

**Interbridges
New Brighton Road
Emsworth**

**Proposed Traffic Signals Junction
Specification**

December 2009

RPF ASSOCIATES

**Interbridges
New Brighton Road
Emsworth**

**Proposed Traffic
Signals Junction**

Specification

December 2009

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Proposed Traffic Signals Junction

Specification June 2009

Issue and Revision Record

Rev	Date	Originator (Print) (Signature)	Checker (Print) (Signature)	Approver (Print) (Signature)	Description
C	December 2009	P. S. Fox	P.S. Fox	J.E.M. Rennie	Revisions to Appendice to suit HCC S278 comments
B	June 2009	P. S. Fox	P.S. Fox	J.E.M. Rennie	Revisions to Appendix 7/1
A	May 2009	P. S. Fox	P.S. Fox	J.E.M. Rennie	First Issue



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PREAMBLE TO THE SPECIFICATION

1. The Specification referred to in the Tender shall be the 'Specification for Highway Works', published by The Stationery Office (formerly HMSO) as Volume 1 of the Manual of Contract Documents for Highway Works, as modified and extended by the following:
 - Appendix 0/1: Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures
 - Appendix 0/2: Contract-specific minor alterations to existing Clauses, Tables and Figures
 - Appendix 0/3: List of numbered appendices referred to in the specification and included in the contract
 - Appendix 0/4 contains a list of the Drawings
2. The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates.
3. An Additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is a Contract-specific alteration.
4. A Substitute Clause as indicated by a suffix 'SR' in Appendix 0/1 is a Contract-specific alteration.
5. A Cancelled Clause indicated by a suffix 'CR' in Appendix 0/1 is a Contract-specific alteration.
6. Insofar as any of the numbered Appendices may conflict or be inconsistent with any provision of the Specification for Highway Works the Numbered Appendices shall always prevail.
7. Any reference in the Contract to a Clause number or Appendix shall be deemed to refer to the corresponding Substitute Clause number or Appendix 0/1 or 0/2.
8. Where a Clause is altered any original Table/Figure referred to in the Clause shall apply unless the Table/Figure is also altered. Where a Table/Figure is altered any reference in a Clause to the original Table/Figure shall apply to the altered Table/Figure.
9. Where a Clause in the Specification relates to work goods or materials which are not required for the works it shall be deemed not to apply.
10. Any Appendix referred to in the Specification which is not used shall be deemed not to apply.
11. 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 the Overseeing Organisation and/or delegated deputies.
12. Where the Specification requires the provision of documentation to the Overseeing Organisation for statutory or type approval such documentation shall be provided to the Overseeing Organisation, Contract Co-ordinator and delegated deputies.

13. If the Specification is used in conjunction with a Contract under which the Contractor is responsible for the design of any part of the works, the delegation of the roles and functions of the Overseeing Organisation as stated in paragraph 11 above shall be amended as follows:
- i) If any agreement, consent or approval required to be obtained from the Overseeing Organisation impacts on the health and safety of the general public, the environment or any property or equipment not owned or operated by the Contractor, such agreement, consent, approval shall be obtained from the Employer.
 - ii) Where the Specification provides for the Overseeing Organisation to require a test, waive the requirement for a test or alter testing frequency, the party to whom the Overseeing Organisation's roles and functions have been ascribed by paragraph 11 above shall exercise such decisions in accordance with the Employer's requirements/Construction requirements stated in the Contract.

SPECIFICATION FOR HIGHWAYS WORKS: SCHEDULE OF PAGES AND RELEVANT PUBLICATION DATES

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000	1	March 1998
000	3F	May 2005
000	2	November 2006
100	2	May 2001
100	W1F	May 2005
100	12 to 12, 20F	November 2005
100	1, 3 to 7, N1, N3, N5	May 2006
100	8 to 11, 15 to 19 N2, N4 to N6F	November 2006
200	1, 3F	May 2001
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300	1	May 2001
300	2, 4, 6F	November 2002
300	5	May 2006
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400	1 to 12F	November 2006
500	20, 33 to 26	November 2004
500	28F	May 2005
500	1, 7, 11, 13 to 14, 16, to 19, 21	November 2005
500	3, 12, 22, N1F	May 2006
500	2, 4 to 6, 8 to 10, 15, 27	November 2006
600	33	November 2003
600	2, 27 to 32, 34 to 67F, N1, N3 to N4F	November 2005
600	1, 3 to 26, S1 to S3F, N2	November 2006
700	1	November 2004
700	16 to 17	May 2001
700	23 to 25F	May 2002
700	2 to 15, 18 to 22, N1 to N5F	November 2006
800	1, 22 to 25, 27 to 32F	May 2005
800	4 to 6, 8 to 9, 13 to 16, 19 to 21	November 2004
800	7	May 2004
800	2, 17 to 18, 26	November 2005
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1000	3, 5 to 6	November 2005
1000	1 to 2, 4, 7 to 15, 19 to 33F	May 2006
1000	16 to 18	November 2006
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1200	1, 14 to 16F, N3	May 2004
1200	2 to 3, 6 to 7, W1F, N2	August 2003
1200	4, 8 to 11, 13, N4F	May 2005
1200	5	May 2001
1200	12, N1	November 2006
1300	3 to 4	November 2004
1300	N2F	November 2003
1300	1, 5 to 12F	November 2005
1300	2, 11 and N1	May 2006
1400	2, N1F	May 2001
1400	1, 3 to 9F	May 2006
1500	2	February 2003
1500	3 to 4, 8 to 11, 13	November 2004
1500	7	May 2001
1500	1, 5 to 6, 12, 14 to 17F	November 2006
1600	1, 4 to 5, 9, 15, 17 to 18, 22, 24 to 26, 29 to 31, 35, 38 49F	March 1998
1600	2, 6 to 8, 10 to 14, 16, 19, 27 to 28, 32 to 34, 36 to 37, 39 to 42, 44 to 48	November 2003
1600	3, 20 to 23, 43	November 2005
1700	2 to 7, 10 to 15	May 2004
1700	8 to 9	May 2005
1700	1, 16 to 22F	May 2006
1800	1, 4, 6, 8 to 9	May 2004
1800	2 to 3, 5, 7, 10 to 12F	November 2005
1900	1 to 16, 18 to 30F, S1 to S2F	May 2005
1900	17	May 2003
2000	1, 3 to 4F	May 2001
2000	2	November 2004
2100	1, 4F	March 1998
2100	2	November 2003
2100	3	November 2005
2300	1	March 1998
2300	2 to 3F	May 2001
2400	1, 4, 7F	May 2005
2400	2 to 3, 5 to 6	May 2006
2500	1	May 2001
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2500	6 to 7, 9	May 2005
2500	10	November 2004
2500	5	May 2006
2500	3 to 4	November 2006

Series/ Appendix	Page Number	Publication Date
2600	1	March 1998
2600	2 to 4	November 2003
2600	5	May 2005
2600	6	November 2004
2600	7F	November 2006
3000	1, 4 to 19, 21 to 27F	May 2001
3000	20	November 2004
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Appendix A	7 to 20, 23 to 25F	November 2006
Appendix A	1 to 6, 21 to 22	May 2007
Appendix B	1	May 2006
Appendix B	2 to 7F	November 2006
Appendix C	1	May 2005
Appendix C	2F	November 2006
Appendix D	1F	May 2005
Appendix D (NI)	N1F	March 1998
Appendix E	1F	May 2005
Appendix E (N1)	N1F	May 2005
Appendix F	1 to 57F	November 2006
Appendix G	1F	2004
Appendix H	1	May 2004
Appendix H	2, 6 to 8F	November 2005
Appendix H	3 to 5	November 2006

**APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED
CLAUSES AND TABLES INCLUDED IN THE CONTRACT**

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None

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List of Substitute Clauses and Tables

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270AR SIDING

1. Siding may be required where excessive or hardened dirt, vegetation or any other undesirable material has overgrown the edges of adjoining carriageways, footways and cycle tracks and requires removal as part of a specific scheme, site or, a programme of sites requiring siding will be presented to the Contractor via the Works Information.
2. Footways, cycleways and carriageways may be sided out either manually or mechanically. However, the Contractor shall ensure that any siding out machine employed does not cause damage to the existing footway, cycleway and carriageway surface.
3. No deposits/arising shall be left on the road margins, verges, footway and cycletracks, unless specifically instructed by the Overseeing Organisation where arising shall be spread and levelled on adjacent verges.
4. All sided out edges shall be trimmed to a neat line.
5. Where the sided out edge does not exceed a height of 75mm above the existing footway or cycle track surface, they may be trimmed with a vertical face. Where they generally exceed a height of 75mm above the existing footway or cycle track surface they shall be trimmed to an approximately 45 degree battered face.

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

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571AR CONCRETE BAG WALLING AND LINING

1. Concrete bag walling shall be provided on banks of ditches and streams where shown on the Drawings or directed by the Overseeing Organisation. Before placing the bags, the bank shall be cut into horizontal steps to provide a suitable foundation. The bottom course of bags shall be at least 450mm below the stream bed and all succeeding courses shall be horizontal and all vertical joints shall be staggered in alternate courses. Headers shall be placed at every third bag in alternate courses. The face of the bag walling shall be to the batters and profiles as described in the Works Information or directed by the Overseeing Organisation and the construction shall be such that the walling is stable.
2. Concrete bag lining shall be provided to protect ditch and stream beds and banks where required by the Overseeing Organisation to the thickness and number of courses as described in the Works Information.
3. The bags are to be hessian and shall conform to BS 1214. The size of the bags shall be such, that when filled, the dimensions shall be 450mm x 300mm x 150mm. The filling shall be concrete mix ST4 and shall have a low workability with a slump of 25mm.
4. The bags shall be placed in position and rammed solid, beaten to true profile and any voids behind or between the bags shall be filled with concrete mix ST4.
5. The finished exposed faces of the bagwork shall not be punctured or torn and no tucked ends shall be visible.
6. The top three courses of bags shall be spiked together with be 10mm x 900mm long mild steel dowel bars at 500mm intervals along the top of the wall. The first rising course shall be spiked together with the invert lining with a 10mm x 300mm long mild steel dowel bar at 500mm intervals.

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

List of Substitute Clauses and Tables

Clause No.	Title	Page No
572AR	REPLACING, RAISING OR LOWERING COVERS, GRATINGS AND FRAMES ON EXISTING CHAMBERS AND GULLIES	
1.	Where existing covers, gratings or frames have to be replaced, the Contractor shall carefully remove any damaged parts and clean any parts to be re-used. If necessary, any concrete or mortar bedding shall be broken out, the surface shall be prepared and the frame, grating or cover bedded or replaced to its original position on a polyester resin mortar or a proprietary quick setting mortar approved by the Overseeing Organisation.	
2.	Where the levels of existing covers or gratings have to be adjusted the Contractor shall carefully excavate for and remove the existing cover or grating and frame, which shall be cleaned to remove all adhering material. The underlying brickwork, concrete or mortar in bedding, chamber or shaft walls shall then be broken down to the required level and the surface prepared to receive new construction.	
3.	New construction in brickwork or concrete shall be built on the existing chamber or shaft and shall conform with the relevant requirements of the Works Information for new manholes, catchpits, gullies, Statutory Undertakers' chambers and the like. Unless otherwise directed by the Overseeing Organisation, the existing pre-cast concrete cover slabs and the existing covers, gratings and frames shall be re-used in the works.	
4.	METHOD OF RE-LEVELLING FRAMES AND COVERS IN THE CARRIAGEWAY (i) Prior to initial removal all covers shall be marked in such a way that when the covers are replaced in the frame, they occupy the same positions as they did before removal. (ii) Remove the cover(s) from the frame. (iii) Excavate the area approximately 150mm wide around the frame and to the depth of the frame taking care not to damage the frame or walls of the chamber. All loose or weakly adhering material shall be removed from the sides and base of the excavation. (iv) Remove the frame from the jointing chamber. Prepare the frame for re-use by removing all of the old bedding material or other detritus. Ensure the surfaces of the frame are clean and free of any rust . Cut off any existing levelling bolts flush with the underside of the frame. (v) Prepare a sound surface at 165mm below the carriageway surface by cutting back or building up as required. Any adjustment to the uppermost surfaces of the chamber shall be achieved using solid engineering bricks or quarry tiles, being bonded with resin mortar.	

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

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572AR REPLACING, RAISING OR LOWERING COVERS, GRATINGS AND FRAMES ON EXISTING CHAMBERS AND GULLIES (Continued)

- (vi) Remove all foreign matter from the top of the chamber walls or shaft and, if wet, wipe off all surface water with a clean cotton rag.
- (vii) Locate the frame square with the chamber walls or shaft and, by supporting it under the corners with pieces of broken tile or other suitable materials, raise the frame until it is level with the carriageway surface.
- (viii) Clean the cover and frame seatings, carefully replace the cover/s and check for rocking. If necessary, adjust to eliminate any rock by providing similar supports under the long sides of the frame, particularly under any frame joints.
- (ix) Remove the covers taking care not to disturb the frame.
- (x) On the inside of the chamber, face off the gap under the frame and any voids between the bricks or quarry tiles with resin mortar. **DO NOT FORCE THE MORTAR UNDER THE FRAME** - the purpose of the facing is to provide an inside shutter to contain the resin bedding.
- (xi) Allow the mortar to develop initial set, which is indicated when it feels firm against finger pressure, then mix the resin bedding and pour it around the frame until the bedding just lips over the lower flange.
- (xii) Allow a minimum of 2 hours to elapse before replacing the cover/s (and removable grid/s where fitted) or commencing reinstatement. It is important that during this curing period the frame is not disturbed in any way. (This may best be achieved using a proprietary system.) The cover shall also not be trafficked for at least a further hour (i.e. minimum 3 hours from placing frame to permitting trafficking)
- (xiii) Check that the covers do not rock and/or foul the jointing chamber walls or removal grids, if either occurs take whatever corrective action is necessary and ensure that the cover and the frame seatings are free of dirt or spilt resin.

REINSTATEMENT

5. Prior to reinstatement in a bituminous surface, the sides of the excavation and the outside of the frame shall be primed with bitumen emulsion and the space surrounding the frame reinstated using a suitable bitumen bound material.

**APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND
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572AR	REPLACING, RAISING OR LOWERING COVERS, GRATINGS AND FRAMES ON EXISTING CHAMBERS AND GULLIES (Continued)
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|----|--|
| 6. | In the event of any damage whatsoever to third party Apparatus the Contractor shall immediately inform the Overseeing Organisation and report the occurrence immediately by contacting the Company concerned:- |
| 7. | The above requirements do not relieve the Contractor of any of any of its obligations under the Contract. |

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

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670AR TRIAL PITS

1. From time to time the Contractor will be instructed to excavate trial pits for purposes such as locating services, determining surfacing depths and investigating pavement or ground conditions.

Trial pits shall be excavated by saw cutting to at least 50mm depth in bound materials.

Material shall be removed in layers as directed by the Overseeing Organisation.

Location of Services

2. The Overseeing Organisation will obtain initial services information which will be supplied to the Contractor. The Contractor shall be responsible for arranging for undertakers to trace and mark the approximate location of their services, if considered necessary, before the start of excavation.

Trial pits which are specifically for locating services or where services could reasonably be expected shall be dug by hand.

Recording of Information

3. The Contractor shall agree the timing of the excavation with the Overseeing Organisation to enable the Overseeing Organisation to arrange attendance. Measuring and recording of information will be carried out by the Overseeing Organisation unless the Contractor is instructed to do so.

Reinstatement

4. Reinstatement shall be carried out as soon as recording of information is complete unless instructed otherwise. The materials used and the degree of compaction shall be such as to restore the Site as near as possible to its original condition. Settlement of reinstatements in excess of 10mm at any position within 1 month of reinstating shall be made good by the Contractor at no additional cost to the Overseeing Organisation.

**APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND
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CONTRACT**

List of Substitute Clauses and Tables

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671AR CLEANING OF DITCHES

1. Cleaning of ditches shall be carried out as detailed in the Works Information.
2. All vegetation and debris shall be removed from the ditches.
3. Ditches shall be cleaned to remove all silt, loose obstructions and other detritus.
4. The Contractor shall ensure that the ends of the ditches are free from vegetation and other obstructions including any material disturbed during cleaning.
5. The Contractor shall dispose of all debris and arisings from the works in a licensed tip off the highway network unless otherwise instructed by the Overseeing Organisation.

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

List of Substitute Clauses and Tables

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891AR GRANULAR SUB-BASE TYPE CDD

1. Type CDD granular material shall be Crushed Demolition Debris (CDD) or other mixed materials as defined within this Clause.

The material shall be well graded and lie within the grading-limits of Table 8/5.

TABLE 8/5: Sub-Base Type CDD

BS sieve size	Cumulative % by mass passing
63 mm	100
31.5 mm	80 – 99
16 mm	53 – 92
8 mm	34 – 60
4 mm	23 – 41
2.0 mm	16 – 33
1.0 mm	11 – 27
75 micron	0 – 10
63 micron	0 – 9

In addition, the grading shall not vary from the lower limit on one sieve to the upper limit on any adjacent sieve, or vice versa. The particle size shall be determined by the washing and sieving method of BS EN 933 -1.

2. The material shall contain a minimum of 80% by mass of crushed concrete or crushed rock. The remaining 20% by mass may comprise crushed brick, road planings or other inert materials subject to no instability on laying or compaction. However, the organic content must be kept to an absolute minimum (0.1% max) and may require hand sorting of larger lumps on site.
3. Any glass incorporated shall be crushed to produce particles without sharp edges and all passing a 10mm BS sieve.
4. The material passing the 425µm BS sieve shall be non-plastic as defined by BS 1377 : Part 2 and tested in compliance therewith.

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

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Clause No.	Title	Page No
5.	The material shall be laid and compacted to the requirements of Clause 802, without drying or segregation.	
891AR	GRANULAR SUB-BASE TYPE CDD (Continued)	
6.	The material shall have a Los Angeles coefficient $\leq$ or $=$ 50 (LA_{50}) when tested in compliance with BS EN1097-2.	
7.	The combined coarse aggregate shall, when tested in accordance with BS EN 1367-2, have a magnesium sulphate soundness value less than 35 (MS_{35}). For routine testing of such aggregates, the water absorption value of the coarse aggregate shall be determined as in BS EN 1097-6, as appropriate. If the absorption value of the coarse aggregate is greater than 2%, the magnesium sulphate soundness test in BS EN1367-2 shall be carried out on the material to be delivered to site.	

APPENDIX 0/1 : CONTRACT SPECIFIC ADDITIONAL SUBSTITUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

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892AR GRANULAR SUB-BASE TYPE RP

1. Type RP granular material shall be Crushed, Milled or Pulverised road construction materials as defined within this Clause.

The material shall be well graded and lie within the grading-limits of Table 8/7.

TABLE 8/7 : Sub-Base Type RP

BS sieve size	Cumulative % by mass passing
63 mm	100
31.5 mm	80 – 99
16 mm	53 – 92
8 mm	34 – 60
4 mm	23 – 41
2.0 mm	16 – 33
1.0 mm	11 – 27
75 micron	0 – 10
63 micron	0 – 9

In addition, the grading shall not vary from the lower limit on one sieve to the upper limit on any adjacent sieve, or vice versa. The particle (Lump) size shall be determined by the washing and sieving method of BS EN 933-1.

Well graded material marginally outside this grading envelope may be acceptable, providing the Contractor can demonstrate that the material can be laid and compacted effectively to form a sound base.

2. The material shall comprise one or a mixture of milled/crushed concrete, asphalt/macadam planings, crushed rock, gravel or other inert granular road construction/subgrade materials subject to no instability on laying or compaction.
3. The material may contain traces of historic tar surface dressings, providing the mixture overall does not contain more than 0.1% * by mass of Poly Aromatic Hydrocarbons (PAHs). Any obvious agglomerations of tar rich materials shall be removed.

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*Specifically the sum of the percentage content of Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (k) fluoranthene, Dibenzo (a,h) anthracene, shall not exceed 0.1% by mass of the total mixture.

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892AR	GRANULAR SUB-BASE TYPE RP (Continued)	
4.	The material passing the 425 um BS sieve shall be non-plastic as defined by BS 1377 : Part 2 and tested in compliance therewith.	
5.	The material shall be laid and compacted to the requirements of Clause 802, without drying or segregation.	
6.	The material shall have a Los Angeles coefficient of 50 or less when tested in compliance with BS EN 1097-2 . The acceptability of bitumen bound materials shall be judged on the properties of the included aggregates.	
7.	The combined coarse aggregate shall, when tested in accordance with BS EN 1367-2, have a Magnesium sulphate soundness value less than MS35. For routine testing of such aggregates, the water absorption value of the coarse aggregate shall be determined as in BS EN 1367-2. If the absorption value of the coarse aggregate is greater than 2%, the soundness test shall be carried out on the material delivered to site.	
8.	The material shall not exceed more than a Total Compacted Layer Thickness of 200mm.	

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973 AR	GRITTING OF NEWLY LAID STONE MASTIC ASPHALT AND THIN SURFACE COURSES	
1.	Where instructed, clean, dry, uncoated crushed quartzite aggregate to the grading shown in Table 973/1 shall be applied evenly to the hot surface of new Stone Mastic Asphalt and Thin Surface Courses (Clauses 960 AR and 970AR). Locations for gritting shall be shown on the scheme drawing. Typical locations where gritting may be required are shown below with the exception that sites in category (i) shall always be gritted. (i) <u>areas</u> to be overlaid by a High Friction Surfacing; (ii) <u>bends with</u> a radius less than 250m (where speed limit is <u>40 mph or greater</u>); (iii) <u>gradients of</u> greater than 5% where more than 50m long (single carriageways both directions and dual carriageways downhill only); (iv) roundabouts (not mini-roundabouts); (v) within 75m on the approaches to any roundabout, junction, pedestrian crossing, traffic signals, railway level crossings, or similar features during the initial rolling of the surfacing.	
2.	The grit shall be applied evenly to the hot surfacing prior to rolling. The rate of application shall be to provide 60-80% surface coverage (approximately 500g/m ² .)	
3.	After the final rolling of the surfacing any surplus aggregate will be removed and sufficient 'loose chipping' signs erected before the road is opened to traffic.	
4.	The Contractor shall remove surplus aggregate from the carriageway by approved suction sweeper in accordance with the following: (i) An operation shall be carried out to remove surplus material within 24 hours of completion of the gritting. Further operations to remove any subsequently loosened material shall be carried out over the next 14 days after completion of the gritting. (ii) The Contractor shall maintain adjacent side roads, footways and paved areas free of loose and surplus aggregate for a period of 14 days after completion of the surfacing work, hand sweeping where necessary.	

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973 AR GRITTING OF NEWLY LAID STONE MASTIC ASPHALT AND THIN SURFACE COURSES (Continued)

Table 973/1: Grading of Surface Applied Grit

BS Test Sieve	% Passing
6.3mm	100
5.0mm	95-100
3.35mm	66-90
1.18mm	0-20
600 microns	0-8
75 microns	0-1.5

Note: Possible sources of supply are from the Hillhead and Blackhill quarries.

5. Determination of surface texture shall not apply to sections where grit has been applied.

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1426AR MAINTENANCE OF STREET LIGHTING

1. Existing and new road lighting units and lit signs within the Site shall be maintained by the Contractor until the entire new installation has been completed to the satisfaction of the Overseeing Organisation.
2. **Defect Repair Response Times**

 Upon notification of a defect by any party, the Contractor shall report the nature of the defect to the Overseeing Organisation in writing, and arrange for the defect to be rectified within the following response times:

Generally	- Maximum of 5 working days
Regulatory signs	- 2 working days
Door off columns	- Emergency attendance within 2 hours
Bollards knocked down	- Emergency attendance within 2 hours to make safe, sign and cone
3. In the event of the Contractor's failure to meet these response times the Overseeing Organisation may arrange for the Highway Authority's Street Lighting Maintenance Contractor to rectify the defects and recover the full cost from money due under the Contract.

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924SR SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS

General

1. High friction surfacing systems shall have current British Board of Agrément HAPAS Roads and Bridges Certificates. Such systems shall only be installed by a Contractor approved by the BBA and certificate holder as an Approved Installer of that system.
2. The BBA/HAPAS Type Classification required for each location shall be as specified by the Overseeing Organisation (Table NG9/24: Volume 2: Notes for Guidance on the Specification for Highway Works)
3. The installation and quality procedures shall be in accordance with the HAPAS certificate for each system and the current method statement agreed by the BBA. These documents and the results of all quality control checks carried out on site by the Contractor and quality assurance information completed in accordance with the requirements of HAPAS, including results from BBA surveillance visits, shall be supplied to the Overseeing Organisation.
4. For each location where 'Special Surfacing' systems are applied, the total quantities of each system component used, the measured area of the surface treated and the calculated coverage rate in kg/m² shall be notified in writing to the Overseeing Organisation within 5 days of completion at that location. For systems in which aggregate is broadcast over a film of binder applied to the surface, the calculated coverage rate shall be that of the binder film and shall not include the mass of aggregate.

Site Suitability

5. The Contractor will be deemed to have visited the site(s) in order to be satisfied with the conditions and to assess the existing surface for suitability and design purposes. The Contractor's attention is drawn to this particularly in connection with newly laid surface courses and fatted surface dressings.

The Contractor shall ensure that it is satisfied that the surface is suitable for the application.

Surface Treatment

6. Special Surfacing, made with resin-based binders (i.e. Polyurethane, epoxy or thermoplastic) and aggregate of high polishing resistance, shall be applied by spray, brush, squeegee or screed box onto a sound substrate to provide a textured, durable matrix of adequate skid resistance.

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
	Binder	
7.	The binder shall contain a Polyurethane, thermoplastic, epoxy or other approved resin component, as approved under HAPAS certification.	
	Aggregate	
8.	All Special Surfacing shall incorporate an aggregate of suitable Polished Stone Value (PSV). For 'High Friction Surfacing' the aggregate shall be 100% calcined bauxite with a PSV exceeding 70. For 'Gateway' type surfacings, where braking stresses are lower, an aggregate with a PSV of at least 60 shall be used for 100% of the aggregate. Unless otherwise agreed with the Overseeing Organisation the colour of the aggregate in 'Gateway' type surfacings shall match that of the resin colour specified. All PSV tests shall have been carried out in accordance with BS EN 1097-8 by a UKAS accredited laboratory(ies), or equivalent, for that test within the previous 24 months for calcined bauxite and 12 months for other aggregates. The Contractor's attention is also drawn to sub-clause 19.6 of this specification.	
9.	The grading of any aggregate used shall be such that a surface texture of over 1.0mm (when determined in accordance with the procedures noted in sub-clause 19.5) shall be maintained for at least three years from the time of application. The aggregate shall be clean, hard, durable and free from any foreign matter.	
	Mixing of Material	
10.	All materials shall be thoroughly mixed in the proportions specified by the manufacturer. At no stage shall the temperature of the materials exceed that recommended by the material manufacturer. A temperature gauge, calibrated every six months to an accuracy of $\pm 2^{\circ}\text{C}$, shall be used to ensure overheating does not take place. A record of the mixing/spray temperature of each batch shall be kept by the Contractor and be readily available for inspection on site by the Overseeing Organisation. The Contractor shall provide UKAS accredited test results of the cured epoxy or other resin component binder.	

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924SR SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)

The Contractor shall provide samples of binder from a mixed batch or from the spraybar of spray equipment, at a rate of not less than two samples for each shift worked or each 1,000 square metres completed, whichever is lesser. Each sample shall be poured to a depth of 3.2 ± 0.4 mm into a shallow tray of at least 150mm x 150mm which shall be supplied by the Contractor. The binder shall be cured, with no further mixing, at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and after 7 days tested as described in BS 2782:Part 3 Method 320A:1976 (1986) except that the rate of grip separation shall be 5mm per minute with a tolerance of 20%. Although the test piece shall be cut to the dimensions shown in Figure 1. Method 320A, the requirement that the narrow parallel portion shall nowhere deviate by more than 2% from the mean shall be deleted. The conditioning period shall be at least 2 hours at $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ immediately before testing takes place. The tensile strength and elongation at break of the specimens shall not be less than 10.5N/mm² and 30% respectively. The results of this testing shall be supplied to the Overseeing Organisation within two weeks of completion.

Colour

11. Where coloured special surfacings are specified, the Contractor shall provide the Overseeing Organisation, for approval, samples of each colour in an unworn condition and in a worn state when the aggregate colour is clearly visible. Samples shall be of at least 80mm diameter size and shall be comprised of the same constituent materials, mixed in the same proportions, as will be used on any site works.
12. 'High Friction' and 'Gateway' surfacings, when applied, shall be of a uniform colour, which matches the samples approved by the Overseeing Organisation.

Surface Preparation

13. The surface shall be prepared to remove dust, laitence and other loose matter, or suspect material. Any oil, diesel or petrol on the surface shall be completely removed by a method agreed by the Overseeing Organisation. The surface shall be dry before application of the binder. Any excessive build up of rubber on the surface shall be removed by an abrasive pre-treatment method approved by the Overseeing Organisation.

Weather

14. It is the Contractor's responsibility to decide when weather conditions and other circumstances are suitable for carrying out the work. (See also sub-clause 5)

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
	Protection of Street Furniture	
15.	Surface treatment shall be applied to the full width of the carriageway or in lanes as agreed by the Overseeing Organisation. It shall be applied up to the carriageway edge without overlapping on to the kerbs, channels, footways or any structure adjoining the highway. The Contractor shall provide, fix, remove on completion, and dispose of, self-adhesive masking material (or other approved) to protect all road studs and cover all carriageway ironwork and similar fixtures prior to dressing to give complete protection from the binder. Unless instructed to the contrary by the Overseeing Organisation, all existing road markings shall also be masked prior to application. All covering material shall be removed to the Contractor's tip off site.	
	Transverse End Joints	
16.	If the special surfacing includes the machine sprayed application of binder then transverse end joints shall be made with a protective mat or paper strip not less than 1 metre wide at each end of the site. Application shall then commence and finish on the protective mats or strips.	
	Quality of Materials	
17.	All materials used within the selected process(es) shall comply with the appropriate British Standards and Highways Agency Specification clauses, where such exist, and recent (less than six months old) evidence provided in terms of test results, etc to prove such compliance.	
	Surface Finish	
18.	The finished surface of the treated area shall be of uniform appearance, free from irregularities and ridges. The substrate shall be fully covered with a continuous and impervious film through which no visible holes shall be permitted.	
	Any remedial work required to restore road markings, clean ironwork, kerbs, channels and adjacent areas resulting from poor protection during the surfacing treatment will be agreed with the Overseeing Organisation and undertaken by the Contractor at no additional cost to the Employer.	

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
	Performance Specification	
19.	The surface treatment work carried out at each site shall only be deemed acceptable if the minimum standards of performance are achieved and maintained throughout the defects correction period, which shall be 3 years for this Clause. For the purposes of this Clause the wheel-track zone shall be taken to be between 0.5m and 1.1m and between 2.55m and 3.15m from the centre of the nearside lane markings for each traffic lane. By applying a High Friction Surfacing the Contractor shall be deemed to be accepting that the condition of the existing surface is suitable for the purposes of achieving the performance criteria over the Defects Correction Period. Any areas of existing surfacing causing concern to the Contractor shall be notified in writing to the Overseeing Organisation, together with the reasons, and action agreed if necessary. Performance criteria in this respect shall be monitored by the Overseeing Organisation and shall be evaluated in terms of the following properties:	
19.1	Aggregate Stripping Aggregate stripping shall be deemed to have taken place where more than 25% of the surface aggregate particles have been lost from the original mosaic pattern over the following areas: i) Any single area of 0.5m ² or more; ii) Any cumulative area ≥15% within the wheel tracks.	
19.2	Loss of Adhesion to Substrate Areas of total loss due to the matrix/binder film having lost adhesion to the original road surface are easily identified. Remedial works to any such areas shall be carried out as soon as possible when any area of 0.2m ² , or more, within the works, or where a cumulative area of ≥15% within the wheel tracks, has been identified by the Overseeing Organisation. Additionally, any regular pattern of loss (e.g. coinciding with joints between adjacent screed runs) shall be made good in a manner approved by the Overseeing Organisation. Any remedial treatment shall be applied in such a way so as to ensure the surface has consistent properties and appearance.	

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
19.3	Total Abrasion Loss	
	Gradual abrasion of the matrix and/or aggregate is permissible within the service life of the applied materials, provided that a continuous mosaic of aggregate is exposed throughout the surface at all times. When such abrasion completely reveals the underlying binder film or original road surface, this shall be defined as "Total Abrasion Loss". Remedial works to any area of Total Abrasion Loss shall commence when any such area of 0.2m ² , or more, within the works, or where a cumulative area of $\geq 15\%$ within the wheel tracks, has been identified by the Overseeing Organisation.	
19.4	Surface Cracking	
	Isolated cracking of the 'Special Surfacing' that extends into the surface course and produces cracks in excess of 0.5mm width shall be sealed by the Contractor using a suitable epoxy or similar resin and the 'Special Surfacing' made good.	
	Multiple cracking of whatever width and depth shall be made good by removing all cracked material as a continuous area and replacing with special surfacing (and new surface course if cracked) unless otherwise agreed by the Overseeing Organisation.	
19.5	Aggregate Embedment	
	Where the continuous mosaic of aggregate on the surface becomes reduced to a discontinuous mosaic due to partial or complete embedment into the matrix or binder film, or substrate, then a reduction in macrotexture will become evident. The criterion for embedment shall therefore be defined in terms of macrotexture, measured by the Sand Patch Test in accordance with BS598: Pt.105. The number of individual measurements shall be decided by the Overseeing Organisation as appropriate to the size of area under consideration, but this shall not be less than one measurement per square metre, and shall not be less than five measurements for any single dispute.	
	Remedial work shall be carried out when any area of 1.0m ² or more is found by the Overseeing Organisation to have a macrotexture mean value of below 1.0mm.	

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
19.6	Skid Resistance	
	The skid resistance of the surfacing may be measured by the Overseeing Organisation at any time during the defects correction period. Testing will be carried out using either a 12-monthly calibrated 'Pendulum' skid tester in accordance with RRL Road Note 27 or a Griptester in accordance with BS 7941-2. On roads with a speed limit of 40mph or greater, tested with the 'Pendulum' tester ONLY, corrections for surface texture will be applied to the 'as-measured' results as noted in Table 4 of TRRL report LR 510. In all cases a 'Seasonal Correction Factor' as outlined in Table 2 of RRL Road Note 27 will be applied to the 'texture corrected' or 'as-measured' result, as appropriate. The resulting value of skidding resistance shall be known as the 'Best Estimate Summer Skidding Resistance'.	
19.6.1.	'High Friction' surfacings shall be deemed unacceptable unless, throughout the defects correction period, the average 'Best Estimate Summer Skidding Resistance Value' as measured by the Pendulum tester at 10m intervals exceeds 70 (or 0.76 Griptester reading) for any 50m section and that no individual reading is below 63 (or 0.68 Griptester reading). Testing shall be carried out in the nearside wheeltrack of any lane treated.	
19.6.2.	'Gateway' surfacings shall be deemed unacceptable unless, throughout the defects correction period, the average 'Best Estimate Summer Skidding Resistance Value' as measured by the Pendulum tester at 10m intervals exceeds 65 (or 0.65 Griptester reading) for any 50m section. Testing shall be carried out in the nearside wheeltrack of any lane treated.	
19.7	Defects	
	Defects arising from damage caused by settlement, subsidence or structural failure of the carriageway on which the surface has been applied are excluded from the guarantee.	
	Remedial Works	
20.	The Contractor shall carry out any subsequent works, required to attain and/or maintain the performance requirements, at no additional cost to the Overseeing Organisation.	

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21.	The materials and methods selected for any such remedial work will depend on the actual areas involved and the time of year. <u>Details shall be agreed with the Overseeing Organisation.</u> In the event of any first time remedial work not being successful the Overseeing Organisation may, at their discretion, agree to the Contractor undertaking further remedial works - otherwise the procedures in sub-clause 22 shall apply.	
22.	The Overseeing Organisation reserves the right to take appropriate action to remove or alleviate any potential danger arising at any time as a result of failure or partial failure of the surfacing and to recover the cost of this from the Contractor. Should the Contractor have any special requirements for dealing with such situations then these must be defined at time of tender. The Overseeing Organisation will notify the Contractor of any such action to be taken as soon as possible.	
	Reimbursement	
23.	When remedial action is inappropriate or unsuccessful then the Contractor shall reimburse the employer the full cost of Providing the Works on the carriageway lengths (full width), which have failed to meet the performance requirements.	
	Opening to Traffic	
24.	The process used must have a sufficiently short curing time to enable the treated surface (including any remedial treatment) to be opened to traffic within the maximum curing time specified by the Overseeing Organisation. The site shall not be opened unless all excess chippings have been removed and sufficient loose chipping signs have been erected.	
	Storage of Materials	
25.	The Contractor shall notify the Overseeing Organisation of its sites for storage of materials and plant. Access for sampling or inspection purposes shall be provided to the Overseeing Organisation at least three days prior to their use in the works.	
	Loading of Chippings	
26.	The Contractor shall ensure that chippings are not spilled on carriageways or footways during any operation of loading or unloading of any temporary stockpiles, within the County.	

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924SR	SPECIFICATION FOR SPECIAL (HIGH FRICTION AND GATEWAY) SURFACINGS (Continued)	
	Surplus Aggregate	
27.	The Contractor shall remove surplus aggregate from the carriageway by approved suction sweeper in accordance with the following:	
27.1	An operation shall be carried out to remove by suction only all surplus material within 24 hours of completion of the surfacing. Further operations to remove any subsequently loosened material shall be carried out over the next fourteen days after completion of the surfacing.	
27.2	The Contractor shall maintain adjacent side roads, footways and paved areas free of loose and surplus aggregate for a period of fourteen days after completion of the surfacing work, hand-sweeping where necessary.	
28.	All surplus materials shall be removed and disposed of by the Contractor at no extra cost to the Overseeing Organisation. The Contractor's attention is drawn to the Waste Management Regulations 1994 and the Environmental Protection Act 1990 - The Duty of Care.	

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948SR	COLD RECYCLED BITUMINOUS BASE/BINDER COURSE	
	Aggregates	
1.	Coarse and fine aggregates shall as far as is possible arise from planed, milled or crushed road construction materials (excluding any obviously binder rich materials which could affect the stability of the final product). The aggregates shall be crushed, screened and recombined as appropriate to ensure a well graded aggregate mix is provided for subsequent stabilisation with foamed bitumen.	
2.	Recycled road construction materials may be supplemented by other secondary aggregates or a minimal proportion of virgin aggregates of appropriate nominal size to achieve the appropriate overall particle size distribution.	
3.	PFA shall be added to the mixture in appropriate quantities to achieve the required overall particle size distribution and to promote effective mixing.	
	Mixing Plant	
4.	Cold recycled bituminous base/binder course shall be produced in an approved foamed bitumen mixing plant. The plant shall be capable of mixing controlled amounts of water and binder agents (liquid and powder) into granular material. The plant shall be equipped with suitable calibrated monitoring devices to ensure accurate proportioning of all constituents.	
	Binder	
5.	Bitumen shall comply with the requirements of BS EN 12591. The bitumen shall be foamed during mixing by the controlled injection of cold water and (if necessary) proprietary additive(s) into hot penetration grade bitumen through a specially designed spray bar and nozzles, to produce a foam that shall expand to a nominal volume at least 10 times greater than the volume of the hot penetration grade bitumen. The base grade of binder shall be between 70 and 125 penetration depending on the stiffness requirements of the mix.	
	Powders.	
6.	For stock grade material to be used on footways and Unclassified roads 2% by mass of Hydrated Lime shall be included during mixing as a catalyst to pozzolanic reaction within the PFA.	
7.	Where the material is to be used on Classified Roads or Industrial Sites, the Hydrated Lime shall be replaced with a minimum of 2% by mass of Portland Cement, to promote a more rapid cure and to increase the overall level of stiffness achieved in service.	

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948SR COLD RECYCLED BITUMINOUS BASE/BINDER COURSE (Continued)

Target Aggregate Grading.

8. The mixed aggregate/s, including any fillers/powders, shall be well graded and lie within the grading envelope shown in the table below:
9. The grading shall not vary from the lower limit on one sieve to the upper limit on any adjacent sieve, or vice versa. The washing and sieving method of BS EN 933-1 shall be used to determine aggregate grading.

BS Test Sieve (mm)	Grading Envelope	
	20mm material	14mm material
31.5	100	
20.0	95 - 100	100
14.0	85 - 100	90 - 100
10.0	68 - 100	70 - 98
4.0	38 - 74	38 - 74
2.0	26 - 58	30 - 58
500 micron	13 - 38	20 - 43
250 micron	9 - 28	15 - 35
63 micron	5 - 21	5 - 21

Mix Stiffness

10. For footways, cycleways and unclassified roads, the mixture shall have a nominal (mean) stiffness (ITSM dry) of 2400 Mpa. (no individual value less than 2000 Mpa) .
11. For Classified Roads and Industrial Sites a heavy duty mixture will be required which shall have a nominal (mean) stiffness (ITSM dry) of 4000 Mpa. (no individual value less than 3200 Mpa)
12. In all cases the ITSM stiffness after soaking shall not be less than 80% of the appropriate dry value.
13. Stiffness measurements (ITSM) shall be determined in accordance with BS DD 213:1996 after curing to the regime as set down in TRL report 386 Part 2 clause 44.

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14.	The Contractor shall supply the results of routine laboratory testing from production control testing to demonstrate compliance with stiffness requirements on a regular basis.	
948SR	COLD RECYCLED BITUMINOUS BASE/BINDER COURSE (Continued)	
	Binder Content	
15.	The target added binder content shall be determined through mix design procedures to deliver the appropriate mix stiffness and durability characteristics.	
16.	The added binder content of the mixed material shall lie within the range plus 0.5% to minus 0.5% of the target binder content, subject to an absolute minimum added binder content of 3.0%. For quality control and compliance testing purposes the binder content shall be determined in accordance with BS598 : Part 102 or BS EN 12697-39 whereby the added binder content shall be defined as the difference between the total binder content of the mixed material and the binder content of the blended aggregate prior to stabilisation taking due consideration of likely variations in the feedstock.	
	Moisture Content	
17.	The moisture content of the mixture shall be adjusted during mixing to lie within the range plus 2% to minus 2% of 0.75 times the optimum moisture content, as determined in accordance with BS 1924 : Part 2 : 1990	
18.	The moisture content of the mixture shall be monitored routinely in accordance with BS 1377 : Part 2.	
	Storage	
19.	Stockpiles of stock grade materials (be they in depots or on site) shall be covered to prevent ingress of water or drying out, to preserve the moisture content within the permitted range.	
20.	Stock grade materials shall ideally be used within 7 days of mixing but it may be permissible to extend this to 28 days under temperate conditions providing it can be demonstrated that the performance requirements in sub-clauses 6 and 18 are not compromised..	
21.	Heavy Duty mixtures containing cement shall be placed and fully compacted within 4 hours of mixing.	
	Transport	

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| 22. | Vehicles used to transport cold recycled bituminous materials shall be sheeted at all times from loading until discharge to maintain moisture levels. Delivery vehicles shall use only a small quantity of 0/20 planings as a lorry-bed release agent. | |
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948SR COLD RECYCLED BITUMINOUS BASE/BINDER COURSE (Continued)

Site Preparation

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| 23. | Cold recycled bituminous materials must be laid on a firm sound base. Any soft spots (elastic stiffness less than 30 MPa as measured by the German Dynamic Plate) in the substrate shall be removed and reinstated with granular sub-base or otherwise treated with the approval of the Overseeing Organisation prior to laying. | |
| 24. | Cold recycled bituminous materials shall not be laid in standing water and any ponding must be removed prior to laying. | |
| 25. | Adequate lateral support (temporary if necessary) must be provided to ensure the cold recycled bituminous materials are compacted effectively. | |

Weather constraints

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| 26. | Cold recycled bituminous materials shall not be laid in freezing conditions or in rain heavy enough to render the moisture content non compliant or prevent effective application of the sealing spray. | |
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Layer Thicknesses

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| 27. | In carriageway work, cold recycled bituminous materials shall be laid in layers of compacted thickness not less than 60mm and not greater than 120mm. Thinner lifts may be acceptable for footway works subject to agreement with the Overseeing Organisation. | |
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Control of Segregation

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| 28. | Special care must be taken to ensure cold recycled bituminous materials do not become segregated. | |
| 29. | When laying through a paver, the paver shall not be allowed to discharge fully between loads. | |
| 30. | When hand laying, any coarse material accumulating on the surface shall be raked to the bottom of the layer. | |

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| 31. | Where areas of segregated coarse aggregate appear on the surface, these shall be blinded with foam stabilised fines (8mm down) prior to compaction. | |
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948SR COLD RECYCLED BITUMINOUS BASE/BINDER COURSE (Continued)

Compaction

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| 32. | Cold recycled bituminous materials shall be compacted using a vibrating roller of appropriate dimensions. Initial passes shall be carried out with dead weight only and the level of vibration gradually increased. | |
| 33. | The material shall be compacted to at least 95% of the refusal density. | |
| 34. | Experience has shown that: <ul style="list-style-type: none"> (i) For relatively thick lifts in the carriageway a Bomag 120 or equivalent twin drum vibrating roller or heavier compaction plant should achieve the required compaction after about six passes. (ii) For narrow haunches a boom mounted vibrating plate compactor (RF Systems Markvibrator or similar) operating in “low” mode should achieve the required compaction after about six slow passes. (iii) For thinner lifts in footway work a Bomag 75 or equivalent twin drum pedestrian vibrating roller should achieve the required compaction after about six passes. | |
| 35. | Compliance shall be demonstrated using the sand replacement method. Alternatively density may be determined using an isotopic density meter providing a robust equivalent target density can be determined/agreed in advance. Any meter used shall be calibrated in accordance with BS1377 : Part 9 | |

Curing

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| 36. | Immediately after compaction and density/compliance testing, the cold recycled bituminous material shall be sprayed with an emulsion tack coat (type K1-40) at a rate of 0.8 to 1.2 litres/m ² to provide a membrane that retains moisture for hydration to take place and to prevent rain damage. | |
| 37. | If the material is to be trafficked as a temporary running surface, final compaction shall be with a pneumatic tyred roller to seal the surface and the sealing membrane shall be supplemented with an application of coated grit. | |

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38.	If the surface is trafficked for an extended period it may be necessary to apply a further tack coat/bond coat prior to laying the final surface course – details to be agreed with the Overseeing Organisation.	

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948SR COLD RECYCLED BITUMINOUS BASE/BINDER COURSE (Continued)**Compliance Testing**

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| 39. | For all works, the mean elastic modulus for each days work, measured after final compaction within 24 hours using a German Dynamic Plate shall be not less than 50 MPa. Additionally, no single measurement of elastic modulus shall be less than 30 MPa. |
| 40. | In carriageway applications, prior to surfacing, a repeat test using a dynamic plate or penetration test shall show an increase in elastic modulus of not less than 20 per cent for each single test with an overall mean increase of not less than 30 per cent. |
| 41. | For Heavy Duty applications, the initial and gain in elastic modulus shall be agreed on a scheme specific basis. |

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951SR PATCHING

BITUMINOUS AREAS

1. Patching is defined as replacement of Surface Course, Binder Course and Base where the materials are laid by hand or when instructed by the Overseeing Organisation by machine, in accordance with Clause 771AR in respect of infra-red patching. Exact areas to be patched will be stated in the Works Information, subject to the minimum dimensions stated in Appendix 7/2.

Note; Other proprietary alternative specifications may be proposed for the approval of the Overseeing Organisation. This may be particularly appropriate for Patching Type 13 Appendix 7/2.
2. The existing defective surfacing and/or filling of trenches or depressions shall be broken out so as to provide a cavity with straight vertical edges.
3. Joint edges shall be formed by diamond saw cutting to a depth of at least 40mm or cold milling in accordance with Clause 901.22, and materials removed to the required depth as stated in the Works Information. The vertical edge faces of surface course and binder course joints shall be painted with grade 190 Pen bitumen, a cold applied thixotropic bitumen or a polymer modified adhesive bitumen tape. Proprietary spray applied products may be permitted with the approval of the Overseeing Organisation.
4. All loose material shall be removed off Site.
5. Replacement materials shall be as specified and detailed in the Schedules listed in Appendix 7/2.
6. A bitumen emulsion tack coat shall be sprayed in accordance with Appendix 7/4 to any underlying bituminous or cementitious layer exposed by the removal process.
7. All construction layers shall be laid and compacted such that, wherever possible, on completion each layer shall be at the same level as the adjacent course.
8. On completion of the patch repair any missing 'Give ways', 'Stop Lines' and 'Centre Lines' shall be replaced with a temporary material approved by the Overseeing Organisation.

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951SR PATCHING (Continued)

9. Bituminous material shall be compacted to achieve the following air voids specification:

Material	Air Voids Specification	
	Max	Min
Stone Mastic Asphalt and Hot Rolled Asphalt	8%	2%
Macadam Binder Course and Base	10%	2%
0/10mm & 0/14mm Close Graded Surface Course	10%	2%
0/6mm Dense Surface Course	13%	2%

10. Testing shall be carried out on all layers in accordance with Clause 929 except at a rate of 2 cores per patching gang per month's work or part thereof (see also Appendix 1/5). Copies of all test results shall be provided to the Overseeing Organisation
11. Sampling and testing of the cores and receipt of the test certificates (from a UKAS accredited laboratory) by the Standards/Research Engineer shall be within 6 months of the Patching works being completed. It is acceptable for such testing to be organised in 'batches' providing the time limits for receipt of results are met.
12. Test certificates shall contain the following information as a minimum:
- Road Number and/or Name
 - Nearest City/Town/Village (as appropriate)
 - Carriageway direction (and lane if more than 1)
 - Precise location of patch sampled (relative to junctions, house numbers, names, etc – a marked map is acceptable as an alternative)
 - The size of the patch cored
 - The nature and thickness of materials recovered in the core
 - The bulk density, maximum density and air voids of each bituminous layer in the cores
 - The name/address of the testing laboratory, the test methods used and the UKAS accreditation status of the test certificate

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- (ix) The material types and thicknesses specified for the patching works.

951SR PATCHING (Continued)

- (x) Any evidence of debonding between layers, poor compaction, disintegration of layers, limestone fine aggregate in any 0/6mm Dense Surface Course material or 'deferred set' material.
- (xi) A statement as to whether the coarse aggregate in the Surface Course (Surface Course) was, or was not, limestone.
- (xii) A statement as to whether any bound material could not be recovered and the nature/thickness of it
- (xiii) A colour photograph of the core (close view to full frame).
13. Coreholes shall be reinstated flush with the surrounding surface using a HAUC approved carriageway grade permanent cold-lay surfacing material approved by the Overseeing Organisation. Core reinstatements that settle by more than 8mm within 3 months of the reinstatement shall be retreated, if directed by the Overseeing Organisation, at no extra cost.

CONCRETE AREAS

14. Repair Process:
- (i) Saw cut perimeter of repair to regular profile with straight vertical edges and minimal overcutting at corners, to a depth of 40mm
- (ii) Break out remaining defective concrete, taking care to leave any protruding reinforcement in place around the perimeter. Leave the sides rough cut sloping inwards to improve the key with the parent concrete
- (iii) Reshape/recompact or replace sub-base as appropriate.
- (iv) In reinforced concrete areas, cut new reinforcement to size and wire to existing reinforcement.
- (v) Place C32/40 class concrete and compact to refusal. Materials shall be as specified and detailed in the Schedules listed in Appendix 7/2.
- (vi) Profile surface as appropriate to match existing. Finish with a brushed texture transverse to the traffic direction.
- (vii) Apply curing compound or cover with damp hessian/polythene.
- (viii) Protect until cured.
- (ix) On completion of the repair any missing 'Give ways', 'stop lines' and 'centre lines' shall be replaced with a temporary material approved by the Overseeing Organisation.

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RESOURCES

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| 15. | The Contractor shall ensure that sufficient patching resources are available across the County throughout the year. | |
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1212SR	ROAD MARKINGS	
	General	
1.	Road markings shall be white or yellow (Class Y1) complying with BS EN 1436 Table 6, as appropriate except where an alternative shade has been specified in Appendix 12/3. The markings shall consist of continuous or intermittent lines, letters, figures, arrows or symbols and comply with sub-Clauses 2 to 12 of this Clause. Statutory requirements controlling road markings are contained in The Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No. 3113) and subsequent amending Regulations.	
	Permanent Road Markings	
2.	Permanent road markings shall be one of the following Kite Marked or equivalent approved materials and comply with the colour, location and material type requirements described in Appendix 12/3: (i) thermoplastic road marking material or paint in accordance with BS EN 1871; (ii) other materials as described in Appendix 12/3 to BS EN 1871. All materials and solid glass beads shall be obtained from manufacturers who operate Third Party QA schemes under BS EN ISO 9001: 2000. They shall also be tested in road trials to the Roll-over class P5 in accordance with the procedure stated in BS EN 1824 to demonstrate compliance with the performance requirements as stated in sub-clauses 3 – 6. The test report, which shall be submitted with the Tender shall give particulars of the quality and quantity of the material, including drop on glass beads laid at the test site for future reference and comparison purposes should such a need arise.	
3.	Road markings shall have the following road performance as defined in BS EN 1436 for the period of the functional life starting from the date of application or when the road is trafficked, whichever is later. The materials to be used shall be to the same mix, material quality, quantity and rate of application as used on the test site.	

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1212SR ROAD MARKINGS (Continued)

Property	BS EN 1436 Reference	Requirement	Minimum Value
Colour	Table 6	1. White 2. Yellow Class Y1,	x, y co-ordinates given BS 381C No. 310 (Primrose)
Luminance Factor	Table 5	1. Class B2 2. Class B1	0.3 0.2
Skid Resistance	Table 7	1. Class S3 2. Class S1	55 45
Retro-reflectivity	Table 2 Class of RL for dry markings	1. Class R2 2. Class R1	100 80

Note: 1 = White, 2 = Yellow

4. The length and width tolerances and thickness for screed, spray, preformed and extruded white or yellow lines shall be in accordance with The Traffic Signs Regulations and General Direction 2002. The permitted tolerances shall be as follows:

Length: +10%, -5%

Width: +10%, -5%

Road Marking materials shall be laid to the following thicknesses:

- | | |
|---|---------------|
| (i) Screed lines | 2.0mm minimum |
| (ii) Sprayed Yellow edge lines | 0.8mm minimum |
| (iii) Sprayed lines (other than yellow) | 1.5mm minimum |
| (iv) Extruded lines | 2.5mm minimum |

With the exception of the road markings listed in Regulation 32 (2) of The Traffic Signs Regulations and General Directions in no case shall any materials be laid more than 6 mm thick.

Unless specified, all white markings shall be reflectorised with glass beads in accordance with BS EN 1423 and BS EN 1424 by incorporation (apart from preformed markings) into the road marking mixture and to the wet surface of the marking.

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1212SR ROAD MARKINGS (Continued)

5. Where there is requirement for improved visibility in wet conditions at night, products showing the following performance in addition to that stated in sub-clause 3 shall be used.

Property	BS EN 1436 Reference	Requirement	Minimum Value
Colour	Table 6	White	x, y co-ordinates given
Luminance Factor	Table 5	Class B3	0.4
Wet Skid Resistance	Table 7	Class S2	50
Dry Retroreflectivity	Table 2	Class R2	100
Wet Retroreflectivity	Table 3	Class RW3	50

6. Where there is a requirement for improved skid resistance as referred to in Appendix 12/3 products showing the following performance in addition to that stated in sub-clause 3 shall be used.

Property	BS EN 1436 Reference	Requirement	Minimum Value
Wet Skid Resistance	Table 7	Class S4	60

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1212SR ROAD MARKINGS (Continued)

7. The pavement shall be prepared in accordance with the following:
 - (i) Where the marking is to be applied on concrete carriageways, the transverse texturing shall be freed from all traces of curing compound by wire brushing or other approved means. Prior to the application of the thermoplastic material a tack coat compatible with the road surface and the marking material shall be applied in accordance with the manufacturer's instructions. Prior to application of road marking material the pavement should have a minimum 48 hours of dry conditions in order to ensure minimum moisture content. Road marking material should not be laid before the concrete has cured for at least 28 days.
 - (ii) On surface dressed carriageways, all loose chippings where the marking is to be applied shall be removed prior to application.
 - (iii) It is the Contractor's responsibility to ensure the road surface is sufficiently clean and dry to achieve the necessary level of adhesion with the road marking. Where the Contractor believes that mechanical sweeping is needed to remove extensive detritus, loose chippings, etc. or that warming/drying of the road surface is necessary, this shall be agreed with the Overseeing Organisation.
8. The application of permanent road markings shall be in accordance with the Sector Scheme described in Appendix A. A copy of the lining contractors current UKAS accredited certificate showing compliance with this scheme shall be submitted prior to the starting date.

Note 1: This Scheme requires Road Marking operatives to hold a relevant qualification being either:-

NVQ Level 2 Pavement Marking - Certified by RSMA

or

Certified Operatives Training Scheme - Administered by CSCS or LGNTO

All trained operatives shall carry a registration card indicating their level of competence/training. Road marking operations shall only be undertaken in the presence of a trained operative whose registration card covers the operations being undertaken as part of the works.

Road marking materials shall only be applied to surfaces which are clean and dry. Markings shall be free from raggedness at their edges and shall be uniform and free from streaks. Longitudinal road markings shall be laid to a regular alignment.

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1212SR ROAD MARKINGS (Continued)

9. The Contractor shall be responsible for the correct setting out of all lines, arrows, letters, symbols, hatching, triangles, zig-zag lines, chevrons, road studs and the like. The Overseeing Organisation will give any advice required by the Contractor to enable it to site the markings in their correct positions (in writing, if requested by the Contractor or their representative). Studs complying with the requirements of Clause 1213 and Appendix 12/3 shall be fixed in the carriageway generally parallel to the centre line and other markings and conforming to the Traffic Sign Regulations & General Directions 2002 and the Traffic Signs Manual.

On completion of each day's work the road shall be left clean and free from any surplus material spilled during the progress of the work. All markings shall be uniform and free from streaks or blisters, and shall be free from raggedness at the edges. Trimming of edges, where necessary shall be undertaken as the work proceeds. Arrows associated with solid line systems shall be replaced no later than 48 hours after the completion of the adjoining continuous white line.

The Contractor shall submit to the Overseeing Organisation within seven days a daily record of work carried out.

Raised Rib Road Markings

10. Raised Rib Road Markings shall only be used on all-purpose roads (both single and dual carriageway) with at least 1 metre wide hardstrips. They shall comply with sub-Clauses 1, 2(i), 3, 5, 6, 7 and 8 of this Clause.
11. Raised Rib Road Markings shall be white lines which are continuous over the sections where they are specified in Appendix 12/3. Where specified in Appendix 12/3 gaps shall be provided for drainage purposes.
12. Raised Rib Road Markings shall be in accordance with The Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No. 3113), Diagrams 1012.2 and 1012.3, as appropriate. Spacing of the transverse raised ribs shall be 500 mm or 250 mm as specified in Appendix 12/3.
13. Raised Rib Road Markings shall not be used adjacent to hatched areas or central reserve crossings except as prescribed for use with diagrams 1040.3, 1040.5 and 1042.

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Temporary Road Markings

14. Temporary road markings shall only be adopted with the prior approval of the Overseeing Organisation. They shall comply with sub-Clauses 1 to 8 of this Clause or if required to be removable, be constructed only from a proprietary preformed road marking material complying with BS EN 1790.
15. When temporary road markings are used on surfaces that will continue to be used by public traffic after their removal, any shadow trace remaining after their removal shall be permanently obliterated. Preformed materials shall not be used for this obliteration.
16. Temporary road markings constructed from a proprietary preformed road marking material shall only be adopted in locations and on types of road surface as described in Appendix 12/3 and shall comply with any other requirement therein. The marking material shall be new and together with any primer shall be stored and installed in accordance with the manufacturer's instructions and within the recommended shelf life.
17. Temporary preformed road markings shall only be applied to surfaces that are clean and dry. Upon removal they shall be disposed of off Site and if any making good is necessary to the road surface it shall be satisfactorily carried out before the road is opened to traffic.

Road Markings on Porous Asphalt Surfacing

18. Spray paint, thermoplastic applied by machine screed, spray or extrusion or preformed road markings shall be used for carriageway markings on porous asphalt surfacing. Manual screeding shall not be permitted except for directional arrows and similar markings.

Removal of Road Markings

19. The removal of road markings on surfaces that will continue to be used by traffic shall be undertaken in a manner that will avoid damage to the surface.

The removal of temporary road markings shall comply with sub-Clauses 14 and 15 of this Clause. For bituminous running surfaces, the removal of permanent road markings shall be by mechanical means or forced air abrasive (shot blasting) only. Hot Compressed Air (HCA) lance is not to be used unless agreed previously with the Overseeing Organisation where it may be permitted on other types of running surfaces. In all cases the Contractor shall submit details of the proposed method for the Overseeing Organisation's consent. Advice on removal methods is given in sub-Clause NG 1212.12.

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Masking of Road Markings

20. When black masking materials are required to cover existing permanent road markings, they shall comply with BS 7962. The total thickness of original and masking materials shall not exceed 6 mm.

Longitudinal Road Markings Lateral Tolerances

21. For longitudinal road markings, the lateral tolerance shall be within ± 25 mm from the designed position. Any discontinuities between road markings shall be replaced with a smooth taper from one road marking to the other. The length of the transition shall be derived from table below. All road markings shall comply with the dimensions, angles and proportions stated in the Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No.3113) and any subsequent amending Regulations.

Speed Limit (mph)	Taper
30	1 in 40
40	1 in 40
50	1 in 45
60	1 in 50
70	1 in 55

Performance Standard

22. Unless otherwise specified in Appendix 12/3 white road markings laid as part of this performance specification shall comply with the minimum standards of performance defined in 3 and 4 above. Where high performance road markings are specified they shall comply with the requirements defined in 4 and 5 or 6 above. Unless otherwise specified in Appendix 12/3, this performance standard shall apply for a period of 2 years, from the date of application, for all road markings.

Testing

23. Where specified in Appendix 1/5 the Contractor shall carry out monitoring of the road markings they applied as part of the works in accordance with Appendix 1/5 and Appendices W to Z of this Clause. Additional testing shall be undertaken between 8 months and 11

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	months after application and results shall be submitted within 15 days of testing to the Overseeing Organisation.	
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APPENDIX W. DETERMINATION OF THICKNESS

General

- W1. The thickness of road marking materials shall be determined using an agreed system, such as the ZMM 5000 digital thickness gauge .

APPENDIX X. DETERMINATION FOR TESTING THE LUMINANCE FACTOR B AND CHROMATICITY CO-ORDINATES x AND y OF IN SITU ROAD MARKINGS

General

- X1. This procedure is recommended for the use of portable equipment as described in BS EN 1436 "Road marking Performance for Road Users" Annex C.
- X2. Equipment shall be calibrated and operated in line with the manufacturer's instructions and BS EN 1436 Annex C.
- X3. Equipment shall not be moved large temperature changes.
- X4. All markings shall be measured free from loose dirt and in a completely dry state. A suitable brush should be used to remove loose dirt and/or glass beads prior to testing (see X16 Cleaning of Lines).
- X5. Safety must be given prime consideration during this operation. Constant attention must be given to the safety of the operator and of other road users. Refer to the current edition of the RSMA Safety Code of Practice.

Selection of a Test Area

- X6. Test sections shall be chosen such that the area of marking appears to be representative of the total to be assessed.

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The following areas shall be avoided:

- Areas of excessive dirt
- Areas where the wear characteristics are excessive or minimal to the norm.
- The very start of applications where initial problems could have been experienced before equipment 'warmed up'.

X7. Selection of test areas should take account of the location of the marking in relation to the movement of traffic. Some markings will be more heavily trafficked than others, for example, cross hatched areas may be virtually untrafficked compared to adjacent longitudinal lines. In area where markings are unevenly worn, ensure a representative number of markings are tested such that there is a balance of degree of trafficking. The condition of the marking tested shall be recorded in the report.

X8. The following test intervals are recommended:

Length of Site	Frequency of Testing
Less than 1km	At approx $\frac{1}{4}$ and $\frac{3}{4}$ of the marking length
1km to 1.9km	Every 0.5km
2km to 4.9km	Every 1km
5km to 9.9km	Every 2km
10km or more	At 5 points (approximately equidistant)

Number of Readings

X9. For continuous lines 15 readings shall be taken over a 5-metre (minimum) section. If the marking is a centre line 15 readings shall be taken with the equipment facing in each direction.

X10. For intermittent lines, 5 readings shall be taken per mark for 3 consecutive markings.

Note: Readings should not be taken at the very beginning or very end of the line, as sometimes due to problems with 'cut-off' of the bead dispensers, glass bead coverage may not be ideal.

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X11.	Readings shall generally be taken along the central axis of the line but some 'off centre' readings may also be included. Care shall be taken to ensure that any such 'off centre' measurements are still made within the confines of the marking. The equipment should not be used for line widths less than the width of the field of measurement.	
X12.	If a particular reading appears to be a rogue result the test shall be repeated.	
	Recording and interpretation of results	
X13.	A test report for each location shall be produced. Information to be included in the report shall be as follows: (i) Operator's name (ii) Equipment type and geometry (iii) Test procedure (iv) General location (v) Length of site (vi) Location of measurement point (vii) Date and time of test (viii) Ambient temperature (ix) Type and dimensions of markings (x) Condition of marking (xi) Pre-treatment of marking i.e. washed/brushed (xii) Road Surface Type	
X14.	The average of all readings for a particular section shall be calculated.	
X15.	Readings for individual marks shall be sub-totalled before being combined, to test consistency.	

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Cleaning of Lines

- X16. If after removing loose dirt, trafficked markings do not reach the specified level of performance, the test area should be cleaned and dried using the following procedure:
- (i) Using clean water with a mild detergent added and a suitable brush, thoroughly clean the test area;
 - (ii) Rinse the test area with clean water;
 - (iii) Dry the test area with sponges, absorbent cloths and/or a 'gentle' hot air heater;

Important Note: A marking may appear to be dry but could still have moisture present during winter months. Moisture will have an adverse affect on readings.

APPENDIX Y PROCEDURE FOR THE MEASURING IN-SITU WET SKID RESISTANCE OF THERMOPLASTIC ROAD MARKINGS

General

- Y1. The wet skid resistance of road markings shall be measured in accordance with BS EN 1436 Annex D.
- Y2. The Portable Skid Resistance Tester shall be calibrated yearly and the rubber slider replaced yearly or whenever the edge has worn beyond the limits specified in BS EN 1436: Annex D: Figure D1.
- Y3. All markings shall be measured free from loose dirt. A suitable brush should be used to remove loose dirt and/or glass beads prior to testing.
- Y4. Care shall be taken to ensure that the rubber slider measures the whole width of the test surface. This is of particular relevance on lines where the crown of the road is large.
- Y5. Safety must be given prime consideration during this operation. Constant attention must be given to the safety of the operator and of other road users. Refer to the current edition of the RSMA Safety Code of Practice.

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Selection of a Test Area

Y6. Test sections shall be chosen such that the area of marking appears to be representative of the total to be assessed.

The following areas shall be avoided:

- Areas of excessive dirt
- Areas where the wear characteristics are excessive or minimal to the norm.
- The very start of applications where initial problems could have been experienced before equipment 'warmed up'.

Y7. Selection of test areas should take account of the location of the marking in relation to the movement of traffic. Some markings will be more heavily trafficked than others, for example, cross hatched areas may be virtually untrafficked compared to adjacent longitudinal lines. In area where markings are unevenly worn, ensure a representative number of markings are tested such that there is a balance of degree of trafficking. The condition of the marking tested shall be recorded in the report.

Y8. The following test intervals are recommended:

Length of Site	Frequency of Testing
Less than 1km	At approx $\frac{1}{4}$ and $\frac{3}{4}$ of the marking length
1km to 1.9km	Every 0.5km
2km to 4.9km	Every 1km
5km to 9.9km	Every 2km
10km or more	At 5 points (approximately equidistant)

Number of readings

Y9. For continuous lines 3 readings shall be taken over a 15-metre (minimum) section. If the marking is a centre line 3 readings shall be taken with the equipment facing in each direction.

Y10. For intermittent lines, 3 readings shall be taken per mark for 3 consecutive markings.

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Note: Readings should not be taken at the very beginning or very end of the line, as sometimes due to problems with 'cut-off' of the bead dispensers, glass bead coverage may not be ideal.

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List of Substitute Clauses and Tables

Clause No.	Title	Page No
1212SR	ROAD MARKINGS (Continued)	
Y11.	Readings shall generally be taken along the central axis of the line in the direction of traffic flow.	
Y12.	If a particular reading appears to be a rogue result the test shall be repeated.	
Y13.	Recording and interpretation of results	
Y14.	A test report for each location shall be produced. Information to be included in the report shall be as follows:- (i) Operator's name (ii) Equipment type (iii) Test procedure (iv) General location (v) Length of site (vi) Location of measurement point (vii) Date and time of test (viii) Ambient temperature (ix) Type and dimensions of markings (x) Condition of marking (xi) Pre-treatment of marking i.e. washed/brushed (xii) Road Surface Type	
Y15.	Readings shall be corrected for temperature as detailed in BS EN 1436: Annex D: Paragraph D.6.	
Y16.	The average of all readings for a particular section shall be calculated.	
Y17.	Readings for individual marks shall be sub-totalled before being combined, to test consistency.	

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1212SR ROAD MARKINGS (Continued)

APPENDIX Z DETERMINATION OF RETRO-REFLECTIVITY. PROCEDURE FOR STATIC TESTING THE RETRO-REFLECTIVITY OF IN-SITU ROAD MARKINGS

General

- Z1. This Appendix describes the method for determining the Retro-reflectivity of marking materials.

Method

- Z2. Testing shall be carried out in accordance with BS EN 1436: Annex B

Procedure

- Z3. Always calibrate and operate the equipment in line with the manufacturer's instructions and BS EN 1436 - Annex B.
- Z4. Moving the instrument through large temperature changes shall be avoided. (i.e. allow time for equipment to acclimatise to prevailing operational temperatures.)
- Z5. If required, ensure that the instrument is effectively shielded from direct sunlight.
- Z6. For Longitudinal lines, the equipment shall be positioned such that its light source shines in the same direction as a vehicle's headlights would. If the marking is a centre line, take measurements shall be taken in both directions.
- Z7. Measurements on other markings such as symbols, letters etc should be taken, wherever appropriate, but in the general direction in which vehicles approach.
- Z8. All markings to be measured should be free from loose dirt and completely dry. A suitable brush should be used to remove loose dirt and/or loose glass beads prior to testing (see 5. Cleaning of lines).
- Z9. Safety must be given prime consideration during this type of operation. Constant attention must be given to the safety of the operator and of other road users. Refer to the Road Safety Markings Association's "Safety Code of Practice".

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1212SR ROAD MARKINGS (Continued)

Selection of the Test Area

- Z10. Areas of markings which appear to be representative of the total shall be assessed. The following areas shall be avoided:
- Areas of excessive dirt e.g. a farm entrance.
 - Areas where wear characteristics are excessive or minimal to the norm.
 - The very start of applications where initial problems could have been experienced before equipment "warmed up".
- Z11. Selection of test areas should take into account the location of the marking in relation to the movement of traffic. Some markings will be more heavily trafficked than others, for example, cross hatched areas may be virtually untrafficked compared to adjacent longitudinal lines. In areas where markings are unevenly worn, ensure a representative number of markings are tested such that there is a balance of degree of trafficking. The condition of the marking shall be noted in the report.

The following test intervals are recommended:

Length of Site	Frequency of Testing
Less than 1km	At 2 points (approximately equidistant)
1km to 4.9km	At 3 points (approximately equidistant)
5km to 9.9km	At 4 points (approximately equidistant)
10km or more	At 5 points (approximately equidistant)

Number of Readings

- Z12. For continuous lines, 15 readings shall be taken over a 5 metre section minimum. If the marking is a centre line, 15 readings shall be taken with the equipment facing in each direction.
- Z13. For intermittent lines, take 5 readings per mark for 3 consecutive marks.
- Note: Readings should not be taken at the very beginning or end at the Line, as sometimes due to problems with 'cut off' of the bead dispensers, glass bead coverage may not be ideal.*
- Z14. For lines wider than 150mm, readings shall generally be taken down the central axis of the line but some 'off centre' readings may be included also. Care shall be taken to ensure that any such 'off centre' measurements are still made within the confines of the marking. The

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	equipment should NOT be used for line widths less than the width of the field of measurement (45mm).	
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1212SR	ROAD MARKINGS (Continued)	
Z15.	For markings other than longitudinal, i.e. 'symbols', 'lettering' transverse lines etc, readings shall be taken at 5 approximately equidistant points on the surface of the marking.	
Z16.	If a particular reading appears to be a rogue result the test shall be repeated.	
Z17.	Recording & Interpretation of Results	
Z18.	A test report for each location should be produced. Information to be included in the report should be as follows: (i) Operator's name (ii) Equipment type and geometry (iii) Test procedure (iv) General location (v) Length of site (vi) Location of measurement point (vii) Date and time of test (viii) Ambient temperature (ix) Type and dimensions of markings (x) Condition of marking (xi) Pre-treatment of marking i.e. washed/brushed (xii) Weather conditions at the time of testing (xiii) Road Surface Type	
Z19.	Calculate the average of all readings for a particular section.	
Z20.	Readings for individual marks should be 'sub-totalled' before being combined, to test consistency.	
	Cleaning of Lines	
Z21.	If after removing loose dirt, trafficked markings do not reach the specified level of performance, the test area should be cleaned and dried using the following procedure: ▪ Using clean water with a mild detergent added and a suitable brush, thoroughly clean the test area; ▪ Rinse the test area with clean water; ▪ Dry the test area with sponges, absorbent cloths and/or a 'gentle' hot air heater	

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Important Note: A marking may appear to be dry but could still have moisture present during winter months. Moisture will have an adverse affect on readings.

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2602SR	CONCRETE FOR ANCILARY PURPOSES – USE OF RECYCLED AGGREGATES FOR LOW STRENGTH APPLICATIONS.	
	General	
1.	Concrete mixes referred to in the Contract as ST followed by a number shall mean concrete for ancillary purposes which shall comply with this Clause and any additional requirements in Appendix 26/1.	
2.	Concrete for ancillary purposes shall be a standardised prescribed concrete complying with BS EN 206-1 and BS 8500 and with the additional requirements of this Clause.	
	Cement	
3.	Cement types as defined in BS 8500, see Table A.6 of BS 8500-1 or Table 1 of BS 8500-2, shall comprise one of the following: CEM I, CEM II/A-V, CEM II/B-V and CEM IIIA or equivalent combinations, unless otherwise specified within the standard detail drawings or where required in Appendix 26/1, SRPC (sulfate-resisting Portland cement).	
	Aggregates	
4.	Aggregates shall comply with BS EN 12620 and unless otherwise described in Appendix 26/1 the maximum size shall be 20 mm. The total acid-soluble sulfate content of the concrete mix, as SO ₄ , shall not exceed 5% of the mass of cement in the mix. The acid soluble sulfate (AS) shall be determined in accordance with Test No. 2 in TRL Report 447. Any combination of washed recycled aggregate produced in accordance with the WRAP quality protocol, recycled concrete aggregate or recycled asphalt plantings containing less than 1% by mass of “foreign material” e.g. plastic, metals, large particles of glass, etc. may be used for concrete of Class ST1 but no higher grade. Where recycled asphalt plantings are used as the primary aggregate the addition of crushed green glass sand will be permitted up to a maximum of 5% by mass of the total aggregate. The mix proportions shall be determined by weight in accordance with Table 7 of BS8500-2:2006 or by volume in accordance with Table 8 of the same standard. The aggregate may be incorporated as separate coarse and fine fractions or as an “all-in” material (Class 0/20 to Table E.1 of PD 6682-1:2002).	

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2602SR CONCRETE FOR ANCILARY PURPOSES – USE OF RECYCLED AGGREGATES FOR LOW STRENGTH APPLICATIONS (Continued)

Where an “all-in” aggregate is used and the concrete is to be batched by volume, the volume of “all-in” aggregate to be incorporated shall be the sum of the coarse and fine aggregate fractions as shown in Table 8 of BS8500-2:2006 multiplied by 0.6.

Consistence

- The consistence of the concrete shall be defined by its consistence class (slump) and be within either consistence class S1, S2 or consistence class S3 of BS EN 206-1 and BS 8500 as appropriate to the purpose.

Standardised Prescribed Concrete

- The standardised prescribed concrete used for each purpose shall be as described in Table 2602/1 unless otherwise described in Appendix 26/1.

Table 2602/1: Concrete for Ancillary Purposes

Purpose	Standardised prescribed concrete*
1 Footings for fence posts and augered foundations for traffic sign posts	ST2
2 Foundations for environmental barrier posts and planted lighting columns	ST5
3 Blinding concrete, backfill for structural foundations, overdig of post holes and preparation of formation to Clause 616	ST1
4 Bedding and backing to pre-cast concrete kerbs, channels, edgings and quadrants	ST1
5 Bed to drains Type A#. Foundations, channels and benching to chambers	ST4
6 Bed, haunch and surround to drains other than Type A#. Surround to chambers and gullies	ST2

* Unless otherwise described in Appendix 26/1

Refer to HCD drawing number F1 and F2

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List of Substitute Clauses and Tables

Clause No.	Title	Page No
2602SR	CONCRETE FOR ANCILARY PURPOSES – USE OF RECYCLED AGGREGATES FOR LOW STRENGTH APPLICATIONS (Continued)	
	Transporting, Placing and Compacting Concrete	
7.	Concrete shall be transported and placed so that contamination, segregation and loss of materials does not occur. The maximum temperature of the concrete at any time between mixing and placing shall be no greater than 30°C. Concrete shall be placed and compacted within two hours of mixing. After compaction it shall not be disturbed within 12 hours.	
8.	Concrete shall be compacted by tamping or vibrating until it is thoroughly worked around any embedded metal and into corners of formwork or excavations, until a solid mass substantially free from voids is obtained without segregation and with no free water on the surface. The Contractor shall select the consistence as described in sub-clause 5 of this Clause to achieve this.	
9.	Surface finishes shall comply with Clause 1708 and, unless otherwise described in Appendix 26/1, the following: <i>Buried surfaces:</i> Unformed surfaces shall be Class U1 Formed surfaces shall be Class F1 <i>Exposed surfaces:</i> Unformed surfaces shall be Class U2, except benching to chambers, which shall be Class U3 Formed surfaces shall be Class F2	
10.	Formwork shall be struck without damage to the concrete not less than two days after placing the concrete. Exposed surfaces shall be cured as described in Clause 1027 or by covering them with an opaque impermeable membrane or with hessian or sand which shall be kept damp. Such covering shall not be removed for four days after placing the concrete.	
11.	This Clause shall be complied with where standardised prescribed concrete to BS EN 206-1 and BS EN 8500-2, is shown on the Drawings for purposes other than those in Table 26/1.	

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Clause 602 CLASSIFICATIONS, DEFINITIONS AND USES OF EARTHWORKS MATERIALS

GENERAL REQUIREMENTS

8th line, after "Appendix 6/1" insert:-

Topsoil shall not be stripped when it is raining or where there has been rain within the previous 24 hours such that the Overseeing Organisation considers that handling is likely to damage the soil structure. No stripped topsoil shall be removed from the Site unless agreed in writing by the Overseeing Organisation. Topsoil shall be kept free of contamination by subsoil or any other material.

Clause 702 HORIZONTAL ALIGNMENTS, SURFACE LEVELS AND SURFACE REGULARITY OF PAVEMENT COURSES

702.7 After "... shall be taken on 75m lengths." Add the following additional text:-

When checking compliance with Table 7/2, Class A roads shall be regarded as Category A roads and all other roads as Category B roads.

Additionally, the riding quality of Category A roads when tested within 28 days of laying using a single wheel bump integrator towed at a nominal speed of 32km/h shall not be greater than the limits specified below for any 50m length:

Irregularity Index "r"

Surface Course 200cm/km

Binder Course 230cm/km

Where the existing riding quality is very poor and the Contractor considers that they will be unable to comply with the above tolerances. The Contractor shall give adequate notice in writing to the Overseeing Organisation so that the irregularity of the existing surface can be checked and, if necessary, additional regulating agreed.

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Clause 901 BITUMINOUS BASE, BINDER COURSE AND SURFACING MATERIALS

Aggregates for Bituminous Materials

901.3 Aggregates for Bituminous Mixtures

After BE EN 13043, add

The coarse aggregate shall be crushed rock or slag – flint gravel is not acceptable. If more than one type of stone or slag is used in any mixture, then approval must be obtained for each of the types proposed and the proportions to be used. In carriageway Surface Course materials, limestone shall not be permitted as the coarse aggregate in any material nor the fine aggregate in any 6mm Dense Surface Course, Stone Mastic Asphalt or Thin Surface Course materials.

901.15 This sub-clause to be numbered (i)

Add the following sub clauses:

- (ii) No fluxing or volatile oils shall be used in the manufacture of any permanent bituminous material unless specified by the Overseeing Organisation in writing,
- (iii) For all Surface Course materials except Hot Rolled Asphalt where the coarse aggregate is quartzite, basalt, or any other igneous rock, the binder shall include an adhesion agent.

Clause 903 PLACING AND COMPACTING OF BITUMINOUS MIXTURES

DENSE MACADAM BINDER COURSE AS A SURFACE COURSE

903.28 In sub clause (i) delete reference to PSV50 and replace with PSV55.

903.28 Delete sub clause (ii) and add:-

- (ii) Where approved by the Overseeing Organisation AC 20 dense bin material may be used as a temporary (less than 3 weeks) surface on low speed lightly trafficked 'C' or Unclassified roads if the aggregate is crushed rock (other than limestone) with a PSV of not less than 55.

Add the following sub-clauses after 903.29.

903.30

- (i) At the end of the carpet and across side roads, transverse joints shall be made by letting into the surface. The change in gradient in the finished transition length shall not exceed 1 in 50 unless by so doing a smoother transition can be achieved.

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- | | |
|------|--|
| (ii) | The Contractor shall make provision for making safe in suitable material, the run-on and run-off and any raised longitudinal joint or projecting ironwork at the end of each day's work and shall remove such material prior to continuing the surface operations unless otherwise agreed by the Overseeing Organisation. Signing shall be in accordance with the requirements of Appendix 1/17. |
|------|--|

Clause 909 DENSE MACADAM SURFACE COURSE

909 Add the following after BSI PD 6682-2 :-

3. Where the coarse aggregate used is quartzite, basalt or any other igneous rock, the binder shall include an adhesion agent.

Clause 912 CLOSE GRADED MACADAM SURFACE COURSE

The following sub-clauses 4 & 5 to be added:-

- 912.4 With 10mm and 14mm materials, natural sand or a blend of crushed rock and natural sand fines is to be used. No fluxing oils are permitted in manufacture as in 901.15
- 912.5 Where the course aggregate used is quartzite, basalt or any other igneous rock the binder shall include an adhesion agent.

Clause 915 COATED CHIPPINGS FOR APPLICATION TO PRE-MIXED SURFACINGS

915.2 After Appendix 7/1, add the following:-

The Polished Stone Value shall be determined in accordance with BS EN 1097-8.

The aggregate shall be deemed to comply if the mean of the 6 most recent consecutive results from tests relating to the material to be supplied, carried out within the previous 12 months by at least 3 independent testing laboratories with the relevant UKAS accreditation within 6 weeks of sampling, is greater than or equal to the value specified in Appendix 7/1.

Additionally, no individual result shall be more than 2 PSV units below the value specified in Appendix 7/1 and the most recent result (no more than 2 months old) shall not be below the value specified in Appendix 7/1 also.

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Clause 916 OPEN GRADED MACADAM SURFACE COURSE

The following sub-clauses 4 & 5 to be added:-

- 916.3 With 10mm and 14mm materials, natural sand or a blend of crushed rock and natural sand fines are to be used. No fluxing oils are permitted in manufacture as in 901.15
- 916.4 Where the course aggregate used is quartzite, basalt or any other igneous rock the binder shall include an adhesion agent.

Clause 921 SURFACE TEXTURE OF BITUMINOUS SURFACE COURSE ON HIGH SPEED ROADS

921.2 Insert after 'shown in Table 9/2' the following:-

'a surface having a value greater than 2.2 mm will not be accepted in the works'

Add sub-clauses 3 and 4:-

- 3 For screening purposes only, on Hot Rolled Asphalt works the texture depth may be measured using a Mini Texture Meter where compliant values shall be as follows:-
- (i) On roads where the 85 percentile speed is in excess of 90km/hour a mean Sensor Measured Texture Depth (SMTD) shall not be less than 1.03 and no 50m section reading shall be less than 0.9.
 - (ii) On all other sites a mean SMTD shall not be less than 0.9 and no 50m section reading shall be less than 0.8. Unless otherwise stated in Appendices 7/1/A to C & H to M.
- 4 The Mini Texture Meter may be used for screening purposes to measure the surface texture of other materials providing a correlation exercise has been undertaken.

Clause 929 DESIGN MIXTURES: DENSE BASE AND BINDER COURSE MACADAMS

929.12 Insert after "clause 9.5.1.3" with the following amendment:-

If the core represents a single bituminous layer and has been cut in half the density of the core is the average of the value obtained from each half of the core.

If the core represents more than one bituminous course and has been split into layers then the density shall be determined separately for each layer.

NOTE 1: A 'layer' is defined as a thickness of material spread by a single operation.

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Clause 937 STONE MASTIC ASPHALT BINDER COURSE) AND REGULATING COURSE

After 'SMA 20 bin PMB' in sub-clause 1 add the following:

- 1.1 Fine aggregate shall comply with Clause 901 and shall comprise crushed rock or crushed slag which may be blended with not more than 50% of natural sand. Crushed gravel shall not be permitted.

Clause 942 THIN SURFACE COURSE SYSTEMS

942. Add an additional sub-clause:-

7. Fine aggregate shall comply with Clause 901 and shall comprise crushed rock or crushed slag which may be blended with not more than 50% of natural sand. Crushed gravel shall not be permitted.

Clause 943 HOT ROLLED ASPHALT SURFACE COURSE AND BINDER COURSE (PERFORMANCE-RELATED DESIGN MIX)

943.4 After 'modified binders' in line 2 add :-

'only pre-blended modified binders shall be used.'

Delete 'whether the modifier into the asphalt mixer'

943.5 Delete 'PSV₄₄' and replace with 'PSV₅₀'

Clause 1104 FOOTWAYS AND PAVED AREAS (PRECAST CONCRETE FLAGS)

Add the following to sub-clause 2:

1104.2 The joints shall be close joints (2-4mm).

Clause 1107 FOOTWAYS AND PAVED AREAS (CONCRETE BLOCK PAVING)

Add the following sub-clauses 4, 5, 6, 7, 8, 9 and 10:-

- 1107.4 The layout of blocks and details of edges, manholes, gullies and other openings shall be agreed with the Overseeing Organisation prior to laying.

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Clause No.	Title	Page No
1107.5	The blocks shall be laid by workmen experienced in the laying of concrete blocks and the Overseeing Organisation will require references in support of this requirement.	
1107.6	Blocks shall be cut to fit all edges using a water lubricated disc cutter. The bond of any edge shall be adjusted such that insert pieces are of a size not less than one half of a full block.	
1107.7	For the purposes of the Contract Table B1 in BS 7533 Part 3 applies The level of any two adjacent blocks shall not differ by more than 2mm. The maximum deviation of the finished surface shall not exceed 10mm below the 3m straight edge.	
1107.8	The paving shall be treated with an approved colourless sealant before the pavement is trafficked.	
1107.9	Blocks shall have a Polished Pendulum Test Value (PPTV) of 45 minimum or 55 minimum (when tested in accordance with BS 7932) as specified by the Overseeing Organisation. Any sealant used shall not reduce the slip / skid resistance of the blocks surface.	
1107.10	Bedding Sand shall comply with Category 1B : Tables D2 and D3 : BS 7533-3.	

Clause 1108 FOOTWAYS AND PAVED AREAS (CLAY PAVERS)

Add the following sub-clauses 4, 5, 6, 7, 8, 9 and 10:-

- | | |
|--------|--|
| 1108.4 | The layout of blocks and details of edges, manholes, gullies and other openings shall be agreed with the Overseeing Organisation prior to laying. |
| 1108.5 | The blocks shall be laid by workmen experienced in the laying of concrete blocks and the Overseeing Organisation will require references in support of this requirement. |
| 1108.6 | Blocks shall be cut to fit all edges using a water lubricated disc cutter. The bond of any edge shall be adjusted such that insert pieces are of a size not less than one half of a full block. |
| 1108.7 | For the purposes of the Contract Table B1 in BS 7533 Part 3 applies.
The level of any two adjacent blocks shall not differ by more than 2mm.
The maximum deviation of the finished surface shall not exceed 10mm below the 3m straight edge. |
| 1108.8 | The paving shall be treated with an approved colourless sealant before the pavement is trafficked. |

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1108.9	Clay pavers shall have a minimum Polished Pendulum Test Value (PPTV) of 45 or 55 minimum (when tested in accordance with BS 7932) as specified by the Engineer. Any sealant used shall not reduce the slip / skid resistance of the blocks surface.	
1108.10	Bedding Sand shall comply with Category 1B : Tables D2 and D3 : BS 7533-3.	

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Clause 1707 CONCRETE - CONFORMITY AND IDENTITY TESTING

1707.2 Add the following additional paragraphs:-

For each grade of concrete where the total quantity supplied will be less than 80 cu.m. the Strength Testing regime shall be:

(i) General

Compliance with the specified characteristic strength shall be based on tests made on cubes at an age of 28 days unless there is evidence, satisfactory to the Overseeing Organisation, that a particular testing régime is capable of predicting the strength at 28 days of concrete tested at an earlier age. Alternatively the use of additional test cubes to indicate satisfactory compressive strength gain at an earlier age than 28 days is permitted.

Unless otherwise instructed by the Overseeing Organisation, the rate of sampling shall be as given in Table 17/4 but not less than one sample shall be taken on each day that concrete of that grade is used.

Table 17/4: Rates of Sampling and Testing

Use of concrete	Sample from one batch selected randomly to represent an average volume of not more than the lesser of:	Workability Tests
Prestressed concrete	6m ³ or 6 batches	} every batch
Reinforced concrete	10m ³ or 10 batches	
Mass concrete	20m ³ or 20 batches	

(ii) Testing

Two cubes shall be made from a sample taken from a randomly selected batch of concrete.

NOTE: As it is considered likely that loads of concrete close to the upper limit of the specified workability limit range may have reduced compressive strength samples may be also targeted at such loads. Samples shall be taken at the point of discharge from the delivery vehicle. The cubes shall be tested and the mean of the two results shall be taken as the test result. When the difference between the results divided by their mean exceeds 15%, the test result shall be deemed invalid. Each individual test result shall be greater than 85% of the specified characteristic strength. If any test result fails to meet the above requirement then that result shall be considered to represent only the particular batch of concrete from which those cubes were taken.

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**Clause 2004 MATERIALS FOR WATERPROOFING BELOW GROUND CONCRETE
SURFACES**

Delete sub-clause 2 and replace with the following:

- 2 Tar shall not be permitted.

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

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INTRODUCTION		
(	0/1	Contract-specific Additional, Substitute and
(		Cancelled Clauses and Tables Included in the
(		Contract.
(	0/2	Contract-specific Minor Alterations to
(		Existing Clauses and Tables Included in the
(		Contract.
(E) (	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.
(	0/5	NOT USED
PRELIMINARIES		
(	1/1	NOT USED
(	1/2	NOT USED
(	1/3	NOT USED
(	1/4	NOT USED
(	1/5	Testing to be Carried out by the Contractor.
(	1/6	Supply and Delivery of Samples to the Overseeing
(		Organisation.
(	1/7	Site Extents & Limitations on Use
(	1/8	NOT USED
(	1/9	Control of Noise and Vibration
(	1/10	NOT USED
(E) (	1/11	NOT USED
(	1/12	Setting Out and Existing Ground Levels
(	1/13	Programme of Works
(	1/14	Payment Applications
(	1/15	Accommodation Works
(	1/16	Privately and Publicly Owned Services and Supplies
(	1/17	Traffic Safety and Management
(	1/18	NOT USED

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
PRELIMINARIES (Continued)		
(	1/19	Routeing of Vehicles
(	1/20	NOT USED
(	1/21	Information Boards
(	1/22	NOT USED
(	1/23	Risks to Health & Safety from Materials or Substances
(	1/24	NOT USED
(	1/25	NOT USED
(	1/26	NOT USED
(	1/27	NOT USED
SITE CLEARANCE		
(	2/1	NOT USED
(	2/2	NOT USED
(E) (	2/3	Retention of Material arising from Site Clearance.
(	2/4	NOT USED
(	2/5	NOT USED
FENCING AND ENVIRONMENTAL BARRIERS		
(E) (	3/1	Fencing, Gates and Stiles.
ROAD RESTRAINT SYSTEMS (VEHICLE & PEDESTRIAN)		
(E) (	4/1	NOT USED
(	4/2	NOT USED
DRAINAGE AND SERVICE DUCTS		
(	5/1	Drainage Requirements.
(	5/2	Service Duct Requirements.
(E) (	5/3	NOT USED
(	5/4	NOT USED
(	5/5	NOT USED.
(	5/6	NOT USED
(	5/7	NOT USED
EARTHWORKS		
(	6/1	Classification and Acceptability of Earthworks Materials
(	6/2	Requirements for Dealing with Class U1B and U2

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
(	Unacceptable Material	
(6/3	Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction)	
(6/4	NOT USED	
(E) (6/5	NOT USED	
(6/6	NOT USED	
(6/7	NOT USED	
(6/8	Topsoiling	
(6/9	NOT USED	
(6/10	NOT USED	
(6/11	NOT USED	
(6/12	NOT USED	
(6/13	NOT USED	
(6/14	NOT USED	
(6/15	NOT USED	
ROAD PAVEMENTS - GENERAL		
(7/1	Permitted Pavement Options - Flexible and Flexible Composite Construction	
(7/2	Patching	
(E) (7/3	NOT USED	
(7/4	Bituminous Sprays (Clause 920).	
(7/5	NOT USED	
(7/6	Breaking Up or Perforation of Redundant Pavement	
(E)(C)(T)(P) (7/7	NOT USED	
(7/9	Cold Milling (Planing) of Bituminous Bound Flexible Pavement	
(C) (7/10	NOT USED	
(7/11	NOT USED	
(7/12	NOT USED	
(C) (7/13	NOT USED	
(7/14	NOT USED	
(7/15	NOT USED	
(7/16	NOT USED	
(C) (7/17	NOT USED	
(E) (7/18	NOT USED	
(7/19	NOT USED	
ROAD PAVEMENTS – GENERAL (Cont'd)		
(7/20	NOT USED	
(E)(C)(T) (7/21	NOT USED	
(7/22	NOT USED	
(7/70	Modified Binder and Mixture Data Requirements	

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
ROAD PAVEMENTS – CONCRETE AND CEMENT BOUND MATERIALS		
(T) (	10/1	NOT USED
KERBS, FOOTWAYS AND PAVED AREAS		
(E) (	11/1	Kerbs, Footways & Paved Areas.
(	11/2	NOT USED
TRAFFIC SIGNS		
(	12/1	Traffic Signs: General.
(	12/2	NOT USED
(	12/3	Traffic Signs: Road Markings & Studs.
(E) (	12/4	Traffic Signs: Cones, Cylinders, FTDs & Other Traffic Delineators.
(	12/5	NOT USED
(	12/6	NOT USED
ROAD LIGHTING COLUMNS AND BRACKETS		
	13/1	Information to be Provided when Specifying Lighting & Column Brackets
	13/2	NOT USED
	13/3	NOT USED
	13/4	NOT USED
	13/5	NOT USED
	13/6	NOT USED

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS		
(14/1	Site Records	
(14/2	Location of Lighting Units and Feeder Pillars	
(14/3	Temporary Lighting	
(14/4	NOT USED	
(14/5	NOT USED	
MOTORWAY COMMUNICATIONS		
15/1	NOT USED	
15/2	NOT USED	
PILING AND DIAPHRAGM WALLING		
(16/1	NOT USED	
(16/2	NOT USED	
(16/3	NOT USED	
(16/4	NOT USED	
(16/5	NOT USED	
(16/6	NOT USED	
(16/7	NOT USED	
(16/8	NOT USED	
(16/9	NOT USED	
(16/10	NOT USED	
(16/11	NOT USED	
(16/12	NOT USED	
(16/13	NOT USED	
(16/14	NOT USED	
(16/15	NOT USED	
(16/16	NOT USED	
(16/17	NOT USED	
(16/18	NOT USED	

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
STRUCTURAL CONCRETE		
(	17/1	Schedule For The Specification Of Designed Concrete
(	17/2	NOT USED
(	17/3	NOT USED
(	17/4	NOT USED
(	17/5	NOT USED
(	17/6	NOT USED
STRUCTURAL STEELWORK		
	18/1	NOT USED
PROTECTION OF STEELWORK AGAINST CORROSION		
	19/1	NOT USED
	19/2	NOT USED
	19/3	NOT USED
	19/4	NOT USED
	19/5	NOT USED
WATERPROOFING FOR STRUCTURES		
(C)(P)	20/1	NOT USED
(E)	20/2	NOT USED
BRIDGE BEARINGS		
	21/1	NOT USED
PARAPETS		
	22/1	NOT USED
BRIDGE EXPANSION JOINTS AND SEALING OF GAPS		
	23/1	NOT USED
	23/2	NOT USED
BRICKWORK, BLOCKWORK AND STONEMWORK		
	24/1	NOT USED

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
SPECIAL STRUCTURES		
25/1	NOT USED	
25/2	NOT USED	
25/3	NOT USED	
25/4	NOT USED	
25/5	NOT USED	
MISCELLANEOUS		
26/1	Ancillary Concrete	
26/2	NOT USED	
26/3	NOT USED	
LANDSCAPE AND ECOLOGY		
30/1	NOT USED	
30/2	NOT USED	
30/3	NOT USED	
30/4	NOT USED	
30/5	Grass Seeding, Wild Flower Seeding and Turfing.	
30/6	NOT USED	
30/7	NOT USED	
30/8	NOT USED	
30/9	NOT USED	
30/10	NOT USED	
30/11	NOT USED	
30/12	NOT USED	
MAINTENANCE PAINTING OF STEELWORK		
(C)(P)	50/1	NOT USED
(C)(P)	50/2	NOT USED
(C)(P)	50/3	NOT USED
(C)(P)	50/4	NOT USED
(Co)	50/5	NOT USED

Guide to types of Numbered Appendices - who compiles/completes

Symbol

(E) Overseeing Organisation compiles.

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
(E/C)	Overseeing Organisation partially compiles and Contractor completes and returns to Overseeing Organisation.	
(E/T)	Overseeing Organisation partially compiles and Tenderer completes and returns with Tender.	
(C)	Contractor completes and returns to Overseeing Organisation.	
(I)	For Contractor's information only.	
(P)	This indicates the Appendix is a national proforma and format must not be altered.	

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

List of Substitute Clauses and Tables

Clause No.	Title	Page No
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ROAD PAVEMENTS - GENERAL

7/70	Modified Binder and Mixture Data Required.	
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APPENDIX 0/4 : LIST OF DRAWINGS INCLUDED IN THE CONTRACT

Supplied to Each Tenderer

[illegible]

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

Supplied to Each Tenderer

[illegible]

CONTRACT APPENDICES**APPENDIX 0/4 : LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)****1. Standard Drawings (Continued)**

Supplied to Each Tenderer

Drawing Number	Drawing Title
Hampshire County Council Standard Details 'L Series'	
HCC9/L/050	Externally Illuminated Sign Mounted on Steel Post and Foundation Details
HCC9/L/055	Externally Illuminated Sign - Equipment and Wiring Arrangements
HCC9/L/060	Internally Illuminated Bollard Detail
HCC9/L/065	Termination of S.W.A. Cables in Columns or Posts
HCC9/L/070	Underground Cabling
HCC9/L/075	Street Lighting Drawpit Type 2
HCC9/L/080	Typical Base Compartment Arrangement for Columns or Posts with Southern Electric Service
HCC9/L/085	Steel Wire Armour Cable Method of Termination
HCC9/L/090	General Feeder Pillar Details
HCC9/L/105	Bracket Type B - Sign
HCC9/L/135	Sign Offset Brackets
HCC9/L/165	Warning notice for equipment in vicinity of overhead lines
Hampshire County Council Standard Details 'M Series'	
HCC9/M/005	Kerb Replacement (on New Base)
HCC9/M/010	Kerb Replacement (on Existing Base)
HCC9/M/015	Haunch Details Employing Cold Recycled Bituminous Base Material (CRBBM)
HCC9/M/020	Carriageway Haunch Repair Detail
HCC9/M/025	Carriageway Repair Details
HCC9/M/030	Overlay Ramp and Tie-in
HCC9/M/045	Pedestrian Guard Rail
HCC9/M/070	Cellular Concrete Block Construction Detail Type 'A' and 'B'

CONTRACT APPENDICES**APPENDIX 0/4 : LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)****1. Standard Drawings (Continued)**

Supplied to Each Tenderer

Drawing Number	Drawing Title
Hampshire County Council Standard Details 'T Series'	
HCC9/T/005	Traffic Signal Drawpit Type 1
HCC9/T/010	Traffic Signal Drawpit Type 2
HCC9/T/015	Traffic Signal Drawpit Type 2A (Brick Alternative)
HCC9/T/020	Details of Traffic Signal Controller Chambers Types A and B
HCC9/T/025	Details of Traffic Signal Pole Connection
HCC9/T/030	Details of Connection of Vehicle Detector Loop to Drawpit
HCC9/T/035	Demountable Traffic Signal Pole and Combined Drawpit Types 3 and 4
HCC9/T/040	Puffin / Pelican / Toucan Crossing Layout Details
HCC9/T/045	Power Supply Pillar
HCC9/T/050	Carriageway Loop Tail Chamber Detail

CONTRACT APPENDICES**APPENDIX 0/4 : LIST OF DRAWINGS INCLUDED IN THE CONTRACT (Continued)****2. Scheme Specific Drawings**

Drawing Number	Drawing Title
RPF Associates Scheme Drawings	
RPF/120/002	Combined Services Layout & Proposed Diversions
RPF/120/004	Location Plan
RPF/120/005	Scheme Layout
RPF/120/006	Traffic Signals Layout
RPF/120/007	Long Section & Visibility Splays
RPF/120/010	Cross Sections

3. (i) Available to Tenderers

The following drawings are made available to Tenderers on request. The Overseeing Organisation (RPF Associates) to be contacted on 07813 691989, email: psf@rpfassociates.com

The plans supplied by the Statutory Authorities and proposed diversions have been incorporated on drawing number RPF/120/002.

Drawing No	Title	Aspect required if not whole Drawing
N/A	C2 & C3 NRSWA Information	Whole drawings and plan extracts

(ii) Brought into the Contract by Reference

Highway Construction Details published by the Stationary Office as Volume 3 of the Manual of Contract Documents for Highway Works contains relevant drawings brought into this Contract by reference, unless a relevant Hampshire County Council Standard Detail (listed in Section 1 of this Appendix) exists. **In these circumstances, Hampshire County Council Standard Details shall take precedence.**

CONTRACT APPENDICES**APPENDIX 1/5 : TESTING TO BE CARRIED OUT BY THE CONTRACTOR****GENERAL NOTES:**

1. The Tables which follow show the minimum frequency of testing to be carried out by the Contractor to demonstrate compliance with the Specification. The actual frequency of testing to be carried out by the Contractor will be expected to be increased, in the event of materials failing to comply, until it can be demonstrated to the Overseeing Organisation, that those materials are again reliably compliant.
2. Unless otherwise shown in this Appendix, tests or certificates for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the works.
3. Tests equivalent to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See sub-Clause 105.5).
4. The Contractor shall be responsible for carrying out tests in conjunction with Structures designed by the Contractor after agreeing testing requirements with the Overseeing Organisation.
5. Cube strengths are not required routinely for concrete complying with Clause 2602 / 2602SR.
6. The Contractor shall be responsible for cutting all cores for air voids testing, wheel tracking, stiffness and deformation resistance determinations at locations directed by the Overseeing Organisation in accordance with Clauses 929, 937, 942, 943, 960AR, 970AR, 989AR, 1003 and 1030. Cores will be required from each layer. A layer is defined as that thickness of material laid in one single pass of the paver. The Contractor shall also carry out the reinstatement and sealing of core holes using appropriate bituminous or cementitious materials as instructed by the Overseeing Organisation. Any core hole that settles by more than 8mm within 3 months of reinstatement shall, at the direction of the Overseeing Organisation, be retreated at no extra cost.
7. Where the Contractor is responsible for sampling and or testing the cores they shall ensure all cores are protected, stored and transported in accordance with the relevant clause.
8. In the cases of 6 and 7 the Contractor is responsible for ensuring the cores taken are of the correct dimensions and straightness and are clearly marked as required by the relevant clause. Cores shall be contained in such a way that their individual identities and locations are preserved and traceable.
9. Where tests are required at the rate of 1 per source, the Contractor shall either supply recent (i.e. not older than 12 months) appropriate test results or conduct testing specifically at the material approval stage.
10. (N) indicates that the test in question shall be carried out to UKAS standards and a UKAS accredited test report or Certificate is required.
11. Test Certificates. Where a requirement for test certificates is shown in any particular segment of the table, this requirement shall apply to all items adjacent to that segment.

CONTRACT APPENDICES

12. Copies of all test certificates specified for the 900 Series shall be automatically sent to the Overseeing Organisation.

CONTRACT APPENDICES

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 300					
306	Permanent fencing				Quality management scheme applies
	Concrete components	Cover to reinforcement	1 per consignment (max 1 per 100 components)	Required	
308 & 311	Preservation of timber	Moisture content (using the oven drying method)	As required in sub-Clause 311.2(v)	Required for each batch	Quality management scheme applies
Series 400					
402	Welding	Welding procedures (Manufacturer's tests)	(Every seven years)		Quality management scheme applies
		Welder qualification (Manufacturer's tests)	As required in Sub Clause 402.6(iii)		
		Production testing (Manufacturer's tests)	As required in Sub Clause 402.6(iv)		
	Welded joints	Destructive testing (Manufacturer's tests) (N)	(See sub-Clause 402.6 (v) and 402.6(vi))	Required	++ [See NG402(N)]
403	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence [See NG 403.15]
404	Anchorage in drilled holes	Loading test on site	1 per site or as required in Appendix 4/1	Required	
	Post foundations		1 per 100 linear m or per section, whichever is greater		Contractor to provide equipment and carry out test [See NG404.3 and 4]
406	Vehicle parapets			Required (BS 6779-1 1998 (Amd. No. 14290 21 March 2003))	Check Manufacturer's Test Certificate

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
407	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence [See NG 407.2]

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 400 (cont'd)					
409	Vehicle parapet posts	Production testing as specified in BS 6779-1 1998 (Amd No 14290. 21 March 2003) (Manufacturer's tests)		Required	Certification in accordance with Clause 409 is required.
410	Anchorage in drilled holes.	Loading test on site	(As required)	Required	[See NG410.1]

Series 500					
501	Pipes for drainage and service ducts				
		Vitrified clay	[See Note 1] Evidence of CE Marking or BBA Agreement Cert.	Required [See Note 2]	Product certification scheme applies. [Note 1. Additional manufacturer's tests are provided for in the relevant BS but should not normally be required.]
		Concrete-PC/S RC			
		Concrete Pre-stressed			
		not exceeding 900mm diameter			
		Iron-cast			
		Iron-ductile		[See Note 2]	[Note 2 Certificates are provided for in the relevant BS but should not normally be required except for pipes which are not quality marked by a UKAS or equivalent accredited body listed in Appendix B.]
		PVC-U			
		GRP			
		Plastics, see Table 5/1			
		Corrugated steel	(Manufacturer's tests)	Required (AASHTO)	
		Corrugated steel bitumen protection			
		Not exceeding 900mm diameter			
		Other materials		Required	BBA certification (or equivalent) applies

CONTRACT APPENDICES

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
503	Pipe bedding	Grading and fines content (N) For a recycled content see Clause 710 (N)	1 per source at approval and at 3 month intervals	Required	Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of BS EN 13242.
		Water-soluble sulphate (WS) content (N)	5 per source at approval and at 3 month intervals	Required	<i>[Minimum to allow for natural variability of sulphur compounds.]</i>

CONTRACT APPENDICES

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (cont'd)					
503 cont'd	Pipe Bedding	Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per source at approval and at 3 month intervals	Required	
		Resistance to fragmentation (N)	1 per source* at approval and 1 per year		[LA category]
505	Filter medium backfill	Plastic index (N)	1 per source at approval and at 3 month intervals thereafter	Required	[Results of routine control tests from the factory production control system operated by the producer to be provided – see annex C of BS EN 13242 and Annex D of BS EN 13285.]
		Resistance to fragmentation (N)	1 per source at approval and 1 per year thereafter	Required	
		Water soluble sulphate (WS) content (N)	5 per source at approval and at 3 month intervals thereafter	Required	[Minimum to allow for natural variability of sulphur compounds.]
		Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per source at approval and at 3 month intervals thereafter	Required	
		Grading and fines content (N)	1 per source at approval and at 3 month intervals thereafter	Required	[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of BS EN 13242 and Annex D of BS EN 13285.]
		For a recycled content see Clause 710		Required	
		Permeability (N)	1 per source at approval and annually thereafter	Required	If required by App 5/1
506	Sealing existing drains				
	Concrete		Site specific compiler to specify		
	Grout				
507	Chambers			Required	
	Pre-cast concrete	Evidence of CE Mark or BBA Agreement Cert.	Each type and source annually		Product certification scheme applies

CONTRACT APPENDICES

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (cont'd)					
507 cont'd	Chambers				
	Corrugated galvanized steel	(Manufacturer's tests)		Required	Product certification scheme applies
	Chamber steps	BS EN 124 Tests	1 per type and source annually	Required	Product certification scheme applies Quality Management scheme applies
	Steel fitments				
	Covers, grates and frames				
	Cover bolts				
	Watertightness				As App 5/1
508	Gullies and pipe junctions	Evidence of CE Mark or BBA Agreement Cert.	1 per type and source annually	Required	Product certification scheme applies BBA certification applies
	Pre-cast concrete				
	Clay				
	Plastic				
509	Watertightness of joints	Air test	All pipelines with watertight joints <i>[As required in Appendix 5/1 for partly watertight joints]</i>	Required	To be observed by the Overseeing Organisation
512	Backfill to pipe bays	Grading and fines content (N) For a recycled content see Clause 710	1 per source at approval and at 3 monthly intervals thereafter	Required	Minimum to allow for natural variability of sulphur compounds
		Water-soluble sulphate (WS) content	5 per source at approval and at 3 monthly intervals thereafter		
		Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per source at approval and at 3 monthly intervals thereafter	Required	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (cont'd)					
513	Permeable backing to earth retaining structures	Plastic index (N)	1 per 200 tonnes or per scheme whichever is the greater	Required	
		Water-soluble (WS) content	5 per source per scheme at approval	Required	[Minimum to allow for natural variability of sulphur compounds]
		Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per source per scheme at approval	Required	[Minimum to allow for natural variability of sulphur compounds]
		Resistance to fragmentation (N)	1 per source per scheme at approval	Required	
		Grading and fines content (N) For a recycled content see Clause 710	1 per 200 tonnes (min of 1 per scheme)*	Required	
		Permeability	1 per source per scheme at approval	Required	[LA category]
	Pre-cast hollow concrete blocks	(Manufacturer's tests)	1 set per source per scheme at approval	Required	
514	Fin drains	(Manufacturer's tests) BBA Agreement Cert		Required	BBA certificates (or equivalent) applies
515	Narrow filter drains	Geotextile, pipes and fittings	(Manufacturer's tests) BBA Agreement Cert	Required	BAA certification (or equivalent) applies
		Granular fill	Plastic index (N)	1 per source per scheme	
			Resistance to fragmentation (N)		
			Water-soluble sulphate (WS) content (N)		
			Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per source at approval and at 3 monthly intervals thereafter	[Minimum to allow for natural variability of sulphur compounds]
				5 per source at approval and at 3 monthly intervals thereafter	
Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (cont'd)					
515 cont'd	Narrow filter drains				

CONTRACT APPENDICES

			Grading and fines content (N) For a recycled content see Clause 710	1 per 200 tonne per scheme		[Results of routine control tests from the factory production and control system operated by the producer to be provided – see Annex C of BS EN 13242]	
			Permeability (N)	1 per source per scheme at approval			
516	Combined drainage and kerb systems		Load test (Manufacturer’s test)	A minimum of 1 test for each type and source annually	Required	Certification that the systems comply with Clause 516 is required	
517	Linear drainage systems		Load test	A minimum of 1 test for each type and source annually	Required	Certification that the systems comply with Clause 517 is required	
518	Thermoplastic structured wall pipes and fittings		(Manufacturer's tests) BBA Agreement certificate		Required	BBA certification (or equivalent) applies	
Series 600							
601 631 to 637 640	Acceptable material			Testing of fill materials Class 1 to 4 to be agreed and priced on a scheme specific basis depending on circumstances. Frequencies of testing will be in line with overall guidance as set out in Table NG1/1 of SHW		[For recycled aggregate, see sub-Clauses 601.12, 601.18 and Clause 710]	
	Class	General Description					
	1	General granular fill	Grading/ uniformity coefficient (N)				
			mc/MCV (N)				
			OMC Max. dry density				
			SMC of chalk (N)				
		IC only	Resistance to fragmentation (N)			[LA Category]	
	2	General cohesive fill	Grading (N)				[Cross-references should be made to any requirements in Appendix 6/1]
			mc/MCV/PL				
			Undrained shear strength (N)				
			SMC of chalk (N)				
			Bulk density (pfa) (N)				
	3	General chalk fill	mc (N)				
			SMC (N)				
	4	Landscape fill					

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (cont'd)						
601 631 to 637 640 cont'd	5B	Topsoil (imported)	Grading (N)	1 per day	Required	
			Full analysis to BS 3882 - determination of nitrogen content - extractable phosphate content - extractable potassium content - extractable calcium content - extractable magnesium content - extractable sodium content - extraction of exchangeable cations - calculation of exchangeable sodium percentage -determination of loss of mass on ignition - determination of mineral carbonate content - soil texture recommendation for handling and use	1 full suite of tests at approval and 1 per 400 tonnes thereafter	Required	
	6	Selected granular fill	PI/LL (N)	Testing of fill materials Class 6 and 7 to be agreed and priced on a scheme specific basis depending on circumstances. Frequencies of testing will be in line with overall guidance as set out in NG I/1 of SHW	Required	
			Resistance to fragmentation (N)			
			SMC (N)			
			omc/mc, mc or MCV (N)			
			Organic matter/water soluble sulphate (WS) (N)			
					Required	[LA category but not for Class 6F4 and 6F5] [Not for Class 6F4 and 6F5] [At least 5 tests per source for sulphur compounds over the course of the contract in accordance with TRL Report 447, tests 105]

CONTRACT APPENDICES

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (cont'd)						
601 631 to 637 640 cont'd	Acceptable material Class	General Description	Oxidisable sulfides (OS) and total potential sulphate (TPS) content (N)		Required	
			pH/chloride ion content (N)			
			Resistivity (N)			
			Undrained and drained shear parameters (N)			[Cross reference should be added to any requirements in App 6/1]
	6F3		Bitumen content			
	6F4 and 6F5		Size designation and overall grading category (N)			[Results of routine control tests from the factory production control system operated by the producer to be provided for Class 6F4 ad Class 6F5 – see Annex C of BS EN 13242 and Annex D of BS EN 13285]
			Maximum fines and oversize categories (N)			
			Volume stability of blast furnace slag			
			Volume stability of steel (BOF and EAF) slag			
			Other aggregate requirements	Annex C of BS EN 13242	Required	
			Laboratory dry density and optimum water content (N)			[Declared values from the factory production control system operated by the producer to be provided for Class 6F4 and Class 6F5 – see Annex D of BS EN 13285]
			Water content (N)			
	6H, I, J		Redox potential, microbial activity index			As required in Table 6/3
	6K and 6LL		Sulphides and hydrogen sulphide			Standard textbook hydrogen sulfide qualitative inorganic analysis
	6N and 6P		Permeability			
			Slope stability effective angle of internal friction (ϕ') and effective cohesion (c')			

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (cont'd)						
601 631 to 637 640 cont'd	Acceptable material					
	Class	General Description				
	7	Selected cohesive fill	Grading/mc/ MCV/bulk density (N)		Required	
			SMC of chalk (N)			
			PI/LL (N)			
			Organic matter/ water soluble (WS) sulphate content (N)			
			Oxidisable sulfides (OS) and total potential sulphate (TPS) content (N)			
			pH/chloride ion content (N)		Required	
			Resistivity (N)		Required	
			Undrained and drained shear parameters (N)		Required	[Cross reference should be made to any requirements in Appendix 6/11]
			Permeability (N)		Required	
	7A		Effective angle of internal friction and cohesion Clause 636		Required	

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (cont'd)						
601 631 to 637 640 cont'd	Acceptable material				Required	
	Class	General Description				
	7B		Coefficient of friction and adhesion Clause 639 Slope Stability Clause 610			
	7C		Redox potential			
	9	Stabilised materials	Pulverisation	Testing of stabilised materials to be agreed and priced on a scheme specific basis depending on circumstances. Testing requirement will be in line with overall guidance in HA74/07 and table NG1/1 of SHW	Required	
			mc/MCV (N)			
			Target compacted density			
Bearing ratio (N)						
Pulverised fuel ash		Chemical analysis	1 per consignment	Required	[As appropriate to properties stated in Table 6/1 or Appendix 6/1]	
Incinerator bottom ash aggregate		Grading (N)	1 per 300 tonnes*			
Fill adjacent to cementitious material or metallic items		Water-soluble sulphate (WS) content, oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)	5 per 400 tonnes or per location if less than 400 tonnes*			
609 621	Geotextiles		Tensile load	1 per source and type	Required	Manufacturer's certification required to demonstrate compliance with Appendices 6/5 or 6/9
			Permeability			
			Pore size			

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 (cont'd)					
612	Compaction of fills			Required	
	Method compaction	Field dry density (N)	Testing requirement for as installed characteristics of earthworks and stabilised materials to be agreed and priced on scheme specific basis depending on circumstances. Testing frequencies shall be in line with general guidance as set down in HA74/07 and Table NG1/1 of SHW	Required	
	End product compaction	Optimum mc (2.5kg rammer/vibrating hammer method) (N)			
		Field dry density (N)			
614	Cement stabilisation to form capping	Rate of spread of cement		Required	
615	Lime stabilisation to form capping	Rate of spread of lime		Required	
641		Available lime content			
643					
622	Earthworks for reinforced soil and anchored earth structures	Redox potential	Testing requirements to be agreed and priced on a scheme specific basis depending on circumstances	Required	
638	Drainage layers	Grading (N)			
639		Chemical analysis			
	Reinforcing elements	Coeff. of friction			
	Anchor elements	Adhesion			
624	Ground anchorages	Proof loading		Required	
626	Gabions			Required	
	Fill	Grading (N)			
		10% fines values (N)			
		Soundness test (N)			
	Geomesh	[As appropriate to properties stated in Appendix 6/10]		Required	
	PVC coated wire			Required (ASTM G23)	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
642	Earthworks materials for corrugated steel buried structures	Constrained soil modulus (M*)		Required	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 700						
702	Longitudinal and transverse surface regularity	Rolling straight edge or 3m straight edge	As required in Clause 702	Required	Overseeing Organisation notified in advance to enable observation of the testing	
	Texture depth (N)	BS598-105 or BS EN 13036-1	Min 1, 50m section or as required in Annex B of BS 598-105	Required	As per Clause 921	
	Bump integrator	As TRL SR 26 UC	As required on any lengths of 250m or more	Required	To be called up by the Overseeing Organisation in accordance with Clause 702/942SR or Appendix 7/1 as appropriate	
710	Constituent materials in recycled aggregate	Quality control (N) Constituents (N)	Checks are to be carried out by the Contractor in accordance with the procedure set down in 'Quality Control - Production of Recycled Aggregates' with those in this Clause 1 for approval (see comments) and 1 per week during works for each material supplied	Required	The quality control procedure should be in accordance with the 'Quality Control - Production of Recycled Aggregates' published by Waste and Resources Action programme is available from WRAP website http://www.wrap.org.uk . The suppliers results of all quality control checks shall be accepted by the Overseeing Organisation in lieu of Contractor testing.	
770AR	Overband sealing of cracks in bituminous pavement				BBA certification (or equivalent) applies	
		Skid resistance	Pendulum test	Random 5% of sites treated, to be tested after 12 months	Required	
771AR	Infrared Patching		BS598-105 or BS EN 13036-1	Minimum 1 per patch or 1 per 10 linear metre per patch, whichever if greater	Required	Only 1 per 20 patches greater than 1 sqm.
	Texture Depth (N)					

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 800					
801 803 891AR 892AR	General requirements for unbound mixtures for adjacent to cement bound materials, concrete pavements, structures or products	Water soluble sulphate (WS) content(N)	5 tests/source/ annum	Required	[Minimum to allow for natural variability of sulphur compound]
		Oxidisable sulfides (OS) content and total potential sulphate (TPS) content (N)			Supplier results
	Unbound mixtures beneath surface of a road or paved central reserve (up to 350mm of finished road level)	Frost heave (N)	1 per source for approval and per year		[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of BS EN 13242]
		Grading and fines content (N)	1 per month		
		For recycled content see Clause 710			
		Crushed, broken or rounded test			
		Plastic index (N)			
		Resistance to fragmentation (N)	6 monthly*		[LA category]
		Resistance to wear – micro-Deval test			[Where required. See NG 801.9]
		Resistance to freezing and thawing (magnesium sulphate soundness (N)	1 per source for approval and per year		[Where required - see NG 803.4]
		Water absorption (N)	6 monthly		[See NG 801.10]
		Volume stability of blast furnace slags	6 monthly		
		Volume stability of steel (BOF and EAF) slags	6 monthly		
		CBR (N)	1 per source and then 6 monthly*		[See sub-Clause 801.6]
		OMC/mc (N)	[As required]		[Declared values from the factory production control system operated by the producer to be provided – see Annex D of BS EN 13285]
		Density (N)	[As required]		

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 800 (cont'd)					
870	Testing of hydraulically bound mixtures for sub-bases	Testing to be agreed and priced on a site specific basis. Depending on circumstances frequencies will be in line with general guidance in HA74/07 and Table NG1/1 of SHW			
Series 900					
901 902 925 937 938 943 942SR 960AR 970AR	Aggregates for bituminous materials			Required at approval stage	National quality management sector schemes apply
	Resistance to fragmentation (hardness)	Resistance to fragmentation (N)	At approval then 1 per source per year		
	Resistance to freezing and thawing (durability)	Soundness (N)	At approval then 1 per source per year		
		Water absorption (N)	At approval then 1 per source per year		
	Cleanliness	Sieve test (mass passing 0.063mm sieve) (N)	At approval then 1 per source per year		Washing and sieving method to be used
	Shape	Flakiness index (N)	At approval then 1 per source per year		
	Blastfurnace slag	Bulk density (N)	At approval then 1 per source per year		[VS EN 1097-3]
		Soundness	At approval then 1 per source per year	Required	
		Dicalcium silicate disintegration (N)	At approval then 1 per source per year		[These are for air-cooled blastfurnace slag]
		Iron disintegration (N)			
	Steel slag	Bulk density (N)	At approval then 1 per source per year		

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Volume stability (N)	At approval then 1 per source per year		

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)						
902 925 937 938 943 942 960AR 970AR Cont'd		Coarse aggregate for surface courses	Resistance to polishing (PSV) (N)	6 per source at approval as Cl. 915.4 Update every 2 months for approved sources		As required in Cl. 915.3SR
			Resistance to surface abrasion (AAV) (N)	1 per source at approval then yearly		
	Binders for bituminous materials	Penetration (N)	1 per source*	Required	National quality management sector schemes apply. Modified binders should have a BBA HAPAS Roads and Bridges Certificate. In the event that no such Certificates have been issued, then in the interim only modified binders undergoing BBA assessment should be considered for approval by the Overseeing Organisation. <i>[More frequent tests/samples should be scheduled for modified binders.]</i>	
		Softening point (N)	1 per source*			
		[Other BS EN tests]	[As required]			
	903 to 907 909 to 912 914 916 925 926 929 937 938 942SR 943 946 to 948 960AR 970AR	Bituminous mixtures		Laying records including rolling temperature	Each load	Required
929	Base and Binder Course Macadams		Refusal air void content (N) (PRD Test)	At approval per source and per year		If the Job Mixture Approval Trial has been carried out off site then the results shall be supplied at least 10 working days before use on
			Binder volume (N)			
			Grading (N)			

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Binder content (N)			site. Otherwise JMA trial will be required on site
Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
929 cont'd	Base and Binder Course Macadams	In situ air void content (N)	1 per month		Contractor to arrange coring. Cores must be taken perpendicular to the road surface.
911	Rolled asphalt wearing course (design mix)	Stability value (N) Flow value (N) Density (N) with combinations and sources of constituents	1 per source annually	Required	National quality management sector schemes apply. Provide results, at least 10 working days before use, with all graphs. The design shall be less than 12 months old. This information must be for exactly the same mixture as that proposed for the works
915	Coated chippings	Grading (N)	1 per stockpile*	Required	Update every 2 months for approved sources. From 3 test houses and less than 12 months old
		Binder content (N)	1 per stockpile*		
		Flakiness index (N)	1 per source*		
		Resistance to polishing (PSV) (N)	6 per source* As Cl. 915.4		
		Resistance to surface abrasion (AAV) (N)	1 per source* at approval and annually		Not required for coated chippings for surface dressing
		Hot sand test (N)	1 per stockpile		
		Rate of spread (N)	Min 1 per day		
921	Surface macrotexture	BS EN 13036-1 Volumetric Patch Technique (N) or SMTD BS 598-105 Sand patch test	50m sections including a minimum one third of the scheme	Required	Where surface texture is required in Appendix 7/1
924SR	High friction and Gateway surfaces	Quality control checks	As required in BBA approved method statement		BBA HAPAS Roads and Bridges certification (or equivalent) applies
		System coverage	Required for each section applied		

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Tensile testing on thermosetting binder BS 2782-3 method 320A (N)	2 samples per shift		

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)						
924SR cont'd		Aggregate	Resistance to polishing (PSV) (N)	6 per source* and as required for coated chippings in sub-Clause 915.4		Only 1 per source per year for calcined bauxite
970AR	Stone mastic asphalt		Job mixture approval trial	1 per source at approval and annually	Required	National quality management sector schemes apply. Information to be supplied at least 10 working days before use
			In-situ and Laboratory testing	as required by Clause and Contract documentation		
937	Stone mastic asphalt (SMA) binder course and regulating course		Job mixture approval trial As required in Clause 937 for the <i>works</i>	1 per source at approval and annually	Required	National quality management sector schemes apply
			Binder drainage test	In accordance with DD 232: 1996	Required	
960AR	Thin Surface Course		Aggregate grading (N)	1 per mixture per year	Required	BBA/HAPAS scheme applies
			Binder Content (N)			
			Binder volume (N)			
			Bulk density (N)			
			Job mixture trial wheel-tracking rate and rut depth (N)			
			In situ wheel-tracking rate and rut depth (N)	1 scheme in 10 selected by the Overseeing Organisation at random		Not more than 12 months old
			Binder drainage	1 per mixture per year		
			PSV (N)	6 per source per year		
			AAV (N)	1 per source per year	Required	Coarse aggregates only less than 12 months old
			AIV (N)	1 per source per year		
			Flakiness Index (N)	1 per source per year		
			LA	1 per source per year		
			Indirect tensile stiffness modulus (N)	1 per source per year		

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
		Calibration of bond coat distributor (N)	Certificate less than 6 months old			
Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 900 (cont'd)						
960AR cont'd		Vialit pendulum cohesion of bond coat (N)	1 per bond coat per year			
		Rate of spread of bond coat	1 per scheme		Records of Contractors Tests to be provided	
		Surface texture sand patch	As required in Annex B of BS598 Part 105			
943	Rolled asphalt wearing course (performance related design mix)	Stability value (N)	1 per source at approval and annually	Required	National quality management sector schemes apply. See NFG 943.3 to 7 (Tendering) JMA trial information to be supplied at least 10 working days before use with details of components and properties. Results of wheel tracking, air voids, binder volume and design information with graphs	
		Flow value (N)				
		Density (N) with combinations and sources of constituents				
		Grading (N)				
		Binder content (N)				
		Density (N)				
		Wheel-tracking rate (N)				
		Wheel-tracking rut depth (N)				
		Air voids content (N)				
		In situ Air voids and wheel-tracking rate and rut depth	1 scheme in 10 selected by the Overseeing Organisation at random			
920	Bond coats, tack coats and other bituminous sprays					
		Binder	Product identification	At approval and 2 years	Required	Tests are expected to be repeated every two years
			Vialit cohesion	At approval and 2 years	Required	Tests are expected to be repeated every two years
			Penetration at 25°C and 5°C (N)	At approval and annually	Required	Manufacturer's QA test results may be submitted
			Accuracy of spread calibration of binder distributor (N)	Certificate to be less than 6 months old	Required	

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Rate of spread Carpet tile test	1 set per site	Required	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
918SR	Slurry surfacing incorporating microsurfacing – for footways				
		Binder			Modified binders should have a BBA HAPAS Roads and Bridges Certificate. In the event that no such Certificates have been issued, then in the interim, modified binders shall only be used if the binder is undergoing BBA assessment and with the approval of the Overseeing Organisation
		Product Identification	Per product per source at approval and annually thereafter	Required	
		Vialit cohesion	Per product per source at approval and annually thereafter	Required	
		Penetration at 25°C and 5°C (N)	Every manufactured batch	Required	Manufacturer's QA test results may be submitted
		Aggregates	Flakiness index (N)	Required	
			Resistance to polishing PSV(N)	Required	To be updated every 2 months for approved source.
			Resistance to surface abrasion AAV(N)	Required	
		System	TAIT or BBA/HAPAS	Required	
			Rate of spread mass per square metre (binder and aggregate separately)	Required	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
960AR	Microasphalt for carriageways	Binder and Bond Coat			Modified binders should have a BBA/HAPAS Roads and Bridges Certificate. In the event that no such certificates have been issued then in the interim only modified binders undergoing BBA assessment may be used with the approval of the Overseeing Organisation
		Product identification	Per product per source at approval and annually thereafter	Required	
		Vialit Cohesion	Per product per source at approval and annually thereafter	Required	
		Penetration at 25°C and 5°C (N)	Every manufactured batch	Required	Manufacturer's QC test results will be acceptable
	Aggregates (Coarse Aggregate only)	Flakiness Index (N)	1 per source at approval and annually thereafter	Required	
		Resistance to Polishing PSV(N)	6per source at approval as Clause 915.4 and annually thereafter	Required	
		Resistance to Abrasion AAV (N)	1 per source at approval and annually thereafter	Required	
		Los Angeles abrasion value	1 per source at approval and annually thereafter	Required	
	Application	Thickness	At least twice per site	Required	
		Surface Macrotexture untrafficked sand patch or SMTD	50m sections including a minimum one third of a scheme	Required	
		Surface Macrotexture at age 2 years sand patch or SMTD	50m sections including a minimum one third of a scheme	Required	

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			In situ Air voids and wheel tracking rate and rut depth (N)	As required in Clause 960AR.79	Required	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
948SR	Cold recycled bitumen bound material (ex-situ process only)			Required	
		Mixture Design	At approval and annual verification thereafter for each mix	Required	
		Optimum Moisture Content (N)			
		Maximum Bulk Density (N)			
		Air voids content at Maximum Bulk Density (N)			
		Target Added Binder Content			
		Target Grading			
		Target in-situ density			
		ITSM (dry) (N) *			* At target in-situ density cured for 72 hours @ 60°C
		ITSM (soaked) (N) *			
	The <i>works</i>	Insitu Density (Sand Replacement) (N)	Per site or programme of works as agreed with the Overseeing Organisation	Required	Density may be determined using the nuclear density gauge using a Calibration determined in accordance with BS 1377-9
		Layer thickness			
		On final compaction Dynamic Stiffness (GDP)			
		After 24 hours Dynamic Stiffness (GDP)			
	Process Control	Added binder content	Every 1000 tonnes of production		
		In-situ density Calibration to BS 1377-9 (N)			
		Moisture content (N)			
		ITSM both dry and soaked (N)			At in-situ density cured for 72hours at 60°C

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
951SR	Patching	Type and compacted thickness of materials as Cl. 951SR	2 cores per patching gang per month's work or part thereof	Required	Contractor to arrange coring. 150mm nominal diameter cores which must be taken perpendicular to road surfaces
		In situ bulk density (N)			BS 598 : Part 104
		Maximum density (N)			DD 228
		In situ air voids (N)			
	Surface macrotexture	BS EN 13036-1 Volumetric Patch Technique (N) or BS 598-105 Sand patch test	50 m sections including a minimum one third of the scheme	Required	
970AR	Stone Mastic Asphalt	Binder volume	1 per source at approval and annually	Required	From recent production No more than 3 months old. National quality management sector scheme applies
		Density (N)	1 per source at approval and annually	Required	See sub-Clause 970.10 No more than 6 months old
		Wheel-tracking rate (N)	1 set of 6 per source at approval and annually		Wheel-tracking results to be no more than 12 months old Tested at primary test temperature specified
		Wheel-tracking rut depth (N)	1 set of 6 per source at approval and annually		See sub-Clause 970.19 No more than 12 months old
		Laboratory air voids content	1 set of 6 per source at approval and annually		See sub-Clause 970.18 No more than 12 months old
		Binder drainage test	1 per source at approval and annually		See sub-Clause 970.3(a) Keep updated every 2 months
		PSV (N)	6 per source at approval		Coarse aggregate only
		AAV (N)	1 per source at approval and annually		

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (cont'd)					
970AR cont'd	Stone Mastic Asphalt	AIV (N)	1 per source at approval and annually		Results to be no more than 6 months old
		Flakiness index (N)	1 per source at approval and annually		
		Los Angeles abrasion (N)	1 per source at approval and annually		
		In situ air voids content – the <i>works</i>	1 scheme in 10 selected by Overseeing Organisation at random	Required	Cores to be at 90 degrees to surface and holes to be sealed and reinstated with similar material
		In situ wheel-tracking rate (N)	1 scheme in 10 selected by Overseeing Organisation at random		
		In situ wheel-tracking rut depth (N)	1 scheme in 10 selected by Overseeing Organisation at random		
990AR	Rejuvenation of Bituminous Pavements				
	Past performance of rejuvenation products		Each product at approval and annually thereafter	Evidence of satisfactory past performance required	BBA/HAPAS approval or documented evidence from other agencies
	Determination of dosage rates	• Test panels • Coring • Binder preference in accordance with Table 1	Each site and significant change of surface type within each site		Requirements for coring and laboratory testing may be waived if evidence can be provided re the acceptable treatment of similar materials elsewhere
	Rates of spread of rejuvenation product and sand/grit	Carpet tile/tray tests	Daily or for each site whichever is the most frequent	Required	
	Effectiveness of rejuvenation product	Coring of pavement before/after treatment and determination of binder properties	For each site larger than 30,000m²: Minimum 3 cores per lane before treatment and 3 air flush cores per lane after	Required	Results will be used as a basis for payment. Number of cores required shall be sufficient to provide the necessary sample size of binder

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000					
1002 1003 1004 1044	Pavement Concrete	Air content test (N)	1 per 10m ³	Required	Product certification scheme applies
		In-situ density (N)	1 core per 100m ²		
		Strength (N)	3 cubes per 20m ³ min/set per scheme		1 cube tested at 7 days 2 at 28 days
1005	Consistence (Workability)	Degree of Compactability (Compaction Index) (N)	1 per 10m ³	Required	[See also sub-Clause 1005.2]
		Vebe (N)			
		Slump (N)			
1015	Joint filler board	Weathering test	3 per type and source at approval	Required	Normally undertaken by manufacturer
		Compression and recovery	4 per type and source at approval		
		Extrusion	1 per type and source at approval		
	Cork filler board	Immersion in water	2 per source at approval		
		Immersion in acid	2 per source at approval		
1016 1017	Applied sealants			Required BSEN 14188-1 BS 2499-2 BS 5212-1 and 2 BSEN 13880-2 and 3 and BS 4254	
		Initial Penetration	1 at approval and 1 per scheme		
		Resilience	1 at approval and 1 per scheme		
	Compression seals			Required (ASTM D2628) (BS 2752) (BS 4443: Part 4 Method 10 and BSEN ISO 2440) (BSEN ISO 1856) BS 903: Part A 16 or BS ISO 1817)	
		Compression set	1 per type of seal* at approval and per year		
		Immersion in oil	1 per type of seal* at approval and per year		
	Self expanding cork seal	Tests specified in Clause 1017	1 per type of seal* at approval and per year		

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 1000 (cont'd)						
1026 1044	Surface macrotexture	BS EN 13036-1 Volumetric Patch Technique (N) or BS 598- 105 Sand patch	1, 50m section (set of 10)* including a min 1/3 of the scheme	Required		
1027	Aluminised curing compound	Efficiency index	1 per source* at approval and per year	Required		
1030	Wet lean concrete	Density Cube strength (N)	2 cubes/30m³ Minimum 2 cubes per day	Required	Where early trafficking is proposed by the <i>Contractor</i> and approved by the Overseeing Organisation, additional site cured cubes will be required to demonstrate that the required strength has been achieved prior to trafficking	
1036 1037 1038	Cement bound material	Aggregate grading and fines content (N)	1 per source at approval and annually	Required	Only required for Clause 1037	
		Los Angeles abrasion (N)				Only required for Clause 1038
		Soundness value (N)				
		Compressive strength (N)	2 samples per 200 m²			
		Cube density (N)				
		In situ wet density	2 readings from 2 locations per 200 m²			
1043	Foamed concrete	Cube strength (N)	2 cubes per 12 m³			

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1100						
1101	Pre-cast concrete kerbs, channels, edgings and quadrants		Bending strength (N)	Minimum of 8 units of each product at approval and annually (BSEN 1340)	Required	Test certificates less than 12 months old to be supplied
			Skid resistance (PPTV Test) BS 7932 (N)	Duplicate tests at approval and annually		
			Water absorption and or freeze/thaw resistance (N)	At approval and annually		
1104	Pre-cast concrete flags		Bending strength (N)	Minimum of 8 per 1000 m ² of each product BS EN 1339)	Required	Test certificates less than 12 months old to be supplied
			PPTV (N)	At approval and annually		
1104 cont'd	Pre-cast concrete flags		Water absorption and or freeze/thaw resistance (N)	At approval and annually		
	Bedding/jointing	Granular material	Grading and Fines content (N)	1 per 50 tonnes or part of.		
		Mortar	Compressive strength (N)	1 set of 2 cubes per day		
1107	Concrete block paving		Compressive strength (N)	Minimum of 8 of each product (BS EN 1338) at approval and annually	Required	
			Shape and dimensions (N)	Minimum of 8 of each product (BS EN 1338) at approval and annually		
			Abrasion resistance (N)	1 per source at approval and annually		
			PPTV (N)	2 per source at approval and annually		
			Water absorption and or freeze/thaw resistance (N)	1 per source at approval and annually		

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1100 (cont'd)						
1108	Clay Pavers		Transverse Breaking Load	Minimum of 8 of each product (BS EN 1344) at approval and annually	Required	Not recommended for use on HCC works
			Shape and dimensions (N)	Minimum of 8 of each product (BS EN 1344) at approval and annually		
			Abrasion resistance (N)	1 per source at approval and annually		
			Water absorption and or freeze/thaw resistance (N)	1 per source at approval and annually		
			Skid resistance PPTV (N)	2 per source at approval and annually		
1170AR	Natural stone		Bending strength BS EN 12372	Minimum of 10 of each product (BS EN 1341) at approval and annually	Required	
			Shape and dimensions (N)	Minimum of 10 of each product (BS EN 1341) at approval and annually		
			Abrasion resistance (N)	1 per source at approval and annually		
			Water absorption and or freeze/thaw resistance (N) BS EN 12371	1 per source at approval and annually		
			Skid resistance PPTV (N)	2 per source at approval and annually		
1107 1108 1170		Bedding sand	Grading (N)	1 per source at approval and annually for Category 2, 3 & 4 and Jointing. Category 1A and 1B at start of each scheme	Required	No more than 3 months old
	Jointing sand	No more than 2 months old				

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1100 (cont'd)					
1172AR	Granite setts	Compressive strength BS EN 1926	Minimum of 10 of each product at approval and annually	Required	Suppliers tests less than 12 months old
		Shape and dimensions (N)	Minimum of 10 of each product (BS EN 1341) at approval and annually		
		Abrasion resistance (N)	1 per source at approval and annually		
		Water absorption BS EN 13755 and freeze/thaw resistance (N) BS EN 12371	1 per source at approval and annually		
		Skid resistance PPTV (N)	2 per source at approval and annually		
1173AR 1174AR	Footpath gravel Type E and Self binding path gravel system	Grading, PI, m/c, (N)	1 per source at approval and annually	Required	
Plasticity Index (N)					
Optimum m/c (N)					
Series 1200					
1202	Permanent traffic signs		1 per type and source at approval and annually	Required	Quality management scheme applies; Certification that the traffic sign is passing the tests in BS 873: Part 1 is required
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		1 per type and source at approval and annually	Required [where considered appropriate]	Certification that the holding down bolts and anchorages are capable of complying with the performance requirements of BS 873: Part 3 is required

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 1200 (cont'd)						
1212SR	Road markings			Required	Quality management scheme applies	
		Approval	Colour		1 per material per source at approval and per year	Copy of BS EN 1824 road trial certificate
			Luminance factor			
			Skid resistance			
			Dry retroreflectivity			
			Wet retroreflectivity (RW)			
		'A' Roads & 'B' Road Junctions (Section 11.3)	Dry retroreflectivity (N)		10% of markings as per Appendix 12/3	White material only Testing regime detailed in Appendix 12/3
			Skid resistance (N)			
		Other roads	Dry retroreflectivity (N)		3% of road markings as per Appendix 12/3	
			Skid resistance (N)			
	Pavement marking paints	Tests specified in BS EN 1871	1 set per source at approval and annually	Required	Quality management and product certification schemes apply	
1214	Permanent traffic cones and traffic cylinders			Required	Certification that permanent traffic cones and cylinders have been tested and comply with BS 873: Part 8 is required	
		Tests specified in BS 873: Part 8	2 of each size and category/ type		[Where required]	
	Flat traffic delineators			Required	Certification that FTDs have been tested and comply with Clause 1214 is required	
		Tests specified in Clause 1214	[As required]		[Where required]	
	Other traffic delineators			Required	Certification that the delineators have been tested and comply with Clause 1214 is required	
			[As required]		[Where required]	

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200 (cont'd)					
1214 cont'd	Temporary cones, cylinders, FTDs and other delineators			Required	Certification that at least 1 in 500 of any batch of cones, cylinders, FTDs and other delineators to be used in the Temporary Works have passed the tests in Clause 1214 as appropriate is required
Series 1700					
1702 1703 1704	Cement types as stated in sub-Clause 1702.1			Required	Quality management and product certification schemes apply
	Cements (all types)				Tests to be carried out by the manufacturer and results included on the test certificates required above
	Portland-blastfurnace			Required (BS EN 197-4)	Quality management and product certification schemes apply
	Sulphate-resisting Portland			Required (BS 4027)	
	Portland pulverised-fuel ash			Required (BS EN 197-4)	
	Low heat Portland			Required (BS 1370)	
	High slag blastfurnace			Required (BS EN 197-4)	
	Pulverised-fuel ash	Colour index		Required (BS 3892: Part 1)	Product certification scheme applies.
	Ground granulated blastfurnace slag	Acid-soluble alkali content		Required (BS 6699)	Product certification scheme applies
	Cement (all types)	Chloride content	Monthly	Required	Tests to be carried out by the manufacturer and results included on the test certificates required above
	Aggregates	Grading and fines content (N)	1 per week (per source)	Required	Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex H of BS EN 12620

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (cont'd)					
1702 1703 1704 cont'd		Shell content (N)	1 per source	Required at approval stage	Product certification scheme applies unless otherwise stated. Structural concrete must be supplied by QSRMC accredited organisation. Non structural rely on Contractor's Quality system.
		Flakiness index (N)	1 per source		
		10% fines value (N)	1 per source		
		Drying shrinkage(N)	1 per source		
		Chloride content(N)	1 per source		
		Sulphate content(N)	1 per source		
	Blastfurnace slag	Bulk density (N)	Every 6 months	Required	
		Stability (N)	Every 6 months	Required	
		Sulphur content (N)	Every 6 months	Required	
	Water	Tests specified in BS EN 1008	[As required]	Required	Results of routine control tests from the factory production control system operated by the producer to be provided.
	Chloride content		Required	Results of routine control tests from the factory production control system operated by the producer to be provided.	
Acid-soluble alkali content			Required	Results of routine control tests from the factory production control system operated by the producer to be provided.	
Admixtures	Chloride content	1 per consignment	Required (BS EN 934-2)	Results of routine control tests from the factory production control system operated by the producer to be provided.	
	Sulfate content	1 per consignment	Required		
Acid-soluble alkali content	1 per consignment				

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (cont'd)					
1707	Concrete	Cube strength (N)	Mass and Reinforced concrete as required by Clause 1707	Required	Concrete other than ST (standard prescribed mixes)
			Additional Cubes for special purposes		
		Hardened Density	Each Cube tested	Required	
1709	Silane			Required for each delivery	Certification that the silane complies with Clause 1709 is required
1710	Concrete packing, Mortar packing, Epoxy resin bonding agent	Compressive / tensile / adhesive strengths as appropriate	Each batch	Required	
	Pre-cast concrete manufactured off-site	Cube strength (Manufacturer's tests)		Required	Contractor to make available records of tests by the manufacturer
1711	Grout				
	Admixtures			Required (BS 5075)	
1712	Reinforcement				Product certification scheme applies
	Steel bars			Required (BS 4449)	
	Steel wire			Required (BS 4482)	
	Steel fabric			Required (BS 4483)	
1713	Fabrication reinforcement			Required	Certification that fabricated reinforcement complies with the routine inspection/testing requirements of BS 4466 is required if the fabrication is not covered by a product certification scheme listed in Appendix B
1716	Reinforcement jointing systems	Permanent elongation Characteristic strength (Manufacturer's tests)	1 per source per scheme	Required for each type of connection	BBA Roads and Bridges or CARES Certificate of product assessment or fully equivalent scheme applies

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (cont'd)					
1717	Reinforcement metal arc welding	Welding procedure approval (BS 7123)	As required in BS 7123		Tests should be carried out by an independent testing body specified in BS 8666
		Welder approval (BS 7123)	Each welder	Required	
1724	Post-tensioning anchorages	Tests in accordance with BS 4447 (Manufacturer's tests)		Required	Contractor to make available records of tests by the manufacturer
1726	Stainless steel bar			Required (BS 6744)	Certificates to be provided
1727	Inspection and testing of structures and components				Tests as required in BOQ items
1770AR	Existing concrete in structures	Compression test on cores in accordance with BS 1881: Pt 120	As required	Required	
1771AR	Repair material (hand placed)	Compression test on mortar cubes (N)	3 per day	Required	Only required where repair area is greater than 1m ² per structure
	Repair material (spray applied)	Compression test on cores cut from test panels (N) See 1771AR	2 panels per structure		
	Concrete repair	Pull off test to BS 1881 Pt 207	1 per structure		
		Compression test on core from repaired area to BS 1881 Pt 120 (N)			
Series 2000					
2003	Mastic asphalt	Test specified in BS 6925	1 per source	Required (BS 6925)	Sampling to comply with BS 6925
	Permitted waterproofing systems	(As required - see NFG 2007)		Required	Registration and BBA certification apply and Certificates to be provided.
		Pull off adhesion test	One per 20m2 or part of, at least 4 per bridge deck	Required	
	Additional bituminous protection	Tests specified in BS 598 : Part 102	1 per source	Required	Sampling to comply with BS 598 : Part 100
		Stability value	Tests specified in BS 598 : Part 107	1 per source	Required
2004	Bitumen emulsions or proprietary systems	Manufacturers tests	1 per source per scheme	Required	Certificates to be provided to confirm fitness for purpose.

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Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2100					
2101	Bridge bearings	Elastomeric bearings	Hardness	As required	Required (BS 5400: Section 9.2)
			Tensile strength		
			Elongation		
			Ageing		
			Compression set Ozone resistance		
	Complete bearings	Tests specified in Appendix 21/1	As required in Appendix 21/1		
Series 2200					
2202	Metal parapets			Required (BS 6779 : Part 1)	Quality management scheme applies
2204	Welding	Welding procedures (Manufacturer's tests)	(Every seven years)	Required	
		Welder qualification (Manufacturer's tests)	(Every two years)	Required	
		Production testing (Manufacturer's tests)	(Sub-Clause 2204 (19.2.4))	Required	
	Welded joints	Destructive testing	(See Sub-Clause 2204 (19.2.5))	Required	(N) See NG 2204
2207	Parapet posts	Production testing as specified in BS 6779 : Part I : 1991 (Manufacturer's tests)		Required	Certification in accordance with Clause 2207 is required
2208	Anchorage in drilled holes	Loading test on site	(As required)		Departmental registration applies
Series 2400					
2401	Masonry cement	Chloride content and Manufacturers Tests	1 per source per scheme	Required (BS EN 413-1)	Quality management scheme applies Test to be carried out by the manufacturer and results included on the test certificate

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments	
Series 2400 (cont'd)							
2402	Sand		Grading and fines content (N)		Required per consignment (BS EN 13139)		
			Chloride content	1 per source per scheme		Test to be carried out by the manufacturer and results included on the test certificate	
2403	Water		Tests specified in BS EN 1008	As required	Required	Only required if not from public mains supply	
2404	Mortar admixtures				Required (BS EN 934-3)	Product certification scheme applies	
2405	Lime				Required (BS EN 459-1)		
2406	Bricks						
			Clay	Soluble salt content	1 set per type and source at approval and annually	Required	
				Efflorescence			
				Compressive strength			
				Water absorption			
				Initial rate of suction (BS EN 771-1)			
			Calcium silicate	BS EN 771-2		Required	
			Concrete	BS 6073-1 / BS EN 771-3		Required	
2407	Blocks						
			Clay	Soluble salt content	1 set per type and source at approval and annually	Required	
				Efflorescence			
				Compressive strength			
				Water absorption			
				Initial rate of suction (BS EN 771-1)			
			Concrete	BS 6073-1 / BS EN 771-3		Required	
2408	Reconstituted stone		As BS 6457	1 set per type and source at approval and annually	Required		
2410	Reinforced brickwork/ blockwork			1 set per type and source per scheme			

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 2400 (cont'd)						
2411		Stainless steel Wire/fabric	As BS EN10088-1		Required	Product certification scheme applies unless otherwise stated. Structural mortar must be supplied by QSRMC accredited organisation. Non structural rely on Contractor's Quality system.
		Stainless steel bars	As BS 6744		Required	
		Ready mixed mortars	Tests specified in Appendix A1 of BS EN 10521-1	1 set of tests per batch	Required	
		Mortars	Tests specified in Appendix A1 of BS EN 10521-1	1 set of tests per mix designation	Required	
Series 2600						
2601	Bedding mortar materials				Required for each batch	Certification in accordance with Clause 2601 is REQUIRED
	Bedding mortar		Flow cone test	Each batch	Required	Laboratory tests see Clause 2601
			Flow between glass plates			
			Compressive strength			
			Expansion test			
			Water absorption			
			Elastic stability	1 per source	Required	Site control tests
			Flow cone test Compressive strength	Each load	Required	
2602SR	Ancillary Concrete					
	Cement (all types)		Chloride content		Required	Tests to be carried out by the manufacturer and results included on the test certificates required above
			Sulphate content		Required	
			Acid-soluble alkali content		Required	
	Aggregates		Grading and Fines content Clause 710 for recycled material	1 per source at approval and annually	Required	Results of routine control
			Shell content (N)	1 per source at approval and annually	Required	tests by the manufacturer/ supplier to be provided.
Flakiness index (N)			1 per source at approval and annually	Required		

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Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 2600 (cont'd)						
2602SR cont'd	Ancillary Concrete		Los Angeles value (N)	1 per source at approval and annually	Required	Product certification scheme applies
			Drying shrinkage (N)	1 per source at approval and annually	Required	
			Chloride content (N)	1 per source at approval and annually	Required	
			Sulphate content (N)	1 per source at approval and annually	Required	
	Water		Tests specified in BS EN 1008	(As required)	Required	Only required if not from public mains supply
			Chloride content		Required	
			Sulphate content		Required	
			Acid-soluble alkali content		Required	
2604	Plastic coating to fencing posts, gates and ancillaries		Impact test Adhesion Retention of adhesion Salt spray Accelerated weathering (Manufacturer's tests)		Required	Records of all tests to be available for inspection
Series 5000						
5007SR	Paints					Contractor shall carry out the measurement of Specific Gravity of each type of paint. (minimum 1 per coat) in the presence of the inspector/supervisor
		'A' & 'B' Samples	Specific Gravity	As Clause 5009		
			Colour match	Minimum 1 per type		
			Composition			
	Application characteristics					

* indicates that the frequency of testing is given for general guidance and is only indicative of the frequency that may be appropriate (i.e. no frequency is given in the SHW or reference documents). Where materials are known to be marginal or if initial test results show them to be such, the frequency of testing should be increased. Conversely where material properties are consistently in excess of specified minimum requirements or well below specified maximum limits, then the frequency of testing should be reduced.

(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 OVERSEEING ORGANISATION

GENERAL NOTES

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1. The Tables which follow indicate the likely average requirements for samples for testing by the Overseeing Organisation but these requirements may increase or decrease depending on the perceived quality of the work, goods or material in question.
2. Sampling rates for low cost materials such as aggregates, fresh concrete and bituminous mixtures for testing by the Overseeing Organisation, to establish compliance with the following Clauses, are not defined but materials shall be supplied as the Overseeing Organisation may reasonably require:
 - i) Clauses 503, 505, 512, 513, 515
 - ii) Series 600, (excluding 609, 624 and 626), 700, 800, 900, 1000, 1100, 1700
 - iii) Clauses 2003, 2004, 2600
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. Samples comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (see sub-Clause 105.5).
5. Unless otherwise stated in this Appendix, all sampling of materials shall be undertaken by the Overseeing Organisation.
6. Samples of concrete to Clause 2602SR are not required.
7. Where it is specified that sampling is to be undertaken by the Contractor, it is the Contractor's responsibility to ensure that:
 - i) sampling is carried out in accordance with the appropriate Standard, (including any requirements for UKAS accreditation),
 - ii) the samples are representative of work, goods or materials incorporated in the works,
 - iii) a fully completed sampling certificate is provided.

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

8. Wherever this Appendix specifies that samples shall be delivered to the Overseeing Organisation's laboratory, or some other location, it is the Contractor's responsibility to ensure that the samples are:
 - i) supplied in a suitable container and clearly labelled,
 - ii) transported and delivered in such a way that upon delivery they are intact and representative of work, goods or materials incorporated into the works.

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9. The Contractor shall be responsible for cutting cores for the Percentage Refusal Density, air voids and wheel tracking tests at locations directed by the Overseeing Organisation in accordance with Clauses 929, 937, 943, 960AR, 970AR, 989AR, 1003 and 1030. Cores will be required from each layer. A layer is defined as that thickness of material laid in one single pass of the paver. The Contractor shall also carry out the sealing and reinstatement of coreholes using HRA or DBM for bituminous materials and cement bound material for Clause 1003 and 1030 materials, as instructed by the Overseeing Organisation.
10. (N) indicates that samples shall be taken by staff accredited under UKAS procedures for the sampling of the particular material/product specified.
11. Where samples or equipment is required to be delivered to the Hampshire County Highways Laboratory, the address is: Stockbridge Road Micheldever Station SO21 3BB Hampshire
Phone 01962 774502 fax 01962 795042

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Clause	Sample Description	Frequency of Sampling	Delivery Location	Comments
Series 500				
507	Chambers		County Highways Laboratory	Testing by the Overseeing Organisation will not be required if the <i>Contractor</i> has undertaken this testing under Appendix 1/5 at the Materials approval stage
	Covers, grates and frames	1 per type and source		
	Cover bolts	1 per type and source		
Series 600				
609 621	Geotextiles	One 5m ² sample per type		(Requirements should be given in Appendix 6/5 or 6/9 as appropriate)
Series 900				
929 942 943 960AR 970AR	Cores of compacted bituminous material	As required by the Clause No or BS 4987: Part 2 as appropriate	County Highways Laboratory	Cores to be taken perpendicular to the road surface
Series 1000				
1003 1030	Concrete (Density of in situ concrete cores)	As required in Table 10/7	County Highways Laboratory	<i>Contractor</i> to cut the cores perpendicular to the slab surface at positions indicated by the Overseeing Organisation
Series 1100				
1107	Bedding sand	1 per load		
	Jointing sand	1 per load		
1108	Bedding sand	1 per load	County Highways Laboratory	
	Jointing sand	1 per load		

CONTRACT APPENDICES**APPENDIX 1/7 : SITE EXTENT AND LIMITATIONS ON USE****1. Extent of Site**

The Contractor shall confine its operations to within the existing highway boundaries and site limits shown within the Works Information.

In addition, all areas necessary to erect, maintain and remove signing and temporary works specified in Appendices 1/17 shall be included within the site extents.

Areas of land required to complete accommodation works are not included within the general extents of the site, however arrangements for access to these areas will be set out in the Works Information.

2. Limitations on the Use of the Site

The Contractor shall not use the Site for any purpose other than the proposed work. The Contractor shall obtain the approval of the Overseeing Organisation's representative to the proposed siting of all temporary offices, plant, materials and spoil heaps.

CONTRACT APPENDICES**APPENDIX 1/9 : CONTROL OF NOISE AND VIBRATION**

1. Without in any way limiting the liabilities and obligations imposed upon the Contractor elsewhere in the Contract, the Contractor shall provide the Works in such a manner so as to minimise at all times the levels of site generated noise. Procedures for noise control and the assessment of site noise shall be in accordance with BS 5228 Part 1 1984 (Noise control on Construction and Open Sites, Part 1 Code of Practice for basic information and procedures for noise control).
2. The Local Authorities responsible for the control of noise from the Working Area are the various Environmental Health Departments of the local District Councils. The names and addresses of these Authorities are given below.

Havant Borough Council
Civic Offices
Civic Centre Road
Havant
Hampshire
PO9 2AY

Tel: Havant (02392) 474174
3. The Local Authority has informally agreed that the following measures would be acceptable and these are given as a guide; however it is for the Contractor to decide whether to seek the Local Authority's formal consent to its proposed methods of work and to the steps he proposes in order to minimise noise:-
 - i) The best practicable means, as described in Section 79 of the Environmental Protection Act 1990, to reduce noise to a minimum shall be employed at all times.
 - ii) All vehicles and mechanical plant used for the purpose of the works shall be "sound reduced" or muffled models fitted with effective exhaust silencers in accordance with the manufacturer's recommendation. Where acoustic covers are fitted or temporary screens used, they shall be kept closed whenever the machine is in use. Vehicles and plant shall be shut down or throttled down to a minimum in the intervening periods between work.
 - iii) The Contractor shall furnish such information as may be requested by the Overseeing Organisation in relation to noise levels emitted by all constructional plant installed on Site or which the Contractor intends to install on the Site and shall afford all reasonable facilities to enable the Overseeing Organisation to carry out such investigations as he may consider to be necessary.
 - iv) The date of Commencement of Works shall be notified in writing by the Contractor to the Local Authority at least 7 days prior to the commencement of any works. A telephone number for emergency use shall also be notified prior to the commencement of any works.

CONTRACT APPENDICES

- v) The name and address of any persons other than the Contractor who it is intended will carry out works on the Site shall be notified by the Contractor to the Local Authority before the commencement of any Works.
- vi) Compliance with these conditions will not constitute protection from proceedings instituted under Sections 80 and 82 of the Environmental Protection Act, 1990 (whereby a Local Authority or any occupier of premises may institute summary proceedings).
- vii) Subject to the requirements of Appendix 1/17 paragraph 1 the normal working hours within the Site shall be restricted to:
- Monday to Friday between 0730 hours and 1800 hours, and
 - Saturday between 0730 hours and 1400 hours, with
 - No working on Sundays or public holidays.
- Exceptionally, consent for work outside of these hours may be given after the necessary consultation. Fourteen days' notice is required from the *Contractor* when seeking such consent.
- viii) The total sound level from all sources when measured 1 metre from the facade of any adjacent building shall either not exceed the appropriate level given in the schedule to this appendix, or not exceed by more than 3 dB(A) the ambient equivalent continuous sound level at the same point of the facade measured over the same period, whichever level is the greater.
- ix) The following types of plant shall not be permitted to be used on the Site:
- a) Vibrating rollers with a mass/metre width in excess of 2900kg
 - b) Dropping weight compactors
 - c) Unsilenced piling equipment (see 4b below).

CONTRACT APPENDICES**APPENDIX 1/9 : CONTROL OF NOISE AND VIBRATION (continued)**

4. SCHEDULE

TOTAL NOISE LEVELS AT ANY ADJACENT RESIDENTIAL FAÇADE

Period	Hours	Noise (L_{Aeq}) Measured at Nearby Dwelling (dB)	Period of Hours over which L_{Aeq} is applicable	Maximum Noise (L_{Amax}) measured at Nearby Dwelling (dB)
Monday to Friday	0730-0800	65	any 1 hour	74
	0800-1800	75	any 1 hour	88
Saturday	0730-0800	65	any 1 hour	74
	0800-1400	75	any 1 hour	88
Sunday				
Night				
All unattended plant outside normal working hours	-	50	any 1 hour	52

Notes

The total sound level is the noise from all sources in the vicinity, including that from the construction operations, over the specified period, expressed as L_{Aeq}

- a) The existing ambient noise level is the total noise from all sources in the vicinity over the specified period excluding noise caused by Providing the Works, expressed as L_{Aeq}
- b) The maximum noise level is the highest indicated on a sound level meter which meets the requirements of BS EN 60651: Type 1 or Type 2, set to the slow response and frequency weighting A.

5. PILING OPERATIONS (Including the driving of trenching sheets)

- i) All piling operations shall be limited to between the times of 0830 hours and 1630 hours Monday to Friday only.
- ii) For the installation of driven piles the Contractor shall utilise an appropriate silenced system based on the following alternative principles:
 - 1. Impact driver with cushioned blow
 - 2. Impact driver with enclosing sound reducing muffler
 - 3. Hydraulic driver without impact
 - 4. Vibratory driver

CONTRACT APPENDICES**APPENDIX 1/9 : CONTROL OF NOISE AND VIBRATION (continued)**

- iii) Unless the Contractor demonstrates otherwise, by calculation or measurement, to the satisfaction of the Overseeing Organisation it shall be assumed that any piling equipment with an activity equivalent continuous sound pressure level at 10 metres distance over 1 cycle of operation in excess of 78 dB(A) will not satisfy the environmental noise requirements of the Contract.

6. VIBRATION

- i) The Contractor shall also normally limit vibration levels arising from site activities at any residential dwelling between 0800 & 1800 hours weekdays and 0800 to 1400 Saturdays, to a peak particle velocity of 1.5mm/second in the vertical direction. No perceptible vibration is permitted in such buildings at any other time.
- ii) Exceptionally, for short periods not exceeding 2 hours in any weekday, vibration levels of up to 2mm/second may be permitted at the discretion of the Environmental Health Officer.
- iii) Where vibration occurs, reference should be made to ISO 2631 – Guide for the evaluation of human exposure to whole body vibration and BS 6472 – Evaluation of human response to vibration in buildings.

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APPENDIX 1/12 : SETTING OUT AND EXISTING GROUND LEVELS

1. Setting out details and levels will be supplied as necessary and agreed by the Overseeing Organisation.

CONTRACT APPENDICES**APPENDIX 1/13 : PROGRAMME OF WORKS**

1. The Contractor shall provide the Programme of Works in a form of a Gantt/Bar Chart and must abide by the constraints below. It shall show the level of detail appropriate to each stage of Providing the Works and all activities, restraints and resources, each of which shall be given a short title. All events shall be numbered and annotated with earliest and latest event dates, and the critical path operations highlighted.
2. At the time of presentation of the Programme the Contractor shall also provide a drawing showing its intended sequence of works.
3. SCHEDULE OF CONSTRAINTS
 - i) The extent of the site, and limitations on its use, as detailed in Appendix 1/7 and any additional information detailed on the specific scheme contract drawings
 - ii) Restrictions on noise and vibration, as detailed in Appendix 1/9 and any additional information detailed on the specific scheme contract drawings
 - iii) Accommodation works to properties fronting the site, as detailed on the specific scheme contract drawings (If applicable)
 - iv) Work to privately and publicly owned services and supplies, as outlined in Appendix 1/16 and any additional information detailed on the specific scheme contract drawings
 - v) Traffic safety and management including notice requirements, as detailed in Appendix 1/17 and any additional information detailed on the specific scheme contract drawings
 - vi) Restrictions arising from substances hazardous to health, as detailed in Appendix 1/23 and any additional information detailed on the specific scheme contract drawings
 - vii) Possession (rail, property, etc).
 - viii) Provision of environmental protection prior to the main construction operations (environmental barriers, etc).
 - ix) Trials and demonstrations in advance of main construction.
 - x) Compliance with technical approval procedures in relation to structures designed by the Contractor, including awaiting approvals resubmissions and modifications.
 - xi) The Contractor's attention is drawn to Appendix 1/17 and that no lane closure will be permitted over Bank Holiday weekends, Bank Holidays and the day preceding these dates.
 - xii) Restrictions on the application of high friction surfacing, as details in Clause 924SR. (If applicable)
 - xiii) Work by street lighting, traffic signal and other contractors.

CONTRACT APPENDICES**APPENDIX 1/13 : PROGRAMME OF WORKS (Continued)**

4. The level of detail should be not less than the following:-

Level 1

Within 4 weeks of the Contract Date and any subsequent revision(s):-

- i) Earthworks - each cutting and embankment.
- ii) Roadworks - in lengths not exceeding 150m for main route and for each side road.
 - a) Fencing
 - b) Setting up of Traffic Management
 - c) Site Clearance
 - d) Drainage
 - e) Sub-base
 - f) Sub-grade improvement layer
 - g) Road base or concrete paving
 - h) Kerbing and Footway works
 - i) Carriageway Surfacing
 - j) Application of anti-skid
 - k) Road Markings & Signing
- iii) Major privately and publicly owned services and supplies.
- iv) Traffic management measures including operation of site accesses, plant crossings and temporary diversions for traffic.

Level 2

Further breakdown of items and other details as may be required.

CONTRACT APPENDICES**APPENDIX 1/14 : PAYMENT APPLICATIONS**

The payment applications submitted to the Overseeing Organisation in accordance with the conditions of contract by the Contractor shall, whenever dealing with matters covered by the Price List, be set out under Part and Section headings similar to those in the Price List and shall separately identify each item and specify quantity, unit, rate and value. Items not described in the Price List but appropriate for inclusion as measured work shall be shown at the end of the relevant section or under new section headings as appropriate indicating quantity, unit rate and value. In respect of all other matters referred to in the conditions of contract the Contractor shall separately show in the statement quantities, units and rates of goods and/or materials and also details of any other matters to which it considers itself entitled. The Contractor shall allow the Overseeing Organisation to inspect invoices for goods or materials included in the statement as may be required.

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APPENDIX 1/15 : ACCOMMODATION WORKS

1. Details of Accommodation Works will be supplied to the Contractor and agreed with the Overseeing Organisation.

CONTRACT APPENDICES**APPENDIX 1/16 : PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES**

1. Details of preliminary arrangements that have been made with Statutory Undertakers and others for the alteration of services affected by the works will be provided on the specific contract drawings
2. The Contractor shall make arrangements with the Statutory Undertakers and others concerned, for the coordination of its work with all work which needs to be done by them or their contractors concurrently with the works. Compliance with the periods of notice given in this Appendix does not relieve the Contractor of its obligations.
3. Private Services to individual properties have not generally been listed or shown on the drawings. The Contractor shall make arrangements with the Statutory Undertakers and others concerned for the phasing of all necessary disconnections and diversions of private services affected by the works.
4. Disconnected apparatus shall be removed by the Contractor only with the prior consent of the Authority concerned.
5. The names, addresses and telephone numbers of the authorities serving in the locality are listed below.

Name	Address	Initial Contact Telephone Number
Electricity		
SSE Power Distribution	Portsmouth Depot PO Box 93 Basingstoke Hampshire PO6 2BP	02392 624200 02392 624251 (Fax)
Gas		
Scotland Gas Networks	Scotland Gas Networks Plant Location 95 Kilbirnie Street GLASGOW G5 8JD	0141 4184093
Telecommunications		
BT	Portsmouth Repayments Group pp 3004. Central Telephone Exchange King Henry 1 Street Portsmouth Hampshire PO1 2BZ Area of cover :- Fareham, Petersfield, Midhurst, Havant, Portsmouth	023 92 867075 023 92 812078 (Fax)

APPENDIX 1/16 : PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES
(Continued)

Name	Address	Initial Contact Telephone Number
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CONTRACT APPENDICES

Telecommunications (cont'd)		
Virgin Media	Virgin Media National Plant Enquiries Team Ground Floor Cable Phone House Small Heath Business Park Talbot Way Birmingham B10 0HJ Anne Fergusson – if enquiry is urgent.	0870 8883116 (Option 2) 0121 694 1742 (fax) Email: plant.enquiries.team@telewest.co.uk
Global Crossing	Plant Enquiries Global Crossing Rosalind House Jays Close Viabes Basingstoke RG22 4BS	01256 858415 01256 858581 (Fax) stat.request@GlobalCrossing.com.co.uk
Sewerage		
Southern Water	Southern Water Southern House Sparrowgrove Otterbourne Winchester SO21 2SW	01962 716156 01962 715246 (Fax)
Water		
Portsmouth Water plc	Portsmouth Water plc PO Box No 8 West Street Havant PO9 1LG	023 9249 9888 023 9245 3632 (Fax)
Others		
Network Rail	Network Rail Outside Parties CP2/1/H Suite 2, General Offices Waterloo Station London SE1 8SW Contact :- Tony Norman	0207 922 9846 0207 902 3925 (Fax)

**APPENDIX 1/16 : PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES
(Continued)**

Name	Address	Initial Contact Telephone Number
Others		

CONTRACT APPENDICES

The Environment Agency	Contact information available at: www.environment-agency.gov.uk	
Pipelines (various companies)	Web based enquiry service available at: www.linesearch.org	
National Grid	National Grid Asset Protection Team National Grid PO Box 3484 Warwick CV34 6TG	0800 731 2961 Opt 3 01926 656574 (Fax)
National Grid (Gas)	National Grid Gas Distribution Plant Protection Team Lakeside House The Lakes Bedford Road Northampton NN4 7HD	01604 815361

CONTRACT APPENDICES**APPENDIX 1/17 : TRAFFIC SAFETY AND MANAGEMENT**

The Contractor shall be responsible for the traffic safety and management as described in Clause 117 and the following, unless otherwise instructed in writing by the Overseeing Organisation:

1. TRAFFIC CONTROL AND DIVERSIONS

- i) The Contractor shall note that to minimise disruption to traffic the optimum use must be made of traffic management instructed or provided in connection with this contract. The traffic management will not be measured where its use extends beyond the times instructed by the Overseeing Organisation unless the extension of use is for reasons outside the Contractor's control.
- ii) The Contractor shall provide traffic management in accordance with Chapter 8 of the Traffic Signs Manual (2006) and "Safety at Streetworks and Roadworks" a code of practice (2002), and the 'Guidance for safer temporary traffic management' published on behalf of the Highways Agency, Health and Safety Executive and CSS.
- iii) Requirements will be outlined with the individual Work Package.
- iv) Single line traffic operation will be required when the undivided clear width of carriageway available is less than 5.5 metres. When single line traffic operation is required, the Contractor shall provide a width of at least 3 metres, or wider as necessary at curves and junctions, and the length of single line operation at any one time shall not exceed 200 metres unless otherwise directed by the Overseeing Organisation.
- v) If required by the Overseeing Organisation traffic control for single line operation shall be carried out by the Contractor using manually operated "Stop/Go" signs or vehicle actuated portable traffic signals supplied by the Contractor and such signs shall conform with the requirements of Chapter 8 of the Traffic Signs Manual (2006) published by HMSO or any amendment thereof for the time being in force.
- vi) The advice of the Police and the Overseeing Organisation shall be sought for works at junctions or roundabouts where more than two way traffic signals will operate and especially where Pelican Crossings or any signal operated site is involved. If sites have to be left unfinished overnight traffic control measures must be agreed with the Police and the Overseeing Organisation.
- vii) Where work is to be undertaken within 800 metres of a half barrier level crossing the Contractor shall comply with Chapter 8 of the Traffic Signs Manual or any amendment thereof for the time being in force and shall notify the Overseeing Organisation at least seven days before commencing work of its intention to do so.
- viii) At all times whilst Providing the Works a safe, through route shall be maintained for pedestrians in accordance with "Safety at Streetworks and Roadworks" a code of practice.

All proposals for traffic control, diversions, restricted carriageway or footway widths etc shall be agreed with the Overseeing Organisation and the Police prior to the starting date. Both reserve the right to require the works to be stopped and the removal or reduction of the traffic restriction where it is causing undue congestion.
- ix) The Contractor shall submit detailed proposals to the Overseeing Organisation not less than four weeks before the date on which it is intended to effect such diversions or arrangements.

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Compliance with the requirements of this Appendix shall not relieve the Contractor of any other obligations imposed by this Contract or by Statute.

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2. DEPARTMENT OF TRANSPORT PUBLICATIONS

DoT publications relevant to this Clause are listed below and shall include subsequent amendments:-

- i) Traffic Signs Manual, Chapter 8.
- ii) ALL CONTRACTORS SUPERVISORS ARE REQUIRED TO HAVE A COPY OF "SAFETY AT STREETWORKS AND ROADWORKS" a code of practice (1992) published by HMSO.

3. TRAFFIC SAFETY & CONTROL

- i) All traffic barriers used in the carriageway shall incorporate rigid rails to be continuous between supports and fixed so that they cannot be accidentally knocked over.
Lightweight barriers utilising road pins and traffic tape shall not be used.

Where the carriageway is not barriered off whilst Providing the Works care must be taken at all times to ensure that the surface is safe for all users. Any raised boxes or manhole covers etc must be temporarily ramped and trenches reinstated using bound materials to make them safe.

- ii) Where the circumstances of any particular case are not covered by the recommendations of Clause 117.1, the Contractor shall submit proposals for dealing with such situations to the Overseeing Organisation for approval at least one week before installation is due to commence. Compliance with this requirement shall not relieve the Contractor of any of its obligations and liabilities under the Contract and under the relevant provisions of the Highways Acts.

4. REQUIREMENTS FOR HIGHWAY TRAFFIC CONTROL

- i) The Traffic Control Area is defined as the area of highway affected by the works in any phase in each direction between:-
 - a) The first advance roadworks sign.
 - b) The roadworks "End" sign.
 - c) or between "Road Closed" signs, however, all diversion signs in conjunction with a road closure shall be defined as part of the traffic control area.
- ii) The Contractor shall appoint a responsible senior person to act as Traffic Safety Officer during the total contract period and shall notify the Overseeing Organisation accordingly before the starting date. The Traffic Safety Officer shall be available both during and out of working hours to direct:-
 - a) immediate replacement of damaged or displaced signs, cones, cylinders or white lines and full restoration of the traffic control layout;
 - b) assistance with the removal of crashed vehicles and debris from the trafficked lanes if so instructed;

The Traffic Safety Officer shall take instructions direct from the Overseeing Organisation or the Police if the Police have assumed control in an emergency.

- iii) The Contractor shall be responsible for covering and uncovering, cleaning and maintaining any existing signs as specified or directed by the Overseeing Organisation within the Site. On no account will adhesives be stuck to existing sign faces. The

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Contractor shall not organise any other signing in connection with the works, except as specified or directed by the Overseeing Organisation.

- iv) The Contractor shall ensure that the traffic control layout of signs, cones, cylinders, barriers, lamps, temporary road studs and temporary road markings is inspected once per day. The traffic layout shall be maintained in accordance with the Contract drawings and in accordance with the recommendations of Chapter 8 of the Traffic Signs Manual 2006, and Signing for Traffic Management at certain Major Roadworks Sites (TD 14/83).
- v) The Overseeing Organisation may direct the Contractor to assist in the removal and replacement of signs, traffic cones etc, to facilitate the movement of abnormal indivisible loads. The Contractor shall submit to the Overseeing Organisation a full record of plant, labour and materials used in such an operation within 24 hours.
- vi) The Contractor shall sweep, patch, remove debris, restore road surface to its original condition and otherwise maintain the trafficked carriageway surfaces within the Traffic Control Area to allow traffic to pass safely within the speed restrictions on the Traffic Control Area.

5. REQUIREMENTS FOR INSTALLATION OF HIGHWAY TRAFFIC CONTROL

- i) The Contractor shall inform the Overseeing Organisation before the installation of signs, cones, cylinders etc is carried out, and the Overseeing Organisation will inform the Police if necessary. This work shall be carried out in "off peak" periods as agreed with the Overseeing Organisation. Traffic shall not be diverted until the approval of the Overseeing Organisation has been obtained. The Contractor shall not alter or adjust the traffic control without the approval of or unless directed by the Police or the Overseeing Organisation.

The following peak hours apply unless otherwise agreed by the Overseeing Organisation, or stated in Paragraph 14 below in respect of Traffic Sensitive Streets:-

DAY	MORNING PEAK	EVENING PEAK
Monday	0630 to 0930	1600 to 1830
Tuesday	0630 to 0930	1600 to 1830
Wednesday	0630 to 0930	1600 to 1830
Thursday	0630 to 0930	1600 to 1830
Friday	0630 to 0930	1600 to 1830
Saturday	-	-
Sunday	-	-

- ii) No work shall be undertaken on the trafficked lanes of the Site without the approval of the Overseeing Organisation.
- iii) The Contractor shall not open any area to traffic that has previously been closed until:-
 - a) appropriate road markings have been laid;
 - b) the carriageway has been swept and cleared of all items of plant, personnel, material and debris to the satisfaction of the Overseeing Organisation;
 - c) verge or central reserve works and bridge maintenance works have been completed to the satisfaction of the Overseeing Organisation.
- iv) No lane closures shall be permitted over bank holiday weekends, bank holidays and the days preceding and following bank holiday weekends without prior written approval from the Overseeing Organisation.

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6. ACCIDENTS AND EFFECT ON THE WORKS

- i) In the event of an accident occurring on the trafficked lanes within the Site the Police may direct operations, including instructions to the Traffic Safety Officer (defined in paragraph 4.(ii). The Overseeing Organisation or the Police may direct the Contractor to remove broken down or damaged vehicles and debris which are capable of being removed by the vehicles and equipment on the Site. The Overseeing Organisation or the Police may call in specialist contractors to assist in the removal of large vehicles, dangerous chemicals etc. The Contractor shall, on the direction of the Overseeing Organisation, restore the road surface to its original condition to the satisfaction of the Overseeing Organisation and shall submit to the Overseeing Organisation within 24 hours a record of plant, materials and labour used for this purpose.

7. TRAFFIC ORDERS

- i) All temporary diversions and the use of three or four way signals proposed by the Contractor will require traffic orders to be processed by the Highway Authority and the Contractor shall allow for this procedure in its programme.
- ii) Where in addition to any closure instigated by the Overseeing Organisation the Contractor considers its works necessitate closing a road or amendment of existing traffic movements, or interference with waiting, loading or parking arrangements the Contractor shall notify the Overseeing Organisation in writing **at least 6 weeks** before the date when it is desired to Provide the Works so that the necessary advertising and posting of statutory notices may be put in hand in accordance with the provisions of the Road Traffic Regulations Act.
- iii) Where multi way including two way traffic signals are involved the details of the site, including position of traffic heads and all signs, shall be submitted to the Overseeing Organisation **not less than three weeks** before the intended date of use.

If owing to an emergency a road has to be closed without notice, due to danger to road users, the Contractor shall notify the Overseeing Organisation, Police, Fire Services, Ambulance Service and Public Transport Operators immediately in order that suitable diversions may be arranged.

- iv) Notice required by the Employer to arrange orders and licences are:

▪ Amending or making traffic orders (temporary)	8 weeks
▪ Authorising non-prescribed signs	6 months
▪ Authorising two-way temporary traffic lights	7 day
▪ Authorising three/four-way temporary traffic lights	21 days
- v) At all times vehicular and pedestrian access shall be maintained to all properties.

Every endeavour must be made to accommodate disabled or handicapped persons requiring access through the site.

8. ADVANCE INFORMATION SIGNS

Advance information signs shall be erected at least one week prior to the start of specific schemes as instructed by the Overseeing Organisation. These signs are temporary in nature, the minimum specification being that they are non-reflective, waterproof and mounted on a backing such as tempered hardboard. The lettering size should be approximately 100mm 'x'

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height. Likely wording shall be 'Roadworks/closure here, date, time' for example, or as instructed by the Overseeing Organisation. The exact number and form of signs required will be instructed by the Overseeing Organisation.

Alternatively the Overseeing Organisation may provide temporary signs for the Contractor to erect for specific schemes.

CONTRACT APPENDICES**9. PUBLIC HIGHWAYS AND PRIVATE ROADS AND OTHER WAYS AFFECTED BY THE WORKS**

- i) All highways and public rights of way are under the Authority of:-

The Environment Department
Hampshire County Council
The Castle, Winchester
SO23 8UD
Tel: 0845 603 5633

- ii) Where pedestrian access is required footways shall be maintained at least 1.5m wide. Pedestrian barriers must be rigid barriers to protect pedestrians from traffic, excavations, plant or material. Pedestrian barriers shall have hand rails between 1.0 and 1.2 metres above ground level and tapping rails fixed with the lower edge approximately 150mm above ground. All rails shall be solid, continuous between the supports and fixed so that they cannot be accidentally knocked over.

For excavations deeper than 1.2m the type of barriers required shall be agreed with the Overseeing Organisation.

Lightweight barriers utilising road pins and traffic tape shall not be used.

- iii) Where the footway is not barriered off whilst Providing the Works care shall be taken at all times to ensure that the surface is safe for pedestrians. Any raised boxes or manhole covers etc shall be temporarily ramped and trenches reinstated using bound materials to make them safe.
- iv) Access to and from the existing highways by works vehicles shall be made only by means of clearly signed works accesses.

10. PUBLIC FOOTPATHS

Safe pedestrian access to and from the public highway shall be maintained at all times as agreed with the Overseeing Organisation.

11. PRIVATE RIGHTS OF WAY

Private rights of way shall be maintained at all times in a safe condition as agreed with the Overseeing Organisation.

12. TRAFFIC SIGNAL SUB-SURFACE LOOP DETECTORS

The Contractor shall ensure, when working in the vicinity of traffic signal facilities at junctions and controlled pedestrian crossings which utilise induction loops inlaid in the carriageway, that these cables are not damaged.

The Overseeing Organisation if requested will arrange for the position of such loops to be indicated on site subject to reasonable notice.

These cables if damaged require specialist facilities and any damage caused by the Contractor shall be repaired by the Employer at the Contractor's expense or deducted from any sum due or which may become due to the Contractor.

13. TEMPORARY DIVERSIONS FOR TRAFFIC SPECIFIED BY THE OVERSEEING ORGANISATION

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The Contractor's attention is drawn to the requirements of Clause 117 and Appendix 1/17 on traffic safety and management in implementing the Temporary Diversions of traffic listed below:

Requirements for temporary diversions of traffic will be shown on a drawing to be supplied by the Overseeing Organisation.

Implementing and maintenance of Temporary diversions of traffic shall be the responsibility of the Contractor.

Special legend signs may be required for specific schemes and wording of these will be instructed by the Overseeing Organisation. These signs are required to be Class 1 high intensity, black legend on yellow background with a 'x' height of 100mm. These signs shall be covered until effective, if erected in advance of the starting date.

14.

TRAFFIC SENSITIVE SITES

15-20 % of the Employer's Highway Network is traffic sensitive. Details of sensitive sites are provided below (USRN – Unique Street Referencing Number):

(Maps showing these sites may be inspected at the highway authority's offices at the address noted above.

Havant (Authority code 1735)

USRN	Street name	Area	Town
17024795	Bartons Road	Bondfields	
17024802	Bedhampton Hill Road	Bedhampton	
17025045	Bedhampton Road	Bedhampton	
17024216	Bedhampton Way	Battins	Havant
17023677	Church Road	Hayling West	Havant
17024091	Crookhorn Lane	Purbrook	Havant
17024243	Dunsbury Way	Warren Park	Havant
17024853	Elettra Avenue	Waterloo	
17024427	Elm Lane	St Faiths	Havant
17024857	Elmleigh Road	St Faiths	
17024109	Frendstaple Road	Stakes	Havant
17024883	Hambledon Road	Waterloo	
17023665	Havant Road	Bedhampton	Havant
17023666	Havant Road	St Faiths	Havant
17025639	Havant Road	Hayling West	
17024601	High Street	Emsworth	Havant
17024896	Hulbert Road	Waterloo	
17025044	Hulbert Road (Part)	Bedhampton	Havant
17024897	Hulbert Road Service Road	Stakes	
17024898	Hulbert Road Service Road	Waterloo	
17024040	Ladybridge Road	Purbrook	Havant
17023668	Langstone Bridge	St Faiths	Havant

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USRN	Street name	Area	Town
17023667	Langstone Road	St Faiths	Havant
17025035	London Road	Purbrook	
17025036	London Road	Stakes	Havant
17025037	London Road	Waterloo	Havant
17025038	London Road	Hart Plain	Havant
17024925	Manor Road	Hayling West	
17024931	Middle Park Way	Several	
17024933	Milton Road	Waterloo	
17024940	New Road	Battins	
17024944	North Street	Emsworth	
17024177	Park Lane	Bedhampton	Havant
17023670	Park Road North	St Faiths	Havant
17025042	Petersfield Road	Battins	
17024964	Purbrook Way	Barncroft	
17024991	Stakes Hill Road	Stakes	
17024992	Stakes Road	Purbrook	
17024995	Stockheath Lane	Battins	
17024996	Stockheath Road	Battins	
17025009	Waterlooville Inner Relief Rd	Waterloo	

All Hampshire Traffic Sensitive streets are traffic sensitive (i.e. no working during these times) between **06:30 to 09:30 and 16:00 to 18:30 on all weekdays.**

15. **DETAILS OF EVENTS THAT COULD IMPACT ON THE DELIVERY OF WORKS**

The Contractor shall be aware that other contractors will carry out works on the highway network from time to time. These works may include (although not exhaustively) statutory undertakers, developers, highway improvements, major maintenance schemes, specialist surfacing works, bridgeworks and inspections, technical and drainage surveys, traffic signal installation, commissioning and maintenance, and street lighting maintenance and installation.

The Employer shall endeavour to keep the Contractor informed of planned works on the highway network at all times, in line with the provisions of the Traffic Management Act.

The Contractor should also note that other events may have a bearing on works, and major planned events, such as the Southampton Boat Show can place significant restrictions on access to the highway network and will be discussed in detail with the Contractor with a minimum of 3 months notice.

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16. THE TRAFFIC MANAGEMENT ACT 2004

Highway Authorities have a duty to coordinate all activities on the public highway and to minimise congestion. The NRSWA 1991 and the TMA 2004 prescribe powers to execute these duties. Although primarily aimed at utility works, the same principles shall be adopted for Hampshire's own works.

The Contractor's operations will affect traffic flow and accordingly the Contractor should organise the works to minimise the impact. Details of how this will be achieved will be agreed with the Overseeing Organisation prior to commencement of work.

The Contractor shall maintain programmes for all work packages ordered and **shall submit street works notices in accordance with the New Roads and Street Works Act**, as amended by the Traffic Management Act. Where a 3 month notice for proposed works is required, the Overseeing Organisation will serve this notice in advance of the actual scheme being issued to the Contractor. Where a notice is served by the Overseeing Organisation, a copy will be provided to the Contractor upon issue of the Work Package, to ensure details such as the unique reference number is correct on the remaining required notices that will be served by the Contractor.

If notices are required, the type and notice period shall be as set out in the Table 1/17_16 below:

CONTRACT APPENDICES**Table 1/17_16 – Activity Types and Notice Periods for the Traffic Management Act**

No.	Activity Type / Description	Notice Type	Notice Period / Served at
1	Minor Activities; Any planned activity that is to take 3 days or less. E.g.; Sign cleaning, gully emptying. Some lines, Studs, emergency potholes, rural grass cutting, footway patching, off highway repairs, surface dressing (all types).	S55	3 Days (min)
		S74 Wks closed	Within 24 hours of completion
2	Standard Activities; Any planned activity that is to last longer than three days, but less than, or equal to ten days. E.g., Vehicle crossings, small SM / RS Schemes, most safety / traffic calming schemes, significant c'way patching.	S55	10 Days (min)
		S74 In progress	Within 24 hours of works commencing
		S74 Wks closed	Within 24 hours of completion
3	Major Activities; Any planned activity that is to last 11 days or more or any planned activity that requires a temporary traffic order or any activity identified on an annual programme or normally planned at least six months in advance. E.g.; SM / RS schemes. Capital improvement schemes.	S54	3 Months (min)
		S55	10 Days (min)
		S74 In progress	Within 24 hours of works commencing
		S74 Wks closed	Within 24 hours of completion
4	Immediate Activities (Emergency); Unplanned activities undertaken to immediately resolve life threatening problems. E.g.; Safety fence repairs, major pothole repairs etc	S57	Within 2 Hours of works commencing
		S74 Wks closed	Within 24 hours of completion
	Immediate Activities (Urgent); Unplanned activities undertaken to put an end to unplanned interruption of service.	S55	Within 2 Hours of works commencing
		S74 Wks closed	Within 24 hours of completion

A notice shall be produced for each road on which works are taking place. If therefore works are taking place at a junction, a notice for each road on the junction will be required.

Cancellation/extension notices shall be managed as follows:

- **Cancellation:** All notices must be either closed with a registration notice or abandoned if the works are subsequently cancelled. Furthermore an existing notice must be abandoned if the works fail to start within the validity periods. If the works are cancelled or postponed beyond the validity dates a registration notice must be sent confirming the status to be 'abandoned' and giving an abandoned date. Subsequent notices MUST NOT reuse the same unique reference number, even if they refer to the same works that were postponed.

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- **Extending:** Once works have commenced if the duration of the works needs to be extended beyond the estimated end date then a further S74 'In Progress' notice, giving the revised end date, must be submitted BEFORE the existing end date expires.
- **Hampshire Coordination:** Co-ordination of all works and activities on the highway is the responsibility of the Highway Authority. In Hampshire this is carried out by local co-ordinators in the Highway Sub Units. Each co-ordinator has the authority to deny access to the highway, or give directions regarding the timing and duration of the works. They may also deny an extension. Furthermore a coordinator may direct the timing of works and may prescribe extended hours, weekend or night working. Such powers are exercised with respect to ensuring minimum disruption for highway traffic. Primarily these powers are exercised on traffic sensitive streets, but may be used on any street if the co-ordinator considers the circumstances warrant such restrictions. If a co-ordinator wishes to exercise these powers they will do so in response to a notice. Failure to comply with a direction from a co-ordinator will result in a non-compliance and possible removal from site.

Information Required for Noticing:

- Unique reference number, e.g. FF400 "Order No." A, B, C etc (A, B, C if more than one road on an order)
- Road Name (Street Gazetteer) – Available from system
- Grid reference, 6 figure Eastings and Northings – Map books
- Start / End date of works.
- Traffic Management details (from Works order).
- Description of works – In plain English. (Patching etc).
- Text Description of location of work.
- Street Unique Street Reference Number (USRN) – From system.

If a notice fails to have the required information in the required format, or submitted in the wrong sequence, then it may be invalid and may be rejected (usually within 1 working day). Upon receipt of the reject report the Contractor shall rectify the error and resubmit it.

If a notice for proposed works is late then it may be invalid and be rejected at the discretion of the co-ordinator. Where a notice for proposed works will result in a notice period less than specified then the Contractor should contact the local co-ordinator to confirm whether this is acceptable.

CONTRACT APPENDICES**APPENDIX 1/19 : ROUTING OF VEHICLES****1. Permitted Access Routes To and From the Site**

The Contractor shall ensure that construction traffic uses only those permitted routes shown within the Works Information, if applicable. The Contractors attention is drawn to the existing low rail bridge immediately south of the site which could affect deliveries and/or plant movements to or from the site. The plated height available is indicated as 3.5m (11'6"). The A27 bridge immediately north of the site whilst not classified as a low bridge will also restrict movements of abnormally high loads.

The Contractor shall, at the Commencement of the Contract, erect appropriate signs clearly indicating this requirement. These signs shall be removed upon the completion date. The legend, size and location of these signs shall be agreed with the Overseeing Organisation

2. The Use of the Works by Construction Traffic

The structures and finished pavement forming part of the works shall only be used to carry construction traffic when measures approved by the Overseeing Organisation have been taken to protect them from damage.

The Contractor shall not be permitted to use any of the structures or finished pavement forming part of the works to carry construction traffic outside the current Motor Vehicle (Construction and Use) Regulations.

The use by construction traffic of the works, over or adjacent to railway tracks or property, private property or public highways will only be permitted when suitable protective measures to the Overseeing Organisation's approval have been implemented. The cost of all such measures shall be borne by the Contractor.

The approval of the Overseeing Organisation to proposals to use structures or finished pavement forming part of the works for construction shall not relieve the Contractor of its responsibilities under the Contract.

CONTRACT APPENDICES**APPENDIX 1/21 : INFORMATION BOARDS**

An appropriate number of Scheme Sign Boards shall be erected on temporary posts as directed and at locations determined by the Overseeing Organisation.

When directed by the Overseeing Organisation, the Contractor shall carefully take down the Scheme Sign Boards and deliver them to the HCC offices at Micheldever.

The Scheme Sign Boards shall comply with HCC Standard Detail Drawing No HCC9/C/145.

CONTRACT APPENDICES**APPENDIX 1/23 : RISKS TO HEALTH AND SAFETY FROM MATERIALS OR SUBSTANCES****1. Restrictions in relation to traffic management measures**

In addition to the requirements of Appendix 1/17 and any further requirements contained within the Works Information relating to Traffic Management, the Contractor shall be responsible for the provision of such measures as additional safety zones, signs, barriers etc where these are considered necessary for the protection of the public.

2. Restrictions in relation to working practices.

Attention is drawn to the safety precautions required when using resin based materials for bedding mortars. The Contractor shall comply with the manufacturer's instructions.

Fires or the burning of materials on Site shall not be permitted.

3. Measures to be taken to protect members of the public

Members of the public are to be protected from activities within, and from gaining access to the working area by whatever means necessary, e.g. temporary fencing, appropriate signing etc, to prevent their interaction with any hazardous materials.

The Contractor shall use methods approved by the Overseeing Organisation which prevent nuisance and pollution due to dust, smoke or noise arising from the removal of carriageway materials and from cutting pavements, paving slabs and blocks, kerbs, pipes, etc.

Due consideration shall be given to wind speed and direction during operations to remove existing road markings.

4. Monitoring to be undertaken by Contractor

The Contractor shall be responsible for monitoring operations required to Provide the Works to ensure that measures to limit risks to health and safety from materials and substances are being implemented as agreed with the Overseeing Organisation.

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

1. The Overseeing Organisation shall notify the Contractor when the Works Information is issued of any materials which are to be retained and stored or reused. These materials shall be carefully removed, cleaned and delivered to store. The address of the store will be notified to the Contractor when the Works Information is issued and payment for transport from site shall be paid on dayworks.
2. Other redundant items arising from site clearance shall become the property of the Contractor and disposed of under the Contract.

CONTRACT APPENDICES**APPENDIX 3/1 : FENCING, GATES AND STILES**

The types and location of fencing works required will be supplied by the Overseeing Organisation in the Works Information.

CONTRACT APPENDICES**APPENDIX 4/1 : ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)****1. Pedestrian Restraint Systems**

The location and site specific requirements for any pedestrian parapets and pedestrian guardrails required will be provided within the Works Information.

CONTRACT APPENDICES**APPENDIX 5/1 : DRAINAGE REQUIREMENTS**

1. Drainage layouts shall be as stated in the Works Information.
2. **Foul and Surface Water Drains**
 - i) Details of Surface Water drains are detailed in the Works Information.
 - ii) For trench & bedding details see Specification for Highway Works Volume 3: Highway Construction Details, drawing F1.
 - iii) Joints in foul and surface water drains shall be watertight.
 - iv) The locations of existing drains to be sealed, removed or filled in accordance with Clause 506.3 shall be as stated in the Works Information.
 - v) Details of surface water chambers are detailed in the Works Information.
3. **Filter Drains**
 - i) Details of Filter Drains are detailed in the Works Information.
 - ii) For trench, bedding and backfill details see HCC Standard Detail Drawing No. HCC9/D/010.
4. **Chamber Covers & Frames**
 - i) Chamber covers and frames shall conform to the following:
 - a) All covers and frames shall be made of ductile iron and shall be both certified by a UKAS accredited body (e.g. BSI or equivalent) and to BS EN 124 (Class D400), unless otherwise stated by the Overseeing Organisation.
 - b) Minimum frame depth shall be 150mm, unless otherwise stated by the Overseeing Organisation.
 - c) All covers and frames shall incorporate a permanent non-rock feature. If the security of the chamber cover within the frame relies upon the depth of insertion only, the depth of insertion shall be increased to 80 mm.
 - d) Where a chamber cover incorporates couplings they shall be loose couplings of steel hexagon headed complying with BS 4190. They shall be no less than M16 size complete with a hexagon nut. Other type of loose coupling shall have a minimum cross-sectional area of 140mm².
 - e) Pins and circlips used as part of the securing device shall be of equal cross-section or be sufficiently protected to give a life equal to the main components.
 - f) Chamber covers shall be provided with at least two keyways. Where a cover is divided into two or more sections, each section shall be provided with at least one keyway. Closed keyways shall be used at all times.

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- g) All chamber frames shall have a minimum bedding width of the frame of 75mm which shall be solid metal. If slots/holes are incorporated within the bedding area of the frame the overall width of the frame shall be increased to give a compensating area of solid flange. The external corners of the frame shall be solid and may be square, curved or chamfered but at no point less than the minimum bedding width.
- h) Where the manufacture of the gully frame includes vertical frame webs/gussets, the tops of the web/gussets shall be at least 15mm below the top surface of the frame for triangular gussets and at a minimum of 25mm for rectangular gussets.
- i) Where the weight of any frame exceeds 15kg it shall be provided with suitable holes or hooking points. These shall be located to give a balanced lift.
- j) All chambers fitted with BS EN 124 D400 to F900 manhole covers shall have the following features:
- Frame-Flange features which promote sympathetic dispersal of applied vehicular loads, and which do not act as stress raisers to the bedding mortar. Acceptable features will include, but not be restricted to, circular section Frame-Flange perimeter beads and hole/aperture surrounds;
 - Frame features which indicate a non-crack inducing but gripping surface to the underside of the flange, in order to eliminate lateral frame movement. This gripping surface should be predominant in the regions coincident with the cover element seating positions;
 - Frame features which incorporate an increase in the flange underside mortar contact area coincident with the cover element seating positions.
 - These features are available on several manufactures products. The manufacturer's recommended polyester resin bedding mortar shall be used.
- ii) The five manhole Standard Details within the HCC9/D/045 to 065 have been produced in accordance with the 6th edition of Sewers for Adoption (SfA) with the purpose of ensuring that all manholes are constructed to adoptable standards. The Clause numbers referred to are from the Specification for Highway Works, and are equivalent to those referred to in SfA. There are three water Authorities operating within the County of Hampshire; Southern Water, Thames Water and Wessex Water. Each of these Authorities and the County Council have different requirements in terms of chamber clear opening dimensions and the provision of step irons, ladders and safety chains. The table below provides details of each Authorities requirements, which should be entered in the relevant chamber schedule reflecting the requirements of the adopting Authority.

Adopting Authority	Standard Access Manhole Types M1A to M1C and M2A to M2C (Sewer Diameter (mm))			Manhole Fitting Requirements All manhole Types		
	150 - 874	875 - 1074	1074 or Greater	Step Irons (Type)	Safety Chains (Materials)	Ladders (Clearance from Wall to Ladder)
Southern Water	675 x 675	675 x 675	675 x 675	No	No	No

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HCC	675 x 675	675 x 675	675 x 675	Less than 3m (Single)	450mm pipe dia. or greater	Over 3m
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5. **Gullies and Gully Connections**

- iii) Details of the treatment of existing and proposed gullies will be described in the Works Information.
- iv) Gullies shall be constructed as shown on HCC Standard Detail Drawing No. HCC9/D/015.
- v) The joining of a gully connection to an existing pipe shall be made using a saddle, all to be constructed as described in Clause 508.7.
- vi) Gully Gratings and Frames shall conform to the following:
 - a) They shall be made from ductile iron and shall be to both BS EN 124 (Class D400) and certified by a UKAS accredited body (e.g. BSi or equivalent).
 - b) They shall be supplied coated by dipping, or other equivalent means, using a hot applied coal tar based material complying with the requirements of BS 4164. Alternatively, at the option of the manufacturer a cold applied black bitumen material complying with the requirements of BS 3416 may be used. No coating shall be applied to any casting, unless the surfaces of the casting are clean, dry and free from rust.
 - c) The upper surface of the gully grating shall be flat and slot orientation shall be between 45° and 135° relative to traffic as BS EN 124 Clause 7.9.
 - d) Gratings shall be non-rocking and captive hinged, with the hinge at the on-coming traffic end of the frame.
 - e) The minimum clear opening dimensions shall be 400mm x 350mm and the maximum clear opening dimensions 450mm x 410mm.
 - f) The minimum total waterway areas shall be 900cm².
 - g) There shall be a minimum waterway area of 45cm² between the kerb face of the frame and a parallel line 50mm from the kerb face.
 - h) There shall be a minimum waterway area of 65cm² between the kerb face of the frame and a parallel line 90mm from the kerb face.
 - i) The minimum frame depth shall be 100mm.
 - j) The minimum bedding width of the frame shall be 75mm, which shall be solid metal. If slots/holes are incorporated within the bedding area of the frame the overall width of the frame shall be increased to give a compensating area of solid flange. The external corners of the frame shall be solid and may be square, curved or chamfered, but at no point less than the minimum bedding width.
 - k) Where the manufacture of the gully frame includes vertical frame webs/gussets, the tops of the webs/gussets shall be at least 15mm below the top surface of the frame for triangular gussets and a minimum of 25mm for rectangular gussets.
 - l) Where the weight of any frame exceeds 15kg it shall be provided with suitable holes or hooking points. These shall be located so as to give a balanced lift.

CONTRACT APPENDICES**6. Raising Or Lowering Covers, Gratings & Frames on Existing Chambers and Gullies**

- vii) Existing manhole covers, gully gratings, covers to BT, Water Authority, Electricity, Gas apparatus or any other described in the Contract shall be carefully taken up and laid, in accordance with Clause 572AR, to the appropriate levels to suit the new carriageway, footway or verge surface levels.
- viii) All frames shall be bedded on a minimum thickness of 15mm of polyester resin mortar.
- ix) Adjustments are to be made to the following requirements:

<i>Level raised by:</i>	<i>Materials to be used:</i>
Not exceeding 25mm	Resin mortar and bedding only
Between 25mm and 75mm	Slate or tile 150mm wide bedded in 1:0.25:3 cement/lime/sand mortar fair faced internally and splayed externally (but see note below).
Between 75 and 150mm	225mm Class B solid engineering bricks bonded and bedded in 1:0.25:3 cement/lime/sand mortar pointed with flush joints (but see note below).

Note: Polyester resin mortar to be used for all carriageway locations.

7. Contractor's Alternatives For Specified Drain Materials

- i) Where the Contractor wishes to use pipe or drain materials or construction not specified in the Contract, it shall submit details of its proposed alternatives at least 14 days prior to the date when the alternative is to be installed, for the Overseeing Organisation's approval. The submitted details shall include the following:
 - a) Hydraulic roughness and flow capacity characteristics of the pipe.
 - b) Manufacturer's name, material properties and durability of the materials.
 - c) Strength characteristics and structural properties of the pipe and pipe bedding combination including calculations showing structural adequacy for the application.
- ii) Following receipt of these details the Overseeing Organisation may ask for further details and clarification as necessary.
- iii) In circumstances where Type Z bed and surround is to be used with plastic pipes at less than 1m depth, the individual lengths of plastic pipe used shall be no more than 3m in length.
- iv) The following pipes shall not be used:
 - a) Flat invert corrugated UPVC pipes ("horseshoe profile")
 - b) Glass Reinforced Plastic (GRP)
 - c) Corrugated Steel

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- d) Thermoplastic Solid Wall (including PVC-U, PP & PE)

8. Highway Drainage

Ditches and piped drainage systems shall at all times be kept clear of deposits of silt and deleterious material from excavations and pumping operations. Adequate provision shall be made to prevent silt from entering the drainage system of the highway. The Contractor shall be responsible for all necessary clearing of gullies, pipes and ditches to the satisfaction of the Overseeing Organisation.

Any drains or culverts disturbed or damaged by the excavations shall be reinstated to the requirements of the Overseeing Organisation at the Contractor's expense or deducted from any sum due or which may become due to the Contractor.

CONTRACT APPENDICES**APPENDIX 5/1 : DRAINAGE REQUIREMENTS (Continued)**

1 Schedule 1a: Surface Water Drains

RPF ASSOCIATES

Highglade Properties

SCHEME TITLE:- Interbridges Pipe Schedule									Sheet 1 of 1
PIPE SCHEDULE: SURFACE WATER DRAINAGE									
PIPE RUN				SIZE (mm)	LENGTH (m)	MINIMUM COVER (m)	DRAIN GROUP NO.	NO. OF GULLY CONNE- CTIONS	DRAWING No.
LOCATION		INVERT LEVEL							
Upstream	Downstream	Upstream	Downstream						
S1	E1	5.200	5.050	150	6.0	0.85	5	0	RPF/120/005C
S2	E1	4.700	4.600	150	23.0	1.50	5	0	RPF/120/005C
G1	S1	5.050	3.200	150	7.0	0.40	5	0	RPF/120/005C
G2	S1	5.370	5.300	150	10.0	0.40	5	0	RPF/120/005C
G3	S2	5.300	5.200	150	5.0	0.40	5	0	RPF/120/005C
RE1	S1	6.600	5.500	150	27.0	0.50	5	0	RPF/120/005C FILTER DRAIN
RE2	S2	5.800	5.300	150	13.0	0.50	5	0	RPF/120/005C FILTER DRAIN
EG2	E3	4.900	4.000	150	3.0	0.40	5	0	RPF/120/005C
E3	S2	4.800	4.700	150	3.0	0.70	5	0	RPF/120/005C

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Date

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APPENDIX 5/1 : DRAINAGE REQUIREMENTS (Continued)**2 Schedule 2a: Alternative Pipe & Bedding (Foul and Surface Water Drains)**

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Sheet 1 of 1

Pipe Diam (mm)	Pipe Group No	Vitrified Clay					Precast Concrete			Ductile Iron	GRP	Thermoplastic	
		L	95	120	160	200	L	M	H			Structured Wall	SRD 41
150 Cover over 650	5				ASBF N	ASBF N	ASBF N	ASBF N	Z	ST	-	-	
150 Cover less than 650	5				Z	Z	Z	Z	Z	ST	-	-	

This schedule is to be read in conjunction with the drainage schedules, the engineering plans and Highway Construction Detail F1 in Volume 3 of the Specification for Highway Works.

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Schedule 3a: Chambers (Surface Water)**RPF ASSOCIATES****Highglade Properties**

SCHEME :- Interbridges									Sheet 1 of 1	
CHAMBER SCHEDULE										
Chamber Reference	Chamber Type	Lowest Pipe Invert Level (m)	Base Slab Level (m)	Proposed Cover Level (m)	Existing Cover Level (m)	Chamber Depth (m)	Cover Type	Proposed Connection Sizes (mm) In	Proposed Connection Sizes (mm) Out	Ring Size (mm)
S1	S 2A	5.500	2.900	6.400		3.000	D400	150 (from RE1)		3000
		5.300					600x600	150 (from G2)		
		5.200							150 (to E1)	
S2	S 2A	5.500	2.700	6.200		3.000	D400	150 (from RE2)		3000
		4.800					600x600	150 (from E3)		
		4.700							150 (to E1)	
RE1	rodding eye	6.500	6.930	7.230			C250	N/A	150	N/A
		(at bend)								
RE2	rodding eye	5.700	6.150	6.450			C250	N/A	150	N/A
		(at bend)								
E1	manhole	3.020	2.900 (approx)	6.020	5.820		D400			1500
		5.050					600x600	150 (from S1)		
		5.150						150 (from RE1)		
		4.600						150 (from S2)		

Details of access dimensions and manhole fitting requirements are given in Table 5/1, above. * L = Access Ladder, S = Step Irons, SC = Safety Chain, H = Safety Chain hooks only. No manholes or catchpits to be adopted by HCC shall be fitted with step irons or ladders

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APPENDIX 5/1 : DRAINAGE REQUIREMENTS (Continued)

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Schedule 4a: Existing Gullies

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Highglade Properties

SCHEDULE OF EXISTING GULLIES

Scheme Title :		Interbridges, Emsworth							Sheet 1 of 1	
GULLY REF N0	REQUIREMENTS FOR EXISTING GULLIES									
	CHAINAGE	Lower 70-225mm	Lower 25-70mm	Lower 0-25mm	No Change	Raise 0-25mm	Raise 25-70mm	Raise 70-225mm	COMMENTS	
EG1									Remove gully grating and frame, fill in pot and connection length	
EG2						/			Maintain gully, re-adjust grating and frame to suit new alignment	

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APPENDIX 5/1 : DRAINAGE REQUIREMENTS (Continued)

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Schedule 4b: Proposed Gullies

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Highglade Properties

SCHEDULE OF PROPOSED GULLIES

Scheme Title : Interbridges, Emsworth						Sheet 1 of 1
GULLY REFERENCE NO./TYPE	GRATING TYPE	CONNECTION TO	CONNECTION INVERT LEVEL (m)	CONNECTIO N LENGTH (m)	CONNECTION PIPE GROUP	COMMENTS
G1	D400	E1	4.950	7.000	Z	Connects to E1 using existing connection from EG1
G2	D400	S1	5.300	10.000	Z	
G3	D400	S2	5.200	5.000	Z	

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APPENDIX 5/2 : SERVICE DUCT REQUIREMENTS

1. The layout of service ducts shall be as provided in the Works Information
2. Details of service ducts shall be as scheduled in the Works Information
3. Drawpits for Street Lighting Ducts shall be constructed as HCC Standard Detail Drawing No. HCC9/L/075.
4. Drawpits for Traffic Signal Ducts shall be constructed as HCC Standard Detail Drawing No. HCC9/T/005 or HCC9/T/010, as specified.

CONTRACT APPENDICES**APPENDIX 6/1 : CLASSIFICATION AND ACCEPTABILITY OF EARTHWORKS MATERIALS****1. GENERAL NOTES:**

- i) The Contractor shall be responsible for the testing for classification and assessment of acceptability of earthworks materials prior to excavation or import.
- ii) The Contractor shall notify the Overseeing Organisation in advance of the trial pitting for the above testing, in order that the Overseeing Organisation may observe the trial pitting and/or carry out any such testing of their own that may be required.
- iii) The Contractor shall notify the Overseeing Organisation of its determination regarding the extent and classification of acceptable earthworks materials and of the intended methods of working prior to commencement of excavations.
- iv) The Contractor's assessment of acceptability/ classification will be conditional on the earthworks materials remaining substantially unchanged. If in the opinion of the Overseeing Organisation the condition of the materials has changed significantly then repeat acceptability testing shall be undertaken.
- v) The Overseeing Organisation will carry out their own sampling and testing of earthworks materials at the point of deposition in order to ensure compliance with the Contract.
- vi) All disposal of material off-site shall be undertaken by the Contractor in accordance with the requirements of the Waste Management Licensing Regulations 2005.
- vii) Fill shall be as follows unless otherwise directed by the Overseeing Organisation:-

<u>Use</u>	<u>Class</u>
General Fill	1A-C, 2A-E or 3
Landscape Fill	4
Topsoil	5A or 5B
Selected Fill	6A-S or 7A-I
Capping Layer	6F1-5
Miscellaneous Fill	8
Stabilised Materials	9A-F

2. REQUIREMENTS FOR GROUND DEWATERING

- i) Water from pumping shall be led to a suitable drainage outlet so as not to cause any nuisance or damage. No backfilling shall take place in trenches containing water.
- ii) Dewatering or other methods of reducing the natural ground water level within the limits of the highway will not be permitted without the approval of the Overseeing Organisation.

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

1. No Class U1B or U2 material shall be anticipated within the site boundaries, unless stated within the Works Information. If such material is encountered whilst Providing the Works, the Overseeing Organisation shall contact the Environmental Health Officer and agree the appropriate measures to be taken. The Contractor will be responsible for complying with all current regulations and requirements for dealing with Class U1B or U2 Unacceptable Material.

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

1. Requirements for earthworks will be given within the Works Information.
2. Blasting for excavations is not a permitted method of excavation.
3. Requirements for cutting faces:-
 - i) Undercutting of cuttings or embankments shall not be undertaken.
 - ii) No special face stability measures are required as part of the Contract. However should an excavated face be such, that in the opinion of the Overseeing Organisation some form of protection is required, the measures to be taken shall be as directed by the Overseeing Organisation.
4. Clearance and regrading of existing ditches shall be carried out at locations as instructed by the Overseeing Organisation.

The clearance and regrading shall include the removal of vegetation, vegetable matter and all other deposits within the ditch profile. Materials resulting from this clearance shall be dealt with as unacceptable material.
5. Profile types are shown in the standard detail drawings listed in Appendix 0/4.
6. No arisings shall be left on the verge or margin adjacent to the ditch without the prior approval of the Overseeing Organisation. All material shall be disposed of in licensed tips provided by the Contractor off site.

CONTRACT APPENDICES**APPENDIX 6/7 : SUB-FORMATION AND CAPPING AND PREPARATION AND TREATMENT OF FORMATION**

1. In areas of new embankment construction utilising 2B or 2C general fill 6F5 capping may be required, subject to CBR testing. A CBR<2% will require 600mm of capping, between 2-5% will require 350mm of capping, between 5-15% will require 225mm of capping and >15% no capping. Capping thicknesses may be reduced by incorporating Geogrid reinforcement, subject to the agreement of the Overseeing Organisation. All CBR testing must establish equilibrium CBR values to allow for season variation in ground water levels.
2. Permitted class of capping layer material is 6F5.
3. In cuttings and embankments the procedure to be adopted for construction of capping is as set out in clauses 613.11 and 613.12 respectively.
4. The Contractor, when requested by the Overseeing Organisation, shall demonstrate the methods, equipment and materials he intends to use in the preparation and surface treatment of the sub-formation and formation in areas specified by the Overseeing Organisation.

CONTRACT APPENDICES**APPENDIX 6/8 : TOPSOILING**

1. The areas to be topsoiled will be detailed in the Works Information.
2. Areas and depths of topsoil to be stripped will be detailed in the Works Information.
3. Topsoil shall be kept separate from other classes of deposited materials.
4. No work shall be carried out when rain is falling, when there has been heavy rain within the previous 24 hours or when in the opinion of the Overseeing Organisation the subsoil is likely to be damaged.
5. Topsoiling shall be in accordance with Clause 618 unless instructed otherwise by the Overseeing Organisation .
6. Topsoil shall be spread in layers not exceeding 150mm and shall be consolidated as work proceeds to the depths shown on the drawings.
7. During fallow periods prior to seeding, the ground shall be kept substantially weed free.
8.
 - i) Imported topsoil class 5B shall be from a source approved by the Overseeing Organisation

It shall comply with BS 3882, be of general purpose grade and unless agreed in advance with the Overseeing Organisation, shall not be screened.

In addition, the texture and PH should match existing topsoils on site as far as is reasonable, or as agreed with authorised officer.

If fertility, organic content, texture or Ph is not readily obvious from inspection of the source, or a sample submitted for approval, or a test certificate is not available, ameliorants may be required to be supplied and incorporated to attain a quality to support healthy growth of planting in the first season of planting available after topsoil is spread on site.

Ameliorants are to be supplied and incorporated as agreed by the Overseeing Organisation in advance of delivery to site.

Generally, topsoils with a high clay or stone content or poor structure are not acceptable for areas to receive planting, or for areas where frequent grass mowing will be required.
 - ii) Topsoil ameliorants shall be:
 - a) Organic Materials:
 - Peat shall not be used
 - Composted green waste in the form 'Progrow' or equivalent approved by the Overseeing Organisation .

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- Well rotted stable manure, free of weed roots
- Well composted mushroom compost
- Composted leaf mould, free of weed roots
- Composted bark chippings, free of fungi, diseases and contaminants.

CONTRACT APPENDICES**APPENDIX 6/8 : TOPSOILING (Continued)**

- b) Drainage improvers:
 - Graded horticultural grit
 - Clean washed sharp sand
 - Clean washed angular gravel 0-3 mm diameter grade
 - Composted for a minimum of 16 weeks wood chippings,
 - 25-75mm, maximum 15% fines
- c) Fertilizers:
 - Organic fertilizer in the form of sterilized bonemeal, shall be supplied and spread at a rate to be agreed with the Overseeing Organisation.
- iii) For manufactured imported topsoil a laboratory test certificate shall be provided in advance, to accompany each sample submitted for inspection and approval and shall include the following:
 - (a) Source
 - (b) Texture to BS 3882, figure K1
 - (c) Reaction, to BS 1377-3: pH
 - (d) Organic matter
 - (e) Nutrient content: Minimum index values for nitrogen, phosphorus, potassium and magnesium to be as for general purpose grade of BS 3882
 - (f) Crumb structure: Made up of discernible crumbs, typically 2-7 mm diameter, each comprising an aggregation of soil particles attracted around a sticky humus centre
 - (g) Size of stones in any dimension (maximum)
 - (h) Foreign matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation and the like

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS**

The attention of Tenderers is drawn to the introduction of BS EN 13108 Bituminous Mixtures - Material Specifications and BS 594987 Asphalt for roads and other paved areas, Specification for transport, laying and compaction, and design protocols, which came into effect on 1 January 2008. The detailed designations and specifications for bituminous mixtures to be supplied shall use the latest European terminology in line with the recommendations within the National Guidance Document (PD6691). Tenderers are advised to liaise closely with their chosen supply chain partners in order to understand the likely impact of adopting BS EN 13108 and BS 594987 and to ensure that any known financial implications are taken on board when tendering.

Table 1 PERMITTED PAVEMENT OPTIONS – SCHEDULE 1

Drawing Reference	Pavement Treatment Type	General Requirements	Permitted Pavement Options
RPF/120/005	1	Schedule 2	1

Table 2 GENERAL REQUIREMENTS – SCHEDULE 2

Schedule 2: General Requirements – Pavement Treatment Type ...		
Grid for checking surface levels of pavement courses	Longitudinal dimension:	10m max
	Transverse dimension:	2m max
Surface regularity	Category of Road:	A
Interval for measurement of longitudinal regularity		Continuous
Interval for measurement of transverse regularity		20m
Whether measurement of surface texture is required Average: 1.2 mm Maximum: 2.0 mm Minimum: 0.9 mm		Yes

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Table 3** PERMITTED CONSTRUCTION MATERIALS – SCHEDULE 3

Schedule 3: Permitted Construction Materials						
	Pavement Option 1					
Pavement Layer	Material Ref.	Thickness (mm)				
Surface Course	SC 1	30mm				
Binder Course	BC 1	70mm				
Base	RB 1	200mm				
Subbase	SB 1	150mm				
[Other – e.g. regulating]		N/A				
Total Thickness	-	655mm				
Capping is required as described in Appendix 6/7	CP 1	200mm				
Geotextile	G 1	5mm				

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CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Table 4** GENERAL REQUIREMENTS FOR CONSTRUCTION MATERIALS – SCHEDULE 4

Schedule 4: General Requirements for Construction Materials	
Clause	Requirement
802.14	Thickness of compacted sub-base layer required for trafficking trial, to be as specified in Schedule 3 above.
801.7	All sub-base material shall comply with sub-Clause 801.7
802.4	Material of compacted thickness equal or greater than 200mm shall be laid in two or more layers.
903.28	A minimum PSV ₅₅ is required for a temporary running surface.
942	Sections of Thin surface course which are to be overlaid with a non-thermoplastic High Friction surfacing shall be treated with an even application of grit as para. 9.10 of HD37 and Clause 973AR during initial rolling of the TSC/SMA.
942.15	In the first sentence of this clause, delete word “trunk” and replace with “County”

TABLE 5 REQUIREMENTS FOR CONSTRUCTION MATERIALS – SCHEDULE 5**Requirements for Regulating Course**

The following table (Table 1) gives the permitted regulating materials and the range of thicknesses they can be laid over. Regulating thicknesses of less than 10mm/15mm (dependent upon the materials permitted within each surfacing appendix) shall be achieved within the thickness of the overlying bituminous material, unless otherwise agreed by the Overseeing Organisation.

All Regulating Course material shall be laid in accordance with BS 594987.

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Table 1 – Permitted Regulating Materials**

Ref No	Layer Thickness (mm)	Regulating Material	Grade of Binder	Requirements
1	0 – 20	HRA 0/2 F surf 40/60 des to –BS EN 13108-4	40/60 pen only	Wheel Tracking Level 1 to BS 598 part 110
3	35 – 65	HRA 50/14 bin des 40/60 to –BS EN 13108-4	40/60 pen	Wheel-tracking criteria to match that specified for surface course specified in Table 2 of this Appendix..
4a	50-100	AC 20 dense bin 40/60 des to –BS EN 13108-1 & Clause 929	40/60 Pen	Coarse Aggregate to be crushed rock or slag.
4b		AC 20 dense bin 100/150 des to –BS EN 13108-1 & Clause 929	100/150 Pen	Fine aggregate to exclude natural sand fines
4c		AC 20 HDM bin 40/60 des to –BS EN 13108-11 & Clause 929	40/60 Pen	Wheel-tracking criteria to match that specified for surface course specified in Table 2 of this Appendix.. Where no requirement is stated these may be recipe mixes
5a	70-150	AC 32 dense bin 40/60 des to –BS EN 13108-1 & Clause 929	40/60 Pen	Coarse Aggregate to be crushed rock or slag.
5b		AC 32 dense bin 100/150 des to –BS EN 13108-1 & Clause 929	100/150 Pen	Fine aggregate to exclude natural sand fines
5c		AC 32 HDM bin 40/60 des to –BS EN 13108-1 & Clause 929	40/60 Pen	Wheel-tracking criteria to match that specified for surface course specified in Table 2 of this Appendix.. Where no requirement is stated these may be recipe mixes.

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Requirements for Surface Course****Table 2 – Schedule of Surface Course Materials**

Element	Material Ref.	Clause	Material	Requirements
Surface Course	SC 1	942	10mm Thin Surface Course System	Traffic Count (commercial traffic in each lane) : 300cvd per day Site Definition and Stress Level : 2 Minimum PSV of Course Aggregate : 60 Maximum AAV of Course Aggregate : 16 BBA HAPAS Roads and Bridges Certificate (Tyre noise level relative to HRA required on certificate) : Level 2 Wheel tracking requirements to BS 598-110 of Level 1 in accordance with PD 6691 Table B4 Minimum and/or Maximum Compacted Layer Thickness Permitted : 30mm Guarantee Period: 5 years Surface Macrotexture Performance Guarantee : 2 years

Element	Material Ref.	Clause	Material	Requirements
			High Friction Surfaces	
Surface Treatments	HFS 1	924SR	Colour – Dark Grey	Type Classification: HAPAS BBA Type 1 Thermosetting resin system Minimum PSV: 70 (100% calcined bauxite) Guarantee Period: 3 years
	HFS 2		Colour – Buff	Type Classification: HAPAS BBA Type 1 Minimum PSV: 70 (100% calcined bauxite) Guarantee Period: 3 years

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Requirements for Binder Course****Table 3 – Schedule of Binder Course Mixtures**

Element	Material ref.	Clause	Material	Requirements
Binder Course	BC 1	929	Dense Binder Course Asphalt Concrete (Design Mixes)	BS EN 13108-1, PD 6691, BS 594987 AC 20 dense bin 40/60 des Clause 945 applies Binder Grade : 40/60 Aggregate Size : 0/20mm Wheel tracking requirements to BS 598-110 of Level 1 in accordance with PD 6691 Table B4. Coarse Aggregate to be crushed rock or slag. Fine aggregate to exclude natural sand fines.

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Requirements for Base and Subbase Materials****Table 4 – Schedule of Base and Subbase Materials**

Element	Material Ref.	Clause	Material	Special Requirements
Base	RB 1	929	Dense Base Asphalt Concrete (Design Mixes)	BS EN 13108-1, PD 6691, BS 594987 AC 32 dense base 40/60 des Clauses 945 applies Binder Grade : 40/60 Aggregate Size : 0/32mm Coarse Aggregate to be crushed rock or slag. Fine aggregate to exclude natural sand fines.
Base	RB 2	948SR	Heavy Duty Cold Recycled Bitumen Bound Material	Ex-situ recycling ONLY. Min. Indirect Tensile Stiffness Modulus (Dry): Individual Value = 2.5 Gpa Mean Value = 3.1 Gpa Min. Indirect Tensile Stiffness Modulus (water saturated): Individual Value = 2.0 Gpa Mean Value = 2.5 Gpa Minimum added bitumen content = 3%. Minimum added cement content = 2%. Compaction = 93% Min. PRD
Base	RB 3	1030	C8/10 Wet Lean Concrete (for use in narrow <1m constructions).	BS 8500-1 To be fully compacted by internal vibration only. Crack inducers to be max 3m centres. Must achieve equivalent of 7 days strength before overlaying permitted. ST mixes not permitted.

Element	Material Ref.	Clause	Material	Special Requirements
Subbase	SB 1	891AR	Granular Subbase Material Type CDD	

CONTRACT APPENDICES**APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)****Table 6 – Schedule of Capping Materials**

Element	Material Ref.	Clause	Material	Special Requirements
Capping	CP 1	613	Recycled 6F5	Refer to Appendix 6/7.

Table 7 – Schedule of Pavement Reinforcement

Element	Material Ref.	Clause	Material	Special Requirements
Geogrid	G 1		Pavement Reinforcement	Pavement reinforcement shall be submitted by the Contractor for the Overseeing Organisations approval

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APPENDIX 7/1 : PERMITTED PAVEMENT OPTIONS (Continued)

Requirements for Pavement Reinforcement

1. Grid Type 3 (Polypropylene Composite)

- 1.1 Primarily intended for use where cracking has been caused by vertical movement (e.. clay shrinkage) and the grid can be placed beneath binder course.

The composite grid shall comply with the following requirements:

Geotextile Polymer – Polyester

Weight (g/m²) –130

Thickness without load (mm) – 1

Tensile Strength DIN 53857 (kN/m) Longitudinal – 8.2 Transverse – 2.0

Maximum Elongation DIN 53857 (%) Longitudinal – 18 Transverse – 80

(e.g. Netlon's Tensor ARG or equivalent)

The grid shall be fixed to the carriageway using an emulsion bond coat approved by the grid supplier/manufacturer. Other types of bond coat shall not be used unless approved by the Overseeing Organisation.

2. General Requirements

The Contractor shall provide two copies of the following information for the proposed grid at least 20 days prior to installation for approval by the Overseeing Organisation. Please note that the above three Grid Type options are not equivalents. Each Type is for specific situations.

- i) Samples of the proposed reinforcement grid;
- ii) Manufacturer's comprehensive data sheets;
- iii) Manufacturer's instructions for the storage, handling; lapping and joining of the grid;
- iv) Approved list of installers (if available).

The reinforcement grid shall be installed in accordance with the manufacturer's instructions subject to the following:

- i) Special care shall be taken to ensure 'rucks' in the grid are kept to a minimum and shall be cut and lapped where necessary or where instructed by the Overseeing Organisation;
- ii) Unless otherwise approved by the Overseeing Organisation, only an emulsion bond coat approved by the grid supplier/manufacturer shall be used;
- iii) Working methods shall ensure construction traffic does not run over the uncovered grid more than is absolutely necessary;
- iv) All areas of reinforcement grid shall be covered by surface course material by the end of the working day.

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Reinforcement grids shall be laid in widths of at least 1.5m such that it extends a minimum of 0.75m, in all directions, beyond any crack or construction joint formed as a result of the widening works.

CONTRACT APPENDICES**APPENDIX 7/2 : EXCAVATION AND REINSTATEMENT OF EXISTING SURFACES**

1. Should the Contractor need to excavate in existing paved surfaces typical reinstatement details are indicated below. The existing surface and binder course shall have neat vertical saw-cut joints, painted with bitumen in accordance with Clause 903.22.
2. Paved areas to be scarified, regulated and reinstated to achieve required finished levels at tie points between new and existing pavements as shown in the Works Information
3. Typical trench reinstatement details:
 - Carriageway HCC9/C/090
 - Footways HCC9/C/095
4. Reinstatement materials to be as Appendix 7/1
5. PVC coated glass fibre reinforcement shall be placed beneath the surface course unless the sub grade is Clay. In this case Tensar AR1 or equivalent should be placed beneath the binder course with at least 60mm cover, overlapping the trench edges by a minimum 300mm.

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CONTRACT APPENDICES**APPENDIX 7/4 : BITUMINOUS SPRAYS (CLAUSE 920)**

Clause 903.4 requires a tack-coat or bond coat to be applied prior to placing bituminous material on any bound substrate, it shall be applied at a uniform rate in accordance with Clause 920. There shall be no bare areas or areas of ponding. Bond coat can be substituted for tack coat at suitable application rates, but not vice versa.

Street Furniture, iron work and drop kerbs shall be masked using self adhesive masking materials before application starts and removed prior to the *completion date*.

In the case of thin overlays being applied, where a thickness of bituminous material of less than 40mm is to be applied, a proprietary polymer modified bond coat, with a minimum peak vialit cohesion value of 1.0 J/cm² shall be used.

If the bituminous material is a proprietary product, then the manufacturer's recommendations shall be followed.

Where it is necessary for the layer to be temporarily trafficked by pedestrians or vehicles a "non-tack" bond coat shall be used.

A bond coat shall be used where required to improve the relative impermeability of a lower layer.

CONTRACT APPENDICES**APPENDIX 7/6 : BREAKING UP OR PERFORATION OF REDUNDANT PAVEMENT**

Where breaking up is specified, the pavement shall be broken out by any appropriate means to full depth. All loose material shall be disposed of by the Contractor. The area is to be reinstated as detailed in the Works Information.

Where perforation is specified, minimum 50mm diameter holes shall be made through the pavement at no greater than 300mm centres extending into the sub-grade.

CONTRACT APPENDICES**APPENDIX 7/9 : COLD MILLING (PLANING) OF BITUMINOUS BOUND FLEXIBLE PAVEMENT**

6. Areas to be cold-milled shall be as specified in the Works Information and shall be in accordance with Clause 709.
7. All arisings from the cold-milling areas above shall be recycled wherever possible after processing if required. For example, used as Type RP Sub-base beneath carriageways and footways or recycled into cold recycled bitumen bound material unless agreed with the Overseeing Organisation.
8. The Contractor shall locate buried metalwork, all in accordance with Clause 709.11.

CONTRACT APPENDICES**APPENDIX 7/70 : MODIFIED BINDER AND MIXTURE DATA REQUIREMENTS**

The following data shall be provided to the Overseeing Organisation as required in sub-clause 943.5 and 960AR in respect of the proposed modified binder and of the proposed mixture as appropriate.

1. Binder Samples

For polymer modified bitumens the binder shall be sampled from the delivery according to BS EN 58.

2. Penetration

Penetration at 25°C (BS 2001), 100g 5 secs and at 5°C 200g 60 secs, before and after hardening in the Rolling Thin Film Oven Test (RTFOT) in accordance with ASTM D 2872 and after RTFOT followed by the BBA HAPAS high pressure ageing test (HiPAT).

3. Product Identification Test and Rheological Properties

Results for the binder(s) proposed shall comprise rheological data for each binder in the form of a complex stiffness modulus (G^*) and phase angle (δ) determined in accordance with Clause 928 for binder as supplied, after RTFOT and after RTFOT followed by HiPAT.

4. Storage Stability Test

All binders shall be stored in accordance with the manufacturer's instructions. Binders claimed to remain homogeneous in storage without agitation shall be tested for storage suitability in the manner described in Clause 941. The mean of the differences in softening point between the top and bottom samples, of not less than five pairs of such samples shall not exceed 5°C. Manufacturers of pre-blended modified binder shall state what precautions are necessary to ensure that adequate homogeneity is maintained during storage.

5. Photomicrograph

A typical photomicrograph of the modified binder using ultra-violet or other technique to provide maximum contrast of the polymer structure to the binder before modification shall be supplied together with details of sample preparation techniques.

6. Cohesion

Vialit Pendulum cohesion test curve of the modified binder, in accordance with Clause 939 for the binder as supplied, after RTFOT followed by HiPAT.

7. FRAASS Brittle Point (IP80)

FRAASS brittle point measured using IP80 shall be provided on the binder as supplied, after RTFOT and after RTFOT followed by HiPAT.

CONTRACT APPENDICES**APPENDIX 7/70 : MODIFIED BINDER AND MIXTURE DATA REQUIREMENTS
(Continued)****8. Mixing and Compaction Temperatures**

Maximum and minimum mixing temperatures shall be stated.

Maximum and minimum compaction temperatures shall be stated and any wind chill factor differing from conventional hot rolled asphalt utilising unmodified bitumen.

9. Mix Sensitivity Analysis

Wheel-tracking rate for the proposed mixture but with the binder content by mass increased above the target to the maximum binder content anticipated by the *Contractor*, but not more than + 0.6% above the target.

Modified Mixture Data to be supplied if available

The following additional data concerning the modifier and the mixture shall be supplied if it is available.

10. Indirect Tensile Stiffness Modules (ITSM) to DD 213 before and after water immersion (LINK Protocol).

11. Repeated Load Axial Test (RLAT) to DD 226 (for correlation to performance in terms of deformation).

12. Indirect Tensile Fatigue Test (ITFT) after ageing, see LINK Protocol (for correlation to performance in terms of fatigue).

CONTRACT APPENDICES**APPENDIX 7/71 : PATCHING****1. References**

Details of typical patching and haunch repair of existing carriageways are shown in the following standard detail drawings:

Drawing Number	Drawing Title
HCC9/M/15	Haunch Details Employing Cold Recycled Bituminous Base Material (CRBBM)
HCC9/M/20	Carriageway Haunch Repair Details
HCC9/M/25	Carriageway Repair Detail

2. Schedule of Patching Types

Patching Type	Description	Repair Type (refer to HCC9/M/25)	Minimum Dimensions
1	HRA 15/10 F surf 40/60 rec, 40mm thick with 14/20mm coated chippings to Appendix 7/1/M.	B1	750mm x 750mm
2	HRA 15/10 F surf 40/60 rec, 40mm thick with 14/20mm coated chippings to Appendix 7/1/M on AC 20 dense bin 40/60, 60mm thick to Appendix 7/1.	B2	1m x 1m
3	HRA 15/10 F surf 40/60 rec, 40mm thick with 14/20mm coated chippings to Appendix 7/1/M on AC 20 dense bin 40/60, 60mm thick to Appendix 7/1 on AC 32 dense base 100/150 100mm thick to Appendix 7/1.	B3	1m x 1m
4	AC 6 dense surf 100/150, 25mm thick to Appendix 7/1/F on AC 20 bin 40/60, 60mm thick to Appendix 7/1.	B1	750mm x 750mm
5	AC 10 close surf 100/150, 30mm thick to Appendix 7/1/E on AC 20 dense bin 40/60, 70mm thick to Appendix 7/1.	B1	750mm x 750mm
6	AC 10 close surf 100/150 (see note 1), 30mm thick to Appendix 7/1/E on AC 20 dense bin 40/60, 70mm thick to Appendix 7/1 on AC 32 dense base 100/150, 100mm thick to Appendix 7/1.	B3	1m x 1m

CONTRACT APPENDICES**APPENDIX 7/71 : PATCHING (Continued)**

Patching Type	Description	Repair Type (refer to HCC9/M/25)	Minimum Dimensions
7 (Footway)	Dense surface course, 0/6mm aggregate, 20mm thick to BS 4987 Part 1 Clause 7.5 (190 Pen) on open graded Macadam binder course, 0/20mm aggregate, 45mm thick to BS 4987 Part 1 Clause 6.1 (190 Pen)	N/A	750mm x 750mm

3. Restrictions on Open Trenches

The Contractor must ensure that openings in carriageways and footways are no wider or longer than they reasonably need be at any time as may be agreed by the Overseeing Organisation. In areas of high pedestrian movement or where otherwise reasonably required by the Overseeing Organisation all obstructions will be fenced or removed outside normal working hours.

4. Supporting of Trenches

The sides of trenches, pits and other excavations shall be adequately supported having regard to the recommendations of British Standard 6031 (1981) "Code of Practice for Earthworks". Battered sided trenches will not be permitted unless there is prior written agreement by the Overseeing Organisation.

5. Maintenance of Temporary Reinstatements

The Contractor shall maintain any temporary reinstatements in a safe condition with an even surface to the satisfaction of the Overseeing Organisation.

6. Typical trench reinstatement details

Carriageways HCC9/C/090

Footways HCC9/C/095

CONTRACT APPENDICES**APPENDIX 11/1 : KERBS, FOOTWAYS AND PAVED AREAS**

1. The dimensions of proposed kerbs shall be as shown on Standard Detail Drawing No:

HCC9/C/010 – Pre-cast Concrete Kerb
HCC9/C/015 – K-Lite Traditional Kerbs

2. **Footways and Paved Areas**

Details of permitted types and materials to be used are shown on the following standard detail drawings:

Drawing No:	Drawing Title
HCC9/C/045	Footways Type 1B
HCC9/C/065	Uncontrolled Crossing in Existing Footway

3. **Take up and Relay Paving (not exceeding 2 square meters)**

Where instructed in the Works Information, the *Contractor* shall take up damaged or loose paving (up to 70mm thick) including bedding (up to 50mm thick). The paving shall be re-laid on new bed to match existing. Replacement of paving damaged prior to the *starting date* shall match existing and be paid for on dayworks.

4. **Concrete Kerbs**

All cuts to be made using wet cutting equipment, cutting equipment with dust extraction or hydraulic splitter, providing an acceptable finished face results.

5. **Concrete Flags**

To be laid and bonded as stated in the Works Information. All cuts to be made using wet cutting equipment, cutting equipment with dust extraction or hydraulic splitter, providing an acceptable finished face result.

CONTRACT APPENDICES**APPENDIX 11/1 : KERBS, FOOTWAYS AND PAVED AREAS (Continued)****6. K - Lite Traditional Kerb (CT3)**

The following requirements for specially textured kerbing should be read in conjunction with the appropriate Standard Detail:

CT3 kerbs shall be laid with dimensions - 100 x 290 x 215mm long

7. Cellular Block Construction (e.g. Grassgrid, or similar)

Typical block thickness - 80mm, 100mm or 125mm

Colour - Grey

Materials - Concrete or Plastic

8. Uncontrolled Pedestrian Crossings

Uncontrolled pedestrian crossings, located as shown in the Works Information shall be constructed as detailed on Standard Detail Drawing No. HCC9/C/060 & 065, as appropriate. In each case the width of the dropped kerb shall be 2m and the blister tactile paving flags shall be buff coloured.

9. Blister Tactile Paving Blocks

Where specified in the Works Information, Blister Tactile Paving Blocks shall be laid as detailed on Standard Detail Drawing No. HCC9/C/060, 065 & 070, as appropriate.

Blocks shall be module 3 200mm x 133mm x 60mm thick concrete tactile paving blocks to BS EN 1338 and BS 7997.

The blocks shall be buff in colour unless otherwise agreed.

10. 'Stick-on' Tactile Tiles

Where specified in the Works Information, Stick-on Tactile Tiles shall be laid as detailed on Standard Detail Drawing No. HCC9/C/060, 065 & 070, as appropriate.

Tiles shall match any existing surrounding tactile paving in pattern, orientation and colour.

Tiles shall be supplied by Visual Design Ltd or similar approved.

The tiles shall be buff in colour unless otherwise agreed.

11. Geotextile Weed/Root Barrier

Where specified in the Works Information a geotextile weed or root barrier shall be installed at footway formation.

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For standard weeds, Terram - 1000 shall be used or similar approved. For voracious and injurious weeds such as Bindweed, Bellbind and Ragwort, Terram – weed guard or similar shall be used. For tree roots, Terram – root guard or similar shall be used.

CONTRACT APPENDICES**APPENDIX 12/1 : TRAFFIC SIGNS – GENERAL****1. Location Of Traffic Signs**

The approximate locations of each traffic sign to be erected or replaced shall be detailed in the Works Information. The exact locations shall be agreed on site with the Overseeing Organisation.

2. Signing Requirements

Proposed signs shall be detailed in a Sign Schedule included in the Works Information.

A Schedule of Existing Signs may also be included with the Works Information detailing whether signs are to be retained, taken down and disposed or taken down and stored for re-use (also see Appendix 2/3)

A detail drawing of the sign face will be provided by the Overseeing Organisation for all directional and information signs.

3. Overall Size Of Sign Plates

The sizes of the signs together with the sign face details (for existing temporary and permanent signs) are included in the Traffic Signs Schedule or as specified in the Works Information.

4. Material Requirements

Each traffic sign or part thereof shall comply with BS 873-6. Sign plates shall be manufactured from high intensity reflective material having a photometric performance complying with the requirements set out in Table 1 of Annex C of TA19, (see ix below) except where prohibited by Regulations or directed by the Overseeing Organisation. The sign faces shall also be rivet less.

Aluminium shall not be used for sign faces less than 1.1 square metres in area excluding double sided end mounted finger post signs unless otherwise directed by the Overseeing Organisation.

5. Foundations For Permanent Traffic Signs

The type and size of foundations required for each direction and other traffic signs shall be as detailed in HCC Standard Detail Drawing No. HCC9/C/140, and for those requiring illumination, Drawing Nos. HCC9/L/050 and /055.

Foundations for illuminated sign posts shall have a 50mm minimum diameter smooth bore duct for cable entry, as detailed in HCC9/L/050.

Where a post foundation is contiguous with the filter material of a filter drain, formwork shall be used as required to prevent the ingress of concrete into the filter material unless otherwise agreed by the Overseeing Organisation.

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CONTRACT APPENDICES**APPENDIX 12/1 : TRAFFIC SIGNS – GENERAL (continued)****6. Posts For Permanent Traffic Signs**

All tubular sign posts for the support of signs shall be manufactured from steel complying with BS 4360-2, grade 43c.

Post wall thickness should be:

- Post 76mm = 3mm thick wall
- Post 89mm = 3mm thick wall
- Post 114mm = 3.2mm thick wall
- Post 140mm = 3.6mm thick wall
- Post 168mm = 3.6mm thick wall

All steel posts shall be protected against corrosion by hot dip galvanising to BS EN ISO 1461 with a minimum thickness of 65µm.

Wide base posts shall be used for illuminated signs. These shall be manufactured from steel complying with BS EN 10210. The shaft and base compartment shall be jointed by a tapered shoulder with welded joints. The base compartment shall have a minimum internal diameter of 150mm. A weatherproof door with minimum opening of 100mm x 400mm shall be fitted with a captive triangular head bolt (Drawing No's: HCC9/L/050 and 055). The lower door edge shall be positioned so that when installed, it is not less than 300mm above ground level.

Where signs are fixed to any lighting column, then the column must be protected by the use of 3mm translucent EPDM 60° Shore A rubber sheeting as per Standard Detail Drawing HCC9/L/165.

The section, size and number of posts shall be shown in the Traffic Signs Schedule.

Each post shall have a base plate having a minimum area of 0.052 m² and a post top waterproofing cap. Both base plate and post cap shall be in accordance with BS 873.

7. Sign Face Material

The type of material used for pre-printed sign faces or in rolls or as individual letters, numbers and symbols shall be in accordance with BS 873-6. All pre-printed sign faces shall be to the colour, design and layout as set out in the latest DMRB drawings. All screen printing inks are to be of a type approved by the manufacturer of the sheet material. All reflective materials supplied shall conform to DMRB Advice Note TA19 Annex C with respect to the minimum coefficients of retro-reflection. Where specified, 3M Scotchlite Diamond Grade VIP, or equivalent material, shall be used.

CONTRACT APPENDICES**APPENDIX 12/1 : TRAFFIC SIGNS – GENERAL (continued)****8. Damage To Signs, Posts And Fittings**

Signs, posts or fittings having damaged faces, backs, paintwork or plastic coating may be rejected by the Overseeing Organisation and shall then be replaced at the Contractor's expense. Slight damage may be rectified by touching in, at the Contractor's expense, but only with the approval, and in accordance with the instructions, of the Overseeing Organisation.

The Contractor shall be responsible for the protection of sign posts, sign fascias and fixings until such a time as this responsibility is discharged by the Overseeing Organisation.

9. Cleaning Of Signs

Upon completion and servicing of the signs, they shall be thoroughly cleaned immediately prior to being handed over.

The cleaning shall be carried out in the manner described in Chapter 12(3) of the Traffic Signs Manual. The type of detergent used shall be to the approval of the Overseeing Organisation.

CONTRACT APPENDICES**APPENDIX 12/1 : TRAFFIC SIGNS – GENERAL (continued)****10. Manufacturer's Trade Marks**

The manufacturer's name or trade mark will not be permitted on the sign face.

The following information shall be clearly and durably marked on the back of the sign, as required by BS EN 12899-1:

- i) The number and date of this European Standard
- ii) The relevant performance classification of the product
- iii) The month and the last two digits of the year of manufacture
- iv) The name, trademark, or other means of identification of the manufacturer, or supplier when not the manufacturer

The markings shall be in characters legible at the normal reading distance, such that the total area of the marking does not exceed 30cm², and shall be sufficiently durable to last the expected life of the sign.

CONTRACT APPENDICES**APPENDIX 12/1 : TRAFFIC SIGNS – GENERAL (Continued)**

SCHEDULE OF EXISTING TRAFFIC SIGNS														A
SCHEME		B2148 New Brighton Road, Emsworth												
Sign Ref	Sign Face Details							Horizontal Clearance (min)	Vertical Clearance (min)	Post Details				Wattag
	Figure No. 2002 TSR&GD	Type	Width	Depth	'x' Height	Reflective	Illum-inated			No. & Length	Size & Section	Post Spacing	Lighting Unit No. & Type	
P1	543	Traffic Signals Warning	600	600	N/A	HI	EI	500	2100	3700	89 Dia WBP	N/A	Simmon sign Lua/92	1 x 11w
P2	543	Traffic Signals Warning	600	600	N/A	HI	EI	500	2100	3700	89 Dia WBP	N/A	Simmon sign Lua/92	1 x 11w
T1	7014	New Traffic Signals Ahead	900	700	75	EG	No	500	2100	N/A	Sign to be strapped to existing lighting column commissioning of signals			
T2	7014	New Traffic Signals Ahead	900	700	75	EG	No	500	2100	N/A	Sign to be strapped to existing lighting column commissioning of signals			
KEY TO ABBREVIATIONS														
	EG = Engineering Grade 'Scotchlite' (Class 2, BS 873-6) HI = High Intensity Prismatic (Class 1, BS 873-6) DG = Diamond Grade VIP (> Class 1, BS 873-6) EI = Externally Illuminated II = Internally Illuminated						TSP = Tubular Steel Post AP = Aluminium Post RSJ = Rolled Steel Joist UB = Universal Beam			PC = Photo Cell TS = Time Switch LFT = Lit Full Time WBP = Wide Based Post			DRAWN	
													DATE	
													CHECKED	
													APPROVED	
													REVISION	

CONTRACT APPENDICES**APPENDIX 12/3 : TRAFFIC SIGNS - ROAD MARKINGS AND STUDS****1. Permanent Road Markings**

The exact locations of road markings shall be in accordance with the Traffic Signs Manual (Chapter 5) and agreed with the Overseeing Organisation prior to installation.

All permanent road markings shall comply fully with the specification and performance requirements of Clause 1212SR.

All yellow road markings shall be to BS 381C No. 310 (Primrose)

2. Preparation Of Road Surfaces

On concrete carriageways or where directed by the Overseeing Organisation a tack coat, compatible with the material, shall be applied. Prior to application of road marking material the pavement should have a minimum 48 hours of dry conditions in order to ensure minimum moisture content. Road marking material should not be laid before the concrete has cured for at least 28 days.

The Contractor shall be responsible for ensuring the road surface is sufficiently clean and dry to achieve the necessary level of adhesion with the road marking. Where the Contractor believes that mechanical sweeping is needed to remove extensive detritus, loose chippings, etc. or that warming/drying of the road surface is necessary, this shall be agreed with the Overseeing Organisation.

3. Existing Markings

Where a marking is laid on top of an existing marking the combined total thickness shall not exceed 6mm as detailed in current Traffic Signs Regulations and General Directions, and that any superseding marking is either permanently removed or totally and efficiently covered by the new marking.

When directed by the Overseeing Organisation, the Contractor shall carefully remove old markings by an approved method to ensure that the prepared surface is suitable to receive a new marking of regular thickness. Damage to the adjacent road surface caused by removal of road markings shall be avoided. Where damage occurs it shall be corrected using a method agreed by the Overseeing Organisation at no additional cost.

Where marking is required by Overseeing Organisation to be laid on top of an existing marking which exhibits significant signs of deterioration or contamination, then the Contractor shall not be responsible for the subsequent integrity of the overlaid material. Such instances shall be reported and agreed by the Overseeing Organisation prior to their installation. The sites will also be recorded for possible future reference. Notwithstanding this, the performance requirements of the road marking material itself shall comply with the relevant table in Clause 1212SR.

4. Performance Monitoring

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The Contractor is required to undertake monitoring of the Dry Retro-reflectivity and Wet Skid Resistance on a proportion of the road markings laid each year. Details of the proportion of road markings to be tested, the frequency of testing and the format/submission of results are included within Clauses 1212SR.

5. **Quality Assurance**

All materials and solid glass beads shall be obtained from manufacturers who operate Third Party QA schemes under ISO 9002, EN29002.

A copy of the Manufacturer's current Road Trial report to BS EN 1824 shall be submitted yearly and at least 10 days prior to any road markings being laid.

The Contractor shall operate a Quality System complying with Scheme No.7 of the Sector Schemes for Quality Management in Highway Construction – "Application of Road Marking Materials".

The Contractor shall hold and maintain a valid certificate of registration in the above scheme, issued by a UKAS accredited Certification Body. A copy of the current certificate shall be submitted yearly and at least 10 days prior to any road markings being laid.

6. **Road Studs**

- i) All retroreflecting road studs shall comply with BS EN 1463 parts 1 & 2 and the Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No. 3113) regulations 31, 32 and directions 57 and 58, the Traffic Signs (Amendment) General Directions 2003 (Statutory Instrument 2002 No. 393) and any subsequent amending Regulations and General Directions.
- ii) Retroreflecting road studs and components which are not within the scope of BS EN 1463-1, but which have statutory type approval by the Secretary of State under direction 58 of the Traffic Signs Regulations and General Directions 2002 (Statutory Instrument 2002 No. 3113), and any subsequent amending General Directions can be incorporated into the works.
- iii) The type, location and colour of all retroreflecting road studs shall be included in the Works Information.
- iv) All road studs shall be fixed using the manufacturer's instructions relating to high speed roads as used on the road trials.
- v) A copy of the official road test certificate for the product the Contractor proposes shall be supplied with the Tender together with details of the actual test results.

CONTRACT APPENDICES**APPENDIX 12/3 : TRAFFIC SIGNS - ROAD MARKINGS AND STUDS (Continued)****7. Temporary Covering Of Road Studs And Road Markings**

- i) Temporary Covering of Road Studs shall be by one of the following means:
 - a) Retroreflecting road studs - depressible type - the rubber inserts shall be removed and set aside for re-fixing immediately the studs once more become a part of the Road Marking system.
 - b) Retroreflecting road studs - non-depressible type - shall be removed to be replaced with new immediately the studs once more become a part of a Road Marking system.
- ii) Where it is impracticable to completely remove redundant white lines during phases of the roadworks then, either a black paint meeting the requirements of BS 6044, or an approved temporary removable Road Marking tape shall be used.

CONTRACT APPENDICES**APPENDIX 12/3 : TRAFFIC SIGNS – GENERAL (Continued)**

SCHEDULE OF PROPOSED TRAFFIC SIGNS						All dimensions in mm
SCHEME	Interbridges, B2148 New Brighton Road, Emsworth					
Road Marking Reference No	TSRGD 2002 Diagram No	Type	Mark	Gap	Width	Location
M1	1004	Warning Line	4000	2000	100	B2148 Southbound
M2	1001	Stop Line	Cont	N/A	200	B2148 Southbound
M1	1004	Warning Line	4000	2000	100	B2148 Northbound
M2	1001	Stop Line	Cont	N/A	200	B2148 Northbound
M1	1004	Warning Line	4000	2000	100	Side Road
M2	1001	Stop Line	Cont	N/A	200	Side Road

				DRAWN	PSF		
				DATE	30/04/09		
				CHECKED	JEMR		
				APPROVED	PSF		
				REVISION			

CONTRACT APPENDICES**APPENDIX 12/4 : TRAFFIC SIGNS - CONES, CYLINDERS FTD'S AND OTHER TRAFFIC DELINEATORS**

Only cones, cylinders and flat traffic delineators shall be used.

The material shall be rubber or flexible plastic material. All reflectorised finishes shall conform to BS 873-8.

Traffic cylinders shall be capable of being fixed to standard 'Catseye' road stud for marking emergency cross-over points on dual carriageways or for lane control of traffic during roadworks.

Testing requirements to be specified, if required.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS – TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT****PERMANENT TRAFFIC SIGNALS****i) GENERAL**

- a) The installation of traffic signal equipment shall be undertaken by a signal installer appointed by Hampshire County Council under the County Council's Term Contract for the Installation of Traffic Signals. The traffic signal equipment shall be procured by the Overseeing Organisation. The Contractor shall be responsible for all civil engineering works associated with traffic signal junctions and signal controlled pedestrian crossings.
- b) The Contractor shall give 8 weeks notice to the Overseeing Organisation, unless specified elsewhere in the Contract, for the delivery of the traffic signal equipment to the Contractor's compound by the traffic signal installer.
- c) The Works contained in this appendix shall refer to the installation of permanent traffic signals, Pelican crossings, Puffin crossings, Pegasus crossings, Toucan crossings and cycle facilities.

(ii) LOCATIONS FOR:

- a) Signal poles and gantries)
- b) Controller)
- c) Traffic signal ducting of carriageway)
cable crossings) Drawing No.
- d) Electricity power supply pillar) RPF/120/006A
- e) Traffic signal draw pits and verge traffic signal)
ducting)
- f) Road markings)
- g) Traffic surveillance cameras (if applicable))
- h) Tactile paving and flush dropped kerbs)

(iii) STANDARDS, SPECIFICATIONS AND REGULATIONS

All works shall be undertaken in accordance with the following:

- i) BS EN 12368
- j) IEE Regulations for Electrical Installations (current edition) BS 7671
- k) Current Department for Transport (DfT) Specifications relating to traffic signals and associated equipment

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

- l) Highways Agency Manual of Contract Documents for Highways Work Volume 1 Specification for Highways Works Series 1400 - 'Electrical Work for Road Lighting and Traffic Signs'
 - m) Current DfT Standards relating to traffic signals and associated equipment
 - n) Current DfT Advice Notes relating to traffic signals and associated equipment
 - o) The Traffic Signs Regulations and General Directions 2002
 - p) The Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997
 - q) DfT Local Transport Note 1/98 The Installation of Traffic Signals and Associated Equipment
 - r) DfT Specification TR 2210(C)
 - s) The Traffic Signs Manual
 - t) Current health and safety legislation
 - u) TA 84/01 Code of Practice for Traffic Control and Information Systems
 - v) Hampshire County Council Standard Specification for traffic signals.
- (iv) EQUIPMENT
- a) General
 - i) The Contractor shall be responsible for collecting the traffic signal poles, bus detection pillars and controller root bases from the third party signal contractor. The Contractor shall make allowance for collecting the traffic signal poles, bus detection pillars and controller root bases on separate visits. All other traffic signal equipment shall be delivered to the Contractor's compound by the third party traffic signal installer.
 - ii) On receipt/delivery of the traffic signal poles, controller root base and any associated equipment the Contractor shall be responsible for the safe storage of this equipment. This signal equipment shall be kept free from damage during storage and construction and any damage or loss of the equipment shall be rectified at the Contractor's expense. In addition the Contractor shall provide a secure locked container within the site compound which shall be used by the third party signal contractor to store the signal equipment e.g. signal heads, cables, etc.
 - iii) All street furniture shall be installed at the positions shown on the drawings and in accordance with the Overseeing Organisation's siting instructions. The Overseeing Organisation's Intelligent Transport Systems (ITS) Group (01962 847997) shall set out the position of all traffic signal street furniture, traffic signal draw pits,

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

- iv) traffic signal ducting and detection on site before the equipment is installed. Where engineering difficulties necessitate alternative positions the Contractor shall inform the Overseeing Organisation prior to installing the furniture and provide amended drawings to show all new positions.
- v) Unless otherwise specified in the Tender, the construction of traffic signal ducts, traffic signal draw pits, controller root bases and the erection of all traffic signal poles will be undertaken by the main civil engineering Contractor for the Works.
- vi) Controller root bases are to be installed so that the front of the base does not face directly away from the carriageway and such that all normal maintenance and checking can be readily carried out without encroachment on the carriageway by equipment or personnel.
- vii) Responsibility for checking the vertical alignment of signal posts rests with the Contractor who shall also ensure that there is adequate stability before the third party traffic signal installer attends the site to fit any signal heads. The Contractor shall notify the Overseeing Organisation immediately if any signal poles fail to satisfy the aforementioned requirements. All traffic signal poles shall be installed with the cut out section directly abutting the adjacent traffic signal draw pit.
- viii) All traffic signal equipment shall be installed in accordance with the Overseeing Organisation's standard detail drawings.

1. The Contractor shall obtain confirmation from the Overseeing Organisation on the availability of the traffic signal equipment and the traffic signal installer for installation of the equipment. This information shall be obtained prior to submission of the programme of works. The time scales specified by the Overseeing Organisation for the delivery of the traffic signal equipment, the installation of the traffic signal equipment and its commissioning by the Overseeing Organisation shall be incorporated into the Contractor's programme of works. The time scale specified for the installation of the traffic signal equipment shall not be altered unless any costs incurred by the third party traffic signal installer resulting from an agreed reduction in the time scales for the installation of traffic signal equipment.

- i. The Contractor shall ensure that all traffic signal poles, traffic signal ducting, traffic signal draw pits and power supply pillar (including mains power supply) are installed prior to the Overseeing Organisation instructing the third party signal installer to commence the installation of the signal equipment. The traffic signal installation work shall only commence when all traffic signal poles, ducting, draw pits and power supply are fully installed.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

- ii. Where the Contract will require the existing traffic signal equipment to be switched off, this shall be undertaken by agreement with the Overseeing Organisation by the third party traffic signal installer. The Contractor shall notify the Overseeing Organisation a minimum period of 5 days in advance of the switch off date. The Contractor shall be responsible for providing and maintaining all traffic management for the duration that the permanent traffic signals are switched off. The Contractor shall notify the Overseeing Organisation a minimum period of 5 days in advance of the switching back on of permanent traffic signals. Any waiting time to the third party traffic signal installer caused by the delayed switching on or off the signals by the Contractor actions shall be recharged to the Contractor.
 - iii. Where the Contract includes working at existing traffic signal equipment the responsibility for maintaining the permanent traffic signals shall remain with the Overseeing Organisation. Where a fault occurs to the traffic signal equipment as a consequence of the Contractor's work, the Overseeing Organisation shall arrange for the third party traffic signal installer to attend the site and to rectify the fault at the Contractor's own expense.
- b) Controller
- i) The Contractor shall provide wooden shuttering around the controller root base.
 - ii) The Contractor shall provide a separate 50mm diameter duct for a telemetry connection which shall terminate above the final base seal level, unless otherwise instructed by the Overseeing Organisation. The duct entry shall be sealed to prevent the ingress of moisture but the seal shall be removable to allow telemetry equipment to be installed subsequently by the Overseeing Organisation.
 - iii) The Contractor shall backfill any void between the shuttering around the root base and the surrounding ground level.
 - iv) A hard standing area shall be provided around the full extent of the controller cabinet to a minimum width of 600mm.
- c) Vehicular Signal Heads
- i) The lowest part of any signal head assembly including brackets shall have a minimum clearance above the finished ground level of 2.1 metres except the northbound signal head sited between the carriageway and boundary fencing behind which shall be 1.8m.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

- ii) There shall be a minimum lateral clearance of 450mm between the outer surface of the traffic signal pole and the kerb face of the carriageway. Where the minimum clearance cannot be achieved the Contractor shall notify the Overseeing Organisation immediately.
 - iii) The Contractor shall be responsible for providing the means of access to enable the third party traffic signal installer to installing vehicular signal heads on overhead mast arms and tall signal poles (exceeding 4 metres length). This shall include the hiring of lifting equipment and traffic management. The provision of this activity shall be identified in the programme of works and agreed with the Overseeing Organisation.
 - iv) Where two signal heads (twin) are positioned adjacent to each other and face in the same direction on the same signal pole the Contractor shall ensure the structural stability of signal pole and provide a base plate where necessary.
- d) Pedestrian Signal Heads and Push Buttons
- i) The lowest part of any pedestrian signal head assembly including brackets shall have a minimum clearance of 2.1 metres above the finished ground level.
 - ii) Where poles have pedestrian push buttons, the poles shall be located at 500mm from edge of tactile paving to the centre of the pole and 500mm from the kerb face to the centre of the pole.
- e) Signal Heads for Cyclists
- i) The lowest part of any cycle signal head assembly including brackets shall have a minimum clearance of 2.3 metres above the finished ground level.
- f) Additional Signs
- i) The lowest part of the signal head assembly including any additional signs and brackets shall have a minimum clearance of 2.1 metres above the finished ground level.
 - ii) There shall be a minimum lateral clearance of 450mm between the outer edge of all additional signs including backing board and the kerb face of the carriageway.
 - iii) The Contractor shall supply and install 'New Traffic Signals Ahead' signs or 'Traffic Signal Priority Changed' signs on the approaches to each traffic signal junction. These type, location and size of these signs shall be specified elsewhere. The Contractor shall be responsible for removing these signs and any associated posts no sooner than 3 months and no later than 4 months after each traffic signal junction has been switched on.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

- g) Slot cutting
 - i) All slot cutting work shall be undertaken by the traffic signal installer. The Contractor shall work with the slot cutting operatives to provide Chapter 8 traffic management. The Contractor shall be responsible for erecting, maintaining and dismantling all Chapter 8 Traffic signing including traffic control required to complete the slot cutting. The method of traffic control is to be stated by the Overseeing Organisation and may include the use of temporary traffic signals at the Contractor's own expense.
 - ii) Where necessary, the Contractor shall be responsible for arranging any temporary road closures and associated measures to enable slot cutting on single carriageway sections e.g. Redlands Lane.
 - iii) Where loop detection is required in areas of skid resistant surfacing, the Contractor shall ensure that slot cutting of the detector loops by the third party traffic signal contractor shall be completed prior to the application of skid resistant surfacing.
 - iv) The Contractor shall ensure that road markings are in place before the slot cutting is undertaken.
 - v) The Contractor shall be responsible for installing draw strings in all traffic signal duct runs.
 - vi) Pulling of signal cables will be the responsibility of the third party traffic signal installer.
- h) Mains Connection
 - i) The Contractor shall be responsible for placing an order with Southern Electric Contracting (SEC), who shall supply and install a power supply pillar with a 230V 50Hz (with a suitable power supply). The power supply shall be provided to the ongoing side of the Electricity Board fusible cut-out. Fuse rating shall be 60 amp cut-out 25 amp fuse for Traffic Signals and 60 amp cut-out 16 amp fuse for Pelican, Puffin and Toucan Crossings in accordance with BS 88-2.
 - ii) The Contractor shall install a 50mm diameter black duct between the power supply pillar and the controller root base.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)****2 TEMPORARY TRAFFIC SIGNALS****a) General**

- i) The Contractor is required under the Contract to submit, for the Overseeing Organisation's approval, details of the traffic management measures he proposes to adopt as part of the construction phasing. This submission shall include full details of any modifications to existing traffic signal installations and of any temporary traffic signal installations.
- ii) Temporary traffic signal equipment, inspection, testing, installation and servicing shall in all respects comply with the "Code of Practice for Portable Light Signals for the Control of Vehicular Traffic" published by the Association of Road Traffic Sign Makers.
- iii) The Contractor shall give the Overseeing Organisation six weeks notice prior to the use of temporary traffic signals.

b) Traffic Signal Layout

- i) The Contractor shall provide drawings at 1:500 scale for each stage of the Works showing the following:-
 - a. The proposed phasing/staging arrangement together with details of timings.
 - b. The type and location of all signal heads and the method of support.
 - c. The type and location of the controller.
 - d. The proposed method of vehicle detection. All temporary signal installations shall be capable of vehicle-actuated operation. Except where otherwise agreed with the Overseeing Organisation, temporary traffic signal installations shall include inductive loop vehicle detection. The Contractor shall indicate, on his Drawings, the proposed location of loops.
 - e. The proposed cabling and ducting arrangement. Where cables are required to cross a trafficked carriageway, these shall be routed, wherever possible, via existing cable ducts or by new ducts provided under new (permanent or temporary) road construction. Only where absolutely necessary will the Overseeing Organisation permit a cable to be laid across the surface of a trafficked carriageway. The Contractor shall propose, for the Overseeing Organisation's approval, a suitable method of protecting the cable from damage by traffic.
 - f. Details of the proposed power supply. Where practicable power should be from a mains supply. Where agreed by the Overseeing Organisation a power supply may be a portable generator.
 - g. Full details of road markings and traffic signs associated with the traffic signal installation.

CONTRACT APPENDICES**APPENDIX 12/5 : TRAFFIC SIGNS : TRAFFIC SIGNALS AND ASSOCIATED EQUIPMENT (Continued)**

c) Testing

- i) Temporary traffic signals shall not be brought into operation until the installation has been thoroughly tested on Site and the Overseeing Organisation's written approval is obtained.

d) Maintenance/Servicing

- i) Maintenance, servicing and fault repair shall be the responsibility of the Contractor who shall submit his proposed methods for the approval of the Overseeing Organisation.

e) Training of Operatives

All personnel involved in controlling traffic using temporary traffic signals shall be trained in the use of the equipment. The Contractor's attention is drawn to the requirements of the Code of Practice (see Clause 2.1 of this Appendix) and in addition, to the Department of Transport's publication "An Introduction to the Use of Vehicle Actuated Portable Traffic

CONTRACT APPENDICES**APPENDIX 13/1 : INFORMATION TO BE PROVIDED WHEN SPECIFYING LIGHTING COLUMNS AND BRACKETS****1 GENERAL INFORMATION**

The information shown on scheme layout Drawing No.'s RPF/120/005 are intended to complement information provided elsewhere in the documents, to enable the submission of a tender and completion of Data Sheets 1 and 2 given in Appendix 13/2.

- 1.2 Lighting columns shall be designed in accordance with the requirements of Departmental Standard BD 94 and with HCC Standard Detail Drawing No HCC9/L/015, Type 2A. Design provision for lighting columns to carry attachments shall be as specified in clauses 7.2, 7.3, and 7.5 of BD 94.
- 1.3 Columns shall be manufactured from 50c type steel with a silicon content of greater than 3%. Column bases for 8m columns shall use 6.3mm material.
- a) Each column and post shall be earthed with an 8mm diameter brass earthing terminal with 2 no. brass plain washers and nuts. The earthing stud shall be in a readily accessible position.
 - b) The Contractor shall submit the completed data sheets before substantial completion of the works.
 - c) This date should generally be not earlier than 2 weeks after the date of award of Contract; however, there may be special reasons to advance this date, such as when there is a requirement for lighting columns of high aesthetic standard. This date may sometimes be better determined after the award of Contract based on the Contractor's programme and his reasonable lead-times for approval and procurement. 1303.1)
 - d) The Contractor shall submit to the Overseeing Organisation a copy of the Design and Check Certificates as required by Departmental Standards BD 2: Part IV, for the design of each lighting column and luminaire, foundations for columns and their associated anchorage's and attachment systems.
 - e) Typical column and foundation arrangements are shown on HCC Standard Detail Drawing No.'s HCC9/L/025 and 026.
 - f) Specific foundation details are shown on drawing numbers (to be confirmed)
 - g) All columns shall incorporate stainless steel M8 anti-vandal door bolts as manufactured by Pudsey Diamond Engineering Ltd quoting "As part no 6161 (30mm), 6162 (40mm), 6163 (50mm) (or similar approved) with hexagonal head complete with integral centre pin, capable for being operated only with special hexagonal key with centre hole to accept pin location.
 - h) Columns shall be provided with a 'Strimmex' protective sleeve to the ground level section.
 - i) The Corrosion Protection for the columns shall be either:
 - i) Abcite over galvanise or
 - ii) G2a equivalent with factory applied final finish using either Ameron PSX 700 or Dacrylite.
 - j) As this site is within 5Km of the coast it is defined as a very exposed site in BD94, therefore the Technical Approval procedures for high masts given in BD2 (DMRB 1.1) shall apply.

2 ERECTION

CONTRACT APPENDICES

The Contractor shall be aware of overhead power lines and comply with working clearances in G39/1 (regional electricity company Scottish and Southern Energy recognised standard) during the erection of lighting columns. Warning notices regarding proximity to overhead power lines shall be provided where required

The safety requirements in relation to underground and overhead obstructions and column lifting, as outlined in ILE Code of Practice for Electrical Safety in Highway Electrical Operations, Clause 11, must be observed.

Columns shall be erected strictly in accordance with the ILE document “Safety During The Installation And Removal Of Lighting Columns And Similar Street Furniture In Proximity To High Voltage Overhead Lines”, published in 2004 as a supplement to the “Code Of Practice For Electrical Safety In Highway Operations” fifth edition.

Control gear, luminaires and attachments shall not be fitted until the column is in position and has been left for 48 hours or until the concrete has reached its design strength.

The completed column shall be truly vertical and the luminaire shall be checked so that it is at 90 degrees to the carriageway.

All locks, hinges and catches shall be re-greased prior to handover.

When directed, hinged columns shall be of the base-hinged type with a planted root. The contractor shall provide a suitable foundation and install the column as directed by the column manufacturer. Hinged columns shall be installed such that they can be safely and easily lowered without obstruction by safety fences and the like. They shall not lower towards or over a traffic lane. The Contractor shall provide details of the columns, foundations, fixings and lowered positions of all hinged columns for approval by the Overseeing Organisation.

Hinged columns adjacent to overhead lines shall carry two warning notices they shall face across the carriageway, with one fixed immediately below the column location reference and the other one metre from the top of the column. Each notice shall consist of an aluminium plate attached to the column with a stainless steel bracket.

Fixed columns adjacent to overhead lines shall carry two warning notices, they shall face across the carriageway, with one fixed immediately below the column location reference and the other one metre from the top of the column. Each notice shall consist of an aluminium plate attached to the column with a stainless steel bracket in accordance with HCC Standard Detail Drawing HCC9/L/165 .

3

NUMBERING OF COLUMNS AND ILLUMINATED SIGNS

Each column shall be numbered as directed by the Overseeing Organisation with black numerals 50mm high on a white background. Backgrounds shall be 50mm wide with a minimum 12mm border surrounding the numerals. Two or three figure numbers shall run down the column. Labels shall be black vinyl polypropylene tape with high performance exterior grade adhesive in accordance with HCC standard detail HCC9/L/160. Numbers shall be a minimum of 2.5m from ground level and face the road perpendicular to the flow of traffic

CONTRACT APPENDICES**APPENDIX 14/1 : SITE RECORDS**

1. As built drawings shall be produced by the Overseeing Organisation. The Contractor shall provide all necessary information to enable the drawings to accurately reflect the installation.
2. Hampshire County Council's Street Lighting and Illuminated Sign Completion Certificates shall be completed for each item of illuminated equipment. The Contractor will be supplied with a certificate for each item. The Certificates will have Sections 1 and 2 completed by the Overseeing Organisation. The Contractor shall complete Sections 3 and 4 on each certificate and follow the instructions for distribution.
3. Scottish and Southern Energy PLC require a completed certificate for all items before servicing can commence.

The address of Scottish and Southern Energy PLC office to send the certificates is given in Appendix 1/16.

4. Further to Cl.1426AR the documentation required for the Highway Authority to assume responsibility for the maintenance of street lighting and illuminated signs comprises:
 - a) Lighting Column and Bracket Data Sheets (completed by the Highway Authority's Street Lighting Contractor)
 - b) Lighting Column compliance certification (Cl.1302)
 - c) HCC Completion Certificates (see 2 above)
 - d) Test and Inspection Certificates (Cl.1424)

Failure to provide this documentation may delay the issue of the Certificate of Completion. Where documentation is incomplete at the time of issuing the Certificate of Completion, the Overseeing Organisation will make arrangements for missing documentation to be assembled by others. The full cost of making these arrangements will be deducted from payments due under the contract. This cost is estimated to be £100 per unit.

CONTRACT APPENDICES**APPENDIX 14/2 : LOCATION OF LIGHTING UNITS AND FEEDER PILLARS**

The locations of lighting units will be shown in the Works Information and exact setting out is to be agreed with the Overseeing Organisation.

Lighting columns in a verge shall be set back 1.5m from the edge of carriageway, or installed at the rear of a footway where this is immediately adjacent to the highway and not more than 2m wide, unless specifically shown otherwise on the contract drawings. Where neither of these locations is appropriate, the Overseeing Organisation's site representative shall be requested to give further instructions.

Electricity services to all lighting units/feeder pillars can be provided by any Independent Connections Provider but must be adoptable for maintenance by Scottish & Southern Energy Plc.

CONTRACT APPENDICES**APPENDIX 14/3 : TEMPORARY LIGHTING**

1. Temporary lighting shall be provided where new sections of highway are opened to traffic before their permanent lighting systems are in operation.
2. When required, the standard for temporary lighting will be specified within the Work Package as appropriate, in accordance with BS 5489-1:2003 : Part 1 (Code of Practice for the Design of Road Lighting), and the Contractor must demonstrate by calculation and/or measurement that its installation complies with these recommendations.

Road lighting lanterns shall be G3 classification as defined in EN13201-2:2003 Annex A: and the Contractor shall ensure that any temporary lighting it provides does not cause glare to traffic using any highway nor annoyance to occupants of surrounding property.

Existing illuminated regulatory signs, where not part of a traffic signal installation, must be maintained either in their existing locations or temporary locations and the same standard of illumination maintained by either existing or temporary lighting. This lighting is to be maintained until the relevant regulation ceases to be appropriate and may not be removed without the prior approval of the Overseeing Organisation in writing.

3. The Contractor may if it wishes, propose the advance installation of fixed road lighting units in their final positions in order to fulfil the requirements of 1 and 2 above, but will be fully responsible for any damage which may occur to such equipment before final handover.

The Contractor shall ensure that all existing road lighting remains in operation for as long as that road is open to traffic. Where electrical supplies to existing units are disconnected during the execution of the Works the Contractor shall provide and install temporary supply cables as directed by the Overseeing Organisation.

CONTRACT APPENDICES**APPENDIX 17/1 : SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE**

Requirement	Schedule		
Compressive Strength Class of Concrete	C25/30	C32/40	C40/50
Minimum Cement Content (kg/m ³)	260	320	340
Maximum Free Water/Cement Ratio	0.65	0.55	0.45
Required Group or Type and Class of Cement or Combination	C111A	C111A	C111A
Maximum Aggregate Size, mm	20	20	20
Chloride Content Class	Cl. 0,30	Cl. 0,30	Cl. 0,30
Consistence Class	See Note 1	See Note 1	See Note 1
Maximum Cement Content (kg/m ³)	550 (See Note 2)	550 (See Note 2)	550 (See Note 2)
Required Admixture	See Note 4	See Note 4	See Note 4
Air Entrainment Required	No	No	No
Minimum or Maximum Temperature of Fresh Concrete °C	5 Min 30 Max	5 Min 30 Max	5 Min 30 Max
Sampling and Testing	See Note 3	See Note 3	See Note 3
Other Requirements	None	None	None

NOTES

1. Contractor to specify the selection of consistence and to inform the Overseeing Organization of the requirements.
2. Where the Contractor wishes to use a total cement content in excess of 400kg/m³, proposals and calculations shall be submitted to the Overseeing Organization showing early thermal cracking is within limits set out in the Standard BD 28/87 INCLUDING Amendment No. 1.
3. Refer to Appendices 0/2, 1/5 and 1/6 for testing requirements.
4. The use of rapid hardening High Alumina cement will not be permitted. The use of admixtures will be considered in accordance with clause 1702.3.

CONTRACT APPENDICES**APPENDIX 26/1 : ANCILLARY CONCRETE**

Concrete for ancillary purposes shall be to Clause 2602SR, except where otherwise described on Hampshire County Council Standard Detail Drawings.

CONTRACT APPENDICES**APPENDIX 30/5 : GRASS SEEDING, WILDFLOWER SEEDING AND TURFING****1. Seed Mixtures****i) Road verges mix, GRADE A18 consisting:-**

- 30% Adinda (strong creeping Red Fescue)
- 25% Talgo (Perennial Ryegrass)
- 20% Mentor (Hard Fescue)
- 12.5% Balin (Smooth Stalked Meadow Grass)
- 10% Highland (Browntop Bent)
- 2.5% Aberace (Small Leaved White Clover)

Manufactured by British Seed House Limited or similar approved.

ii) New Forest Mix consisting:-

- 30% Festuca rubra subsp. rubra, (Red Fescue)
- 20% Agrostis tenuis (Brown Top Bent)
- 25% Poa pratensis (Smooth Meadow Grass)
- 25% Cynosurus cristatus (Crested Dogs Tail)