings Brought into the Contract by Reference

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

2 Standard Drawings
2(iii) Brought into the Contract by Reference

HCD published by HMSO as Volume 3 of the Manual of Contract Documents for Highway Works contains the following drawings brought into the Contract by reference. Unless otherwise stated below the whole drawing is brought into the Contract.

Drawing No.	Title	Date	Aspect / Alternative(s) Reqd. if Not Whole Drawing
F1	Surface Water Drain - Trench and Bedding Details	Dec.91	
F2	Filter Drains - Trench and Bedding Details	Nov.03	
F3	Type 1 Chamber (Brick or Insitu Concrete Manhole)	May 06	
F4	Type 2 Chamber (Precast Concrete Manhole)	May 06	
F5	Type 3 Chamber (Precast Concrete Manhole)	May 06	
F6	Type 4 Chamber (Precast Concrete Manhole)	May 06	
F7	Type 5 Chamber (Precast Concrete Manhole)	May 06	
F11	Type 7 Chamber (1050 Catchpit)	May 06	
F13	Precast and Insitu Cast Gullies	May 04	
I2	Duct Trench Cross Sections and Details of Mandrel		

APPENDIX 1/1: TEMPORARY SITE ACCOMMODATION AND EQUIPMENT FOR THE OVERSEEING ORGANISATION

1. Accommodation required

1.1 Temporary office accommodation is to be provided and is required for the shared use by the Employer, the Overseeing Organisation, the Supervisor, the Contractor, their staff and authorised visitors in accordance with the following details, unless otherwise stated in the Scheme Specific Information.

2 Duration of time for accommodation provided

2.1 The accommodation as described shall be complete, fully equipped and available for full use one week prior to the date for commencement of the works and shall remain, complete for a period stated in the scheme specific Works Information, for the whole of the works as certified by the Overseeing Organisation in accordance with Clause 30.2 of the EEC NEC Conditions of Contract.

3 Locations and accommodation specifications

3.1 Office location, layout, access requirements and services:

i) **Location** The offices shall be positioned at a location arranged for by the Contractor and as agreed by the Supervisor.

ii) **Layout** The layout of the office accommodation shall be approved by the Project Manager prior to erection. All the offices shall be interlinked and include mess room, toilets, welfare facilities and store.

iii) **Access** The access to the site shall be via a formalised vehicle access crossing onto a hard paved surface off the nearest existing road with a paved parking area adjacent to the Offices for the minimum number of cars stated in the scheme specific Works Information and all site vehicles provided by the Contractor for the Overseeing Organisation under Appendix 1/2. This area shall be for the exclusive use of the Overseeing Organisation and their staff. Once the scheme is completed the Vehicle access crossing shall be removed and reinstated to standard footway/verge construction.

iv) **Floor Area** The offices shall comply with the Offices, Shop and Railway Premises Act 1963 and the Health and Safety at Work Act 1974 and shall have a minimum floor area suitable for an agreed number of supervisory staff to have a DSE compliant workspace each, taking into account any current Government guidelines on socially distancing within the desk space and circulation areas.

v) **Flooring** All floors shall be covered using cork, linoleum or vinyl.

APPENDIX 1/1: TEMPORARY SITE ACCOMMODATION AND EQUIPMENT FOR THE OVERSEEING ORGANISATION (Continued)

vi) **Doors** External doors shall be provided with locks and one key for each member of the Overseeing Organisation's staff. All internal doors shall be provided with locks and two keys and bear the designation of the Occupant(s). The door to the store shall be provided with a mortice lock and two keys.

vii) **Walling** Internal walls shall be suitably insulated, lined, decorated and be sufficiently sturdy to receive shelving.

viii) **Lighting** The window shall be a minimum of 20% of the floor areas. The offices shall be fitted with electric lighting to provide a minimum service value of 400 lux in all rooms. All office windows shall be fitted with Venetian blinds.

ix) **Heating** The offices shall be fitted with thermostatically controlled electric heating, capable of maintaining the room temperature of 21°C. Toilet, mess, washroom and corridors to be heated with black bar heater to maintain 15°C. Alternative forms of heating shall be supplied in the event of power restrictions or cuts.

x) **Ventilation** Adequate ventilation is to be provided by opening windows, fans and the like.

xi) **Water Supply** To be mains supply as required for washing/drinking etc.

xii) **Toilets** A mains flushing toilet and urinals with hand washing facilities shall be provided unless otherwise agreed with the Project Manager. in the scheme specific Works Information. The toilets and washing facilities shall be regularly and properly cleaned.

xiii) **Welfare Facilities** As a minimum these should contain a refrigerator, a microwave oven and hand cleaning facilities.

xiv) **Power supply** Unless stated otherwise in the scheme specific Works Information, this shall be mains electric supply; if unavailable for use one week prior to commencement of the Works, a generating set (push button start nominal rating 16KVA) shall be supplied at no extra cost until mains supply is connected. Where a generating set is utilised, arrangements shall be made for its routine servicing and maintenance to be undertaken outside of office hours. Between the months of October to April the generator is to be left running overnight.

xv) **Cleaning** The Offices are to be cleaned and serviced on a daily basis as described in the scheme specific Works Information.

APPENDIX 1/1: TEMPORARY SITE ACCOMMODATION AND EQUIPMENT FOR THE OVERSEEING ORGANISATION (Continued)

xvi) **Internet Connection** An Internet Connection sufficient to carry out communications and design shall be provided.

3.2 Equipment, furnishings, fittings, supplies and initial consumable stores.

i) **Copier** When stated in the scheme specific Works Information, a photocopier machine to be maintained in good working order at all times with a supply of each size of paper. The machine shall have the capability to copy A3 and A4 size, and to enlarge and reduce documents.

ii) **Telephone** lines and handsets shall be provided as described in the scheme specific Works Information.

iii) **Fire Extinguishers** These shall be supplied in sufficient numbers to satisfy safety regulations.

iv) **Furniture** All furniture shall be new or good second-hand condition to the approval of the Overseeing Organisation.

v) **PC Computer, Printer/Scanner, Programmes and Plotter** These shall be provided as described in the scheme specific Works Information.

vi) **Individual Offices** shall be furnished as described in the scheme specific Works Information.

4. Removal of the Principal Offices for the Overseeing Organisation

4.1 Timing of Removal

The Principal Offices for the Overseeing Organisation shall only be removed with the agreement of the Supervisor. The removal date shall be agreed at least seven days in advance between the Overseeing Organisation and the Contractor.

APPENDIX 1/2: VEHICLES FOR THE OVERSEEING ORGANISATION

Where detailed in the scheme specific Works Information, vehicles shall be provided as follows:

Type A (Estate or 4 Door Saloon Car)

1 The vehicle shall have independent suspension, front wheel drive and a manual gearbox.

2 The vehicle shall be finished in a plain light colour and be free from markings, identifying any company associated with the Contract.

3 The engine shall be at least 1,600cc petrol.

4 The equipment shall include a nearside external driving mirror, reversing lights, heated rear window with wash/wipe facility, fire extinguisher, front seat head restraints and a tool kit.

Type B (Light Van)

1 The vehicle shall have a carrying capacity of at least 0.25 tonne, a minimum ground clearance (unladen) of 150mm, independent suspension and have front wheel drive.

2 The vehicle shall be finished in a plain light colour and be free from markings identifying any company associated with the Contract.

3 The engine shall be at least 1,600cc petrol or its diesel equivalent.

4 The equipment shall include a nearside external driving mirror, reversing lights, heated rear window with wash/wipe facility, fire extinguisher, front seat head restraints and a tool kit.

Type C (4 Wheel Drive, Landrover type vehicle)

1 The Type C vehicle shall be a hardtop vehicle with a wheel base of at least 2.75m, a turbo charged diesel engine of at least 2.5 litre with a five-speed gearbox and two speed transfer box, with the option of either two or four wheel drive. The vehicle shall be adapted for CBR testing. It shall be supplied with rubber pads for clutch and brake pedals, tow rope, towing hooks, front and rear, and link mats front and rear.

APPENDIX 1/2: VEHICLES FOR THE OVERSEEING ORGANISATION (Continued)

Other Requirements

1 The vehicles will be used not only within the limits of the Site but also on public highways for site access and necessary journeys away from the Site. The Contractor's insurance must cover for such use of the vehicles.

2 The vehicles shall be new or less than one year old to the approval of the Overseeing Organisation. Seat belts shall be of the inertia reel type.

3 Each vehicle shall be fitted with a roof mounted amber strobe type flashing beacon controlled by an internal switch and a sign at the rear reading "HIGHWAY MAINTENANCE" (lettering to be 50mm high in black on yellow background.

4 Each vehicle is to be fitted with a permanently mounted communications unit (powered by the vehicle electrical system) and external aerial, as provided in the Contract operative from the first day of the Contract.

5 The vehicles shall be provided, fully equipped for use two days before commencement of the works, and where stated in the scheme specific Works Information, shall remain for up to four weeks after completion of the works.

6 Vehicles provided for the overseeing organisation shall be equipped with a fire extinguisher suitable for fighting a fire in the cab or engine of the vehicle in accordance with the latest HSE guidance.

7 Vehicles supplied to the overseeing organisation shall be equipped with a first aid kit in accordance with the latest revision of BS 8599-2

APPENDIX 1/4: WORKING AND FABRICATION DRAWINGS

Series	Description of Work	Minimum Period for submission prior to commencement of Related Works
	As described in the Scheme Specific Woks Information	
400	Vehicle Restraint Systems	
400	Pedestrian Restraint Systems	
500	Proprietary Duct Chambers	
500	Culvert Headwalls	
500	Combined Drainage and Kerbing Systems	
500	Surface Water Sewers of internal diameter greater than 900mm	
500	Manholes in excess of 1.5m diameter	
1200	Permanent Traffic Signs	
1300	Road Lighting Columns and Brackets	
1400	Electrical Work for Road Lighting and Traffic Signs	
1600	Piles	
1700	Formwork	
1800	Steelwork	
2100	Bearings	
2500 2500	Corrugated Steel Buried Structures, Environmental Barriers	

APPENDIX 1/5: TESTING TO BE CARRIED OUT BY THE CONTRACTOR

1.1 Samples should be delivered for testing to the employer in accordance with appendix 1/6 unless there is prior agreement from the overseeing organisation for testing to be carried out by the contractor.

1.2 Where testing is to be carried out by the contractor it shall be in accordance with the requirements of appendix 1/6 in addition to the requirements of this appendix if used.

1.3 If the Contractor does not have UKAS accredited staff to take the samples they shall place an order with a UKAS accredited laboratory to undertake the sampling.

1.4 The contractor must provide Factory Production Control documentation for all imported aggregate products for approval by the overseeing organisation prior to commencement of works on site.

1.5 Imported recycled aggregates must demonstrate their compliance with WRAP Quality Protocol: Aggregates from Inert Waste.

1.6 Sub-base material must comply with the requirements of SHW Cl. 803 or 807.

1.7 Earthworks materials must comply with the requirements of SHW series 600 and appendix 6/1 of this document.

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER

In the following schedule are details of the samples to be provided or made available by the Contractor for testing by the Employer and the locations to which they are to be delivered.

Notes to the schedule –

1. Samples comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (see Clause 105.6).

2. Unless otherwise shown in this Appendix, samples of work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.

3. Unless otherwise scheduled under Clause 2602 samples of concrete complying with that Clause are not required.

4. All testing is to be carried out by a UKAS accredited laboratory unless agreed otherwise in advance.

5. The Contractor shall be responsible for obtaining and transporting all samples to the Staffordshire Highways Laboratory (SHL), Stafford, for testing on behalf of the Employer

6. Samples indicated as having a delivery location of Staffordshire Highway Laboratory, are required to be transported by the Contractor to:

   Staffordshire Highways Laboratory, Sandyford Street, Stafford. ST16 3NF
   Tel: (01785) 277360

   Normal working hours at the Laboratory are 08.00 – 16.30 Monday to Friday (Public Holidays excepted), but samples may be accepted outside of these days and hours by prior arrangement.

7. As part of the provision of samples to the Employer, the Contractor shall keep a daily record of samples of goods and materials provided. Records shall be in sufficient detail to record the nature and source/supplier and the location of sampling in relation to the permanent works being constructed with such goods and materials. A copy of the daily record shall be provided by the Contractor to the Site Manager.

8. For all Staffordshire County Council schemes, samples are to be delivered to SHL for testing.

9. The Overseeing Organisation reserves the right to prove compaction of unbound materials via dynamic stiffness testing.

10. Natural ground formation samples must be tested via laboratory Equilibrium Design CBR. Remoulded CBR or plate bearing are not acceptable alternatives.

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 500 – Drainage and Service Ducts					
503 505 512 515	Pipe bedding Filter Medium Backfill Granular Fill	Grading	1 per source per scheme		
Series 600 - Earthworks					
601 631 to 637 640	Material classes 1 to 9	Moisture content Grading OMC Plasticity MCV Uniformity Coefficient Recycled material constituents	1 per source or material type per scheme and 1 per 500t thereafter. (sampling rates may vary on a site-specific basis by mutual agreement)		The appropriate testing and assessment regime is dependent on the category of earthworks defined in Staffordshire Highways Standard Appendix 6/1.
612	Compact-ion of Fill (End product)	In-situ density	3 tests per 500t		
	Compact-ion of Fill (Method)	Plate bearing (CBR)	1 test per 30 linear m.		
		In-situ density (Engineered Fill)	See App 6/1		
		Settlement tests (600mm plate)			
	Compact-ion of Fill (Existing natural ground)	Equilibrium design CBR	1 test per 30 – 50 linear m.		
Series 700 – Road Pavements - General					
702	Surface Regularity	Rolling Straight Edge	One per lane, per direction, per scheme		

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests (Continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 800 - Unbound, Hydraulically Bound and other materials					
803 and 807	Granular Sub-base material, Type 1 and Type 4	Grading	1 per scheme then 1 per 500t thereafter		Acceptance testing
		Grading	Compliance testing: 1 per 400t if not 1 per production week	Factory Production Control Certificates to be provided by supplier in advance of works starting	Factory Production Control testing of Recycled sub-base produced by the Infrastructure+ partnership will be tested as indicated.
		Frost heave	1 per year		
		Soundness	1 per year		
		Los Angeles Index	2 per year		
		Water absorption	1 per year		
		Plasticity Index	1 per source		
		Sulphate Testing	1 per year		
Series 900 – Bituminous bound materials					
904 to 914, 916, 929, 930, 942, 943, 971AR	Bituminous mixtures	Binder content, grading	1 per material per source per scheme then 1 per 500t		
		Air void determination	3 core pairs per 1,000m^2 – minimum 3 core pairs per scheme		See 970AR
		Maximum Density	1 per material / source		More testing will be required if the aggregate types vary.
915	Coated Chippings	Binder content, Binder condition, grading, Flakiness index.	1 per source per scheme		

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests (Continued)

Clause	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 – Bituminous bound materials (Continued)					
920	Bond coats	Rate of application, carpet tile test.	1 set of tiles		To be carried out wherever application is to reduce permeability of substrate.
921	Surface Texture	Volumetric patch texture depth	2 sets per scheme on SMA. 1 set per 150m per lane on HRA. Random checks on surface dressing.		To be carried out wherever >1mm is specified
922	Surface Dressing	Grading	1 per size/source per month		
		Flakiness Index			
		Chipping rate of spread	1 per operating crew per week		
		Binder rate of spread			
		Depot tray test (Transverse Distribution)	Once, prior to start of dressing season	Yes	To be repeated after any major equipment maintenance.

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests (Continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 – Bituminous bound materials (Continued)					
947, 948	Cold Recycled Bitumen Bound Material	Grading of aggregate stock	1 per 500t	Design Verification	Each scheme where existing design is used
		NAT stiffness	3 specimens @ Target binder and OPC	Design Verification	
		Grading	1 per 500t	Design process	New designs
		OMC	1 No. on finalised mixture		
		NAT stiffness	6 No @ minimum of 5 different/binder OPC contents, with at least one set of 6 specimens having a bitumen content of 0.5% above design target bitumen content.		
		Bitumen content of planings	3 No.		
		Grading Binder Content	1 per 500t		Process Control
		In-situ density In-situ stiffness	Daily site visit		

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests (Continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 1200 – Traffic Signs					
1212	Road Markings	Retroreflectivity Skid resistance	1 set (3 locations) per scheme		To be carried out on schemes having > 250m of white road marking.
Series 1700 - Structural Concrete					
1707	Concrete	Compressive strength Density	3 cubes per 24m^3		Reinforced concrete only
Series 1700 - Structural Concrete					
1700 1707	Concrete	Concrete cube strength identity testing	2 No cubes from each pour / every 24m^3	Staffordshire Highways Laboratory Sandyford Street	Tested at 28 days (Additional tests e.g. early strip cubes, arranged by Contractor)
1700 1707	Concrete	Concrete consistence – slump test	Each batch	Delivery area	Representative sample from initial discharge

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER (Continued)

Schedule of Tests (Continued)

Cl.	Work, Goods or Material	Test	Test frequency	Test Cert.	Comments
830 890 AR	FABM-1	**Constituents**			
		Water content BS EN 13286 - 1	1 per week		
		Grading BS EN 933 - 1	1 per week.		
		Imported lime		Supplier certificate weekly	
		Mixture			
		Water content at mixing BS EN 13286-1	1 per hour		
		Water content at final compaction BS EN 13286 - 1	1 per day		
		In-situ wet density Permanent works	5 per 1000 sq.m but not less than 4 per day		Sub-clause 870.5 Measured using a calibrated nuclear density gauge in the backscatter mode in accordance with BS1924-2. Each test to consist of 3 measurements at 120 degrees
		Laboratory mechanical performance	5 per 1000m^2 but not less than 4 per day		Table 8/20 i.e. as BS EN 13286 – 41 for Rc,
		Layer thickness	Dipping of foundation layer and compacted FABM layer @ 10m x 2m grid		
		Grading	1 per week		BS EN 14227 - 3
		In-Situ Dynamic Stiffness	N/S and O/S wheel tracks of each lane every 20 linear metres		Light drop-weight tester used in accordance with the manufacturer's instructions
		Immediate Bearing Index	Mixture design stage (880.3)		

APPENDIX 1/7: SITE EXTENT AND LIMITATIONS ON USE

1 Extent of the Site, Working Areas and Working Hours

1.1 The limits of the Site are indicated by the General Arrangement drawings (including all verges and footways).

1.2 For the purpose of providing, maintaining and removing the traffic safety and management the Site will temporarily be extended to the traffic lanes coned off for this particular operation and the temporary signs required as advance warning signs for the works and in the case of when road closures are in operation, those roads onto which traffic is temporarily diverted, plus all associated diversion signs.

1.3 Working hours to be as per site specific planning permission or in accordance with borough/district council guidelines, with reference to appendix 1/17 cl. 1.6.

1.4 Working hours are:

2. Limitations on the Use of the Site

2.1 No equipment, plant, materials or other items will be permitted to remain or to be placed on areas which are not part of the Site as defined in this Appendix with the exception of items needed to control traffic which have been placed in positions agreed by the Overseeing Organisation.

2.2 The Contractor shall take all due care to avoid damage to the grass verges, footways and the drainage system, providing sleeper or other protection whenever they require plant or vehicles to cross these features. Any damaged areas of verge shall be reinstated with topsoil and seeded in accordance with the specification. Any damaged or disturbance to drains shall be reinstated by the Contractor within 24 hours or such other time as the Overseeing Organisation may agree in writing, and works to check adjacent lengths of drains possibly damaged by Contractor's plant shall be carried out concurrently if the Overseeing Organisation so directs. Other areas of the Site, including the Contractor's accesses shall be reinstated to the original condition on completion of the Works.

2.3 Access to the frontages is to be maintained at all times. The Contractor is to liaise with frontage occupiers when works interfere with access points.

2.4 No materials will be allowed to be stored on areas designated as public highway without the prior consent of the Overseeing Organisation.

APPENDIX 1/7: SITE EXTENT AND LIMITATIONS ON USE (Continued)

2.5 All advertisements, contractors and sub-contractors name-boards to be erected within the Site shall be approved by the Overseeing Organisation. Advertisements and nameboards will not be allowed in the vicinity of traffic lanes where in the opinion of the Overseeing Organisation such would distract drivers or conflict with statutory traffic signs. All advertisements and nameboards within the site shall be removed within two weeks of the date of the Certificate of Completion of the Works. Nameboards providing directional information erected beyond the Site and within the highway shall only be erected with the consent of the Highway Authority.

2.6 The Contractor shall take all necessary precautions within the Site, and land temporarily occupied for purposes of the Contract, against the growth of weed injurious to agriculture until the defects date.

3. The Contractor shall afford all reasonable facilities and services for any other contractors employed by the Employer and their operatives and of any properly authorised authorities or statutory bodies who may be employed in the execution on or near the Site and Working Areas of any work not in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the Works. In this context services shall include for the setting out of the Works and the checking thereof necessary for the Others to carry out their works compatibly with the Works described in the Contract.

4. Refer to clause 1/17.

APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION

General

1 The Local Authority having responsibility for the area is:
.....
.....
Tel: .....
Email: .....

2 The measures detailed in this Appendix are given as a guide; however, it is for the Contractor to decide whether to seek the Local Authority's formal consent to their proposed methods of work and to the steps they propose in order to minimise noise.

3 Data/Local Authority information/requirements. *[Include here any known data, relevant information or additional requirements.]*

4 Monitoring requirements ……..

Restrictions on Working Hours

5 …….. *[Include details on any working hours restrictions due to the control of noise and vibration, these should be considered and cross referenced, where necessary, with any site restrictions specified elsewhere, e.g. for traffic safety and management under contract specific Appendix 1/17, or general restrictions given in contract specific Appendix 1/7.]*

Noise

Noise Limits: *[note to compiler: include here details of which method is being used for noise restrictions]*

Method 1: Pre-existing ambient +5dB …….. *[include here the restriction details]*

Method 2: Local Authority Noise Limit ……..…… *[include here the restriction details]*

Notes:

i. Noise levels relate to free field conditions. Where noise monitoring is undertaken at nearby noise sensitive receptor (NSR) where sound level meters are located at least 1 m from facades of buildings.
When noise levels are measured within 1m of a building façade. The permitted noise levels can be increased by 3dB.

ii. The Pre-Construction Ambient noise level, LAeq, at a NSR is the total LAeq from all the noise sources in the vicinity over the representative period prior to the commencement of the works.

APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION (Continued)

iii. The Total Noise level, LAeq, at a NSR is the total LAeq from all the noise sources in the vicinity over the representative period plus the construction noise.

Method 1 *[delete if Method 1 is not being used]*

6 Table 1 details the results of the construction noise assessment demonstrating that ……*(number)* neighbouring noise sensitive premises are affected by significant noise levels as a result of the works.

[Note to compiler: the hours shown in the table below must cover the whole 24-hour period.]

Table 1: Construction Noise Assessment

Period	Hours	Noise Sensitive Receptor	Pre-Construction Ambient Noise level dB LAeq, Period	Total Noise dB LAeq, Period	Significance (Total Noise Pre-Construction Ambient) dB LAeq
Mondays to Fridays					
Saturdays					
Sundays					
Bank Holidays					
All unattended plant outside normal working hours					

Method 2 *[delete if Method 2 is not being used]*

7 The ambient noise level, LAeq from all sources when measured 2.0 m above the ground at noise control stations numbers 1 to ... on Drawing Numbers ..... shall not exceed the appropriate level given in the Noise Limit (see notes).

Noise Reduction

8 (05/14) The following noise reduction methods have been identified and shall be undertaken by the Contractor:

- …….
- …….
- …….

reducing the total noise level to within the pre-construction ambient noise (LAeq, Period) plus 5dB or less.

APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION (Continued)

9 Where it is not possible to reduce noise levels to within the pre-construction ambient noise (LAeq, Period) plus 5dB, despite extensive mitigation, consent to undertake noisy works will be made to the local authority in consultation with neighbouring noise sensitive premises.

Vibration

10 The use of explosives is not permitted, See Appendix 2/4.

11 Limits on vibration levels arising from the site activities …….. *[insert details of limits giving limits of vibrational amplitude and resultant peak particle velocity]*

12 Vibration control stations ……. *[insert location(s) details]*

13 Requirements for instrumentation and monitoring

14 Any known arrangements for Contractor to monitor vibration in property off site.

15 The following vibration reduction methods have been identified and shall be undertaken by the Contractor:

- …….
- …….
- …….

APPENDIX 1/13: PROGRAMME OF WORKS

1. Further to Clause 31.2 of the EEC Conditions of Contract, attention is drawn to the following constraints on the Contractor's programming of the works:

   i) In the case of traffic signs and road lighting and electrical work thereto the satisfactory final test shall mean the inspection and testing prescribed by Clause 1424 of the Specification.

   ii) Any scheme-specific requirement described in Appendices to the Specification that may be considered to be a "constraint".

2. Other information which the Contractor shall show in a Programme submitted for acceptance is as follows:

   i) The Programme shall be in the form of a bar chart produced as a result of a `critical path analysis' and must abide by the constraints below. It shall show a level of detail appropriate to each stage of the Works and all activities and restraints, each of which shall be given a short title. All events shall be numbered and annotated with earliest and latest dates.

   ii) At the time of presentation of the Programme the Contractor shall also provide a diagram showing their Intended "earthworks" movements and locations of licensed tipping facilities and of anticipated plant and other resource input.

   iii) The programme shall indicate the following level of details as a minimum, with scheme specific amendments:

      a. Traffic management proposal for each phase of the works.
      b. Each public utility;
      c. Roadworks, including;
         i. Site Clearance;
         ii. Fencing;
         iii. Drainage/ Ducting (each drain and duct run);
         iv. Earthworks including Topsoil Strip;
         v. Capping Layer;
         vi. Sub-base;
         vii. Pavement Construction;
         viii. Kerbing;
         ix. Footways / Cycleway;
         x. Signs and Markings;
         xi. Road Lighting;

   iv) The time base for the programme shall be "a day" being 0730hrs - 1900hrs for weekdays and Saturdays.

   v) The programme shall clearly and precisely define where the work is progressing.

   vi) The Contractor shall make allowance in their programme for the installation the new services to be provided by others, as detailed in 'Privately and Publicly Owned Services and Supplies and Works by others' in Appendix 1/16.

APPENDIX 1/13: PROGRAMME OF WORKS (continued)

vii) The programme shall be submitted to the overseeing organisation in an electronic version of the original software, PDF and readable colour print.

3. The work required to be done by the Completion Date for the Whole of the Works shall be the Whole of the Works described in the Works Information.

4. Further Requirements

4.1 The programme submitted to the Overseeing Organisation shall always represent the Contractor's working programme throughout the Contract. Where considered necessary by the Overseeing Organisation, the Contractor shall update the programme at monthly intervals and to match progress meetings.

4.2 In accordance with the Conditions of Contract the Contractor shall deliver each week to the Overseeing Organisation returns of Labour and Plant for each working day, in a form to be agreed with Overseeing Organisation's Representative.

4.3 Subject to and without prejudice to the Conditions of Contract, in the case of traffic signs and road lighting and electrical work thereto the satisfactory final test shall mean the inspection and testing prescribed by Clause 1424 of the Specification.

APPENDIX 1/16: PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES

1 In order to fulfil obligations under Clause 116 of the Specification and the Conditions of Contract; complete the below schedule with the names and addresses of authorities within the working areas.

2 This list is not exhaustive, and the Network Management department of the Overseeing Organisation should be consulted to obtain current details.

Statutory Undertakers / Authority	**Address/Telephone Number**	**Contacts**
Scheme Specific Works Information	No.1 Staffordshire Place, Stafford ST16 2DH 0300 111 8000	Network Management Unit
Local Planning Authority	1. Castle House, Barracks Road Newcastle-under-Lyme, ST5 1BL 01782 717717 2. Moorlands House, Stockwell Street, Leek, ST13 6HQ 0345 6053010 3. PO Box 8045, Burton upon Trent DE14 9JG 01283 508000 4. Civic Centre, Riverside, Stafford ST16 3AQ 01785 619000 5. Civic Centre, Beecroft Road, Cannock, Staffordshire WS11 1BG 01543 462621 6. District Council House, Frog Lane, Lichfield, Staffordshire WS13 6YY 0154 308000 7. Marmion House, Lichfield Street, Tamworth, Staffordshire B79 7BZ 01827 709709	1. Newcastle-under-Lyme Borough Council 2. Staffordshire Moorlands District Council 3. East Staffordshire Borough Council 4. Stafford Borough Council 5. Cannock Chase District Council 6. Lichfield District Council 7. Tamworth Borough Council
Clean Water Supplier	1. PO Box 5345, Coventry, CV3 9FU 0345 6033285 2. Green Lane, Walsall, Staffordshire WS2 7PD 3. Streetworks and Compliance Team 1st Floor, Haweswater House, Lingley Mere Business Park Lingley Green Avenue, Great Sankey Warrington WA5 3LP 0345 0720829	1. Severn Trent Water 2. South Staffs Water 3. United Utilities
Foul Water Disposal	PO Box 5345, Coventry, CV3 9FU 0345 6033285	Severn Trent Water
Surface Water Disposal	No.1 Staffordshire, Place, Stafford ST16 2DH 0300 111 8000	Staffordshire County Council/Amey Highways

Gas and Electric	1. Street Works Administration Team Hinkley Operational Centre Brick Kiln Street, Hinckley Leicestershire, LE10 0NA 01455 232822 2. Hazeldean, Station Road, Leatherhead, KT22 7AA 01372 227560 3. 2 Europa View, Sheffield Business Park, Sheffield S9 1XH 0845 6413010 4. Unit 23, Woolpit Business Park Woolpit, Bury St Edmunds, Suffolk IP30 9UL 01359 244066 5. Streetworks Team C/O Herald Way Pegasus Business Park Castle Donnington, DE74 2TU 01332 827008	1. Cadent Gas 2. ES Pipelines Ltd 3. Fulcrum Pipelines Ltd 4. GTC Pipelines Ltd 5. Western Power Distribution West Mids
Communications	1. Telecom House, Trinity Street Hanley, Stoke on Trent Staffordshire, ST1 5ND 01313 457381 2. National Noticing and Defect Admin Mayfair Business Park, Broad Lane Bradford, West Yorkshire, BD4 8PW 0800 0643772	1. BT 2. Virgin Media
Others as required e.g. Coal Authority	1. 25th Floor, 1 Canada Square Canary Wharf, London, E14 5AB 020 7944 6478 2. The Old Stables, Watery Lane Tipton, West Midlands 0121 520 7474 3. The Cube, 199 Wharfside Street Birmingham, B1 1RN 0300 123 5000 4. Cat and Kitten Lane, Featherstone Wolverhampton, WV10 7JB 0800 111 999	1. High Speed Two (HS2) Ltd 2. Network Rail 3. Highways England 4. National Grid

3. List of works that are required to be undertaken.

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT

1. Traffic Safety and Management Requirements (General Requirements)

1.1 Not Used.

1.2 The Contractor shall throughout the progress of the Works have full regard for the safety of all persons entitled to be on the Site and in the Working Areas, and shall keep the Site and the Working Areas (so far as the same are under their control) and the Works (so far as the same are not completed or taken over by the Employer) in an orderly state appropriate to the avoidance of danger to such persons and shall, amongst other things in connection with the works, provide and maintain all lights guards fencing warning signs and watching when and where necessary or required by the Overseeing Organisation or by any competent statutory or other authority for the protection of the works or for the safety and convenience of the public or others.

1.3 **Phasing of the Works -** At least seven days prior to the commencement of the Contract, the Contractor shall submit to the Overseeing Organisation for approval, a programme detailing the proposed method and phasing for the execution of the Traffic Safety and Management requirements of the work and the timing of all activities and resources to be utilised.

1.4 **Requirements for Traffic Management**

The Contractor shall be responsible for:-

a) The installation, maintenance and removal of the Traffic Management system.

b) Ensuring illumination of signs to standards required in BS EN 12899-1, or in compliance with particular requirements of the Contract. Taking steps to avoid dazzle.

c) Taking care not to damage statutory undertaker's plant when erecting posts for signs.

d) Liaison with the Statutory Authorities and Police Authority.

ii) Sign faces shall be to BS EN12899-1 using Class 2 reflective materials.

iii) The signs are to be new or in good second-hand condition and shall be made available for inspection and approval by the Overseeing Organisation prior to use.

iv) Exact positions of signs shall be agreed with the Overseeing Organisation on site.

v) Reinstatement of post holes in verges shall be carried out by filling the post hole to ground level with concreting sand.

vi) Where the works reduce the carriageway width to less than 6.75m, alternate one-way working shall be introduced, controlled by temporary traffic signals in accordance with Chapter 8 of The Traffic Signs Manual. These shall be manually controlled at peak hours. STOP/GO boards must be provided and be ready for immediate use in the event of signal failure.

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (Continued)

1.5 **Working Areas and Safety Zones**

Working areas and safety zones shall be as defined in Chapter 8 of the Traffic Signs Manual.

1.6 **Timing of Installation, Alteration to, or Removal of Traffic Control Equipment or Road markings**

The Contractor shall not install, alter or remove traffic control equipment or road markings between 08.00 to 09.00 hours and 16.00 to 18.00 hours, Monday to Friday inclusive. The timing of all such operations will be subject to the approval of the Overseeing Organisation. If, in the opinion of the Overseeing Organisation, an operation will not be completed by 08.00 or 16.00 hours, Monday to Friday permission will be withheld.

1.7 **Site Safety**

i) Without prejudice to the other provisions of the Contract the Contractor shall ensure that no actions by they or their employees or Sub-Contractors or their employees, are executed in such a manner as to constitute a hazard or safety risk to traffic or themselves.

ii) The Contractor shall ensure that all Site Traffic only enters or leaves the working area at agreed and designated entry or exit points and must do so in the direction of the prevailing traffic flow. Prior to implementation, the Contractor shall agree with the Overseeing Organisation a method of merging site and public traffic. The Overseeing Organisation reserves the right to require amendments if, in their opinion, the system is not working effectively.

iii) The Contractor shall impose a speed limit of 15mph on site vehicles. All drivers shall be notified individually of the limit. Speed Limit signs to be posted at entrance and at regular intervals through the Site.

iv) The Contractor shall allow for operations to be carried out under Police supervision as required by the Overseeing Organisation.

1.8 **Emergency, Accident or Other Incident**

i) In the event of an emergency, accident or other incident, the Overseeing Organisation, shall have the unqualified right to instruct the Contractor's workmen on any matters relating to traffic safety and control.

ii) The Contractor shall carry sufficient stocks of material manufactured for use as a diesel oil lift in the event of an accident or spillage on the trafficked carriageway.

iii) The Overseeing Organisation may direct the Contractor to assist in the removal of large debris and to restore the road surface to a serviceable condition after an accident.

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (Continued)

1.9 **Remedial Works**

i) In order to carry out any remedial works, traffic restrictions and traffic management shall be to the standard required to the main works and all associated costs shall be borne by the Contractor.

ii) At least 7 days' notice will be given to the Overseeing Organisation prior to the commencement of any such work.

2. Notice/Licence Requirements under the Traffic Management Act / Highways Act

Under the Traffic Management Act 2004, the majority of activities in the street must be noticed. The types of notification and advance notice period relate to the duration of the works. The below table shows applicable details:

Notice Type	Works Duration	Advance Notice Period	Validity Period
Major Works	>10 days	3 months	5 days
Standard Works	>3 days & <10 days	10 days	5 days
Minor Works	<3 days	3 days	2 days
Immediate Works	N/A	Within 2 hours	N/A

Electronic notices in an EToN format are required to be submitted to Staffordshire County Council Network Management Unit to cover works in a street.

In addition to the above noticing requirements for works it may also be necessary to obtain a permit or licence to cover elements of the work. Licences/Permits are required for the following:

Licences

1. Installation of private apparatus (Section 50 New Roads and Street Works Act 1991).
2. Vehicle access crossings (dropped kerbs) (Section 184 Highways Act 1980).

Permits

1 Road Closures
2 Temporary Traffic Signals
3 Stop/Go temporary traffic controls
4 Lane closures
5 Other Traffic Management that impedes the normal flow of traffic
6 Placement of temporary items on the highway, e.g. site cabins, etc.
7 Scaffolds/ Hoardings / Skips to be housed on the highway
8 Temporary excavations in the highway

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (Continued)

For further details of the Highway Authority requirements, see "Contract Data Part One Data Provided by the Employer; Special Requirements in Relation to the Highway Authority". If the contractor has any queries relating to the above, contact Network Management for clarification.

3. Notice Periods to be allowed for applications / consents

Minimum notice required by the Highway Authority to consider a Contractor's application (on appropriate pro-forma and with plans where necessary) for:

i) amending or making traffic orders 12 weeks
ii) authorising of non-prescribed signs 4 weeks
iii) authorising temporary traffic signals 10 working days (see "Special Requirements in relation to the Highway Authority")
iv) authorising other temporary traffic controls 10 working days (see "Special Requirements in relation to the Highway Authority")
v) moving permanent traffic signs not under the Contractor's responsibilities to be compatible with the state of the Works 4 weeks

The Highway Authority will invoice the Contractor for current charges in respect of work of (i) and (v) as a result of their applications. Such costs are not reimbursable under the Contract.
Applications must provide the relevant details and be completed in full. For application proformas please contact Network Management.

4. Details of Events That Could Have a Bearing on the Works

Any such events are described in the scheme specific Works Information.

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (Continued)

5. Highways, Private Roads, and Other Ways Affected by the Works

Description	(1)	(2)
Predicted 24 hours Annual Average Daily Traffic AADT	See Scheme Specific Works Information.	
Eighty-Fifth Percentile Speed of cars (mph)		
Speed limit (mph) if proposed		
Type(s) of Traffic Control		
Special Facilities		
Whether to be Kept Open or Closed		

Note: particulars of constructed temporary diversions for traffic are contained in Appendix 1/18 (Where Utilised). Highways including footpaths, cycle tracks and bridleways described above or listed in Appendix 1/19 are the responsibility of:

Authority: Staffordshire County Council,
Address: No 1 Staffordshire Place,
Tipping Street,
Stafford.
ST16 2DH.
Tel.: 0300 111 8000

6. Driver Information Signs at Roadworks

See Scheme Specific Works Information.

7. Works to be Carried Out During the Period of Maintenance

See Scheme Specific Works Information.

8. Traffic Management for Surface Dressing Operations

See Appendix 7/3.

APPENDIX 1/19: ROUTEING OF VEHICLES

1. Permitted Access Routes to and from the Site

1.1 Except for direct access to and from quarries, tips or suppliers, all site traffic shall be routed via the M, A or B Class highway network unless written approval is first obtained.

1.2 The Contractor shall take measures to prevent vehicular damage to Highways during disposal of materials operations. It may be necessary to determine routes different for access to and return from a licensed tipping site and to construct maintain and remove and reinstate on completion of the Works any temporary works to the access routes as required by and to the satisfaction of the Highway Authority.

1.3 Dump trucks, tracked machines and the like will not be allowed to traverse the existing road network under any circumstances. These types of machines will only be allowed within the site and will only use crossing points agreed in advance with the Overseeing Organisation where public and private rights of way required to be kept open are to be crossed. Where Site traffic joins the existing road network, wheel washes shall be provided to keep the road network clean and safe for other road users.

2. Movement of Machinery and Plant Across Public & Private Rights of Way

2.1 All crossings shall be kept clear of mud and debris to prevent danger to the public. Warning signs shall be erected to warn drivers, pedestrians and machine/plant operators of crossing points. Temporary diversions shall be treated in the same manner as the original route. Where frequent crossings are required at the same location then the carriageway or footpath construction shall be strengthened as agreed in advance with the Signs, barriers, etc., shall be erected as agreed in advance with the Overseeing Organisation and the crossing point manned during the site working hours.

2.2 When a crossing point is not in use it shall be fenced off to prevent unauthorised access to the site.

3. The use of Permanent Works by Construction Traffic

3.1 If the Contractor intends to use any part or section of the permanent works prior to those times detailed in any other Clause or Appendix or intends to use machinery or plant that is heavier than the designed loads for the carriageway and structures, then the Contractor will submit details of their proposals to prevent any damage being incurred to the carriageway and structures. Site Traffic shall use the designated site access roads and exit points agreed with the Overseeing Organisation.

APPENDIX 1/21: INFORMATION BOARDS

1. For Improvement and large maintenance schemes as agreed on scheme specific basis Information Boards shall be designed on a scheme specific basis. One pair of each sign shall be erected at locations agreed with the Overseeing Organisation. The scheme specific text for signs shall be as described in the scheme specific Works Information.

2. Information Boards shall be erected in positions to be agreed with the Overseeing Organisation and to the following:
   - *a)* There should be a minimum set back from the channel of 600mm;
   - *b)* The mounting height shall be 2.1m to the underside of the sign where there is a possibility of pedestrians passing or 1.5m elsewhere;
   - *c)* The ground shall be reinstated after erection to match the existing;
   - *d)* The signs shall be removed within four weeks of the date of the Completion Certificate and the ground reinstated to match its surroundings.
   - *e)* Information Boards shall be kept clean and in a good state of repair.
   - *f)* Appropriate signing will be maintained at all permanent depot locations.

APPENDIX 1/23: RISKS TO HEALTH AND SAFETY FROM MATERIALS OR SUBSTANCES

1. Prior to commencing any operation or activity that is deemed to create a risk to the public, the Contractor shall erect and maintain suitable enclosures and take all necessary precautions to reduce that risk.

2. **Restriction of Working Practices**

The Contractor shall ensure that its operatives and site staff comply with the following with the respect to the restriction of working practices:-

i) Food and Environment Protection Act 1985 (FEPA);
ii) Control of Pesticides Regulations 1986;
iii) Health and Safety at Work Act;
iv) Control of Substances Hazardous to Health Act COSHH;
v) Suitable training should be given to operatives and staff that use substances hazardous to health during the performance of their duties;
vi) A Certificate of Competence is required in respect of (v), which may be requested by the Overseeing Organisation so as to demonstrate the competency of the operatives.

3. **Measures to be Taken to Protect Members of the Public**

The general public shall be protected from exposure to the following materials until they have set, cured or are no longer considered harmful:-

i) Bituminous joint sealer;
ii) Cements, concrete, mortars and grouts and any additives;
iii) Solvent based curing agents;
iv) Bituminous pavement materials;
v) Bituminous waterproofing systems;
vi) Grit blasting debris;
vii) Dust from cutting hardwoods;
viii) Dust from cutting pipes (concrete or clay);
ix) Dust from cutting concrete or brickwork.
x) Any other materials identified under the scheme specific COSHH register

Access shall be restricted until materials are cured. Consideration shall be given to wind, strength, temperature and traffic speed when assessing the foregoing.

APPENDIX 1/23: RISKS TO HEALTH AND SAFETY FROM MATERIALS OR SUBSTANCES (Continued)

4. Existing Watercourses and Drains

4.1 The Contractor's attention is drawn to the possible hazard of waterborne diseases, for example Leptospirosis (Weil's Disease).
The Contractor shall ensure the following:-

i) The implementation of the 'Card' system to alert Health Services that the operative has been exposed to work in watercourses, drains and sewers;

ii) That all operatives and staff on site, whether the Contractor's personnel or ones working for other bodies have access to a full and high standard of facility for personal hygiene;

iii) The use of personal protective equipment and proper cleaning and maintenance of the same particularly to avoid exposing the skin to the hazard;

iv) That all operatives and staff have had suitable training and been informed of the substances they are liable to come into contact with, and risk to health that could result from such contact.

APPENDIX 2/2: FILLING OF PIPES AND TRENCHES

1. All pipes, chambers or gullies that are required to be abandoned/filled, are shown on the site clearance, drainage and accommodation works drawings.

2. All sections of carrier or filter drains marked as becoming disused shall be detailed in the scheme specific works information and shall be treated as detailed in paragraph 3 below.

3. The pipes, pipe bedding & surround materials that form the disused drains shall be removed. The trench formed by these works shall be backfilled with Class 8 Miscellaneous Fill in accordance with SHW Clause 505.

4. Chambers to be abandoned shall be treated as follows: -
Existing ironwork to be removed to Contractor's tip off site. Chamber to be excavated and the resulting void backfilled with Class 8 fill in accordance with SHW Clause 505. Any pipe connection shall be treated in accordance with 2 above.

5. Gullies to be abandoned shall be treated as follows: -

   Existing ironwork to be removed to Contractor's tip off site. Gully connection to be sealed and the pot either backfilled with concrete mix ST2 or excavated and the resulting void backfilled with Class 8 fill in accordance with SHW Clause 505. Any pipe connection shall be treated in accordance with 2 above.

   Gullies to be abandoned that lie within proposed carriageway are to be reinstated as per HCD K4.

APPENDIX 2/3: RETENTION OF MATERIAL ARISING FROM SITE CLEARANCE

1. Materials to be retained as part of the site clearance are to be agreed with the Supervisor and are detailed below.

Description	Location	Delivered to:	Requirements
Kerbs, quadrants Paving Setts Chamber covers Gully gratings & frames Gates and fencing Safety barrier components Traffic signs Bollards Road studs Traffic signals Road lighting columns Luminaires Electrical equipment Communications equipment Cables Timber arising from trees Etc.		Location to be agreed on a scheme specific basis	

Note the 'requirements' list is available to detail the disconnection of electrical services, reinstatement of voids and the alike.

APPENDIX 2/4: EXPLOSIVES AND BLASTING

1. **The use of explosives and blasting will not be permitted.**

APPENDIX 2/5: HAZARDOUS MATERIALS

The compiler should list here any hazardous materials identified during site clearance and specific requirements for dealing with them.

The compiler should pay due regard to CDM and COSHH regulations.

Further requirements for dealing with potentially hazardous materials found within the Site are detailed in Appendix 1/23.

APPENDIX 4/1: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)

Refer to the information required in SHW NG 0400

1 Location:

1.1 Vehicle Restraint Systems

(i) The location, Containment Level, Impact Severity Level (ISL), setback, Working Width Class (W), Vehicle Intrusion (VI) maximum height that allows the required visibility, and the Length of Need requirements for safety barriers, RBS and transitions are shown on Drawing Nos. ..... *[Generally the 1:500 or 1:1000 Site Plans].*

(ii) The location, Containment Level, Impact Severity Level (ISL), setback, Working Width Class (W) and Vehicle Intrusion (VI) requirements for vehicle parapets are shown on Drawing Nos..... *[Generally the 1:500 or 1:1000 Site Plans].*

(iii) The location, Containment Level, Impact Severity Level (ISL), setback, Working Width Class (W) and Vehicle Intrusion (VI) requirements for vehicle/pedestrian parapets are shown on Drawing Nos..... *[Generally the 1:500 or 1:1000 Site Plans].*

(iv) The location, Performance Class, Impact Severity Level (ISL), setback, Permanent Lateral Displacement Zone D.x.y) , Exit Box Class (Z), and maximum height that allows the required visibility requirements for terminals are shown on
Drawing Nos. ..... *[Generally the 1:500 or 1:1000 Site Plans].*

(v) The location, Performance Level, *[this should indicate whether a redirective (R) or non-redirective (NR) type of crash cushion]*, Impact Severity Level (ISL), setback, Redirection Zone Class (Z), Permanent Lateral Displacement Zone Class (D), and maximum height that allows the required visibility requirements for crash cushions are shown on Drawing Nos..... *[Generally the 1:500 or 1:1000 Site Plans].*

1.2 Pedestrian Restraint Systems

(i) The location for pedestrian parapets and pedestrian guardrails are shown on Drawing Nos..... *[Generally the 1:500 or 1:1000 Site Plans].*

1.3 Anti-glare Screens

(i) The location for anti-glare screens are shown on Drawing Nos..... *[Generally the 1:500 or 1:1000 Site Plans].*

APPENDIX 4/1: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN) (Continued)

2 Other Details:

Safety Barriers, Terminals, Transitions and Crash Cushions

2.1 Requirements for safety barriers, terminals and transitions if different from the requirements of Clauses 401, 402 and 403.

2.2 Requirements for crash cushions if different from the requirements of Clauses 401 and 403. *[Compiler to specify whether redirective(R) or non-redirective (NR)]*

2.3 Any other details *[to be included as required]:*

(i) Any special requirements *[e.g. environmental considerations, lengths of removable safety barrier, ground conditions and loading requirements for structures];*

(ii) Specific connection requirements to existing safety barriers, vehicle parapets or other structures.

Vehicle Parapets Including Anchorages and Attachment Systems

2.4 Requirements for vehicle parapets if different from the requirements of Clauses 401 and 406.

2.5 Any special requirements for maintenance to the corrosion protection system, other than that required due to accidental damage, permissible within the serviceable life of a metal vehicle parapet or the metal components of a combined metal and concrete vehicle parapet *[Clause 401]*.

2.6 Any additional corrosion protection system required *[Clause 402]*.

2.7 Aesthetic requirements for vehicle parapets *[Clause 406].*

2.8 Requirements for anchorages and attachment systems if different from the requirements of Clause 407.

2.9 Maintenance and/or repair requirements, *[include design, detail, performance and geometry requirements for replacement components, state if the existing system is compliant with BS EN 1317-5 or a legacy system and state the CE marking requirements for replacement components, where known state the performance characteristics of the existing parapet system and the requirements for this performance to be maintained.]*

APPENDIX 4/1: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN) (Continued)

Pedestrian Restraint Systems

2.10 Requirements for pedestrian parapets and pedestrian guardrails - see also Table C.1 of BS 7818 *[Clause 411].*

2.11 Any special requirements for maintenance to the corrosion protection system, other than that required due to accidental damage, permissible within the serviceable life of a metal pedestrian parapet or guardrail or the metal components of a combined metal and concrete pedestrian parapet or guardrail *[Clause 411]*.

2.12 Any additional corrosion protection system required *[Clause 411]*.

Anti-glare Screens

2.13 Requirements for anti-glare screens giving performance requirements which are to be demonstrated by the Declaration of Performance including light screening capability and durability. *[Clause 412].*

3 Testing *[Cross-reference with Appendix 1/5 as appropriate]*

Destructive Testing for Maintenance of Legacy Systems

3.1 Requirements for provision of copies of certified reports of destructive tests and for supply of test components *[Clauses 402.6(v) and 408].*

Site Testing on Post Foundations for Contact Compliance

3.2 Requirements for site load tests on safety barrier, terminal, transition and crash cushion post foundations *[Clause 404]*.

Inspection and Testing of Vehicle Parapet Posts

3.3 Requirements for inspection if different from the requirements of Clause 409.

3.4 Requirements for static testing of posts if different from the requirements of Clause 409.

Site Testing on Anchorages in Drilled Holes

3.5 Details of testing requirements for anchorage and attachment systems *[Clauses 404 and 410]*.

APPENDIX 4/1: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN) (Continued)

4 Temporary Safety Barriers

[Note to compiler: State here:]

(i) Who is to provide temporary safety barriers *[Clause 405].*

(ii) Containment Level *[Clause 401]*.

(iii) Impact Severity Level *[Clause 401]*

(iv) Working Width Class *[Clause 401]*.

(v) Vehicle Intrusion Class *[Clause 401]*.

(vi) Locations to be provided *[Clause 405].*

(vii) Location(s) for removal of temporary safety barrier on completion of the works *[Clause 405].*

(viii) Location(s) from which temporary safety barrier is to be collected and returned by the Contractor if provided by the Overseeing Organisation *[Clause 405].*

5 Schedule of Road Restraint Systems (Vehicle and Pedestrian)

[Note to Compiler: Complete the schedule below and include in Appendix 4/1. Incorporate in the schedule all the Road Restraint Systems (i.e. safety barriers, terminals, transitions, vehicle parapets, crash cushions, pedestrian parapets and pedestrian guardrails) and any associated anti-glare screens required. Cross-reference should be made to the drawings where appropriate. The Road Restraint Systems should be listed in order of occurrence, irrespective of type, and the respective start and end chainages of the proposed systems listed.
All the Performance Class Requirements appropriate for the Road Restraint System and other details such as parapet height should be included. The difference between the Finish and Start Chainages should be at least the Length of Need of the Road Restraint System as defined in TD 19.

APPENDIX 4/1: ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN) (Continued)

Col 0	*Col 1*	*Col 2*	*Col 3*	*Col 4*	*Col 5*	*Col 6*	*Col 7*	*Col 8*	*Col 9*	*Col 10*	*Col 11*	*Col 12*	*Col 13*
RRS Ref	Location & Start Chainage (m)	Finish Chainage (m)	Position on Highway Cross-Section	Type of Road Restraint System	Set-back (m)	Barrier Containment Level/ Terminal Performance Class (P)	Impact Severity Level (ISL)	Working Width Class (W)	Vehicle Intrusion (VI)	Performance Level and whether Redirective (R) or Non-redirective (NR)	Permanent Lateral Displacement Zone (D.x.y) or Characteristic Permanent Lateral Displacement Zone Class (D)	Exit Box Class or Redirection Zone Class (Z)	Other Requirements/ Comments

Notes to compiler:
Col 0 Give unique alpha or numeric reference for use in cross-referencing.
Col 1 Give chainage and location, for example, road name, verge, central reserve, slip road etc.
Col 3 For example, south verge, central reserve, north verge etc.
Col 4 Give barrier type: Safety barriers, vehicle parapets, vehicle/pedestrian parapets, transitions, RBS, terminals, crash cushions, pedestrian parapets, pedestrian guardrails). Enter temporary safety barrier where required.
Col 6 Give containment level for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS and terminal performance class for terminals. Enter temporary safety barrier where required.
Col 7 Give the Impact Severity Level for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS, terminals, crash cushions. Enter temporary safety barrier where required.
Col 8 Give the Working Width Class for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS. Enter temporary safety barrier where required.
Col 9 Give the Vehicle Intrusion Class for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS with a containment level of H1 or greater.
Col 10 For crash cushions give the Performance Level and whether the cushion should be Redirective (R) or Non- redirective (NR).
Col 11 For terminals give Permanent Lateral Displacement Zone (D.x.y) and for crash cushions give Permanent Lateral Displacement Zone Class (D). Enter temporary safety barrier where required.
Col 12 For Terminals give Exit Box Class and for crash cushions give Redirection Zone Class (Z). Enter temporary safety barrier where required.
Col 13 Give all other requirements including required RRS heights, need for anti-glare screens, dynamic deflection. Enter temporary safety barrier where required.

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APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF TRANSITIONS AND TERMINALS TO CLAUSE 401

Refer to SHW NG 0400 for the proformas which are required to be completed and submitted by the client to the Overseeing Organisation, with supporting information, to demonstrate compliance of the proposed road restraint system transition and/or terminal with BS EN 1317-1:2010 ,BS EN 1317-2:2010 and DD ENV 1317-4:2002 as required by clause 401, and request acceptance.

APPENDIX 5/1: DRAINAGE REQUIREMENTS

1. Piped Drains

1.1 A list of Drawings and Schedules is contained in the scheme specific Works Information.

1.2 The positions of manholes, catchpits and gullies are shown in the scheme specific Works Information. Precise positions are to be agreed with the Supervisor. The positions of headwalls shall be agreed with the Supervisor.

1.3 Pipes shall be laid to straight alignments / constant gradients between the pipe invert levels stated in the schedules and on the layout plans. Bends are not acceptable.

1.4 All pipe joints shall be watertight and comply with Clause 504 of the MCHW.

1.5 Alternative pipe bedding combinations are given in the schedules in this Appendix and in the scheme specific Works Information.

1.6 The hydraulic design of the drainage system has been carried out using the Wallingford procedure using the following design criteria: -

a)	the pipe roughness height	= 0.600mm
b)	the time of entry	= 4.0 mins.
c)	the minimum design velocity	= 1.0 m/s
d)	the minimum DWF velocity	= 0.75 m/s
e)	the return period	= 1 in 1 years
f)	there shall be no flooding for a return period	= 1 in 5 years
g)	Climate change to be added to the proposed network as per CG 501	
h)	the minimum pipe diameter (carrier)	= 225mm
i)	the minimum cover of pipes adjacent to or under roads	= 1.00m
j)	Minimum orifice diameter	= 100mm

1.7 Permeable pavements are not permitted as a drainage solution in the highway. See Appendix 7/1 cl. 11.

1.8 At least two weeks before the commencement of the drainage works the Contractor shall submit full details of the following: -

a) Alternative designs the Contractor wishes to be considered. The capacity of the pipes shall not be less than those detailed in the Overseeing Organisation's design;

b) The Contractor's preferred choice of Pipe, Trench and Bedding combinations for the Overseeing Organisation's design and (a) above if applicable.

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

1.9 Following the Overseeing Organisation's acceptance of their proposals the Contractor shall not make any changes to the agreed details without prior written approval of the Overseeing Organisation. Any changes that the Contractor wishes the Overseeing Organisation to consider should be submitted at least four weeks prior to the start date of the works affected. The Contractor shall also submit any such changes in writing.

1.10

a) The 'end on' junction between existing gully connections to be reused and new gully connections shall be made using proprietary systems/products. The end of the existing gully connection shall be cut square as required.

b) The oblique junctions between existing drains and new drains/gully connections shall be to the detail shown on HWD 05.71.

c) Where manholes are not detailed at any junction, preformed carrier drain/entry 'junction pieces' shall be used to connect new drain/gully connections to new carrier drains.

2. Materials

2.1 Any concrete products (pipes, gully pots and the like) shall be a minimum Class DC-3 sulphate-resistant to BS8500.

2.2 The material used for bedding surface water drains shall be in accordance with Clause 503 and Tables 5/3 and 5/4.

2.3 Grading and geometrical requirements of filter material shall be in accordance with Clause 505 and Table 5/5.

2.4 UPVC pipes shall have a minimum ring stiffness of 6kN/m^2 when tested in accordance with BS EN ISO 9969, the creep ratio shall be less than 4.0 when tested in accordance with BS EN ISO 9967, and the impact resistance shall comply with the test to BS EN ISO 11173.

2.5 The use of twin wall pipes that hold a current BBA Certificate shall be permitted.

3. Construction

3.1 Backfilling of trench material, except for trenches in existing carriageway and paved areas, shall be in accordance with Clause 505 and layers not exceeding 150mm in thickness. Each layer shall be thoroughly compacted using power rammers or vibrating plate. The Contractor's attention is drawn to tables 6/1 and 6/4 of MCHW.

3.2 All trenches in carriageway and paved areas shall be backfilled up to the underside of base layer with Cl. 803 or 807 sub-base.

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

3.3 The withdrawal of timber or sheeting shall be carried out simultaneously with the compaction of the filling material so that no void shall be left in the finished work. Under no circumstances will the withdrawal of timber of sheeting be permitted after compaction has been carried out and no payment will be made to the Contractor for timber sheeting left in the excavation.

3.4 All Carrier Drains with cover less than 1.2m within carriageways and less than 0.9m elsewhere shall have bedding and surround Type Z.

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APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)
List of Alternative pipe, trench and bedding combinations- Carrier Drain

Sheet 1 of 2

Pipe Material >		VITRIFIED CLAY					PRECAST CONCRETE	DUCTILE IRON	GRP	THERMOPLASTIC	
Pipe Class >		L	95	120	160	200	120			STRUCTURED WALL	SRD 41
Pipe diameter (mm)	Pipe Group No.	Trench and Bed Types					Trench and Bed Types	Trench and Bed Types	Trench and Bed Types	Trench and Bed Types	
150	5	-	-	-	ASBFN	ASBFN	-	S	S	ST	ST
225	5	-	-	-	ASBFN	ASBFN	-	-	-	ST	ST
300	5	-	-	-	ASBFN	ASBFN	-	S	S	ST	ST
375	5	-	-	-	ASBFN	ASBFN	ASBF	-	-	ST	ST
450	5	-	-	ASBF	ASBFN	-	ASBF	-	-	ST	ST
500	5	-	ASB	ASBF	ASBFN	-	-	S	S	ST	ST
525	5	-	-	-	-	-	ASB	-	-	-	-
600	5	A	ASB	-	-	-	ASBF	S	S	ST	ST
150	11	-	-	-	ASFBN	ASBFN	-	S	S	S	ST
225	11	-	-	-	ASBF	ASBF	-	-	-	S	S
300	11	-	-	-	ASBF	ASBF	-	S	S	S	S
375	11	-	-	-	ASBF	ASBFN	ASB	-	-	-	-
450	11	-	-	ASBF	ASBF	-	ASB	-	-	-	-
500	11	-	AS	ASBF	ASBF	-	-	S	S	S	S
600	11	-	AS	-			ASB	S	S	S	S
750	11	-	-	-			ASB	-	-	-	-

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)
List of Alternative pipe, trench and bedding combinations- Carrier Drains

Sheet 2 of 2

Pipe Material >		VITRIFIED CLAY					PRECAST CONCRETE	DUCTILE IRON	GRP	THERMOPLASTIC	
Pipe Class >		L	95	120	160	200	120			STRUCTURED WALL	SRD 41
Pipe Diameter (mm)	Pipe Group No.	Trench and Bed Types					Trench and Bed Types	Trench and Bed Types	Trench and Bed Types	Trench and Bed Types	
900	11	-	-	-			ASB	S	S	S	S
225	14	-	-	-	ASBF	ASBF	-	-	-	-	-
300	14	-	-	-	ASBF	ASBF	-	S	S	-	S
375	14	-	-	-	ASBF	ASBF	-	-	-	-	-
450	14	-	-	ASB	ASBF	-	AS	-	-	-	-
500	14	-	A	ASB	ASBF	-	-	S	S	-	S
525	14	-	-	-	-	-	AS				
600	14	-	A	-	-	-	AS	S	S	-	S
750	14	-	-	-	-	-	AS	-	-	-	-
900	14	-	-	-	-	-	AS	S	S	-	S
150	17	-	-	Z	Z	Z	Z	Z	Z	Z	Z
225	17	-	-	Z	Z	Z	Z	Z	Z	Z	Z
300	17	-	-	Z	Z	Z	Z	Z	Z	Z	Z

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)
List of Alternative pipe, trench and bedding combinations- Filter Drains
Sheet 1 of 1

Lower trench Condition HCD F2	Upper trench Condition HCD B15 or as stated	Nominal Size DN (mm)	Pipe Group Number	VITRIFIED CLAY						THERMOPLASTIC	
				L	95	120	160	200		STRUCTURED WALL	SRD 41
H, I	See Scheme Specific Works Information	150	√	-	-	-	√	√		√	√
H, I		225	√	-	-	-	√	√		√	√
H, I		300	√	-	-	-	√	√		√	√

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

4. Chambers

4.1 Chamber schedules consist of the following, and the Type references used are as follows-

a)	manholes: type	1a, 1b, 1c	HCD F3,
		2a, 2b	HCD F4,
		3a, 3b, 3c, 3d	HCD F5,
		4a, 4b, 4c	HCD F6,
		5a, 5b, 5c	HCD F7,
b)	catchpits: type	7	HCD F11,
		7A	As HCD F11 but grating, frame & apron substituted by solid cover and frame
		8	HCD F12.
c)	drawpits: type	D1	HWD 05.41
		D2	HWD 05.42
		D3	HWD 05.43.

Particular requirements are:

i) corrugated galvanised steel chambers shall not be used.

ii) cast in-situ concrete chambers shall not be used.

iii) brickwork in chambers shall use unperforated bricks.

iv) Sulphate Resisting Portland cement is required for all pipes, chamber rings, cover slabs and gully pots manufactured from concrete. Also, any ancillary concrete used in conjunction with the drainage installation shall use sulphate resisting Portland cement.

Existing chambers to have the covers and frames raised or lowered are described in the Schedules in the project specific Works Information. Raising and lowering of covers and frames on existing chambers shall be carried out in accordance with CD534.

Raising or lowering of covers to heights or depths greater than 500mm shall be achieved by the extension or reduction of the main chamber or shaft in materials of the same size and type such that the completed manhole/chamber complies with the equivalent manhole detailed in the Contract for the appropriate depth.

5. Gullies

5.1 Gully schedules (in paragraph 1.1) consist of the following, and the type references used are as follows:-

Gully type	1	MCHW HCD F13 (precast gully),
	2	Highway Works Details 05.67 (precast gully),
	3	Highway Works Details 05.65 (brick gully),
	4	Highway Works Details 05.68 (insitu gully with plastic liner).

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

5.2 Gullies requiring the gratings and frames to be raised or lowered are described in the Schedules in the project specific Works Information. Raising and lowering of gratings and frames on existing gullies shall be carried out in accordance with CD 534.

5.3 Reinstatements of carriageways after construction of drainage trenches shall comply with the requirements of Appendix 7/2.

5.4 All connections between carrier drains and gullies shall be at a straight grade.

5.5 All new carriageway gully pots to be 900mm deep x 450mm diameter.

5.6 Manholes / Catchpits shall be provided at:

- 5.6.1 Every change of gradient or alignment
- 5.6.2 Every change in size of pipe
- 5.6.3 a maximum spacing of 90m

5.7 Gullies shall be positioned so that:

- 5.7.1 The area draining into each road gully does not exceed requirements of gully drainage design CD 526. For minor schemes a general rule of thumb is that the area draining to each gully should not exceed 200m^2 however this should still comply with CD 526.
- 5.7.2 The spacing of gullies does not exceed 50m along each channel.
- 5.7.3 Double gullies are provided at all low points on a concave channel profile. In this circumstance, separate connections should be made to each gully.
- 5.7.4 At all road junctions, pedestrian crossings and private drive entrances they are sited on the upstream side of the junction, crossing or drive.
- 5.7.5 The maximum length of connection is 20m.

5.8 The flow width for gullies shall be designed in accordance with CD 526. Where a road is anticipated to have high volumes of pedestrians crossing at uncontrolled points the maximum permitted flow width is 0.5m. Wider roads with low anticipated pedestrian traffic may have a wider flow width on a scheme specific basis.

6 Design Considerations for Chamber and Gully Tops

6.1 Chamber tops and gully tops shall be specified to comply with BS EN 124, BS 7903 and CD 534 and Clause 507.9 of MCHW.

6.2 The minimum class of chamber top or gully top to be installed in major carriageway locations shall be D400. In pedestrianised locations where the ironwork is to be subjected to only occasional traffic loading up to 5 tonnes, class C250 may be used.C250 is also the minimum requirement for footways adjacent to the carriageway.

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

6.3 Where ironwork is located in the wheel paths of major routes, carrying >1500 cvd in each direction, then consideration should be given to specifying class E600.

6.4 All products used shall have been assessed and certified as required by CD 534 and shall have been issued with product conformity certificates to BS EN 124.

6.5 For sites carrying predominantly pedestrian traffic, cyclists or equestrians, a value of not less than PSVR 45 for average or low risk sites, or PSRV 60 for potentially high-risk sites shall be applied. The unpolished Skid Resistance Value (USRV) is not an acceptable alternative.

7. Design of Chamber Tops

7.1 Any chamber constructed for entry purposes, with a rectangular opening, should have a minimum clear opening of 600mm with a diagonal measurement >700mm. Circular openings should be 700mm minimum diameter. Triangular openings should have a minimum diametric measurement of 700mm.

7.2 Class D400 frames should be a minimum 150mm deep. The depth of insertion of the cover within the frame should be 50mm minimum if the cover is secured or 80mm minimum if relying on the depth of insertion for security.

7.3 Seatings of covers in frames shall be such that stability and quietness are achieved without the need for cushioning inserts or the need for periodic maintenance.

7.4 The frame bearing area shall be designed in such a way that:

a) The nominal bearing pressure, in relation to the appropriate BS EN 124 test load, shall not exceed 2.1N/mm^2.

b) The minimum bedding width of the frame at any point shall be 50mm.

7.5 Frames weighing more than 15kg should be provided with lifting holes located to permit a balanced lift.

7.6 Frames should not contain bedding flange holes located beneath the cover seatings. Any bedding flange holes present should be allowed for when calculating the bearing pressure under test load.

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

8. Design of Gully Tops

8.1 Gully tops shall meet the following requirements:
- 8.1.1 Compliance with BS EN 124, BS 7903 and CD 534
- 8.1.2 450mm x 450mm clear opening
- 8.1.3 150mm frame depth
- 8.1.4 D400 strength
- 8.1.5 Checked for compliance with this appendix on a per-scheme basis

8.2 Hinged gully gratings shall be side hinged rather than kerb hinged unless previously agreed with the overseeing organisation.

8.3 The side/end hinge shall be placed so approaching vehicles would close an open grating.

8.4 The minimum area of waterway should be 1200cm^2, the frame depth shall be 150mm and the grating shall be Type R in accordance with CD 526.

9. Bedding Materials

9.1 Chamber tops and gully tops shall be bedded using material with the following properties:
- *a)* Low-shrink.
- *b)* Minimum workable life of 10 min.
- *c)* Compressive strength >20N/mm^2 in 2 hrs.
- *d)* Tensile strength > 5N/mm^2 in 3 hrs.

9.2 This specification is for a rapid hardening material and is typically achieved by the use of resin-based products. Bedding materials should be laid strictly in accordance with manufacturer's recommendations, taking particular account of site conditions, temperatures and thickness of material used.

10. Small Headwalls and Small Revetments.

10.1 Small outfalls shall be to the details shown on HWD 05.31.1 for Types 1 and 2 and HWD 05.31.2 for Types 3. Locations and Types are as Scheduled in the scheme specific Works Information.

11. Land Drains

11.1 Any land drain encountered shall be piped into the nearest drainage ditch and connected via a suitably sized headwall.

12. Filter Drains

12.1 List of Drawings and Schedules is contained in the scheme specific Works Information.

APPENDIX 5/1: DRAINAGE REQUIREMENTS (Continued)

13. Cleansing of Drainage Systems Adoptable by the Highway Authority

13.1 On completion of construction and prior to undertaking CCTV surveys, internal surfaces of gullies, chambers, drains and sewers shall be thoroughly cleansed to remove all deleterious matter, without such matter being passed forward into existing public sewers or watercourses. The gullies, chambers, drains and sewers shall be maintained in a clean and serviceable condition until they are adopted by the highway authority or other body.

13.2 Where a maintenance period applies, the drainage system including gullies shall be cleansed prior to inspection for adoption.

14. Testing of Completed Drainage Systems

14.1 As specified in Appendix 1/5, the integrity of any drainage system to be adopted by the Highway Authority is to be proven by the contractor. All testing shall be in accordance with Clause 509 of the MCHW.

15. Chip-Free Channel Width Requirements

15.1 When Laying Hot Rolled Asphalt and Pre-Coated Chippings, the allowable chip-free drainage channel is min. 150mm and max. 300mm

16. Attenuation and Control Features

16.1 As far as possible, attenuation and control features are not permitted in HMPE and should be designed to be off the adopted highway network.

16.2 Where the use of such a feature has been agreed on a scheme specific basis, these features should be under highway verge or footway and ensure that the design facilitates safe access to these features for operation and maintenance vehicles.

16.3 Carriageway attenuation will only be accepted in exceptional circumstances by departure agreement.

APPENDIX 5/2: SERVICE DUCT REQUIREMENTS

1. Service Duct Requirements for Works Other Than for Statutory or Other Bodies

1.1 Ducts shall comply with BS 65 or BS EN ISO 1452-1 to 5 or BS 4660 or BS EN 1401-1.
Duct shall have the following Type references:

- Types A MCHW HCD I2 (suffix number to A indicates number of ducts)
- Types B MCHW HCD I2 (suffix number to B indicates number of ducts)
- Type 6 Highway Works Detail drg.no. 05.52
- Type 7 Highway Works Detail drg.no. 05.52
- Type 8 Highway Works Detail drg.no. 05.52
- Type 9 Highway Works Detail drg.no. 05.52

1.2 Ducting for street lighting cables shall be in accordance with the Staffordshire Street Lighting Specification.

1.3 Ducting for traffic signal cables shall be in accordance with the Staffordshire Street Lighting Specification.

1.4 Bedding of pipework in duct trenches shall comply with the requirements of HWD 05.52 and 05.53.

1.5 Backfilling of trenches above the pipe cover material shall be undertaken using only Class 1 material complying with Table 6/1 and the 600 series of the MCHW.

1.6 Reinstatement of duct trenches in paved areas shall comply with the requirements of Appendix 7/2.

1.7 The Type references for Duct Chambers are indicated on HWD 05.41, 05.42 and 05.43 and are to be constructed at the locations specified in the scheme specific Works Information.

1.8 Covers and frames for Duct Chambers shall comply with BS EN 124: Grade D400 and shall have a solid bearing area.

1.9 Permanent markers for ends of service ducts shall be as described on …….. Ends of draw ropes shall be given a minimum 1.0m slack and coiled under the marker block.

1.10 All duct crossings to extend a minimum of 1.5 metres behind of kerb line.

1.11 Duct/cable marker tape colour and inscription to be agreed with the Supervisor.

APPENDIX 5/5: COMBINED DRAINAGE AND KERB SYSTEMS

Combined drainage and kerb systems, and slot drainage channels are not to be used without the prior agreement of the Project Manager. Due to their long-term maintenance requirements, these should not be implemented unless absolutely necessary.

However, if such a system is required then it must meet the following requirements:

1. The scheme specific drawings show the locations of the combined drainage and kerb system, with the position and invert level of the surface water outfall connection and the kerb profile.

2. The contractor shall be responsible for the design of the combined drainage and kerb system gradients, access locations, silt trap locations and outfall & end units.

3. Silt traps should be installed every 200m^2 and easily accessible for maintenance.

4. Proprietary systems shall be installed in accordance with manufacturer's specification and recommendations.

5. As a minimum 150mm backing concrete to ST3 and dowel bars should be present to protect kerbs from overrun damage.

6. Special fittings shall be compatible with the drainage and kerb units used in accordance with the manufacturer's recommendations.

7. The system shall be cleaned out by high pressure water jetting or other appropriate means on completion of the Works. The system shall be left clean and free from all obstructions.

8. The contractor's attention is drawn to clause 516.7 of the Specification which states that the joints between the units shall be watertight.

9. Outfalls shall be trapped and be provided with an access cover.

10. Cutting of units in order to obtain a shorter length of unit is not acceptable.

11. The correct size radius kerbs must be used in all instances. It is not acceptable to cut them to size.

12. The kerb upstand shall be 125mm.

13. Units shall have minimum Class D400 strength.

14. The hydraulic design of the system shall be carried out using the following design criteria: -
    - *a)* design rainfall = 50mm/hour
    - *b)* there shall be no flooding for a return period = 1 in 5 years

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS

1. This Appendix must be read in conjunction with the Site Investigation Report, a copy of which is supplied with the Scheme Specific Site Information.

2. The Contractor should note that the information provided in the Ground Investigation Borehole Logs is not necessarily representative of the conditions on the site other than at the boreholes or trial pits.

3. The classification of earthwork materials shall be carried out using the requirements shown in Table 6/1 of this Appendix to support and supplement the requirements shown in Table 6/1 of Series 600 of MCHW.

4. The classification and confirmation of acceptability of the earthwork materials shall be carried out by the Contractor. The classification shall include all materials excavated on-site, imported general fill and other imported materials. Trial pit locations for classification purposes shall be agreed with the Overseeing Organisation in advance. If, in the opinion of the Overseeing Organisation, the material has altered its classification or become unacceptable for whatever reasons, they may require the Contractor to repeat the classification and acceptability tests given in Table 6/1 of this Appendix. The minimum rate of testing required by the Contractor shall be agreed with the Overseeing Organisation.

5. Topsoil and turf to be designated as Class 5A material shall be the material to the depths and at the locations shown on the relevant 'Scheme Specific' drawing(s).

6. Unacceptable material Class U1 shall be composed of complying with the requirements of Clause 601.2.

7. There are no materials to be designated as Class 3 material.

8. Class 4 materials shall comprise those complying with the requirements stated in Table 6/1. Materials complying with the requirements for Class 1 or 2, but surplus to the quantity needed to construct the works may also be used as Class 4 material.

9. 'Hard Material' is:-

   i) material so designated in the Scheme Specific Works Information,

   or

   ii) material which requires the use of blasting, breakers or splitters for its removal but excluding individual masses less than 0.20 cubic metres.

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued)

10. The contractors' attention is drawn to the Upper and Lower limits specified in Table 6/1 of this appendix, which are to be used in addition to the details shown in table 6/1 of Series 600 of the MCHW.

11. The Selected Granular Material (Capping) 6F1 and 6F4 are not permitted for use.

12. Any material class in MCHW which is not listed in this appendix is not permitted for use without prior agreement.

13. See appendix 6/7 for pavement foundation design guidance.

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued)
Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1

Class	General Material Description	Required Uses	Permitted Constituents	Material Properties				Compaction Requirements
				Property	Test	Limits		
						Lower	Upper	
1A	Well graded granular material	General fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties i),ii), and iv) in next column shall not apply to chalk). Recycled Aggregate.	i) grading ii) uniformity coefficient iii) optimum mc iv) mc	BS1377: Part 2 see Note 5 BS1377: Part 4 (4.5 kg rammer method) BS1377: Part 2 and Note 4	Table 6/2 10 - Optimum mc -2.0%	Table 6/2 - - Optimum mc +1.0%	Table 6/4 Method 2
1B	Uniformly graded granular material	General fill	Any material, or combination of materials, other than chalk and material designated as Class 3 in the Contract. Recycled aggregate.	i) grading ii) uniformity coefficient iii) optimum mc iv) mc	BS1377: Part 2 or BSEN13242 see Note 5 BS1377: Part 4 (2.5 kg rammer method) BS1377: Part 2 and Note 1	Table 6/2 - - Optimum mc -2.0%	Table 6/2 - - Optimum mc +1.0%	Table 6/4 Method 3
1C	Coarse granular material	General fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties i and ii) in next column shall not apply to chalk). Recycled Aggregate.	i) grading ii) uniformity coefficient iii) Los Angeles Abrasion	BS1377: Part 2 see Note 5 Clause 635	Table 6/2 5 -	Table 6/2 - 50	Table 6/4 Method 5

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued) Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1								
Class	**General Material Description**	**Required Uses**	**Permitted Constituents**	**Material Properties**				**Compaction Requirements**
				Property	**Test**	**Limits**		
						Lower	**Upper**	
2A	Wet cohesive material	General fill	Any material, or combination of materials, other than chalk	i) grading ii) MCV iii) Effective angle of internal friction (ϕ') and effective cohesion (c') iv) plastic limit	BS1377: Part 2 Clause 632 Clause 636.5 BS1377: Part 2	Table 6/2 8 $\phi'=33°$ $c'=0°$ -	Table 6/2 12.9 - -	Table 6/4 Method 1
2B	Dry cohesive material	General fill	Any material, or combination of materials, other than chalk	ii) grading ii) MCV iii) Effective angle of internal friction (ϕ') and effective cohesion (c') iv) plastic limit	BS1377: Part 2 Clause 632 Clause 636.5 BS1377: Part 2	Table 6/2 13 $\phi'=33°$ $c'=0°$ -	Table 6/2 16 -	Table 6/4 Method 2
2C	Stony cohesive material	General fill	Any material, or combination of materials, other than chalk	i) grading ii) MCV iii) Effective angle of internal friction (ϕ') and effective cohesion (c') iv) plastic limit	BS1377: Part 2 Clause 632 Clause 636.5 BS1377: Part 2	Table 6/2 8 $\phi'=33°$ $c'=0°$ -	Table 6/2 16 -	Table 6/4 Method 2

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued) Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1								
Class	**General Material Description**	**Required Uses**	**Permitted Constituents**	**Material Properties**				**Compaction Requirements**
				Property	**Test**	**Limits**		
						Lower	**Upper**	
2D	Silty cohesive material	General fill	Any material, or combination of materials, other than chalk.	i) grading ii) Optimum mc iii) mc iv) Effective angle of internal friction (ϕ') and effective cohesion (c')	BS1377: Part 2 BS1377: Part 4 (2.5Kg rammer method) BS1377: Part 2 and Note 4	Table 6/2 - Optimum mc -2.0% $\phi'=33°$ $c'=0°$	 Optimum mc +1.0%	Table 6/4 Method 3
2E	Reclaimed pulverised fuel ash cohesive material	General Fill	Reclaimed material from lagoon or stockpile containing not more than 20% furnace bottom ash	i) mc ii) bulk density	BS1377: Part 2 and Note 4. BS1377: Part 9	To enable compaction to Clause 612 -	 -	End product 95% of maximum dry density of BS1377: Part 4 (2.5kg rammer method)
4	Various	Fill to landscape areas	Any material	i) grading ii) MCV	BS1377: Part 2 Clause 632	- 6	125mm 18	See Clause 620
5A	Topsoil or turf, existing on site	Topsoiling	Topsoil or turf designated as Class 5A in the Contract	i) grading	Clause 618	-	Clause 618	-
5B	Imported Topsoil	Topsoiling	General purpose grade complying with BS3882	-	-	-	-	-

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued)
Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1

Class	General Material Description	Required Uses	Permitted Constituents	Material Properties				Compaction Requirements
				Property	Test	Limits		
						Lower	Upper	
6A	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed rock other than argillaceous rock, crushed concrete, chalk well burnt colliery spoil or any combination thereof (Property ii) in next column shall not apply to chalk) Recycled aggregate. Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	i) grading ii) uniformity iv) plasticity index	BS1377: Part 2 (On-site) BS EN 933-2 (Imported onto site) See Note 2 BS1377: Part 2	Table 6/2 Table 6/5 10 Non Plastic	Table 6/2 Table 6/5 - Non Plastic	No Compaction
6B	Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil or any combination thereof (Property ii) in next column shall not apply to chalk) Recycled Aggregate. Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	i), grading ii) plasticity index iv) Los Angeles coefficient	BS 1377: Part 2 (On-site) BS EN 933-2 (Imported onto site) BS 1377: Part 2 Clause 635	Table 6/2 Table 6/5 Non Plastic -	Table 6/2 Table 6/5 Non Plastic 50	Table 6/4 Method 5

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued)
Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1

Class	General Material Description	Required Uses	Permitted Constituents	Material Properties				Compaction Requirements
				Property	Test	Limits		
						Lower	Upper	
6C	Selected uniformly graded granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag, or any combination thereof. (Property ii) in next column shall not apply to chalk) Recycled Aggregate Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	i) grading ii) plasticity index iii) Los Angeles coefficient iv) uniformity coefficient	BS1377: Part 2 (On site) BS EN 933-2 (Imported onto site) BS 1377: Part 2 Clause 635 See Note 2	Table 6/2 Table 6/5 Non Plastic LA_{50} -	Table 6/2 Table 6/5 Non Plastic - 10	Table 6/4 Method 3
6D	Selected uniformly graded granular material	Starter layer below pulverised fuel ash	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag, or any combination thereof. Recycled Aggregate. Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	i) grading ii) plasticity index iii) uniformity coefficient	BS1377: Part 2 (On site) BS EN 933-2 (Imported onto site) BS1377: Part 2 See Note 5	Table 6/2 Table 6/5 Non Plastic -	Table 6/2 Table 6/5 Non Plastic 10	Table 6/4 Method 4

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued) Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1								
Class	**General Material Description**	**Required Uses**	**Permitted Constituents**	**Material Properties**				**Compaction Requirements**
				Property	**Test**	**Limits**		
						Lower	**Upper**	
6E	Selected granular material (Class 9A)	For stabilisation with cement to form capping	Any material or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Properties i, ii and iii shall not apply to chalk) Recycled Aggregate. Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	i) Grading	BS1377: Part 2 (On site) BS EN 933-2 (Imported onto site)	Table 6/2 Table 6/5	Table 6/2 6/5	
				ii) mc	BS 1377: Part 2 See Note 4		45	
				iii) liquid limit	BS 1377: Part 2		20	
				iv) plasticity index	BS 1377: Part 2			
				v) organic matter	BS 1377: Part 3			
				vi) water soluble sulphate content	BS EN 1744-1 cl. 10		3000mg/l as SO_4	
				vii) oxidisable sulphides content			0.6% as SO_4	
				viii) SMC of chalk	BS EN 1744-1 cl.13 Clause 634		20%	

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued) Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1								
Class	**General Material Description**	**Required Uses**	**Permitted Constituents**	**Material Properties**				**Compaction Requirements**
				Property	**Test**	**Limits**		
						Lower	**Upper**	
6F2	Selected granular material (coarse grading)	Capping	Any material or combination of materials including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. (Property i) in next column shall not apply to chalk. Property iii shall no apply if the asphalt content is 20% or less. Where material in this class is imported onto site it shall be classified is 6F5 and comply with the requirements for that material.	i) grading ii) optimum mc iii) Los Angeles coefficient iv) mc v) Asphalt content vi) Bitumen content	BS1377: Part 2 BS1377: Part 4 (Vibrating hammer method) Clause 635 BS1377: Part 2 see note 4 Clause 710 BS EN 12697-1 or BS EN 12697 - 39	Table 6/2 - - Optimum mc -2% - -	Table 6/2 - LA_{50} Optimum mc 50% 2.0%	Table 6/4 Method 6
6F3	Selected granular material	Capping	Any material or combination of materials with not less than 50% by mass of recycled bituminous planings and granulated asphalt but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. Where material is imported onto site which is not 'as dug' it shall aggregate confirming to BS EN 13242	i) grading ii) optimum mc iii) mc iv) bitumen content	BS1377: Part 2 (On site) BS EN 933-2 (Imported onto site) Clause 613 Clause 613 see note 4 BS EN 12687-1 or BS EN 12697-39	Table 6/2 Table 6/5 - Optimum mc -2% -	Table 6/2 Table 6/5 - Optimum mc 10%	Table 6/4 Method 6 Maximum compacted layer thickness shall be 200mm

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued)
Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1

Class	General Material Description	Required Uses	Permitted Constituents	Material Properties				Compaction Requirements
				Property	Test	Limits		
						Lower	Upper	
6F5	Selected granular material (coarse grading) – imported on to site	Capping	Unbound mixture complying with BS EN 13285 containing aggregate confirming to BS EN 13242. Aggregates from mixed recycled aggregate shall not contain more than 50% of constituents of bituminous materials. Property x in the next column shall not apply if the asphalt content of any recycled aggregate is 20% or less.	i) Size designation and overall grading category	BS EN 13285 – 0/80 and G_E	Table 6/5	Table 6/5	Table 6/4 Method 6
				ii) Maximum fines and oversize categories	BS EN 13285 – UF_{12} and OC_{75}	Table 6/5	Table 6/5	
				iii) Los Angeles Coefficient	BS EN 13242 – LA_{50}	-	50	
				iv) Volume stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	-	-	
				v) Volume stability of steel (BOF and EAF) slag	BS EN 13242 – V_5	-	-	
				vi) Other aggregate requirements	BS EN 13242 – $Category_{NR}$ (no requirement)	-	-	
				vii) Laboratory dry density and optimum water content	BS EN 13285, clause 5.3 – declared values	-	-	
				viii) Water content	BS EN 1097-5	Optimum wc - –2%	Optimum wc	
				ix) Asphalt content	Clause 710	-	50%	
				x) Bitumen content	BS EN 12697-1 or BS EN 12697- 39	-	2.0%	

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (Continued) Acceptable Earthworks Materials: Contract-specific Classification and Acceptability Criteria to support Table 6/1								
Class	**General Material Description**	**Required Uses**	**Permitted Constituents**	**Material Properties**				**Compaction Requirements**
				Property	**Test**	**Limits**		
						Lower	**Upper**	
6N	Selected well graded granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug', it shall be aggregate confirming to BS EN 13242	i) grading ii) uniformity coefficient iii) Los Angeles Abrasion iv) undrained shear parameters iv) effective angle of internal friction (ϕ') and effective cohesion (c') v) permeability vii) mc viii) MVC ix) Slope stability test	BS1377: Part 2 (On site) BS EN 933-2 (Imported onto site) See note 5 LA_{40} – CL 635 Cl 633 Clause 636 Clause 640 BS1377:part 2 Clause 632 Clause 610	Table 6/2 Table 6/5 10 App 6/1 App 6/1 App 6/1 App 6/1 App 6/1 App 6/6	Table 6/2 Table 6/5 - 40 - - - App 6/1 App 6/1	End product 95% of maximum dry density of BS1377: Part 4 (vibrating hammer method)
8	Class 1 or 2 materials	Lower trench fill	Any, except there shall not be any stones or lumps of clay >40mm nominal diameter. Recycled aggregate. Where material is imported onto site, which is not as dug, it shall be aggregate confirming to BS EN 13242	i) mc ii) MCV	BS1377: Part 2 and note 4 Clause 632	As stated for Class 1 or Class 2 as acceptable material		Table 6/4

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIALS (continued)

Footnotes to Table 6/1:

1. The moisture content shall be determined on the material passing the 37.5mm BS sieve.

2. Uniformity coefficient is defined as the ratio of the particle diameters D_{60} to D_{10} on the particle-size distribution curve, where:
   D_{60} = particle diameter at which 60% of the soil weight is finer.
   D_{10} = particle diameter at which 10% of the soil weight is finer.

3. Permeability is to be determined from the formula: $k = 0.0016 (D_{10})^2$ m/s (D_{10} in millimetres).
   where D_{10} = particle diameter at which 10% of the soil by weight is finer.

4. Where BS 1377: Part 2 is specified for mc, this shall mean BS 1377:Part 2 where the material is a soil or BS EN 1097-5 where the material is required to confirm to a harmonised European Standard.

5. Refer to Manual of Contract Documents for Highway Works Volume 1 Series 600, table 6/1 for full list of permitted constituents.

6. Refer to Manual of Contract Documents for Highway Works Volume 1 Series 600, table 6/7 for full list of material source codes.

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIAL

1. Class U2 unacceptable material is not expected to be widely encountered within the Works. Where Class U2 material is known to be present, specific requirements will be provided in the Scheme Specific Site Information.

2. Should Class U2 Unacceptable material be encountered in a scheme, the requirements for dealing with it shall be obtained from the Overseeing Organisation.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

1. Excavation

1.1 Excavations shall be excavated to the lines and levels stated on the relevant 'Scheme Specific' drawing(s).

1.2 Cutting slopes and toes of cuttings shall only be undercut for the purposes of installation of drainage works, the extent of such excavations shall not exceed 20 metres in length or remain open for a period in excess of 24 hours and must be backfilled with well compacted materials as soon as is practical after temporary works, unless stated otherwise in the 'Scheme Specific' Site Information.

1.3 All topsoil shall be completely removed prior to the excavation of acceptable material.

1.4 Explosives and blasting for excavation shall not be permitted.

1.5 Treatment of cutting faces that are not to receive topsoil shall be as described in Clauses 603.5 and .6. The locations and extent of these faces are on the relevant 'Scheme Specific' drawing(s).

1.6 Cutting faces which are to receive topsoil shall, where required to be made secure, be dealt with in accordance with Clause 603.7. The locations and extent of these faces are on the relevant 'Scheme Specific' drawing(s).

1.7 Excavations for the clearance of redundant watercourses will be described in the 'Scheme Specific' Site Information.

1.8 Excavations for new and enlarged watercourses will be described in the 'Scheme Specific' Site Information

2. Depositions and Fills

2.1 Fills, including embankments, shall be constructed to the lines and levels stated on the relevant 'Scheme Specific' drawing(s).

2.2 Requirements for starter layers are shown on the relevant 'Scheme Specific' drawing(s).

2.3 All topsoil shall be completely removed prior to the deposition of acceptable material.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION) (Continued)

3. Embankments

3.1 No oversteepening of embankment slopes will be permitted, except, with the prior permission of the Overseeing Organisation. Trenches for drainage or other works at the toe of the embankment slopes must be adequately supported to prevent failure of the slopes. Such trenches must not exceed 20 metres in length or remain open for a period in excess of 24 hours and must be backfilled with well compacted materials as soon as is practical after temporary works, unless stated otherwise in the 'Scheme Specific' Site Information.

3.2 Unless specifically provided for within the contract no trenches or other excavations will be permitted within completed embankment slopes.

3.3 Embankments shall be constructed in such a way as to ensure unrestricted drainage of water from the earthworks. Granular materials placed in composite embankments must be placed beneath cohesive soils in order to prevent perched water tables within the embankments and any associated softening and/or instabilities. No stockpiling of fill to a height greater than the final embankment height will be permitted.

3.4 In addition, embankments up to 5m height and containing cohesive fill materials shall be compacted with a tamping roller, for a minimum distance of 5 metres from the edges of the embankment. Smooth wheeled rollers shall only be used to seal these surfaces at the end of working periods. Such surfaces shall be scarified and re-compacted with a tamping roller before placing the next lift. As soon as possible after completion of embankment, the side slopes shall be topsoiled and seeded, as indicated in Appendices 6/8 and 30/5, to prevent subsequent erosion of the slopes.

4. Benching

4.1 Benching shall be carried out as described below unless stated otherwise in the 'Scheme Specific' Site Information.

4.2 Where the existing ground is shown to be benched on the 'Scheme Specific' drawing(s) then;

i) loose surface materials are to be excavated up to a depth of 200mm below existing ground levels over the area indicated on the drawings and,

ii) the area of the existing slope of gradient greater than 1v:6h is to be benched in 0.5m vertical steps unless otherwise directed on the drawings.

4.3 Temporary slopes in existing ground or fill areas shall be benched as part of the temporary works.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION) (Continued)

4.4 Interfaces between different classes of fill (except topsoil) or fill placed at different times shall be benched as follows unless otherwise shown on the drawings.

4.5 The interface shall be benched in 0.5m to 1.0m vertical steps so as to maintain the average slope/interface line shown on the drawings. Vertical interfaces or interfaces sloping at less than 1v:6h do not required benching.

4. Cuttings

5.1 No oversteepening of cutting slopes will be permitted. Trenches for drainage or other works at the toe of the embankment slopes must be adequately supported to prevent failure of the slopes. Such trenches must not exceed 20 metres in length or remain open for a period in excess of 24 hours and must be backfilled with well compacted materials as soon as is practical after temporary works, unless stated otherwise in the 'Scheme Specific' Site Information.

5.2 Progressive excavation in cuttings must at all times ensure unrestricted drainage of ground water or surface water from the excavations particularly where the formation or sub-formation is uncovered or where, in the process of excavation, materials which are susceptible to weathering are exposed to the elements. Any materials rendered unacceptable by the Contractor's failure to keep earthworks free of water shall be removed by them and replaced with acceptable material at their expense.

5.3 As soon as reasonably practicable after completion of cuttings and any associated permanent drainage works, the side slopes shall be topsoiled.

6. Compaction

6.1 The Contractor's attention is drawn to Clause 612 and Table 6/4 of the Specification for Highway Works which gives the approved methods of compaction for the highway embankments.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION) (Continued)

7. Disposals of materials

7.1 The Contractor will have title to materials from site clearance, excavations and demolitions, unless as described in this Appendix. This requirement shall take precedence over Clause 73.2 of the EEC NEC Conditions of Contract.

7.2 Subject and without prejudice to the provisions of the Conditions of Contract, expressions 'run to spoil in tips provided by the Contractor', 'haulage and deposition in tips off Site provided by the Contractor', 'disposal of material' and the like, both in this Series and in any other Series of the Specification shall be deemed to have the meanings of requiring the use of waste carriers registered and tipping sites licensed under the Control of Pollution Acts and in compliance with the Environmental Protection Act.

The Contractor shall, before commencing any part of the Works, submit to the Overseeing Organisation a list of locations of tips off Site that they propose to use for the disposal of materials arising from the temporary and permanent works. The list shall be updated to represent actual practice until issue of the Maintenance Certificate.

7.3 The Contractor shall whenever required produce to the Overseeing Organisation information to show that the disposal sites have current licences or planning consents as appropriate together with details of any conditions or constraints upon their use and that the nature of materials for disposal together with the manner rates and timings of the disposals are acceptable to the waste regulation and disposal authorities, the licensed waste managers, and the local planning authorities, as appropriate.

7.4 The Contractor will be required to provide copies of all Controlled Waste Transfer Notes relating to the disposal of materials arising from the temporary and permanent works.

APPENDIX 6/5: GEOTEXTILES USED TO SEPARATE EARTHWORKS MATERIALS

1. Geotextiles, where required, will be specified in the in the 'Scheme Specific' Site Information.

APPENDIX 6/6: FILL TO STRUCTURES AND FILL ABOVE STRUCTURAL FOUNDATIONS

1 Fill to structures and fill above structural foundations where required will be specified in the in the 'Scheme Specific' Site Information.

APPENDIX 6/7: SUB-FORMATION AND CAPPING AND PREPARATION AND SURFACE TREATMENT OF FORMATION

1. Capping

1.1 Capping in pavements shall normally be Class 6F2 or 6F5 material, complying with the requirements of Table 6/1 contained in Appendix 6/1.

1.2 Where required, capping shall be 350mm or 600mm thick as described in the 'Scheme Specific' Site Information. Where capping is 350mm thick it shall extend a minimum of 500mm behind the channel line, where 600mm thick it shall extend a minimum of 750mm behind the channel line.

1.3 Capping shall be used at the locations shown on the relevant 'Scheme Specific' drawing(s).

1.4 As an alternative to 6F2 or 6F5, capping may be formed by treatment of existing site material using any suitable combination of lime, PFA, GGBS and OPC. Treatment may be carried out by mix-in-place or mix-in-plant methods to produce a mixture with a soaked CBR of at least 15% at 7 days. The Contractor shall provide a specification and method statement for their proposed treatment.

1.5 In cuttings the Contractor shall adopt the method described in Clause 613.11(i) of the Specification for the construction of capping.

1.6 On embankments the Contractor shall adopt the method described in Clause 613.12 (i) of the Specification for the construction of capping.

1.7 Demonstration areas are not required, unless stated such in the 'Scheme Specific' Site Information.

2. Sub-Formation

2.1 In general the sub-formation shall have the same longitudinal gradient and cross fall as the formation. However, at flat areas of transition the sub-formation shall be so constructed as to provide falls of 1v : 100h towards the edge of carriageway.

3. Formation

3.1 The formation shall have the same longitudinal gradient and cross fall as the finished pavement

3.2 The formation of all footways shall be sterilised in accordance with 674AR.

3.3 Natural formation is to be assessed for CBR value using Equilibrium Design CBR method sampling every 30-50 linear metres. Samples must be delivered to the nominated laboratory for testing. Plate bearing on natural formation is not acceptable.

APPENDIX 6/7: SUB-FORMATION AND CAPPING AND PREPARATION AND SURFACE TREATMENT OF FORMATION (continued)

3.4 The determination of Soil Type following Equilibrium CBR testing shall be in accordance with the following table:

Table 3.4

Soil Type	Plasticity Index	Equilibrium CBR %
Clay/Silt	50 or greater	less than 2
"	35 - 49	3
"	26 - 34	4
"	16 - 25	3
"	10 - 15	2
Silt	less than 10	less than 2
Silt	Non-plastic	less than 2
Poorly graded SAND	"	7
Well graded SAND	"	10
Poorly graded GRAVEL	"	10
Well graded GRAVEL	"	15

Notes for Table 3.4:

i Granular material with greater than 15% passing 63 μm test sieve will be considered on a site specific basis.

ii CBR values for made or placed ground may be determined using in-situ methods if the material is granular in nature.

3.5 Once CBR values have been determined, the layer thickness of pavement foundation construction may be assessed according to the below table 3.5:

Table 3.5

CBR value of formation	Layer thickness
CBR 15% or greater	150mm sub-base
CBR 5% to less than 15%	225mm sub-base laid in 2 layers (max single layer thickness 125mm)
CBR 2% to less than 5%	150mm sub-base plus 350mm capping
CBR less than 2%	150mm sub-base plus 600mm capping

Note: This table serves as guidance only and formation may alternatively be assessed by CD225.

APPENDIX 6/8: TOPSOILING

1. Topsoil

1.1 Topsoil is required to be stripped in the locations shown on and to the depths stated on the relevant 'Scheme Specific' drawing(s).

1.2 Unless stated otherwise in the 'Scheme Specific' Site Information, at least two weeks before the commencement of topsoil stripping all areas to be stripped shall be sterilised in accordance with 674AR.

1.3 Topsoil and turf to be designated as Class 5A material is described in Appendix 6/1.

1.4 Stockpiling of stripped and imported topsoil shall not exceed 1.5m high and shall be treated with a suitable herbicide in accordance with 674AR at appropriate intervals to prevent the seeding of weeds. Contractor shall ensure any required planning consent is obtained.

1.5 Class 5A material in excess of requirements for topsoiling shall be disposed of off-site.

1.6 Imported topsoil Class 5B is required where stated in the 'Scheme Specific' Works Information

1.7 Where trees are to be planted, the topsoil shall comply with the requirements of Staffordshire's 'Tree Planting Specification'.

2. Topsoiling

2.1 Constraints on excavating topsoil from stockpiles are those stated in Clause 618.3 and any additional constraints stated in the 'Scheme Specific' Site Information.

2.2 Unless stated otherwise in the 'Scheme Specific' Site Information, topsoil shall be spread 150mm thick.

APPENDIX 6/9: EARTHWORK ENVIRONMENTAL BUNDS, LANDSCAPE AREAS, STRENGTHENING EMBANKMENTS

1. Earthwork Environmental Bunds

1.1 Earthwork environmental bunds shall be constructed at the locations shown on the relevant 'Scheme Specific' drawing(s). with the fill materials and compaction requirements stated in the 'Scheme Specific' Site Information.

1.2 Unless stated otherwise in the 'Scheme Specific' Site Information all earthwork environmental bunds shall be topsoiled to the requirements of Appendix 6/8 and grass seeded to the requirements of Appendix 30/5.

2. Landscape Areas

2.1 Landscape areas are designated on the relevant 'Scheme Specific' drawing(s) with Class 4 fill materials and compaction to the requirements of Clause 620.2, unless stated otherwise in the 'Scheme Specific' Site Information.

2.2 Unless stated otherwise in the 'Scheme Specific' Site Information all landscape areas shall be topsoiled to the requirements if Appendix 6/8 and grass seeded to the requirements of Appendix 30/5.

3. Strengthened Embankments

3.1 Strengthened embankment shall be constructed at the locations shown on the relevant 'Scheme Specific' drawing(s). with the fill and strengthening materials and compaction requirements stated in the 'Scheme Specific' Site Information.

3.2 Unless stated otherwise in the 'Scheme Specific' Site Information all strengthened embankments shall be topsoiled to the requirements of Appendix 6/8 and grass seeded to the requirements of Appendix 30/5.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS

PERMITTED PAVEMENT OPTIONS – SCHEDULE 1

Drawing Ref.	Area	General Requirement	Permitted Pavement Option (Scheme Specific)			
Scheme Specific Pavement Drawings	Area A	Scheme Specific Works Information	A1	A2	A3	etc.
	Area B		B1	B2	B3	etc.
	Area C		C1	C2	C3	etc.
	etc.		etc.	etc.	etc.	etc.

1. The Mean annual frost index value for Staffordshire is greater than 50.

2. This contract requires that the compaction level of bituminous base and surfacing materials in the Permanent Works shall be determined by end result compaction in terms of its air void content.

3. The Staffordshire Highways Laboratory (SHL) will usually carry out core cutting. The Contractor shall carry out reinstatement of core holes.

4. All bituminous mixtures used in the works shall be produced in plants that are registered to the BS EN ISO 9001 and shall be laid by contractors registered to and operating in accordance with the "Sector Scheme 16 for the Laying of Asphalt Mixes". All non-proprietary mixtures shall be CE marked and comply with BS EN 13108 and the relevant annex of BSI PD 6691.

5. Bituminous mixtures shall be transported, handled and laid in accordance with BS 594987. See 973AR for Low Temperature Asphalt provision.

6. Surface course shall not be laid outside the hours of daylight, i.e. the hours between the nationally published sunrise and sunset for the Midlands area, unless agreed otherwise.

7. Where bound pavement material is to be overlain with bituminous bound material, the requirements stated in Appendix 7/4 shall be followed.

8. Unless stated otherwise in the Scheme Specific Works Information the PSV and AAV values shall be selected by reference to the Staffordshire Skid Resistance Policy, which amends CD236 tables 3.3a and 3.10

9. Further to Cl 8, the minimum PSV on carriageways shall be 60, and 45 on footways. PSV requirements shall be assessed in accordance with Cl 8 to ensure adequate levels are achieved.

10. High Friction Surfacing (HFS) is not permitted for use unless in exceptional circumstances to be justified on a scheme by scheme basis.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS (Continued)

11. Porous asphalt is not permitted for use because it does not retain its porosity over time due to the voids becoming filled with detritus. Alternative methods for resolving drainage issues must be undertaken on a scheme specific basis.

12. See appendix 6/7 Cl 3 for pavement foundation design guidance.

13. Surface regularity is to be measured against MCHW Cl702 table 7/2 for new build schemes, or SROH S2.4 table S2.3 for reinstatements.

14. For pavement thickness design guidance utilising permitted Base and Binder courses in Schedule 5, refer to HD26/06 (Withdrawn). HD26/06 must be used because the current version of CD226 does not contain this Specification's required base and binder course materials.

15. For chip-free drainage channel requirements, see appendix 5/1 cl. 15.

16. Sealing grit is a mandatory requirement for all SMA surface courses and shall be applied in accordance with cl. 971AR.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS (Continued)

2. GENERAL REQUIREMENTS – SCHEDULE 2

Schedule 2: General Requirements – General		
Grid for checking surface levels of pavement courses (see scheme specific works information for details at roundabouts)	Longitudinal dimension:	10m
	Transverse dimension	1.5m
Surface regularity	Category of Road:	As stated in the Scheme Specific Works Information
Interval for measurement of longitudinal regularity		Continuously along both wheel tracks for each lane.
Interval for measurement of transverse regularity		10m
Whether surface texture is required		As stated in the Scheme Specific Works Information
Whether measurement of surface texture is required Average: Maximum: Minimum:		As stated in the Scheme Specific Works Information

3. PERMITTED CONSTRUCTION MATERIALS – SCHEDULE 3

Schedule 3: Permitted Construction Materials
See Scheme Specific Works Information.

4. REQUIREMENTS FOR CONSTRUCTION MATERIALS - SCHEDULE 4

Clause	**Requirement**
901.19	Determination of compaction level of all bituminous mixtures shall be in accordance with Clause 970 AR.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS (Continued)

5. REQUIREMENTS FOR CONSTRUCTION MATERIALS - SCHEDULE 5

SC1 (Modified) Preferred on ≤30mph low risk locations. *See Note 1*	911	HRA 55/10 F surf 100/150 des	PD 6691 Annex C table C2 col 5 Minimum target binder 5.8% Coarse aggregate: Crushed rock only excluding limestone. No RA to be used in the mix Minimum PSV and Maximum AAV: See Staffordshire Skid Resistance Policy
SC2 Preferred on high speed and heavily trafficked locations *See Note 1*	911 and 915	HRA 35/14 F surf 40/60 des 14/20 Pre-coated Chippings	EN 13108–4 & PD6691 table C.2 col 7 Limiting wheel track values PD 6691 table C.4 Coarse aggregate: Crushed rock only. PSV 45 min AAV 12 max. $B_{min\ 6.6}$ PD 6691 Annex C Minimum PSV and Maximum AAV: See Staffordshire Skid Resistance Policy
SC3	971AR	SMA 10 surf 40/60	Clause 971 AR Coarse Aggregate: Single source crushed rock only see 971AR Minimum PSV and Maximum AAV: See Staffordshire Skid Resistance Policy Sealing grit to be mechanically applied at the rate of 0.5 - 0.7kg/m^2 during compaction.
SC4	971AR	SMA 6 surf 40/60 for c/way surface course or regulating or 100/150 for f/ways	Clause 971 AR Coarse Aggregate: crushed rock only Minimum PSV: 45 for footways Maximum AAV: N/A
SC5	909	AC 6 dense surf 160/220	PD 6691 Table B.15 Minimum PSV: 45 Coarse aggregate: Crushed rock only excluding limestone.
SC 6	911	HRA 45/10 F Surf 100/150	For use in only speed cushions and other minor patching areas by prior agreement.

APPENDIX 7/1: PERMMITTED PAYMENT OPTIONS (Continued)

5. REQUIREMENTS FOR CONSTRUCTION MATERIALS - SCHEDULE 5

SC7		Alternative proprietary surface course material. See note 3.	Coarse Aggregate: crushed rock only Minimum PSV and Maximum AAV: See Staffordshire Skid Resistance Policy Limiting wheel tracking values, texture depth etc. to be specified on a site-specific basis.
SG	971AR	Coated sealing grit	Lightly coated to allow free flow. Minimum PSV 55.
Bond	920	Bond coat	BS 594987 clause 5.5
BC1	906	AC 20 dense bin 100/150 rec (160/220 for f/ways)	PD 6691 Table B.11 Coarse aggregate: crushed rock or crushed gravel only (use of gravel shall reduce penetration grade to 40/60 for the same layer thickness). Thickness: See 7/1 Cl. 14
BC2	906	AC 32 dense bin 100/150 rec	PD 6691 Table B.11 Coarse aggregate: crushed rock or crushed gravel only. (use of gravel shall reduce penetration grade to 40/60 for the same layer thickness). Thickness: See 7/1 Cl. 14
BC3	929	AC 20 HDM bin 40/60 des	PD 6691 Tables B.6 and B.7 Coarse aggregate: crushed rock or crushed gravel Thickness: See 7/1 Cl. 14
BC4	929	AC 32 HDM bin 40/60 des	PD 6691 Tables B.5 and B.7 Coarse aggregate: crushed rock or crushed gravel Thickness: See 7/1 Cl. 14
BC 5	905	HRA 50/20 F bin 40/60 rec	PD 6691 Annex C Table C.1 Coarse aggregate: crushed rock or crushed gravel Thickness: See 7/1 Cl. 14
BC6		AC 20 dense bin 100/150 (enriched)	PD 6691 Table B.11 Minimum target binder 0.5% above requirement in table above. Coarse aggregate: Crushed rock excluding limestone This option must be used if binder course is to be exposed for longer than one month. Thickness: See 7/1 Cl. 14
BC7		Alternative proprietary binder course material.	See note 4.
Fly Ash Bound Mixture	830	FABM – 1	Clause 890 AR. Mechanical Performance Level C $_{6/8}$

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS (Continued)

5. REQUIREMENTS FOR CONSTRUCTION MATERIALS - SCHEDULE 5

B1	906	AC 32 dense base 100/150 rec	PD 6691 Table B.11 Coarse aggregate: crushed rock or crushed gravel only. (Use of gravel shall reduce penetration grade to 50 pen for the same layer thickness). Thickness: See 7/1 Cl. 14
B2	929	AC 32 HDM base 40/60 des	PD 6691 Table B.1 and B.3 Coarse aggregate: crushed rock or crushed gravel only. Thickness: See 7/1 Cl. 14
SB1	803 & 807	Granular Type 1 or Type 4	MCHW Vol 1 Cl 803 and 807
SB2	1043	Foamed Concrete Reinstatement	See SROH guidance. Preferred backfill for excavations over 1.5m

Notes

1. Materials other than SC1 and SC2 are permitted through SC3 – SC7, however their use must be justified on a scheme specific basis.
2. The use of Polymer Modified Binder (PMB) instead of the specified pen stiffness is permitted on a scheme specific basis, for a specific purpose, and must be justified.
3. Alternative surface course material, SC7, may be specified in a site-specific Appendix 7/1.
4. Alternative binder course material, BC7, may be specified in a site-specific Appendix 7/1.
5. Coarse aggregate greater than 4mm in size used in surface course mixtures shall be from a single geological source. Blending of different PSV aggregates to achieve a specified value is not permitted.
6. Low temperature asphalt is the default material of choice between March and October and can be used outside this period with agreement. Refer to clause 973AR.
7. See clause 970AR for air void specification.
8. See clause 971AR for SMA specification.
9. Product specifications should be agreed with Highways Laboratory staff prior to first use. The need to select appropriate aggregate and to comply with specified texture depth and air void limits shall override other considerations.
10. The use of recycled aggregate in surface course is not permitted due to concerns over long term durability.
11. The use of recycled aggregate in base and binder course is limited to a maximum of 50% aggregate in accordance with the recommendations set out in PD6691
12. Asphalt shall be machine laid, except where the Supervisor has agreed otherwise.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS (Continued)

5. REQUIREMENTS FOR CONSTRUCTION MATERIALS – SCHEDULE 6

SCHEDULE 6a – Texture Depth for Stone Mastic Asphalt and Unchipped Hot Rolled Asphalt Only

TEXTURE DEPTH			
Level	Texture depth (mm)		Traffic speed
	Maximum	Minimum	
3	1.8	1.0	85 percentile ≥ 50mph
2	1.5	0.7	Posted limit 40mph
1	1.3	0.6	Posted limit ≤ 30mph
0	NR	NR	Posted limit ≤ 30mph for 55/10 and 45/10 HRA only (see note 2)

Note:

1. Any 50m section cannot be less than 80% of the specified texture depth.

2. The use of HRA 55/10 or 45/10 Surf should be restricted to sites with low speed and where there are no local conditions such as poor drainage which may increase the risk of high speed wet weather skidding. See schedule 5 for other permitted options.

SCHEDULE 6b – Texture Depth for Chipped Hot Rolled Asphalt Only

TEXTURE DEPTH			
Level	Texture depth (mm)		Traffic speed
	Maximum	Minimum	
4	2.0	1.2	85 percentile ≥ 50mph
3	1.8	1.0	Posted limit ≤50mph

Note:

1. Any 50m section cannot be less than 80% of the specified texture depth.

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES

1. Excavation of Existing Surfaces

1.1. The boundaries of all existing pavements to be excavated shall be saw cut. For excavations deeper than 100mm a 100mm saw cut shall be provided. For excavations less than 100mm the saw cut will be the full depth of the excavation with a minimum depth of cut of 40mm.

1.2. Longitudinal joints shall be stepped to provide a minimum 300mm horizontal offset between joints in overlaying pavement layers.

2. Reinstatements of Existing Surfaces

2.1. The reinstatement of existing surfaces are required at the locations shown on the relevant Scheme Specific Drawing(s).

2.2. Trenches within existing pavements or paved areas shall be reinstated in accordance with the "Specification for the Reinstatement of Openings in the Highway" issued by the Highway Authorities and Utilities Committee. The binder layer shall be of AC 20 dense bin 100/150 rec. (Appendix 7/1 Schedule 5 BC 1).

2.3. The vertical faces of all pavement reinstatements shall be painted with edge sealant, prior to the laying of the reinstatement material to the existing pavement level.

3. Junctions Between New and Existing Pavements/Paved Areas

3.1. The locations of the junctions between new and existing pavements/paved areas are shown on the relevant Scheme Specific Drawing(s).

3.2. Junctions between new and existing pavements/paved areas shall be reinstated with materials specified in Appendix 7/1 and to the thicknesses shown on HWD 07.01.

3.3. All transverse joints shall be saw cut vertical. Vertical faces shall be painted with edge sealant, prior to the laying of bituminous materials.

4. Permanent Patching Including Surface Dressing Pre-Patching

4.1. Work shall be carried out following the principles set out in the Specification for Reinstatement of Openings in the Highway (SROH) and the performance requirements of the SROH shall apply except where stated otherwise in this document.

4.2 Guidance for choosing the most appropriate patching materials is in cl. 974AR

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES (Continued)

4.3 Permanent patching is carried out to restore the mechanical integrity and surface profile of a carriageway with the aim of increasing the life of defective areas to that of the adjacent, undamaged road. To this end it is important to distinguish between surfacing defects and structural defects and to carry out repairs to an appropriate depth using suitable materials.

4.4. This part of the specification is restricted to the replacement of bituminous layers and it is assumed that bituminous mixtures will only be placed on top of adequate foundations.

4.5 Defective areas shall be defined and removed. Cutting of the existing surface shall be carried out by planing or sawing. Care must be taken to avoid damage to the carriageway beyond the limits of the repair, in particular the bond between layers. Any loose, damaged or de-bonded material or standing water shall be removed.

4.6 Where deep repairs are carried out reinstatement shall be stepped by a minimum of 100mm at 100mm below road surface level.

4.7 Prior to reinstatement, all patch edges shall be straight and vertical. All vertical faces within 100mm of the carriageway surface shall be sealed with edge sealant. Bond coat shall be applied to the base of the reinstatement and between all bituminous layers. In reinstatements less than $2m^2$ edge sealant may be used in lieu of bond coat; tack coat is not suitable for use as edge sealant.

4.8 Binder course material, where used, shall be AC 20 dense bin 100/150 rec (Appendix 7/1 Schedule 5 BC1) in carriageways and 160/220 in footways.

4.9 Carriageway surface course material shall generally be HRA 55/10 F Surf 100/150 des (Appendix 7/1 Schedule 5 SC1) on low speed roads or HRA 35/14 F Surf 40/60 des with 14/20 Pre-coated chippings on high speed and heavily trafficked roads (Appendix 7/1 Schedule 5 SC2). On a site specific basis, where large scale work is to be carried out, engineers may specify surface course replacement on a "like for like" basis e.g. SMA in existing SMA. This should still comply with Appendix 7/1 Schedule 5.

4.10 Footway surface course material shall generally be AC 6 dense surf 160/220 (Appendix 7/1 SC5). Where emergency response footway defects are to be repaired adjacent to or in the general vicinity of carriageway work then AC 10 close surf 100/150 or 160/220 may be used. AC 6 dense surf should not be used in carriageways.

4.11 In small ($<2m^2$) or narrow (<300mm) work multiple lifts of appropriate surface course material may be used in place of binder course material.

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES (Continued)

4.12 All bituminous mixtures shall be compacted within the temperature ranges and lift/layer thickness limits shown in Table 1, subject to clause 973AR. A method of work which facilitates good compaction by keeping the material warm is required. This may be achieved using hotboxes, insulated containers or insitu mobile heating plant. Insitu mobile heating utilising a mobile heater of pre-packaged asphalt is only permitted with prior approval of the material and method from the Project Engineer. Permitted air void content of completed work is shown in Table 2.

4.13 Requirements for compaction plant and associated lift thickness and number of passes are given in Table 3.

4.14 Surface texture and surface regularity shall be as detailed in the SROH.

4.15 Aggregate PSV requirements are given in full in the Staffordshire Skid Resistance Policy, which amends CD236 of DMRB. An abbreviated version, from the SROH, is shown here as Table 4. Clause 9 of appendix 7/1 applies.

4.16 If Overband is used, it should be in accordance with the requirements of 974AR- Permanent Maintenance Pavement Guidance and SROH S6.8.8

4.17 It is acknowledged that the existing carriageway construction can often fall below modern construction standards, as such the reinstatement depth is to be at the discretion of the inspector (See 4.2) with the following caveats:

- 4.17.1 Minimum repair to the full depth of the surface course, where the binder course is sound.
- 4.17.2 Where failure extends beyond surface course, repair to full depth of failure.
- 4.17.2 Where bound material does not achieve minimum construction standards, repair is to be carried out to the extent of bound material meets unbound material.

4.18 Particular attention is to be paid to the requirements of 'S6.8.9 Proximity to road edges and fixed features' from SROH when carrying out reinstatements in the carriageway.

5. Alternative Permanent /Semi-Permanent Repair Methods

5.1 See Appendix 7/22.

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES (Continued)

Table 1

Material	Binder Grade (pen)	Maximum Temperature at any stage	Minimum Temperature ^{0}C		Compacted Lift Thickness (mm)		
			Arrival ✳	Minimum Rolling	Minimum at any point	Nominal Lift Thickness	Maximum at any point
AC 6 dense surf	160/220	170	110	85	15	30	40
AC 10 close surf	100/150	170	120	95	25	30	50
AC 20 dense surf	100/150	170	120	90	40	60	110
HRA 30/14 or 35/14 surf 40/60	40/60	190	140	110	35 or 45	40	50
HRA 55/10 surf 100/150	100/150	170	120	85	30	35	45

Notes for Table 1

1 * = In the lorry within 30 minutes after arrival on site.

2 For coated slag mixtures 10 °C lower may be used.

3 Greater compactive effort may be required to achieve an acceptable air voids ratio as the temperature approaches the lower limit.

4 For Low Temperature Asphalts, see 973AR.

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES (Continued)

Table 2

Asphalt Materials	Permitted Air Voids			
	Carriageways		Footways	
	Max %	Min %	Max %	Min %
AC 6 dense surf	**NP**	**NP**	13	2
AC 10 close surf	11	2	**NP**	**NP**
HRA surf	7	2	10	2
SMA surf	8	2	10	2
AC bin	10	2	12	2
HRA Bin	9	2	12	2
SMA Bin	6	2	**NP**	**NP**
PCSM Materials	10	2	13	2

Note for Table 2
NP = not permitted

Table 3

Compaction Plant and Weight Category	Bituminous Mixtures			
	Minimum Passes/Lift for compacted lift thickness up to			
	40 mm	60 mm	80 mm	100 mm
Vibrotamper 50 kg minimum	5 #	7 #	**NP**	**NP**
Vibrating Roller				
Single Drum				
600-1000 kg/m	10	12	NP	NP
1000-2000 kg/m	6	10	NP	NP
2000-3500 kg/m	5	7	8	NP
Over 3500 kg/m	4	6	7	NP
Twin Drum				
600-1000 kg/m	5	7	NP	NP
1000-2000 kg/m	4	5	6	8
Over 2000 kg/m	3	4	4	6
Vibrating Plate				
1400-1800 kg/m^2	6	**NP**	**NP**	**NP**
Over 1800 kg/m^2	3	5	6	8
All Above Plant	**For Maximum and Minimum compacted lift thickness See Appendix A2.6, Table A2.1 of the SROH.**			

Alternative Compaction Plant for Areas of Restricted Access (including small excavations and trenches less than 200 mm width)	
Vibrotamper 25 kg minimum	Minimum of 6 compaction passes
Percussive Rammer 10 kg minimum	Maximum of 75 mm compacted lift thickness

APPENDIX 7/2: EXCAVATION, TRIMMING AND REINSTATEMENT OF EXISTING SURFACES (Continued)

Notes for Table 3

1. **NP** = Not Permitted

2. **#** = Vibrotamper not permitted on permanent surface course.

3. Twin drum vibrating rollers are preferred for compaction of bituminous mixtures.

4. Single drum vibrating rollers are vibrating rollers providing vibration on only one drum.

5. Twin drum vibrating rollers are vibrating rollers providing vibration on two separate drums.

Table 4

Road Type	Reinstatement Minimum PSV	
	Site A Potentially High Risk	Site B Average or Low Risk
0	68	68
1	68	65
2	65	60
3	65	60
4	65	60

APPENDIX 7/3: SURFACE DRESSING – PERFORMANCE SPECIFICATION

1. Description of existing surface

To be included in works information required for design.

2. Road hardness

To be recorded where possible and included in works information required for design.

3. System of Surface Dressing permitted

To be agreed and recorded in works information.

4. Minimum texture depth at end of a 2-year period

In accordance with MCHW Volume 2 Series NG 900 Table NG 9/18.

5. Maximum texture depth after 4 weeks trafficking

Not used.

6. Maximum percentage decrease in macrotexture between 12 months and 24 months after start of trafficking

Not used

7. Frequency of testing for roads other than trunk roads and motorways

In accordance with Appendix 1/5.

8. Category of fatting up, tracking and bleeding (% Area – P1) acceptable

In accordance with MCHW Volume 2 Series NG 900 Table NG 9/20.

9. Category of scabbing and tearing (% area affected– P2) acceptable

In accordance with MCHW Volume 2 Series NG 900 Table NG 9/21

10. Category of fretting (% chipping loss – P_3)

In accordance with MCHW Volume 2 Series NG 900 Table NG 9/22.

11. Category of streaking (Length of streaking – P_4)

In accordance with MCHW Volume 2 Series NG 900 Table NG 9/23.

12. Special restrictions

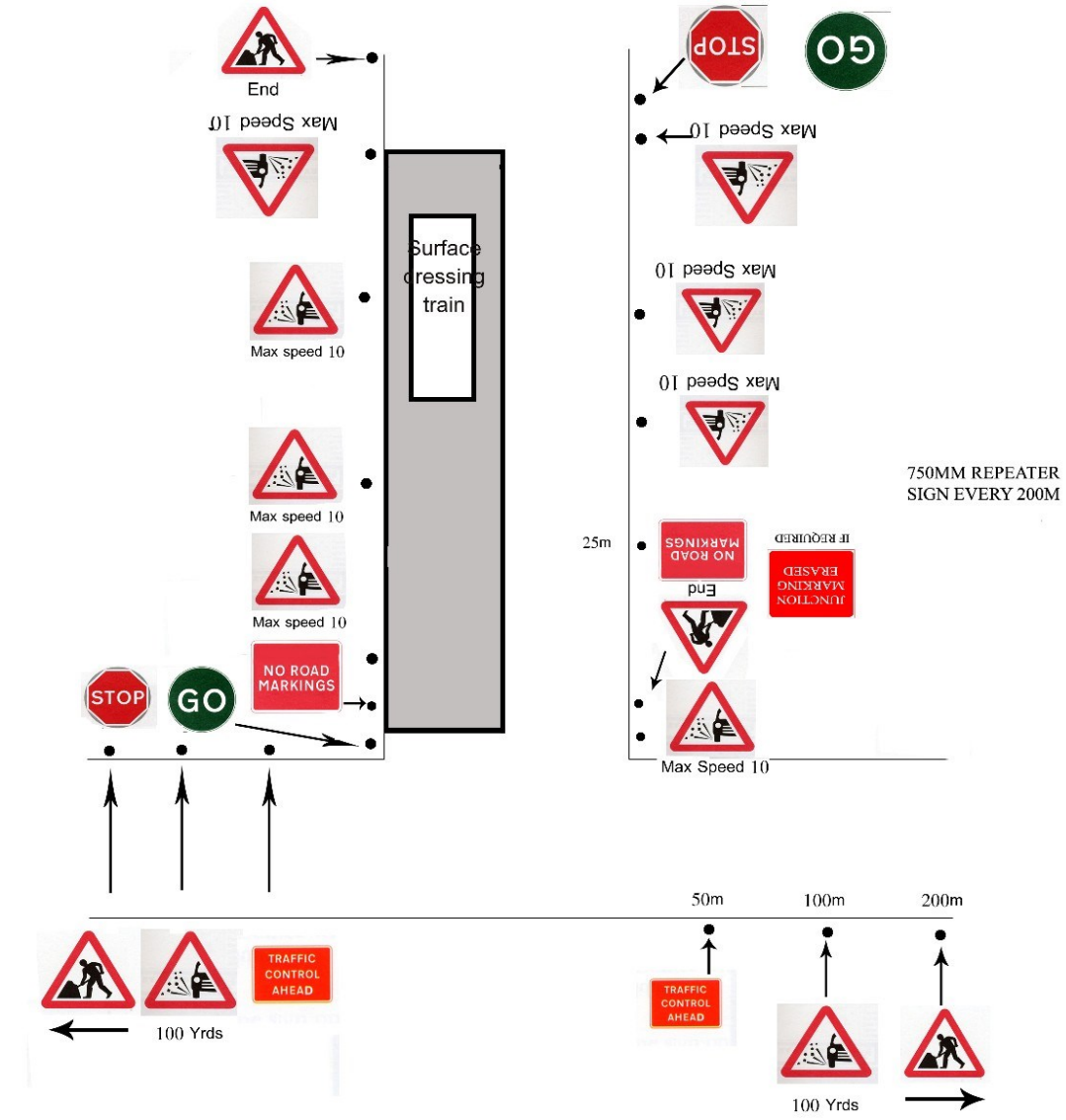
The maximum road surface temperature at which laying shall be allowed is 35 degrees Celsius for A and B roads and 40 degrees Celsius for all other roads.

APPENDIX 7/3: SURFACE DRESSING – PERFORMANCE SPECIFICATION (Continued)

SINGLE CARRIAGEWAY URBAN STREET/RURAL LANE

Less than 6.0m wide where works start at junction

LAYOUT 5



NOTES;
1. Layout of signs duplicated from opposite direction with reversed if applicable areas layout 22 where appropiate.
2.Size of signs= 750MM

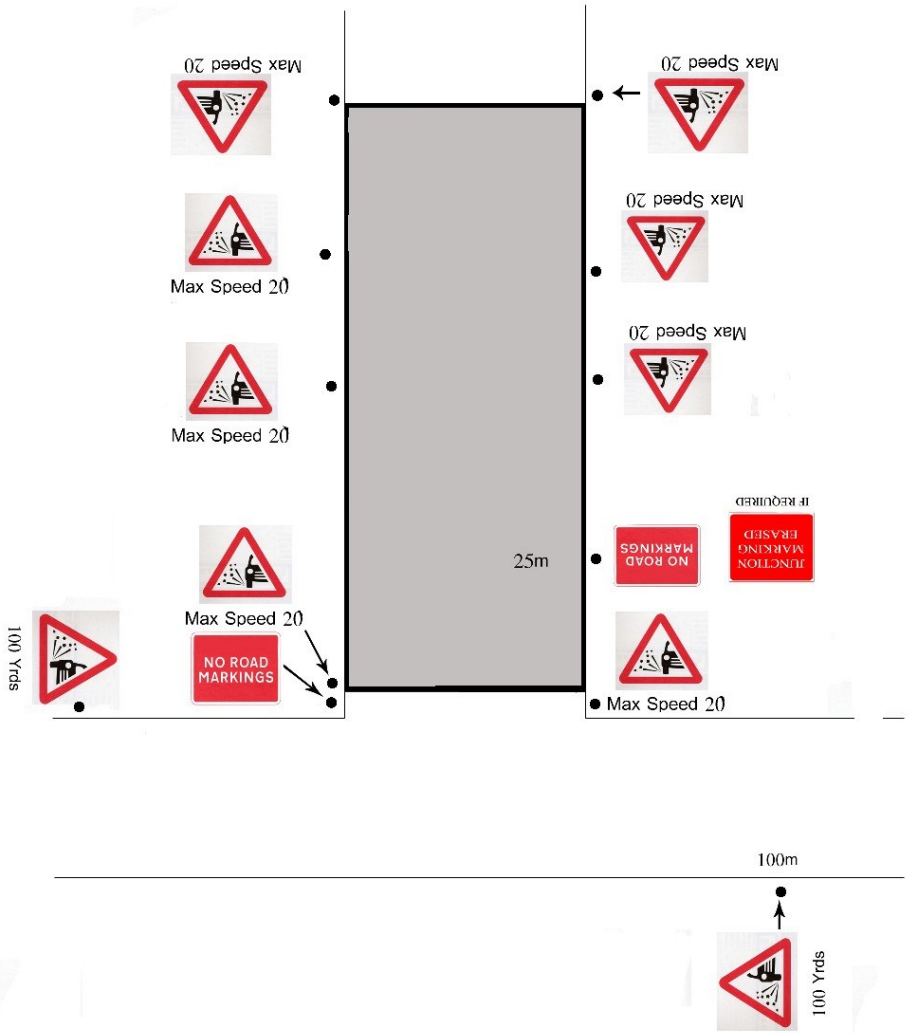
APPENDIX 7/3: SURFACE DRESSING – PERFORMANCE SPECIFICATION (Continued)

SINGLE CARRIAGEWAY URBAN ST/RURAL LANE

LATOUT 6

Less than 6.0m wide work at junction after dressing completion

ROAD SWEEP TO CARRY OWN WARNING SIGNS



NOTES;

1.Layout of signs duplicated from opposite direction with reversed if applicable areas layout 23 where appropriate

2.Size of signs= 750MM

APPENDIX 7/4: BOND COATS, TACK COATS AND OTHER BITUMINOUS SPRAYS

Tack Coat

1. Tack coat is no longer considered best practice and is not to be used without prior agreement.

Bond Coat

1. Bond coat shall be applied prior to the laying of a new asphalt layer on any bound substrate.

2. Bond coat shall be applied in accordance with BS 594987 clause 5.5.

3. Prior to bond coating, surfaces shall be pressure washed and/or mechanically swept, to remove all debris, and loose or unbound materials from the surface.

4. Overspray shall be minimised and should not extend up the face of kerbs.

5. The Contractor shall provide the following information with their tender, or prior to the commencement of the work;
   - 5.1. The product or products they propose to use, together with their data sheets, product identification data, cohesivity data as specified.
   - 5.2. For each product, a copy of the BS EN ISO 9001 certificate showing the name of the manufacturer, the name of the certification body and the reference number and date of the certificate.
   - 5.3. The spraying equipment proposed, and a test certificate.
   - 5.4. The source or sources of any blinding material proposed.
   - 5.5. Contingency plans in the event of any breakdown.
   - 5.6. The results of any other tests or other data the Contractor considers would assist the Overseeing Organisation in assessing the technical merit of the treatment such as:
     - *i)* Tackiness test and/or trafficability time and methods of test.
     - *ii)* Breaking time test results for different weather conditions and substrates.
     - *iii)* Test results for bond to newly laid concrete. The data supplied should not be more than six months old.

APPENDIX 7/6: BREAKING UP OR PERFORATION OF EXISTING PAVEMENT

1. The breaking up and perforation of existing surfaces shall be carried out at the locations shown on the relevant Scheme Specific Drawing(s).

2. Details of the construction and thickness of existing pavement to be broken up or perforated are stated in the Scheme Specific Works Information.

3. Areas of existing pavement to be perforated shall receive a minimum of 8 perforations per square metre.

4. Perforations shall be a minimum of 50 millimetres diameter and penetrate the full depth of the material to be perforated.

5. Unless stated otherwise in the Scheme Specific Works Information existing pavement material that has been broken up or perforated shall be left in place.

APPENDIX 7/9: COLD-MILLING (PLANING) OF BITUMINOUS BOUND FLEXIBLE PAVEMENT

1. The cold milling of existing surfaces shall be carried out at the locations shown on the relevant Scheme Specific Drawing(s).

2. Details of the thickness of existing pavement to be cold milled are shown on the relevant Scheme Specific Drawing(s).

3. Unless stated otherwise in the Scheme Specific Works Information cold milling shall be carried to the same profile as the finished pavement surface, to avoid the need for regulating to achieve the required finished levels.

APPENDIX 7/18: SITE SPECIFIC DETAILS AND REQUIREMENTS FOR COLD RECYCLED BITUMEN BOUND MATERIAL

1 Site description, location details and depth of recycling:

i)	Overall location	reference to drawings
ii)	Section details	reference to drawings and sections
iii)	Location of services	reference to drawings and sections
iv)	Depth of recycled layer	…… mm
v)	Location and condition of drainage	reference to drawings and sections
vi)	Type and severity of deterioration	reference to drawings and sections
vii)	Subgrade bearing capacity & condition	……
viii)	Edge detail and verge condition	reference to drawings and sections
ix)	Future traffic loading	……

2 Type of lime required for modification of cohesive soils ……

3 Locations of stockpiles of excess pulverised materials awaiting re-use elsewhere

4 Rate of application of bitumen emulsion sealant spray l/m^2

5 Minimum elastic modulus within 24 hours obtained using a dynamic plate or penetration test;

Single point value	MPa
Mean value	MPa
Minimum % increase of single point elastic modulus values	… %
Minimum % increase of mean elastic modulus values	… %

6 Absolute minimum added bitumen content … %

7 Nominal grid pattern

8 Rolling mean of 10 FWD derived stiffness values shall not be less than …..MPa and no individual result less than 85% of ….. MPa.

APPENDIX 7/22: REPAIR TO POTHOLES

1. General

1.1 Wherever possible, pothole repairs should be carried out to the same permanent patching repair standard detailed in Appendix 7/2. If, in exceptional circumstances e.g. emergency response repairs, it is not practical to use hot material or cut reinstatement edges or otherwise fully comply with the permanent patching procedure then the patch will be deemed "temporary" and will be identified as such on works records.

1.2 Where the contractor proposes to use a non-conventional method, or trial a new method or material, this must be agreed in advance with the overseeing organisation and the Staffordshire Highways Laboratory consulted.

1.3 The procedure for choosing the most appropriate treatment is laid out in the Staffordshire Infrastructure+ Treatment Matrix, which forms a part of the Staffordshire Infrastructure+ Highway Inspectors Handbook.

2. Alternative Permanent /Semi-Permanent Repair Methods

2.1 Alternative techniques, e.g. the use of infra-red carriageway heating equipment should be considered. These procedures may have advantages in some circumstances, and they are particularly suitable where edge sealing of existing patches or trench reinstatement has been problematic. Also, velocity patching and joint sealant products are suitable for use but will be subject to agreement on use.

3. Road stud holes

3.1 Reinstate the road stud socket with AC 6 dense surf 160/220 or approved cold lay material.

APPENDIX 7/70: SITE SPECIFIC DETAILS AND REQUIREMENTS FOR RECYCLED CEMENT BOUND MATERIAL

1 Site description, location details and depth of recycling:

i)	Overall location	reference to drawings
ii)	Section details	reference to drawings and sections
iii)	Location of services	reference to drawings and sections
iv)	Depth of recycled layer	….. mm.
v)	Location and condition of drainage	reference to drawings and sections
vi)	Type and severity of deterioration	reference to drawings and sections
vii)	Subgrade bearing capacity and condition	……
viii)	Edge detail and verge condition	reference to drawings and sections
ix)	Future traffic loading	……

2 Type of lime required for modification of cohesive soils

3 Locations of stockpiles of excess pulverised materials awaiting re-use elsewhere

4 Rate of application of bitumen emulsion sealant spray …… l/m^2

5 Minimum elastic modulus within 24 hours obtained using a dynamic plate or penetration test;

Single point value	MPa
Mean value	MPa
Minimum % increase of single point elastic modulus values	…… %
Minimum % increase of mean elastic modulus values	…… %

6 Nominal grid pattern

7 Rolling mean of 10 FWD derived stiffness values shall not be less than ……MPa and no individual result less than 85% of …… MPa.

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS

Unless stated otherwise in the Scheme Specific Works Information Kerbs, Channels, Edgings, Footways and Paved Areas shall be as described below.

1. Standard requirements for kerbs, channels, edgings and combined drainage and kerb blocks are as listed in 1.1.1 below:-

1.1 Unless stated otherwise in the 'Scheme Specific Works Information' all concrete used for foundations, bedding, backing, and additional concrete, in the installation of kerbs, edgings, channels blocks, combined drainage and units kerb blocks or other proprietary pre-cast concrete units shall be minimum Class ST3.

1.1.1 Kerbing

Type/ Group	Detail Drg. Ref.	Construction	Profile	Kerb Dimensions (mm)	Foundation (mm thick)
K1	HWD 11.01	Pre-cast concrete	HB2	125 x 255	150mm
K2	HWD 11.01	Pre-cast concrete	SP	125 x 255	150mm
K3	HWD 11.01	Pre-cast concrete	BN	125 x 150	180mm
K4	HWD 11.47.1 & HWD 11.47.2	Pre-cast concrete	Bus Docking		250mm
K5	HWD 11.05	Pre-cast concrete	High Containment	(390 x 410 nom)	200mm
K6	HWD 11.02	Pre-cast concrete	HB2	125 x 255	150mm
K7	HWD 11.02	Pre-cast concrete	SP	125 x 255	150mm
K8	HWD 11.02	Pre-cast concrete	BN	125 x 150	150mm
K9	HWD 11.47.3 &HWD 11.47.4	Pre-cast concrete	HB1	125 x 305	250mm
T1	HWD 11.01	Pre-cast concrete	TL (HB to SP)	125 x 255	150mm
T2	HWD 11.01	Pre-cast concrete	TR (SP to HB)	125 x 255	150mm
T3	HWD 11.01	Pre-cast concrete	DL1 (HB to BN)	125 x (255 to 150)	150mm
T4	HWD 11.01	Pre-cast concrete	DR1 (BN to HB)	125 x (150 to 255)	150mm
T5	HWD 11.01	Pre-cast concrete	DL2 (SP to BN)	125 x (255 to 150)	150mm
T6	HWD 11.01	Pre-cast concrete	DR2 (BN to SP)	125 x (150 to 255)	150mm
T7	HWD 11.47.1 & HWD 11.47.2	Pre-cast concrete	Proprietary products	250 mm	250mm
T8	HWD 11.02	Pre-cast concrete	TL (HB to SP)	125 x 255	150mm
T9	HWD 11.02	Pre-cast concrete	TR (SP to HB)	125 x 255	150mm
T10	HWD 11.02	Pre-cast concrete	DL1 (HB to BN)	125 x (255 to 150)	150mm
T11	HWD 11.02	Pre-cast concrete	DR1 (BN to HB)	125 x (150 to 255)	150mm
T12	HWD 11.02	Pre-cast concrete	DL2 (SP to BN)	125 x (255 to 150)	150mm
T13	HWD 11.02	Pre-cast concrete	DR2 (BN to SP)	125 x (150 to 255)	150mm

Note: - Profile reference is that from BS EN 1340

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

1.1.2 The kerbing layout, showing the types/groups and the locations of quadrants, dropper kerbs and other special kerb units, are shown on the Scheme Specific Drawing(s).

1.1.3 Transitions Types T1 and T2 shall be used at the junction between kerb Types K1 and K2. Likewise, Transitions types T8 and T9 shall be used at the junction between kerb types K6 and k7.

1.1.4 Drop kerbs Types T3 and T4 shall be used at the junction between kerb Types K1 and K3 handed as necessary.

1.1.5 Transitions Types T5 and T6 shall be used at the junction between kerb Types K2 and K3. Likewise Drop Kerb types T12 and T13 shall be used at the junction between kerb types K7 and K8.

1.1.6 Transitions Type T7 shall be used at all junctions between kerb Type K5 and all other kerbs types (including existing kerbs). They shall be proprietary units from the same manufacturer as the 'Bus Docking Kerbs' used.

1.1.7 Transition from K9 kerbs (150mm face) shall be achieved by saw cutting the adjacent full length kerb to match the lower kerb face (125mm being standard).

1.1.8 Where proposed kerbs are laid within existing carriageway limits the existing pavement shall be excavated so that the bottom of the kerb foundation is a minimum of 150mm below existing carriageway levels, excavation into existing pavement materials shall be 300 mm wide between vertical saw cuts.

1.1.9 The minimum length of cut straight kerbs shall be 50% of their original manufactured length.

1.1.10 The correct size radius kerbs must be used in all instances. It is not acceptable to cut them to size.

1.1.11 The space between kerbs should always be min 2mm - max 4mm, unless the manufacturer's specification says otherwise.

1.1.12 Kerb foundations should be vibrated unless the supervisor agrees otherwise.

1.1.13 Kerb upstand shall be:

Kerb Types K1, K2, K6 and K7	125mm
Kerb Type K3	25mm at vehicular crossing points 0 - 6 mm at pedestrian crossing points.
Kerb Type K5	160mm
Kerb Type K9	150mm
Transitions T1 and T2	125mm
Transitions T3, T4, T5 and T6	Varies 125 to 25/0 (to match adjacent Kerb Type K3).

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

1.2.1 Channels

Construction Ref. (Group)	Detail Drg. Ref.	Channel Type	Construction
CS1	HWD 11.03	CS1	Pre-cast concrete
CS2	HWD 11.03	CS2	Pre-cast concrete
CD1	HWD 11.03	CD 90 x 305	Pre-cast concrete
CD2	HWD 11.03	CD 125 x 255	Pre-cast concrete
CD3	HWD 11.03	Fluted channel	Pre-cast concrete

Note: Profile reference is that from BS EN 1340.

1.2.2 The channel layout, showing the groups and the locations of special units, is shown on the Scheme Specific Drawing(s).

1.2.3 The minimum length of cut channels shall be 50% of their original manufactured length.

1.2.4 Any particular requirements will be specified in the Scheme Specific Works Information.

1.3.1 Edgings

Type/ Group	Detail Drg. Ref.	Construction	Profile/ dimension	Foundation	Footway/ Paved Area
E1	HWD 11.11	Pre-cast concrete	EBN 150 x 50	HWD 11.11	As described in the Scheme Specific Works Information
E2	HWD 11.11	Pre-cast concrete	EF 150 x 50	HWD 11.11	
E3	HWD 11.11	Pre-cast concrete	ER 150 x 50	HWD 11.11	

Note: Profile reference is that from BS EN 1340.

1.3.2 The edging layout, showing the types/groups is shown on the Scheme Specific Drawing(s).

1.3.3 Particular requirements:

i) Edging Types E1 and E3 shall have an up stand of 15mm above adjacent footway/paved area.

ii) Edging Type E2 shall be laid flush with adjacent footway/paved area.

iii) Edging Type E1 shall have radiused edge to footway/paved areas

1.4. Combined drainage and kerb systems are not to be used without prior approval from the overseeing organisation. See Appendix 5/5.

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

1.5 Re-use of previously set-aside kerbs, channels, edgings and combined drainage and kerb blocks shall be as described in the Scheme Specific Works Information at the locations shown on the relevant Scheme Specific drawing(s).

2. Footways and Paved Areas

2.1 The footway and paved area layout, showing the types are shown on the Scheme Specific Drawing(s).

2.1.1 Surface course materials shall be black in colour. Deviations from this clause should be agreed with the overseeing organisation and discussed with the Staffordshire Highways Laboratory beforehand.

2.1.2 Tactile blocks adjacent to the carriageway must be 200mm * 133mm blocks. Tactile flag paving may be used at controlled crossings.

2.1.3 Tactile blocks should be 60 or 65mm deep as per supplier's standard units by default, and a thicker design considered where significant overrunning is anticipated.

2.1.4 Blocks should be buff in colour and any variation agreed with the Project Manager considering long term maintenance costs.

2.1.5 The formation shall be sprayed with a total weed killer in accordance 674AR.

2.2 Footway Type 1: (Flexible footway and/or cycleway)

Material Course	Clause	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	1105	AC 6 dense surf	160/220 (hand lay) or 100/150 (paver)	20	PD 6691 Table B.15 PSV coarse aggregate 45 min.
Binder Course	1105	AC 20 dense bin rec	160/220	50	PD 6691 Table B.11 See 7/1
Sub-base	803 or 807	Granular Type 1 or 4	-	100	
				170	Total thickness

2.3 Footway Type 2: (Domestic access crossings)

Material Course	Clause	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	1105	AC 6 dense surf	160/220	20	PD 6691 Table B.15 PSV coarse aggregate 45 min.
Binder Course	1105	AC 20 dense bin rec	160/220	50	PD 6691 Table B.11
Sub-base	803 or 807	Granular Type 1 or 4	-	150	
				220	Total thickness

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

2.4 Footway Type 3: (Overlay and regulating to existing flexible footway and/or cycleway)

Material Course	Clause	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	1105	AC 6 dense surf	160/220	20	PD 6691 Table B.15 PSV coarse aggregate 45 min.
Surface Course Regulating	1105	AC 6 dense surf	160/220	Varies 0 – 15	PD 6691 Table B.15
Surface Course Regulating	1105	AC 10 close surf	160/220	Varies 15 - 40	PD 6691 Table B.14
Binder Course Regulating	1105	AC 20 dense bin	160/220	Varies 30 - 60	PD 6691 Table B.11
				Varies 75 - 135	See Scheme Specific Works Information for total thickness

2.5 Footway Type 4: (Pre-cast concrete tactile block - see clause 2.1.2 of this appendix for guidance)

Material Course	Clause	Material	Thickness (mm)	Special Requirements
Blister Blocks	1107	Pre-cast concrete blocks	60 - 65	See Scheme Specific Works Information for colour of paving. See clauses 2.1.2 – 2.1.4.
Bedding	1107	Sharp sand to grading C or M	30 - 50	
Sub-base	803 or 807	Granular Type 1 or 4	150	
			240 - 265	Total thickness

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

2.6 Footway Type 5: (Block paving – Pedestrianised Areas under agreement with overseeing organisation only)

Material Course	Clause	Material	Thickness (mm)	Special Requirements
Pre-cast concrete or clay blocks	1107 Or 1108	Pre-cast concrete Or Clay	50 or 65	See Scheme Specific Works Information for material and dimensions of blocks.
Bedding	1107 Or 1108	Sharp sand to grading C or M	30 - 50	
Sub-base	803 or 807	Granular Type 1 or 4	100	Sub base shall be increased to 150mm thick if area is open to light traffic.
			Varies 180 - 215	Total thickness

2.7 Footway Type 6: (Grass/Concrete paving)

Material Course	Clause	Material	Thickness (mm)	Special Requirements
Pre-cast or in-situ concrete	1109	Pre-cast or In-situ concrete	100	Pre-cast or In-Situ units as stated in the Scheme Specific Works Information. Cavities within concrete units shall be filled with friable topsoil and grass seeded as described in Appendix 30/5.
Bedding	1109	Sharp sand grading C or M	50	
Sub-base	803 or 807	Granular Type 1 or 4	100	Sub base shall be increased to 150mm thick if area is open to light traffic.
			250	Total thickness

2.8 Footway Type 7: (Commercial access crossings)

Material Course	Clause	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	971AR	SMA 6 surf	100/150	40	
Binder Course	906	AC 20 dense bin rec	100/150	60	PD 6691 Table B.11
Base	906	AC 32 dense base rec	100/150	130	PD 6691 Table B.11
Sub-base	803 or 807	Granular Type 1 or 4	-	220	
				450	Total thickness

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS (Continued)

2.9 Footway Type 8: (Agricultural Vehicle crossing)

Material Course	Clause	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	971AR	SMA 6 surf	100/150	40	
Enriched Binder Course	906	AC 20 dense bin rec	100/150	60	PD 6691 Table B.11. Enriched binder to 7/1
Base	906	AC 32 dense base rec	100/150	130	PD 6691 Table B.11
Sub-base	803 or 807	Granular Type 1 or 4	-	220	
				450	Total thickness

2.10 Footway Type 9: (Pre-cast concrete flag tactile paving - controlled crossings)

Material Course	Clause	Material	Thickness (mm)	Special Requirements
Pre-cast concrete textured paving	1104	Pre-cast concrete	50	See Scheme Specific Works Information for colour of paving. Pre-cast concrete flag blister tactile paving shall only be used at controlled crossings
Bedding	1104	Class 2 Cement mortar	25	
Sub-base	803 or 807	Granular Type 1 or 4	100	
			175	Total thickness

2.11 Re-use of previously set-aside paving flags and blocks shall be as described in the Scheme Specific Works Information at the locations shown on the relevant Scheme Specific drawing(s).

2.12 Footway Slurry Surfacing shall be in accordance with Clause 1170AR.

2.13 Footway Air Void requirements shall be in accordance with Clause 970AR.

3. Ductile iron covers and frames should be used for areas subject to vehicle loading including car parking on the carriageway and on the footway adjacent to the carriageway. In grass verges or footpaths not adjacent to the carriageway plastic covers and frames may be used. Covers and frames for stop tap tubes should be ductile or grey iron Type 135B1H or B2H in accordance with BS5834: Part 2.

APPENDIX 12/1: TRAFFIC SIGNS : GENERAL

1. Overseeing Organisation's Temporary Traffic Signs

1.1 The Overseeing Organisation's temporary traffic signs are detailed the Scheme Specific Works Information.

2. Temporary Traffic Signs

2.1 All plate signs and internally illuminated signs shall be constructed to a similar standard as a permanent sign.

2.2 Unless otherwise directed by the Overseeing Organisation all signs shall be mounted with a clearance of 600mm from the kerb.

2.3 Precise locations of signs are to be agreed on site with the Overseeing Organisation.

3. Illuminated Traffic Signs

3.1 Posts and equipment for illuminated traffic signs shall be in accordance with the E.on Lighting for Staffordshire Ltd documents.

4. Permanent Traffic Signs

4.1.1 The locations of 'Directional', 'Informatory', 'Warning', 'Regulatory', and other traffic signs are contained in the Scheme Specific Works Information and Drawing(s).

4.1.2 Legend and symbol layouts for sign faces are detailed on Scheme Specific Drawing(s).

4.1.3 The contractor shall submit information relating to traffic signs to be designed by the Contractor for the Overseeing Organisation's approval at least four weeks prior to commencing the related works.

4.1.4 Luminaires shall be as described in the Works Information, for the types described in the Schedules of traffic signs.

4.1.5 Requirements for stub-posts described in the Schedules shall be determined by the Contractor in consideration of sign plate fixings, lit sign units mountings, conduit fixings and the like, and to not project below the sign plate. Stub-posts shall be capped top and bottom.

4.1.6 Posts shall be assembled using baseplates, base angles and caps to the recommendations of the manufacturer/supplier of the posts.

4.1.7 Preparation and protection to steel sign plates, frames and fittings and purlins shall be as detailed in Clause 1221, unless described otherwise in the Scheme Specific Works Information.

4.1.8 The sign plate shall be manufactured from either sheet aluminium, of not less than 3.0mm thickness, or extruded aluminium plank sections.

APPENDIX 12/1: TRAFFIC SIGNS : GENERAL (Continued)

4.1.9 Posts for non-illuminated signs shall be steel tubular or rectangular hollow section and galvanised.

4.1.10 Posts for non-illuminated signs shall be fitted with baseplates and the open ends shall be fitted with a suitable cap to prevent water ingress.

4.1.11 The sizes of posts are listed below:

Tubular	Rectangular
76mm OD x 3.2mm thick	80mm x 40mm x 3.2mm thick
89mm OD x 3.2mm thick	100mm x 50mm x 3.2mm thick
114mm OD x 3.5mm thick	
140mm OD x 6.3mm thick	
168mm OD x 6.3mm thick	
193mm OD x 6.5mm thick	
219mm OD x 6.3mm thick	
273mm OD x 10.0mm thick	

4.2 Foundations

4.2.1 Foundations described in the Schedules of traffic signs by type references have the following meanings:

- Type A - mix ST2 concrete installation for augered foundations only as described in sub-Clause 1203.3 (non-illuminated signs only);
- Type B - designed foundation mix C25/30 to dimensions stated in the Schedules;
- Type C - designed foundation C25/30 concrete for reinforced or unreinforced concrete to sign-specific detail drawings.

Foundation concrete for Types B and C shall be compacted by vibration. Unless described otherwise in the Scheme Specific Works Information or shown otherwise on the Scheme Specific Drawing(s), a minimum of 50mm thick concrete shall be placed and compacted under the bearing areas of the posts prior to placing and aligning the posts.

Unless described otherwise in the Scheme Specific Works Information or shown otherwise on the Scheme Specific Drawing(s), concrete to Types B and C shall be placed to within 150mm of the ground surface.

The type and size of foundation shall be designed on a scheme specific basis.

4.2.2 Foundations for lit signs shall contain a preformed duct of minimum 50mm internal diameter, capable of retaining its cross-sectional shape and position during the compaction of the concrete, secured at the cable entry of the post. The Contractor shall take measures to prevent ingress of concrete and soil that would impede cable installation to the ducts and post bases.

4.2.3 Reinforcement Schedules for foundations are in the Scheme Specific Works Information.

APPENDIX 12/1: TRAFFIC SIGNS : GENERAL (Continued)

4.3 Location and Erection

4.3.1 Approximate locations of each installation are given in the Scheme Specific Sign Schedules.

4.3.2 Precise locations of signs are to be agreed on site with the Overseeing Organisation.

4.3.3 Particular requirements for set-back of posts from kerb faces, post spacings, post alignments necessary for aligning the sign plates to avoid specular reflection, post positions relative to foundation dimensions, mounting heights, are shown on Scheme Specific Sign Schedules.

4.3.4 Single-post signs having posts not centrally assembled are shown on Scheme Specific Sign Schedules.

4.3.5 Projection of sign plates beyond post centres for two post signs should be to Clause 1208.3 unless stated otherwise shown on Scheme Specific Sign Schedules.

4.3.6 Projection of sign plates beyond post-centres for installations using more than two posts are shown on Scheme Specific Sign Schedules.

4.3.7 Multi-post signs requiring base compartments on one or more of the posts are identified shown on Scheme Specific Sign Schedules, including exclusions from the requirements of sub-Clause 1204.

4.3.8 Mounting heights stated in the Scheme Specific Sign Schedules refer to the vertical distance at the stated position measured between the finished ground level and the underside of the lowest sign plate or bottom light spill screen, as appropriate to that installation.

4.3.9 The fixing for signs on single posts shall be of a type that prevents rotation of the sign about the post.

4.4 Operational Requirements

4.4.1 Cover plates over part or whole of sign plate legends and symbols shall be to the requirements stated in the Scheme Specific Sign Schedules. They shall be coloured, display legends, symbols and borders as required by the Schedules and detail drawings of sign faces and shall be compatible with the manufactured sign plates to which they are to be affixed.

5. Permanent Internally Illuminated Bollards

5.1 Permanent Internally Illuminated bollards shall be in accordance with the E.on Lighting for Staffordshire Ltd documents. Bollards are scheduled on the Scheme Specific Sign Schedules.

APPENDIX 12/1: TRAFFIC SIGNS : GENERAL (Continued)

6. Non-Illuminated Bollards

6.1 Non-illuminated bollards are scheduled on the Scheme Specific Sign Schedules.

6.2 The use of non-illuminated bollards in Staffordshire has been authorised by the Department for Transport and the following types **only** are approved:
6.2.1. Signature "Truflex (Staffordshire Specification)"
6.2.2. TMP "Metro (Staffordshire Specification)"
6.2.3. Sign Post Solutions SPS360.

7. Remove from Store and Re-Erect Traffic Signs

7.1 Signs set-aside for re-use is identified in Scheme Specific Works Information.

8. Vehicle Activated Signs, Speed Indication Devices etc.

Where there is a requirement in the scheme for the provision of Vehicle Activated Signs, Speed Indication Devices etc., then the contractor shall liaise with the County Council's Road Lighting Unit to verify the required design and installation requirements.

APPENDIX 12/3: TRAFFIC SIGNS : ROAD MARKINGS AND STUDS

A. ROAD MARKINGS

1. Scope

1.1 This Appendix deals with the supplying and laying of screed, sprayed cold applied road marking paint, extruded thermoplastic road marking paint, solid glass beads and pre-formed road markings. It is an enhancement of Clause 1212.

1.2 The basis of this specification is a requirement to achieve prescribed standards of performance during a two-year maintenance period. The formulation of the line marking and its application on the site is the responsibility of the Contractor and any material composition may be used providing the performance requirements are achieved and that the materials satisfy the criteria listed in paragraph 2 of this Appendix.

1.3 The markings shall be white or yellow continuous or intermittent lines, words, figures, arrows or symbols. Unless otherwise directed by the Overseeing Organisation, all markings shall conform to the requirements of the current Traffic Signs Regulations and General Directions and any subsequent amendments thereto.

1.4. Superimposed white stripes at pedestrian crossings shall be of a nominal width as directed by the Overseeing Organisation and shall conform with the requirements of the Zebra, Pelican and Puffin Pedestrian Crossing Regulations and General Directions and any subsequent amendments thereto.

1.5 Road Markings at pedestrian crossings shall comply with Local Transport Notes 1/95 and 2/95.

1.6 Abnormal events and subsequent failures of other materials in the highway shall be deemed to be outside the scope of the Contractor's responsibility. Where the effects of abnormal events are temporary however, the Contractor's responsibility for maintenance of Performance Standards shall resume at an appropriate time.

1.8 The Overseeing Organisation shall carry out the performance testing stated in Appendix 1/6.

APPENDIX 12/3: TRAFFIC SIGNS : ROAD MARKINGS AND STUDS (cont.)

1.9 The use of Methyl Methacrylate (MMA) cold applied paint over traditional heated thermoplastic paint is recommended for consideration due to its enhanced durability, improved safety and lower lifetime carbon footprint. Cold applied systems can be broken down into three distinct groups by application type and it is advised to take guidance from the manufacturer when specifying which product to use for each application group:

Group 1	Highway Specification Paints	Low stress locations, for example bay markings, edge lines, centre lines within less trafficked urban areas, active travel schemes.
Group 2	Spray Applied MMA	Medium stress locations for example centre lines and edge markings on trunk roads, link roads, rural 'A & B' roads and the strategic network.
Group 3	Screed Applied MMA	High stress locations for example junction markings, informative markings, roundabouts and pedestrian crossing panels.

1.9 It is acknowledged that usage of MMA is a developing technology and the equipment and operative training may not yet be available for Group 2 applications. The use of MMA should be considered on a scheme specific basis, under advisement of the MMA provider.

2. Permanent road markings

2.1 Permanent road markings are required to the layouts shown on the Scheme Specific Drawing(s).

2.2 Unless otherwise stated, markings shall be reflectorised to the requirements of the Scheme Specific Works Information.

2.3 A skid resistance level of 45 minimum is required for all road markings unless stated otherwise in the Scheme Specific Works Information.

3. Specification

3.1 The works shall be carried out in accordance with BS EN 1436, BS EN 1824, British Standard Kitemark Scheme for Road Marking Materials to BS EN 1824, BS EN 1436, BS 7962 and BS EN 1463.

4. Preparation of Road Surfaces

4.1 Road markings should not be laid on new concrete surfaces before 28 days curing has occurred and, for all concrete surfaces, the surface shall have a minimum 48 hours of a dry condition to ensure minimum moisture content.

APPENDIX 12/3: TRAFFIC SIGNS : ROAD MARKINGS AND STUDS (Continued)

4.2 The Contractor will be responsible for light hand sweeping except when the Overseeing Organisation agrees that mechanical sweeping is necessary for the removal of excessive detritus or loose chippings.

5. Performance Requirements

5.1 The road marking shall be firmly bonded to the underlying surface.

5.2 The Total Wear Index, at any position in the works as selected by the Overseeing Organisation, shall not exceed 30 when assessed in accordance with the RSMA procedure for determining wear/erosion of road markings.

5.3 **White road marking** shall have the following minimum standard of performance as defined in BS EN 1436 for a period of two years from the date of application.

Property	BS EN 1436 Reference	Requirement	Value
Colour	Table 6	White	x,y co-ordinates given
Luminance	Table 2	Class B2	0.30
Skid Resistance	Table 7	Class S1	45
Retro-reflectivity	Table 3 Classes of RL for dry markings	Class R2	100
Retro-reflectivity (conditions of wetness)	Table 4	Class RW0	No requirement
Retro-reflectivity (conditions of rain)	Table 5	Class RR0	No requirement

APPENDIX 12/3: TRAFFIC SIGNS : ROAD MARKINGS AND STUDS (Continued)

5.4 **Yellow road marking** shall have the following minimum standard of performance as defined in BS EN 1436 for a period of two years from the date of application.

Property	BS EN 1436 Reference	Requirement	Value
Colour	Table 6	Yellow	x,y co-ordinates given
Luminance	Table 2	Class B1	0.20
Skid Resistance	Table 7	Class S1	45
Retro-reflectivity	Table 3 Classes of RL dry markings	Class R0	No requirement
Retro-reflectivity (conditions of wetness)	Table 4	Class RW0	No requirement
Retro-reflectivity (conditions of rain)	Table 5	Class RR0	No requirement

5.5 The width tolerances and thickness for screed, spray, pre-formed and extrusion white or yellow lines shall be in accordance with the current Traffic Signs Regulations and General Directions.

5.6 Unless otherwise specified, all white markings shall be reflectorised by incorporation into the road marking material and to the wet surface of the marking of either solid glass beads to BS EN 1423 and BS EN 1424 or equivalent materials.

5.7 Where there is a requirement for enhanced retro-reflectivity, products complying with one of the following retro-reflectivity performance levels shall be used.

Property	BS EN 1436 Reference	Requirement	Value
Retro-reflectivity	Table 3	Class R3	150
Retro-reflectivity	Table 3	Class R4	200

5.8 Where there is a special requirement for enhanced wet night visibility, products showing one the following retro-reflectivity performance levels shall be used.

Property	BS EN 1436 Reference	Requirement	Value
Retro-reflectivity	Table 4	Class RW3	50
Retro-reflectivity	Table 4	Class RW4	75

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

5.9 Where there is a special requirement for enhanced skid resistance, products conforming to the following skid resistance performance level shall be used.

Property	BS EN 1436 Reference	Requirement	Value
Skid resistance	Table 7	Class S3	55

5.10 Where there is a special requirement for enhanced luminance, products complying the following luminance performance level shall be used.

Property	BS EN 1436 Reference	Requirement	Value
Luminance	Table 2	Class B3	0.40

5.11 Where there is a requirement for enhanced retro-reflectivity for yellow products, products complying with the following retro-reflectivity performance levels shall be used.

Property	BS EN 1436 Reference	Requirement	Value
Retro-reflectivity	Table 3 Class RL	Class R1	80

6. Programme of Works

6.1 The Overseeing Organisation and the Contractor shall define an agreed Programme of Works. As part of this programme, the Overseeing Organisation shall complete a site-specific risk assessment to categorise the type of Traffic Management required for the work ordered for each location, not less than seven days prior to the scheduled commencement of the works on site, in order for the Contractor to undertake and submit a risk assessment for approval. The process of defining risk assessment shall be agreed at the commencement of the contract.

6.2 On every day throughout any programme the Contractor shall inform the Overseeing Organisation's Representative of their intended works programme for that day between 8.30am and 9.00am.

7. Traffic Safety Measures and Control

7.1 At all times the Contractor shall have in place a comprehensive Health & Safety Policy.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

7.2 Traffic measures and control of roadworks shall conform to National Sector Scheme 12D "Installing, Maintaining and Removing Temporary Traffic Management on Rural and Urban Roads" and Chapter 8 of the Traffic Signs Manual published by The Stationery Office. On identifying the work required the Client/Overseeing Organisation shall complete a site-specific risk assessment to categorise the type of TM required for the work ordered. Liaison with the police and other appropriate statutory bodies should be considered where circumstances justify such action.

7.3 The implementation of traffic management in relation to this specification shall be as laid out in National Highways Sector Scheme 12D and Chapter 8 of the Traffic Signs Manual. The Contractor shall be deemed to provide inclusive rates for the provision of traffic management, in the following specific circumstances only:

Single carriageway all-purpose roads:
all works in locations subject to a speed limit not greater than 30mph and/or near side moving works only, without the provision of positive traffic control.

7.4 The Contractor shall be asked to arrange traffic management at a cost to be agreed with the client on a day-by-day basis.

7.5 All vehicles used by the Contractor on public highways shall display at the rear in a conspicuous place signs reading "HIGHWAY MAINTENANCE" in black letters on a yellow background. The lettering shall be 150mm standard type for lorries and 50 mm high standard type for cars and light vans. All vehicles shall in addition be equipped with amber rotating beacons of approved type, which shall operate continuously whilst the vehicle is working within the limits of the works. All vehicles shall comply with the requirements for high conspicuity decals as defined in Chapter 8.

7.6 Every employee whilst on a public highway shall wear high visibility clothing in accordance with BS EN 471.

7.7 The method of working shall conform to the current edition of Chapter 8 of the Traffic Signs Manual.

8. Traffic Safety Measures and Control – Dual Carriageways

8.1 The Contractor will erect the signs and close the appropriate traffic lanes before the time stipulated for commencement of work and remove the signs and open the appropriate traffic lanes after the completion of work.

8.2 No work shall be started until the signs, properly illuminated when applicable, cones and other warning devices have been erected and the traffic management system signed off by the traffic management contractor.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

9. Setting Out

9.1 The Contractor shall be responsible for the correct setting out of all lines, words, arrows and stripes. Unless otherwise directed, on roads having road studs, intermittent lines shall be laid symmetrically between the studs.

10. Existing Markings

10.1 Where a marking is required to be laid on top or partially on top of an existing marking, the combined total thickness shall not exceed 6mm as detailed in current Traffic Signs Regulations and General Directions, and any superseded marking shall be either permanently removed or totally covered by the new marking.

10.2 When directed by the Overseeing Organisation, the Contractor shall remove old markings by an approved method to ensure that the prepared surface is suitable to receive a new marking of regular thickness.

11. Dimensional Tolerances

11.1 The length and width of road markings shall be as specified with the permitted tolerance as follows :-

- Length: +10%, -5%
- Width: +10%, -5%
- Thickness: Maximum 6mm (with the exception of raised rib)

12. Workmanship

12.1 On completion of each day's work the road shall be left clean and free from any surplus material spilled during the progress of the work. All markings shall be uniform and free from streaks or blisters and shall be free from raggedness at the edges. Trimming of edges, where necessary shall be undertaken as the work proceeds. Arrows associated with solid line systems shall be replaced no later than 48 hours after the completion of the adjoining continuous white line.

13. Daily Record of Work

13.1 The Contractor shall submit to the Overseeing Organisation within seven days a daily record of work carried out.

14. Quality Assurance Scheme - Materials

14.1 All materials and solid glass beads shall be obtained from manufacturers who operate QA Schemes under ISO 9001.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

14.2 A copy of the Manufacturer's current road trial Reports to BS EN 1824 for road markings shall be submitted with the Tender.

15. Temporary road markings

15.1 Temporary road markings as prefabricated reflectorised material will be required for temporary diversions of traffic unless stated otherwise in the Scheme Specific Works Information.

15.2 Temporary road marking material as black prefabricated material shall be used for temporary covering of existing road markings unless stated otherwise in the Scheme Specific Works Information. Black paint is not acceptable.

16. Health & Safety

16.1 The Overseeing Organisation shall operate in accordance with the requirements of the Construction (Design and Management) Regulations (CDM) 2015 (CDM 2015).

16.2 The Overseeing Organisation shall draw up a pre-tender Health and Safety Plan and maintain this Health and Safety Plan in accordance with the requirements of CDM 2015 and the Contractor shall submit their tender against such Health and Safety Plan.

16.3 On award of the Contract, the Contractor shall develop the pre-tender Health and Safety Plan in accordance with the above Regulations. The Overseeing Organisation shall confirm that the developed Health and Safety Plan is adequate to the cover the Contractor's operations.

16.4 Throughout the duration of the works, the Contractor shall continue to provide all relevant information necessary for inclusion in the Health and Safety File.

17. Permanent Removal of Existing Road Markings

17.1 Where existing road markings are to be permanently removed from bituminous running surfaces this shall be by mechanical means, hydro-blasting or forced air abrasive (shot blasting). Hot compressed air lance shall not be used on concrete pavements and not on other surfaces without prior consent. Obliteration of road markings using bituminous, resinous paint or pre-fabricated materials will not be permitted.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

B ROAD STUDS

18. Scope

18.1 This Appendix deals with retro-reflecting road studs complying with BS EN 1463-1 and BS EN 1463-2.

18.2 Studs are to be placed where deemed mandatory by TSRGD 2016. Any other proposed usage of road studs is to be agreed with the overseeing organisation on the recommendation of a scheme specific risk assessment.

18.3 Where studs have been determined to be required they shall be placed in accordance with Chapter 5, Section 4 of the Traffic Signs Manual.

18.4 Studs are to have a minimum life span durability target of 5 years.

18.5 Studs shall be inset only. Surface mounted is not acceptable.

19. Road Studs - Permanent Reflecting

19.1 Permanent reflecting road studs are required at the locations and positions shown on the Scheme Specific Drawing(s).

19.2 Further requirements are described in the Scheme Specific Works Information.

20. Materials

20.1 Only studs falling into a category of BS EN 1463 or that hold a current statutory approval by the Secretary of State shall be used on any public road.

20.2 Fixing materials shall be as recommended by the manufacturer.

21. Workmanship

21.1 Fixing methods shall follow the manufacturer's instructions.

21.2 Inset studs shall be removed by cutting around the perimeter of the stud. Levering out of position shall not be permitted. The carriageway cavity shall be immediately made good with 6mm medium graded surface course or 10mm close graded bitumen macadam as directed, fully compacted and finished level with the adjoining surface.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

21.3 Inset studs set aside for reuse shall be stacked neatly in positions to cause no hazard to highway users.

21.4 Inset studs to be lifted and refixed in a new cavity only shall be thoroughly cleaned and inspected before refixing. Any studs found to be damaged shall be rejected and removed by the Contractor to a licensed tip.

21.5 Cavities for installation of inset road studs shall be cut by mechanical milling only.

21.6 All excavated and surplus material shall be removed by the Contractor to a licensed tip, leaving the road in a clean and tidy condition.

21.7 Studs to be taken to store shall be transported to the Overseeing Organisation's store during normal working hours and the Contractor shall receive/obtain a receipt for all studs delivered.

21.8 Fixing of studs shall not proceed during adverse weather conditions without the written instructions of the Overseeing Organisation or their representative.

21.9 When fitting new reflector pads into existing inset studs, all detritus shall be removed before fitting each new pad.

22. Fixing Overseeing Organisation's Studs

22.1 Where studs are provided by the Overseeing Organisation, the Contractor shall collect the studs from the Overseeing Organisation at location(s) stated in the Scheme Specific Works information, during normal working hours.

23. Programme of Works

23.1 As per cl 6 of this Appendix

24. Traffic Safety Measures and Control

24.1 As per Cl. 7 of this Appendix.

25. Traffic Safety Measures and Control – Dual Carriageways

25.1 As per cl 8 of this Appendix.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS AND STUDS (Continued)

26. Setting Out

26.1 The Contractor shall be responsible for the correct setting out of all studs. Studs shall be fixed in the carriageway generally parallel to the centre line and other markings and at spacings conforming to the current Traffic Signs Regulations and General Directions, and the Traffic Signs Manual. Unless otherwise directed by the Overseeing Organisation, on roads having existing intermittent line markings the studs shall be located symmetrically between markings.

27. Daily Record of Work

27.1 As per cl. 13 of this Appendix.

28. Quality Assurance Scheme – Materials

28.1 All materials shall be obtained from manufacturers who operate QA Schemes under ISO 9001.

29. Road Studs - Temporary Reflecting

29.1 Temporary reflecting road studs are required at the locations described in the Scheme Specific Works Information.

30. Road Studs - non reflecting

30.1 Non-reflecting road studs are required at the locations described in the Scheme Specific Works Information.

31. Re-Use of Road Studs

31.1 Road studs set aside for re-use under Appendix 2/3, shall be re-used at the locations and with new materials described in the Scheme Specific Works Information.

32. Covering Road Studs

32.1 Any temporary covering of road studs shall comply with the requirements stated in the Scheme Specific Works Information.

33. Health & Safety

33.1 As per cl. 16 of this Appendix.

APPENDIX 12/5: TRAFFIC SIGNS: TRAFFIC SIGNALS

Traffic signal installations shall be in accordance with Traffic Signal Design Guide (January 2023) and Appendix 12/5 (January 2023) both published by Staffordshire County Council.

1300 SERIES APPENDICES

Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)

Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)

Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)

1400 SERIES APPENDICES

Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)

Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)

Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)

APPENDIX 17/4: CONCRETE - GENERAL

Requirements for sampling and testing are detailed in Appendix 1/6.

1900 SERIES APPENDICES

Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)

Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)

Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)

APPENDIX 26/1: ANCILLARY CONCRETE

1. Unless stated otherwise in the Scheme Specific Works Information, concretes for Ancillary Purposes shall be to the following requirements, with purposes of Table 26/1 being substituted and additional purposes being added.

2. Where stated in the Scheme Specific Works Information, sulphate resistant concrete shall be used.

Purpose/Location	Mix	Other Requirements
1. Blinding concrete, backfill to structural foundations, overdig to post holes and planted lighting columns.	ST1	
2. Footings for fence posts and augered foundations to traffic signs. Foundations for pedestrian guardrails.	ST2	
3. Bed, haunch and surround to drains other than Type A. Surround to pre-cast concrete chambers and gullies.	ST2	
4. Filling redundant gullies.	ST2	
5. Bedding and backing to precast concrete kerbs, edgings, channels and quadrants.	ST3	
6. Bed to drains Type A. Foundations, channels and benching to chambers. Surround to plastic gullies.	ST4	
7. Footings for Regulatory and Warning Sign posts, scheme signboard posts and temporary sign posts.	C25/30	
8. Bedding and backing to precast concrete 'Bus Docking' kerbs.	ST4	
9. Foundations for safety barrier posts, environmental barrier posts and planted lighting columns.	ST5	
10. Anchor blocks for safety barrier.	ST5	

Table 26/1

APPENDIX 30/5: GRASS SEEDING, WILD FLOWER SEEDING AND TURFING

1. Grass seeding shall be carried out during the periods stated in Clause 3005.1.

2. All areas to be grass seeded shall be reduced to a fine tilth as described in Clause 3005.2, unless stated otherwise in the Scheme Specific Works Information.

3. All areas to be grass seeded shall be fertilised at a rate of spread not least than 35g/m^2, unless stated otherwise in the Scheme Specific Works Information. Proposed fertiliser and any other soil ameliorants shall be agreed with the Overseeing Organisation.

4. Grass seed and wildflower seed mixtures shall be as stated in the Scheme Specific Works Information.

5. Rate of spread of grass seed shall be at least 35g/m^2, unless stated otherwise in the Scheme Specific Works Information.

6. Rate of spread of wildflower seed shall be as stated in the Scheme Specific Works Information.

7. Hydraulic seeding and turfing shall be as described in the Scheme Specific Works Information.

8. All areas that have been grass seeded, hydraulic seeded or turfed within the Contract shall receive 2 No establishment cuts as described in Clause 3005.29, unless stated otherwise in the Scheme Specific Works Information.

APPENDIX 30/6: PLANTING

1. Planting shall be carried out during the periods stated in Clause 3006.17

2. Planting shall be carried out in accordance with the Staffordshire 'Tree Planting Specification' and Clause 3006 and all relevant sub-clauses.

3. Unless stated otherwise in the Scheme Specific Works Information, Typical Hedge Types as per HWD 30.01 and Table 30/6 may be used. Hedge Type A – Double Staggered Row or Type B – Single Line and Hedge Composition shall be as stated in the Scheme Specific Works Information.

4. Further guidance can be found in the 'Highway Tree Selection Guide – Staffordshire Urban or Staffordshire Rural'

Composition of Hedge		
Single species		
Typical species:		
Beech	*Fagus sylvatica*	S 450mm
Hawthorn	*Crataegus monogyna*	S 450mm
Hornbeam	*Carpinus betulus*	S 450mm
Mixed native species		
Typical mix:		
Blackthorn	*Prunus spinosa*	S 450mm
Field maple	*Acer campestre*	S 450mm
Hawthorn	*Crataegus monogyna*	S 450mm
Hazel	*Corylus avellana*	S 450mm
Holly	*Ilex aquifolium*	S 450mm
Formal hedge		
Typical species:		
Beech	*Fagus sylvatica*	S 450mm
Hornbeam	*Carpinus betulus*	S 450mm
Portuguese laurel	*Prunus lusitanica*	S 600mm
Yew	*Taxus baccata*	S 500mm
Evergreen hedge		
Typical species:		
Holly	*Ilex aquifolium*	S 450mm
Western red cedar	*Thuja plicata*	S 600mm
Yew	*Taxus baccata*	S 500mm

APPENDIX 30/6: PLANTING (Continued)

Specification

Species	Height (cm)	Times Transplanted	Classification	Notes
Acer campestre	40-60	1+1	Transplant/ Open Ground	Minimum of 3 breaks
Carpinus betulus	40-60	1+1	T/O	Minimum of 3 breaks
Corylus avellana	40-60	1+1	T/O	Minimum of 3 breaks
Crataegus monogyna	40-60	1+1	T/O	Minimum of 3 breaks
Fagus sylvatica	40-60	1+1	T/O	Minimum of 3 breaks
Ilex aquifolium	40-60		Pot grown 1L	Single stem
Prunus lusitanica	40-60		Pot grown 1L	Minimum of 3 breaks in lower third
Prunus spinosa	40-60	1+1	T/O	Minimum of 3 breaks
Taxus baccata	20-30	2+2	Pot grown 1L	Minimum of 3 breaks
Thuja plicata	30-40	1u1	T/O	Bushy plants

Key to plant age

1+0 1 year seedling
1u1 1 year seedling undercut and grown in situ for 1 further year
1+1 1 year seedling lined out for 1 further year
1+2 1 year seedling lined out for 2 further years

Table 30/6