

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 Unless otherwise specified, the latest release will always supersede outdated references.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 Policy
 - 5.2. The Staffordshire Highways Design Code
 - 5.3. Staffordshire Highway Infrastructure Asset Management Plan
 - 5.4. Staffordshire Highways Safety Inspection Code of Practice
 - 5.5. The specification for Reinstatement of Opening in the Highway (SROH v4 - Department for Transport)
 - 5.6. Traffic Signs Regulations and General Directions 2016

Scheme Works Order

1. 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.
 2. It should be supplemented by additional Appendices which are not included in this base document but are required for the scheme.
 3. Any texts or Appendices which are not relevant to the scheme should be deleted.
- 

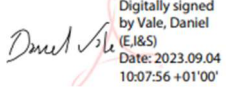
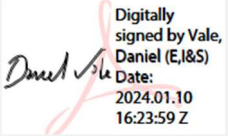
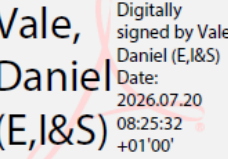
Highways Base Specification

Version 2.6

July 2026

Staffordshire County Council



Version	Status	Section Changes	Approval	Date
2.2	Superseded	Explanatory notes expanded. 971AR, 7/1 Schedule 5 SC3 and Note 5 amended. 974AR amended, Appendix 5/1 cl 8.1, 8.2, 8.3, 8.4. 7/1 Schedule 5 AAV references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 CI 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	Superseded	971AR SMA sealing grit and definition 974AR overbanding. 5/1 amended or added clauses 1.3, 1.7, 9.1 and 16. 7/1 CI 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
2.5	Superseded	975AR Added and referenced throughout. 5/1 cl. 5.1 F13 removed 5/1 cl. 5.8 amended 5/5 amended intro. 7/1 cl/ 17 added 7/1 sch. 5 SC1 notes. 11/1 Cl. 2 full refresh. 11/1 Cl. 3 Amended 26/1 Cl. 3 Added 30/5 Cl. 3, 4, 9 & 10 amended/added	 Digitally signed by Vale, Daniel (E,I&S) Date: 2024.06.14 10:13:28 +01'00'	14/06/2024
2.6	Live	App 1/5 Tables amended App 1/16 amended App 2/2 amended App 5/1 CI 4 amended	 Vale, Daniel (E,I&S) Digitally signed by Vale, Daniel (E,I&S) Date: 2026.07.20 08:25:32 +01'00'	20/07/2026

		App 5/1 CI17 added App 5/4 Added App 5/5 CI 7 added App 7/1 Sch. 1, 3 & 5 amended App 7/1 Sch. 6b note added App 7/2 note added App 7/22 App 11/1 1.1.9 amended App 12/1 4.1.7 & 4.1.8 amended App 12/3 CI 4.8 amended App 26/1 Ancillary Concrete table 26/1 amended. App 30/6 Table 30/6 & CI 5, 6, 7, & 8 added		
--	--	--	--	--



Preamble to the Specification

1. The Specification shall be the 'Specification for Highway Works' with reference to the legacy volumes published prior to the September 2025 updates.
2. 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:
 - a) Appendix 0/1: Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures.
 - b) Appendix 0/2: Contract-specific minor alterations to existing Clauses, Tables and Figures.
 - c) The Numbered Appendices listed in Appendix 0/3. Appendix 0/5: Special national alterations of the Overseeing Organisation of Scotland, Wales or Northern Ireland.
 - d) Appendix 0/4 contains a list of the Drawings.
3. The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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)

10. 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.
11. Any Appendix referred to in the Specification which is not used shall be deemed not to apply.
12. Where a Clause in the Specification is prefixed by an # this indicates that this 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.
13. 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.
14. 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.
15. 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:
 - a) If any agreement, consent or approval required to be obtained from the Overseeing Organisation impacts on the health and safety of the 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.
 - b) 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.
16. 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.

Preamble to the Specification (continued)

17. 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
975AR	Surface Course Aggregate Selection
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 (continued)

List of Additional 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:

1. 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:

1. 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.
3. The burning of materials resulting from site clearance operations is not permitted; therefore, such materials should be disposed of off-site.
4. 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

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

1. 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 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

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 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.

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

Table 5/70: CCTV Camera Speeds.

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)

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 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 Cl. 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-month 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.
6. 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*'.
7. Treated vegetation, part used materials and containers, shall be transported and disposed of by approved means off-site.
8. The Contractor shall consider the recommendations contained in the '*HSE Code of Practice for Using Plant Protection Products*'.
9. 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 (SHL) 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) (continued)

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 □ 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.

Table 890AR – FABM mixture and control limits.

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 m². 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
<i>Note: All figures marked * to be increased by 1% for hand-lay work</i>								

Table 970AR – Appropriate range for state of compaction.

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 to determine the suitability of the existing binder course and all proposals agreed with the Staffordshire Highways Laboratory (SHL).

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 Staffordshire Highway Asset 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) **Policy for use of SMA on County Roads**

4. Use of Sealing Grit

- 4.1 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 (SC3 and SC4 – when used as c/way surface course), unless agreed otherwise in advance.
- 4.2 The grit shall be mechanically applied at a spread rate between 0.5 to 0.7 kg/m² during compaction.
- 4.3 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.
- 4.4 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. A mechanically calibrated roller mounted spreader capable of distributing an even rate of spread should be used. Application of grit by hand operations shall only be permitted in the following circumstances:
 - In confined spaces, where it is impractical for a mechanical spreader to operate.
 - As a temporary expedient, when adjustments must be made to spreader distribution mechanism.
 - When hand laying of the surface course is permitted.
 - To correct uneven distribution of grit.
- 4.5 The coated grit shall be uniformly applied and then rolled on to the surface after an initial roll by the primary roller. The surface shall then be rolled and compacted in accordance with the requirements of Cl. 901.
- 4.6 Any excess loose grit should be swept prior to, or immediately upon, sites being opened to unrestricted traffic.

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) **Policy for use of SMA on County Roads**

- 4.7 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 Skidding Resistance Policy*’.
- 4.8 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.
- 4.9 On heavily trafficked sites skid resistance may exceed investigatory levels within a shorter period and a three-month skid test may be requested. This would have the advantage of avoiding an unnecessary proliferation of signs.
- 4.10 In all cases, the aim should be to avoid leaving signs in place after their usefulness has expired to avoid “familiarity breeding contempt”.
- 4.11 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) (continued) 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.

1.1.1. Two different materials are specified:

- **SMA 10 surf**

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

- **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 - Not less than 60 for carriageway surface course but as specified in Appendix 7/1 after reference to Cl. 975AR. 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 LA30, or as specified in Appendix 7/1.

2.1.3. Aggregate abrasion Value – for carriageway material, not more than 12, or as specified in cl. 975AR.

2.1.4. Durability (Water Absorption) – Category WA24 2 or as specified in Appendix 7/1.

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)

Stone Mastic Asphalt Surface Course

2.1.5. 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.

2.1.6. Particle shape - The flakiness category for the coarse aggregates shall be FL₂₀.

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 to demonstrate conformity with EN 13108 – 5 and PD 6691, as amended below:

3.2.1. Minimum target binder shall be:

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

3.3. Void content shall be $V_{min\ 1.5}$ and $V_{max\ 4}$ 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) (continued) **Stone Mastic Asphalt Surface Course**

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.
- 5.2. 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:

- SMA 10mm: 40mm
- SMA 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

- 1.1. 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*'.
- 1.2. 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 can withstand the normal traffic for the site when first opened.
- 1.3. 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.

2. The System

- 2.1. 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.

3. Materials and Equipment - The Binder

- 3.1. 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. If the binder does not have a certificate, it is expected that the supplier can demonstrate that approval is being sought.

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)

- 3.2. 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.
- 3.3. 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.

4. Materials and Equipment – The Chippings

- 4.1. 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.

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)

4.2. 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.

5. Preparation

- 5.1. 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.
- 5.2. 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.

6. Traffic Safety and Management

- 6.1. 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.

7. Application

- 7.1. 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.

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)

7.2. 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.

8. Aftercare

8.1. 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.

8.2. 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, to prevent further damage to the preventative treatment.

8.3. 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.

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

9. As Built Manual

9.1. 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.

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. Performance Standards Surface Macrotexture

- 10.1. 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 700C to 1300C; 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

Layer	Location	Material	From BS 594987 – per layer			Multiple Layers	From Staffordshire Highways Specification Appendix 7/1			Notes
			Min. Layer Thickness	Max. Layer Thickness	Target Layer Thickness		Speed Limit	Texture Depth Schedule 6	Material Ref. Schedule 5	
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	Level 3 or 4	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	None
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			SC5	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			BC1	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			BC5	Same material - multiple layers required. Use with HRA and 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.

Overbanding must not be used on footways.

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

Additional clauses, tables and figures:

975AR Surface Course Aggregate Selection

The tables within this clause adapt cl. 3 of CD 236 “Surface Course Materials for Construction” and all guidance, definitions and notes are as per CD 236 unless otherwise stated below. This clause applies to both new works and carriageway maintenance operations.

1. Investigatory Level and Site Category

- 1.1. The site category and investigatory level to be used in table 975/1 below, shall be those which have been allocated to the specific site on which the material is to be laid.
- 1.2. Site category and investigatory level shall be determined by following the procedures in the Staffordshire Skidding Resistance Policy.

2. Polished Stone Value

- 2.1. For all roads and surfacing materials, PSV shall be selected from the rows of table 975/1 for the relevant material type, and corresponding site category and Carriageway Hierarchy Category.
- 2.2. Where traffic flows have been measured for a specific site, the use of these shall supersede the use of Carriageway Hierarchy Category to determine PSV.
- 2.3. Where PSV values are required for a new development which changes the character of the existing carriageway, design traffic values must be used to make this determination. Site category and investigatory level shall be re-assessed in accordance with the Staffordshire Skidding Resistance Policy.
- 2.4. The appropriate PSV values taken from table 975/1 shall be inserted into Appendix 7/1, Schedule 5, of the scheme specific specification.
- 2.5. Where ‘68+’ material is listed in the table, none of the three most recent results from consecutive PSV tests relating to the aggregate to be supplied shall fall below 68.
- 2.6. PSVs below 60 are not accepted for use on carriageway surface courses in Staffordshire.

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

Additional clauses, tables and figures:

975AR Surface Course Aggregate Selection (continued)

PSV required for given Investigatory Level (IL), traffic level and type of site								
Site Category	Site Description	IL	Traffic (cv/lane/day) at design life					
			1-250	251-500	501-750	751-1000	1001-2000	2001-3000+
			Staffordshire Carriageway Hierarchy Category					
			C5	C4	C4	C3	C2	C1
B	Non-event carriageway with one-way traffic	0.3	60	60	60	60	60	60
C	Non-event carriageway with two-way traffic	0.35	60	60	60	60	60	60
Q	Approaches to and across minor and major junctions; approaches to roundabouts and traffic signals	0.45	60	65	65	68+	68+	68+
K	Approaches to pedestrian crossings and other high-risk situations	0.5	65	65	65	68+	68+	68+
R	Roundabout	0.45	60	60	60	60	65	65
G1	Gradients 5-10% longer than 50 m	0.45	60	60	60	65	65	68+
G2	Gradient >10% longer than 50 m	0.45	60	60	60	65	65	68+
S1	Bends radius <500 m – carriageway with one-way traffic	0.45	60	60	60	60	65	65
S2	Bends radius <500 m – carriageway with two-way traffic	0.45	60	60	60	60	65	65

Table 975/1 – PSV requirements for specific IL, traffic level and site category.

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

Additional clauses, tables and figures:

975AR Surface Course Aggregate Selection (continued)

3. Aggregate Abrasion Value

- 3.1. The AAV for the coarse aggregate shall be selected from table 975/2, based on the relevant site categories and Carriageway Hierarchy Category.
- 3.2. Where traffic flows have been measured for a specific site, the use of these shall supersede the use of Carriageway Hierarchy Category to determine AAV.
- 3.3. The appropriate AAV values taken from table 975/2 shall be inserted into Appendix 7/1, Schedule 5, of the scheme specific specification.

Maximum AAV of chippings, or coarse aggregates in unchipped surfaces, for new surface courses				
Traffic (cv/lane/day) at design life	≤ 250	251 - 1000	1001 - 1750	1751 - 2500+
Staffordshire Carriageway Hierarchy Category	C5	C4	C3 - C2	C1
Max. AAV for chippings for hot rolled asphalt, surface dressing and for aggregate in slurry and micro-surfacing systems	14	12	12	10
Max. AAV for aggregate in thin surface course systems, exposed aggregate concrete surfacing and asphalt concrete surface course	16	16	14	12

Table 975/2 – AAVs for chippings and coarse aggregates for new surface courses.

4. High Friction Surfacing

- 4.1. High Friction Surfacing (HFS) is not accepted for general use in Staffordshire.
- 4.2. If a site-specific risk has been identified which may justify the use of HFS, a 'Staffordshire Highway Asset Departure Request Form' must be completed and approved prior to any installation. These sites will primarily be skidding accident cluster locations.
- 4.3. Alternative methodologies for reducing skid risk shall be reviewed before consideration of HFS and the report submitted as part of any departure request.
- 4.4. Departure requests should include known traffic flows, justification for an increased Investigatory Level and reference to the requirements of CS 228 and CD 236.

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

Additional clauses, tables and figures:

975AR Surface Course Aggregate Selection (continued)

5. Coloured Surfacing

- 5.1. Coloured surfacing is not accepted for general use on Highway Maintainable at Public Expense (HMPE) in Staffordshire.
- 5.2. If a site-specific risk has been identified which may justify the use of coloured surfacing, a 'Staffordshire Highway Asset Departure Request Form' must be completed and approved prior to any installation.
- 5.3. If approval is given for use of coloured surfacing, it shall be noted that;
 - a. It must be a surface course material of appropriate thickness as determined by appendix 7/1 or 11/1. Surface treatment is not acceptable.
 - b. The requirements of this surface course otherwise remain the same as those in Appendix 7/1, cl. 971AR and this cl. 975AR.
 - c. Where the main purpose of the coloured surfacing is to generate awareness of changed road layouts for drivers, the colour surface will not be maintained or replaced during future maintenance activities.

6. Porous Asphalt

- 6.1. Porous asphalt is not accepted for use on Highway Maintainable at Public Expense (HMPE) in Staffordshire.



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 frontages,
- 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.

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.

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 (continued)

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 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, frames, etc, are set to new levels after the surfacing is laid, the reinstatement of the area around the covers, frames, 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.

7.3. Manholes etc., shall be reset flush (+ 3mm) with, and the gullies 6mm (+ 3mm) below, the level of the new 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 – Specification (continued)

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 – Specification (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 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 1.0m².

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 (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 +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. 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. 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. 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.

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)

4. 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
1 Staffordshire Place
Tipping Street
Stafford
ST16 2DP

For the attention of (Principal Designer)

- 4.2. The Principal Designer shall check and submit the Health and Safety 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*

Clause	Amendment to Clause
506.2	1st 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	2nd 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."

* Clause changes reference legacy volumes of 'Specification for Highway Works' published prior to the updates made in September 2025.

Appendix 0/2: Contract – Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Contract (continued)

Alterations to be Made (continued)

Appendix F	Amendment to List Contents	Specification Clause/Table/ Appendix
List 6	Page 51- Insert the following additional publication after ‘(vii) CS 230 Pavement maintenance assessment procedure’: “(viii) LA 120 Environmental Management Plans”	3000
List 8	Page 55 – Insert the following legislation before ‘Wildlife and Countryside Act 1981’: “The Control of Pesticides Regulations 1986” and “Plant Protection Products (Sustainable Use) Regulations 2012”	3001
List 10	Page 60 – Insert the following miscellaneous: “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)” and “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’” and “Civil Engineering Specification for the Water Industry, 8th Edition. (CESWI) - November 2023”	1300 1400 500 500

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.
		1/16	Privately and Publicly Owned Services and Supplies.

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)
		1/17	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.
			Fencing
	Not Used	3/1	Fencing, Gates and Stiles.
			Road Restraint Systems (Vehicle & Pedestrian)
		4/1	Road Restraint Systems (Vehicle and Pedestrian).
		4/2	Information Required to Demonstrate Compliance of Transitions and Terminals to Clause 401.

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
			Drainage & 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.
		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.

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)
	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 Micro-surfacing (Sheets 1, 2 and 3).
	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.

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	7/19	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 & Cement Bound Materials
	Not Used	10/1	Plant and Equipment for the Construction of Exposed Aggregate Concrete Surface.
			Kerbs, Footways & 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 & Brackets, CCTV Masts & 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.
		13/5	Typical CCTV Mast Data Sheet.
		13/6	Instructions for Completion of CCTV Mast 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
			Road Lighting Columns & Brackets, CCTV Masts & Cantilever Masts (continued)
	See Appendix 0/2	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.
			Electrical Work for Road Lighting & 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 & 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.
	Not Used	16/13	Contiguous Bored 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 & Embedded Retaining Walls (continued)
	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.
	Not Used	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.
			Waterproof for Structures
	Not Used	20/1	Waterproofing for Concrete Structures.
			Bridge Bearings
	Not Used	21/1	Bridge Bearing Schedule.
	Not Used	21/2	Not Used.
			Bridge Expansion Joints & 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).

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
			Brickwork, Blockwork & 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.
			Miscellaneous
		26/1	Ancillary Concrete.
	Not Used	26/2	Bedding Mortar.
	Not Used	26/3	Cored Thermoplastic Node Markers.
			Landscape & 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

[illegible]

Appendix 0/4: List of Drawings Included in the Contract (continued)

2. Standard Drawings Supplied to Each Tenderer

Drawing No. HWD Series	Title
	Preliminaries
01.10	Preventative Surface Treatment Signs.
	Fencing
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 Fence Types 1 and 2.
03.31	Timber Double Field Gate Type 2.
03.51	Individual Tree Guard.
	Road Restraint Systems (Vehicle & Pedestrian)
04.01	Pedestrian Guardrail Type 1.
04.02	Pedestrian Guardrail Type 2.
04.03	High Visibility Pedestrian Guardrail.
	Drainage & Service Ducts
05.01	Carrier Drains 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 Drains 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 In-situ 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	In-situ 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.

Appendix 0/4: List of Drawings Included in the Contract (continued)

2. Standard Drawings Supplied to Each Tenderer (continued)

Drawing No. HWD Series	Title
	Drainage & Service Ducts (continued)
05.72	Gully Cover Reinstatement.
	Earthworks
06.01	Watercourses - Intercepting Ditches.
	Road Pavements - General
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.
	Kerbs, Footways & Paved Areas
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.
11.06	Kerbing Details on Roundabouts and Overrun Areas.
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	Heavy - Vehicle Crossings in Kerbed Verges.
11.45	Construction of Typical Light-Vehicle Access Crossing.
11.46	Heavy-Vehicle Crossings on Classified Roads.
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.

Appendix 0/4: List of Drawings Included in the Contract (continued)

2. Standard Drawings Supplied to Each Tenderer (continued)

Drawing No.	Title
HWD Series	
	Traffic Signs
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.
	Landscape & Ecology
30.01	Hedge Types.
	Miscellaneous
60.11	Permanent Ground Markers - Type1 and 2.
60.12	Permanent Ground Markers - Type 3 and 4.
60.15	Permanent Benchmarks.

Appendix 0/4: List of Drawings Included in the Contract (continued)

2. Standard Drawings Supplied to Each Tenderer (continued)

Drawing No.	Title
TS Series	
	Traffic Signals
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.

[illegible]

Appendix 0/4: List of Drawings Included in the Contract (continued)

4. Standard Drawings 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) Req'd. 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 In-situ Concrete Manhole).	May 06	
F4	Type 2 Chamber (Precast Concrete Manhole).	May 06	
F5	Type 3 Chamber (Precast Concrete Manhole).	May 06	
F6	Type 3 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 In-situ Cast Gullies.	May 06	
I2	Duct Trench Cross Sections and Details of Mandrel.	May 04	

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.
- 1.2. The accommodation, furnishings and fittings and equipment provided should be in good condition, but unless there is any particular reason need not be new. They should also be proportional to the size, value and duration of the works.
- 1.3. When procuring accommodation, furnishings, fittings and equipment, Contractor should consider the Government Buying Standards (GBS) which are designed to make it easier to buy sustainably so as to save costs, reduce carbon and deliver other environmental benefits.

2. Duration of Time for the 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:

- **Location**

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

- **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.

- **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

Appendix 1/1: Temporary Site Accommodation and Equipment for the Overseeing Organisation (continued)

Organisation and their staff. Once the scheme is completed the Vehicle access crossing shall be removed and reinstated to standard footway/verge construction.

- **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.

- **Flooring**

All floors shall be covered using cork, linoleum or vinyl.

- **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.

- **Walling**

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

- **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.

- **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.

- **Ventilation**

Adequate ventilation is to be provided by opening windows, fans and the like.

- **Water Supply**

To be mains supply as required for washing/drinking etc.

- **Toilets**

A mains flushing toilet and urinals with hand washing facilities shall be provided unless otherwise agreed with the Project Manager. The toilets and washing facilities shall be regularly and properly cleaned.

Appendix 1/1: Temporary Site Accommodation and Equipment for the Overseeing Organisation (continued)

- **Welfare Facilities**

As a minimum these should contain a refrigerator, a microwave oven and hand cleaning facilities.

- **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.

- **Cleaning**

The Offices are to be cleaned and serviced daily as described in the scheme specific Works Information.

- **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:

- **Copier**

When stated in the scheme specific Works Information, a photocopier machine to be always maintained in good working order, 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.

- **Telephone**

Lines and handsets shall be provided as described in the scheme specific Works Information.

- **Fire Extinguishers**

These shall be supplied in sufficient numbers to satisfy safety regulations.

- **Furniture**

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

- **PC Computer, Printer/Scanner, Programmes and Plotter**

These shall be provided as described in the scheme specific Works Information.

- **Individual Offices**

Offices shall be furnished as described in the scheme specific Works Information.



Appendix 1/1: Temporary Site Accommodation and Equipment for the Overseeing Organisation (continued)

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:

1. **Type A: Car (Estate or 4 Door Saloon)**

- 1.1. The default should be zero or ultra-low emission at tailpipe. Any diesel car alternative must be certified as meeting Real Driving Emissions (RDE) standards (Euro 6d-TEMP or Euro 6d) where possible Euro 6d
- 1.2. In exceptional circumstances, when considering alternative vehicles, emissions must not exceed 95g CO₂/km.
- 1.3. The vehicle shall be finished in a plain conspicuous colour (e.g. yellow or white) and be free from markings identifying any company associated with the Contract.
- 1.4. The equipment shall include a nearside external driving mirror, reversing lights, heated rear window with wash and wipe function, fire extinguisher, front seat head restraints and a tool kit.

2. **Type B: Van (Light Commercial Van - Category N1)**

- 2.1. The default should be zero or ultra-low emission at tailpipe. Any diesel car alternative must be certified as meeting Real Driving Emissions (RDE) standards (Euro 6d-TEMP or Euro 6d) where possible Euro 6d
- 2.2. In exceptional circumstances, when considering alternative vehicles, emissions must not exceed 147g CO₂/km.
- 2.3. The vehicle shall have a Gross Vehicle Weight (GVW) not exceeding 3.5t (3,500kg).
- 2.4. The vehicle shall be finished in a plain conspicuous colour (e.g. yellow or white) and be free from markings identifying any company associated with the Contract.
- 2.5. The equipment shall include a nearside external driving mirror, reversing lights, heated rear window with wash and wipe function, fire extinguisher, front seat head restraints and a tool kit.

3. **Type C: 4x4 (Off-road Vehicle)**

- 3.1. Vehicle emissions must not exceed 255g CO₂/km.
- 3.2. The Type C vehicle shall be a hardtop vehicle with a wheelbase of at least 2.75m, with the option for either two-wheel 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)

4. For All Vehicles

- 4.1. The default is zero or ultra-low emission at tailpipe with all vehicles certified as meeting a minimum of Euro 6 / Euro VI emission standard.
- 4.2. Contractor supplied vehicles should be fit for the purpose for which they are intended and appropriate for the specific site.
- 4.3. The vehicles will be used not only within the limits of the Site but also on the public highway for site access and necessary journeys away from the Site. The Contractor must provide insurance which covers such use of the vehicles.
- 4.4. All vehicles must have a minimum and valid 5-star Euro NCAP safety rating.
- 4.5. 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.
- 4.6. 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.
- 4.7. 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 (As described in the Scheme Specific Works Information)	Minimum Period for Submission Prior to Commencement of Related Works
400	Vehicle Restraint Systems	
400	Pedestrian Restraint Systems	
500	Proprietary Duct Chambers	
500	Culvert Headwalls	
500	Combined Drainage and Kerb 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	Corrugated Steel Buried Structures, Environmental Barriers	

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer

1. The Developer is responsible for arranging and bearing the cost of carrying out all required testing detailed in this Appendix.
2. 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).
3. Table NG1/1 within this Appendix provides a non-exhaustive list from which contract specific requirements for testing may be drawn, with the onus on the designer to extract and schedule in a contract specific Appendix 1/5.
4. 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.
5. Tests marked with an 'N' indicate that a UKAS test report or certificate is required, where UKAS stands for United Kingdom Accreditation Service.
6. The frequency of testing is given as guidance. Where materials are known to be marginal or initial test show them to be such, the frequency of testing should be increased. Conversely where a material source is known from experience to have good compliance or initial tests exceed minimum requirements, then the engineer may agree to reduce the stated frequency of testing.
7. 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.
8. 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.
9. Imported recycled aggregates must demonstrate their compliance with WRAP Quality Protocol: Aggregates from Inert Waste.
10. Sub-base material must comply with the requirements of SHW Cl. 803 or 807.
11. Earthworks materials must comply with the requirements of SHW series 600 and Appendix 6/1 of this document.
12. Unless otherwise scheduled under Clause 2602 samples of concrete complying with that Clause are not required.
13. The Overseeing Organisation reserves the right to prove compaction of unbound materials via dynamic stiffness testing.

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments	
Series 300 - Fencing						
306	Permanent fencing				Quality Management Scheme applies	
	Concrete components	Cover to reinforcement	1 per consignment (max. 1 per 100 components) (BS 1722)		(Tests/samples should not normally be required)	
308	Gates & stiles				Quality Management Scheme applies	
	Reinforced concrete posts	Cover to reinforcement	1 per consignment (max. 1 per 100 components) (BS 3470)		(Tests/samples should not normally be required)	
Series 400 - Vehicle Restraint Systems						
403	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacture tests)		Required	To provide well attested and documented evidence (see NG 403.5)	
404	Anchorage in drilled holes	Loading test on site	As required by the engineer	Required		
	Post foundations				(see NG 404.3)	
Series 500 - Drainage and Service Ducts						
501	Pipes for drainage and service ducts				Product Certification Scheme or equivalent applies	
	Vitrified clay					
	Concrete PC/SRC	Not >900 mm dia.				
	Concrete pre-stressed					
	Iron-cast					
	Iron-ductile					
	UPVC					
	GRP					
	Plastics, see table 5/1					
	Corrugated steel	(Manufacturer tests)			Required (AASHTO)	

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Materials	Test	Test Frequency	Test Certificate	Comments
Series 500 - Drainage and Service Ducts (continued)					
501	Corrugated steel bitumen protection	Not >900 mm dia.	(Manufacturer tests)		
	Other materials			Required	Product Acceptance Scheme or equivalent applies
503	Pipe bedding	Soluble sulfate (N)	1 per source per scheme*	Required	
		Los Angeles coefficient (N)			
505	Filter Medium Backfill	Plastic index (N)	1 per source per scheme*	Required	
		Los Angeles coefficient (N)			
		Soluble sulfate content (N)			
		Permeability (N)	1 per source per scheme*		
506	Sealing existing drains			Required	Product to comply with Cl. 506.3
	Concrete				
	Grout				
507	Chambers				
	Precast concrete				Product Certification Scheme or equivalent applies
	Corrugated galvanised steel	(Manufacturer tests)		Required	
	Manhole steps				
	Steel fitments				
	Covers, grates and frames				Quality Management Scheme or equivalent applies
	Cover bolts				
508	Gullies and pipe junction				Product Certification Scheme or equivalent applies
	Precast concrete				
	Clay				
	Cast iron and steel				

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods, or Material	Test	Test Frequency	Test Certificate	Comments
Series 500 - Drainage and Service Ducts (continued)					
509	Watertightness of joints and general pipe condition	Water test	All pipelines with watertight joints	Required	
		CCTV survey (in place of Mandrel test)	All surface water sewer pipes on completion of the Works and again before issue of the Final Certificate		CCTV footage and reports including gradient profiles to be submitted. Cross reference should be made to any requirements in Appendix 5/1
512	Backfill to pipe bays	Soluble sulfate content (N)	1 per source per scheme*		
514	Fin drains	(Manufacturer tests)		Required	Product Acceptance Scheme or equivalent applies
515	Narrow filter drains				
	Geotextile, pipes and fittings	(Manufacturer tests)		Required	Product Acceptance Scheme or equivalent
	Granular fill	Plastic Index (N)	1 per source per scheme		
		Resistance to fragmentation (N)			
		Soluble sulfate content (N)	5 per source		
		Permeability	1 per source per scheme		
516	Combined kerb drains	Load test	1 per 1000m	Required	Cert. to Cl. 516 required
517	Linear drainage systems	Load test	1 per 1000m	Required	Cert. to Cl. 517 required

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods, or Material		Test	Test Frequency	Test Certificate	Comments
Series 600 - Earthworks						
601 631 to 637 640	Acceptable material				Required	Cross referenced with any specific requirements defined in Appendix 6/1
	Class	General descript.				
	1	General granular fill	SMC of chalk (N)	Twice a week*		
			IC only	Los Angeles Coefficient (N)		
	2	General cohesive fill	Grading	Twice a week*		
			SMC of chalk (N)	Twice a week*		
			Bulk density (PFA) (N)	2 per 1000m ³ up to max of 5 per day*		
	3	General chalk fill	mc (N)	2 per 1000m ³ up to max of 5 per day*		
			SMC (N)	Daily*		
	6	Selected granular fill	PI/LL (N)	Daily*		LA category but not for 6F4 and 6F5
			Los Angeles Coefficient (N)	Weekly*		
			SMC (N)	Weekly*		
			Organic matter/water soluble sulfate (N)	Weekly*		BS EN 1744-1 Cl. 10, Cl. 13
			Oxidisable sulfides and total potential sulfate content (N)	Weekly*		BS EN 1744-1 Cl. 10, Cl. 13
			PH/chloride ion content (N)	Weekly*		
			Resistivity (N)	As required		
			Undrained and drained shear parameters (N)	As required		Cross referenced with any specific requirements defined in Appendix 6/1

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods, or Material		Test	Test Frequency	Test Certificate	Comments
Series 600 (continued)						
601 631 to 637 640	Class	General descript.				
	6F4 and 6F5	Selected granular fill	Size designation and overall grading category	1 per week*	Required	
			Maximum fines and oversize category	1 per week*		
			Volume stability of blast furnace slag	6 monthly		
			Volume stability of steel (BOF and EAF) slag	6 monthly		
			Other aggregate requirements	Annex C of BS EN 13242		
			Laboratory dry density and optimum water content			
			Water content			
			7	Selected cohesive fill		
	PI/LL	Daily*				
	Organic matter/water soluble sulfate (N)	Twice a week* or daily where sulfates are expected				
	Oxidisable sulfides and total potential sulfate content (N)	Twice a week* or daily where sulfates are expected				
	pH/Chloride ion content (N)	Weekly*				
	Resistivity (N)	As required				

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material		Test	Test Frequency	Test Certificate	Comments
Series 600 (continued)						
601 631 to 637 640	Class	General descript.				
	7	Selected cohesive fill	Undrained and drained shear parameters (N)	As required	Required	Cross referenced with any specific requirements defined in Appendix 6/1
			Permeability (N)	As required		
	9	Stabilised materials	Pulverisation	1 per lane width per 200m length*		
			Bearing ratio (N)			
	Pulverised fuel ash		Chemical analysis	1 per consignment*		Cross referenced with any specific requirements defined in Appendix 6/1
	Furnace bottom ash		Grading	1 per 300 tonnes*		BS EN 1744-1 Cl. 10, Cl. 13
	Fill adjacent to cementitious material or metallic items		Soluble sulfate content, oxidisable sulfides content and total potential sulfate content (N)	1 per 400 tonnes or per location is less than 400 tonnes*		
602	Earth works material beneath surface of a road or paved central reserve		Frost heave (N)			Required
	(i) Imported onto site (ii) On site source			1 every four months* As required		

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material		Test	Test Frequency	Test Certificate	Comments
Series 600 (continued)						
601 631 to 637 640	Class	General descript.				
			Soluble sulfate content, oxidisable sulfides content and total potential sulfate content (N)	1 per 400 tonnes or per location is less than 400 tonnes*	Required	BS EN 1744-1 Cl. 10, Cl. 13
602	Earth works material beneath surface of a road or paved central reserve		Frost heave (N)		Required	
	(i) Imported onto site (ii) On site source			1 every four months* As required		
609, 621	Geotextiles		Tensile strength	1 per 400 square metres*	Required	Cross reference with details as defined in Appendix 6/5 or 6/9
			Elongation			
			Tensile strength of seams and joints			
			Static puncture			
			Pore size			
			Permeability			
			Durability			
612	Compaction of fills					
		Method compaction	Plate bearing (CBR) (N)	1 test per 30 linear meters*	Required	
			Field dry density (N)	As required		Refer to Appendix 6/1
			Settlement tests (600mm plate) (N)			

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material		Test	Test Frequency	Test Certificate	Comments
Series 600 (continued)						
612	Compaction of fills				Required	Refer to Appendix 6/1
		End product compaction	Optimum mc (2.5kg rammer/vibrating hammer method) (N)	Each class or sub class of material*		
			Field dry density (N)	3 tests per 500 tonnes*		
614	Cement stabilisation to form capping		Rate of spread of cement	1 per 500 square metres of cement spread*	Required	
615, 641, 643	Lime stabilisation to form capping		Rate of spread of lime	1 per 500 square metres of lime spread	Required	
			Available lime content	Each source of lime weekly during stabilisation operation*		
Series 700 - Road Pavements: General						
702	Surface levels of pavement courses		As specified in Cl. 702	As specified in Cl. 702	Required	
	Surface regularity					
710	Constituent materials in recycled aggregate		Quality control	As required by the 'Quality Protocol for the Production of Aggregates from Inert Waste'		
711	Overbanding and inlaid crack sealing systems					Product Acceptance Scheme or equivalent applies

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 800 - Road Pavements: Unbound, Hydraulically Bound and other Materials					
801	Unbound sub-base material for use adjacent to cement bound materials, concrete pavements, structures or products	Soluble sulfate content (N)	1 per 400 tonnes or per location if less than 400 tonnes*	Required	Acceptance testing
		Frost heave	1 per year		Factory Production Control testing of recycled sub-base produced by the Infrastructure+ partnership will be tested as indicated
		Blast furnace slag	Bulk density (N)		
	Stability (N)				
		Sulfate content (N)			
803, 807	Granular sub-base material Type 1 and Type 4	Grading (N)	1 per scheme then 1 per 500 tonnes thereafter*	Required	Acceptance Testing
		Grading Compliance (N)	1 per 400 tonnes if not 1 per production week*		Factory Production Control testing of recycled sub-base produced by the Infrastructure+ partnership will be tested as indicated
		Frost heave (N)	1 per year*		
		Soundness (N)	1 per year*		
		Los Angeles Index (N)	2 per year*		
		Water absorption (N)	1 per year*		
		Plasticity Index (N)	1 per source*		
		Sulphate content (N)	1 per year*		

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 800 - Road Pavements: Unbound, Hydraulically Bound and other Materials (cont.)					
830	FABGM-1				
	Constituents	Water content BS EN 13286-1	1 per week	Required	
		Grading BS EN 933-1	1 per week		
		Imported lime	1 per week		Supplier certificate
	Mixture	Water content at mixing BS EN 13286-1	1 per hour	Required	
		Water content at final compaction BS EN 13286-1	1 per day		
		In situ wet density Permanent works	5 per 1000 square metres 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 1000 square metres 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 FABGM 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 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 – Road Pavements: Bituminous Bound Materials					
901, 925, 937, 943	Aggregates for bituminous materials				
		Hardness	Los Angeles coefficient (N)	Monthly*	Required
		Durability	Soundness (N)	1 per source*	
			Water absorption (N)	As required	
		Cleanliness	Sieve test (mass passing 0.063mm sieve) (N)	Monthly*	
		Shape	Flakiness index (N)	Monthly*	
		Blast furnace slag	Bulk density (N)	1 per 500 tonnes*	
			Soundness (N)		
			Dicalcium silicate disintegration (N)		
			Iron disintegration (N)		
		Steel slag	Bulk density (N)	1 per 500 tonnes*	
			Volume stability (N)		
		Coarse aggregate for surface courses	Resistance to polishing (PSV) (N)	1 per source*	
			Resistance to surface abrasion (AAV) (N)	1 per source*	
	Binders for bituminous materials	Penetration (N)	1 per source*		
		Softening point (N)	1 per 750 tonnes*		
		Other BS EN tests	As required		

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 - Road Pavements: Bituminous Bound Materials (continued)					
903 to 914, 929, 930, 942, 943, 971 AR	Bituminous mixtures	Grading (N)	1 per material per source per scheme then 1 per 500 tonnes*	Required	
		Binder content (N)	1 per material per source per scheme then 1 per 500 tonnes*		
		Air void determination (N)	3 core pairs per 1000m ² minimum 3 cores pairs per scheme		See 970AR
		Maximum density	1 per material source per scheme then 1 per 500 tonnes*		More testing will be required if the aggregate types vary
911	Rolled asphalt surface course (design mix)	Stability value (N)	1 per material source per scheme then 1 per 500 tonnes*	Required	
		Flow value (N)			
		Density (N)			
915	Coated chippings	Grading (N)	1 per stockpile*	Required	
		Binder content (N)	1 per stockpile*		
		Flakiness index (N)	1 per source per scheme*		
		Resistance to polishing (PSV) (N)	1 per source per scheme*		
		Resistance to surface abrasion (AAV) (N)	1 per source per scheme*		
		Hot sand test (N)	1 per source per scheme*		
		Rate of spread (N)	As required		
920	Bond coats	Rate of application (carpet tile test)	1 set of tiles		To be carried using carpet tile test where application is to reduce permeability of substrate

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 – Road Pavements: Bituminous Bound Materials (continued)					
921	Surface macrotexture	Volumetric patch (N)	2 sets per scheme on SMA 1 set per 150m per lane on HRA Random, testing on surface dressing	Required	To be carried out wherever >1mm is specified.
922	Surface dressing				
	Binder	Product Identification		Required	
		Vialit cohesion (N)			
		Accuracy of spread (N)			
		Rate of spread	1 per operating crew per week		
		Penetration at 25°C and 5°C (N)			
	Chippings	Resistance to polishing (PSV) (N)		Required	
		Resistance to surface abrasion (AAV) (N)			
		Grading (N)	1 per size/source per month		
		Binder content (N)	1 per stockpile		
		Flakiness Index (N)	1 per size/source per month		
		Accuracy of spread (N)			
		Rate of spread	1 per operating crew per week		Frequency to be reduced to daily after 3 satisfactory results, but not less than 1 test per lane per site

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments	
Series 900 - Road Pavements: Bituminous Bound Materials (continued)						
922	Surface dressing					
	Chippings	Depot tray test (Transverse Distribution)	Once prior to start of dressing season	Required	To be repeated after any major equipment maintenance	
	Rollers	Spray bars working	Before work starts and daily during works			
947, 948	In situ cold recycled bound material	Grading of aggregate stock	1 per 500 tonnes	Design verification	Each scheme where existing design is used	
		NAT stiffness	3 samples at target binder and OPC			
		Grading	1 per 500 tonnes	Design process	New designs	
		OMC	1 No. on finalised mixture			
		NAT stiffness	6 samples @ minimum of 5 different binder OPC contents. At least one set of 6 specimens having a bitumen content of 0.5% above design target bitumen content			
		Bitumen content of planings	3 samples			
		Grading binder content	1 per 500 tonnes			Process control
		In situ density	Daily site visit			
		In situ stiffness				
		Series 1100 - Kerbs, Footways & Paved Areas				
1101	Precast concrete kerbs, channels, edgings and quadrants	Transverse strength	Minimum of 3 per 1000 units of each product (BS 7263: Part 1)	Required		
		Water absorption				

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material		Test	Test Frequency	Certificate	Comments
Series 1100 - Kerbs, Footways & Paved Areas						
1104	Precast concrete flags		Bending strength	16 per 5000 blocks (BS 6677: Part 1)	Required	Appropriate test/samples should be scheduled where not included under other Clauses
	Bedding material					
		Granular material				
		Mortar				
1107	Concrete block paving		Compressive strength		Required	
1108	Clay pavers		Bending strength		Required	
			Skid resistance			
Series 1200 - Traffic Signs & Road Markings						
1202	Permanent traffic signs				Required (where considered appropriate)	Quality management scheme applies. Certification that the sign passes the tests in BS873: Part 1
1207	Anchorage in drilled holes to supports of traffic signs		Loading test on site	As required		
1210	Holding down bolts and anchorages to bases of permanent bollards				Required (where considered appropriate)	Certification that the holding bolts and anchorages pass the tests in BS873: Part 3
1212	Road markings		Retro-reflectivity, luminance, skid resistance as specified in BS EN 1436 & BS 1824	Specified tests for each visit. Minimum of 1 test per 250m of road or part thereof for retro-reflectivity	Required	National Quality Management Sector Scheme applies. Procedures are given in BS EN 1824. Performance values specified in Appendix 12/3
	Pavement marking paints				Required BS 6044	Quality Management and Product Certification schemes apply

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 1700 - Structural Concrete					
1707	Concrete	Compressive strength (N)	Reinforced concrete – 3 cubes per 24m ³ or 24 batches whichever represents the lesser volume	Required	Tested at 28 days (additional tests e.g. early strip cubes, arranged by Contractor)
			Prestressed concrete – 3 cubes from 10m ³ or 10 batches whichever represents the lesser volume		
			Mass concrete – 3 cubes from 50m ³ or 50 batches whichever represents the lesser volume		
	Fresh concrete	Consistence (slump test) (N)	Each batch	Required	Representative sample from initial discharge
1712	Reinforcement				
	Steel bars			Required (BS 4449)	Product certification scheme or equivalent applies
	Steel wire			Required (BS 4482)	
	Steel fabric			Required (BS 4483)	
1718	Prestressing tendons				
	Steel wire and strand			Required (BS 5896)	Product certification scheme or equivalent applies
	Steel bar			Required (BS 4486)	
	Pre-stressing steel (all types)	Proof load Breaking load Elongation Ductility Relaxation Modulus of elasticity	As required		

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 1700 - Structural Concrete (continued)					
1718	Prestressing tendons				
	Other than lowest strength wire or strand to BS5896	0.1% proof load	Each reel		
Series 2000 - Waterproofing for Concrete Structures					
2003	Permitted waterproofing systems	As required see NG2003			Product Acceptance Scheme or equivalent
	Additional bituminous protection		1 per 15 tonnes*		
	Stability value		1 per 15 tonnes*		
2004	Proprietary materials	As required see NG2003	1 per source*		Sampling to comply with BS 76
Series 2100 - Bridge Bearings					
2101	Bridge bearings				
	Bearings (other than elastomeric bearings)	Load testing - serviceability limit	As required in contract specific Appendix 21/1		
		Load testing - ultimate limit state			
		As per contract specific App. 21/1			
	Elastomeric bearings	Compressive test	As required in contract specific Appendix 21/1		Use test methods given in BS EN 1337-3 section 4.3.3 and Annex H, or state in contract specific Appendix 21/1
		Stiffness test			
		Shear stiffness test			
		As per contract specific App. 21/1			

Appendix 1/5: Testing to be Carried Out by the Contractor or Developer (continued)

Table NG 1/1: Schedule of Tests (continued)

Cl.	Work, Goods or Material	Test	Test Frequency	Test Certificate	Comments
Series 2600 - Miscellaneous					
2601	Bedding mortar materials			Required for each batch	Certification in accordance with Cl. 2601 is required
	Bedding mortar				
		Flow cone test	Each batch		Laboratory tests
		Flow between glass plates			
		Compressive strength			
		Expansion test			
		Water absorption			
		Elastic stability	1 per source		Site control tests
		Flow cone test compressive strength	Each load		
Series 3000 - Landscape & Ecology					
3005	Grass seeding, wildflower seeding & turfing	Rate of spread of fertiliser	1 per 1000 square metres*		
		Rate of spread of seeding	1 per 1000 square metres*		
		Chemical analysis of fertiliser	1 per source*		
			Grass seed germination and purity (Official Seed Testing Station tests)	1 per source and mix variety*	Required prior to sowing

Key

- * Indicates that the frequency of testing is for guidance. Where materials are known to be marginal, or initial tests show them to be such, then the frequency of testing should be increased. Conversely where a material source is known from experience to have good compliance or initial tests exceed minimum requirements, then the engineer may agree to reduce the stated frequency of testing.
- (N) Indicates that a UKAS or equivalent accredited laboratory sampling and test report or certificate is required.

Appendix 1/6: Supply and Delivery of Samples to the Employer

1. 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.
2. 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).
3. 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.
4. Unless otherwise scheduled under Clause 2602 samples of concrete complying with that Clause are not required.
5. All testing is to be carried out by a UKAS accredited laboratory unless agreed otherwise in advance.
6. 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.
7. 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

8. 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.
9. 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.
10. For all Staffordshire County Council schemes, samples are to be delivered to the SHL for testing.
11. The Overseeing Organisation reserves the right to prove compaction of unbound material via dynamic stiffness testing.
12. Natural ground formation samples must be tested via laboratory Equilibrium Design California Bearing Ratio (CBR). Remoulded CBR or plate bearing testing are not acceptable alternatives.

Appendix 1/6: Supply and Delivery of Samples to the Employer (continued)

Cl.	Work, Goods or Materials	Test	Test Frequency	Test Certificate	Comments
Series 500 - Drainage and Service Ducts					
503	Pipe bedding	Grading	1 per source per scheme	Required	
505	Filter Medium Backfill				
512	Backfill to pipe bays				
515	Narrow filter drains				
	Granular fill	Grading	1 per source per scheme	Required	
Series 600 - Earthworks					
601 631 to 637 640	Material classes 1 to 9	Moisture content	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.
		Grading			
		OMC			
		Plasticity			
		MCV			
		Uniformity coefficient			
		Recycled material constituents			
612	Compaction of Fill (End product)	In-situ density	3 tests per 500t		
	Compaction 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)			
	Compaction 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		
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

Appendix 1/6: Supply and Delivery of Samples to the Employer (continued)

Cl.	Work, Goods, or Material	Test	Test Frequency	Test Certificate	Comments
Series 800 - Unbound, Hydraulically Bound and Other Materials (continued)					
803 and 807	Granular Sub-base material, Type 1 and Type 4	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		
830 and 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 1000m ² 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

Appendix 1/6: Supply and Delivery of Samples to the Employer (continued)

Series 800 - Unbound, Hydraulically Bound and Other Materials (continued)					
830 and 890 AR	FABM-1	Mixture			
		Layer thickness	Dipping of foundation layer and compacted FABM layer at 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)		
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		
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

Appendix 1/6: Supply and Delivery of Samples to the Employer (continued)

Cl.	Work, Goods, or Material	Test	Test Frequency	Test Certificate	Comments
Series 900 - Bituminous Bound Materials					
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.
947 and 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 at target binder and OPC	Design Verification	
		Grading	1 per 500t	Design process	New designs
		OMC	1 No. on finalised mixture		
		NAT stiffness	6 No at min of 5 different/binder OPC contents, with at least one set of 6 specimens having 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		
		Series 1200 - Traffic Signs & Road Markings			
1212	Road Markings	Retro-reflectivity	1 set (3 locations) per scheme		To be carried out on schemes having >250m of white road marking.
		Skid resistance			

Cl.	Work, Goods, or Material	Test	Test Frequency	Test Certificate	Comments
Series 1700 - Structural Concrete					
1700 and 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)
		Concrete consistence - slump test	Each batch	Delivery area	Representative sample from initial discharge
1707		Compressive strength density	3 cubes per 24m ³		Reinforced concrete only

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 the appropriate Borough/District Council guidelines, with reference to Appendix 1/17 Cl. 1.6.
- 1.4. Working hours to be completed by the Contractor.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Working hours	Start							
	Finish							

Table 1/7/1: Contractor defined working hours.

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 except for 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.
- 2.7. 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.
- 2.8. Traffic safety and management - refer to Appendix 1/17.



Appendix 1/9: Control of Noise and Vibration

1. General

1.1. The Local Authority having responsibility for the area is:

..... District/Borough Council

Tel:

Email:

1.2. 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.

1.3. Local Authority information and/or requirements:

1.3.1. *[Include here any known data, information or additional requirements]*

1.4. Monitoring requirements:

1.4.1. *[Include here any monitoring agreed with the Local Authority]*

2. Restrictions on Working Hours

2.1. *[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.]*

3. Noise

3.1. Contractor to indicate below the method of noise assessment to be carried out and include any details of proposed restrictions.

Noise Limits	
Method 1	Details of Restrictions
Pre-existing ambient +5dB	
Method 2	Details of Restrictions
Local Authority Noise Limit	

Table 1/9/1: Details on testing and restrictions for site noise limits.

Notes:

- 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.

Appendix 1/9: Control of Noise and Vibration (continued)

- When noise levels are measured within 1m of a building façade. The permitted noise levels can be increased by 3dB.
- The Pre-Construction Ambient noise level, $L_{Aeq, Period}$ at a NSR is the total $L_{Aeq, Period}$ from all the noise sources in the vicinity over the representative period prior to the commencement of the works.
- The Total Noise level, $L_{Aeq, Period}$ at a NSR is the total $L_{Aeq, Period}$ from all the noise sources in the vicinity over the representative period plus the construction noise.

1. **Method 1** (delete if Method 1 is not to be used)

1.1. Table 1/9/2 details the results of the construction noise assessment demonstrating that [value] neighbouring noise sensitive premises are affected by significant noise levels as a result of the works.

Period	Hours	Noise Sensitive Receptor	Pre-construction Ambient Noise Level dB $L_{Aeq, Period}$	Total Noise dB $L_{Aeq, Period}$	Significance (Total Noise Pre-construction Ambient) dB $L_{Aeq, Period}$
Monday to Friday					
Saturday					
Sunday					
Bank Holiday					
All unattended plant outside normal working hours					

Table 1/9/2: Construction noise assessment

2. **Method 2** (delete if Method 2 is not to be used)

2.1. The ambient noise level, $L_{Aeq, Period}$ from all sources when measured 2.0 m above the ground at noise control stations numbers 1 to [value] shown on Drawing Numbers [insert drawing numbers] shall not exceed the appropriate level given in the Noise Limit (see Table 1/9/1).

Appendix 1/9: Control of Noise and Vibration (continued)

3. Noise Reduction

3.1. In order to reduce the total noise level to within the pre-construction ambient noise ($L_{Aeq, Period}$) +5dB or less, the following noise reduction methods have been identified and shall be undertaken by the Contractor:

3.1.1. [*list proposed noise reduction measures*].

3.2. Where it is not possible to reduce noise levels to within the pre-construction ambient noise ($L_{Aeq, Period}$) +5dB or less, despite extensive mitigation, consent to undertake noisy works will be made to the Local Authority in consultation with neighbouring noise sensitive premises.

4. Vibration

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

4.2. Limits on vibration levels arising from the site activities:

- [*insert details of limits, giving limits of vibrational amplitude and resultant peak particle velocity*].

4.3. Vibration control stations will be at locations detailed below:

- [*Insert location(s) details*]

4.4. Requirements for instrumentation and monitoring:

4.4.1. The Contractor shall monitor the levels of vibration using an approved vibration meter plus a geographical level recorder. A record of this shall be provided to the Overseeing Organisation within 24 hours.

5. Vibration Reduction

5.1. In order to reduce the level of vibration, the following methods have been identified and shall be undertaken by the Contractor:

5.1.1. [*list proposed vibration reduction measures*].



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:
 - 1.1. 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.
 - 1.2. 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:
 - 2.1. 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.
 - 2.2. 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.
 - 2.3. 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:
 - Site clearance
 - Fencing
 - Drainage/Ducting (each drain and duct run)
 - Earthworks including topsoil strip
 - Capping Layer
 - Sub-base
 - Pavement construction
 - Kerbing
 - Footways/cycleways
 - Traffic signs and road markings
 - Road lighting
 - 2.4. The time base for the programme shall be "a day" being 0730hrs - 1900hrs for weekdays and Saturdays.

Appendix 1/13: Programme of Works (continued)

- 2.5. The programme shall clearly and precisely define where the work is progressing.
- 2.6. 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.
- 2.7. 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. 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.
5. 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.



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 schedule contains a list of standard contacts; however, it is not exhaustive and must be populated with current contact details for each utility. The Traffic and Network Management Team of the Overseeing Organisation may be consulted to obtain current details.

Statutory Undertakers/ Authority	Contact Name	Contact Details
Scheme Specific Works Information	Third Floor, 1 Staffordshire Place, Stafford, ST16 2DH	Traffic & Network Management
Local Planning Authority		Newcastle-under-Lyme Borough Council Staffordshire Moorlands District Council East Staffordshire Borough Council Stafford Borough Council Cannock Chase District Council Lichfield District Council Tamworth Borough Council
Clean Water Supplier		Severn Trent Water South Staffs Water United Utilities
Foul Water Disposal		Severn Trent Water
Surface Water Disposal	Third Floor, 1 Staffordshire Place, Stafford, ST16 2DH	Staffordshire County Council/Amey Highways
Gas and Electric		Cadent Gas ES Pipelines Ltd Fulcrum Pipelines Ltd GTC Pipelines Ltd National Grid Distribution West Midlands
Communications		BT/Openreach Virgin Media
Others (as required e.g. Coal Authority)		High Speed Two (HS2) Ltd Network Rail National Highways National Grid

Table 1/16/1: Schedule of scheme contacts relating to statutory undertaker apparatus.

Appendix 1/16: Privately and Publicly Owned Services and Supplies (continued)

3. The Contractor shall provide plans or drawings showing the position of all known services and supplies, cross-referenced within Appendix 1/16.
4. The Contractor is to provide details of highway systems which may be affected by the works together with details of any necessary alterations or temporary alternative provisions.



Appendix 1/17: Traffic Safety and Management

1. General Requirements

1.1. 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.

1.2. It is essential that all traffic safety measures are in accordance, where applicable, with the requirements and advice given in Chapter 8 of the Traffic Signs Manual and any other relevant requirements. Contract specific deviations from Chapter 8 of the Traffic Signs Manual should be discussed with the representative Engineer and clearly indicated within a scheme specific Appendix 1/17.

1.3. Phasing of Works

1.3.1. 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

1.4.1. 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 specific requirements of the Contract.
- c. Taking steps to avoid dazzle.
- d. Taking care not to damage statutory undertaker's plant when erecting posts for signs.
- e. Liaison with the Statutory Authorities and Police Authority.

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

Appendix 1/17: Traffic Safety and Management (continued)

- 1.4.3. 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.
- 1.4.4. Exact positions of signs shall be agreed with the Overseeing Organisation on site.
- 1.4.5. Reinstatement of post holes in verges shall be carried out by filling the post hole to ground level with concreting sand.
- 1.4.6. 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.

1.5. Working Areas and Safety Zones

- 1.5.1. 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

- 1.6.1. 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

- 1.7.1. 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.
- 1.7.2. 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.

Appendix 1/17: Traffic Safety and Management (continued)

1.7.3. 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.

1.7.4. 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

1.8.1. 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.

1.8.2. 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.

1.8.3. 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.

1.9. Remedial Works

1.9.1. 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.

1.9.2. 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

2.1. 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	More than 10 days	3 months	5 days
Standard Works	More than 3 days & less than 10 days	10 days	5 days
Minor Works	Less than 3 days	3 days	2 days
Immediate Works	N/A	Within 2 hours	N/A

Table 1/17/1: Types of notification and advance notice periods for works.

Appendix 1/17: Traffic Safety and Management (continued)

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

2.3. 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:

2.3.1. Licences

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

2.3.2. Permits

- Road closures
- Temporary traffic signals
- Stop/Go temporary traffic control
- Lane closures
- Other traffic management that impedes the normal flow of traffic
- Placement of temporary items on the highway, e.g. site cabins, fencing, etc.
- Scaffolds, hoardings, skips to be housed on the highway
- Temporary excavations in the highway
- Works requiring a Temporary Traffic Regulation Order

2.4. 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 Traffic & Network Management for clarification.

3. Notice Period to be Allowed for Application & Consents

3.1. Minimum notice required by the Highway Authority to consider a Contractor's application (on appropriate pro-forma and with plans where necessary) are shown in Table 1/17/2.

Appendix 1/17: Traffic Safety and Management (continued)

Ref	Application Type	Minimum Notice Period
i	Amending or making traffic orders	12 weeks
ii	Authorising of non-prescribed signs	4 weeks
iii	Authorising temporary traffic signals (see "Special Requirements in Relation to the Highway Authority")	10 working days
iv	Authorising other temporary traffic controls (see "Special Requirements in Relation to the Highway Authority")	10 working days
v	Moving permanent traffic signs not under the Contractor's responsibilities to be compatible with the state of the Works	4 weeks

Table 1/17/2: Minimum notice requirements allowed for applications and consents.

3.2. The Highway Authority will invoice the Contractor for current charges in respect of work to process applications relating to reference type 'i' and 'v'. Such costs are not reimbursable under the Contract.

3.3. Applications must provide the relevant details and be completed in full. For application proformas please contact Traffic & Network Management.

- **Details of Events That Could Have a Bearing on the Works**

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

- **Highways, Private Roads and Other Ways affected by the Works**

3.5. When planning traffic safety and management measures the Contractor must consider those roads affected by the works and list the details in Table 1/17/3.

Description	Affected Road (1)	Affected Road (2)
Road name & number		
Predicted 24-hour Annual Average Daily Traffic (AADT)		
85 th ile speed of cars (mph)		
Type(s) of traffic control		
Special facilities		
Is the highway to remain open or closed?		

Table 1/17/3: Details of all roads affected by the works.

Appendix 1/17: Traffic Safety and Management (continued)

3.6. Details of constructed temporary diversions for traffic are contained within Appendix 1/18 (where used). Highways including footpaths, cycle tracks and bridleways described above or listed in Appendix 1/19 are the responsibility of the Local Highway Authority.

Staffordshire County Council
1 Staffordshire Place
Tipping Street
Stafford
ST16 2DH
300 8000

- **Driver Information Signs at Roadworks**

3.7. See Scheme Specific Works information.

- **Works to be Carried Out During the Period of Maintenance**

3.8. See Scheme Specific Works information.

- **Traffic Management for Surface Dressing Operations**

3.9. 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. Dumper 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 600mm measured from the kerb face to the leading edge of the sign face plate,
 - b. The mounting height shall be 2.1m where there is a possibility of pedestrians passing, 2.4m on cycle routes and 1.5m in all other situations. Height measured from finished surface level to underside of sign face plate,
 - c. The ground shall be reinstated to match the existing surface material after erecting the sign,
 - d. The signs shall be removed within four weeks of the date of the Completion Certificate and the ground reinstated to match the existing surface material,
 - 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: Health & Safety Restrictions, Precautions and Monitoring

1. General Requirements

- 1.1. The Contractor shall at all times comply with the provisions of Health and Safety legislation and, in particular, the Construction (Design and Management) Regulations 2015, the Health and Safety at Work etc Act 1974, and the Management of Health and Safety at Work Regulations 1999, and shall take account of the latest issues of Construction Safety Manuals, European Safety Directives, etc.
- 1.2. The Contractor shall provide the Client with information to be included on any F10 submission.
- 1.3. 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

- 2.1. The Contractor shall ensure that its operatives and site staff comply with the following with the respect to the restriction of working practices:
 - a. Food and Environment Protection Act 1985 (FEPA),
 - b. Control of Pesticides Regulations 1986,
 - c. Health & Safety at Work Act 1974,
 - d. Management of Health & Safety at Work Regulations 1999,
 - e. Control of Substances Hazardous to Health Act 2004 (COSHH),
 - f. Control of Asbestos at Work Regulations,
 - g. Suitable training should be given to operatives and staff that use substances hazardous to health during the performance of their duties,
 - h. A Certificate of Competence is required in respect of (g), 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

- 3.1. The public shall be protected from exposure to the following materials until they have set, cured or are no longer considered harmful or a risk:
 - a. Bituminous joint sealer,
 - b. Cements, concrete, mortars, and grouts and any additives,
 - c. Solvent based curing agents,
 - d. Bituminous pavement materials,
 - e. Bituminous waterproofing systems,
 - f. Grit blasting debris,

Appendix 1/23: Health & Safety Restrictions, Precautions and Monitoring (continued)

- g. Dust from cutting hardwoods,
 - h. Dust from cutting pipes (concrete or clay),
 - i. Dust from cutting concrete or brickwork,
 - j. Any other materials identified under the scheme specific COSHH register
- 3.2. The Contractor shall ensure that the Client is notified of any substances hazardous to health which may be used in connection with the contract. Full information, including manufacturers' hazard data sheets and the Contractor's own COSHH assessment, shall be provided by the Contractor to the Client for approval 28 calendar days prior to the use of any substance hazardous to health under COSHH Regulations 2004.
- 3.3. All work shall be planned to avoid generating dust. Where dust is generated and it is practical to do so, a water bowser, or other suitable dust suppressant or mechanical dust extractor, shall be on site to enable dust to be controlled. For minor cutting with hand tools, a fine water spray shall be used.
- 3.4. Live carriageways and footways shall be protected from dust or spray arising from a site which might otherwise reduce visibility. The Contractor shall take measures to prevent debris, dust, spray or other materials from affecting any live carriageway or footway.
- 3.5. The Contractor shall ensure that the protective measures stated in Highways Agency Advice Note SA 8/94 'Use of Substances Hazardous to Health in Highway Construction', incorporating Amendment No. 1 dated October 1994, are enforced. The following substances and activities are likely to be used during the works and may be hazardous to health:
 - a. Bituminous substances,
 - b. Proprietary materials or substances, and
 - c. Working in and around existing drainage systems.
- 3.6. Access shall be restricted until materials are cured. Consideration shall be given to wind, strength, temperature and traffic speed when assessing the foregoing.
- 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:

Appendix 1/23: Health & Safety Restrictions, Precautions and Monitoring (continued)

- a. The implementation of the 'Card' system to alert Health Services that the operative has been exposed to work in watercourses, drains and sewers,
- b. 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,
- c. The use of personal protective equipment and proper cleaning and maintenance of the same particularly to avoid exposing the skin to the hazard,
- d. 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 Cl. 3 below.
3. All disused soil and surface water drains, sewers, cables and ducts together with any bed, haunch or surround within 1m of formation level shall be removed and backfilled in accordance with Cl. 11, unless otherwise stated in Scheme Specific Works Information.
4. The ends of existing drains and sewers arising as a result of alterations of the drainage layout shall be sealed to comply with "Drainage pipes" in Section 1 of CC 500.
5. Superfluous and/or no longer required underground structures, chambers and foundations that are not to be completely removed shall be cleaned out and filled using general fill material to comply with "*General earthworks construction*" in Section 5 of CC 601.
6. Superfluous and/or no longer required underground structures, chambers and foundations that are not removed shall be perforated with holes made at 500mm centres to facilitate drainage unless stated in Scheme Specific Works Information.
7. Material used to fill superfluous and / or no longer required underground structures, chambers and foundations shall be compacted in accordance with "*Compaction of earthworks fill*" in Section 6 of CC 601.
8. Superfluous and/or no longer required underground structures, chambers and foundations that are not to be completely removed shall be free draining and not form a barrier to the horizontal or vertical movement of water.
9. Disused larger pipes, culverts, chambers or other voids where there is a risk of collapse and/or subsidence that are to be excavated, and the trench backfilled shall be excavated and backfilled in accordance with CC 601.
10. All trenches that are no longer required shall be backfilled to comply with Class 1, 2, or 3 fill material unless otherwise stated in Scheme Specific Works Information.
11. Class 1, 2, or 3 fill material shall comply with "*Acceptable earthwork material classes, properties, and frequency of testing*" in Section 3 of CC 601.

Appendix 2/2: Filling of Pipes and Trenches (continued)

12. Gullies to be abandoned shall be treated as follows:

- a. 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 in accordance with Cl. 11. Any pipe connection shall be treated in accordance with Cl. 4.



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 and bollards			
Road studs			
Traffic signals			
Road lighting columns			
Luminaires			
Electrical equipment			
Communications equipment			
Cables			
Timber arising from trees			
Other			

Table 2/3/1: Details of materials for proposed retention.

Notes:

- The above table contains examples of the items which may be considered for retention, this list is not exhaustive and can be added to where appropriate.
- Delivery location to be agreed on a scheme specific basis.
- The 'Requirements' list is available to detail the disconnection of electrical services, reinstatement of voids and similar.

Appendix 2/4: Explosives and Blasting

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



Appendix 2/5: Hazardous Materials

1. Where site clearance could involve handling and disposing of hazardous materials (e.g. asbestos) the Contractor should have discussions with the Environment Agency, appropriate health authority and/or the Health & Safety Executive.
2. The Contractor should include within this Appendix any specific requirements and/or, as a guide, measures which would be acceptable to them. Cross-reference to contract specific Appendix 1/23 maybe appropriate.
3. The Contractor should pay due regard to Construction (Design and Management) Act 2015 (CDM) and Control of Substances Hazardous to Health Act 2004 (COSHH).
4. 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)

1. Vehicle Restraint Systems General

- 1.1. Refer to the information required within Specification for Highway Works NG Series 0400 when detailing vehicle restraint systems (VRS).
- 1.2. Safety barrier, vehicle parapet (excluding concrete vehicle parapet), terminal, transition and crash cushion systems should conform to CD 377, various parts of BS EN 1317 and DD ENV 1317-4:2002.
- 1.3. The Contractor must specify VRS using performance class requirements and not by stipulating specific types of system.
- 1.4. The Contractor should use contract specific Appendix 4/1 to detail the performance requirements using a schedule (Table 4/1/1) and other contract specific requirements.

2. Vehicle Restraint Systems Requirements

- 2.1. The type of RRS, location and extents are shown on Drawing Numbers *[insert drawing numbers]*.
- 2.2. The minimum Performance Class Requirements:
 - a. Containment Level,
 - b. Impact Severity Level (ISL),
 - c. Working Width Class (W),
 - d. Vehicle Intrusion (VI),
 - e. Performance Level,
 - f. Redirection Zone (Z),
 - g. Permanent Lateral Displacement Zone Class (D),
 - h. Performance Class (P),
 - i. Permanent Lateral Displacement Zone (D.x.y),
 - j. Exit Box Class (Z),
- 2.3. Other requirements including:
 - a. the Length of Need,
 - b. the Setback,
 - c. the need for double or single VRS,
 - d. the minimum parapet heights,
 - e. requirements for pedestrian provision,
 - f. the maximum height that allows the required visibility,
 - g. for crash cushions, whether they should be redirective or non-redirective,
 - h. for crash cushions and terminals, whether they should be single sided or double sided,

Appendix 4/1: Road Restraint Systems (Vehicle and Pedestrian) (continued)

- i. the required clearance to any highway feature that is vulnerable to residual loading,
- j. the need for mitigation measures for motorcyclists,
- k. measures to reduce the risk of injury to pedestrians, equestrians and other vulnerable users (e.g. no sharp edges),
- l. plinth width for parapets.

3. Pedestrian Restraint Systems

- 3.1. The location and extents of pedestrian parapets and pedestrian guardrails are shown on Drawing Numbers [*insert drawing numbers*].
- 3.2. Requirements for pedestrian parapets and pedestrian guardrails - see also Table C.1 of BS 7818
- 3.3. 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.
- 3.4. Any additional corrosion protection system required.

4. Anti-glare Screens

- 4.1. The location and extents of anti-glare screens are shown on Drawing Numbers [*insert drawing numbers*].
- 4.2. Requirements for anti-glare screens giving performance requirements which are to be demonstrated by the Declaration of Performance including light screening capability and durability.

5. Safety Barriers, Terminals, Transitions and Crash Cushions

- 5.1. Requirements for safety barriers, terminals and transitions if different from the requirements of Cl. 401, 402 and 403.
- 5.2. Requirements for crash cushions if different from the requirements of Cl. 401 and 403. Contractor to specify whether redirective (R) or non-redirective (NR).
- 5.3. Any other details to be included as required:
 - a. Any special requirements e.g. environmental considerations, lengths of removable safety barrier, ground conditions and loading requirements for structures,

Appendix 4/1: Road Restraint Systems (Vehicle and Pedestrian) (continued)

- b. Specific connection requirements to existing safety barriers, vehicle parapets or other structures.

6. Vehicle Parapets Including Anchorages and Attachment Systems

- 6.1. Requirements for vehicle parapets if different from the requirements of Cl. 401 and 406.
- 6.2. 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 (Cl. 401).
- 6.3. Any additional corrosion protection system required (Cl. 402).
- 6.4. Aesthetic requirements for vehicle parapets (Cl. 406).
- 6.5. Requirements for anchorages and attachment systems if different from the requirements of Cl. 407 and the loading limitations of the structure.
- 6.6. Maintenance and/or repair requirements to include:
 - a. design, detail, performance and geometry requirements for replacement components,
 - b. state if the existing system is compliant with BS EN 1317-5 or a legacy system,
 - c. state the CE marking requirements for replacement components,
 - d. where known, state the performance characteristics of the existing parapet system,
 - e. state the requirements for this performance to be maintained.

7. Testing (cross-reference with Appendix 1/5 as appropriate)

- 7.1. Destructive testing for maintenance of legacy system.
 - 7.1.1. Requirements for provision of copies of certified reports of destructive tests and for supply of test components (Cl. 402.6(v) and 408).
- 7.2. Site Testing on Post Foundations for Contact Compliance
 - 7.2.1. Requirements for site load tests on safety barrier, terminal, transition and crash cushion post foundations (Cl. 404).
- 7.3. Inspection and Testing of Vehicle Parapet Posts
 - 7.3.1. Requirements for inspection if different from the requirements of Cl. 409.

Appendix 4/1: Road Restraint Systems (Vehicle and Pedestrian) (continued)

7.3.2. Requirements for static testing of posts if different from the requirements of Cl. 409.

7.4. Site Testing on Anchorages in Drilled Holes

7.4.1. Details of testing requirements for anchorage and attachment systems (Cl. 404 and 410).

8. Temporary Safety Barriers

8.1. The type of temporary safety barrier, location and extents are shown on Drawing Numbers [*insert drawing numbers*].

8.2. The minimum information required to include the following:

- I. Who is to provide temporary safety barriers (Cl. 405).
- II. Containment Level (Cl. 401).
- III. Impact Severity Level (Cl. 401).
- IV. Working Width Class (Cl. 401).
- V. Vehicle Intrusion Class (Cl. 401).
- VI. Locations to be provided (Cl. 405).
- VII. Location(s) for removal of temporary safety barrier on completion of the works (Cl. 405).
- VIII. Location(s) from which temporary safety barrier is to be collected and returned by the Contractor if provided by the Overseeing Organisation (Cl. 405).

9. Schedule of Road Restraint Systems (Vehicle and Pedestrian)

9.1. Complete the schedule (Table 4/1/1) 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 (P)	Impact Severity Level (ISL)	Working Width Class (W)	Vehicle Intrusion (VI)	Performance Level & whether Redirective (R) or Non-redirective (NR) whether Directional or Bi-directional	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

Table 4/1/1: Schedule of all Road Restraint Systems.

Notes to Contractor:

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.

Appendix 4/1: Information Required to Demonstrate Compliance of Transitions and Terminals to Clause 401

1. 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. no surcharge for 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, =1m
 - 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. 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.
- 1.11. The oblique junctions between existing drains and new drains/gully connections shall be to the detail shown on HWD 05.70 or 05.71.
- 1.12. 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 Cl. 503 and Tables 5/3 and 5/4.
- 2.3. Grading and geometrical requirements of filter material shall be in accordance with Cl. 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 in accordance with Cl. 518.

3. Construction

- 3.1. Backfilling of trench material, except for trenches in existing carriageway and paved areas, shall be in accordance with Cl. 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 Series 0600 Tables 6/1 and 6/4 of MCHW.

Appendix 5/1: Drainage Requirements (continued)

- 3.2. Where the bases of trenches formed on water soluble soils shall be sealed with a waterproof geotextile membrane. The geotextile membrane shall be in accordance with Clause 609.
- 3.3. All trenches in carriageway and paved areas shall be backfilled up to the underside of base layer with Cl. 803 or 807 sub-base.
- 3.4. 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 or 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.
- 3.5. All Carrier Drains with cover less than 1.2m within carriageways and less than 0.9m elsewhere shall have bedding and surround Type Z.
- 3.6. A list of alternative pipe, trench and bedding combinations for carrier and filter drains can be found in Tables 5/1/1 and 5/1/2.



Appendix 5/1: Drainage Requirements (continued)

List of Alternative Pipe, Trench and Bedding Combinations - Carrier Drain

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 Number	Trench & Bed Types					Trench & Bed Types			Trench & 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	-	-	-	ASBFN	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	S	S	S	S
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	S	S	-	S
900	14	-	-	-	-	-	AS	S	S	-	S

Table 5/1/1: Alternative trench and bedding types for carrier drains.

Appendix 5/1: Drainage Requirements (continued)

List of Alternative Pipe, Trench and Bedding Combinations - Carrier Drain (continued)

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 Number	Trench & Bed Types					Trench & Bed Types			Trench & Bed Types	
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

Table 5/1/1: Alternative trench and bedding types for carrier drains.

Appendix 5/1: Drainage Requirements (continued)

List of Alternative Pipe, Trench and Bedding Combinations - Filter Drains

Lower Trench Condition on HCD F2	Upper Trench Condition	Nominal Size Dia. (mm)	Pipe Group Number	Pipe Material							
				Vitrified Clay					Thermoplastic		
				L	95	120	160	200	Structured Wall	SRD 41	
H, I, K	Bedding material continues to ground level	150	✓	-	-	-	✓	✓	✓	✓	
H, I, K	Bedding material continues to ground level	225	✓	-	-	-	✓	✓	✓	✓	
H, I, K	See Scheme Specific Works Information	300	✓	-	-	-	✓	✓	✓	✓	

Table 5/1/2: Alternative trench and bedding types for filter drains.

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. Duct Chamber: Type	D1	HWD 05.41
	D2	HWD 05.42
	D3	HWD 05.43

4.2. Specific requirements are as follows:

- 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. Sulfate 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 Sulfate Resisting Portland cement.

4.3. 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 CD 534.

4.4. 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/catchpit complies with the equivalent chamber detailed in the Contract for the appropriate depth.

Appendix 5/1: Drainage Requirements (continued)

- Manholes and catchpits shall be provided for at:
 - I. Every change of gradient or alignment
 - II. Every change in size of pipe
 - III. A maximum spacing of 90m

5. Gullies

5.1. Gully schedules consist of the following, and the type references used are as follows:

- | | | |
|---------------|---|--|
| a. Gully Type | 1 | (not in use), |
| | 2 | HWD 05.67 (precast gully) |
| | 3 | HWD 05.65 (brick gully) |
| | 4 | HWD 05.68 (in-situ gully with plastic liner) |

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 with 450mm diameter,

5.6. Gullies shall be positioned so that:

- 5.6.1. The spacing of gullies does not exceed 50m along each channel.
- 5.6.2. Gullies to be positioned at the edge of the carriageway, against the kerb and within the channel.
- 5.6.3. Double gullies are provided at all low points on a concave channel profile. In this circumstance, separate connections should be made to each gully.
- 5.6.4. At all road junctions, pedestrian crossings and private drive entrances they are sited on the upstream side of the junction, crossing or drive.
- 5.6.5. The maximum length of connection is 20m.

5.7. Gully spacing design shall be carried out in accordance with CD 526.

5.8. The flow width for gullies shall be designed in accordance with CD 526 with specific reference to Table D1.

Appendix 5/1: Drainage Requirements (continued)

- 5.8.1. Where a road is anticipated to have high volumes of pedestrians crossing at uncontrolled points the maximum permitted flow width is 0.5m.
- 5.8.2. On wide carriageways with low anticipated pedestrian traffic or where road gullies are located along one channel then a 1m wide flow width may be applied.
- 5.8.3. At other locations 0.75m is generally acceptable 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.
- 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.

Appendix 5/1: Drainage Requirements (continued)

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.

8. Design of Gully Tops

8.1. Gully tops shall meet the following requirements:

- a. Compliance with BS EN 124, BS 7903 and CD 534
- b. 450mm x 450mm clear opening
- c. 150mm frame depth
- d. D400 strength
- e. 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 minutes
- c. Compressive strength $>20\text{N/mm}^2$ in 2 hours
- d. Tensile strength $>5\text{N/mm}^2$ in 3 hours

Appendix 5/1: Drainage Requirements (continued)

- 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 for Types 1 and 2 and HWD 05.32 for Types 3. Locations and types are as defined 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. Where geotextile membranes are specified in accordance with Cl. 609 the compiler should use contract specific Appendix 6/5 to detail performance requirements for the geotextile.
- 12.2. Requirements for Geotextiles: Geotextiles used as a separation filter in drainage works shall be CE marked as complying with BS EN 13249, BS EN 13251, BS EN 13252.
- 12.3. Where Type B filter media or no fines is specified in filter drains, with either topsoil or paving top, a geotextile will be required above the filter media or no fines concrete to prevent ingress/loss of fine material.
- 12.4. List of drawings and schedules to be contained in a Scheme Specific Appendix 5/4.

13. Narrow Filter Drains

- 13.1. Narrow filter drains refer to drain Type 8 and 9 as indicated in HCD F18. They consist of a porous or perforated pipe laid in a narrow trench surrounded by granular material where the granular material and/or the pipe is enclosed by a layer of geotextile filter.
- 13.2. The geotextile used in narrow filter drains shall comply with all requirements of Cl. 514.4 for geotextiles used in fin drains.
- 13.3. The pore size for the geotextile should be selected using filtration criteria to be compatible with the adjacent soil or construction layer in order to prevent the occurrence of piping, refer to Table NG 5/1.

Appendix 5/1: Drainage Requirements (continued)

- 13.4. List of drawings and schedules to be contained in a Scheme Specific Appendix 5/4.

14. Cleansing of Drainage Systems Adoptable by the Highway Authority

- 14.1. 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.
- 14.2. Where a maintenance period applies, the drainage system including gullies shall be cleansed prior to inspection for adoption.

15. Testing of Completed Drainage Systems

- 15.1. 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 Cl. 509 of the MCHW.

16. Chip-Free Channel Width Requirements

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

17. Attenuation and Control Features

- 17.1. As far as possible, attenuation and control features are not permitted in HMPE and should be designed to be off the adopted highway network.
- 17.2. 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.
- 17.3. Carriageway attenuation will only be accepted in exceptional circumstances by Staffordshire Highway Asset Departure agreement.

18. Sustainable Drainage Systems (SuDS) Features

- 18.1. Refer to the National SuDS Standards, National Planning Policy Framework and Planning Policy Guidance.
- 18.2. Where SuDS features such as swales, ditches and filter drains are proposed in lieu of piped drainage solutions, these must be designed and receive a technical check on a per-scheme basis for each development.

Appendix 5/1: Drainage Requirements (continued)

- 18.3. SuDS features must consider the risk of future deterioration from parking and overrunning from vehicles. This can be achieved through careful location planning or the use of physical delineation such as fencing or bollards.
- 18.4. Features must be clearly delineated from any adjoining properties to eliminate the risk of residents 'adopting' the feature as an extension of their property or unofficial access point.



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:
 - a. Types A MCHW HCD I2 (suffix number to A indicates number of ducts)
 - b. Types B MCHW HCD I2 (suffix number to B indicates number of ducts)
 - c. Type 6 HWD 05.52
 - d. Type 7 HWD 05.52
 - e. Type 8 HWD 05.52
 - f. Type 9 HWD 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 Drawing Numbers [insert drawing numbers]. 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

1. Due to their long-term maintenance requirements, combined drainage and kerb systems, and slot drainage channels, are to be used by pre-agreed Staffordshire Highway Asset Departure agreement only.
2. Where there is a requirement and this has been agreed through the appropriate request process then the chosen drainage system must meet the following criteria:
 - 2.1. The scheme specific drawings and schedules to 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.
 - 2.2. 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 in accordance with CG 501 and CG 526.
 - 2.3. Silt traps should be installed every 200m² and easily accessible for maintenance.
 - 2.4. Proprietary systems shall be installed in accordance with manufacturer's specification and recommendations.
 - 2.5. As a minimum 150mm backing concrete to ST3 and dowel bars should be present to protect kerbs from overrun damage.
 - 2.6. Special fittings shall be compatible with the drainage and kerb units used in accordance with the manufacturer's recommendations.
 - 2.7. Drainage system should comprise of a two-piece kerb block with separate interlocking base channel and top unit. The joints between the units making up the system, and between the channel and units must be watertight.
 - 2.8. The system shall be cleaned out by high pressure water jetting or other appropriate means on completion of the works. The system must be left clean and free from all obstructions.
 - 2.9. Access covers for rodding and other maintenance shall be provided at the start and end of every run of combined drainage and kerb system.
 - 2.10. Additional access units are to be provided no more than 100m apart, or as per the manufacturer's recommendation.
 - 2.11. Outfalls shall be trapped and be provided with an access cover.
 - 2.12. The contractor's attention is drawn to clause 516.7 of the SHW which states that the joints between the units shall be watertight.

Appendix 5/5: Combined Drainage and Kerb Systems (continued)

- 2.13. Cutting of units in order to obtain a shorter length of unit will not be accepted.
- 2.14. For curves of radii 30m or less, special units with appropriate splayed ends shall be used.
- 2.15. The kerb upstand shall be 125mm.
- 2.16. All combined kerb and drainage units shall be D400 loading class minimum to BS EN 124 and conform to BS EN 1433.
- 2.17. The hydraulic design of the system shall be carried out using the following design criteria:
 - a. Design rainfall to be taken as 50mm/hour
 - b. No surcharge for the 1 in 1 year storm event
 - c. No flooding for a return period of 1 in 5 years storm event



Appendix 6/1: Requirements for Acceptability and Testing 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 understands that the information provided in the Ground Investigation Borehole Logs is only representative of the conditions at that borehole or trial pit and therefore the results should not be considered as typical for the rest of the site.
3. The classification of earthwork materials shall be carried out using the requirements shown in Table 6/1/1 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.
 - 4.1. 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 6/1/1 of this Appendix.
 - 4.2. 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 U1A, U1B and U2 shall be composed of complying with the requirements of Cl. 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 6/1/1. 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 to be considered as:
 - a. material so designated in the Scheme Specific Works Information,or
 - b. 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 of Earthworks Materials (continued)

10. The contractors' attention is drawn to the Upper and Lower limits specified in Table 6/1/1 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 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	BS1377: Part 2	Table 6/2	Table 6/2	Table 6/4 Method 3
				ii) uniformity coefficient	see Note 5	-	10	
				iii) optimum mc	BS1377: Part 4 (4.5kg rammer method)	-	-	
				iv) mc	BS1377: Part 2 and Note 4	Optimum mc -2.0%	Optimum mc +1.0%	
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	BS1377: Part 2 or BSEN13242	Table 6/2	Table 6/2	Table 6/4 Method 3
				ii) uniformity coefficient	see Note 5	-	-	
				iii) optimum mc	BS1377: Part 4 (2.5 kg rammer method)	-	-	
				iv) mc	BS1377: Part 2 and Note 4	Optimum mc -2.0%	Optimum mc +1.0%	
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	BS1377: Part 2	Table 6/2	Table 6/2	Table 6/4 Method 5
				ii) uniformity coefficient	see Note 5	5	-	
				iii) Los Angeles Abrasion	Clause 635	-	50	

Appendix 6/1: Requirements for Acceptability and Testing 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	BS 1377: Part 2	Table 6/2	Table 6/2	Table 6/4 Method 1
				ii) MCV	Cl. 632	8	12.9	
				iii) Undrained shear strength of remoulded material	Cl. 633	App 6/1	App 6/1	
				iv) plastic limit (PL)	BS 1377: Part 2	-	-	
2B	Dry cohesive material	General fill	Any material, or combination of materials, other than chalk	i) grading	BS 1377: Part 2	Table 6/2	Table 6/2	Table 6/4 Method 2
				ii) MCV	Cl. 632	13	16	
				iii) undrained shear strength of remoulded material	Cl. 633	-	-	
				iv) plastic limit (PL)	BS 1377: Part 2	-	-	
2C	Stony cohesive material	General fill	Any material, or combination of materials, other than chalk	i) grading	BS 1377: Part 2	Table 6/2	Table 6/2	Table 6/4 Method 2
				ii) MCV	Cl. 632	8	16	
				iii) Undrained shear strength of remoulded material	Cl. 633	-	-	
				iv) plastic limit (PL)	BS 1377: Part 2	-	-	

Appendix 6/1: Requirements for Acceptability and Testing 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	BS 1377: Part 2	Table 6/2		Table 6/4 Method 3
				ii) optimum mc	BS 1377: Part 4 (2.5kg rammer method)	-	-	
				iii) mc	BS 1377: Part 2 and Note 4	Optimum mc -2.0%	Optimum mc +1.0%	
				iv) Undrained shear strength of remoulded material	Cl. 633	-	-	
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	BS 1377: Part 2 and Note 4	To enable compaction to Cl. 612		End product 95% of maximum dry density of BS 1377: Part 4 (2.5kg rammer method)
				ii) bulk density	BS 1377: Part 9	-	-	
4	Various	Fill to landscape areas	Any material	i) grading	BS 1377: Part 2	-	125mm	See Cl. 620
				ii) MCV	Cl. 632	6	18	
5A	Topsoil or turf, existing on site	Topsoiling	Topsoil or turf designated as Class 5A in the Contract	i) grading	Cl. 618	-	Cl. 618	-
5B	Imported Topsoil	Topsoiling	General purpose grade complying with BS3882	-	-	-	-	-

Appendix 6/1: Requirements for Acceptability and Testing 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	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	No compaction
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
				ii) uniformity	See Note 5	10	-	
				iii) plasticity index	BS 1377: Part 2	Non-plastic	Non-plastic	
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	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Table 6/4 Method 5
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
				ii) plasticity index	BS 1377: Part 2	Non-plastic	Non-plastic	
				iii) Los Angeles coefficient	Cl. 635	-	50	

Appendix 6/1: Requirements for Acceptability and Testing 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	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Table 6/4 Method 3
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
				ii) plasticity index	BS 1377: Part 2	Non-plastic	Non-plastic	
				iii) Los Angeles coefficient	Cl. 635	-	50	
				iv) uniformity coefficient	See Note 5	-	10	
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	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Table 6/4 Method 4
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
				ii) plasticity index	BS 1377: Part 2	Non-plastic	Non-plastic	
				iii) uniformity coefficient	See Note 5	-	10	

Appendix 6/1: Requirements for Acceptability and Testing 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.	i) grading	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Not applicable
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
			Properties (i), (ii) and (iii) shall not apply to chalk. Recycled Aggregate.	ii) mc	BS 1377: Part 2 and Note 4	-	-	
				iii) liquid limit	BS 1377: Part 2	-	45	
			Where material is imported into site which is not 'as dug' it shall be aggregate conforming to BS EN 13242	iv) plasticity index	BS 1377: Part 2	-	20	
				v) organic matter	BS 1377: Part 3	-	-	
				vi) water soluble sulfate content	BS EN 1744-1 cl.10	-	3000 mg/l as SO ₄	
				vii) oxidisable sulfides content	BS EN 1744-1 cl.13	-	0.6% as SO ₄	
			viii) SMC of chalk	Cl. 634	-	20%		

Appendix 6/1: Requirements for Acceptability and Testing 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 (vi) shall not apply if the asphalt content of any recycled aggregate is 20% or less. Where material in this class is imported onto site it shall be classified as 6F5 and comply with the requirements for that material.	i) grading	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Table 6/4 Method 6
				ii) optimum mc	BS 1377: Part 4 (vibrating hammer method)	-	-	
				iii) mc	BS 1377: Part 2 and Note 4	Optimum mc -2%	Optimum mc	
				iv) Los Angeles coefficient	Cl. 635	-	50	
				v) Class Ra (asphalt) content	Cl. 710	-	50%	
				vi) bitumen content	BS EN 12697-1 or BS EN 12697-39	-	2.0%	

Appendix 6/1: Requirements for Acceptability and Testing 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	
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 Aggregates from mixed recycled aggregate shall contain at least 50% of constituents in Class Ra (bituminous materials)	i) grading	BS 1377: Part 2 (On-site)	Table 6/2	Table 6/2	Table 6/4 Method 6 Maximum compacted layer thickness shall be 200mm
					BS EN 933-2 (Imported to site)	Table 6/5	Table 6/5	
				ii) optimum mc	Cl. 613	-	-	
				iii) mc	Cl. 613 and Note 4	Optimum mc -2%	Optimum mc	
				iv) bitumen content	BS EN 12697-1 or BS EN 12697-39	-	10%	

Appendix 6/1: Requirements for Acceptability and Testing 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 in Class Ra (bituminous materials). Property (x) in the next column shall not apply if the Class Ra (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, cl.5.3 – declared values	-	-	
				viii) Water content	BS EN 1097-5	Optimum wc -2%	Optimum wc	
				ix) Class Ra (asphalt) content	Cl. 710	-	50%	
				x) bitumen content	BS EN 12697-1 or BS EN 12697-39	-	2.0%	

Appendix 6/1: Requirements for Acceptability and Testing 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	BS 1377: Part 2 (on site)	Table 6/2	Table 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)
					BS EN 933-2 (imported to site)	Table 6/5	Table 6/5	
				ii) uniformity coefficient	See Note 5	10	-	
				iii) Los Angeles coefficient	Cl. 635	-	40	
				iv) undrained shear parameters (c and ϕ)	Cl. 633	App 6/1	-	
				v) effective angle of internal friction (ϕ') and effective cohesion (c')	Cl. 636	App 6/1	-	
				vi) permeability	Cl. 640	App 6/1	-	
				vii) mc	BS 1377: Part 2	App 6/1	App 6/1	
	viii) Slope stability test	Cl. 610	App 6/6	App 6/6				

Appendix 6/1: Requirements for Acceptability and Testing 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	
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	BS 1377: Part 2 and Note 4	As stated for Class 1 or Class 2 as acceptable material		Table 6/4

Table 6/1/1: Acceptable Earthworks Materials: Classification and Compaction requirements.

Footnotes to Table 6/1/1:

1. App = contract specific Appendix
2. Where in the Acceptable Limits column reference is made to App 6/1, only those properties having limits ascribed to them in contract specific Appendix 6/1 shall apply. Where contract specific Appendix 6/1 gives limits for other properties not listed in this Table such limits shall also apply.
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 conform to a harmonised European Standard.
5. Uniformity coefficient is defined as the ratio of the particle diameters D_{60} to D_{10} on the particle-size distribution curve, where:
 - a. D_{60} = particle diameter at which 60% of the soil weight is finer.
 - b. D_{10} = particle diameter at which 10% of the soil weight is finer.
6. Refer to Manual of Contract Documents for Highway Works Volume 1 Series 600, Table 6/1 for full list of permitted constituents.
7. Refer to Manual of Contract Documents for Highway Works Volume 1 Series 600, Table 6/7 for full list of permitted constituents.

Appendix 6/2: Requirements for Dealing with Class U1B and Class U2 Unacceptable Material

1. General Requirements

- 1.1. The Contractor shall be responsible for the detailed classification of any waste (Class U1B & U2) materials for disposal purposes in accordance with the Local Authority/EA Regulations and for any testing on imported materials in order to ensure they are not classed as Hazardous under *Technical Guidance WM3 - Guidance on the Classification and Assessment of Waste*. The Contractor shall be deemed to be the producer of the waste.

2. Suspected Class U1B and U2 Materials

- 2.1. Where Class U1B and U2 material is known to be present, specific requirements will be provided in the Scheme Specific Site Information.
- 2.2. If the Contractor encounters or suspects the presence of any Class U1B or U2 material that has not already been identified in the Contract, they shall cease any excavation work in that area immediately and notify the Overseeing Organisation.
- 2.3. A method statement shall be prepared by the Contractor in consultation with the Overseeing Organisation detailing how this or any other potentially contaminated material will be sampled and tested before commencing any works in that vicinity.
- 2.4. Should leachate or potentially contaminated waters be encountered they should be collected and stored in tanks or lined ponds. Samples will be taken and scheduled for laboratory testing to determine the nature and concentration of any contamination.
- 2.5. The Contractor is responsible for carrying out all suspected material sampling, testing and any associated costs.

3. Disposal of U1B and U2 Material

- 3.1. Transportation off site of Class U1B and U2 material will be in accordance with Local Authority requirements, statutory regulations and relevant legislation. If the Contractor does not possess the relevant licences for handling the Class U1B and U2 material, including asbestos, they shall appoint a licenced subcontractor (approved by the relevant Authorities) to handle the material.
- 3.2. Material shall be disposed of to an appropriately licenced facility in accordance with the current Waste Management legislation and associated statutory instruments. Prior to removal of U1B and U2 material from the site, the Contractor shall submit to the Overseeing Organisation copies of Waste Disposal Noticed and Waste Carrier Notices.

Appendix 6/2: Requirements for Dealing with Class U1B and Class U2 Unacceptable Material (continued)

- 3.3. During the tipping operation, the Contractor shall submit to Overseeing Organisation copies of the transfer notes which shall include a description of each classification of U1B and U2 contaminated material.
- 3.4. No such material shall leave the site without the approval of the Overseeing Organisation. The Contractor shall keep records of the materials removed.



Appendix 6/3: Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction)

1. Excavation

- 1.1. Requirements for earthworks are shown on Drawing Numbers [*Insert drawing numbers*].
- 1.2. The earthworks shall be constructed to the lines and levels shown on the drawings and on the setting out data. Embankments shall be overfilled and trimmed back to provide the specified compaction of all parts of the embankment, including the slope faces.
- 1.3. 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.
- 1.4. All topsoil shall be completely removed prior to the excavation of acceptable material. Where required for further use all topsoil is to be stockpiled in an area provided by the contractor and agreed with the Overseeing Organisation.
- 1.5. Explosives and blasting for excavation shall not be permitted as an alternative to normal excavation practices.
- 1.6. Treatment of cutting faces that are not to receive topsoil shall be as described in Cl. 603.5 and 603.6. The locations and extent of these faces are shown Drawing Numbers [*Insert drawing numbers*].
- 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.
- 1.9. The Contractor shall take all measures required by any Statutory Undertakers, the Management of other publicly owned services, or owners of privately owned services or supplies for the support, protection, backfilling and compaction of material below, adjacent to and above Statutory Undertakers apparatus whether exposed or buried.

2. Depositions and Fills

- 2.1. Requirements for fills, including embankments, are shown on Drawing Numbers [*Insert drawing numbers*].

Appendix 6/3: Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction) (continued)

- 2.2. The fills, including embankments, shall be constructed to the lines and levels shown on the drawings and on the setting out data.
- 2.3. Requirements for starter layers are shown on Drawing Numbers [*Insert drawing numbers*].
- 2.4. All topsoil shall be completely removed prior to the deposition of acceptable material. Where required for further use all topsoil is to be stockpiled in an area provided by the contractor and agreed with the Overseeing Organisation.

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. 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.

Appendix 6/3: Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction) (continued)

- 4.2. Where the existing ground is shown to be benched on the Scheme Specific drawing(s) then;
- a. 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,
 - b. 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.
- 4.4. Interfaces between different classes of fill (except topsoil) or fill placed at different times shall be benched as follows, unless stated otherwise in the Scheme Specific Site Information.
- 4.4 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.

5. 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 and seeded, as indicated in Appendices 6/8 and 30/5, to prevent subsequent erosion of the slopes.

Appendix 6/3: Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction) (continued)

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.
- 6.2 No fill shall be placed and left uncompacted at the end of a working day. Compacted fill shall be graded to falls to ensure free run-off of rainwater without ponding.
- 6.3 Trafficking of the fill by any plant other than compaction plant shall not constitute or be a substitute for compaction plant both for the trials or the works proper.
- 6.4 If weather conditions are such that the specified moisture content and density values cannot be achieved, the Contractor shall cease work until such time that the fill can be placed and compacted to meet specification requirements.
- 6.5 In Table 6/4, column headed N#, the number of passes shown is to be doubled for material Classes 1A, 1B, 2A, 2B, 2C and 2D when such materials occur within 600 mm of sub-formation (if capping is required) or formation.

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 spoil to 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.
- 7.3 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.

Appendix 6/3: Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction) (continued)

- 7.4 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.
- 7.5 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. General

- 1.1. Where required, geotextiles will be specified in the 'Scheme Specific' site information and locations, including details of laying and overlapping, shown on Drawing Numbers [*Insert drawing numbers*].



Appendix 6/6: Fill to Structures and Fill Above Structural Foundations

1. General

- 1.1. Where required, fill to structures and fill above structural foundations will be specified in the 'Scheme Specific' site information and locations shown on Drawing Numbers [*Insert drawing numbers*].



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), numbers [*Insert drawing numbers*].
- 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 Table 6/7/1.

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

Table 6/7/1: Soil types and their corresponding Equilibrium CBR test results.

Notes:

- Granular material with greater than 15% passing 63µm test sieve will be considered on a site specific basis.
- CBR values for made or placed ground may be determined using in-situ methods if the material is granular in nature.
- Once CBR values have been determined, the layer thickness of pavement foundation construction may be assessed according to Table 6/7/2.

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

Table 6/7/2: Prescribed layer thicknesses based on formation CBR value.

Notes:

- This table serves as guidance only and formation may be assessed alternatively by using *CD 225 - Design for new pavement foundations*.

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) numbers [*Insert drawing numbers*].
- 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 the 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 Cl. 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) numbers [*Insert drawing numbers*]. 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) numbers [*Insert drawing numbers*]. The use of Class 4 fill materials and compaction to the requirements of Cl. 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 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

1. The Mean Annual Frost Index (MAFI) 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 the 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 Cl. 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. PSV and AAV values shall be selected by reference to Cl. 975AR.
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) and coloured surfacing are not permitted for general use. See Cl. 975AR.
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 Cl. 702 Table 7/2 for new build schemes, or SROH S2.4 Table S2.3 for reinstatements.

Appendix 7/1: Permitted Pavement Options (continued)

Permitted Pavement Options - Schedule 1 (continued)

14. For pavement thickness design guidance utilising permitted Base and Binder courses in Schedule 5, refer to *HD 26/06 Pavement Design (Withdrawn)*. *HD 26/06* must be used because the current version of *CD 226 - Design for New Pavement Construction* does not contain this Specification's required base and binder course materials.
15. For chip-free drainage channel requirements, see Appendix 5/1 Cl. 16.
16. Sealing grit is a mandatory requirement for all SMA surface courses and shall be applied in accordance with Cl. 971AR.
17. Where 35/14 HRA and Pre-Coated Chippings has been specified (SC2 of Schedule 5), a chip-less strip of maximum 50mm width is permitted around ironworks in the carriageway.

Permitted Pavement Options - Schedule 2

Schedule 2: General Requirements		
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 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 Scheme Specific Works Information.
Whether measurement of surface texture is required.	Average: Maximum: Minimum:	As stated in Scheme Specific Works Information.

Permitted Construction Materials - Schedule 3

1. See Scheme Specific Works Information with reference to Schedule 5 of this Appendix.

Requirements for Construction Materials - Schedule 4

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

Appendix 7/1: Permitted Pavement Options (continued)

Requirements for Construction Materials - Schedule 5

Material Category	Clause	Description	British Standard	General Requirements
SC1 (Modified) Only permitted on < 30mph low risk locations.	911	HRA 55/10 F surf 100/150 des	EN13108-4 / PD 6691 Annex C Table C2.A col 5 as modified by these general requirements	Minimum target binder 5.8% Coarse aggregate: crushed rock only excluding limestone. No recycled aggregate to be used in the mix. Minimum PSV and Maximum AAV: See Cl. 975AR. (Refer to note a).
SC2 Preferred on > 30mph and heavily trafficked locations.	911 & 915	HRA 35/14 F surf 40/60 des 14/20 pre-coated chippings	EN13108-4 / PD 6601 Table C.2A col 7. Limiting wheel track values PD 6691 Table C.4. PD6691 Annex C	Coarse aggregate: crushed rock only excluding limestone. No recycled aggregate to be used in the mix. Minimum PSV: 45. Maximum AAV: 12. Minimum PSV and Maximum AAV: See Cl. 975AR. (Refer to note a).
SC3	Cl. 971 AR	SMA 10 surf 40/60	As modified by Cl. 971AR of this document	Coarse aggregate: single source crushed rock only. Minimum PSV and Maximum AAV: See Cl. 975AR. Sealing grit to be applied in accordance with Cl. 971AR.
SC4	Cl. 971 AR	SMA 6 surf 40/60 for c/way surface course or regulating or 100/150 for f/ways	EN13108-1 / PD 6691 Appendix D	Coarse aggregate: crushed rock only. Minimum PSV: 45 for f/way. Maximum AAV: N/A.
SC5	Cl. 909	AC 6 dense surf 160/220	PD 6691 Table B.15	Coarse aggregate: crushed rock only excluding limestone. Minimum PSV: 45.
SC6	Cl. 911	HRA 45/10 F surf 100/150	-	For use by prior agreement only in speed cushions and other minor patching areas.
SC7		Alternative proprietary surface course material. Refer to Note D.	-	Coarse aggregate: crushed rock only. Minimum PSV and Maximum AAV: See Cl. 975AR Limiting wheel tracking values, texture depth, etc, to be specified on a site-specific basis.

Appendix 7/1: Permitted Pavement Options (continued)

Requirements for Construction Materials - Schedule 5 (continued)

Material Category	Clause	Description	British Standard	General Requirements
SG	971AR	Coated sealing grit	BS 4987:1 Cl. 7.9	Lightly coated to allow free flow. Minimum PSV: 55.
Bond	920	Bond coat	BS 594987 Cl. 5.5	-
BC1	906	AC 20 dense bin 100/150 rec (160/200 for footways)	PD 6691 Table B.11	Coarse aggregate: crushed rock or crushed gravel only (use of gravel should reduce penetration grade to 40/60 pen 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 should 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. If binder course is to be exposed for longer than one month and/or trafficked refer to Note C. 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.
BC5	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	906	AC 20 dense bin 100/150 rec	PD 6691 Table B.11	Coarse aggregate: crushed rock excluding limestone. If binder course is to be exposed for longer than one month and/or trafficked refer to Note C. Thickness: See 7/1 Cl. 14.
BC7		Alternative proprietary binder course material	-	Refer to Note E.
Fly Ash Bound Mixture	830	FABM - 1	Cl. 890AR	Mechanical Performance Level C ^{6/8} .

Appendix 7/1: Permitted Pavement Options (continued)

Requirements for Construction Materials – Schedule 5 (continued)

Material Category	Clause	Description	British Standard	General Requirements
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 should 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 <i>Specification for the Reinstatement of Openings in Highways</i> . Preferred backfill for excavations over 1.5m.

Notes:

- Materials other than SC1 and SC2 are permitted through SC3 – SC7, however their use must be justified on a scheme specific basis.
- The use of Polymer Modified Binder (PMB) instead of the specified pen stiffness is **only** permitted on a scheme specific basis, for a specific purpose, and must be **reviewed by the Staffordshire Highways Laboratory (SHL)**.
- For binder course materials BC3 and BC6, where these are to be exposed for longer than one month and/or trafficked then an enriched bituminous mix must be used. An enriched mix must have a minimum target binder content 0.5% above the requirement in Table B.6, B.7 or B.11 as appropriate. When trafficked (under traffic management) a minimum PSV of 55 is required.
- Alternative surface course material, SC7, may be specified in a site-specific Appendix 7/1.
- Alternative binder course material, BC7, may be specified in a site-specific Appendix 7/1.
- 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.
- Low temperature asphalt is the default material of choice between March and October and can be used outside this period with agreement. Refer to Cl. 973AR.
- See Cl. 970AR for air void specification.
- See Cl. 971AR for SMA specification.

Appendix 7/1: Permitted Pavement Options (continued)

Requirements for Construction Materials - Schedule 5 (continued)

- j. Product specifications must 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.
- k. The use of recycled aggregate in surface course is not permitted due to concerns over long term durability.
- l. 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.
- m. Asphalt shall be machine laid, except where the Supervisor has agreed otherwise.



Appendix 7/1: Permitted Pavement Options (continued)

Requirements for Construction Materials - Schedule 6

1. Schedule 6a - Texture Depth for Stone Mastic Asphalt and Unchipped Hot Rolled Asphalt Only

Level	Texture Depth (mm)		Traffic Speed
	Maximum	Minimum	
3	1.8	1.0	85 th percentile $\geq$ 50mph
2	1.5	0.7	Posted limit 40mph
1	1.3	0.6	Posted limit $\leq$ 30mph
0	NR	NR	Posted limit $\leq$ 30mph for 55/10 and 45/10 HRA only (<i>Refer to note b</i>).

Notes:

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

2. Schedule 6b - Texture Depth for Chipped Hot Rolled Asphalt Only

Level	Texture Depth (mm)		Traffic Speed
	Maximum	Minimum	
4	2.0	1.2	85 th percentile $\geq$ 50mph
3	1.8	1.0	Posted limit $\leq$ 40mph

Notes:

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

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces

1. General

- 1.1. The purpose of this section is to provide guidance for large areas of patching required as part of major projects, junction connections and utility trenches. It is not to be applied to routine and preventative maintenance activities.

2. Excavation of Existing Surfaces

- 2.1. 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.
- 2.2. Longitudinal joints shall be stepped to provide a minimum 300mm horizontal offset between joints in overlaying pavement layers.

3. Reinstatements of Existing Surfaces

- 3.1. The reinstatement of existing surfaces is required at the locations shown on the relevant Scheme Specific Drawing(s) [*Insert drawing numbers*].
- 3.2. 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 BC1).
- 3.3. 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.

4. Junctions Between New and Existing Pavements/Paved Areas

- 4.1. The locations of the junctions between new and existing pavements/paved areas are shown on the relevant Scheme Specific Drawing(s) [*Insert drawing numbers*].
- 4.2. 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.
- 4.3. All transverse joints shall be saw cut vertical. Vertical faces shall be painted with edge sealant, prior to the laying of bituminous materials.

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

5. Permanent Patching Including Surface Dressing Pre-Patching

- 5.1. Work shall be carried out following the principles and performance requirements set out in the '*Specification for Reinstatement of Openings in the Highway*', except where stated otherwise in this document.
- 5.2. For guidance on selecting the most appropriate patching materials refer to Cl. 974AR.
- 5.3. 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.
- 5.4. 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.
- 5.5. 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, particularly the bond between layers. Any loose, damaged or de-bonded material or standing water shall be removed.
- 5.6. Where deep repairs are carried out reinstatement shall be stepped by a minimum of 100mm at 100mm below road surface level.
- 5.7. 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 2m² edge sealant may be used in lieu of bond coat; tack coat is not suitable for use as edge sealant.
- 5.8. 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.
- 5.9. 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.

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

- 5.10. Footway surface course material shall generally be AC 6 dense surf 160/220 (Appendix 7/1 Schedule 5 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.
- 5.11. In small (< 2m²) or narrow (< 300mm) excavations, multiple lifts of appropriate surface course material may be used in place of binder course material.
- 5.12. All bituminous mixtures shall be compacted within the temperature ranges and lift/layer thickness limits shown in Table 7/2/1, 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 in-situ mobile heating plant. In-situ 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 7/2/2.
- 5.13. Requirements for compaction plant and associated lift thickness and number of passes are given in Table 7/2/3.
- 5.14. Surface texture and surface regularity shall be as detailed in the '*Specification for Reinstatement of Openings in the Highway*'.
- 5.15. Aggregate PSV requirements are given in full in Cl. 975AR. An abbreviated version, from the '*Specification for Reinstatement of Openings in the Highway*', is shown here as Table 7/2/4. Cl. 9 of Appendix 7/1 applies.
- 5.16. Where overbanding is used, it should be in accordance with the requirements of 974AR - Permanent Maintenance Pavement Guidance and '*Specification for Reinstatement of Openings in the Highway*' S6.8.8.
- 5.17. 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 with the following caveats:
 - a. Minimum repair to the full depth of the surface course, where the binder course is sound.
 - b. Where failure extends beyond surface course, repair to full depth of failure.

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

c. Where bound material does not achieve minimum construction standards, repair is to be carried out to the extent of bound material meets unbound material.

5.18. Particular attention is to be paid to the requirements of '*Specification for Reinstatement of Openings in the Highway - Proximity to road edges and fixed features*' (S6.8.9) when carrying out reinstatements in the carriageway.

6. Alternative Permanent/Semi-permanent Repair Methods

6.1. Refer to Appendix 7/22.



Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

Asphalt Material	Binder Grade (pen)	Maximum Temperature (°C)	Minimum Temperature (°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 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

Table 7/2/1: Material temperature ranges and compacted lift thicknesses.

Notes:

* Measured in the lorry within 30 minutes of arrival on site.

- For coated slag mixtures 10 °C lower may be used.
- Greater effort for compaction may be required to achieve an acceptable air voids ration as the temperature approaches the lower limit.
- For lower temperature asphalts refer to Cl. 973AR.

Asphalt Material	Permitted Air Voids			
	Carriageways		Footways	
	Max %	Min %	Max%	Min %
AC 6 dense surf	Not Permitted	Not Permitted	13	2
AC 10 close surf	11	2	Not Permitted	Not Permitted
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	Not Permitted	Not Permitted
PCSM Materials	10	2	13	2

Table 7/2/2: Material type and the permitted percentage of air voids.

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

Compaction Plant and Weight Category	Minimum Passes/Lift for compacted lift thickness up to			
	40mm	60mm	80mm	100mm
Vibrotamper				
50kg minimum	5*	7*	Not Permitted	Not Permitted
Vibrating Roller Single Drum				
600-1000kg/m ²	10	12	Not Permitted	Not Permitted
1000-2000kg/m ²	6	10	Not Permitted	Not Permitted
2000-3500kg/m ²	5	7	8	Not Permitted
Over 3500kg/m ²	4	6	7	Not Permitted
Vibrating Roller Twin Drum				
600-1000kg/m ²	5	7	Not Permitted	Not Permitted
1000-2000kg/m ²	4	5	6	8
Over 2000kg/m ²	3	4	4	6
Vibrating Plate				
1400-1800kg/m ²	6	Not Permitted	Not Permitted	Not Permitted
Over 1800kg/m ²	3	5	6	8
All the above plant	For maximum and minimum compacted lift thickness refer to 'Specification for Reinstatement of Openings in the Highway' Appendix A2.6, Table A2.1.			
Alternative compaction plant for areas of restricted access (including small excavations and trenches less than 200mm width)				
Vibrotamper 25kg minimum	Minimum of 6 compaction passes			
Percussive Rammer 10kg minimum	Maximum of 75mm compacted lift thickness			

Table 7/2/3: Requirements for compaction plant and associated lift thickness.

Notes:

* Vibrotamper not permitted for use on permanent surface course.

- Twin drum vibrating rollers are preferred for compaction of bituminous mixtures.
- Single drum vibrating rollers provide vibration on only one drum.
- Twin drum vibrating rollers provide vibration on two separate drums.

Appendix 7/2: Excavation, Trimming and Reinstatement of Existing Surfaces (continued)

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

Table 7/2/4: Minimum reinstatement PSV based on road type and risk level.

Appendix 7/3: Surface Dressing – Performance Specification

1. Description of Existing Surface

1.1. To be included in works information required for design.

2. Road Hardness

2.1. To be recorded where possible and included in works information required for design.

3. System of Surface Dressing Permitted

3.1. To be agreed and recorded in works information.

4. Minimum Texture Depth at End of a Two-Year Period

4.1. In accordance with MCHW Volume 2 Series NG 900 Table NG 9/18.

5. Maximum Texture Depth after 4 Weeks Trafficking

5.1. Not Used.

6. Maximum Percentage Decrease in Macrotexture Between 12 Months and 24 Months Following Start of Trafficking

6.1. Not Used.

7. Frequency of Testing for Roads Other Than Trunk Roads and Motorways

7.1. In accordance with Appendix 1/5.

8. Defect Category: Fatting Up, Tracking and Bleeding (% Area P_1)

8.1. In accordance with MCHW Volume 2 Series NG 900 Table NG 9/20.

9. Defect Category: Scabbing and Tearing (% Area Affected P_2)

9.1. In accordance with MCHW Volume 2 Series NG 900 Table 9/21.

10. Defect Category: Fretting (% Chipping Loss P_3)

10.1. In accordance with MCHW Volume 2 Series NG 900 Table 9/22.

11. Defect Category: Streaking (Length of Streaking m P_4)

11.1. In accordance with MCHW Volume 2 Series NG 900 Table 9/23.

12. Special Restrictions

12.1. 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 7/4: Bond Coat, Tack Coat and other Bituminous Sprays

1. Tack Coat

- 1.1. Tack coat is no longer considered best practice and is not to be used without prior agreement.

2. Bond Coat

- 2.1. Bond coat shall be applied prior to the laying of a new asphalt layer on any bound substrate.
- 2.2. Bond coat shall be applied in accordance with BS 594987 Cl. 5.5.
- 2.3. 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.
- 2.4. Overspray shall be minimised and should not extend up the face of kerbs.
- 2.5. The Contractor shall provide the following information with their tender, or prior to the commencement of the work:
 - a. The product or products they propose to use, together with their data sheets, product identification data, cohesivity data as specified.
 - b. 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.
 - c. The spraying equipment proposed, and a test certificate.
 - d. The source or sources of any blinding material proposed.
 - e. Contingency plans in the event of any breakdown.
 - f. 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. General

- 1.1. The breaking up and perforation of existing surfaces shall be carried out at the locations shown on the relevant Scheme Specific Drawing(s) [*Insert drawing numbers*].
- 1.2. Details of the construction and thickness of existing pavement to be broken up or perforated are stated in the Scheme Specific Works Information.
- 1.3. Areas of existing pavement to be perforated shall receive a minimum of 8 perforations per square metre.
- 1.4. Perforations shall be a minimum of 50 millimetres diameter and penetrate the full depth of the material to be perforated.
- 1.5. 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. General

- 1.1. The cold milling of existing surfaces shall be carried out at the locations shown on the relevant Scheme Specific Drawing(s) [*Insert drawing numbers*].
- 1.2. Details of the thickness of existing pavement to be cold milled are shown on the relevant Scheme Specific Drawing(s).
- 1.3. 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. General

1.1. Site description, location details and depth of recycling.

- | | |
|--|----------------------------------|
| a. Overall location | reference to drawings |
| b. Section details | reference to drawings & sections |
| c. Location of services | reference to drawings & sections |
| d. Depth of recycled layer |mm |
| e. Location and condition of drainage | reference to drawings & sections |
| f. Type and severity of deterioration | reference to drawings & sections |
| g. Subgrade bearing capacity & condition | |
| h. Edge detail and verge condition | reference to drawings & sections |
| i. Future traffic loading | |

1.2. Type of lime required for modification of cohesive soils:

.....

1.3. Locations of stockpiles of excess pulverised materials awaiting re-use elsewhere.

1.4. Rate of application of bitumen emulsion sealant sprayl/m²

1.5. Minimum elastic modulus within 24 hours obtained using a dynamic plate or penetration test;

- | | |
|--|--------|
| a. Single point value | MPa |
| b. Mean value | MPa |
| c. Min % increase of single point elastic modulus values |% |
| d. Min % increase of mean elastic modulus values |% |
| e. Absolute minimum added bitumen content |% |

1.6. Nominal grid pattern

1.7. Rolling mean of 10 FWD derived stiffness values shall not be less thanMPa and no individual result less than 85% of MPa.



Appendix 7/22: Repairs to Potholes

1. General

- 1.1. 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. Road Stud Holes

- 2.1. 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. General

1.1. Site description, location details and depth of recycling.

- | | |
|--|----------------------------------|
| a. Overall location | reference to drawings |
| b. Section details | reference to drawings & sections |
| c. Location of services | reference to drawings & sections |
| d. Depth of recycled layer |mm |
| e. Location and condition of drainage | reference to drawings & sections |
| f. Type and severity of deterioration | reference to drawings & sections |
| g. Subgrade bearing capacity & condition | |
| h. Edge detail and verge condition | reference to drawings & sections |
| i. Future traffic loading | |

1.2. Type of lime required for modification of cohesive soils:

.....

1.3. Locations of stockpiles of excess pulverised materials awaiting re-use elsewhere.

1.4. Rate of application of bitumen emulsion sealant sprayl/m²

1.5. Minimum elastic modulus within 24 hours obtained using a dynamic plate or penetration test;

- | | |
|--|--------|
| a. Single point value | MPa |
| b. Mean value | MPa |
| c. Min % increase of single point elastic modulus values |% |
| d. Min % increase of mean elastic modulus values |% |

1.6. Nominal grid pattern.

1.7. Rolling mean of 10 FWD derived stiffness values shall not be less thanMPa and no individual result less than 85% of MPa.



Appendix 11/1: Kerbs, Footways and Paved Areas

1. General

- 1.1. Unless stated otherwise in the Scheme Specific Works Information kerbs, channels, edgings, footways and paved areas shall be as described in the following specifications.
- 1.2. Standard requirements for kerbs, channels, edgings, combined drainage and kerb blocks are as listed in Table 11/1/1.
- 1.3. Unless stated otherwise in the Scheme Specific Works Information all concrete used for foundations, bedding, backing, and additional concrete used for the installation of kerbs, edgings, channel blocks, combined drainage units, kerb blocks, or any other proprietary pre-cast concrete units, shall have a minimum Class ST3.

2. Kerbing

Type	HWD Ref.	Material	Profile	Dimensions (mm)	Foundation Thickness (mm)
K1	11.01	Pre-cast concrete	HB2	125 x 255	150
K2	11.01	Pre-cast concrete	SP	125 x 255	150
K3	11.01	Pre-cast concrete	BN	125 x 150	180
K4	11.47.1 & 11.47.2	Pre-cast concrete	Bus docking		250
K5	11.05	Pre-cast concrete	High containment	390 x 410 nominal	200
K6	11.02	Pre-cast concrete	HB2	125 x 255	150
K7	11.02	Pre-cast concrete	SP	125 x 255	150
K8	11.02	Pre-cast concrete	BN	125 x 150	150
K9	11.47.3 & 11.47.4	Pre-cast concrete	HB1	125 x 305	250
T1	11.01	Pre-cast concrete	TL (HB to SP)	125 x 255	150
T2	11.01	Pre-cast concrete	TR (SP to HB)	125 x 255	150
T3	11.01	Pre-cast concrete	DL1 (HB to BN)	125 x 255 to 150	150
T4	11.01	Pre-cast concrete	DR1 (BN to HB)	125 x 150 to 255	150
T5	11.01	Pre-cast concrete	DL2 (SP to BN)	125 x 255 to 150	150
T6	11.01	Pre-cast concrete	DR2 (BN to SP)	125 x 150 to 255	150
T7	11.47.1 & 11.47.2	Pre-cast concrete	Proprietary products	250	250
T8	11.02	Pre-cast concrete	TL (HB to SP)	125 x 255	150

Continued overleaf...

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

Type	HWD Ref	Material	Profile	Dimensions (mm)	Foundation Thickness (mm)
T9	11.02	Pre-cast concrete	TR (SP to HB)	125 x 255	150
T10	11.02	Pre-cast concrete	DL1 (HB to BN)	125 x 255 to 150	150
T11	11.02	Pre-cast concrete	DR1 (BN to HB)	125 x 150 to 255	150
T12	11.02	Pre-cast concrete	DL2 (SP to BN)	125 x 255 to 150	150
T13	11.02	Pre-cast concrete	DR2 (BN to SP)	125 x 150 to 255	150

Table 11/1/1: Specification for pre-cast concrete kerbs.

Notes:

- Profile reference is taken from BS EN 1340.
- 2.1. 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).
 - 2.2. Transition Types T1 and T2 shall be used at the junction between kerb Types K1 and K2. Likewise, transition Types T8 and T9 shall be used at the junction between kerb Types K6 and K7.
 - 2.3. Drop kerb Types T3 and T4 shall be used at the junction between kerb Types K1 and K3 and orientated as necessary.
 - 2.4. Transition Types T5 and T6 shall be used at the junction between kerb Types K2 and K3. Likewise drop kerb Type T12 and T13 shall be used at the junction between kerb Types K7 and K8.
 - 2.5. Transition Type T7 shall be used at all junctions between kerb Type K5 and all other kerb types (including existing kerbs). They shall be proprietary units from the same manufacturer as the 'Bus Docking Kerbs' used.
 - 2.6. 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).
 - 2.7. 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.
 - 2.8. Kerb units should not be cut to a length less than 300mm. Smaller units should not be cut to less than one-third of their original length and in no case less than 50mm.

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

- 2.9. For radii less than 12m the correct size radius kerbs must be used in all instances. It is not acceptable to cut them to size.
- 2.10. The space between kerbs should always be min 2mm - max 4mm, unless the manufacturer's specification requirements suggest otherwise.
- 2.11. Kerb foundations should be vibrated unless the supervisor agrees otherwise.
- 2.12. Kerb upstands shall be as shown in Table 11/1/2.

Type	Uprand Requirement (mm)
K1, K2, K6 and K7	125
K3	25 at vehicular crossing points 0-6 at pedestrian crossing points
K5	160
K9	150
T1 and T2	125
T3, T4, T5 and T6	Varies from 125 to 25 or 0 to match adjacent kerb type

Table 11/1/2: Uprand requirements based on different kerb types.

3. Channels

Construction Ref. (Group)	Type	HWD Ref.	Material
CS1	CS1	11.03	Pre-cast concrete
CS2	CS2	11.03	Pre-cast concrete
CD1	CD 90 x 305	11.03	Pre-cast concrete
CD2	CD 125 x 255	11.03	Pre-cast concrete
CD3	Fluted channel	11.03	Pre-cast concrete

Table 11/1/3: Specification for pre-cast concrete channels.

- 3.1. The channel layout, showing the groups and the locations of special units, is shown on the Scheme Specific Drawing(s).
- 3.2. The minimum cut length of channels shall be no less than 50% of their original manufactured length.
- 3.3. Any specific requirements will be included within the Scheme Specific Works Information.

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

4. Edgings

Type	HWD Ref.	Material	Profile	Dimensions (mm)	Foundation Thickness (mm)
E1	11.11	Pre-cast concrete	EBN	150 x 50	100
E2	11.11	Pre-cast concrete	EF	150 x 50	100
E1	11.11	Pre-cast concrete	ER	150 x 50	100

Table 11/1/4: Specification for pre-cast concrete edgings.

- 4.1. The edging layout, showing the types/groups is shown on the Scheme Specific Drawing(s).
- 4.2. Edging Types E1 and E3 shall have an upstand of 15mm above the adjacent footway or paved area.
- 4.3. Edging Type E2 shall be laid flush with the adjacent footway or paved area.
- 4.4. Edging Type E1 shall be laid with edge radii adjacent to footway or paved area.
- 4.5. Combined drainage and kerb systems are not to be used without prior approval from the overseeing organisation. See Appendix 5/5.
- 4.6. Re-use of previously set-aside kerbs, channels, edgings or combined drainage and kerb blocks shall be as described in the Scheme Specific Works Information at locations shown on the Scheme Specific drawing(s).

5. Footways and Paved Areas

- 5.1. The footway and paved area layout, showing the types are shown on the Scheme Specific Drawing(s).
- 5.2. Surface course materials shall be black in colour as per Cl. 975AR.
- 5.3. Tactile blocks adjacent to the carriageway must be rectangular in plan, 200mm x 133mm x 65mm. Tactile flag paving will only be used at controlled crossings where there is likely to be minimal or no vehicle overrun.
- 5.4. Tactile blocks must satisfy the following conditions in accordance with BS 7533-101:2021:
 - a. At a distance of 50mm from any edge, any cross-section does not show a horizontal dimension less than 50mm;
 - b. Its overall length divided by its thickness is less than or equal to four.
- 5.5. Where significant overrunning by vehicles is anticipated then a thicker design block should be considered.

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

- 5.6. Blocks shall be buff in colour at uncontrolled crossings, and red at controlled crossings. Where DfT Guidance on the Use of Tactile Paving Surfaces indicates that alternative colours are preferred to provide visual contrast, an Asset Material Departure request must be submitted and approved prior to the commencement of construction.
- 5.7. Tactile slabs or blocks for purposes shown in HWD 11.35 and 11.36 must be buff in colour. Red is not to be used. Alternative colours as permitted by DfT Guidance on the Use of Tactile Paving Surfaces will require an Asset Material Departure request must be submitted and approved prior to the commencement of construction.
- 5.8. The formation shall be sprayed with a total weed killer in accordance with 674AR.
- 5.9. The definitions of categories of footway are as per CD 239 and shall be:
- a. Pedestrian or cycle only
 - b. Light vehicle
 - c. Heavy vehicle
- 5.10. All footways which are not physically separated from the carriageway shall be considered 'light-vehicle' at minimum. This includes all residential footways.
- 5.11. All vehicular crossing points shall be considered 'light vehicle' as a minimum.
- 5.12. Commercial and agricultural vehicle crossing points shall be designated 'heavy vehicle' and constructed as per footway type 3, and HWD 11.46.
- 5.13. Any proposal which is not included in the categories below, including for pedestrianised urban centres, requires an Asset Material Departure request must be submitted and approved. Any attempt to classify an urban centre area subject to daily deliveries as 'Light-vehicle' requires traffic count justification.
- 5.14. For schemes where a paving flag or block design is proposed as part of a pavement overlay, then an Asset Material Departure request must be submitted and approved prior to the commencement of construction.
- 5.15. Footway Type 6 must be laid in either a two-size herringbone or a 45° stretcher bond laying pattern as per BS 7533-101:2021 Table 19.
- 5.16. Footway Type 8 is for use in maintenance bays only. Any other proposed use requires an Asset Material Departure request must be submitted and approved prior to any construction works taking place.

- 5.17. Perforations in footway Type 8 are to be filled with soil to 30mm below the top surface meeting the requirements of Cl. 3004.8 to Cl. 3004.11. The soil shall be seeded with grass meeting the requirements of Cl. 3005.
- 5.18. Footway and paved area Types 4a, 4b, 5, 6, & 7 are based on an unbound surface laid on a bound base as per BS 7533-101:2021. For bound surface courses an Asset Material Departure request must be submitted and approved prior to the commencement of construction.
- 5.19. Footway and paved area Types 4a, 4b, 5, 6, & 7 assume minimum subgrade CBR of 2.5% as part of a sub-base only design. For other subgrade CBR values or sub-base on capping designs, refer to BS 7533-101:2021 Tables 16 & 17 for the appropriate material thicknesses.
- 5.20. Paved area Types 6 & 7 assume a construction traffic design value of 100 s.a. (up to 100m of road, 10 dwellings or 1000m² development), for larger sites or developments refer to BS 7533-101:2021 Tables 16 & 17.
- 5.21. Where deterrent paving is to be laid, it shall be as per footway Type 5, and 'light vehicle' foundation thickness.
- 5.22. 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).
- 5.23. Footway overlay schemes shall utilise regulating materials AC 6 dense surf, AC 10 close surf or AC 20 dense bin, with binder pen. of 160/220. The thickness of these materials shall be in accordance with BS 594987 Table 1A and the application in accordance with MCHW Cl. 1105.
- 5.24. Footway slurry surfacing shall be in accordance with Cl. 1170AR.
- 5.25. Footway air void requirements shall be in accordance with Cl. 970AR.
- 5.26. All covers, frames to chambers, valves and stopcocks shall be adjusted to the correct levels at least 48 hours prior to laying of the surrounding surfacing.
- 5.27. Ductile iron covers and frames of minimum C250 class should be used for areas subject to vehicle loading including car parking on the carriageway and on the footway adjacent to the carriageway.
- 5.28. In grass verges or footways 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 BS 5834: Part 2.

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

Requirements for Construction Materials

Footway Type 1: Flexible Pedestrian/Cycle Only Physically Separated from Carriageway

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	909	AC 6 dense surf	160/220	20	Appendix 7/1 s.5 SC5
Binder course	906	AC 20 dense bin rec	160/220	50	Appendix 7/1 s.5 BC1
Sub-base	803 or 807	Granular Type 1 or 4	-	100	-
Total Thickness				170	

Footway Type 2: Flexible Light Vehicle Footways and Cycleways

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	909	AC 6 dense surf	160/220	20	Appendix 7/1 s.5 SC5
Binder course	906	AC 20 dense bin rec	160/220	50	Appendix 7/1 s.5 BC1
Sub-base	803 or 807	Granular Type 1 or 4	-	225	Sub-base to be laid in two layers
Total Thickness				295	

Footway Type 3: Flexible Heavy Vehicle Footways and Cycleways and Heavy Vehicle Crossing Points

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	971AR	SMA 6 surf	100/150	40	Appendix 7/1 s.5 SC4
Binder course	906	AC 20 dense bin rec (enriched)	100/150	90	Appendix 7/1 s.5 BC6
Sub-base	803 or 807	Granular Type 1 or 4	-	225	Sub-base to be laid in two layers
Total Thickness				355	

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

Requirements for Construction Materials (continued)

Footway Type 4a: Concrete Block Light Vehicle Footways Including Tactile Blocks (Unbound)

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1107	Pre-cast concrete block	-	60 concrete 65 clay	Refer to Cl. 5.3 to 5.6
Bedding	1107	Sharp sand	C or M	30	-
Base course	906	AC 32 dense base rec	100/150	80	Appendix 7/1 s.5 B1
Sub-base	803 or 807	Granular Type 1 or 4	-	170	Assumes 2.5% CBR
Total Thickness				340 or 345	

Footway Type 4b: Tactile blocks (when laid in footway Type 1 & 2)

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1107	Pre-cast concrete block	-	60 concrete 65 clay	Refer to Cl. 5.3 to 5.6
Bedding	1107	Sharp sand	C or M	30-50	-
Sub-base	803 or 807	Granular Type 1 or 4	-	150 min	Assumes 2.5% CBR
Total Thickness				240 - 265 min	

Footway Type 5: Pre-cast Concrete Tactile Hazard Warning Pavers and Deterrent Paving

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1104	Pre-cast concrete textured pavers	-	60 concrete 65 clay	BS flag designation F65
Bedding	1104	Sharp sand	C or M	30	-
Base course	906	AC 32 dense base rec	100/150	60	Appendix 7/1 s.5 B1
Sub-base	803 or 807	Granular Type 1 or 4	-	170	Assumes 2.5% CBR
Total Thickness				320 or 325	

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

Requirements for Construction Materials (continued)

Footway Type 6: Heavy Vehicle Pedestrianised Area (Pre-cast Concrete Block or Clay Pavers) - Departure Required (Cl. 5.13 refers)

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1107 or 1108	Pre-cast concrete block/clay pavers	-	60 concrete 65 clay	See Scheme Specific Works Information
Bedding	1107 or 1108	Sharp sand	C or M	30	-
Base course	906	AC 32 dense base rec	100/150	100	Appendix 7/1 s.5 B1
Sub-base	803 or 807	Granular Type 1 or 4	-	240	Assumes 2.5% CBR and up to 100m of road
Total Thickness				430 or 435	

Footway Type 7: Heavy Vehicle Pedestrianised Area (Concrete Flags or Natural Stone Slabs) - Departure Required

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1104	Concrete flags or Stone Slabs	-	60, 65 or 70	BS flag designation G60, F65 or E70
Bedding (concrete)	1104	Sharp sand	C or M	30	-
Bedding (Stone)	1104	Crushed igneous rock	-	40	Grading category G _c 85 Flakiness Index < FI ₃₅
Base course	906	AC 32 dense base rec	100/150	80	Appendix 7/1 s.5 B1
Sub-base	803 or 807	Granular Type 1 or 4	-	240	Assumes 2.5% CBR and up to 100m of road
Total Thickness (concrete)				410, 415 or 420	
Total Thickness (stone)				420, 425 or 430	

Appendix 11/1: Kerbs, Footways and Paved Areas (continued)

Requirements for Construction Materials (continued)

Footway Type 8: Grass or Concrete Paving for Use in Maintenance Bays

Material Course	Clause	Description	Grade or Binder	Thickness (mm)	General Requirements
Surface course	1109	Pre-cast or in-situ concrete	-	100	See Scheme Specific Works Information
Bedding	1109	Sharp sand	C or M	50	-
Sub-base	803 or 807	Granular Type 1 or 4	-	225	Sub-base to be laid in two layers
Total Thickness				375	

Notes:

- BS flag designations are based on standard concrete flags with a characteristic bending strength of 5.0MPa (Class 3 to BS EN 1339:2003, Table 5).
- Non-standard concrete flags and all stone slabs should have design thickness calculated using formula (3) in BS 7533-101:2021.
- For sub-base thicknesses >225mm, material is to be laid in two layers.

Appendix 12/1: Traffic Signs - General

1. Temporary Traffic Signs

- 1.1. The Overseeing Organisation's temporary traffic signs are detailed the Scheme Specific Works Information.
- 1.2. All plate signs and internally illuminated signs shall be constructed to a similar standard as a permanent sign.
- 1.3. Unless otherwise directed by the Overseeing Organisation all signs shall be mounted with a clearance of 600mm from the kerb.
- 1.4. Precise locations of signs are to be agreed on site with the Overseeing Organisation.

2. Illuminated Traffic Signs

- 2.1. Posts and equipment for illuminated traffic signs shall be in accordance with the E.on Lighting for Staffordshire Ltd documents.

3. Permanent Traffic Signs

- 3.1. The locations of 'Directional', 'Informatory', 'Warning', 'Regulatory', and other traffic signs are contained in the Scheme Specific Works Information and Drawing(s).
- 3.2. Legend and symbol layouts for sign faces are detailed on Scheme Specific Drawing(s).
- 3.3. 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.
- 3.4. Luminaires shall be as described in the Scheme Specific Works Information, for the types described in the Schedules of traffic signs.
- 3.5. Requirements for stub-posts described in the Schedules shall be determined by the Contractor in consideration of sign plate fixings, lit sign unit mountings, conduit fixings and the like, and to not project below the sign plate. Stub-posts shall be capped top and bottom.
- 3.6. Posts shall be assembled using baseplates, base angles and caps to the recommendations of the manufacturer/supplier of the posts.
- 3.7. Preparation and protection to steel sign plates, frames and fittings and purlins shall be as detailed in Cl. 1221 and BS EN 12899-1:2007 (supersedes BS 873: Part 6), unless described otherwise in the Scheme Specific Works Information.

Appendix 12/1: Traffic Signs - General (continued)

- 3.8. The sign plate shall be manufactured in accordance with the requirements of MCHW Series 1200 Cl.1205 and BS EN 12899-1:2007 (supersedes BS 873: Part 6).
- 3.9. Posts for non-illuminated signs shall be steel tubular or rectangular hollow section and galvanised.
- 3.10. Posts for non-illuminated signs shall be fitted with baseplates, and plastic post caps of a suitable size to the exposed ends of all tubular steel posts to prevent water ingress.
- 3.11. Acceptable post sizes are listed in Table 12/1/1.

Tubular (CHS)	Rectangular (RHS)
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	

Table 12/1/1: Acceptable post sizes for traffic signs.

* Passively safe (of steel grade S355 or lower).

4. Passively Safe Signposts

- 4.1. New traffic signs provided on roads with a speed limit of 50mph or greater must be passively safe and provided in accordance with BS EN 12767:2019.
- 4.2. For sites with a posted speed limit of 30mph and 40mph, the use of passively safe signposts shall be restricted to sites identified as high risk. A cluster analysis of collision data and review of maintenance records will assist targeting those locations where the provision of passively safe street furniture will offer the greatest benefit.
- 4.3. At locations with a posted speed limit of 20mph, 30mph with vertical traffic calming, or sites where on-street parking is prevalent throughout the day and night, it is unlikely to benefit from providing passively safe roadside structures. It is not a requirement to provide passively safe street furniture in these locations.

Appendix 12/1: Traffic Signs - General (continued)

4.4. For further information on the use of passively safe posts and vehicle restraint systems, please refer to the Staffordshire County Council *Passive Safety and Vehicle Restraint Policy and Assessment Procedure*.

5. Foundations

5.1. Foundations described in the Schedules of traffic signs by type references have the following meanings:

- a. Type A - ST2 concrete mix for installation of foundations excavated with an auger only, as described in sub-Clause 1203.3 (non-illuminated signs only).
- b. Type B - designed foundation mix C25/30 to dimensions stated in the Scheme Specific Works Information.
- c. Type C - designed foundation C25/30 concrete for reinforced or unreinforced concrete to sign-specific detail drawings.

5.2. Foundation concrete for Types B and C shall be compacted by vibration.

5.3. 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.

5.4. 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.

5.5. The type and size of foundation shall be designed on a scheme specific basis.

5.6. 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.

5.7. Reinforcement schedules for foundations are shown in the Scheme Specific Works Information.

6. Location and Erection

6.1. Approximate locations of each installation are given in the Scheme Specific Sign Schedules.

6.2. Precise locations of signs are to be agreed on site with the Overseeing Organisation.

Appendix 12/1: Traffic Signs - General (continued)

- 6.3. 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.
- 6.4. Single-post signs having posts not centrally assembled are shown on Scheme Specific Sign Schedules.
- 6.5. 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.
- 6.6. Projection of sign plates beyond post-centres for installations using more than two posts are shown on Scheme Specific Sign Schedules.
- 6.7. 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.
- 6.8. 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.
- 6.9. The fixing for signs on single posts shall be of a type that prevents rotation of the sign about the post.

7. Operational Requirements

- 7.1. 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.

8. Traffic Bollards

- 8.1. Traffic bollards shall be deformable and non-illuminated as scheduled on the Scheme Specific Sign Schedules.
- 8.2. The following traffic bollard types are approved for use in Staffordshire:
 - a. Signature 'Truflex (Staffordshire Specification)'
 - b. TMP 'Metro (Staffordshire Specification)'
 - c. Sign Post Solutions SPS360
- 8.3. The use of any other non-illuminated traffic bollards not listed above requires the submission of an Asset Material Departure form, which must be approved prior to installation.

Appendix 12/1: Traffic Signs - General (continued)

9. Remove from Store and Re-Erect Traffic Signs

- 9.1. Signs set-aside for re-use are identified in Scheme Specific Works Information.

10. Vehicle Activated Signs, Speed Indication Devices, etc

- 10.1. 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 Road Studs

Road Markings

1. General

- 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 Cl. 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 Cl. 6 and Tables 12/3/2 and 12/3/3 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 the Traffic Signs Manual Chapter 6.
- 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.
- 1.7. The Overseeing Organisation shall carry out the performance testing stated in Appendix 1/5.
- 1.8. The use of cold applied paint, such as Methyl Methacrylate (MMA), over traditional heated thermoplastic paint is recommended for consideration due to its 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. Refer to Table 12/3/1.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

Group Ref.	Material Type	Location Types
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	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	High stress locations for example junction markings, informative markings, roundabouts and pedestrian crossing panels

Table 12/3/1: Typical location types for cold applied road marking material.

- 1.9. It is accepted that the equipment and operative training may not yet be available in the application of cold applied paint for Group 2 location types. Therefore, the use of cold applied paint should be considered on a scheme specific basis, under advisement of the product supplier.

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, all white markings shall be reflectorized with solid glass beads in accordance with BS 6088 by incorporation (except for pre-formed markings) into the road marking mixture and to the wet surface of the marking.

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.
- 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.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

5. Durability Requirements

- 5.1. The line marking shall be firmly adhered to the underlying surface. The minimum thickness of a new marking shall be 3mm.
- 5.2. The Wear Index/Score, at any position in the works as selected by the Overseeing Organisation, shall not be less than 30 when assessed through visual inspection in accordance with Appendix B of CS 126.
- 5.3. A skid resistance level of 45 minimum is required for all road markings unless stated otherwise in the Scheme Specific Works Information.

6. Performance Requirements

- 6.1. All white road markings 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 Ref.	Requirement	Value
Colour	Table 6	White	x & y co-ordinates given
Luminance	Table 2	Class B2 (asphaltic)	$\beta \geq 0.30$
Skid Resistance	Table 8	Class S1	$SRT \geq 45$
Retro-reflectivity	Table 3	Class R2	$R_L \geq 100$
Retro-reflectivity (wet)	Table 4	Class RW0	No requirement
Retro-reflectivity (rain)	Table 5	Class RR0	No requirement

Table 12/3/2: Performance requirements for white road marking material.

Note: White road markings to be laid on an unlit road require a minimum of Class R3, $R_L \geq 150$.

- 6.2. 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.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

Property	BS EN 1436 Ref.	Requirement	Value
Colour	Table 6	Yellow	x & y co-ordinates given
Luminance	Table 2	Class B1	$\beta \geq 0.20$
Skid Resistance	Table 8	Class S1	$SRT \geq 45$
Retro-reflectivity	Table 3	Class R0	No requirement
Retro-reflectivity (wet)	Table 4	Class RW0	No requirement
Retro-reflectivity (rain)	Table 5	Class RR0	No requirement

Table 12/3/3: Performance requirements for yellow road marking material.

6.3. The width and thickness for all road markings shall be in accordance with the *Traffic Signs Regulations and General Directions*. For raised rib edge-line markings, in no case shall any materials be laid more than 6mm thick.

6.4. Where there is a requirement for enhanced retro-reflectivity, products complying with Table 12/3/4 shall be used.

Property	BS EN 1436 Ref.	Requirement	Value
Retro-reflectivity	Table 3	Class R3	$R_L \geq 150$
Retro-reflectivity	Table 3	Class R4	$R_L \geq 200$

Table 12/3/4: Enhanced retro-reflectivity standards for road markings.

6.5. Where there is a requirement for enhanced wet night visibility, products demonstrating compliance with Table 12/3/5 shall be used.

Property	BS EN 1436 Ref.	Requirement	Value
Retro-reflectivity	Table 4	Class RW3	$R_L \geq 50$
Retro-reflectivity	Table 4	Class RW4	$R_L \geq 75$
Retro-reflectivity	Table 4	Class RW5	$R_L \geq 100$
Retro-reflectivity	Table 4	Class RW6	$R_L \geq 150$

Table 12/3/5: Retro-reflectivity standards for enhanced wet night visibility.

6.6. Where there is a special requirement for enhanced skid resistance, products conforming to Table 12/3/6 shall be used.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

Property	BS EN 1436 Ref.	Requirement	Value
Skid resistance	Table 8	Class S3	$SRT \geq 55$

Table 12/3/6: Requirements for enhanced skid resistance.

6.7. Where there is a special requirement for enhanced luminance, products complying with Table 12/3/7 shall be used.

Property	BS EN 1436 Ref.	Requirement	Value
Luminance (white)	Table 2	Class B3 (asphaltic)	$\beta \geq 0.40$
Luminance (yellow)	Table 2	Class B2	$\beta \geq 0.30$

Table 12/3/7: Enhanced luminance for white and yellow road markings.

6.8. Where there is a special requirement for enhanced retro-reflectivity for yellow road markings, products complying Table 12/3/8 shall be used.

Property	BS EN 1436 Ref.	Requirement	Value
Retro-reflectivity (yellow)	Table 3	Class R1	$R_L \geq 80$

Table 12/3/8: Enhanced retro-reflectivity for yellow road markings.

7. Quality Assurance Schemes

7.1. All road marking materials shall be obtained from manufacturers who operate Third Party Quality Assurance schemes under ISO 9001.

7.2. The marking material used shall have a BS EN 1824 road trial test report and this shall be made available to the Overseeing Organisation.

8. Setting Out

8.1. 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.

9. Existing Markings

9.1. Where a marking is required to be laid on top of an existing marking, the combined total thickness shall not exceed the maximum permitted as per the *Traffic Signs Regulations and General Directions*. Any superseded marking is either permanently removed or covered entirely by the new marking.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

- 9.2. Where existing road markings are to be permanently removed from bituminous running surfaces this shall be by mechanical means or forced air abrasive (shot blasting). Hot compressed air (HCA) lance shall not be used on concrete pavements and not on other surfaces without the consent of the Engineer. Obliteration of road markings using bituminous, resinous paint or prefabricated materials will not be permitted.

10. Reinstatement of Road Markings

- 10.1. Where carriageway resurfacing, patching, reconstruction, or other reinstatement activities result in the removal or obscuring of existing road markings, all markings shall be reinstated to their original layout, dimensions, colour, and specification unless otherwise directed by the Overseeing Organisation.
- 10.2. Prior to the reinstatement of any parking restrictions (including waiting and loading restrictions, 'School Keep Clear', etc) or edge of carriageway markings, the Contractor shall consult with and obtain approval from the Overseeing Organisation to confirm the extent, type, and current requirements of the markings to be reinstated. The Contractor shall not assume that existing markings are to be reinstated on a like-for-like basis, as amendments may be required to reflect current traffic regulation orders, highway layouts, traffic management requirements, or asset records.

11. Temporary Road Markings

- 11.1. Temporary road markings as prefabricated reflectorised material will be required for temporary diversions of traffic unless stated otherwise in the Scheme Specific Works Information.
- 11.2. Where existing road markings on bituminous pavements are to be temporarily obliterated for traffic management, or any other purpose, the markings shall be completely covered by black tape or covering which shall be able to withstand the traffic load upon it for the required period.
- 11.3. Upon removal of the black tape or covering, the original markings are to be upgraded to the standard apparent before the temporary obliteration. Temporary covering of road markings on concrete pavements shall not be permitted.
- 

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Studs

1. General

- 1.1. Permanent roads studs must comply with the *Traffic Signs Regulations and General Directions 2016* and the *Traffic Signs Manual, Chapter 5, Section 4*.
- 1.2. Replacement of existing road studs, following surfacing works, should be assessed for continued requirement in accordance with *Traffic Signs Manual, Chapter 5, Section 4*.
- 1.3. All other proposed uses, of any type of road stud, should be agreed with the Overseeing Organisation through submission of an Asset Material Departure form, which must be approved prior to installation.
- 1.4. Road studs shall be inset types only; surface mounted systems are not acceptable.

2. Durability and Performance Requirements

- 2.1. Road studs are to have a minimum lifecycle of 5 years.
- 2.2. Permanent retroreflecting road studs shall be compliant with BS EN 1463-1.
- 2.3. The permanent retroreflecting road studs shall meet the performance characteristics as stated in Table 12/3/9.

Performance Characteristics		Class or Value
Night-time visibility - retro-reflectivity	Coefficient of luminous intensity (R)	as required by paragraph 4.1.2.1 of BS EN 1463-1
	Chromaticity coordinates (x,y)	as required by paragraph 4.1.2.2 of BS EN 1463-1
Durability of retro-reflectivity to BS EN 1463-2	Coefficient of luminous intensity (R)	R1

Table 12/3/9: Performance requirements for permanent road studs.

3. Road Studs (Permanent)

- 3.1. Permanent road studs shall be installed in accordance with the manufacturer's instructions.
- 3.2. The installation of permanent road studs shall not result in any loss of structural integrity in the carriageway or any other degradation in the performance of the road surface.
- 3.3. The removal of existing permanent road studs - i.e. during the replacement or renewal of permanent road studs - shall not result in residue, voids, protrusions or loss of structural integrity in the carriageway.

Appendix 12/3: Traffic Signs - Road Markings and Road Studs (continued)

Road Markings (continued)

4. Road Studs - Removal

- 4.1. 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.
- 4.2. 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.

5. Setting Out

- 5.1. 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.
- 5.2. The spacing of road studs shall conform to the current *Traffic Signs Regulations and General Directions*, and the *Traffic Signs Manual, Chapter 5, Section 4*.
- 5.3. Unless otherwise directed by the Overseeing Organisation, on roads having existing intermittent line markings the studs shall be located symmetrically between markings.

6. Road Studs (Temporary)

- 6.1. Temporary reflecting road studs are required at the locations described in the Scheme Specific Works Information.



Appendix 12/5: Traffic Signs - Traffic Signals

1. General

- 1.1. 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.



Appendix 13/1: Road Lighting Columns and Brackets

1. General

1.1. Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

- a. Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)
- b. Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)
- c. Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)



Appendix 14/1: Electrical Work for Road Lighting & Traffic Signs

1. General

1.1. Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

- a. Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)
- b. Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)
- c. Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)



Appendix 19/1: Protection of Steelwork Against Corrosion

1. General

1.1. Information relating to Road Lighting Columns and Brackets can be found in the following E.on Lighting for Staffordshire Ltd. PFI documents:

- a. Document No. SLP500: Street Lighting Design Policy v3.1 (July 2018)
- b. Document No. SLP501: Specification for Road Lighting and Lit Traffic v3.1 (July 2018)
- c. Document No. SLP502: Highway Works Detail Drawings v3.1 (July 2018)



Appendix 26/1: Ancillary Concrete

1. General

1.1. Unless stated otherwise in the Scheme Specific Works Information, concretes for Ancillary Purposes shall be to the following requirements, with purposes of Table 26/1/1 being substituted and additional purposes being added.

1.2. Where stated in the Scheme Specific Works Information, sulphate resistant concrete shall be used.

1.3. Ready mixed concrete shall be supplied by a Concrete Quality Scheme for Ready Mixed Concrete (QSRMC) registered company, from a plant holding current QSRMC certification for product conformity.

Purpose/Location	Designated Concrete	Standardised Prescribed Mix	Other Requirements
Blinding concrete, backfill to structural foundations, over dig to post holes and planted lighting columns.	GEN0	ST1	
Footings for fence posts and foundations excavated with an auger to traffic signs. Foundations for pedestrian guardrails.	GEN1	ST2	
Bed, haunch and surround to drains other than Type A. Surround to pre-cast concrete chambers and gullies.	GEN1	ST2	
Filling redundant gullies.	GEN1	ST2	
Bedding and backing to precast concrete kerbs, edgings, channels and quadrants.	GEN2	ST3	
Bed to drains Type A. Foundations, channels and benching to chambers. Surround to plastic gullies.	GEN3	ST4	
Footings for Regulatory and Warning Signposts, scheme signboard posts and temporary signposts.	RC25/30	C25/30	
Bedding and backing to precast concrete 'Bus Docking' kerbs.	GEN3	ST4	
Foundations for safety barrier posts, environmental barrier posts and planted lighting columns.	RC20/25	ST5	
Anchor blocks for safety barrier.	RC20/25	ST5	

Table 26/1/1: Example ancillary concrete mixes and the purpose/location.

Appendix 30/5: Grass Seeding, Wildflower Seeding and Turfing

1. Grass seeding shall be carried out during the periods stated in Cl. 3005.1.
2. All areas to be grass seeded shall be reduced to a fine tilth as described in Cl. 3005.2, unless stated otherwise in the Scheme Specific Works Information.
3. Fertilisation is generally not required as a matter of course and shall not be used for wildflower mixes. Where site specific concerns have been identified, topsoil testing shall be carried out to determine nutrient requirements.
4. If fertilisation is deemed necessary following topsoil testing, the proposed fertiliser, any other soil ameliorants, and the rate of spread shall be agreed with the Overseeing Organisation on a scheme specific basis.
5. Rate of spread of grass seed shall be at least 35g/m², 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 Cl. 3005.29, unless stated otherwise in the Scheme Specific Works Information.
9. Seed mixes for highway verges shall be hard wearing, salt tolerant and capable of surviving with minimal cuts. The following mix is suitable for these purposes:
 - a. 25% Dwarf Perennial Ryegrass
 - b. 20% Strong Creeping Red Fescue
 - c. 30% Hard Fescue
 - d. 10% Smooth Stalked Meadow Grass
 - e. 10% Highland Browntop Bent
 - f. 5% Small Leaved White Clover
10. Seed mixes for any other use shall be agreed on a scheme specific basis and stated in the Scheme Specific Works Information. This includes (but is not limited to) wetlands, swales, highways within designated protected areas and areas where higher wildflower content may be desirable.

Appendix 30/6: Planting

1. Planting shall be carried out during the periods stated in Cl. 3006.17.
2. Planting shall be carried out in accordance with the Staffordshire 'Tree Planting Specification' and Cl. 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 30/6/1 may be used.
 - a. Hedge Type A - Double Staggered Row, or
 - b. Type B - Single Line
4. Hedge Composition shall be as stated in the Scheme Specific Works Information.
5. Further guidance can be found in the '*Highway Tree Selection Guide - Staffordshire Urban or Staffordshire Rural*'.
6. An assessment shall be carried out to determine whether a pavement support system for tree pits is required. Said system should be used if:
 - a. There is insufficient natural soil rooting volume in the proposed tree location and
 - b. If underground services warrant protection from potential damage that may be caused by tree roots in the future.
7. Where a pavement support system is necessary, the following requirements shall be met:
 - a. Tree Pits (including all support units) shall be entirely contained within highway verge or footpath and shall not encroach into carriageway.
 - b. Where tree pits are in pedestrian/cycle areas and physically separated from the carriageway (as per the definition in CD 239), and there is insufficient natural soil rooting volume, the tree pits shall be constructed from a pavement support system able to withstand A15 loading classification.
 - c. Where tree pits are in verges or footpaths which are not physically separated from the carriageway, they are considered at risk of 'light vehicle' trafficking (as per CD 239) and load bearing classification C250 is required.
 - d. Tree pits are not appropriate for use in heavy traffic areas, as defined by CD 239.
8. Species selections for hedges shall be determined on a site-by-site basis depending on the requirements of the design and location.
9. Species selections for tree planting shall be as per the appropriate '*Highway Tree Selection Guide - Staffordshire Urban or Staffordshire Rural*'.

Appendix 30/6: Planting (continued)

Species	Height (cm)	Times Transplanted	Classification	Notes
Acer campestre	40-60	1+1	T/O	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
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

Table 30/6/1: Hedge planting specification.

Notes:

4. T/O: Transplant or Open Ground.
5. 1+0: 1 year seedling.
6. 1u1: 1 year seedling undercut and grown in situ for 1 further year.
7. 1+1: 1 year seedling lined out for 1 further year.
8. 1+2: 1 year seedling lined out for 2 further years.