COMPETITION FOR THE DESIGN, CONSTRUCTION, COMPLETION AND MAINTENANCE OF THE A9: BERRIEDALE BRAES IMPROVEMENT SCHEME

VOLUME 4 OF 5

SPECIFICATION

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COMPETITION FOR

THE DESIGN, CONSTRUCTION, COMPLETION AND MAINTENANCE OF THE

A9: BERRIEDALE BRAES IMPROVEMENT SCHEME

CONTRACT NUMBER TS/MTRIPS/WKS/2017/06

INVITATION TO SUBMIT FINAL TENDER

VOLUME 4 OF 5

SPECIFICATION

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TRANSPORT SCOTLAND

COMPETITION FOR

THE DESIGN, CONSTRUCTION, COMPLETION AND MAINTENANCE OF THE A9: BERRIEDALE BRAES IMPROVEMENT SCHEME

TS/MTRIPS/WKS/2017/06

INVITATION TO SUBMIT FINAL TENDER

VOLUME 4 OF 5

SPECIFICATION

DOCUMENT ISSUE RECORD

I hereby confirm that this is the current version of the Specification and supersedes all previous issues of such document by the Employer.

Signed .....

Name (Block capitals) .....

Date .....

Participant .....

Copy of signed page shall be sent to, Transport Scotland, [REDACTED].

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COMPETITION FOR
THE DESIGN, CONSTRUCTION, COMPLETION AND MAINTENANCE OF THE
A9 : BERRIEDALE BRAES IMPROVEMENT SCHEME

VOLUME 4 OF 5

SPECIFICATION

CONTENTS **Page**

CONTENTS **Page**

SPECIFICATION

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:

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

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

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

   (iv) Appendix 0/5: Special National Alterations of the Overseeing Organisation of Scotland, Wales or Northern Ireland.

   Appendix 0/4 contains a list of the Drawings.

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

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

   An Additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is a Contract-specific alteration.

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

   A Substitute Clause as indicated by a suffix 'SR' in Appendix 0/1 is a Contract-specific alteration.

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

   A Cancelled Clause indicated by a suffix 'CR' in Appendix 0/1 is a Contract-specific alteration.

6. Insofar as any of the Numbered Appendices may conflict or be inconsistent with any provision of the Specification for Highway Works the Numbered Appendices shall always prevail.

   Additionally, Numbered Appendices 0/1 and 0/2 shall take precedence over Numbered Appendix 0/5.

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

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

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

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.

SPECIFICATION

PREAMBLE TO THE SPECIFICATION (Continued)

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

11. Where a Clause in the Specification is prefixed by an # this indicates that this particular Clause has a substitute National Alteration for one or more of the Overseeing Organisations of Scotland, Wales or Northern Ireland.

    Substitute or additional National Clauses shall be used within countries to which they specifically apply and they are deemed to replace corresponding Clauses in the main text of the Specification as appropriate.

    The substitute National Clauses are located at the end of the relevant Series together with the additional National Clauses of the Overseeing Organisations.

12. Other than where references to the Overseeing Organisation are made in the context of the Overseeing Organisation granting statutory or type approvals, the roles and functions of the Overseeing Organisation shall be undertaken by the Engineer.

    Where the Specification requires the provision of documentation to the Overseeing Organisation for statutory or type approval such documentation shall be provided to the Major Transport Infrastructure Projects (MTRIPS) group of Transport Scotland.

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

    (i) If any agreement, consent or approval required to be obtained from the Overseeing Organisation impacts on the health and safety of the general public, the environment or any property or equipment not owned or operated by the Contractor, such agreement, consent, approval shall be obtained from the Major Transport Infrastructure Projects (MTRIPS) group of Transport Scotland.

    (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 12 above shall exercise such decisions in accordance with the requirements stated in the Contract.

14. Where a Clause or Sub-Clause in the Specification is annotated by "05/01" or similar, this indicates the relevant publication date that alteration(s) to the Clause or Sub-clause were made.

    The first double digit refers to the month and the second double digit refers to the year.

SCHEDULE OF PAGES AND RELEVANT PUBLICATION DATES OF SPECIFICATION FOR HIGHWAY WORKS

Series/Appendix	Page Number	Publication Date
000	1 to 3,	May 2014
000	6 to 7F	February 2016
000	4 to 5	May 2017
100	1 to 2, 4 to 9, 12 to 29F, WF1, N2 to N11F	May 2014
100	3, 10 to 11, N1	December 2014
200	1 to 3F	February 2016
300	1	May 2001
300	4	November 2002
300	2 to 3, 5 to 6F	May 2008
400	1 to 24F	May 2017
500	23 to 24, 26	November 2004
500	28F	May 2005
500	3, 22, N1F	May 2006
500	2, 5, 27	November 2006
500	6, 25	November 2007
500	1, 4, 7 to 21	November 2009
600	1 to 68, 70 to 77F, S1 to S4F, W1 to W4F, N1 to N5F	February 2016
600	69	February 2017
700	1 to 36F, N1 to N6F	February 2016
800	1 to 31F	February 2016
900	2 to 5, 9 to 22, 24 to 26, 28 to 67F	August 2008
900	1, 6 to 8, S1F	November 2008
900	23, 27	May 2009
1000	1 to 45F	February 2016

SCHEDULE OF PAGES AND RELEVANT PUBLICATION DATES OF SPECIFICATION FOR HIGHWAY WORKS (Continued)

Series/Appendix	Page Number	Publication Date
1100	N1F	November 2006
1100	3	August 2008
1100	1 to 2, 4 to 6F	February 2017
1200	5	May 2001
1200	2 to 3, W1F	August 2003
1200	1, 14 to 16F	May 2004
1200	4, 9 to 11, 13	May 2005
1200	12	November 2006
1200	6 to 7, N1 to N4F	November 2007
1200	8	May 2008
1300	N2F	November 2003
1300	3 to 4	November 2004
1300	1, 5 to 10, 12F	November 2005
1300	2, 11 and N1	May 2006
1400	2, N1F	May 2001
1400	1, 3 to 9F	May 2006
1500	1 to 31F	February 2017
1600	1, 4 to 5, 9, 15, 17 to 18, 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	1 to 27F	December 2014
1800	1 to 35F	August 2014
1900	1 to 35F, S1 to S2F	August 2014
2000	1, 3 to 4F	May 2001
2000	2	November 2004
2100	1 to 2F	February 2016

SCHEDULE OF PAGES AND RELEVANT PUBLICATION DATES OF SPECIFICATION FOR HIGHWAY WORKS (Continued)

Series/Appendix	Page Number	Publication Date
2300	1	March 1998
2300	2 to 3F	May 2001
2400	1, 4, 7F	May 2005
2400	2	May 2006
2400	3, 5 & 6	May 2008
2500	1	May 2001
2500	2, 8, 11F	November 2003
2500	10	November 2004
2500	6 to 7, 9	May 2005
2500	5	May 2006
2500	3 to 4	November 2006
2600	1	March 1998
2600	2 to 4	November 2003
2600	5	November 2004
2600	6	May 2005
2600	7F	November 2006
3000	4 to 7, 10, 12 to 17, 19, 22 to 27F	May 2001
3000	20	November 2004
3000	2 to 3	May 2006
3000	8 to 9, 11, 18, 21	May 2008
5000	1, 4 to 19F, S1F	May 2005
5000	2 to 3	November 2008
Appendix A	1 to 4F	May 2014
Appendix B	1 to 3F	May 2014
Appendix C	1 to 2F	May 2014
#Appendix D	1F	May 2014
Appendix D (N1)	N1F	May 2014
Appendix E	1F	May 2014
Appendix F	1 to 52F	May 2017
Appendix G	Not Used	
Appendix H	1	May 2004
Appendix H	2	November 2005
Appendix H	3	November 2006
Appendix H	4 to 9F	November 2008

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

PART A: VOLUME 1 SPECIFICATION

LIST OF ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES

Clause No etc	Title
128AR	Training and Employment Opportunities
270 AR	Tree Felling
271 AR	Existing Vegetation to be Protected
370 AR	Rabbit, Hare Deer and Otter Fence Specifications
890 AR	Performance related Specification for Foundations
891 AR	Demonstration Area for Performance Foundations
892 AR	Permanent Works for Performance Specified Foundations
893 AR	CBR Strength Measurements
894 AR	Density Measurement
895 AR	Surface Modulus Measurement
896 AR	Wheelpath Deformation Measurement
952 AR	Pavement Cores
971 AR	Measurement of Texture Depth Using The TRL Mini Meter
1270 AR	Chart Node and Section Markers
1271 AR	Night Visibility
1471 AR	Special Tools
1472 AR	Fixings for Attachment to Structures
1728 AR	Construction Tolerances in Structural Concrete
1778 AR	Early Thermal Cracking
3000 AR	Landscape Operations
3001 AR	General Conditions
3003 AR	Delivery of Plants

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES

Clause No etc	Title and written text
128 AR	**Training and Employment Opportunities** The Contractor shall adopt Training and Employment Opportunities in accordance with Appendix 0/7 of the Specification and Clause 86 of the Conditions of Contract.
270 AR	**1 Tree Felling** 1.1 Works shall be carried out in accordance with: a) BS 5837: 2012 - Trees in Relation to Design, Demolition and Construction. Recommendations; b) BS 3998: 2010 - Recommendations for Tree Work; and c) BS 4428: 1989 - Code of Practice for General Landscape Operations (excluding hard surfaces). 1.2 Marking of Trees to be Removed 1.2.1 The Contractor shall set out the Works prior to the commencement of any tree felling operations and shall indicate with paint those trees the removal of which he considers necessary for the construction of the Permanent Works. No trees, bushes or hedges shall be felled or uprooted without approval from the Engineer. The Contractor shall submit his proposals for felling to the Engineer for approval not less than 10 working days in advance of felling works. 1.3 Precautions 1.3.1 Before commencing felling operations warning notices and arrangements shall be made by the Contractor to prevent public gaining access to the danger zone. 1.3.2 When felling of mature trees takes place among trees and vegetation that shall be preserved, near property boundaries, public roads, buildings or other Structures, trees shall be carefully cut down in sections so as to avoid damage to adjacent features and vegetation. To avoid compaction of ground appropriate geotextiles shall be laid down where vehicles / plant have access to the Works Site. 1.3.3 Where felling takes place close to side roads the Contractor shall notify the relevant roads authority and the police. The Contractor shall comply with the Code of Practice for Safety at Street and Road Works in respect of warning signs, direction notices and traffic control. 1.3.4 The Contractor shall comply with the Special Requirements of Undertakers and other relevant companies, as provided in the Conditions of Contract. 1.3.5 Where work is to be carried out within the vicinity of overhead telephone lines or electricity lines advice shall be sought from the relevant Undertakers. 1.3.6 Position and depth of all pipes, cables and underground Structures shall be verified. The method of work shall take into account such items.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
270 AR (continued)	1.3.7 Voids left after the removal of stumps and roots shall be filled with suitable material and compacted in compliance with Clause 612 of the Specification. 1.3.8 Damage to trees, tree saplings, shrubs or hedges during felling shall be made good as described in BS 3998: 2010 Tree Work, Section 8. 1.3.9 Prior to commencement of felling and tree work operations preconstruction ecological surveys shall be undertaken to determine presence of protected species including, but not limited, to bats, red squirrels and breeding birds. 1.3.10 Tree work shall be avoided during the bird nesting season of March to August inclusive. During the bird nesting season tree work shall be carried out only after an inspection by the Ecological Clerk of Works (ECoW) establishes that there are no nesting birds present, and only after receiving consent in writing from the Engineer. 1.3.11 Trees shall be checked for bats and appropriate mitigation shall be provided in accordance with sub-Clause 3012.13 of the Specification. Any bat roosts identified by the Contractor shall immediately be reported to the Engineer and ECoW. 1.3.12 No trees containing confirmed bat roosts shall be felled without the necessary licences having been obtained from SNH. Any licences required from SNH shall be arranged by the Contractor once the species of bat and population size has been confirmed by a licensed bat ecologist. 1.3.13 The Contractor shall notify the Engineer and ECoW not less than 7 days in advance of felling any trees containing confirmed bat roosts or having the potential for bat roosting. 1.3.14 The Contractor shall undertake a pre-felling inspection of all trees identified as containing confirmed bat roosts or having the potential for bat roosting under the supervision of a licensed bat ecologist. Each tree with bat roosts or potential for bat roosting shall be inspected by safest practicable means and searched for signs of bats, using a torch and endoscope where necessary, as directed by the licensed bat worker. Where no signs of bats and no potential access points are identified the tree may be felled subject to the approval of the licensed bat ecologist. 1.3.15 Where felling of trees containing bat roosts is undertaken under licence and where potential access points for bats are identified, the trees shall be section felled with the feature of interest lowered gently to the ground on a rope in the presence of the licensed bat ecologist, searched and left on the ground for a period of 24 to 48 hours with the access point exposed to allow any roosting bats to disperse. 1.3.16 Should any bats be found to be present in trees during felling the Contractor shall cease felling works in the area and immediately contact SNH, the licensed bat ecologist and the Engineer and seek their instructions. No further works shall be undertaken on trees containing roosting bats without permission from SNH.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text	
270 AR (continued)	1.4	Weather Conditions for Tree Work
	1.4.1	Work shall cease when trees are very wet, covered in ice or snow, or during storms or high winds except in emergencies, where any work shall be the minimum to make the situation safe.
	1.5	Grubbing up Stumps and Filling Voids
	1.5.1	All stumps and tree roots shall be grubbed up, except stumps in woodland within areas of existing vegetation to be retained, provided this does not damage trees which are being retained. If a stump cannot be removed it shall be cut at least 300 millimetres below ground level, the hole shall be filled with soil, compacted, levelled and seeded.
	1.6	Chipping of Wood and Bark
	1.6.1	Small timber, twigs, bark and roots not infected by honey fungus may be chipped and left on the Site to compost at locations to be agreed with the Engineer and shall be turned over at specified intervals.
	1.7	Preliminary Tree Work - BS 3998: 2010
	1.7.1	The Contractor shall give notice of proposed tree work in conservation areas, and shall seek permission from the relevant authority where trees are protected by a Tree Preservation Order.
	1.7.2	Pruning works include the removal of dead, diseased or damaged branches, removal of heavy branches, crown lifting, crown thinning, pruning damaged tree saplings, bushes and roots and pruning and shaping of overgrown / neglected hedges.
	1.7.3	When a branch is to be removed the cut surface should be made at a fork or at the main stem and the final cut should be just outside the branch bark collar, where present. When there is not a collar the angle of the cut shall be the mirror image of the branch bark ridge (BS 3998: 2010: Page 13; 22; 23; Figure 1 and Figure 2). The outline of pruned trees shall be fair and symmetrical.
	1.7.4	Sealing of the cut surface with an approved wound protectant shall be carried out when there is a high risk of fungal or bacterial infection (BS 3998: 2010: Pages 34 and 35). Otherwise heartwood exposed by pruning shall be left untreated so that the surface dries out. A bitumastic or latex based paint shall be applied to the outer edge of the cut to prevent drying and dieback of the cambium. Treatment of the whole wound is for cosmetic reasons only; a thin layer of bitumastic or latex based paint or household emulsion can be applied.
	1.7.5	Heavy limbs shall be taken down in sections and shall be lowered with ropes to avoid damage to the tree and its surroundings. The method of pruning and sealing of cut surfaces shall be as prescribed.
	1.7.6	In crown lifting lower branches shall be removed to a given height above ground level in a manner described.
	1.7.7	Crown thinning involves the removal of a proportion of secondary branch growth throughout the crown to produce an open crown. Thinning shall not be too severe as it may induce fresh growth of epicormic shoots.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
270 AR (continued)	1.7.8 Damaged tree saplings shall be cut back to sound wood just above a bud. Damaged bushes shall be cut to sound wood or the whole plant shall be cut to base to allow fresh growth to take over. 1.8 Timber - Stacking 1.8.1 Timber shall not be stacked against existing trees and shrubs to be retained. Timber stacks shall not exceed one metre high under any circumstances. Timber stacks shall be constructed in such a way as to prevent the movement or slippage of timber. 1.9 Existing Woodland 1.9.1 The timber from native species to be felled within or adjacent to, existing woodland shall be left within the woodland for habitat enhancement. Stumps within woodland are not to be ground down or removed.
271 AR	**1. Existing Vegetation to be Protected** 1.1 Protection of existing vegetation which is to be retained shall be in accordance with BS 5837: 2012 and as follows: a) The Contractor shall ensure that all work is safeguarded against damage due to the carrying out of other Site operations. Should any damage or loss be caused to any existing or completed works then the Contractor shall reinstate and make good such damage or loss all with the acknowledgement in writing of the Engineer. b) No existing mature trees, protected or designated landscape areas or other artefact shall be removed or cleaned without the prior written agreement of the Engineer. The proposed extent of Site clearance works shall be submitted to the Engineer prior to the Works starting on the Works Site. c) Trees, bushes, undergrowth and other vegetation to be preserved shall be fenced off with protective barrier fencing as detailed in BS 5837: 2012 (Figures 2 and 3) or type CW 120 cleft chestnut pale fencing complying with BS 1722, Part 4 1986, placed in accordance with BS 5837: 2012, and shall be maintained in effective condition until the Works have been fully completed. Fences shall be erected before the Works commence. No existing trees, shrubs, or other plants shall be removed or cut without specific written instructions from the Designer. Protective fencing in accordance with BS 5837: 2012 shall be erected prior to commencement of the Works to protect the areas shown in drawings. No soil, spoil, fuel oil, chemicals, construction materials or rubbish shall be stored or tipped within the spread of existing trees, shrubs or hedges. d) Should any tree or shrub be mistakenly uprooted, destroyed, or in the opinion of the Engineer, be damaged beyond reasonable chance of survival in its original shape due to the Contractor's negligence, then the Contractor shall provide and plant suitable replacement trees or shrubs of a similar type and age. If such

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
271 AR (continued)	replacement trees or shrubs are not obtainable, alternative trees or shrubs, acknowledged in writing by the Engineer, shall be provided and planted. The Contractor's liability shall continue until the replacement trees and shrubs have survived the winter following the planting and have completed satisfactorily the following summer's growth. **2. Management of Existing Vegetation to be Retained** 2.1 The Contractor shall manage existing vegetation to be retained in accordance with paragraphs 4.4.9.14 to 4.4.9.18 of Part 1.
370 AR	**1. Rabbit, Hare, Deer and Otter Fence Specifications** 1.1 Rabbits and Hares 1.1.1 Fences to protect planting areas from rabbits and hares shall be in accordance with the following specification: (a) Post and mesh fence with a galvanised hexagonal wire mesh 1200 millimetres wide having maximum openings of 31 millimetres and 1.25 millimetres (18 gauge) wire. Mesh to be affixed to two galvanised line wires of minimum 4 millimetres in diameter at 900 millimetres and 150 millimetres above ground level using galvanised fixing rings every 600 millimetres on top wire and 1200 millimetres on bottom wire. Mesh to be buried to 150 millimetres depth and returned outwards from protected area. End and change of direction posts to be 125 millimetres diameter round section, 1.87 metres long and driven 770 millimetres into the ground. Strut to be 65 millimetres round section located in notch on main post and held in the ground by 0.6 metre split rail. Line posts to be 1.6 metres long and 65 millimetres square section driven 500 millimetres into the ground at 4 metre centres. Mesh also to be fixed to line posts by 6 number staples per post. 1.2 Deer Fencing 1.2.1 Fences to protect planting areas from deer shall be in accordance with the following specification: a) 1.80 metres high timber post and 4 wire deer fence with rectangular wire mesh. b) Fence shall be constructed to the details on HCD Drawing H12 and BS1722 Parts 2 & 3 with the following additions and amendments:- (i) Top rectangular wire mesh to be type C/6/90/30. (ii) Bottom rectangular wire mesh to be type C/8/80/15. (iii) Timber posts and struts are to be for a 1.8 metres high fence selected from either Table 4 or 5 from BS1722 Part 3. Timber straining posts are to be 2.90 metres length, 178 millimetres minimum diameter. (iv) Intermediate posts are to be set or driven into the ground to

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
370 AR (continued)	a depth of 0.6 metres. Straining posts shall be set into the ground to a depth of 1.0 metre. (v) Struts are to be anchored in the ground in rammed backfill with a 450 x 102 x 51 millimetres timber thrust plate attached to the end of the strut. (vi) 4 line wires complying with the requirements of Clause 2.1 BS1722-4 Part 4, shall be provided set 50, 850, 1750, 1800 millimetres above ground level. The wire mesh shall be attached to the line wires to the details of Clause 3.3.2.4 BS1722-4 Part 4. (vii) Intermediate posts are to be provided at intervals not exceeding 2.75 metres. (viii) Existing ground must be trimmed to maintain the 50 millimetres distance between the ground and the bottom of the fence. 1.3 Combined Otter and Badger Fencing 1.3.1 Combined Otter and Badger fences shall be in accordance with Specification Appendix 30/12.
890 AR	**Performance related Specification for Foundations** **General** 1. Performance Foundations as defined in Interim Advice Note 73/06 Revision 1 (2009) draft must be constructed in accordance with Clause 890 to 896. 2. The foundations for a scheme must be divided into Foundation Areas defined in Appendix 7/1. Each Area shall be defined by the Design subgrade strength or by different foundation materials used in the design. 3. The structure of each Foundation Area must be defined in Appendix 7/1 as either Foundation Class 1, 2, 3 or 4, and foundation materials and minimum layer thicknesses to be constructed must be tabulated. 4. The tests to measure performance in accordance with this specification must be carried out for each Foundation stage at each of the following stages of construction: (i) Top of Sub-grade (ii) Top of Foundation 5. The stiffness modulus performance requirements for the top of a foundation are set out in the Chapter 4 of the IAN 73 for the following situations: • Long-term Foundation Class • Short-term Mean Foundation Surface Modulus to be exceeded by the running mean of five consecutive measurements

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
890 AR (continued)	• Short-term Minimum Foundation Surface Modulus to be exceeded by all individual measurements **Materials** 6. All foundation materials must comply with Series 600 and Series 800 clauses except that a layer thickness of up to 250mm may be used for layers other than the uppermost foundation layer. 7. The use of all materials used in foundations must be acceptable to SEPA and other bodies responsible for the local environment and for water quality and must not result in a deleterious reaction with other pavement or sub-grade materials. 8. Where a Contractor's proposed alternatives are permitted for unbound granular materials, no such materials must have a plasticity index grater the 6% when tested according to BS1377: Part 2 on material passing the 425 micron sieve unless the fraction of such material is less than 10% of the whole. **Placement and Compaction** 9. Class 9D or 9E stabilised materials must not be placed or constructed above Class 6F granular materials or Class 6S granular filter layer materials. 10. The minimum material layer thicknesses to be constructed as defined in Appendix 7/1 must include an allowance for construction tolerances. The Contractor must also make additional allowance for thickness or quality of material to ensure this is no damage if the foundation is to be used as a haul road. 11. The minimum compacted layer thickness must be greater of the following: 2.5 times the maximum particle size or 150mm for bound layers; or 80mm for unbound layers. 12. Unbound foundation materials may be compacted in a layer thickness up to 250mm except for the uppermost foundation layer for which the thickness must not exceed 225mm. 13. Unless stated otherwise in Appendix 7/1, no restriction is placed on the method of compaction of unbound materials so long as the dry density requirements given in sub-clauses 12 to 16 of this Clause are satisfied. 14. Not Used. 15. For cement and other hydraulically bound mixtures to Clause 821, 822, 823, 830, 831, 832, 834 and 840, the compaction plant and method specified in Clause 814 must be used. **Sub-grade Protection** 16. The Contactor must limit any areas of completed formation to suit the output of plant in use and the rate of deposition of sub-base. No prepared formation must remain continuously exposed to rain causing degradation or to be left uncovered overnight.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
891 AR	**Demonstration Area for Performance Foundations** **General** 1. For each Foundation Area, a Demonstration Area must be prepared using the same methods, materials, thickness and compaction as proposed for the permanent works. Each Demonstration Area shall be not less than 400m^2 and not less than 60m long. For foundation constructed using HBM to Clause 810, the Demonstration Area shall comply with the requirements of Clause 817. 2. Records of the performance test results for each construction stage, referenced to the following condition details must be presented to the Engineer in an electronic spreadsheet format, prior to construction of the same foundation type for the Works: (i) Sub-grade CBR value immediately before foundation construction (ii) Date and time of mixing (for stabilised and slow-setting materials) (iii) Date and time of placing compaction (iv) Date of performance testing (v) Values of Surface Modulus recorded (vi) Values of material properties including density and layer thickness (vii) Weather conditions including temperature (viii) Details of samples taken for testing 3. The material placed in the Demonstration Area may form part of the Permanent Works, provided that they may meet the requirements of the Permanent Works. 4. Foundation layers containing at least 3% CEM1 cement by dry mass of mixture must not be tested or trafficked until 7 days after placing unless a strength criterion has been agreed with the Engineer. 5. Where the foundation includes any HBM, then 5 laboratory specimens must be manufactured from samples recovered at locations uniformly distributed across the Demonstration Areas and tested in accordance with the requirements for that material. 6. Where the completed Demonstration Area meets all the requirements, the methods, materials, thicknesses used must not be changed for the construction of the Works without further testing in a Demonstration Area.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
891 AR (continued)	**Trafficking Trial** 7. The Contractor must undertake controlled trafficking on the Top of Foundation Stage of construction in the Demonstration Area. 8. Trafficking must be carried out using a heavy goods vehicle with axle configuration and load as required by Clause 816.28. The number of passes should be equivalent to 1000 standard axles as given in Clause 802 or as agreed otherwise. The deformation must be measured in accordance with, and must not exceed the limits stated in Clause 896. 9. Foundation Surface Modulus performance tests at the Top of Foundation that includes bound materials, must be carried out both before and after Trafficking Trial. Each individual Surface Modulus measurement and the running mean of 5 consecutive measurements of the later series of tests must exceed the values in Clause 891 Sub-clause 16. **Top of Sub-grade - Performance Assessment** 10. The short-term sub-grade CBR strength within the Demonstration Area must be determined in accordance with Clause 893 at not less than 5 locations, distributed uniformly over the Demonstration Area. The locations are to be identified to an accuracy of 0.5m. The measurement of strength must be taken at information level or at sub-information level if capping is part of the foundation design. 11. Not used. 12. Where in-situ stabilisation of the sub-grade is to be used as part of or as the first foundation layer, the sub-grade CBR strength must be measured immediately below the depth of the stabilisation by means of a Dynamic Cone Penetrometer, to the requirements of Clause 893. 13. Where the sub-grade CBR test values are less than the Design CBR, the area must either be improved, and the improvement applied to the permanent works, or the Design CBR reset and another foundation designed, constructed and proved. **Top of Foundation Stage - Performance Assessment** 14. Measurements of the short-term Surface Modulus must be carried out as detailed in Clause 895. A minimum of 25 stiffness tests must be completed, distributed uniformly over the Demonstration Area, with at least five of these tests located above the Top of Sub-grade CBR strength and density tests. 15. Not used.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
891 AR (continued)	16. The short-term Surface Modulus performance requirements for each individual value and for the running mean of five consecutive measurements must be equal to or greater than the requirements for the particular Foundation Class identified in Appendix 7/1 following adjustment in accordance with the procedure in IAN 73 Chapter 4 to the median value of the five sub-grade CBR values from the Demonstration Area. 17. Where the Surface Modulus performance measurements do not meet the requirements detailed in this Clause, the foundation must be redesigned and another Demonstration Area constructed and the design proved.
892 AR	**Permanent Works for Performance Specified Foundations** **General** 1. For each Foundation Area, records of the performance test results for each construction stage, referenced to the following condition details must be presented to the Engineer in an electronic spreadsheet format, prior to construction of the pavement layers above: (i) Sub-grade CBR value immediately before foundation construction (ii) Date and time of mixing (for stabilised and slow-setting materials) (iii) Date and time of placing compaction (iv) Date of performance testing (v) Values of Surface Modulus recorded (vi) Values of material properties including density and layer thickness (vii) Weather conditions including temperature (viii) Details of samples taken for testing 2. Foundation layers containing at least 3% CEM1 cement by dry mass of mixture must not be tested or trafficked until 7 days after placing unless a strength criterion has been agreed with the Engineer. **Top of Sub-grade Stage of Construction** **Performance Assessment** 3. The short-term sub-grade CBR strength must be determined according to Clause 893 at 60m intervals along each lane of prepared sub-grade and staggered by 30m between adjacent lanes. At least 10 tests shall be carried out for each prepared Foundation Area. The location of each test must be identified to the nearest 0.5m. The measurement of strength must be taken at formation level or at sub-formation level if capping is part of the foundation design. 4. The foundation must not be constructed in areas where the sub-grade strength is less than the Design CBR.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
892 AR (continued)	**Top of Foundation** **Performance Assessment** 5. The top of foundation must be tested for Surface Modulus in accordance with Clause 895 immediately prior construction of overlying pavement layers and at 20m intervals along each lane, staggered by 10m between adjacent lanes. Tests should coincide with sub-grade CBR and density tests where appropriate. 6. The short-term Surface Modulus performance for each individual measurement and for the running mean of 5 consecutive measurements must be equal or greater than the minimum and mean values set out in Chapter 4 of IAN 73 for the Foundation Class and identified in Appendix 7/1. 7. A foundation containing unbound materials that fails to comply with the performance requirements of this Clause when the recorded moisture content is in excess of that in the Demonstration Area, may be retested for compliance when the foundation moisture content has reduced to that of the Demonstration Area. Where the Surface Modulus performance values do not meet the requirements detailed in this Clause, the foundation must be redesigned and another Demonstration Area constructed and the design proved. 8. Density tests, as detailed in Clause 894 are to be performed at a spacing of every 200 metres along each lane of the road when Clause 802 (the method specification for laying and compacting unbound materials) has been followed; otherwise the spacing of these tests shall be every 60m, coinciding with surface stiffness modulus tests where such tests are performed. Tests performed in adjacent lanes must be staggered by 30m. The results shall comply with the requirements of Clause 894. 9. Wheelpath deformation must be monitored and measured along all lengths of prepared foundation in accordance with the requirements of Clause 896 and the measured values must not exceed those stipulated in that Clause. 10. Density tests, as detailed in Clause 894 are to be performed at a spacing of every 200 metres along each lane of the road when Clause 802 (the method specification for laying and compacting unbound materials) has been followed; otherwise the spacing of these tests shall be every 60m, coinciding with surface stiffness modulus tests. Tests performed in adjacent lanes must be staggered by 30m. The results shall comply with the requirements of Clause 894.

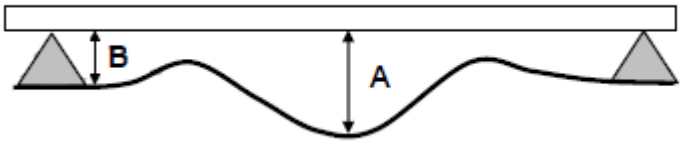
APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
893 AR	**CBR Strength Measurements** 1. CBR strength measurements of the prepared sub-grade must be carried out using a Dynamic Cone Penetrometer (DCP) unless the type of soil is inappropriate for such testing when Dynamic Plate testing must be used. The DCP equipment must incorporate an 8kg steel drop weight that falls vertically through 575mm and makes contact with a steel anvil. This anvil must be rigidly attached, via steel rods (less than 20mm diameter), to a 20mm diameter 60° steel cone, which is driven vertically into the ground. Also see HD29 (DMRB 7.3.2). 2. The result for each test must be expressed as a 50th percentile penetration rate in millimetres per blow between 50mm and 550mm of penetration from top of sub-grade level. If the penetration rate is less than 2mm per blow, then the test should be aborted with one further test attempted nearby. 3. Soil strength expressed as mm/blow must be converted to a CBR value using the following relationship: Log10 (CBR) = 2.48 – 1.057 * Log10 (mm/blow) where CBR is given as a percentage value and the penetration rate of the cone is given in units of mm/blow.
894 AR	**Density Measurement** 1. Each ‘stage’ of the foundation construction shall be tested for in situ density by a nuclear density gauge, calibrated for the material being tested, in accordance with BS1377: Part 9 for unbound materials or Clause 870 for cement and other hydraulically bound mixtures, or by such other in situ density test as may be approved by the Overseeing Organisation. The results shall comply with the requirements of this Clause. 2. The unbound material used in each compacted foundation layer shall achieve a minimum in-situ dry density, when tested in accordance with BS1377: Part 9, or such other test as the Overseeing Organisation may permit, of 95% of the maximum dry density, as determined from the method in BS EN 13286-4. Cement and other hydraulically bound mixtures shall attain a minimum in-situ wet density, when tested in accordance with Clause 870, of 95% of the average wet density of at least five cubes manufactured to BS EN 13286-51. 3. Maximum dry density (for unbound materials) or maximum wet density (for cement and other hydraulically bound mixtures) shall be determined for every 1000 tonnes of material unless otherwise stated in Appendix 7/1 or agreed by the Overseeing Organisation.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
895 AR	**Surface Modulus Measurement** 1. Surface Modulus testing must be carried out using Dynamic Plate Test Device, which has been calibrated to the manufacturer's specification. Regular checking and calibration of the load cell and deflection sensors must be carried out as recommended by the manufacturer. The equipment must be capable of producing a peak stress of 100kPa with a pulse rise time of between 8 to 12 milliseconds, applied to a rigid circular plate of 300mm diameter. Both the applied load and the transient deflection, measured directly on the tested surface, must be recorded. The deflection measurement transducer must be capable of measuring deflections in the range 40-1500 microns. The accuracy of the readings should be ±0.1kN for the load and ± 2 microns for deflection. 2. The peak stress applied during each test shall be selected to produce as high a deflection as possible within the measurement range of the deflection sensor. 3. The following procedure is to be adopted for dynamic plate testing. Each test site should be stable and flat and free from water, ice and snow. The temperature down to 100mm below the surface should be at least 4°C. For a lightweight test device, at least 10 drops are necessary at the beginning of each test session to warm up the rubber buffers. At each test point, 3 initial 'seating' drops shall be carried out to bed the plate into the surface. Three further drops shall then be carried out. The results from the last set of three drops shall be averaged to given the Surface Modulus applicable to that test point. 4. The stiffness modulus shall be computed at each point tested, using the following formula: $$\frac{E = 2(1- v^2) \times R \times P}{D}$$ where: E = Foundation Surface Modulus (in MN/m^2 or MPa) v = Poisson's Ratio (v, by default, = 0.35) R = Load Plate Radius (R, by default, = 150mm) P = Contact Pressure (in kPa) D = Deflection under the centre of the plate (in microns) 5. If a lightweight test device is used, it must be correlated to an FWD which will remain the reference test method. The following procedure must be used to correlate a lightweight device: The FWD and the lightweight devices are both to be used on the same material and at adjacent test positions in the Demonstration Area for the 25 measurement points. The Surface Modulus values obtained from the two devices are to be compared and the square of the correlation coefficient (r2) is to be calculated, if this value is more than 0.45 then there is considered to be sufficient correlation between the two devices.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
895 AR (continued)	An adjustment factor should then be calculated as the mean of the ratios of each FWD value to lightweight value. The lightweight device readings are to be adjusted by this factor for all further readings on that material for that scheme.
896 AR	**Wheelpath Deformation Measurement** 1. Ruts that develop under construction traffic, measured in accordance with this Clause, shall nowhere exceed the following limits: • All stabilised/bound surfaces -10mm • < 250mm thick granular material - 30mm • 250mm thick granular material - 40mm 2. At each point, the cumulative rut, calculated by summing the deformations from each trafficked foundation layer shall not exceed 50mm. 3. Wheelpath deformation measurement shall be carried out using a straight edge with a length of at least 2m. The straight edge shall be placed transverse to the rut and raised clear from the rut by two identical blocks. The blocks shall be placed on undisturbed material outside of the wheel path. The amount of deformation shall be the difference between the deepest vertical measurement from the straight edge to the surface of the foundation (A) and the height of the blocks (B).  **Deformation = A – B**

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
952 AR	**Pavement Cores** 1. Nominal 150mm diameter cores, required for sampling and testing at the frequencies stated in Appendix 1/5, shall be taken using a suitable coring machine in accordance with BS 598:Part100 2. For each core extracted a Roadside Record Sheet (RRS1) shall be completed in order to record the site location, coring conditions and condition of the core. 3. All cores shall be labelled, protected, transported and stored according to the Testing Organisation's quality procedures. 4. In the laboratory each core, prior to any testing, shall be examined, photographed and the information recorded on a Core Record Sheet (CRS1). The cores shall be photographed on a white background with the project, location and core number clearly shown together with the units of measurement that will be easily identifiable on the size of photograph produced. 5. The records are to be stored within the Contractors Quality Records and made available to the Overseeing Organisation when required.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

ROADSIDE RECORD SHEET (RRS1)

a) General

Project Name			
Coring Date			
Core Number		**Position of Core** (See Note 4)	
Chainage		**GPS Coordinates**	
Road Name			
Road Type (See Note 1)		**Core Diameter (mm)**	
Lane Direction (See Note 2)		**Coring Type**	**Dry / Wet**
Lane Number (See Note 3)			
Weather Conditions			

b) Pavement Coring Description

Did the core barrel lock/jam whilst cutting pavement?	Yes	No	**If Yes, at what depth?** Depth (mm):	
Were there difficulties in extracting the core from the barrel?	Yes / No		**Generally coring, extraction and handling may cause debonding, do you believe this was the case here?**	Yes / No
Condition of core (Tick as appropriate)	**Good**	**De-bonded**	**Shattered**	**Partial recovery**
Depth of coring				
Core length				
Any additional information on the core not included above				

Notes:
1. Insert as appropriate i.e. D2AP, S2 etc.
2. Insert eastbound, westbound, northbound, and southbound as appropriate.
3. Insert appropriate descriptor e.g. lane 1 (nearside), lane 2 (offside), hard shoulder.
4. Insert appropriate location e.g. NSWP (Near Side Wheel Path), OSWP (Off Side Wheel Path), Centre, etc.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Core Record Sheet (CRS1)

Project Name		**Road type (See Note 1)**	
Road Name		**Lane Direction (See Note 2)**	
Coring Date		**Lane Number (See Note 3)**	
Core Number		**Chainage**	

Layer	**Layers**				**Aggregate**		**Comments**
Number	Top (mm)	Bottom (mm)	Thickness (mm)	Material	Maximum size (mm)	Type	

Insert picture of core HERE

(The units of measurement should be clearly seen on the photograph)

Notes:
1) Insert as appropriate i.e. D2AP, S2 etc.
2) Insert eastbound, westbound, northbound, and southbound as appropriate.
3) Insert appropriate descriptor e.g. lane 1 (nearside), lane 2 (offside), hard shoulder.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
971 AR	**Measurement of Texture Depth Using The TRL Mini Meter** 1. Texture depth may be measured by TRL Mini Meter (TMM) manufactured or modified to and calibrated to the 1985 TRL specification by a licensed manufacturer. 2. The TMM will be operated and maintained in accordance with the manufacturer's instructions and recommendations as contained in their operating maintenance manual (1986). A Certificate showing the Calibration Factor certified by the manufacturer and dated less than 12 months prior to use will be kept available for reference. This calibration factor must agree with that shown on the recording tape output by the TMM. 3. Texture depth will be measured as soon as possible after surfacing has been laid and before the surfacing has been open to traffic. The road shall be clean, free from loose material and dry or barely damp. 4. The TMM will be operated at a speed between 3 and 6 kph on the "Texture HRA" program. 5. The sensitivity of the TMM will be checked daily on the check provided. The drop out percentage (DO%) of five consecutive tests averaged to the nearest whole number shall be 40 +/-3%. 6. Surface texture will be measured over one or more sections of carriageway lane 1000m in length or the complete carriageway lane if less than 1000m. Measurements will be made on successive 50m lane lengths along the whole of the section tested, on a diagonal line across the carriageway lane width from left to right in the direction of traffic flow. No measurements will be taken closer than 300mm to the edge of the carriageway. 7. The report will be made in accordance with this clause and include the following: (a) The serial number and calibration factor of the meter used. (b) The location of each lane tested. (c) The individual Sensor Measured Texture Depth (SMTD) for each 50m lane length comprising each section together with their average value. (d) Affirmation that the surface course was dry, clean and untrafficked. Any departure from this must be reported. (e) A copy of the printed output for any 50m lane length where the message "DO% HIGH" or "DO% LOW" has been printed in place of the 10m results, together with clear identification of location.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
971 AR (continued)	8. The TRL Mini Meter may be used on all surfacing contracts where texture depth is a requirement. However for comparative purposes the sand patch test, in accordance with BSI BS EN 13036-1, is to be used in addition to the Mini Meter. One set of tests will be required for each 10,000m^2 of surfacing or part thereof laid under any contract. The Sand Patch Tests shall be carried out in a linear manner along the same track as the Mini Meter. This supersedes the particular requirement of BS 598: Part 5 concerning the alignment of the sand patch test locations. The Contractor shall record the location of the Sand Patch Tests and submit details to the Engineer in order that a direct comparison can be made between results.
1270 AR	**Chart Node and Section Markers** 1. Cored thermoplastic road markers shall be installed as chart nodes using the following method: (a) A 100 millimetres diameter x 20 millimetres deep socket shall be formed using a central pilot bit surrounded by an annular bit. The pilot bit permits drilling of an annulus by the annular bit in a precise location by guiding the annular bit. (b) The base of the pocket after breaking out the surface material shall be left jagged. This jagged base assists in the retention of the stud in the pocket. (c) The pocket shall be filled with hot fluid thermoplastic material to the uppermost edge of the pocket projecting slightly above the road surface. This projection depends on the surface tension of the material. The material is then allowed to cool and set to form a stud. (d) The material shall consist of a plastic resin with the white filler and reflective glass particles to BS 3262. This is the same material as is used for white lining purposes. 2. Notwithstanding any other requirements of the Contract, record drawings of the chart node locations shall be provided in accordance with Section 7 of Part 1 of the Employers Requirements.
1271 AR	**Night Visibility** Immediately after application and throughout the period of 60 months thereafter, the retro-reflectivity of the road marking line shall be not less than 150 mcd/lux/m² when measured in accordance with the method below: 1. **Apparatus** The apparatus for measuring the retroreflectivity (SL value) of material shall consist essentially of a light source and a photodetector with a geometry for observation and illumination of 1.37 degrees and 0.74 degrees respectively. 2. **Procedure** Calibrate the instrument in accordance with the manufacturer's instructions.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
1271 AR (continued)	Air temperature shall not be below 10 degrees nor exceed 30 degrees centigrade. The area to be measured shall be 200 millimetres x 100 millimetres. Measurements shall be made at five positions at approximately 200 millimetre intervals along the marking. This procedure shall be repeated at two further locations along the line and within 50 metres of the first set of measurements. The overall average of the fifteen readings shall be reported as the retro-reflectivity value. The road marking will be tested in a dry condition after removal of any loose dirt or foreign particles. If the retroreflectivity value measured is less than the specified value the line shall be thoroughly wetted and cleaned following BS 3262: Part 2 Clause D2 procedure, then dried and re-measured.
1471 AR	**Special Tools** 1. Duplicate sets of special tools, keys and handling devices essential for the correct running operation and maintenance of any equipment shall be made available to the Overseeing Organisation and provided to the Overseeing Organisation on Completion of the Works.
1472 AR	**Fixings for Attachment to Structures** 1. Fixings for attachment to Structures shall use a resin fixed replaceable bolt system.
1728 AR	**1. Construction Tolerances in Structural Concrete** (i) General Notwithstanding any tolerances stated in the DMRB, British and European Standards the following tolerances shall be adopted in the Design, Construction, Completion and Maintenance of the Works. **1.1 In-Situ Concrete** (i) The maximum deviation of hardened concrete surfaces prior to the removal of formwork shall not be greater than 3 millimetres in 3 metres (which tolerance shall not be cumulative) nor greater than 2 millimetres in 1 metre. Of the foregoing deviations, not more than 2 millimetres shall occur at a formwork joint. The overall standard of workmanship to be achieved shall be such that the lines of the finished surfaces shall be smoothly continuous. (ii) Where concrete surfaces are not permanently exposed, the maximum deviation of the finished concrete surfaces shall not be greater than 6 millimetres in 3 metres (which tolerance shall not be cumulative). **1.2. Precast Concrete** (i) For members other than pre-stressed pre-tensioned members, the length, cross-section dimensions, straightness, squareness, twist and flatness of precast concrete shall be measured at 28 $\pm$ 2 days after casting. Unless otherwise stated, the allowable dimensional variations shall not exceed the following:

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
1728 SR (continued)	a) *Length* — *Variation* Up to 3 metres — ± 6 mm 3 to 4.5 metres — ± 9 mm 4.5 to 6 metres — ± 12 mm Additional for every subsequent 6 metres — ± 6 mm b) *Cross section (each direction)* Up to 500 mm — ± 6 mm 500 to 750 mm — ± 9 mm Additional for every subsequent 250 mm — ± 3 mm c) *Straightness or bow (deviation from intended line)* Up to 3 metres — ± 6 mm 3 to 6 metres — ± 9 mm 6 to 12 metres — ± 12 mm Additional for every subsequent 6 metres — ± 6 mm d) *Squareness*. When considering the squareness of a corner, the longer of the two adjacent sides being checked shall be taken as the base line. The shorter side shall not vary in its distance from a perpendicular so that the difference between the greatest and shortest dimensions exceeds the following: Length of shorter sides: Up to and including 1.2 metres — 6 mm Over 1.2 metres but less than 1.8 metres — 9 mm 1.8 metres and over — 12 mm When considering squareness, any error due to lack of straightness shall be ignored; squareness shall be measured with respect to the straight lines that are closest to parallel with the features being checked. When the nominal angle is other than 90°, the included angle between check lines shall be varied accordingly. e) *Twist*. Any corner shall not be more than the deviation stated from the plane containing the other three corners: Up to 600 mm wide and up to 6 metres in length — 6 mm Over 600 mm wide and for any length — 12 mm f) *Flatness*. The maximum deviation from a 1.5 metre straight edge placed in any position on a nominally plane surface shall not exceed 6 mm. In addition, for members where accuracy is important, for example those which form bridge deck copes, the allowable dimensional variations and deviations shall not exceed half the values listed above. **2. Assembly and Erection of Precast Concrete Members other than Prestressed Pretensioned Members** (i) The vertical alignment of the member shall not depart from the

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
1728 SR (continued)	Design level along the line by more than ± 5mm nor more than 3mm in a distance of 3 metres, nor greater than 2mm in 1 metre. (ii) The horizontal alignment of the member shall not depart from the Design alignment along the line where accuracy is important by more than ± 5mm nor more than 3mm in a distance of 3 metres, nor greater than 2mm in 1 metre. (iii) At the joints between adjacent members, the difference in level at the point where accuracy is important shall not exceed 2mm. (iv) At the joints between adjacent members, the difference in horizontal alignment at the point where accuracy is important shall not exceed 2mm. (v) The width of gaps between adjacent members shall be as uniform as possible. (vi) The erection procedure shall incorporate means of accurately locating members in their final position. The procedure shall also incorporate means of making fine adjustments to the level and alignment of the units after installation.
1778 AR	**1 Early Thermal cracking** 1.1 The Contractor shall develop suitable concrete mix designs and safe curing methods to ensure that any cracking due to early thermal effects does not exceed appropriate permissible crack widths in BS EN 1992-2 and to ensure compliance with the following criteria. a) Peak temperature: 65 degrees Celsius a) Maximum temperature differential within a single pour: in accordance with Table 7.1 of CIRIA C660 for internal restraint, R = 0.42, for the appropriate coarse aggregate type. If limestone coarse aggregate is to be used, the assumed value for coefficient of linear thermal expansion shall be demonstrated by measurements on concrete specimens. i) The demonstration shall include the results of early thermal cracking trial pours, as scheduled in Appendix 1/5 of the specification. The temperature rise recorded in the trial pours may be used to establish the temperature rise for the concrete and to enable more reliable predictions of temperature rise using CIRIA C660. ii) The relationship established from the trial pours between temperature and strain change may be used to determine the coefficient of thermal expansion and contraction as the temperature in the block rises and falls. This performance data can then be used to demonstrate compliance with the Agreement requirements to restrict early thermal cracking. **2 Early Thermal Cracking Trial Pours** 2.1 Early thermal cracking trial pours shall be performed in advance of construction for each proposed concrete mix subject to these

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
1778 AR (continued)	considerations. Further testing shall be performed in advance of any changes to materials or mix composition that might have a significant effect on these properties including, but not limited to, changes in type, source or content of cement, ground granulated blastfurnace cement or fly ash. 2.2 Insulated 'hot-blocks' (one cubic metre) shall be used to simulate the temperature conditions in large sections. The base, sides and top should be contained in 18 millimetre plywood with 50 millimetres of polystyrene insulation. The temperature in the block should be measured using thermocouples (at the centre and at the surface). 100 millimetres cores shall be taken at 28 days for testing compressive strength and checking for internal cracks. 2.3 The test blocks should be instrumented using thermocouples and Vibrating Wire strain gauges (VWG) to provide a measure of the temperature rise and the associated strain. 2.4 The following test data shall be recorded on the test certificate: a) Name and address of the test laboratory; b) Date and identification number of the test report; c) Name and address of the organisation responsible for the testing; d) Name and address of the concrete supplier; e) Date of arrival of the concrete; f) Composition of the concrete tested, including sources of materials; g) Purpose of the test; h) Test method; i) Any deviation from the test method; j) Name of the person who performed the test; k) Date of the test; l) Test results, including: i) Compressive strength of cores taken and tested in accordance with BS EN 12504-1 and BS EN 13791 at an age of 28 days; ii) The temperature rise; and m) Date and signature.
3000 AR	**Landscape Operations - Planting and Landscape Maintenance**
3001 AR	**General Conditions** (i) All landscape preparation, planting and seeding work shall be completed at the earliest practical opportunity to ensure early establishment. (ii) Landscape Maintenance a) Landscape Maintenance shall cover a period of 260 weeks from the

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
3001 AR (continued)	issue of the Certificate of Completion. (iii) Special Requirements a) The Contractor shall comply with the requirements of Environmental Criteria given in Section 4.4 of the Employers Requirement's and any other requirements detailed in the Contract Documents. b) The Contractor shall make due allowance for undertaking landscape operations whilst the roads are in use. (iv) Temporary Site Nursery and Accommodation a) The Contractor shall make all arrangements for the delivery or use of temporary or permanent buildings as required, in order to establish a temporary site nursery and to carry out the landscape Works, with the prior acknowledgement of the Overseeing Organisation. (v) Standard of Work a) All Works shall be carried out according to the recommendations of BS 4428: 1989 'General Landscape Operations'. (vi) Cleansing of Site Area From the date of entry to the Land Made Available by the Employer for the Works until the end of the Period of Establishment Maintenance, the Contractor shall be responsible for the removal of all types of litter, debris and rubbish from the Site as follows: a) provision shall be made for removing all arisings and waste resulting from the Works at the end of each day's work, and on completion, the Site shall be left in a clean and tidy condition; b) all paved and hard areas shall be kept clean and free from contamination with soil, arisings, plants and planting materials which shall be cleared after each day's work; c) provision shall be made for the reinstatement of all tracks, grass and agricultural areas used for access as part of the Works. (vii) Protection of Drains Notwithstanding the other provisions of this Contract precautions shall be taken during all planting operations to ensure that drainage systems shall not be damaged, contaminated with soil and the like.
3003 AR	**Delivery of Plants** 1. Deliveries of plant material shall be co-ordinated with planting operations to ensure that no plants are left unplanted for excessive periods and that the Works proceed in accordance with the Clause 14 Programme. Any stock arriving on Site which is defective or below the other provisions of the Contract shall not be permitted in the Works. The Contractor shall ensure that plant material shall be stored as follows: (i) All bare rooted plants shall have their root systems immersed in an alginate root dip immediately on receipt from the supplier and prior to planting. Bare-rooted plants shall be heeled in moist friable soil,

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

Clause No etc	Title and written text
3003 AR (continued)	or supported upright on a well-drained area and the roots immersed in a deep layer of moist straw, compost, pulverised bark, or other suitable material. The material shall be firmed to exclude air (particularly on the inside of bundles) and watered periodically as the condition of the material requires. Watering shall not be carried out in freezing conditions and polythene wrappings shall be removed prior to the plants being heeled in. (ii) Container-grown plants shall be maintained upright on a well-drained area and protected from direct sunlight. The containers/pots shall be covered with a layer of peat and watered as required. Watering and spraying shall not be carried out in freezing conditions. (iii) Rootballed plants with permeable wrappings shall be kept moist by watering and polythene wrappings shall be protected from direct sunlight. For longer periods of storage, rootballs with permeable wrapping shall be placed on a well-drained surface and covered with a deep layer of moist straw, compost, pulverised bark, or other suitable material. (iv) All polythene wrappings shall be non-transparent and shall be protected from direct sunlight at all times. Where delays of more than a few days occur, the bags shall be stored upright, in a cool shady position with the plants root systems covered with a deep layer of moist straw, compost, pulverised bark, or other suitable material.

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT (Continued)

PART B: VOLUME 2 NOTES FOR GUIDANCE ON THE SPECIFICATION FOR HIGHWAY WORKS

LIST OF ADDITIONAL, SUBSTITUTE AND CANCELLED CLAUSES TABLES AND FIGURES

Clause No etc	Title
None	

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

PART A: VOLUME 1 SPECIFICATION

LIST OF MINOR ALTERATIONS TO EXISTING CLAUSES

Clause No etc	Alteration to be made
121	Tidal, Flowing and Standing Water
201	Clearing
606	Watercourses
618	Topsoiling, Grass Seeding and Turfing
901	Bituminous Pavement Mixtures
920	Bond Coats, Track Coats and Other Bituminous Sprays
930	EME2 Base and Binder Course Asphalt Concrete
1309	Amendments and additions to BS 5649 : Part 2 : 1978 (AMD 3136,1979)
1601	General Requirements for Piling and Embedded Retaining Walls
1714	Reinforcement – Fixing
2001	General
2006	Workmanship for Waterproofing Below Ground Concrete Surfaces

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

MINOR ALTERATIONS TO EXISTING CLAUSES

Clause No etc	Alteration to be made
121	**Tidal, Flowing and Standing Water** *Add at the end of Clause:* Notwithstanding any other provisions of the Contract, the Contractor shall take adequate precautions to prevent the damage and pollution of streams, waterways and watercourses and shall indemnify the Employer against all claims arising from any such pollution caused by virtue of the operation during the currency of the Contract. The Contractor shall make good any unnecessary damage to streams, waterways and watercourse at his own expense.
201	**Clearing** *Delete sub-Clause 3 and insert new sub-Clause 3:* Disused chambers located under the road pavement or verge shall be demolished to a depth of 0.5 metres below formation, properly cleaned out, and filled or capped to meet the requirements of the Relevant Roads Authority. To permit free drainage holes of 76mm diameter (minimum) shall be made at 500mm centres over the whole areas of slabs basements etc, which are not removed and which are liable to hold water.
606	**Watercourses** *Add to sub-Clause 2* With the exception of gravels, water worn pebbles and boulders from areas of redundant watercourses which may be excavated and set aside for reuse.
618	**Topsoiling, Grass Seeding and Turfing** *Delete sub-clause 2 and insert* Class 5B imported topsoil shall only be used when permitted in writing by the Employer and shall be tested for major nutrient requirements in accordance with Appendix 1/5.
901	**Bituminous Pavement Mixtures** *Paragraphs 1 to 18 as per the Specification for Highway Works* *Add the following sub clause after sub-clause 18:* **19 Asphalt Durability** In accordance with SEDD Interim Amendment No. 12 – Bituminous pavement courses shall be made using the materials described in Appendix 7/1 and shall be in compliance with the sector Scheme Document for the laying of Asphalt Mixes described in Appendix A. **Appendix A Quality Management Scheme 14** *Insert Note 2 as follows:* “Note 2 in addition to the list of British Standards, the TRL Project Report 65 is to be included for use in the production of the Stone Mastic Asphalt (SMA) mix design for the Works”

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

920	**Bond Coats, Tack Coats and other Bituminous Sprays** *Sub-Clause 1* Delete last sentence and replace with: "In the event that no British Board of Agrément HAPAS Certificates have been issued in respect of any proprietary bond coats, tack coats or other bituminous sprays that comply with Sub-clauses 2 to 12 of this Clause and the requirements specified in Appendix 7/4, detailed proposals accompanied by the Contractors Quality Plans and method statements appropriate to the Design, Construction, Completion and maintenance of the Works may be submitted to the Overseeing Organisation for approval on a project specific basis."
930	**EME2 Base and Binder Course Asphalt Concrete** **Paragraphs 1 – 20 as per the Specification for Highway Works** **Add the following sub-clauses after sub-clause 20:** **Job Mixture Verification Trial** **21 General** For each mixture, a job mixture verification trial shall be carried out to verify the properties of the mixture and the effectiveness of the compaction plant and rolling procedures. The trial area shall be not less than 30m long and shall be of appropriate width for the laying and rolling procedures being demonstrated. Mixing, laying and compaction plant and procedures shall be as close as possible to those to be encountered on the full scale works. **22 Mix analysis** During the laying of the trial area, samples of loose mixture shall be taken at three evenly spaced locations along the trial length, in accordance with BS EN 12697-27. These shall be analysed for soluble binder content and grading to demonstrate conformity with the target composition as described in Table B.8 of PD 6691+A1. **23 Maximum Density** At each of the locations described in Clause 22, a further loose mix sample shall be taken for maximum density determination. The maximum density of each sample shall be determined in accordance with BS EN 12697-5. The average value of maximum density rmax expressed in Mg/m3 shall then be used for subsequent calculation of the air void content of the compacted mixture. **24 Bulk Density and Void Content** At three locations, pairs of 150mm diameter cores shall be taken in accordance with BS EN 12697-27, six cores in total. Two of the cores shall be in the wheel track zones (between 0.5m and 1.1m and between 2.55m and 3.15m from the nearside lane marking) of the completed lane or mat, the third shall be selected as appropriate. The bulk density ρ of each core shall be determined in accordance with BS EN 12697-6 Procedure A. Void contents shall be calculated to ± 0.1% as follows: • Air voids content = $(1 – \rho/\rho_{max}) \times 100\%$ • The average value of the six air void contents shall be in accordance with Clause 930.15.

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

930 (continued)	**25 Dynamic Stiffness** The six cores taken under Clause 24 shall be used for the preparation of specimens for testing of Indirect Tensile Stiffness Modulus in accordance with BS EN 12697-26. The mean result shall be used to determine conformity with Clause 26. **26** The mean Indirect Tensile Stiffness Modulus of the six 150mm diameter cored specimens shall not be less than 4.5 GPa. **27 Calibration of Nuclear Gauge** If a nuclear gauge or other indirect device is to be used to monitor and control compaction during the main works, it may be convenient to use the core results of the job mix verification trial to calibrate against core density. **28 Resistance to Permanent Deformation** Within the trial area resistance to permanent deformation shall be tested in accordance with Paragraph B.3.3.5 of PD 6691. The limiting wheel tracking requirement shall be Category 1, i.e. "Moderate to heavily stressed sites requiring high rut resistance". Resistance to permanent deformation shall be monitored in the main works in accordance with Paragraphs D.3.1, D3.2 and D.3.3 of BS 594987 Annex D, one core shall be tested per lane kilometre, at locations to be agreed with the Overseeing Organisation. Results shall be assessed on successive rolling means of sets of six consecutive results and shall be deemed to conform if the mean is no greater than the specified value and individual values not more than 50% greater than the specified value.
1309	**Amendments and additions to BS 5649 : Part 2 : 1978 (AMD 3136,1979)** *Page 4 Clause 3* Delete references to 3 degrees, 15 degrees 1.5 metres and 2.5 metres *Add* 'In the table delete bracket projections w of 1.25 metres, 2 metres and 3 metres'
1601	**1 General Requirements for Piling and Embedded Retaining Walls** 1.1 Add to end of item 27. In addition to the records required by Table 16/1 in Series 1600 of the MCHW an ultrasonic survey (1 reading per 5 centimetres) shall be carried out of rock socket excavations to record the socket diameter and verticality in 2 orthogonal directions.
1714	**Reinforcement – Fixing** *Add sub-Clause 2:* The cover survey shall be carried out by the use of an electronic covermeter with a facility for downloading to a computer. The results of the cover survey shall be downloaded to a computer and passed to the Engineer within 24 hours

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

	and the results shall also be included in the Bridge Maintenance Manual.
2001	**General** *Add at the end of sub-Clause 1:* Surfaces to receive bridge deck waterproofing shall be prepared as recommended in writing by the particular manufacturer and, in addition, shall be given a light grit blast to produce an open texture surface free from laitance and other deleterious materials.
2006	**Workmanship for Waterproofing Below Ground Concrete Surfaces** *Add at the end of sub-Clause 3:* The waterproofing shall be applied strictly in accordance with the manufacturers written instructions at the recommended rate of application. *Add at the end of sub-Clause 4:* Details of the proprietary system shall be submitted for the consent of the Overseeing Organisation prior to the inclusion in the Works.

PART B: VOLUME 2 NOTES FOR GUIDANCE ON THE SPECIFICATION FOR HIGHWAY WORKS

LIST OF MINOR ALTERATIONS TO EXISTING CLAUSES

Clause No etc	Alteration to be made
NONE	

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

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

List 'A': This is a complete list of the Numbered Appendices referred to in the Specification for Highway Works with those not adopted marked 'Not Used'.

List 'B': This is a complete list of contract- specific Numbered Appendices devised for the Contract.

Guide to types of Numbered Appendices - who compiles/completes

Symbol

(Co)	Compiler compiles: Identified in the Notes for Guidance examples by the term 'Sample' included in their title.
(Co)(C)	Compiler partially compiles and Contractor completes and returns to Overseeing Organisation.
(Co)(T)	Compiler partially compiles and Tenderer completes and returns with Tender.
(C)	Contractor completes and returns to Overseeing Organisation.
(P)	This indicates the Appendix is a national pro forma and format must not be altered.
(T)	Tenderer completes and returns with Tender.

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works

Volume Number	Completed by	Appendix Number	Title
			INTRODUCTION
	(Co)	0/1	Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract
	(Co)	0/2	Contract-specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Contract
	(Co)	0/3	List of contract-specific Numbered Appendices Referred to in the Specification and Included in the Contract
	(Co)	0/4	List of Drawings Included in the Contract
	(Co)	0/5	Special National Alterations of the Overseeing Organisation of Scotland/Wales/Northern Ireland
			PRELIMINARIES
	(Co)	1/1	Temporary Accommodation and Equipment for the Overseeing Organisation
	(Co)	1/2	Vehicles for the Overseeing Organisation
	(Co)	1/3	Radio Communication System for the Overseeing Organisation
	(C)	1/4	Working and Fabrication Drawings
	(Co)(C)	1/5	Testing to be Carried out by the Contractor
	(Co)	1/6	Supply and Delivery of Samples to the Overseeing Organisation
	(Co)	1/7	Site Extent and Limitations on Use
	(Co)	1/8	Operatives for the Overseeing Organisation
	(Co)	1/9	Control of Noise and Vibration
	(Co)	1/10	Permanent Works to be Designed by the Contractor
	(Co)	1/11	Temporary Works Design
	(Co)	1/12	Setting Out and Existing Ground Levels
	(Co)(C)	1/13	Programme of Works
	(Co)	1/14	Payment Applications
	(Co)	1/15	Accommodation Works
	(Co)(T)	1/16	Privately and Publicly Owned Services and Supplies
	(Co)	1/17	Traffic Safety and Management
	(Co)	1/18	Temporary Highways for Traffic
	(Co)	1/19	Routeing of Vehicles
	Not Used	1/20	Recovery Vehicles and Operation for Breakdowns
	(Co)	1/21	Information Boards
	(Co)	1/22	Progress Photographs
	(C)	1/23	Risks to Health and Safety
	(Co)(C)	1/24	Quality Management System
	Not Used	1/25	Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
	Not Used	1/27	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)
			SITE CLEARANCE
	(Co)(C)	2/1	List of Buildings, etc. to be Demolished or Partially Demolished
	(C)	2/2	Filling of Trenches and Pipes
	(C)	2/3	Retention of Material Arising from Site Clearance
	(Co)(C)	2/4	Explosives and Blasting
	(Co)(C)	2/5	Hazardous Materials
			FENCING AND ENVIRONMENTAL BARRIERS
	(Co)(C)	3/1	Fencing, Gates and Stiles
			ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)
	(Co)	4/1	Road Restraint Systems (Vehicle and Pedestrian)
	(Co)(C)	4/2	Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4: 2002
			DRAINAGE AND SERVICE DUCTS
	(C)	5/1	Drainage Requirements
	(C)	5/2	Service Duct Requirements
	(C)	5/3	Surface Water Channels and Drainage Channel Blocks
	(C)	5/4	Fin Drains and Narrow Filter Drains
	(C)	5/5	Combined Drainage and Kerb Systems
	(C)	5/6	Linear Drainage Channel Systems
	(C)	5/7	Thermoplastics Structural Wall Pipes and Fittings
			EARTHWORKS
	(C)	6/1	Requirements for Acceptability and Testing etc. of Earthworks Materials
	(C)	6/2	Requirements for Dealing with Class U1B and Class U2 Unacceptable Materials
	(C)	6/3	Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction)
	(C)	6/4	Requirements for Class 3 Material
	(C)	6/5	Geotextiles Used to Separate Earthworks Materials
	(C)	6/6	Fill to Structures and Fill Above Structural Foundations
	(C)	6/7	Sub-formation and Capping and Preparation and Surface Treatment of Formation
	(C)	6/8	Topsoiling

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
	(C)	6/9	Earthworks Environmental Bunds, Landscape Areas, Strengthened Embankments
	(C)	6/10	Ground Anchorages, Crib Walling and Gabions
	(C)	6/11	Swallow Holes and Other Naturally Occurring Cavities and Disused Mine Workings
	(C)	6/12	Instrumentation And Monitoring
	(C)	6/13	Ground Improvement
	(C)	6/14	Limiting Values for Pollution of Controlled Waters
	(C)	6/15	Limiting Values for Harm to Human Health and the Environment
			ROAD PAVEMENTS - GENERAL
	(T)(C)	7/1	Permitted Pavement Options (Schedules 1, 2, 3, 4 and 5)
	(C)	7/2	Excavation, Trimming and Reinstatement of Existing Surfaces
	(C)	7/3	Surface Dressing (Sheets 1, 2 and 3)
	(C)(P)	7/4	Bond Coats, Tack Coats and Other Bituminous Sprays (Sheets 1, 2 and Binder Data Sheet)
	(C)(P)	7/5	In-Situ Recycling - The Remix and Repave Processes
	(C)(P)	7/6	Breaking Up or Perforation of Existing Pavement
	(C)(P)	7/7	Slurry Surfacing Incorporating Microsurfacing (Sheets 1,2 and 3)
	Not Used	7/8	Not Used
	(C)	7/9	Cold-Milling (Planing) of Bituminous Bound Flexible Pavement
	Not Used	7/10	Not Used
	Not Used	7/11	Overband and Inlaid Crack Sealing Systems
	Not Used	7/12	Arrester Beds
	Not Used	7/13	Saw-Cut, Crack and Seal Bituminous Overlays on Existing Joined Concrete Pavements
	Not Used	7/14	Preparation of Jointed Concrete Pavements Prior to Overlaying and Saw-Cut and Seal of Bituminous Overlay
	Not Used	7/15	Saw-Cut and Seat Existing Jointed Reinforced Concrete Pavements
	Not Used	7/16	Cracking and Seating of Existing Jointed Unreinforced Concrete Pavements and CBM Bases
	Not Used	7/17	Cracking Plant and Equipment Progress Record
	Not Used	7/18	Site Specific Details and Requirements for Cold Recycled Bitumen Bound Material
	Not Used	7/19	Site Specific Details and Requirements for Recycled Cement Bound Material

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
	Not Used	7/20	Not Used
	Not Used	7/21	Surface Dressing – Recipe Specification (Sheets 1, 2 and Binder Data Sheet)
	Not Used	7/22	Repair to Potholes
			ROAD PAVEMENTS – CONCRETE AND CEMENT BOUND MATERIALS
	Not Used	10/1	Plant and Equipment for the Construction of Exposed Aggregate Concrete Surface
			KERBS, FOOTWAYS AND PAVED AREAS
	(C)	11/1	Kerbs, Footways and Paved Areas
	(C)	11/2	Access Steps
			TRAFFIC SIGNS
	(C)	12/1	Traffic Signs: General
	(C)	12/2	Traffic Signs: Marker Posts
	(C)	12/3	Traffic Signs: Road Markings and Studs
	(C)	12/4	Traffic Signs: Cones, Cylinders, FTDs and Other Traffic Delineators
	(C)	12/5	Traffic Signs: Traffic Signals
	Not Used	12/6	Traffic Signs: Special Sign Requirements on Gantries
			ROAD LIGHTING COLUMNS AND BRACKETS
	Not Used	13/1	Information to be Provided When Specifying Lighting Columns and Brackets
	Not Used	13/2	(Specification for Highway Works) Typical Lighting Column and Bracket Data Sheets 1 and 2
	Not Used	13/3	Instructions for Completion of Lighting Column and Bracket Data Sheets
	Not Used	13/4	Information to be Provided When Specifying CCTV Masts
	Not Used	13/5	(Specification for Highway Works) Typical CCTV Mast Data Sheet
	Not Used	13/6	Instructions for Completion of CCTV Mast Sheets
	Not Used	13/7	Information to be Provided When Specifying Cantilever Masts
	Not Used	13/8	(Specification for Highway Works) Typical Cantilever Masts Data Sheets 1 and 2
	Not Used	13/9	Instructions for Completion of Cantilever Masts Data Sheets
			ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS
	Not Used	14/1	Site Records

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
	Not Used	14/2	Location of Lighting Units and Feeder Pillars
	Not Used	14/3	Temporary Lighting
	Not Used	14/4	Electrical Equipment for Road Lighting
	(C)	14/5	Electrical Equipment for Traffic Signs
			MOTORWAY COMMUNICATIONS
	Not Used	15/1	Motorway Communications
	Not Used	15/2	Cable Duct Requirements
			PILING AND EMBEDDED RETAINING WALLS
	(C)	16/1	General Requirements for Piling and Embedded Retaining Walls
	(C)	16/2	Precast Reinforced and Pre-stressed Concrete Piles and Precast Reinforced Concrete Segmental Piles
	(C)	16/3	Bored Cast-in Place Piles
	(C)	16/4	Bored Piles Constructed using Continuous Flight Augers and Concrete or Grout Injection
	(C)	16/5	Driven Cast-in-Place Piles
	(C)	16/6	Steel Bearing Piles
	(C)	16/7	Reduction of Friction on Piles
	(C)	16/8	Non-Destructive Methods for Testing Piles
	(C)	16/9	Static Load Testing of Piles
	(C)	16/10	Diaphragm Walls
	(C)	16/11	Hard/Hard Secant Pile Walls
	(C)	16/12	Hard/Soft Secant Pile Walls
	(C)	16/13	Contiguous Bored Pile Walls
	(C)	16/14	King Post Walls
	(C)	16/15	Steel Sheet Piles
	(C)	16/16	Integrity Testing of Wall Elements
	(C)	16/17	Instrumentation for Piles and Embedded Walls
	(C)	16/18	Support Fluid
			STRUCTURAL CONCRETE
	(C)	17/1	Schedule for the Specification of Designed Concrete
	(C)	17/2	Not Used
	(C)	17/3	Concrete - Surface Finishes
	(C)	17/4	Concrete – General
	(C)	17/5	Buried Concrete
	(C)	17/6	Grouting and Duct Systems for Post-tensioned Tendons
	(C)	17/7	Precast Concrete Products

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
			STRUCTURAL STEELWORK
	(C)	18/1	Requirements for Structural Steelwork
			PROTECTION OF STEELWORK AGAINST CORROSION
	(C)(P)	19/1	(Specification for Highway Works) Form HA/P1 (New Works) Paint System Sheet
	(C)(P)	19/2	Requirements for Other Work
	(C)(P)	19/3	(Specification for Highway Works) Form HA/P2 Paint Data Sheet
	(C)(P)	19/4	Form SEDD/P3 (Works) Paint Sample Despatch List, Sheets 1 and 2
	Not Used	19/5	General Requirements
			WATERPROOFING FOR STRUCTURES
	(C)	20/1	Waterproofing For Concrete Structures
			BRIDGE BEARINGS
	Not Used	21/1	Bridge Bearing Schedule
	Not Used	22/1	Not Used
			BRIDGE EXPANSION JOINTS AND SEALING OF GAPS
	Not Used	23/1	Bridge Deck Expansion Joints Schedule
	Not Used	23/2	Sealing of Gaps Schedule (Other than in Bridge Deck Expansion Joints)
			BRICKWORK, BLOCKWORK AND STONEWORK
	(C)	24/1	Brickwork, Blockwork and Stonework
			SPECIAL STRUCTURES
	Not Used	25/1	Requirements for Corrugated Steel Buried Structures
	Not Used	25/2	Requirements for Reinforced Earth and Anchored Earth Structures
	Not Used	25/3	Requirements for Pocket - Type and Grouted - Cavity Reinforced Brickwork Retaining Wall Structures
	Not Used	25/4	Environmental Barriers
	Not Used	25/5	Requirements for Buried Rigid Pipes for Drainage Structures
			MISCELLANEOUS
	(C)	26/1	Ancillary Concrete
	(C)	26/2	Bedding Mortar
	(C)	26/3	Cored Thermoplastic Node Markers

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

LIST 'A': List of Numbered Appendices Referred to in the Specification for Highway Works (Continued)

Volume Number	Completed by	Appendix Number	Title
			LANDSCAPE AND ECOLOGY
	(Co)(C)(P)	30/1	General, sheets 1, 2 and 3
	(Co)	30/2	Weed Control
	(Co)	30/3	Control of Rabbits and Deer
	(Co)	30/4	Ground Preparation
	(Co)	30/5	Grass Seeding, Wildflower Seeding and Turfing
	(Co)	30/6	Planting, sheets 1 and 2
	(Co)	30/7	Grass, Bulbs and Wildflower Maintenance
	(Co)	30/8	Watering
	(Co)	30/9	Establishment Maintenance for Planting
	(Co)	30/10	Maintenance of Established Trees and Shrubs
	(Co)	30/11	Management of Waterbodies
	(Co)	30/12	Special Ecological Measures
			MAINTENANCE PAINTING OF STEELWORK
	(C)(P)	50/1	(Specification for Highway Works) Form HA/P1 (Maintenance) Paint System Sheet
	(C)(P)	50/2	Requirements for Other Work
	(C)(P)	50/3	(Specification for Highway Works) Form HA/P2 Paint Data Sheet
	(C)(P)	50/4	Form SEDD/P3 Paint Sample Dispatch List: Sheets 1 and 2
	(C)(P)	50/5	General Requirements

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

LIST 'B': List of Contract – Specific Numbered Appendices devised for the Contract

Volume Number	Completed by	Appendix Number	Title
	(Co)(C)	0/7	Training and Employment Opportunities
	(Co)(C)	1/70	Site Safety

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

1. CONTRACT SPECIFIC DRAWINGS SUPPLIED TO EACH PARTICIPANT / TENDERER CONTAINED IN VOLUME 5 OF THE CONTRACT

Drawing Number	Revision	Title
Land Made Available Drawing		
47066861-SHT-05-0000-CH-0001	**A**	Land Made Available Drawing (Sheet 1 of 1)
Reference Drawing		
47066861-SHT-05-0000-CH-0002	B	Scheme Reference Drawing (Sheet 1 of 1)
Indicative Undertakers Works Drawing		
47066861-SHT-05-1600-CH-0001	A	Indicative Undertaker Works (Sheet 1 of 1)
Indicative Landscape and Planting Works Drawings		
47066861-SHT-05-3000-CH-0001	B	Overall Landscape Layout (Sheet 1 of 1)
47066861-SHT-05-3000-CH-0002	B	Landscape Layout (Sheet 1 of 2)
47066861-SHT-05-3000-CH-0003	B	Landscape Layout (Sheet 2 of 2)
47066861-SHT-05-3000-CH-0004	A	Planting Scheme (Sheet 1 of 1)

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

Drawing Number	Revision	Title
Standard Details		

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

2. STANDARD DRAWINGS

2 (i) SUPPLIED TO EACH TENDERER

Drawing Number	Title

2 (ii) INSPECTED BY TENDERERS

NOT USED

2 (iii) List of Drawings Brought into the Contract by Reference

Highway Construction Details (HCD) published by The Stationery Office (formerly HMSO) as Volume 3 of the Manual of Contract Documents for Highway Works contains the following drawings brought into the Contract by reference. Unless otherwise stated below the whole drawing is brought into the Contract.

Drawing Number	Title	Date	Aspect/Alternative(s) if Not Whole Drawing
HCD	All drawings other than those listed below.	Nov 08	

APPENDIX 0/5: SPECIAL NATIONAL ALTERATIONS OF THE OVERSEEING ORGANISATION OF SCOTLAND

The following Additions, Substitutions, Cancellations and minor alteration shall be made:

List of Substitute Clauses, Tables and Figures

Clause No	Title

List of Minor Alterations Clauses, Tables and Figures

Clause No	Title
NONE	

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES

1. Employability & Skills Plan (ESP)

1.1 The Contractor shall be required to provide the Employer with a completed version of the template Employment and Skills Plan (ESP) contained in Appendix 0/7, taking cognisance of the Construction Industry Training Board's (CITB) Client Based Approach (https://www.citb.co.uk/national-skills-academy-for-construction/what-is-the-national-skills-academy-for-construction/client-based-approach/). The output figures for the ESP are to indicate the minimum outputs for each month against the relevant Construction Industry Training Board Employment and Skills Areas contained in the ESP. The 'Summary – Planned Total' column in the ESP template is to be completed utilising the minimum CITB benchmark requirement figures for the Contract provided in Table 1 in Appendix 0/7. Guidance on the Employment and Skills Areas is included within Appendix 0/7. The Contractor is to use his own judgement as to what additional outputs he considers are achievable in relation to the Contract.

Table 1: Employment & Skills Areas - Benchmark Requirements

ESA Ref	Employment and Skills Area	Benchmark Requirement for Contract
1	**Work Placements – Persons** (Total of 1(a)+1(b))	2
1(a)	Work Placements (In education) - persons	
1(b)	Work Placements (Not in education) - persons	
2	**Jobs created by a National Skills Academy for Construction (NSAfC) project** (Total of 2(a)+2(b)+2(c))	4
2(a)	Jobs created by a NSAfC project (Apprentices)	
2(b)	Jobs created by a NSAfC project (New Entrants)	
2(c)	Jobs created by a NSAfC project (Graduates)	
3	**Construction Careers Information, Advice & Guidance (CCIAG) Events**	2
4	**Training Weeks on site** (Total of 4(a)+4(b)+4(c))	45
4(a)	Training Weeks on site (Apprenticeships)	
4(b)	Training Weeks on site (Graduates)	
4(c)	Training Weeks on site (New Entrants)	
5	**Qualifying the Workforce – project workforce** (Total of 5(a)+5(b)+5(c)+5(d))	20
5(a)	Qualifications gained (equivalent VQ2 and above) (Main Contractor)	
5(b)	Qualifications gained (equivalent VQ2 and above) (Sub-Contractor)	
5(c)	Industry certification gained (Main Contractor)	
5(d)	Industry certification gained (Sub-Contractor)	
6	**Training Plans**	1
7	**Case Studies**	2

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES (Continued)

1.2 In relation to the Employment and Skills Area 5(a) listed in Table 1 the Contractor shall maintain the following training opportunity:

(a) a minimum of 1 professional training site-based place for persons undertaking a professional engineering training scheme recognised and accredited by a national professional body (such as the Institution of Civil Engineers) and leading to membership of the professional body at technician or chartered level or equivalent.

2. Employment and Skills Plan (ESP) Method Statement

2.1 The Contractor is required to provide a detailed ESP Method Statement setting out how he intends to implement the employment and training requirements of the Employer and to deliver the ESP. The Method Statement should be restricted to 1000 words and clearly set out the proposed approach for delivery against the Employment and Skills Areas contained in Table 1. The ESP Method Statement should cover, as a minimum, the requirements listed in Table 2.

Table 2: ESP Method Statement Content Requirements

ESP Method Statement Content Requirements
Details of the person(s) in the organisation who will be responsible for managing the training scheme and overseeing the proposals
Details of the education and training providers who will be involved with the delivery of the ESP
Details of the types of accredited and non-accredited training expected to be offered and who are expected to be the main beneficiaries of this training
Details of the trades or occupational areas is it envisaged will be offering Apprenticeship opportunities
Details of the types of Apprenticeship expected to be offered (i.e. traditional, programme, Advanced etc.)
Details of how the target outputs as set out in the ESP will be delivered
Details of how health and safety training will be managed
Details of the actions that will be taken to ensure the support of sub-contractors working on the project
Details of how compliance will be managed (and monitored) with respect to the organising subcontractors

3. Reporting Requirements

3.1 The Contractor shall provide to the Employer the following reports, (a), (b) and (c) on a monthly basis:

(a) A report on a monthly basis, outlining the achievements during the previous month against the ESP and ESP Method Statement and shall provide details of the various employment and skills activities delivered in the month. The Employer will monitor the Contractor's compliance with and implementation of the ESP and ESP Method Statement. The template ESP provided in Appendix 0/7 is suitable for monthly reporting. Documentary evidence (electronic or hard copy) to support validation of each activity shall be collated by the Contractor and filed in date order under each benefit heading. On receipt of each monthly report the Engineer will validate the delivery of benefits, querying as necessary any evidence that is unclear or

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES (Continued)

inconclusive. The Engineer will send a copy of the validated monthly report to Transport Scotland, who may, at any time, carry out monitoring, spot checks or audit the delivery of benefits. A report on a monthly basis, identifying the following information:

For the Contractor:

(i) numbers of staff employed on site broken down by postcode; and

(ii) number of staff providing head office support to the site.

For all Contractor Parties:

(i) numbers of staff employed on site broken down by postcode;

(ii) the total number of staff broken down by postcode providing head office support to the site; and

(iii) the Company Reference Number as registered at Companies House for each Contractor Party.

(b) A report on a monthly basis, in relation to the wider community benefits being delivered, a report covering the data requirements contained in Table 3. Such reporting forms part of the Employer's reporting obligations under the Procurement Reform (Scotland) Act 2014 and in accordance with the Scottish Governments requirements.

Table 3: Community Benefit Reporting Requirements

Ref	ESA Ref	Reporting Criteria	Measure	Monthly Total	Cumulative Total
CB1	ESA 2	Number of vacancies filled by priority groups*	1 job (vacancy)		
CB2	ESA 2(a)	Number of apprenticeships filled by priority groups*	1 job (apprenticeship)		
CB3	ESA 2(a)	Number of apprenticeships recruited to deliver contract	1 person (apprentice)		
CB4	ESA 1(b)	Number of work placements for priority groups*	1 completed placement		
CB5	ESA 1(a)	Number of work placements for school pupils, college and university students	1 completed placement		
CB6	ESA 4&5	Number of qualifications achieved through training by priority groups*	1 qualification/ certification		

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES (Continued)

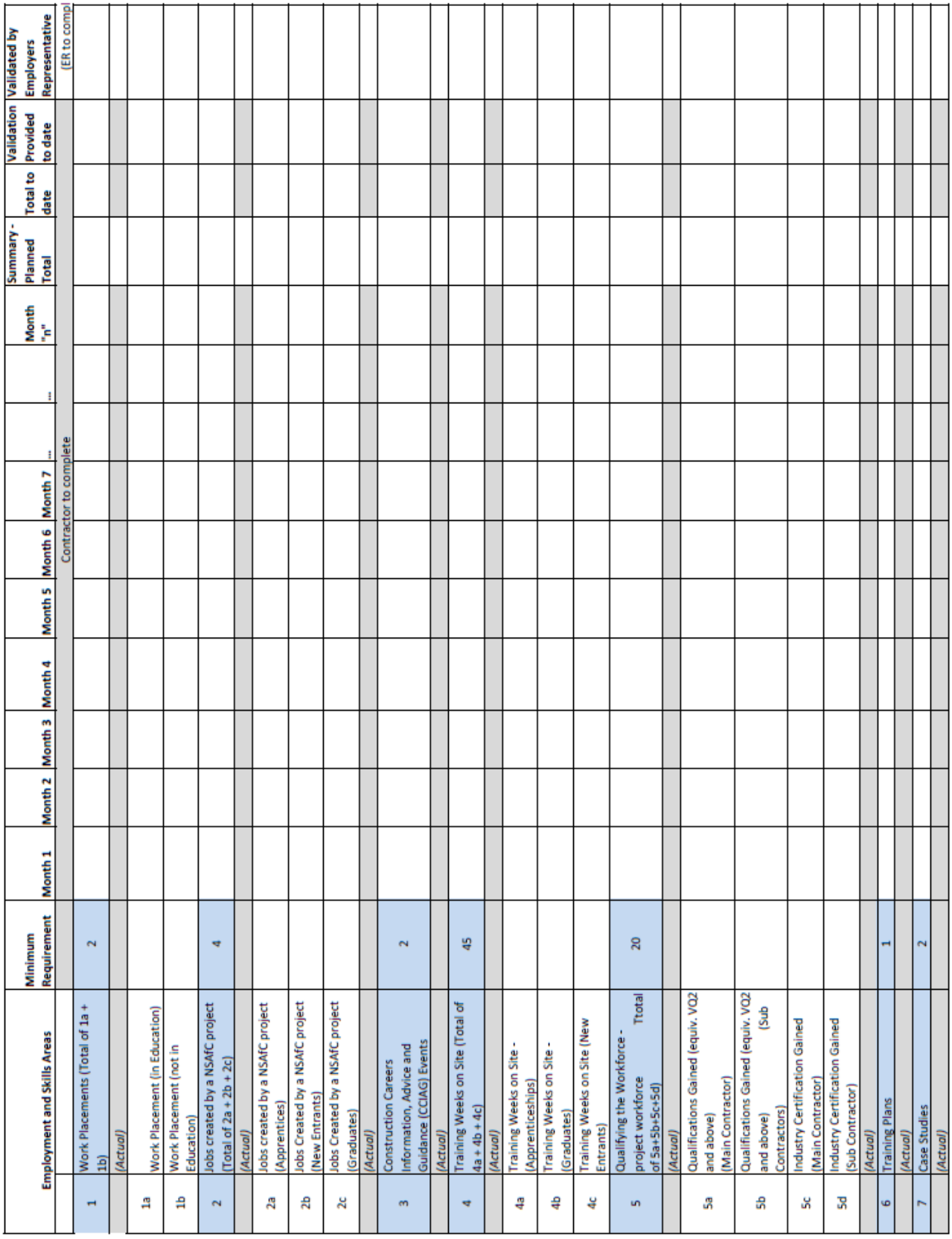
Ref	ESA Ref	Reporting Criteria	Measure	Monthly Total	Cumulative Total
CB7	ESA 4&5	Number of qualifications achieved through training by other employees	1 qualification/ certification		
CB8	ESA 2	Number of recruits from priority groups* employed at 26 weeks after job start	1 person		
CB9	ESA 2(b)	Number of apprenticeships from priority groups* employed at 26 weeks after apprenticeship start	1 person		
CB10	ESA 1&2	Number of work placements for priority groups* subsequently recruited by Contractor/Sub-Contractor	1 person		
CB11	-	Total number of jobs advertised through local job centres	1 job		
CB12	ESA 2	Number of jobs filled by priority groups*	1 job		
CB13	-	Number recruited to deliver Contract	1 person		
CB14	-	Number of sub-contracts awarded to Small to Medium Enterprises SMEs	1 contract		
CB15	-	Value of sub-contracts awarded to Small to Medium Enterprises (SMEs)	£ value		
CB16	-	Number of sub-contracts awarded to Social Enterprises	1 contract		

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES (Continued)

Ref	ESA Ref	Reporting Criteria	Measure	Monthly Total	Cumulative Total
CB17	-	Value of sub-contracts awarded to Social Enterprises	£ value		
CB18	-	Number of sub-contracts awarded to Supported Businesses	1 contract		
CB19	-	Value of sub-contracts awarded to Supported Businesses	£ value		
CB20	-	Number of sub-contracts advertised via Public Contracts Scotland portal	1 sub-contract		
CB21	ESA 3	Community Engagement Activities	Individual activity		

*** Priority groups include young people, unemployed & disadvantaged groups**

APPENDIX 0/7: TRAINING AND EMPLOYMENT OPPORTUNITIES (Continued)



	Employment and Skills Areas	Minimum Requirement	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	...	...	Month "n"	Summary - Planned Total	Total to date	Validation Provided to date	Validated by Employers Representative
			Contractor to complete													(ER to compl
1	Work Placements (Total of 1a + 1b)	2														
	(Actual)															
1a	Work Placement (in Education)															
1b	Work Placement (not in Education)															
2	Jobs created by a NSAfC project (Total of 2a + 2b + 2c)	4														
	(Actual)															
2a	Jobs created by a NSAfC project (Apprentices)															
2b	Jobs Created by a NSAfC project (New Entrants)															
2c	Jobs Created by a NSAfC project (Graduates)															
	(Actual)															
3	Construction Careers Information, Advice and Guidance (CCIAG) Events	2														
	(Actual)															
4	Training Weeks on Site (Total of 4a + 4b + 4c)	45														
	(Actual)															
4a	Training Weeks on Site - (Apprenticeships)															
4b	Training Weeks on Site - (Graduates)															
4c	Training Weeks on Site (New Entrants)															
5	Qualifying the Workforce - Ttotal project workforce of 5a+5b+5c+5d)	20														
	(Actual)															
5a	Qualifications Gained (equiv. VQ2 and above) (Main Contractor)															
5b	Qualifications Gained (equiv. VQ2 and above) (Sub Contractors)															
5c	Industry Certification Gained (Main Contractor)															
5d	Industry Certification Gained (Sub Contractor)															
	(Actual)															
6	Training Plans	1														
	(Actual)															
7	Case Studies	2														
	(Actual)															

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

1. Accommodation Required

1.1 Office Accommodation for Period 1 defined in Section 11 of this Appendix.

An integrated office-building facility comprising accommodation for shared occupation by the Overseeing Organisation and the Contractor shall be provided by the Contractor with single joint entrance and reception area, including shared conference room and messing facilities, car parking and security arrangements.

The office building shall be constructed of secure 'anti-vandal' steel shell office-accommodation units or any system, which is deemed suitable for temporary accommodation of this nature, which is acceptable to the Overseeing Organisation.

The office-building facility shall be connected to existing water, 240 volt AC electricity supply, and telecommunication utilities for provision of water, heating, lighting and telephone. Sewage disposal shall be either direct to existing piped mains facility or specially provided septic tanks which shall be regularly serviced. The Office Building shall comply with and be maintained to comply with the Construction (Health, Safety and Welfare) Regulations 1996. The Electricity at Work Regulations 1989 shall be complied with in all respects in case of equipment and furnishing of rooms in the office-building. Prior to occupation the Contractor shall have the Building appropriately certified by the local authority and fire brigade as suitable for occupation and use intended.

The office accommodation for the use of the Overseeing Organisation and all facilities to be shared with the Contractor shall be to a high standard of, including for but not limited to, structural integrity, aesthetics, internal finishing, equipment and furniture as described below. The location and layout of the integrated office facility shall be wholly acceptable to the Overseeing Organisation whilst conveniently located in close proximity to, and possibly overlooking, the construction works. At the same time the integrated office-building facility shall be set apart from the Contractor’s site operations plant store and depot and routes used by construction traffic.

The office-building shall also be provided with a separate entrance and lobby area away from the main entrance, conveniently located within its layout for direct access by personnel of the Employer and Engineer’s Representative and Contractor when either visiting or returning from the construction site for purpose of changing into or removing/cleaning and storing boots and safety gear.

Raised doorway entrances and access ways to the office building that have steps/stairway approaches shall have tubular steel handrails fitted either side of the access stairway.

The Contractor shall form access from the public road a minimum of 3 metres wide and provide car parking allowing space for 5 No. Overseeing Organisation vehicles and 3 visitor’s cars. The roads and car park shall have a bituminous surface. The road access shall be kept clear of mud and debris and shall not be used by construction plant.

Fire exit routes from the offices shall be of concrete slabs or bituminous surface free from steps and other obstacles constructed so as to enable rapid and efficient drainage. All road surfaces and access to the public road connected with the office –building shall be constructed on a prepared ground and covered with bituminous surfacing and have positive drainage.

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

1.1 Office Accommodation for Period 1 defined in Section 11 of this Appendix. (Continued)

The Overseeing Organisation shall be consulted by the Contractor on the entire integrated layout and specification of the office-building facility that the Contractor intends to provide based on the requirements stated in this Appendix, and shall obtain the approval of the Overseeing Organisation prior to commencement of any work in connection with the building facility.

The integrated office-building (or units) facility shall be adequately guarded at all times to ensure no unlawful or unauthorised entry.

The integrated office-buildings (or units) facility shall fulfil the following construction requirements and operational conditions as a minimum requirement:

The office building shall be erected on pre-prepared under-building of brick or concrete dwarf walls founded on concrete strip-footings with damp-proof course. The underside of the external walls and floors of the office-building shall not be less than 400 millimetres above surrounding ground level. Floors of the office shall be of tongue and groove timber, lined with hardboard or plywood and covered with vinyl floor covering. External walls shall contain a suitable vapour barrier and a 25 millimetres layer of glass wool or equivalent insulation. Internal walls shall be smooth with coloured oil based paint. Headroom shall be not less than 2.25 metres. Ceilings shall be plasterboard covered on top with 25 millimetres layer of glass wool insulation and finished with two coats of white water based paint. The office-building shall be completely weatherproof and watertight. Windows shall comprise double-glazed sealed units or equivalent with window-area being not less than 2 square metres for every 10 square metres of floor area and with each window having opening facility for at least one-third of the window size. All windows shall be fitted with external roller-blinds operated internally for purpose of security and Venetian-type blinds shall be fitted internally.

All pipe-work shall be suitably lagged and/or insulated to prevent freezing.

All internal doors to rooms shall be fitted with mortice-locks and 2 [all] sets of keys for rooms occupied by the Overseeing Organisation and its Representatives shall be handed over to the Overseeing Organisation. The Contractor shall record the distribution of all room-keys and control additional issue of room-keys. The external doors shall be fitted with draught excluders and mortice locks, whilst the doors to the entrance and reception area shall be fitted with an electronic opening and closing / locking device operated by means of electronic smart-card. The Contractor shall provide smart-cards for use by individuals in the Overseeing Organisation and shall record the distribution of all smart-cards.

The offices shall be provided with 240 volt AC electricity supply with 13 amp socket outlets suitably spaced and provided around the office on the basis of 2 dual gang socket for each 5 square metres of office space.

Within the integrated office-building facility, the Contractor shall provide individual office space / rooms for the sole use of the Overseeing Organisation’s staff excepting in cases where staff and /or representatives of the Overseeing Organisation and the Contractor are carrying out comparable duties in which case such office space and rooms shall be occupied by Overseeing Organisation and the Contractor.

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

1.1 Office Accommodation for Period 1 defined in Section 11 of this Appendix. (Continued)

The office-building facility including both individual office space/rooms and the jointly occupied office space/rooms and facilities provided for use by the Overseeing Organisation shall include furniture, fixtures and fittings, equipment, stores, protective clothing, and surveying equipment and supplies as listed below, for the Overseeing Organisation's exclusive use and shall be regarded as the minimum requirement.

All furniture, fixtures and fittings, equipment, stores, protective clothing, and surveying equipment computers, computer peripherals software and all supplies for the Overseeing Organisation's exclusive use shall be new and unused.

Complete security, privacy and confidentiality shall be ensured at all times in the rooms and for all facilities including computers and peripherals which are provided for contract administration activities undertaken by the Overseeing Organisation as described below.

All the telecommunication lines and facilities provided for use by the Overseeing Organisation as described below, shall be completely independent of the Contractor's facilities, to ensure privacy and confidentiality and shall be as a separate account.

The room - layout and particular room requirements of that part of the office-building facility occupied by the Overseeing Organisation and its Representatives shall have minimum floor areas as listed in the table immediately below:

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

ROOM DESCRIPTION	REF	AREA (SQ METRES)	PARTICULAR REQUIREMENTS
Overseeing Organisation			
Overseeing Organisation	A	20	
Reception (with waiting area) - telephone and security desk	B	20	Shared / Managed by Contractor
Conference Room	C	40	Located near main entrance and reception
Engineer's Representative and Staff			
Engineer's Representative	D	20	Adjoining room E/accessed through E
Secretary / Administration	E	16	Located near reception
Assistant Engineers Representative (2)	F	16	
Room for printer/photocopier	G	10	Room adjoining room E but with common access off corridor and not accessed through room E.
Inspectors and part time Engineers	H	12	
Storage room	I	12	
General Shared Facilities			
Kitchen - cooking and dish washing facilities	J	20	Shared with Contractor
Dining Area with drinking water dispenser	K	20	Shared with Contractor
Lobby Area / Boot Room	L	10	Shared with Contractor
Male Toilet Facilities – Linked with N	M	15	Shared with Contractor
Male Shower Closet and changing area - Accessed via M	N	5	Shared with Contractor
Female Toilet Facilities – Linked with P	O	10	Shared with Contractor
Female Shower Closet and changing area - Accessed via O	P	5	Shared with Contractor

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

A regularly serviced supply of cooled bottled drinking water and dispensing device shall be provided in the kitchen area.

The management and administration system implemented by the Contractor shall include for effective and advance allocation of the shared conference room facility to meet the requirements of both the Overseeing Organisation and the Contractor.

The office building shall be properly cleaned and serviced at least once per working day, for so long as it is in use with essential cleaning and servicing being carried out outside normal Site working hours but not without presence of office security or other authorised personnel.

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

1.2 Office Accommodation for Period 2 of the Works as defined in Section 11 of this Appendix

A reduced office requirement shall be provided for use by the Overseeing Organisation for Period 2 over the duration stated in Section 11 of this Appendix while maintaining equal standard of provision and service as for Period 1.

The office layout or area of office accommodation that is to remain occupied shall be as agreed by the Overseeing Organisation such as to fulfil the requirements of the Overseeing Organisation and its Representatives for Period 2. The area of office accommodation in the table herewith below is indicative of such requirements which are the minimum.

ROOM DESCRIPTION	REFERENCE	AREA (SQ. METRES)
Overseeing Organisation	A	20
Conference Room	C	40
Office	D	20
Office	E	16
Room for printer/photocopier	G	10
Office	H	12
Storage room	I	12
Kitchen facilities	J	Shared with Contractor
Male Toilets	M	Shared with Contractor
Female Toilet	O	Shared with Contractor

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

2. Furnishings and Fitments

ROOM A Overseeing Organisation

Quantity	Item
1	Independent telephone and ISDN line
1	Telephone extension connected to switchboard and connection to Contractor
1	1.8 metres by 1.0 metres double pedestal desk with locking drawers with side unit with veneered surface
1	5 point swivel wheeled desk armchair fully adjustable
1	Meeting table; 2 metres long by 1 metre wide or similar with veneered surface with 4 padded chairs
2	Padded office arm Chairs
2	Lockable 4 drawer, steel filing cabinet, each drawer complete with file hangers
4	Coat hooks
1	Wastepaper bin
1	Paper punch and stapler
1	Set / 4 tier filing trays
2	Cat 5 (RJ45) surface mounted boxes – connected to LAN
1	Stand alone A3/A4 colour printer with installation software
1	Laptop as per Section 4.1 and 4.3 below

ROOM C Conference Room

Quantity	Item
1	Conference table 6 metres by 1.5 metres or similar approved
15	Conference chairs
1	1m deep framed cork or strawboard mounted on length of one wall at appropriate height
1	White Marker Board 1m x 1.5m (with supply markers) mounted on wall at appropriate position.
2	Cat 5 (RJ45) surface mount boxes – connected to LAN
1	Telephone extensions connected to switchboard
1	Audio Conferencing Facility

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

ROOM D (Engineer's Representative)

Quantity	Item
1	Telephone extension connected to switchboard and connection to Contractor
1	1.8 metres by 1.0 metres double pedestal desk with locking drawers and side unit with veneered surface
1	5 point swivel wheeled desk armchair fully adjustable
1	Meeting table 2 metres x 1 metre with veneered surface with 4 padded chairs
1	Plan chest A0 size with 6 drawers or Vertical plan-file
2	Padded office arm chairs
1	Lockable steel cupboard 1.2 metres by 1.8 metres minimum
1	Lockable 4 drawer steel filing cabinet, each drawer complete with hangers
1	Framed cork or strawboard panelling wall board mounted 3mx1m
1	White Marker Board 1.5mx1m
1	Glass fronted bookcase 1.5 metres wide by 1.0 metres high
4	Coat hooks
1	Wastepaper bin
1	Paper punch and stapler
1	Set / 4 tier filing trays
1	3 metres of 225 millimetres by 25 millimetres shelving
2	Cat 5 (RJ45) surface mount boxes – connected to hub (LAN)
1	Laptop as per Section 4.1 and 4.3 below

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

ROOM E (Secretary / Administration)

Quantity	Item
1	1.8 m by 1.0m secretarial work station with side desk with locking drawers with veneered surface
1	5 point swivel wheeled armchair fully adjustable
1	Work -table 2 metres x 1 metre wide with veneered surface
1	Office chairs
2	Lockable steel cupboard 1.2 metres by 1.8 metres minimum
4	Lockable 4 drawer steel filing cabinet, each drawer complete with hangers
1	Framed cork or strawboard panelling wall board mounted 3mx1m
6	Coat hooks
1	Wastepaper bin
1	Paper punch and stapler
2	Set/ 4 tier filing tray
2	Cat 5 (RJ45) surface mount boxes – connected to hub (LAN)
1	PC as per Section 4.1 and 4.3 below
1	Caller-connect telephone terminal with two outside lines and capable of handling up to 12 extensions, plus a connection to the Contractor's main office. All telephones to have caller connect and announcement facility
1	
1	
1	Document shredder - business type fully mounted with disposal container.
1	Laptop as per Section 4.1 and 4.3 below
Supply of	A4 and A3 copying paper as required for photocopier and word processing for duration of Period
1	Network colour printer copier scanner with e-mail facility, document feeder and sorting collating facility for exclusive use of the Overseeing Organisation as per Section 4.3.2 below
1	Storage cupboard for supplies, paper etc. (lockable)

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

ROOM F Assistant Engineer's Representatives (2 personnel)

Quantity	Item
1 per person	Telephone extension connected to switchboard
1 per person	1.8 metres by 1.0 metres double pedestal desk with locking drawers and side unit with veneered surface
1 per person	5 point swivel wheeled armchair fully adjustable
1 per room	Table / bench 3.0 metres by 1.0 metres 1 metre above floor level
1 per room	Plan chest A0 size with 6 drawers or Vertical plan-file
1 per person	5 point swivel wheeled chair
1 per person	Lockable steel cupboard 1.2 metres by 1.8 metres minimum
1 per person	Lockable 4 drawer, steel filing cabinet, each drawer complete with A4 hangers
1 per room	Framed cork or strawboard panelling mounted on wall 3mx1m, 1.0 m above floor
1 per person	Glass fronted bookcase 1.5 metres wide by 1.0 metres high
1 set per room	Coat hooks (4)
1 per person	Wastepaper bin
1 per person	Paper punch and stapler
1 per person	4 tier beanstalk filing tray with base
1 set per room	6metres of 225 millimetres shelving
1 per person	Cat 5 (RJ45) surface mount boxes – connected to LAN
1 per person	Laptop as per Section 4.1 and 4.3 below

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

ROOM H – Inspectors and part time Engineer (3 personnel)

Quantity	Item
1	Telephone extensions connected to switchboard
2	1.5 metres by 1.0 metres double pedestal desk with locking drawers with veneered surface
2	5 point swivel wheeled armchair fully adjustable
1	Work table 3.0 metres by 1.0 metres with veneered surface
2	Office chairs
1	Plan chest A0 size with 6 drawers
1	Vertical Plan file (open hangers)
1	Lockable 4 drawer, steel filing cabinet, each drawer complete with vertical hangers
2	3 metres x 1 metre framed cork or strawboard panelling mounted on wall 1.0 metres above floor
2	3 metre long shelves 225 millimetres by 25 millimetres
2	Coat hooks
2	Wastepaper bin
2	Set /4 tier filing tray
1	Cat 5 (RJ45) surface mount boxes – connected to LAN
2	Laptop as per Section 4.1 and 4.3 below
2	Desktop pencil sharpener
1	Storage racks for survey equipment

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

ROOMS J and K Kitchen and Dining Area

Quantity	Item
1	Stainless steel sink with draining board, complete with cupboards and Formica worktop, hot and cold water supply
1	Dishwasher
1	'King size' waste bin complete with supply of liners
1	Wall mounted cupboard 2.0 metres long
1	Base unit 2.0 metres long with drawers and cupboards complete with Formica worktop 3.5 metres long
1	Electric water urn, with filling facilities
1	3 pint electric kettle with automatic switch-off
1	3 pint teapot
1	3 pint coffee pot
1	6 cubic feet refrigerator
1	800 watt microwave with turntable
1	Cold water drinking dispenser
1	Fire extinguishers
1	Fire blanket
1	Window mounted powered extractor fan
1	First aid kit complying with the requirements of the Health and Safety (First Aid) Regulations 1981.
1 set	Crockery, cutlery and cooking utensils for 10 persons or as required by the Overseeing Organisation (to be replaced as required)
	Supply of tea, coffee, milk and sugar (replenished as required during periods)
	Supply of towels (replenished and laundered during periods)
Min 3 sets	Table and 4 chairs

ROOM L Lobby Area / Boot Room

Quantity	Item
2	Timber bench (or fixed seating) 2 metres long
10	Personal metal lockers
1	Clothes drying rack with tubular heater and 8/10 number coat hooks

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

ROOMS M and N Male Toilet Facilities and Shower Unit

Quantity	Item
3	WC suites
3	Toilet roll holders and supply of toilet rolls
3	Bowl type urinals complete with auto-flush
3	Wash-hand basins complete with taps and hot and cold water supply
2	Towel dispensers laundered and replenished when required
2	Liquid soap dispensers with supply of liquid soap, or supply of soap
1	Electric wall-mounted hand drier
1	Wall mirror
4	Coat hooks
1	Window mounted powered extractor fan
1	Shower unit and changing area in separate compartment with door off main toilet area

ROOMS O and P Female Toilet Facilities

Quantity	Item
2	WC suites
2	Toilet roll holders and supply of toilet rolls
1	Wash–hand basins complete with taps and hot and cold water supply
1	Towel dispensers laundered and replenished when required
1	Electric wall-mounted hand drier
1	Liquid soap dispensers with supply of liquid soap, or supply of soap
1	Sanitary bin
2	Wall mirrors
3	Coat hooks
1	Window mounted powered extractor fan
1	Shower unit and changing area in separate compartment with door off main toilet area

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

3. Weather Recording Apparatus

The Contractor shall set up and maintain, at a position to be determined by the Overseeing Organisation, a set of apparatus comprising: maximum/minimum thermometer in a standard shelter and a rain gauge for daily reading. The Contractor shall supply and maintain a portable anemometer provided with tripod and recording device.

4. Computer Equipment

All the equipment listed below shall be maintained by the Contractor up to the issue of the Certificate of Completion for the whole Works plus 3 months unless otherwise stated. The equipment will be installed and commissioned by a reputable Quality Assured supplier (BS EN9001). The equipment will be covered by a hardware maintenance contract with an eight hour maximum response time for repair or replacement. Equipment is to be installed in the respective rooms described above in the preceding Section 2 according to the details specified below; these are regarded as typical and alternative suppliers may be considered; the details of the entire package of computers and peripherals shall however be agreed with the Engineer.

4.1 Laptop / notebook computers – (to be retained by the allocated users for the duration of the Period of Maintenance)

Dell Latitude E7450 or similar mid range light-weight laptop approved by the Engineer	
Processor type	Intel® Core™ i5 Mobile processor
	• Intel® Core i5
	• 2.53GHz (minimum)
Operating system installed	Genuine Microsoft® Windows® 7 Professional 64-bit
Compatible operating systems	Genuine Windows Vista® Business 64-bit, Genuine Windows Vista® Enterprise, SuSE Linux Enterprise Desktop 10
Display type	WXGA
Display size	14.1 inches diagonal
Product weight	Maximum Weight 2.2kg
Product dimensions (W x D x H)	3.1 (at front) x 33.1 x 24.3 cm
Battery life	Up to 8 hours
System features	
Internal drives	256 GB
Hard disk drive speed	7200 rpm
Optical drives	LightScribe DVD+/-RW SuperMulti with Double Layer Fixed
Standard memory	8 GB RAM (minimum)
Chipset	nVIDIA Quadro NVS Graphics Card (minimum)
Portability	
Product weight	Maximum Weight 2.2kg
Product dimensions (W x D x H)	3.1 (at front) x 33.1 x 24.3 cm
Display type	WXGA
Display size	14.1 inches diagonal

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

Laptop / notebook computers – (continued)

Connectivity	
Wireless technologies	Intel 802.11a/b/g/n mini-pci card, Bluetooth; 3G Broadband Wireless integrated
Wireless capability	Yes
Modem	56K modem
Network interface	Intel Gigabit Network Connection (10/100/1000 NIC)
Expandability	
External I/O ports	3 USB 2.0 ports, VGA, stereo microphone in, stereo headphone/line out, Firewire (1394a), power connector, RJ-11, RJ-45
Graphic / audio	
Video resolutions description	1280 x 800 WXGA with camera
Audio	High Definition Audio, stereo speakers, stereo headphone/line out, stereo microphone in, integrated dual-microphone array
Other information	
Keyboard	Full-sized keyboard
Pointing device	Enhanced dual pointing devices (touchpad and pointstick) with scroll zone
Power features	Lithium-Ion battery
Power requirements	AC Adapter with Fast Charge, Spare power pack and cables, Car Charging lead.
Battery life	Up to 8 hours Extended Battery
Security management	McAfee Security Solution, Kensington Lock slot, HP Privacy Filter (optional)
Docking solution	Port Replicator and cabling for mounting in office. Port replicator to be lockable (with 2 keys provided) to allow secure fixing of computer if left in office outside of working hours. Security cable to be provided to connect between locking-point on port replicator and appropriate fixing at the other end mounted securely to the frame of the desk.
Configuration management	Manufacturer Client Configuration Management Agent

4.2 Network (LAN)

The contractor shall provide the following:-

Facilities to allow for a minimum of fifteen concurrent Virtual Private Network (VPN) connections via a high speed broadband solution with a minimum connection speed of 8Mb per VPN connection.

One desktop pc is required to have two hard drives to double as a network server. The server shall have a degree of hardware redundancy built in by utilising hard drive mirroring or similar and an external USB drive attached to back up data on the server each evening.

The network shall be installed by the Contractor to facilitate free access to internet and enable inter-office communication via email.

Facilities to allow for server back up held off-site.

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

4.3 Ancillary Equipment

4.3.1 Computer Software - All of which shall be the most up to date version available at the Date of Award of Contract

The latest versions of the following software shall be installed on each computer:

- Microsoft Office Professional
- Microsoft Outlook
- Firewall hardware (minimum frequency of updates to be weekly for the duration of the Contract)
- Anti Virus software (minimum frequency of updates to be weekly for the duration of the Contract)
- Photo editing/image handling software
- CD/DVD authoring/writing software
- Adobe reader
- Autodesk DWG True View and Autodesk DWF viewer
- Suitable software to download Total Station information

The Contractor shall provide 2 copies of AutoCAD LT, MS Project and 1 copy of Adobe Professional with licences to be installed on computers as directed by the Overseeing Organisation.

The software shall be installed on each computer while each full set of the disks and documentation must be supplied for each set of software installed to the Overseeing Organisation.

4.3.2 Copier/Printers

The following are required to be installed in the Rooms, as indicated in the respective tables in preceding Section 2.

1 No combined colour printer copier scanner with e-mail facility, document feeder and sorting collating facility for exclusive use of the Overseeing Organisation. It shall be capable of printing/scanning/copying to both A4 and A3 paper size, producing more than 20 A4 copies per minute. The equipment shall be provided new and installed and commissioned by a reputable Quality Assured supplier (BSEN9001). The equipment shall be covered by a hardware maintenance contract with a minimum eight hour maximum response time for repair or replacement. It shall be connected to the computer network (LAN) and must have associated network software and cabling. Paper and all consumables shall be supplied by the Contractor as required.

1 No stand alone A3 colour printer (with installation software) shall be provided in room A

4.3.3 Photographic and Video Equipment

Portable video camera (GoPro 4 or similar) and appropriate vehicle dashcam mounting kit.

4.3.4 Audio Conferencing Facilities

The following are required to be installed in the Rooms, as indicated in the respective tables in preceding Section 2.

1 No high quality audio conferencing facility, capable of hosting long distance conference meetings with multiple parties, shall be provided in room C.

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

5. Schedule of Surveying and Other Equipment

The following equipment shall be for the exclusive use of the Overseeing Organisation and his staff, and shall be as described, or equivalent. The Contractor shall be responsible for the supply of labour and materials for cleaning the equipment throughout the period of the Contract:

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

Quantity	Item
1	Total Station with the following minimum equipment and specifications: • Continuous angle encoder with standard deviation (ISO 17123-3) of 5" and minimum reading of 1" of arc. Accuracy 2mm + 2ppm (ISO 17123-4) with capability of measuring to 3km to a single prism. Capable of measuring to all types of prism targets including retro tape. Fitted with laser plummet. Endless horizontal and vertical drives. On-board memory for at least 10,000 data blocks board applications – surveying and orientation, free station, stakeout, tie distance, height transfers, reference line/arc, are calculations, remote height and hidden point.
2	Heavy duty tripod, tribrach, 2 sets internal batteries and charger, data transfer cable, detail pole and large circular prism with target plate. Half transverse kit comprising a heavy duty wooden tripod, tribrach, carrier, optical plummet and prism. If GPS technology is being used on the contract then the Company must supply a GPS(GNSS) receiver to meet the following specifications: (i) Completely cable-free 220 channel GNSS rover capable of tracking GPS frequencies (L1, L2, L2C & L5) and GLONASS frequencies (L1, L2). Fully integrated radio or GPRS modem capable of receiving RTCM 3.x and CMRx corrections. Receiver should be fully ruggedized to IP67 rating. (ii) Accuracy (RMS) in Kinematic mode of 8 millimetres+1ppm in plan and 15 millimetres +1ppm in height. Accuracy (RMS) in Network RTK mode of 8 millimetres +0.5ppm in plan and 15 millimetres +0.5ppm in height. (iii) Initialisation reliability should be >99.9% and standard time for initialisation should be less than 10 seconds. (iv) Logger at pole should be fully ruggedized (MIL-STD-810F); have a Windows Mobile operating system and a battery life of up to 30 hours. Application programs to be included – surveying, stakeout, reference line / arc, area calculations and roading. The roading program should support the reading and use of the industry standard MX GENIO format directly (without conversion to maintain integrity of the data). (v) Heavy duty wooden tripod, tribrach, GPS Tribrach adapter, 2 internal batteries, (2400Ah each) and detail pole. (vi) If a local transformation or calibration is being used by the Company, the parameters must be supplied. While the total station / GNSS receiver must meet all the above requirements, the total station / GNSS receiver shall not be to any lesser specification than that used by the Company's staff and shall be compatible with the Company's method of setting out / setting out data and equipment. The Company shall provide training as requested by the Contracting Authority on the operation and use of the Total Station.
1	Automatic Level with (Minimum specification as follows: 30x magnification, accuracy per 1km double levelling of 0.8mm, Single measurement accuracy of 1.2mm at 30m), aluminium tripod, aluminium staff and detachable staff bubble. Notwithstanding the above requirements, the automatic level shall not be to any

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

Quantity	Item	
	lesser specification than that used by the Company's staff. The Company shall provide training as requested by the Contracting Authority on the operation and use of the automatic level.	
1	Electronic cover meter (with facility for downloading to computer)	
3	30 metre measuring steel tape	To be renewed
1	50 metre measuring fibron tape	by the Contractor
2	30 metre measuring fibron tape	as required by
5	5 metre pocket measuring tapes	the Overseeing Organisation
1	Universal straight edge with wedge gauge for measuring depressions	
2	1.0m and 0.3m spirit levels	
4	Rechargeable torch with batteries – replaced as required	
4	LED head torches with batteries – replaced as required	
-	Supply of waterproof marking chalk in various colours, spray road marking paint in various colours, pegs, rails, wooden stakes, nails, string and nylon line. Supplies to be renewed by the Contractor as and when required	
3	Claw Hammer	
2	Lump / Club Hammer	
2	Maximum and minimum thermometers in weatherproof case	
1	Intrinsically safe inspection lamp with supply of batteries or chargers	
1	Gas detection apparatus with charger	
1	Digital thermometer with material, surface and air probes	

The contractor shall at any reasonable time make available for the use of the Engineer's Representative, his staff and others acting at his request, all appropriate safety equipment necessary to gain safe access to any part of the Works. The Contractor shall provide all training and attendance necessary for the safe and effective use of equipment provided for the purpose of gaining access to the Works.

The Contractor shall make available to the Engineer the use of any other survey equipment on Site as required.

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

6. Supply of Documentation

The Contractor shall supply and maintain for the sole use of the Overseeing Organisation one copy, on compact disk from the Stationary Office, suitable for display on the equipment specified in section 4.1 of Appendix 1/1 of this Specification, of The Manual of Contract Documents for Highway Works and Design Manual for Roads and Bridges comprising:

Specification and Bill of Quantities

Volume 1	Specification for Highway Works
Volume 2	Notes for Guidance on the Specification for Highway Works
Volume 3	Highway Construction Details
Volume 4	Bills of Quantities for Highway Works

Design Manual for Roads and Bridges

Volume 1	Highway Structures: Approval Procedures and General Design
Volume 1a	Highway Structures: Approval Procedures and General Design
Volume 2	Highway Structures: Design (Substructures and Special Structures) Materials
Volume 2a	Highway Structures: Design (Substructures and Special Structures) Materials
Volume 3	Highway Structures: Inspection and Maintenance
Volume 3a	Highway Structures: Inspection and Maintenance
Volume 3b	Highway Structures: Inspection and Maintenance
Volume 4	Geotechnics and Drainage
Volume 4a	Geotechnics and Drainage
Volume 5	Assessment and Preparation of Road Scheme
Volume 6	Road Geometry
Volume 7	Pavement Design and Maintenance
Volume 8	Traffic Signs and Lighting
Volume 10	Environmental Design and Management
Volume 10a	Environmental Design and Management
Volume 11	Environmental Assessment
Volume 12	Traffic Appraisal of Roads Schemes
Volume 12a	Traffic Appraisal of Roads Schemes

Traffic Signs Manual

1 Copy of Chapter 8 of the Traffic Signs Manual published by the Stationary Office Ltd.

1 Copy of Traffic Sign Regulation and General Directions.

British Standards and TRRL Publications

1 Copy of each current British Standard and Code of Practice or computerised equivalent all as referred to or cross referenced in the Contract.

1 Copy of each relevant Road Note

All volumes shall be current at the reference date as specified in Appendix A to Form of Tender.

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

7. Safety and Protective Clothing

Sets of the following to be supplied new within 4 weeks after Date of commencement of the Works in sizes as required by the Overseeing Organisation.

Quantity	**Item**
8 pairs	Wellington Boots with steel toe cap and mid-sole (type to be as agreed by Engineer's Representative)
8 pairs	Waterproof and breathable Protective Safety Boots with steel toe cap and mid-sole (type to be as agreed by Engineer's Representative)
8	Fleece Jacket 380g/m with 2 zipped pockets and draw cord hem. (type to be as agreed by Engineer's Representative)
8	Two band and brace high visibility yellow coats made from high performance waterproof and breathable fabric conforming to BS EN 471 Class 3 and BS EN 343 Class 3 : 3. (GORE-TEX or equivalent type to be as agreed with by Engineer's Representative)
8 pairs	Waterproof over trousers, high visibility to BS EN 471 Class 3 (type to be as agreed by Engineer's Representative)
8	Safety helmets with comfort band chin straps, built in eye protection, detachable ear defenders and detachable thermal insulation
8 pairs	Industrial penetration resistant waterproof gloves
8 pairs	Industrial thermally insulated work gloves
8	High visibility vests to BS EN 471 Class 3
16 pairs	Thermally insulated socks
8 pairs	Safety glasses / goggles
Additional protective clothing for up to 5 visitors shall be made available on request, for periods of up to one day, comprising 5 No. sets high visibility waterproof anorak and safety helmets.	
The Contractor shall make available for the use of the Engineer's Representative and/or his staff, all appropriate safety equipment necessary to gain safe access to any part of the Works at any reasonable time. The Contractor shall provide all training and attendance necessary for the safe and effective use of equipment provided for the purpose of gaining access to the Works	

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

8. Initial Consumable Stores

The Contractor shall provide supplies of consumable items, as and when requested, such as those identified in the list below as required for the sole use of the Overseeing Organisation; the quantity stated for each item in the list below is to be supplied immediately or within reasonable time after Date of commencement of the Works.

Quantity	Description
20	A4 lever arch files with dust covers
20	A4 ring binder files
20	Set A4 file indices (plastic) (A - Z or 1 – 20)
8	Set A4 file dividers
6	A4 fold over clipboards
12	A4 pads ruled feint and margin (200 sheets)
2	A4 pads graph paper
1	A3 pads graph paper
12	Ruled all weather cover A6 notebook
8	Ruled hard cover A4 books
2	Box CD-R 650 MB 74 min recordable disc (25 per box)
2	Box 25 millimetres paper clips
1	Box large drawing pins
4	Bottle white correction fluid
12	Ball point pens (black)
12	Ball point pens (blue)
12	Ball point pens (red)
12	Felt tip pens (Fineliner or equivalent) (black)
12	Felt tip pens (Fineliner or equivalent) (red)
12	Felt tip pens (Fineliner or equivalent) (green)
12	Pencils (HB)
1	Box coloured pencils (12 assorted)
5	Pack highlighter marker pens (6 assorted)
75	A4 manila envelopes
75	DL gummed envelopes
5	Stick adhesive (Pritt stick or equivalent)
5	Roll sellotape with dispenser (25 millimetres wide)
5	Roll invisible tape with dispenser (25 millimetres wide)
20	“Post it” note pads 76 x 127 millimetres

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

Quantity	Description
4	Roll drafting tape
1	Time and date received dial stamp
1	Stamp pad with black ink
20	A4 document wallet
100	A4 clear plastic file pockets (top opening)
100	Suspension files with tabs and inserts

9. Office Insurance

The Contractor shall provide for the insurance against all risks, of the contents of the offices including the property of the Overseeing Organisation and his staff together with any staff of the Employer who may visit the offices from time to time. This includes personal effects required in the normal course of duty and other computer equipment supplied by the Overseeing Organisation and/or the Employer.

10. Heating and Lighting

The offices shall be adequately provided with electric heating capable of maintaining a uniform room temperature of at least 20 degrees centigrade and shall be lit with electrical fluorescent diffused lighting to a standard acceptable for a drawing office to achieve a minimum of 500 lux measured at drawing boards and the horizontal tops of desks. An external light shall be provided over the entrance to the building shielded to prevent misleading traffic on the public road.

11. Required Time Duration for Providing and Maintaining Accommodation and Equipment

Period 1: Period 1 means

The Principal Offices including their contents, access roads and hard-standings thereto shall be available for occupation within 4 weeks of the commencement of Works or as otherwise agreed with the Engineer and shall be maintained and serviced until 12 weeks after the issue of the Certificate of Completion pursuant to Clause 48 of the Conditions of Contract in respect of the Whole of the Works as referred to in Sub Clause 48(3), or until completion of any outstanding works, whichever is the latest.

Period 2: Period 2 means

The reduced office accommodation including contents applicable to the rooms defined, access road and hard-standings shall be maintained and serviced from the expiry of the Period 1 until 24 weeks after the issue of the Certificate of Completion for the Whole of the Works as specified in the Form of Tender.

APPENDIX 1/2: VEHICLES FOR OVERSEEING ORGANISATION

The following specification fulfils the vehicle requirements for the Works.

Vehicles shall be new, (or nearly new subject to the approval of the Engineer), of a light colour, approved by the Engineer in accordance with Section O5.2 of Part 2 of Chapter 8 of the Traffic Signs Manual and be free from markings identifying any company associated with the Contract. If the vehicle is not a conspicuous colour a minimum 50 mm wide high visibility fluorescent yellow retroreflective tape shall be applied along each side of the vehicle.

The vehicles shall be equipped with high visibility rear markings. High visibility rear markings should comprise of chevron markings comprising alternate strips of fluorescent orange-red retroreflective material and fluorescent yellow non-retroreflective material, of not less than 150mm width each, inclined at 45-60° to the horizontal and pointing upwards. The markings should cover as much of the rear-facing portion of the vehicle as possible without obscuring windows, vehicle lighting or registration plates. Retroreflective tape shall be placed on the rear facing edges of doors that are opened.

The vehicles shall be equipped with fire extinguisher, sign board reading 'Highway Maintenance' in accordance with Diagram 7404 of Schedule 13, Part 6 of the Traffic Signs Regulations and General Directions 2016 (The lettering shall be the largest x height that can be accommodated out of the following heights: 37.5, 50, 62.5, 75 or 100mm) and one or more suitable roof mounted amber flashing distinctive lamps fitted in accordance with Section O5.3 of Part 2 of Chapter 8 of the Traffic Signs Manual and The Road Vehicle Lighting Regulations.

Vehicle Types A and B shall be provided for the exclusive use of the Engineer at all times. The Contractor shall indemnify the Engineer, his representatives and their respective staffs authorised to drive the vehicles against claims in respect of damage to vehicles including claims from passengers. The vehicles shall be cleaned inside and outside once per week by the Contractor. An equivalent vehicle shall be provided whilst any vehicle undergoes servicing or repair.

Unless agreed otherwise with the Overseeing Organisation vehicles shall be hybrid or electric. If vehicles require charging points then one charging point per vehicle shall be provided as part of the parking requirements for the Overseeing Organisation in accordance with Section 1.1 of Appendix 1/1.

Anticipated mileage is 1500 miles/week/vehicle.

The following vehicles of EC manufacture shall be provided:

TYPE	VEHICLE	NUMBER REQUIRED	PERIOD REQUIRED
A	Short wheelbase vehicle suitable for off-road use with 4 wheel drive, hard top and sides (Mitshubishi Outlander PHEV or similar).	2	From Commencement to Date of Completion for the Whole of the Works plus 12 weeks
B	2/4 door estate / hatchback (Nissan Leaf or similar)	1	From Commencement to Date of Completion for the Whole of the Works plus 12 weeks

In addition to the above, vehicle of type A above shall be fitted with heavy duty suspension, spare wheel, fuel filler cap lock, bonnet lock and spare wheel lock, internal and external mirrors, mud flaps, link mats front and rear (where applicable), mudshields for front and rear brakes, rubbers pads for clutch and brake pedals, interior sun visors, gearbox covers, tow rope, towing hooks front and rear, laminated windscreen, wire mesh guards for side, tail and flasher lamps, covers for universal joints/hernbolts and sumpguards and 2 number fitted rear seats to vehicle Type A.

APPENDIX 1/3: RADIO COMMUNICATION SYSTEM FOR THE OVERSEEING ORGANISATION

The following specification fulfils the communication system requirements for the Works.

5 No. mobile smartphones (minimum internal memory 16GB) with colour screen and the capacity to record and send minimum 13MP photographic images, capable of reception at all parts of the site.

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

Notes:

1. Unless otherwise stated below, all sampling and testing in this Appendix shall be undertaken by the Contractor.
2. Tests comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See sub-clause 105.4)
3. (N) indicates that a United Kingdom Accreditation Service (UKAS) or European Co-operation for Accreditation of Laboratories (EAL) accredited laboratory sampling and test report or certificate is required.
4. Unless otherwise shown in this Appendix, tests for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
5. Cube strengths are not required for concrete complying with Clause 2602.
6. Unless otherwise shown in this Appendix, test certificates for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
7. The Contractor's attention is drawn to the Employer's Requirements for additional testing requirements.

   The Contractor shall incorporate in the schedule of tests required under Clause 36 of the Conditions of Contract as a minimum the tests detailed in the following table together with all additional tests required by the Contract.
8. All samples and cores taken for testing in accordance with Series 900 of the Specification shall be photographed against a suitable base scale to the approval of the Overseeing Organisation.

   The photographs, together with corresponding RRS1 and CRS1 Forms included in Clause 952AR of Appendix 0/1, shall be delivered to the Overseeing Organisation within seven days of the sampling on site.
9. All reference to FWD within this Appendix shall mean Falling Weight Deflectometer as described in HD29 of the DMRB. Machine calibration and approval shall be in accordance with the procedures described in Clause 5.9 and 5.10 of HD29 of the DMRB.

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 100					
109	Noise Control	L_{Aeq}	As required in Appendix 1/9		Standard as per Appendix 1/9
	Vibration Control	Peak particle velocity	As required in Appendix 1/9		Standard as per Appendix 1/9

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

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 (maximum 1 per 100 components) (BS 1722)		
308	Gates and stiles				Quality management scheme applies
	Reinforced concrete posts	Cover to reinforcement	1 per consignment (maximum 1 per 100 components) (BS 3470)		
308 and 311	Preservation of timber	Full sapwood penetration	As required in sub-Clause 311.2(v)	Required for each batch	Quality management scheme applies

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 400					
402	Welding	Welding procedures (Manufacturer's tests)	(Every seven years)	Required	Quality management scheme applies
		Welder qualification (Manufacturer's tests)	As required in sub-Clause 402.7 (iii)		
		Production testing (Manufacturer's tests)	As required in sub-Clause 402.7(iv)		
	Welded joints	Destructive testing	As required in sub-Clause 402.7(v) and (vi)		
403	Anchorages and attachment systems for use in drilled holes.	Ultimate tensile load (Manufacturer's tests).		Required	To provide well attested and documented evidence.
404	Anchorages in drilled holes	Loading test on site		Required	To provide well attested and documented evidence
	Post foundations		A minimum of 1 test and not less than 1 test per 100m of safety barrier	Required	
406	Vehicle Parapets.			Required	Quality Management Scheme applies – applicable only to legacy systems not falling under the CPR.
407	Anchorages and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturers test)		Required	To provide well attested and documented evidence for legacy systems not falling under the CPR
409	Vehicle parapet components			Required	
	General				In accordance with manufacturer's installation manual
	Legacy systems	Static destructive testing			Acceptance criteria in BS 6779-1 clause 9.4.3.2.6.3
410	Anchorages in drilled holes	On site tensile load test	As required in Appendix 4/1	Required	
411	Pedestrian Parapets and Guardrails		Manufacturer's tests: yield/proof strength of material, ultimate strength and the extension at break		(N)

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500					
501	Pipes for drainage and service ducts				Product certification scheme applies for products not falling under the Construction Products Regulation (CPR)
	Vitrified clay				
	Concrete - PC/SRC, not exceeding 900mm diameter			(See Note 2)	
	Concrete - Pre-stressed, not exceeding 900mm diameter				
	Iron - cast				
	Iron - ductile			(See Note 2)	
	PVC-U				
	GRP				
	Plastics. See Table 5/1				
	Corrugated steel	(Manufacturer's tests)		Required (AASHTO)	
	Corrugated steel bitumen protection, Not exceeding 900 mm diameter				
	Other materials			Required	BBA certification (or equivalent) applies
503	Pipe bedding	Grading and fines content	1 per week (min of 3)	Required	
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)			
		Resistance to fragmentation (N)	1 per source		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (continued)					
505	Filter medium backfill	Plastic index (N)	1 per source	Required	
		Resistance to fragmentation (N)	1 per source		
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
		Grading and fines content	1 per week		
		Permeability (N)	1 per source		
506	Sealing existing drains				
	Concrete				
	Grout				
507	Chambers				Product certification scheme applies
	Precast concrete				
	Corrugated galvanized steel	(Manufacturer's tests)		Required	Product certification scheme applies
	Steel fitments				Product certification scheme applies
	Covers, grates and frames				Product certification scheme applies
	Cover bolts				Quality management scheme applies
508	Gullies and pipe junction				For products not falling under the (CPR), product certification scheme applies
	Precast concrete				
	Clay				
	Cast iron and steel				
509	Watertightness of joints	Air test	All pipelines with watertight joints	Required	
512	Backfill to pipe bays	Grading	1 per 50 tonnes (min of 3)	Required	Minimum to allow for natural variability of sulfur compounds
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (continued)					
513	Permeable backing to earth retaining structures	Plastic index (N)	1 per source		
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
		Resistance to fragmentation (N)	1 per source		
		Grading	1 per 200 tonnes (min of 3)		
		Permeability (N)	1 per source		
	Precast hollow concrete blocks	(Manufacturer's tests)		Required	
514	Fin Drains	(Manufacturer's tests)		Required	BBA certification (or equivalent) applies
515	Narrow filter drains				
	Geotextile, pipes and fittings	(Manufacturer's tests)		Required	BBA certification (or equivalent) applies
	Granular fill	Plastic index (N)	1 per source		
		Resistance to fragmentation (N)			
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
		Grading and fines content	1 per 200 tonnes (min of 3)		
		Permeability (N)	1 per source		
516	Combined drainage and kerb systems	Load test	A minimum of 1 test and not less than 1 test per 1000 metres for each type and source	Required	Certification that the systems comply with Clause 516 is required
517	Linear Drainage Systems	Load Test	A minimum of 1 test and not less than 1 test per 1000 metres for each type and source	Required	Certification that the systems comply with Clause 517 is required
518	Thermoplastics structured wall pipes and fittings	(Manufacturer's tests)		Required	BBA certification (or equivalent) applies

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

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600						
601, 631 to 637, 640	Acceptable material				Required	[For recycled aggregate see sub-Clauses 601.12 and 601.18]
	Class	General Description				
	1	General granular fill	Grading/ uniformity coefficient	Twice a week		
			mc/MCV (N)	2 per 1000 m^3 up to max of 5 per day		
		1C only	Resistance to fragmentation (N)	Weekly		[LA category]
	2	General cohesive fill	Grading	Twice a week		
			mc/MCV/PL Undrained shear strength (N)	2 per 1000 m^3 up to max of 5 per day		Cross reference should be made to any requirements in Appendix 6/1.
			Bulk density (pfa) (N)	2 per 1000 m^3 up to max of 5 per day		
	4	Landscape fill	Grading/mc/MCV (N)	Daily		
	5	Topsoil	Testing for characteristics in accordance with BS 3882:2015, Table 1	Daily		
	6	Selected granular fill	Grading/uniformity coefficient	1 per 400 tonnes		
			PI/LL (N)	Daily		
			Resistance to fragmentation (N)	Weekly for on-site material		[LA category but not for Class 6F4 and 6F5]
			SMC (N)	Weekly		
			omc/mc, mc/MCV (N)	1 per 400 tonnes		[Not for Class 6F4 and 6F5]
			Organic matter/water soluble (WS) sulfate content (N)	Weekly		[At least 5 tests per source sulfur compounds over the course of the contract in accordance with TRL Report 447, tests 1-5]
			Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	Weekly		
			pH/chloride ion content (N)	Weekly		
			Resistivity (N)	As required		
			Undrained and drained shear parameters (N)	As required		[Cross reference should be made to any requirements in Appendix 6/1]

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

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 cont.						
601, 631 to 637, 640 (cont'd)	6F4 and 6F5	Selected granular fill	Size designation and overall grading category	1 per week	Required	[Results of routine control tests from the factory production control system operated by the producer to be provided for Class 6F4 and Class 6F5 – see Annex C of BSI BS EN 13242 + A1 and Annex C of BS EN 13285]
			Maximum fines and oversize categories	1 per week		
			Volume stability of blast furnace slag	6 monthly		
			Volume stability of steel (BOF and EAF) slag	6 monthly		
			Other aggregate requirements	Annex C of BSI BS EN 13242 + A1		
			Other aggregate requirements	Annex C of BSI BS EN 13242 + A1		[Declared values from the factory production control system operated by the producer to be provided for Class 6F4 and Class 6F5 – see Annex C of BS EN 13285]
			Laboratory dry density and optimum water content	As required		
			Water content	As required		
	7	Selected cohesive fill	Grading/mc/ MCV/bulk density (N)	1 per 400 tonnes		
			PI/LL (N)	Daily		
			Organic matter water soluble (WS) sulfate content (N)	Twice a week or daily when sulfates are expected		[At least 5 tests per source for sulfur compounds over the course of the contract in accordance with TRL Report 447, tests 1-5]
			Oxidisable sulfides (OS) and total potential sulfate (TPS) content (N)	Twice a week or daily when sulfides are expected		[At least 5 tests per source for sulfur compounds over the course of the course of the contract]
			pH/chloride ion content (N)	Weekly		
			Resistivity (N)	As required		
			Undrained and drained shear parameters (N)	As required		[Cross reference should be made to any requirements in Appendix 6/1].
			Permeability (N)	As required		
	8	Miscellaneous fill	mc/MCV (N)	Daily		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 cont.					
601, 631 to 637, 640 (cont'd)	9 Stabilised materials	Pulverisation	1 per lane width per 200 metre length		
		mc/MCV (N)			
		Bearing ratio (N)			
	Pulverised fuel ash	Chemical analysis	1 per consignment		[At least 5 tests per source for sulfur compounds over the course of the contract in accordance with TRL Report 447, tests 1-5]
	Furnace bottom ash	Grading	1 per 300 tonnes		[At least 5 tests per source for sulfur compounds over the course of the contract in accordance with TRL Report 447, tests 1-5]
	Fill adjacent to cementitious material or metallic items	Water-soluble sulphate sulfate (WS) content, oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes		
602	Earthworks material beneath surface of a road or paved central reserve	Frost heave (N)		Required	
	(i) Imported onto site		1 every four months		
	(ii) On Site source		1 per source		
609, 621	Geotextiles	Tensile strength	1 per 400 square metres	Required	
		Elongation			
		Tensile strength of seams and joints			
		Static puncture			
		Characteristic opening size			
		Water permeability			
		Durability			
612	Compaction of fills			Required	
	Method compaction	Field dry density (N)	As required		
	End product compaction	Optimum mc (2.5kg rammer/vibrating hammer method) (N)	Each class or sub class of material		
		Field dry density (N)	1 per 400 tonnes		
614	Cement stabilisation to form capping	Rate of spread of cement	1 per 500 square metres of cement spread	Required	

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 cont.					
614 cont.	Cement stabilisation to form capping cont.	Grading	1 per 1000m^2		
		Uniformity Coefficient			
		Mc	3 per 1000m^2		
		MCV	Immediately before compaction		
		Liquid Limit	1 per 1000m^2		
		Plasticity Index	1 per 1000m^2		
		Organic Matter	1 per 1000m^2		
		Water soluble (WS) sulfate content	1 per 1000m^2		
		Oxidisable sulphide (OS) content	1 per 1000m^2		
		Total potential sulfate (TS) content	1 per 1000m^2		
		Pulverisation	2 per 1000m^2		
		Bearing ratio	5 per 1000m^2		
615 641 643	Lime stabilisation to form capping	Rate of spread of lime	1 per 500 square metres of lime spread	Required	
		Available lime content	Each source of lime weekly during stabilisation operation		
		Grading	1 per 1000m^2		
		Mc	3 per 1000m^2		
		MCV	Immediately before compaction		
		Plasticity Index	1 per 1000m^2		
		Organic Matter	1 per 1000m^2		
		Water soluble (WS) sulfate content	1 per 1000m^2		
		Oxidisable sulphide (OS) content	1 per 1000m^2		
		Total potential sulfate (TS) content	1 per 1000m^2		
		Pulverisation	2 per 1000m^2		
		Bearing ratio	5 per 1000m^2		
622 638 639	Earthworks for reinforced soil and anchored earth structures	Redox potential	5 locations within the affected area	Required	
	Drainage layers	Grading Chemical analysis	1 per 400 tonnes		
	Reinforcing elements	Coeff. of friction	Each type of element with each type of fill		
	Anchor elements	Adhesion			

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 cont.					
624	Ground anchorages	Proof loading	As required in Appendix 6/10	Required	
626	Gabions			Required (ASTM G23)	
	Fill	Grading	1 per 400 tonnes		
		Los Angeles coefficient			
	Geomesh	[As appropriate to properties stated in Appendix 6/10]	1 per 400 square metres		
	PVC coated wire				
631	Subgrade	Falling Weight Deflectometer Testing (FWD) (or Light Weight Deflectometer in accordance with Clause 895AR)	FWD/LWD testing at 20m centres per lane.	Required	Foundation Surface Modulus
	Capping or Stabilised Materials	Falling Weight Deflectometer Testing (FWD) (or Light Weight Deflectometer in accordance with Clause 895AR)	FWD/LWD testing at 20m centres per lane.	Required	Foundation Surface Modulus
642	Earthworks materials for corrugated steel buried structures	Constrained soil modulus (M*)	3 on each side of each structure	Required	

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 700					
710	Constituent materials in recycled aggregate	Quality control	Checks are to be carried out by the Contractor in accordance with the procedure set down in 'Quality Control – Production of Recycled Aggregates' and with those in this Clause	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 results of all quality control checks shall be delivered promptly to the Scottish Ministers on request
711	Overbanding and inlaid crack sealing systems			Required	BBA certification (or equivalent) applies

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 800					
801, 803, 804, 805, 806	General requirements for unbound mixtures adjacent to cement bound materials, concrete pavements, structures or products	Water-soluble sulfate (WS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes	Required	
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes		
	Unbound mixtures beneath surface of a road or paved central reserve	Frost heave (N)	1 per source		
		Grading and fines content	1 per week		
		Plastic index (N)			
		Resistance to fragmentation (N)	6 monthly		
		Resistance to wear micro-Deval test	I per source		
		Resistance to freezing and thawing (magnesium sulfate soundness) (N)	1 per source		
		Water absorption (N)	As required		
		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 monthly		
		OMC/mc (N)	As required		
		Density (N)	As required		
		Water absorption (N)	As required		
		Falling Weight Deflectometer Testing (FWD) (or Light Weight Deflectometer in accordance with Clause 895AR).	FWD testing at 20metre centres per lane.		Foundation Surface Modulus
821, 822	Cement and other Hydraulically Bound Mixtures (HBM)	Tests for control and checking of HBM	Test specified in Table 8/14 and Table 8/15	Required	
		Coefficient of linear expansion	As required		
		Tests for laboratory mixture design	Test specified in Clause 880		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Falling Weight Deflectometer Testing (FWD) (or Light Weight Deflectometer in accordance with Clause 895AR)	FWD/LWD testing at 20metre centres per lane.		Foundation Surface Modulus
Series 900					
901, 925, 937, 938, 943	Aggregates for bituminous material			Required	National quality management scheme applies
	Resistance to fragmentation (hardness)	Resistance to fragmentation (N)	1 per source and then annually		
	Resistance to freezing and thawing (durability)	Soundness (N)	1 per source and then annually		
		Water absorption (N)	1 per source and then annually		
	Cleanness	Sieve test (mass passing 0.063mm sieve) (N)	Monthly		Washing and sieving method to be used
	Shape	Flakiness index (N)	Monthly		
	Blast furnace slag	Bulk density (N)	1 per 500 tonnes		[BS EN 1097-3]
		Soundness (N)	Once every 4 months		
		Dicalcium silicate disintegration (N)	1 per 500 tonnes		
		Iron disintegration (N)			
	Steel slag	Bulk density (N)	1 per 500 tonnes		
		Volume stability (N)	1 per 500 tonnes		
	Coarse aggregate for surface courses	Resistance to polishing (PSV) (N)	Latest 3 results and then annually per source		
		Resistance to surface abrasion (AAV) (N)	1 per source and then annually		
	Binders for bituminous materials	Penetration (N)	1 per 750 tonnes	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
		Softening part (N)	1 per 750 tonnes		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
					Scottish Ministers
Series 900 (continued)					
903 to 907, 909 to 912, 914, 916, 925, 926, 929, 930, 937, 938, 941, 943, 946 to 948	Bituminous mixtures	Grading (N)	For Audit Test purpose only		All bituminous mixtures shall be CE marked
		Binder Content (N)			
929	Base and Binder Course Asphalt Concrete (Design Mixtures)Base and Binder Course Macadams	Permanent Works - In situ air void content (N)	20m intervals in alternate wheel-tracks	Required	
		Permanent Works - Refusal air void content (N) (PRD Test)	Every 500m		
		Deformation resistance (design) (N)	6 cores from the first km then 1 core from subsequent km's		
		Stiffness (N)	1 wheeltrack core per pair lane km		
		Air voids in wheeltrack cores	1 wheeltrack core per pair lane km		
		Air voids in edge cores	1 per 250m lane metres unsupported edge only		
930	EME 2	Permanent Works - In situ air void content (N)	20m intervals in alternate wheel-tracks	Required	
		Richness modulus (design)	*(As required)*	Required	The test certificate is the CE Mark for the mixture
		Duriez (design)			
		Deformation Resistance (design)			
		Stiffness (design)			
		Air voids in wheeltrack cores	1 wheeltrack core per pair lane km		
		Air voids in edge cores	1 per 250 lane metres unsupported edge only		

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Stiffness (N)	Q wheeltrack core per pair lane km		
Series 900 (continued)					
911TS	Hot Rolled asphalt surface course (design mix)	Stability value(N)	1 per source	Required	The test certificate is the CE Mark for the mixture. National quality management sector scheme applies
		Flow value (N)			
		Density (N)			
915	Coated chippings	Grading (N)	1 per source		
		Binder content (N)			
		Flakiness index (N)			
		Resistance to polishing (PSV) (N)			
		Resistance to surface abrasion (AAV) (N)			
		Hot sand test (N)			
		Rate of spread (N)			
921	Surface macrotexture	Volumetric Patch (N)BS EN 13036-1 Volumetric Patch Technique (N)	10 individual measurement taken at approximately 5m spacing along a diagonal line across the lane width	Required	There is no compliance requirement for surface macrotexture in TS2010 materials, testing to be carried out for information gathering purposes only
924	High Friction Surfaces	Quality control checks	As required in sub-Clause 924.5 As required in sub-Clause 924.6	Required	BBA HAPAS Roads and Bridges certification (or equivalent) applies
		System coverage			
	Aggregate	Resistance to polishing (PSV) (N)	1 per source* and as required for coated chippings in Clause 915.3	Required	
937	Stone mastic asphalt (SMA) binder course and regulating course	Permanent Works - In situ air void content (N)	6 cores from the first Km then 1 core from each subsequent Km	Required	National quality management sector scheme applies
		Permanent Works - Deformation resistance.			
		Binder drainage test (design)			
		Deformation resistance (design)			
Scottish Surface Course Specification TS2010	Thin surface course system, TS2010	General properties	In accordance with TS2010 Surface Course specification & Guidance Issue 03	Required	Approval certificate required National quality management sector scheme applies.

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
			(October 2015) and BS EN 13108- 21		
Series 900 (continued)					
943	Hot Rolled Asphalt surface course and binder course (performance related design mixtures)	Permanent Works - In situ air void content (N)	6 cores from first Km then 1 core from each subsequent Km	Required	National quality management sector scheme applies. The test certificate is the CE mark for the mixture.
		Permanent Works - Deformation resistance (N)			
		Deformation resistance (design) (N)	6 cores from first Km then 1 core from each subsequent Km		The test certificate is the CE Mark for the mixture
918	Slurry surfacing incorporating microsurfacing				
	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, only modified binders undergoing BBA assessment should be considered for approval by the Overseeing Organisation, Scottish Ministers.
		Product identification	Per product per source	Required	Tests are expected to be repeated every two years
		Vialit cohesion	Per product per source	Required	Tests are expected to be repeated every two years
		Rate of spread	For each machine	Required	Not more than 6 weeks prior to start of work
		Penetration at 25ºC and 5ºC (N)	Every manufactured batch		Manufacturer's QA test results may be submitted
	Aggregates	Flakiness index (N)	1 per source	Required	*(Less than 6 months prior to work)*
		Resistance to polishing (AAV) (N)	Source approval	Required	*(Less than 6 months prior to work)*
		Resistance to surface abrasion (AAV) (N)	Source approval	Required	*(Less than 6 months prior to work)*
		Grading (N)	1 per 200 tonnes	Required	
	System	TAIT or BBA/HAPAS		Required	
920	Bond coats, tack coats and other bituminous sprays				

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

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	Binder	Product identification	1 per product per source	Required	Tests are expected to be repeated every two years
Series 900 (continued)					
920 cont.		Vialit cohesion	1 per product per source	Required	Tests are expected to be repeated every two years
		Accuracy of spread	1 for each binder and sprayer per month	Required	Not more than 6 weeks prior to start of work and one per month
		Rate of spread	1 per week		
		Penetration at 25ºC and 5ºC (N)	Every manufactured batch		Manufacturer's QA test results may be submitted
919 922	Surface Dressing				National quality management sector scheme applies
	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, only modified binders undergoing BBA assessment should be considered for approval by the Scottish Ministers.
		Product identification	1 per product per source	Required	Tests are expected to be repeated every two years
		Vialit cohesion (N)	1 per product per source	Required	Tests are expected to be repeated every two years
		Accuracy of spread	1 for each binder and spray per week	Required	Not more than 6 weeks prior to start of work and one per week
		Rate of spread	Every 1000 linear metres initially	Required	Frequency to be reduced to daily after 3 satisfactory results, but not less than 1 test per site
		Penetration at 25ºC and 5ºC (N)	Every batch		For cut back binders as supplied, manufacturer's QA viscosity test results may be submitted
	Chippings	Resistance to (PSV) polishing (N)	Source approval	Required	Less than 6 months prior to work
		Resistance to abrasion (AAV) (N)	Source approval	Required	Less than 6 months prior to work
		Grading (N)	1 per 200 tonnes	Required	
		Binder content (N)	1 per 200 tonnes	Required	Coated chippings only

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

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Flakiness index (N)	1 per 200 tonnes	Required	
Series 900 (continued)						
912, 922 cont.			Accuracy of spread (N)	1 for each chipping spreader for every change of chipping size or source	Required	Initial test not more than 6 weeks prior to start of work
			Rate of spread	Every 500 linear metres initially		Frequency to be reduced to daily after 3 satisfactory results, but not less than 1 test per site
		System	TAIT or BBA/HAPAS		Required	
		Rollers	Water Spray bars working	Before work starts and daily during works		
950	Depressions					BBA HAPAS Roads and Bridges Certification (or equivalent) applies.

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000					
1001 1030 1044	Cement			Required	Quality management and product certification schemes apply
	Portland cement CEM I				Tests and test certificates are required
	Portland blastfurnace cement				
	Blastfurnace cement CEM III/A				
	Portland PFA cement CEM II/B-V				
	Pozzolanic cement CEM IV/A			Required (BS6610)	
	Portland cement with microsilica			Required	BBA Roads and Bridges Certificate required for microsilica
	Pulverised - fuel ash				Tests and test certificates are required. Product certification schemes apply to pfa and slag.
	Ground granulated blast furnace slag				
	Admixtures				
	Mixing water	Sulfate content (N)	Monthly		
	Aggregates	Resistance to freezing and thawing - magnesium sulfate soundness (N)	1 per source	Required	
		Water absorption (N)	As required		
		Flakiness index (N)	Monthly	Required	
		Shell content (N)	1 per source		
		Resistance to fragmentation (N)	6 monthly		
		Resistance to polishing (PSV) (N)	1 per source		
		Resistance to abrasion (AAV) (N)	1 per source		
		Grading and fines content (N)	1 per week as per source		
		Chloride content (N)	Weekly or as otherwise agreed (1 per source for CBM Aggregate)		
		Total sulfur (TS) and acid-soluble sulfate (AS) content (N)	Every 6 months		

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
1001 1030 1044 (cont'd)	Flint coarse aggregate containing white flints	Water absorption (N)	3 per source thereafter weekly	Required	
	Sand (i.e. Fine aggregate)	Acid-soluble material (N)	Monthly		Not required for CBM aggregate
	Blastfurnace slag	Bulk density (N)	Every 6 months		
		Dicalcium silicate disintegration (N)	Every 6 months		
		Iron disintegration (N)	Every 6 months		
		Total sulfur (TS) and acid-soluble sulfate (AS) content (N)	Every 6 months		
	Pulverised-fuel ash			Required (BS3892: Part 2)	
1002 1003 1004 1044	Pavement Concrete	Air content test (N)	As required in Table 10/10	Required	Product certification scheme applies
		Density (N)	As required in Table 10/10		
		Strength (N)	As required in Table 10/10		
1005	Consistence (Workability)	Degree of Compact-ability (Compaction Index) (N)	As required in Table 10/10	Required	
		Vebe (N)			
		Slump (N)			
1011 1012	Dowel bars Tie bars			Required (BS 4449+A3)	Product certification scheme applies
	Dowel bars and supporting cradles	Load test	1 per arrangement		
	Sheathed dowel bars	Bond stress	4 bars		
	Cranked tie bars (coated)	Bend test	4 bars		
		Salt fog cabinet	4 bars		
1015	Joint filler board	Weathering test	3 per source	Required	Normally undertaken by manufacturer
		Compression and recovery	4 per source		
		Extrusion	1 per source		
	Cork filler board	Immersion in water	2 per source		
		Immersion in acid	2 per source		

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
1016 1017	Applied sealants	Initial Penetration	1 per 1000 m or 1 per day	Required (BS EN14188-1, BS 2499-2, BS5212-1, BS5212-2) (BSEN13880-2, BSEN13880-3 and BS4254)	
		Resilience	1 per 1000 m or 1 per day		
	Compression seals			Required (ASTM D2628) (BS2752) (BS4443:Part 4) Method 10 and (BS EN ISO 2440) (BS EN ISO 1856) (BS903: Part A16 or BS ISO 1817)	
		Compression set	1 per type of seal		
		Immersion in oil	1 per type of seal		
	Self expanding cork seal	Tests specified in Clause 1017	1 per type of seal	Required	
1026 1044	Surface macrotexture	BS EN 13036 - 1 Volumetric Patch Technique (N)	1 per day (set of 10)	Required	
1027	Aluminised curing compound	Efficiency index	1 per source	Required	
1030	Wet lean concrete	Density	As required in Table 10/9	Required	
		Cube strength (N)			
1043	Foamed Concrete	Cube strength (N)	2 cubes per $12m^3$	Required	

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

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1100						
1101	Precast concrete kerbs, channels, edgings and quadrants		Bending Strength	Minimum of 8 per 1000 units of each product (BS EN 1340)	Required	
1102	In situ asphalt kerbs		Grading	1 test per 500 metres laid	Required	
			Binder content			
1104	Precast concrete flags		Bending strength	Minimum of 8 per 1000 m^2 of each product (BS EN 1339)	Required	
	Bedding	Granular material				
		Mortar				
1107	Concrete block paving		Compressive strength	Minimum of 8 per 1000 m^2 of each product (BS EN 1338)	Required	
1108	Clay pavers		Bending strength	Minimum of 8 per 1000 m^2 of each product (BS EN 1344)	Required	
			Skid resistance	Minimum of 8 per 1000 m^2 of each product (BS EN 1344)		

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200					
1202	Permanent traffic signs			Required	Quality management scheme applies. Certification that the traffic sign is capable of passing the tests in BS 873: Part 1 is required
1207	Anchorage in drilled holes to supports of traffic signs	Loading test on site			
1210	Holding down bolts and anchorages to bases of permanent bollards			Required	Certification that the holding down bolts and anchorages are capable of complying with the performance requirements of BS873: Part 3 is required
1212	Road Markings	Tests specified in BS EN 1824		Required	National quality management sector scheme applies. Procedures are given in BS EN 1824
1214	Permanent traffic cones and traffic cylinders	Test specified in BS EN 13422	2 of each size and category / type	Required	Certification that permanent traffic cones and cylinders have been tested and comply with BS EN 13422 is required
	Flat traffic delineators			Required	Certification that the FTD's have been tested and comply with Clause 1214 is required
		Test specified in Clause 1214	As required		
	Other traffic delineators			Required	Certification that the delineators have been tested and comply with Clause 1214 is required
		Test specified in Appendix 12/4	As required		
	Temporary cones, cylinders, FTD's and other delineators			Required	Certification that at least 1 in 500 of any batch of cones, cylinders, FTD's and other delineators to be used in the Temporary Works have passed the tests in Clause 1214 as appropriate is required

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1400					
1421	Cable				Product certification scheme applies
1424	Lighting Units	Tests specified in Clause 1424	Each unit	Required	Product certification scheme applies Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required.
	Networks	Test specified in Clause 1424	Each network	Required	Certification that the installation complies with BS 7671 (the IEE Wiring Regulations) is required

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1600					
1601	Soil samples In situ soil tests			Required	
1602 to 1606 1610 to 1615	Concrete Grout Reinforcement Prestressing Steelwork Welding Protection against corrosion			Required	
1606	Coatings for protection against corrosion	Adhesion	As required in Appendix 16/6		
1607	Reduction of friction on piles				
1608	Integrity testing			Required	
1616	Dynamic Testing			Required	
1609	Static load testing of piles			As Applicable	
1612	Self hardening slurry mixes			Required	
1617	Instrumentation			Required	
1618	Support fluids	To be proposed by the Contractor			See Appendix 16/18

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700					
1707	Hardened concrete – Identity Testing	Cube strength (N) – as described in contract specific Appendix 17/4	Pre stressed concrete two cubes from 12 m^3 or 2 batches whichever represents the lesser volume	Required	Contractor to cast and test sufficient additional cubes to demonstrate cube strength before transfer
			Reinforced concrete two cubes from 24 m^3 or 4 batches whichever represents the lesser volume		
			Mass concrete - two cubes from 50 m^3 or 50 batches whichever represents the lesser volume		
			Additional cubes for special purposes		Contractor to specify as required.
		Density	As required		
	Fresh concrete – Identity Testing	Consistence (slump or flow) (N)	Each batch	Required	
		Air content	Each batch		
		Density	As required		
		Water/cement ratio			
1710	Concrete packing Mortar packing Epoxy resin bonding agent				
	Precast concrete not conforming to any Product Standard or to BS EN 13369	Cube strength (Manufacturer's tests)			Contractor to make available records of tests by the manufacturer. See sub-Clause 1710.8

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 cont.					
1711	Grouting and Duct Systems for Post-tensioned tendons				Product acceptance scheme or equivalent applies
		Full scale trials, where required in the contract			See sub-Clause 1711.1 and Appendix 17/6
		Duct assembly verification tests			See sub-Clause 1711.4 and Appendix 17/6
		Fluidity	In accordance with BS EN 447 and BS EN 446		See sub-Clause 1711.2 and sub-Clause 1711.3
		Bleeding			
		Volume change			
		Cube strength			
		Sieve			
		Density			
		Time Setting			
1712	Reinforcement				
	Steel bars			Required (BS 4449)	Product certification scheme or equivalent applies
	Steel wire			Required (BS 4482)	
	Steel fabric			Required (BS 4483)	
	Stainless Steel			Required (BS 6744)	
1713	Fabricated reinforcement			Required (BS 8666)	Certification that fabricated reinforcement complies with the routine inspection / testing requirements of BS 8666 is required if the fabrication is not covered by a product certification scheme or equivalent.
1716	Reinforcement jointing systems	Permanent elongation characteristic strength (Manufacturer's test)		Required for each type of connection	Product acceptance scheme or equivalent applies
1717	Reinforcement Welding	Welding procedure approval (BSEN ISO 17660)	As required in BS EN ISO 17660		Tests should be carried out by an independent testing body.
		Welder approval (BS EN ISO 17660)			

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

Clause	Work Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1718	Prestressing tendons				Product certification scheme or equivalent applies
	Steel wire and strand			Required (BS5896)	
	Steel bar			Required (BS4486)	
	Prestressing steel (all types)	Proof load Breaking load Elongation Ductility Relaxation Modulus of elasticity	As required		
	Other than lowest strength wires or strand to BS5896	0.1% proof load	Each reel		
1724	Post-tensioning anchorages	Tests in accordance with BS EN 13391 (Manufacturer's tests)		Required (BS EN 13391)	Product certification scheme or equivalent applies
1726	Stainless steel bar			Required (BS6744)	Product certification scheme or equivalent applies
1727	Inspection and testing of structures and components				Contractor to specify as appropriate to requirements of Appendix 17/4.

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1900					
1903	Abrasives	Grading	As required		
		Hardness			
1909	Galvanised coatings	Test specified in BS EN ISO 1461	As required		
	Thermally sprayed aluminium coatings	Tests specified in BS EN ISO 2063	As required		
	Aluminium coating material			Required in accordance with BS EN ISO 14919	
1910	Thermally sprayed aluminium metal coating	Pull off adhesion test in accordance with ASTM D4541-Type III	At the start of the works		
	Thermally sprayed aluminium metal coating (excepted areas)	Grid test specified in BS EN ISO 2063	As required		
1911, Table 19/2B	Hot dip galvanised coating to fasteners	Tests specified in BS EN ISO 10684	As required		
1912 1912SE	Paints – 'A' and 'B' samples	Provision of samples for 'A' and 'B' sample tests			Samples selected in accordance with Clause 1912 and 1912SE
	Paints – 'A' and 'B' samples	Specific gravity	As required by rate of 'A' and 'B' sampling		See NG 1912, 3; Appendix 19/4, Note 4; Appendix 19/4SE, Note 4; NG 1912.3NI, 3 and Appendix 19/4NI.
	Paints – 'A' and 'B' samples	Colour match	As required by rate of 'A' and 'B' sampling		See NG 1912,3 and NG 1912NI, 3.
1914	Coating system minimum film thickness	Minimum dry film thickness measurements. In accordance with BS EN ISO 2808, BS3900-C5	Required – representative testing		
	Coating system adhesion	Pull off adhesion test in accordance with ASTM D4541 – Type III	Required – representative testing		
	Coating system defects	Visual assessment supplemented by appropriate testing	Required		
	Coating system defects – pin-holing or porosity	Low or high voltage detectors in accordance with ASTM G62-07	Required – representative testing excluding corners, bolted joints or welds		

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

Clause	Work Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2000					
2003	Permitted waterproofing systems				Product Acceptance Scheme or equivalent applies.
	Additional bituminous protection		1 per 15 tonnes		
	Stability value		1 per 15 tonnes		
2004	Tar	Tests specified in BS76	1 per source		Sampling to comply with BS76
	Cut back bitumen		1 per source		

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

Clause	Work Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2400					
2401	Masonry cement				
2402	Sand				
2403	Water	Tests specified in BS EN 1008	As required		
2404	Mortar admixtures				
2405	Lime				
2406/ 2417	Bricks				
	Clay				
	Calcium silicate				
	Concrete				
2407	Blocks				
	Clay				
	Concrete				
2408	Reconstituted stone				
2410 2411	Stainless steel				
	Wire/fabric				
	Bars				
	Ready mixed mortars				
	Mortars		1 set of tests per mix		

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2500					
2501	Materials for corrugated steel buried structures exceeding 900mm clear span or internal diameter				Type approval applies
	Steel components			Required as appropriate to the standard or specification listed in the type approval Certificate	
	Zinc coating				
	Protective coating				
	Paved invert system				Product Acceptance Scheme or equivalent applies
2502	Materials for reinforcing elements, prefabricated facing and capping units, and washers				Product Acceptance Scheme or equivalent applies
	Carbon steel strip			Required (BS 1449: Part 1.1 or BS EN 10025-1) and (BS EN 10025-2)	Silicon content and mechanical properties to be stated on the certificate
	Stainless steel strip			Required (BS EN 10029, 10048, 10051, 10258 and 10259)	Mechanical properties to be stated on the certificate
	Reinforcing bar for anchor elements			Required (BS 4449)	Tests scheduled under Clauses 1717 and 1909 are required for welding and galvanising of anchor elements
	Materials for fasteners				
	Stainless steel				
	Bolts, screws and nuts				
2503	Materials for pocket type reinforced brickwork retaining wall structures	(Soluble salt content; Efflorescence; Compressive strength Water absorption; and Initial rate of suction) (BS 3921 and BS EN 771-1:2011+A1:2015 / TRL Report 447) (N)	1 set of tests per type of brick		
	Clay bricks				

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

Clause	Work Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2500 (continued)					
2504	Environmental barriers				Quality management scheme applies
	Timber				
	Concrete				
	Steel				
	Brickwork				
	Other materials				
	Barriers	Sound absorption	As required in Appendix 25/4		
		Sound insulation			
	Post foundations	Loading test on site	As required in Appendix 25/4		
2505, 2506	Drainage structures/buried rigid pipes for drainage structures. Pipes for drains and culverts having diameters or clear span exceeding 900 mm				
	Vitrified clay				
	Concrete PC/SRC	(Manufacturer's test)			See sub-clause 2506.28
	Iron				
	Corrugated steel	(Manufacturer's test)			Type Approval Certificate and Product Acceptance Scheme or equivalent apply.

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
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		Laboratory tests
		Flow between glass plates			
		Compressive strength			
		Expansion test			
		Water absorption			
		Elastic stability	1 per source		
		Flow cone test Compressive strength	Each load		Site control tests
2604	Plastic coating to fencing posts, gates and ancillaries			Required (BS 1722 : Part 16)	Certification by powder manufacturer and coating applicator is required.
2607	Granolithic concrete				Testing to be in accordance with Clauses 1702, 1703, 1707 and 1710

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 3000					
3001	General				Inspection reports as required in Appendix 30/1
3005	Grass Seeding, Wildflower Seeding and Turfing	Rate of spread of fertiliser	1 per 1000 square metres		
		Rate of spread of seeding	1 per 1000 square metres		
		Chemical analysis of fertiliser	1 per source		
		Grass seed germination and purity (Official Seed Testing Station tests)	1 per source and mix variety	Required prior to sowing	

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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 5000					
5003	Abrasives	Grading	As required		
		Hardness			
5005	Aluminium and zinc spray coatings	Test specified in BSI BS EN ISO 2063	As required		Areas to be tested in accordance with Clause 5006
	Aluminium coating material			Required (BS EN 1301-1)	
	Zinc coating material			Required (BS EN 1179)	
	Sheradized coatings	Tests specified in BS 4921	As required		
	Zinc electroplated coatings	Tests specified in BS 3382 : Part 2	As required		
	Plating to high strength grip and tension control bolts				
5006	Metal spray coatings	Tensile test specified in BS EN 22063	As required		
		Grid test specified in BS EN 22063	As required		
5007, 5007SE	Paints				
	'A' and 'B' Samples	Specific gravity			Samples will be selected in accordance with Clause 5007SE
		Colour match			
		Composition			
		Application Characteristics			

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

When required by the Engineer the Contractor shall provide samples of any material proposed to be incorporated in the Works.

APPENDIX 1/7: SITE EXTENTS AND LIMITATION ON USE

1. Site Extent

1.1 The Site Extent is defined in Clause 1 of the Conditions of Contract as 'Land Made Available by the Employer for the Works' and comprises:

(i) The Land Made Available by the Employer for the Works is described in Section 3.1 of the Employer's Requirements.

(ii) Any further Land acquired by or conveyed to the Employer (from any person, including the Contractor) from time to time for the purposes of the Design and the Works.

(iii) The Contractor shall make provision for carrying out work on private land as required under the Contract for example Accommodation Works, traffic signing, drainage works and the like.

2. Limitations On The Use Of The Site

2.1 The Site shall be used solely for the construction and maintenance of the Works.

2.2 The Contractor's attention is drawn to the Special Requirements listed in Clauses 77 and 78 of the Conditions of Contract.

2.3 The Contractor shall not use areas of land with a temporary right of access for any purpose other than the construction and maintenance of the Works.

2.4 When carrying out Accommodation Works on land not made available by the Employer for the Works, the Contractor shall minimise the area of land occupied to that which is essential for the safe construction and maintenance of such part of the Works.

2.5 The Contractor shall ensure that all areas of land which have been temporarily occupied are reinstated to the satisfaction of the affected landowner, occupier and the relevant Authorities.

2.6 The Contractor shall ensure that Scotland TranServ and any other contractor appointed by the Employer is granted with access to Site within the Land Made Available to enable the construction and completion of the advance fencing and site clearance works.

APPENDIX 1/8: OPERATIVES FOR THE OVERSEEING ORGANISATION

The following specification fulfils the operative requirements for the Whole of the Works.

Operatives	**Number**	**Period Required**
Driver / Handyman	1 available on request	From Date of Commencement of the Works as defined in Clause 41 of the Conditions of Contract to date of issue of Certificate of Completion

APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION

Noise Control

1. The Contractor shall consult and comply with the requirements of the Highland Council prior to commencement of work on Site.

   These requirements, together with the Contractor's proposed methods of work and Constructional Plant to be used shall be discussed and agreed in writing by Highland Council prior to commencement of the relevant activities on Site.

2. The Contractor shall comply with the contents and recommendations of BS 5228-1: 2009 + A1: 2014 "Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise and Part 2 Vibration", together with the specific requirements of this Appendix.

3. All Constructional Plant used on the Works shall be subject to the acknowledgement of the Overseeing Organisation and shall be the quietest of its type practical for carrying out the work required and shall be maintained in good condition with regard to minimising noise output.

   All Constructional Plant shall be operated and maintained in accordance with the manufacturer's written recommendations.

4. Best practicable means shall be employed including the positioning of Constructional Plant and activities to minimise noise at sensitive locations, the use of mufflers on pneumatic tools, the use of non-reciprocating Constructional Plant and the use where practical of effective sound reducing enclosures to ensure all Constructional Plant used in connection with the Works operates with the minimum of noise.

5. Subject to the other requirements of the contract the normal working hours within the Site shall be Monday to Friday between 08.00 and 19.00 hours and Saturday between 08.00 and 13.00 hours, with no working on Sundays and public holidays.

   The Contractor shall have written permission to operate at the relevant permissible noise levels for each area, within the normal working hours, from Highland Council.

   The Contractor shall apply, in writing, for permission to work outside normal working hours, including Sundays and public holidays, to Highland Council, at least 14 days in advance of the proposed work. Operating times and noise levels shall be subject to the agreement and written consent of Highland Council.

   In the event of permission being granted, in writing, the Contractor shall provide the Overseeing Organisation with a copy of the written permission at least 48 hours prior to commencing the work.

   The Contractor shall also arrange for leaflets to be delivered to residents within 200 metres of the Site boundary, giving a full description of the proposed Works and their duration and of the sources, character and levels of noise expected to arise, and a named contact to respond to any noise or vibration concerns. The leaflets shall be issued 48 hours prior to Works commencing.

6. The construction noise levels, Leq (see note (ii) of this Appendix) from the locations specified in the Schedule contained in this Appendix shall not exceed the appropriate level agreed with Highland Council.

7. Notwithstanding the specific requirements of this Appendix 1/9, the Contractor shall comply with the contents of The Noise Insulation (Scotland) Regulations 1975.

8. A pre-construction ambient noise assessment shall be undertaken by the Contractor using an appropriately qualified acoustician before the Works commence, for agreement with Highland Council. The noise assessment shall demonstrate the typical pre-construction ambient noise levels at representative properties adjacent to the Works.

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

9. Measurement locations chosen for the pre-construction ambient noise assessment shall be representative of surrounding properties, shall be considered the “worst case” property in terms of construction noise impacts for that particular area.

10. The Contractor’s noise expert shall be required to undertake additional assessments or noise measurements at locations using methods agreed previously in writing with Highland Council as necessary.

11. Certificates of Consent from Highland Council under Section 61 of the Control of Pollution Act 1974 shall be required for any work outwith the normal working hours, defined in Clause 5 of this Appendix.

    The granting of such Certificates will be dependent amongst other things on the Contractor demonstrating to the satisfaction of Highland Council in his application that;

    (i) It is not reasonably practicable to carry out the work during normal working hours;

    (ii) He has considered all mitigation measures and has implemented appropriate measures;

    (iii) He has consulted all interested parties; and

    (iv) He has explored all means to reduce the amount of work to be carried out outwith normal working hours.

    A Certificate of Consent shall be required for each and every occasion when the Contractor proposes to work out-with normal working hours.

12. Permissible construction noise levels shall avoid significant effects in accordance with Annex E of BS 5228-1:2009+A1:2014.

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

Vibration Control

1. The Contractor shall consult and comply with the requirements of Highland Council, as appropriate, prior to commencement of work on Site. These requirements, together with the Contractor's proposed methods of work and Constructional Plant to be used shall be discussed and agreed in writing by Highland Council, as appropriate, prior to commencement of the relevant activities on Site.
2. The Contractor shall provide Consultation Certificates in accordance with the Certification Procedure in respect of this requirement.
3. Significant effects shall be avoided in accordance with Annex B of BS 5228-2:2009+A1:2014.
4. The Contractor shall provide written details of the proposed method and periodicity of monitoring of the Vibration Dose Value, to Highland Council and the Overseeing Organisation.
5. The Contractor shall carry out a risk assessment of the effects of Design, construction and maintenance on the structural integrity of adjacent buildings.
6. The Contractor shall carry out a structural or dilapidation survey of all buildings that are considered to be at risk and inform the Overseeing Organisation in advance such that the survey can be witnessed, and provide a copy of the survey to the Overseeing Organisation prior to construction of the Works commencing.

Vibration Monitoring Equipment

1. To ensure compliance with the specified vibration limits, monitoring shall be undertaken by the Contractor using a vibration monitor compliant with BS EN ISO 8041:2005.

Consultations

All consultations shall be undertaken with Highland Council Transport, Environment and Community Services,

Contact: [REDACTED]

Email: [REDACTED]

Telephone: [REDACTED]

APPENDIX 1/10: PERMANENT WORKS TO BE DESIGNED BY THE CONTRACTOR

1. Refer to the Employer's Requirements for details of Permanent Works to be designed by the Contractor.

APPENDIX 1/11: TEMPORARY WORKS DESIGN

1. Refer to the Employer's Requirements for details of Temporary Works to be designed by the Contractor.

APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS

1. The Contractor shall supply setting out information, including a schedule of co-ordinated survey stations, to the Overseeing Organisation whenever such information is available, updated or revised.
2. Clearly marked chainage markers at 50 metre intervals shall be erected by the Contractor at suitable locations for the duration of the Works.
3. Before commencement of any earthworks, the Contractor shall establish permanent survey stations within the Site sufficient for the setting out and checking of the Works.

APPENDIX 1/13: PROGRAMME OF WORKS

1. Form of Programme

The Contractor shall prepare and provide any programme in accordance with the requirements below (inclusive of the Contractor's Programme and any future updates or revisions to that programme):

1.1 The Contractor's Programme shall be prepared using Primavera (or equal and approved by the Engineer).

1.2 The Contractor's Programme shall take the form of a fully logic linked gantt chart and critical path methodology.

1.3 The Contractor's Programme shall be provided to the Engineer in;

- Source electronic file containing all data;
- Summary gantt chart in PDF format (Level 1); and
- Expanded gantt chart in PDF format (Level 3).

1.4 The Contractor's Programme shall be supplemented by time chainage diagrams(s) produced using Tilos (or equal and approved by the Engineer) software and utilise the same programme source data. The Time Chainage Diagram shall be submitted in both native electronic file and PDF format.

1.5 The Engineer may request Time Chainage Diagram extracts as required to monitor the Works.

2. Specific Requirements

The Contractor's Programme shall:

- Include the time periods required for all pre-construction activities (including design and procurement and the requirements of the Employer's Information Requirements) necessary to undertake the Works;
- Ensure no part of the Works shall commence until the Design (or relevant stage of Design) shall be complete and that all necessary certification required under the Contract has been acknowledged;
- Show for each item relating to Design, allowances for the necessary work to be undertaken by the Design Checker;
- Show in relation to the requirements of the Employer's Information Requirements, allowances for the necessary project milestone reporting and demonstration of progress against BIM deliverables;
- Show a reasonable period for the preparation of submissions to and acknowledgement by the Engineer of all the certificates identified in the Certification Procedure including the Design and Design Check Certificates, the Road Safety Audit Certificates and the Consultation Certificates all as identified in the Employer's Requirements;
- Identify clearly the sequence of all construction operations at element/activity level required to complete the Works;
- Be accompanied by a narrative to explain the planned methods of working; sequencing contained within the programme; resources, key risks and contingency plans and highlight key programme interfaces, including but not limited to earthworks and mass haul strategy;
- Identify within a dedicated section of the programme, all deliverables which the Contractor requires to be provided/undertaken by the Engineer or any other third

party. The milestones shall be fully logic linked to the construction activities;

- Identify any significant temporary works elements or staging requirements to facilitate completion of the Works.
- Clearly identify any required consents or approvals required to facilitate completion of the Works.
- Include the following milestones;
  - Access dates;
  - Key dates;
  - Substantial completion date.
- Use unique reference ID's for each activity;
- Be fully resource loaded at activity level including as a minimum manhour and plant units;
- Be fully logic linked and with a critical path; and
- Be based on the working calendar (or calendars) to be utilised on the project, specifically identifying planned working hours and holiday periods.

3. Schedule of Constraints

The Contractor's Programme shall take account of constraints imposed by the Employer's Requirements and the Specification in respect of but not limited to:

(i) Work to Privately and Publicly Owned Services and Supplies and, in particular, cognisance shall be given to the Notice Periods and liaison stipulated in Appendix 1/16. Notice Periods and Time to Completion shall be shown on the Programme. Advanced Works shall also be shown on the Programme where relevant;

(ii) Traffic Safety and management. Refer to Appendix 1/17 for more detailed constraints, Notice Periods and consultation requirements, which should all be shown on the Programme;

(iii) Environmental constraints including seasonal restrictions and provision of environmental protection prior to the main construction operations (environmental barriers, etc.);

(iv) Submission by the Contractor of Road Restraint Systems for acceptance, including awaiting acceptance and resubmission;

(v) Availability of offices for the Overseeing Organisation and the Engineer and the Required Time Duration for Providing and Maintaining Accommodation and Equipment as defined in Appendix 1/1;

(vi) Private access and egress requirements throughout construction as described in Appendix 1/15; and

(vii) Erection of fencing to protect areas of vegetation to be retained prior to the main construction operations;

4. Programme format

When submitting any programme the Contractor shall supply the Engineer with an electronic native version of the programme, together with PDF gantt charts at A3 size. The PDF gantt charts shall include the following information;

- Project title,

APPENDIX 1/13: PROGRAMME OF WORKS

- Programme reference (linked to electronic file)
- Data date to be identified;
- Critical path to be identified in red;
- All activities to be visible (summary bars to be expanded);
- Information to be tabulated against each activity;
    - Activity ID;
    - Activity name/description;
    - Planned start date;
    - Planned finish date;
    - Planned duration;
    - Total Float.

Gantt charts shall be provided displaying the following level of detail:

- The expanded gantt chart shall include all activities as required by the Work Breakdown Structure Set out below (i.e. Level 3).
- The summary gantt chart shall comprise an abridged version of the expanded gantt chart.

5. Work Breakdown Structure

The level of detail in the Contractor's Programme shall not be less than the following:

Project
Key Dates
Details
3rd Party Deliverables
Transport Scotland deliverables
Details
Other 3rd party deliverables
Details
Design
Structures
For each structure
Foundation
Substructure
Superstructure
Finishes
Project Roads
For each project road
Alignment
Site clearance
Road restraints
Drainage systems
Earthworks
Road Pavement

APPENDIX 1/13: PROGRAMME OF WORKS

Kerbs and paved areas
Road markings
Signing
Lighting
Traffic Scotland equipment
Statutory undertakers & Private apparatus
Ecological Mitigation & planting.
Procurement
Long lead items
Details
Construction
Temporary Traffic Management
For each TTM scheme
Details
Utilities
For each alteration to private or public utilities or services.
Details (compliance with Appendix 1/16)
Earthworks
For each earthwork cutting, embankment and processing
Details
Structures
For each structure
Piling
Substructure
Superstructure
Finishes
Roadworks (not exceeding 500m)
For each roadwork section (not exceeding 100m)
Fencing
Site clearance
Topsoil strip
Drainage (pre-earthorks & 2nd stage)
Sub-base
Sub-grades improvement layer
Roadbase or concrete paving
Surfacing
Soiling and seeding
Accommodation Works
Details
Planting
Details

6. Progress Reporting

6.1 The Contractor shall report against the Contractor's Programme on a monthly basis.

6.2 The Contractor's Programme shall be updated for actual progress each month.

APPENDIX 1/13: PROGRAMME OF WORKS

Actual progress shall be recorded by means of updating;

- Actual start dates and actual finish dates for each activity; and
- Physical percentage complete and remaining duration of activities in progress.

6.3 The programme shall be rescheduled to calculate a revised critical path and forecast completion date.

6.4 The Contractor shall provide the Employer with an electronic native file of each updated programme, together with legible PDF gantt charts in A3 size. The PDF gantt chart shall include the following information;

- Project title,
- Programme reference (ID linked to electronic file name)
- Data date to be identified;
- Critical path to be identified in red;
- Information to be tabulated against each activity;
    - Activity ID;
    - Activity name/description;
    - Baseline start date (from previous update);
    - Baseline finish date (from previous update);
    - Baseline duration (from previous update);
    - Actual start date;
    - Actual finish date;
    - Remaining duration;
    - Baseline percentage complete;
    - Actual percentage complete; and
    - Total Float

6.5 If the contractor has made any minor logic and/or duration changes within its updated programme, a schedule of changes should be provided along with explanation to the Engineer within the Contractor's monthly report.

6.6 Where slippage is evident from the updated programme, the Contractor shall provide narrative to explain the reasons for slippage and set out mitigation measures where applicable.

APPENDIX 1/14: PAYMENT APPLICATIONS

The monthly statements submitted to the Engineer by the Contractor in accordance with Clause 60 of the Conditions of Contract shall inter alia set out in detail the Schedule of Payments which are either [REDACTED] complete for each Milestone.

APPENDIX 1/15: ACCOMMODATION WORKS

1. Not Used
2. Not used.
3. The Contractor shall complete Accommodation Works as soon as practicable after the date of commencement of the Works.
4. Notwithstanding this, private access shall be provided across the Site to adjoining landowners and affected parties to the same level as that which shall be provided by the Accommodation Works and until such time as the Accommodation Works are complete.
5. Any access tracks required at various locations shall be designed to comply with the following parameters.
   (i) Minimum horizontal radius and curve widening to suit agricultural vehicle and UK Freight Transport Association Design Articulated Vehicle (1998) (16.48 metres long) use. The Design shall allow for use by a tractor and trailer combination and modern combine harvesters in transportation configuration.
   (ii) Maximum vertical gradient shall be nominally 8% however the gradient may be increased to 15% over short lengths with the agreement of the Landowner.
   (iii) Verges, 1 metre wide shall be provided on both sides of all access tracks over the full length of the access track unless specified otherwise.
6. Where Accommodation Works fencing is required along the boundary of the Land Made Available by the Employer for the Works, the fence shall be set parallel to the boundary with fence posts contiguous to the boundary and with the fence outside the Land Made Available by the Employer for the Works.
7. Not Used
8. Accommodation Works fencing shall be connected to adjacent existing fencing to ensure continuity of the fence.
9. Where water supplies are to be provided as part of Accommodation Works the Contractor shall make every effort to ensure that the installation prevents freezing of the water supply. Any lagging to pipe work shall be robust to prevent damage from livestock.
10. The exact location of all gates, water troughs, holding pens and the like shall be agreed with the relevant landowner and occupier prior to installation.
11. Where access tracks cross existing watercourses, drainage ditches and the like, these shall be piped or bridged and provide the carriageway and verge dimensions prescribed for the adjoining access track. Where watercourses are to be piped or bridged as part of the Accommodation Works, the Contractor shall carry out the Design in accordance with the Employer's Requirements.
12. 'HCD' is defined as the Highway Construction Details contained in the Manual of Contract Documents for Highway Works, Volume 3.
13. Access track and other surfacing shall be in accordance with Section 4.2.7 of the Employer's Requirements.
14. Where tracks are to be provided with adjacent drainage ditches, the ditch shall be of uniform depth with invert gradient which follows that of the track. Offlet culverts shall be provided under the built track with ditch blockers installed immediately downstream of the offlet culvert inlet such that the volumes of flows in the ditches is reduced and an even redistribution of runoff onto the existing ground is provided.

A9 : BERRIEDALE BRAES IMPROVEMENT SCHEME APPENDIX 1/15 - SCHEDULE OF WORKS	
REFER TO DRAWING NO.	
OWNER(S)	**OCCUPIER**
LIST OF WORKS REQUIRED	
Ref No.	**Requirements**
N/A	NOT USED

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

Undertakers Works

1. Notwithstanding any information provided in this Schedule of Privately and Publicly Owned Services and Supplies for the Design, construction, completion and maintenance of the Works, the Contractor shall consult and comply with the requirements of all Undertakers necessary to determine the effect of the Design, construction, completion and maintenance of the Works on Apparatus, and to arrange any alterations of any Apparatus or Private Apparatus which, in the opinion of the Undertakers, may be necessary for or resulting from the Design construction, completion and maintenance of the Works.

2. The Contractor shall make arrangements with the Undertakers and others concerned for the coordination of the Design, construction, completion and maintenance of the Works with all Undertakers' Works and otherwise required to be carried out concurrently with the Design, construction, completion and maintenance of Works.

3. The Contractor shall make arrangements with Undertakers and others for the phasing of all necessary Undertakers Works affected by or forming part of the Works**.**

4. The Contractor shall consult and comply with all Undertakers and others in connection with diversion routes, road closures, interruptions to supplies and otherwise while Undertakers Works are being carried out.

5. The Contractor shall comply with any periods of notice given by Undertakers.

   Any such compliance by the Contractor shall not relieve the Contractor of any of his other obligations under the Contract.

6. The locations of:

   (i) existing Apparatus;

   (ii) existing Private Apparatus; and

   (iii) any advance Undertakers Works

   shown on the Drawings listed in Appendix 0/4 of the Specification are approximate only.

   The Contractor shall satisfy himself as to the exact location of all Apparatus and Private Apparatus (including private water supplies) prior to carrying out work in any part of the Site.

   No warranty or representation is given by the Employer as to the accuracy or completeness of any such information.

   The Employer shall be under no liability for any error, misstatement or omission, and none of such information shall constitute a contract or part of a contract between the Employer and the Contractor and shall not create a duty of care by the Employer to the Contractor.

7. The Contractor shall satisfy himself that the Design construction, completion and maintenance of the Works take account of all existing Apparatus whether or not such existing Apparatus are shown on any Drawings listed in Appendix 0/4 of the Specification.

8. Apparatus and/or Private Apparatus to individual properties have not been shown on the Drawings listed in Appendix 0/4 of the Specification.

   The Contractor shall make arrangements with Undertakers and relevant owners of Private Apparatus and others concerned for the phasing of all necessary Undertakers Works and Private Apparatus Works affected by the Design construction, completion and maintenance of the Works.

9. The names, addresses and telephone numbers of the Undertakers with Apparatus in the locality of the Site include, but are not limited to, those described in Table 1/16A.

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

Notwithstanding the names, addresses and telephone numbers of the Undertakers with Apparatus in the locality of the Site including, but not limited to, those described in Table 1/16A or the Undertakers referred to elsewhere in the Contract, the Contractor shall satisfy himself as part of the Design, construction, completion and maintenance of the Works that he has consulted and complied with the requirements of all Undertakers and any others affected by the Design construction, completion and maintenance of the Works.

Table 1/16A

Undertakers and other Companies	**Address and Telephone Number**	**Contact**
British Telecommunications (Openreach) plc	[REDACTED]	[REDACTED]
Scottish and Southern Energy	[REDACTED]	[REDACTED]
Scottish Water	[REDACTED]	[REDACTED]
Vodafone	[REDACTED]	[REDACTED]

Private Apparatus Works

10. The Contractor shall consult and comply with Undertakers and relevant parties for Private Apparatus Works to determine the effect of the Design, construction, completion and maintenance of the Works and Undertaker's Works on Private Apparatus.

11. The Contractor shall bear the cost of all Private Apparatus Works or any other work that may be required for the Design construction completion and maintenance of the Works.

12. It shall be the Contractor's responsibility to co-ordinate all Undertakers Works and Private Apparatus Works or future provision Works to meet the requirements of Undertakers or relevant owners of Private Apparatus not withstanding any indicative diversions identified in this Appendix.

General

13. The Contractor shall consult and comply with BT Openreach plc regarding the supply of ducting, ironwork or otherwise for their Undertaker's Works.

    All other ducting and ironwork for all other Undertakers Works and Private Apparatus Works required in connection with the Design, construction, completion and maintenance of the Works shall be provided by the Contractor.

    Ducting forming part of the Design, construction, completion and maintenance of the Works shall be to the satisfaction of the appropriate Undertakers or others concerned.

14. Within the Indicative Schedule of Undertakers Works for the Works contained in this Appendix chainage is referenced to the Left (L) and Right (R) of chainage points relative to the direction of increasing chainage and is given in metres.

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

All chainages are approximate.

15. The Contractor shall be responsible for all traffic management associated with the Works in connection with all Undertakers Works and Private Apparatus Works required to be carried out in accordance with the Contract.

16. Not Used.

17. The Contractor shall carry out all works required resulting from the requirement upon the Contractor to consult and comply with the requirements of the Undertakers and the other provisions of the Contract to enable the Undertakers Works in the Indicative Schedule of Undertakers Works contained in Table 1/16B to be completed.

18. Subject to the other provisions of this Appendix 1/16 and the other provisions of the Contract, the additional requirements of services and service ducts in Structures shall be shown separately in Appendix B of the Employer's Requirements.

19. British Telecommunications plc

    (i) All work carried out for British Telecommunications plc shall be in accordance with the edition, current at the Reference Date, of the British Telecommunications Underground Duct Laying and Associated Works Specification LN550 Rev A and the associated specifications and drawings referred to therein.

    (ii) Before the commencement of any of the notification periods to attend Site specified in the Indicative Schedule of Undertaker's Works British Telecommunications plc require a Design and material procurement period, the duration of which has not been advised, to enable British Telecommunications plc to carry out the following:

        (a) examine the Contractors detailed Design drawings for the protection and diversion Works to the British Telecommunications plc services, including cross sections;

        (b) discuss with the Contractor and agree a detailed programme of Works which is acceptable to British Telecommunications plc; and

        (c) prepare the first Works instruction to British Telecommunications plc field staff.

    (iii) The Contractor shall programme, with respect to the Works estimate periods (Works by Undertakers) to allow British Telecommunications plc to carry out their element of the diversion Works.

20. Scottish Water

    The Design of permanent water main diversions for Scottish Water shall be carried out in accordance with the Civil Engineering Specification for the Water Industry (CESWI) 7th Edition and the Scottish Water specification as laid out in the Waters for Scotland 3rd Edition.

21. Scottish and Southern Energy

    All Works carried out for Scottish and Southern Energy shall be in accordance with the Health and Safety Guidance Notes HSG47 and GS6 which give advice on the Avoidance of Danger from Underground Cables and Overhead Lines respectively.

    In accordance with Health & Safety Guidance Note HS (G) 47 care will be necessary when digging in proximity to underground cables, particularly if mechanical excavators are used.

    Before undertaking any work which is within 6 metres horizontal distance of an underground cable, or within 9 metres horizontal distance of a wooden pole overhead line, a site meeting is required to agree method of working, type of mechanical excavators etc and how they will be used when working in the proximity of cables, lines or plant.

22. Vodafone

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

All works carried out for Vodafone shall be in accordance with HSG47 “Avoiding Danger from Underground Services” and NJUG Volume 3 Guidelines on the Management of Third Party Cable Ducting.

All excavations adjacent to Vodafone apparatus are to be carried out by hand until the extent and or location of the Vodafone apparatus is known. Use of mechanical borers and/or excavators shall not be used without the supervisory presence of a Vodafone representative or a given exemption.

23. There are no known diversions of private supplies.

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

Reference Drawing Reference	**General Description of Services**	**UG, OH or OG**	**Works by Undertakers**
BT 1 (See Note 8)	*In advance of BT2:* Recover approx. 636m of co-ax cables from JBF6:1200 to JRC11:1201. Concurrently install sub-duct Mono Bore 5 from MR1:3 to proposed JRCX12C	UG	Design works Procure and deliver appartus Install sub-duct Recover apparatus
BT 2	*In advance of on-line road works:* Expose existing duct in southbound verge from approx. ch.430-510 and lay additional insurance duct with concrete mat. Construct new joint box JRCX12 on southbound verge at ch.430 and lay duct across the A9 at 600mm cover, bringing to the surface beyond the scheme extents. Lay temporary overground duct approx. following existing northbound verge to north extent of layby and provide temporary joint JMF104. Continue temporary ducting down the steep embankment and bury into manhole RC1:8 at approx. ch.15 Draw in new and temporary sub-ducts/cables, change over services and recover redundant cables.	UG & OG	Design works Procure and deliver appartus Install temporary apparatus and carry out jointing
BT 3 (See Note 8)	*In advance of BT4:* Recover approx. 749m of co-ax cables from RC1:8 to JRF11:1208. Concurrently install sub-duct Mono Bore 5 from RC1:8 to JRF11:1208.	UG	Design works Procure and deliver apparatus Install sub-duct Recover apparatus
BT 4	*In advance of on-line road works:* Lay approx. 12m duct across the A9 at ch.15 at 600mm cover Draw in and bury approx.. 60m armoured cable between joint box RC1:8 on northbound side at ch.15 and proposed jointing point along access track.	UG	Design works Procure and deliver appartus Install apparatus and carry out jointing

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

Reference Drawing Reference	**General Description of Services**	**UG, OH or OG**	**Works by Undertakers**
BT 5 (See Notes)	*In advance of on-line road works and after completion of BT2 and BT4:* Blow-in 1x optical fibre cable via new duct between existing joints at MR1:23 and JRF11:1208, approx. 1581m length Change over optical fibre cable, recover redundant fibre cable and cut existing sub-duct at RC1:8 and JRCX12C	UG	Design works Procure and deliver appartus Install temporary apparatus Change over service, recover redundant apparatus and cut existing apparatus
BT 6	*As works progress:* Replace and adjust frame and cover of joint box JRC9:22 at approx. ch.515 and RC1:8 and JRC12:36 at approx. ch.15 Lay new twin PVC duct from RC1:8 at northbound verge ch.15 to JRCX12C southbound verge ch.430, crossing the new road at approx. ch.290 with associated joint boxes Draw in new ducts from approx. ch.15-515, change over services and recover redundant cables Appointed Contractor to demolish redundant joint boxes on existing road alignment	UG	Design works Procure and deliver appartus Adjust joint boxes Install new apparatus and recover redundant apparatus
BT 7 (See Notes)	*On completion of on-line road works:* Blow-in 1x optical fibre cable via new duct in new road between existing joints at MR1:23 and JRF11:1208, approx. 1731m length Change over optical fibre cable and recover redundant cable from temporary duct between RC1:8 and JRCX12C	UG	Design works Procure and deliver appartus Install new apparatus Change over service and recover redundant apparatus
BT 8	*On completion of permanent cable diversion and recovery (BT7):* Remove temporary joint box and overground ducts for temporary diversion, and make good the verge.	UG & OG	Design works Procure and deliver appartus Remove temporary apparatus

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

Notes

1. References BT 1 to BT 8 refer to those diversions and protection Works to BT Openreach services identified on the BT Openreach C4 Diversion Estimate contained within the Information Pack, and indicated on the Indicative Undertakers Works Drawing listed in Appendix 0/4 of the Specification.
2. UG – Underground; OH – Overhead; OG – Overground; L and LHS – Left hand side; R and RHS – Right hand side.
3. The design, procurement, notification, and site works for BT 1 to BT 8 will, on occasions, take place concurrently.
4. Please note that for Openreach Works out with the Contractors traffic management or required to be done independently – the Roads Authority would be entitled to 3 months advance notice under the Transport (Scotland) Act for at least some of those works.
5. 3 months advance Road Authority Notice will be required for major Openreach duct works and Cabling works out with limits of proposed roadworks, and for any works required to be carried out in advance of start of main roadworks noticing/traffic management.
6. 8 weeks minimum advance notice for works within main Contractor's existing traffic management or non-traffic situations.
7. In event of damage to existing co-ax cables during recovery process, an additional cable may need to be installed to the specification detailed within the BT Openreach C4 Diversion Estimate Drawing.
8. Optical fibre cables must be replaced joint to joint to manage service outages.
9. Existing optical fibre joints are recorded in the BT Openreach C4 Diversion Estimate Drawing. These details and positions are to be confirmed by the Contractor before works begin.
10. BT makes no guarantees as to the condition of existing ducts between optical fibre joints.

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

Reference Drawing Reference	**General Description of Services**	**UG or OH**	**Works by Undertakers**
SSE 1	Installation of approximately 100m of new 3c150sp.mm XLPE cable, including installation of new terminal poles and connections to existing apparatus and removal of redundant apparatus.	OH/UG	Design works
			Procure and deliver appartus
			Shtudown network as required
			Install new apparatus and associated connections
			Remove and recover redundant apparatus

Notes

1. Reference SSE 1 refers to the diversion and Works to Scottish and Southern Energy services identified on the SSE C4 Diversion Estimate contained within the Information Pack, and indicated on the Indicative Undertakers Works Drawing listed in Appendix 0/4 of the Specification.
2. UG – Underground; OH – Overhead; OG – Overground; L and LHS – Left hand side; R and RHS – Right hand side.
3. The design, procurement, notification, and site works for SSE 1 will, on occasions, take place concurrently.

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

Reference Drawing Reference	**General Description of Services**	**UG, OH or OG**	**Works by Undertakers**
VF 1	Installlation of approximately 550m of new 1-way duct in the new roadside verge, along with construction of 3 new C1 chambers. Installation of approximately 1,000m of 24F cable between existing Joint and new maintenance joint, including splicing and recovery of the redundant cable.	UG	Design works
			Procure and deliver appartus
			Installation of new duct and associated chambers
			Installation and jointing of new cable
			Recovery and removal of redundant apparatus

Notes

1. Reference VF 1 refers to the diversion and Works to Vodafone services identified on the Vodafone C4 Diversion Estimate contained within the Information Pack, and indicated on the Indicative Undertakers Works Drawing listed in Appendix 0/4 of the Specification.
2. UG – Underground; OH – Overhead; OG – Overground; L and LHS – Left hand side; R and RHS – Right hand side.
3. The design, procurement, notification, and site works for VF 1 will, on occasions, take place concurrently.

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

Reference Drawing Reference	**General Description of Services**	**UG or OH**	**Works by Undertakers**
SW 1	Installation of approximately 85m of new 90mm diameter HPPE water main, including connection to existing apparatus and removal of approximately 80m of redundant 3" asbestos cement water main.	UG	Design works
			Procure and deliver appartus
			Installation of new apparatus, including jointing and connection
			Removal of redundant apparatus

Notes

1. Reference SW 1 refers to the diversion and Works to Scottish Water services identified on the Scottish Water C4 Diversion Estimate contained within the Information Pack, and indicated on the Indicative Undertakers Works Drawing listed in Appendix 0/4 of the Specification.
2. UG – Underground; OH – Overhead; OG – Overground; L and LHS – Left hand side; R and RHS – Right hand side.
3. The design, procurement, notification, and site works for SW 1 will, on occasions, take place concurrently.

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT

1. All Traffic Management shall be carried out in a manner which avoids causing traffic to divert on to alternative routes, minimises the impact on the local community and minimises delays and disruptions to existing traffic. The Contractor shall demonstrate to the satisfaction of those consulted as given in Paragraph 3 of this Appendix that his Traffic Management proposals have been developed such that they include all necessary measures to minimise delays, disruptions and diversions to traffic.

2. Subject to the other requirements of the Contract the Contractor shall comply at all times with the requirements of Chapter 8 of the Traffic Signs Manual and any additional requirements detailed in the Design Manual for Roads and Bridges.

3. Notwithstanding any requirement of the Contract, the Contractor shall liaise with Highland Council, Police Scotland, the Trunk Road Operator and the Overseeing Organisation on all temporary traffic management proposals and shall obtain Consultation Certificates signed by the Contractor and the relevant third parties in accordance with Section 8.9 of the Employer's Requirements.

   Liaison shall be through the following offices:

   Police Scotland

   Road Policing, Operational Planning and Support
   Contact: [REDACTED]
   Email: [REDACTED]
   Telephone Number: [REDACTED]

   Trunk Road

   Network Management Trunk Roads and Bus Operations (TRBO)
   [REDACTED]
   Contact: [REDACTED]
   Telephone Number: [REDACTED]

   Trunk Roads Managed and Maintained by:
   [REDACTED]
   Contact: [REDACTED]
   Email: [REDACTED]

4. Where Works are carried out on or adjacent to a road open to vehicles, all vehicles and mobile plant operating on or adjacent to that road in the execution of the Works shall be painted in a conspicuous colour as described hereafter :-

   (i) All vehicles used in mobile lane closures as defined in Section D6.24 of Part 1 of Chapter 8 of the Traffic Signs Manual shall be painted in non-reflectorised yellow (Colour No 355 to BS 381 C or similar).

   Similarly all vehicles engaged in Works within unprotected trafficked lanes (for example, setting up major traffic management layouts such as tapers and contraflows) on high speed roads shall be painted non-reflectorised yellow.

   (ii) All other vehicles undertaking Works shall be generally light in colour preferably but not necessarily non-reflectorised yellow and/or provide, over the full width and height of the vehicle which is exposed to approaching vehicles, conspicuous markings and signs to define clearly that the vehicle is a roadworks vehicle.

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

(iii) Vehicles shall have a sign board reading “Highway Maintenance” (to Diagram 7404 of Schedule 13 Part 6 of the Traffic Signs Regulations and General Directions 2016) fixed at the rear.

The lettering shall be 150 millimetres “x height” except that for light vans and cars it shall be the largest “x height” that can be accommodated out of the following heights: 37.5, 50, 62.5 or 100 millimetres.

The lettering shall be black capital letters from the alphabet as described in Schedule 17 Part 2 of the Traffic Signs Regulations and General Directions 2016 on a yellow non-reflectorised background in accordance with BS 381C, Colour No 355.

In addition all purpose vehicles and plant shall be provided with either roof mounted light bars or at least two amber flashing beacons, and light vans and cars shall be provided with a roof mounted amber flashing distinctive lamp.

(iv) All warning lamps shall be switched on when the vehicle or plant is manoeuvring into or out of the location of the Works, operating at low speed on the carriageway or hard shoulder open to vehicles or standing on a carriageway or hard shoulder open to vehicles.

5. Proposals for the management of all vehicular and pedestrian traffic shall be submitted to the Overseeing Organisation prior to the commencement of any Works.

6. All applications relating to Traffic Orders and/or authorisation of signs and/or signals shall be submitted to the Overseeing Organisation and Local Authority in writing and require the following notice following payment in accordance with clause 8 below:

(i) amending or making temporary traffic orders – 8 weeks;

(ii) authorisation of temporary traffic signals – 3 weeks; and

(iii) authorisation of non prescribed signs – 8 weeks.

7. The Contractor shall be responsible for the payment of all charges associated with the preparation and publication of all road related orders.

8. The Contractor shall comply with Section 8.11.7 of Part 1 of the Employer’s Requirements in relation to the provision of Stage 2 and Stage 3 Road Safety Audits on all temporary traffic management proposals.

9. Prior to any Works starting on Site, the Contractor shall supply to the Overseeing Organisation details of the following:

(i) Phasing of the Works

(ii) Drawings showing traffic management layouts including, but not limited to, the following:

a) Position of traffic signs, signals and cores

b) Width of lanes

c) Working areas

d) Safety zones

e) Details of temporary barriers for the protection of personnel

f) Entry points for site traffic

g) Provisions for emergency vehicles

h) Crossovers

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

(iii) Timing of operations

(iv) Sufficient information to demonstrate the objectives stated in paragraph 1 of this Appendix 1/17 can be achieved

(v) Name and telephone numbers of the Traffic Safety and Control Officer and other personnel

(vi) Names and telephone numbers of a minimum of 3 personnel who can be contacted by Police Scotland and/or Overseeing Organisation, both during or outwith the working day, and who shall be responsible for initiating whatever action shall reasonably be required in the event of an emergency. At least 2 of these contacts shall be available at any one time including periods when the Site is closed.

Notwithstanding the difficulties associated with mobile telephone coverage in this area, all of the above shall be provided with a communications system sufficient to allow contact to be achieved at all times with coverage extending to the Site and the A9 Trunk Road.

10. Not less than 10 days before implementation of any temporary traffic management proposals the Contractor shall submit to the Overseeing Organisation the two signed copies of a Stage 2 Road Safety Audit Certificate in respect of the temporary traffic management proposals.

11. Not less than 7 days before implementation of any temporary traffic management proposals the Contractor shall submit to the Overseeing Organisation the following:

(i) Two signed copies of Consultation Certificates in respect of the temporary traffic management proposals signed by the Contractor and Police Scotland.

(ii) Two signed copies of Consultation Certificates in respect of the temporary traffic management proposals signed by the Contractor, Highland Council, the Trunk Road Operator and Overseeing Organisation.

(iv) Four copies of drawings showing the temporary traffic management proposals layouts including, as appropriate:

Position of traffic signs, signals and cones

Width of lanes

Working areas

Safety zones

Details of temporary barriers for the protection of personnel

Entry points for site traffic

Provisions for emergency vehicles

(v) Crossovers

(vi) Details of any relevant correspondence between the Contractor and the Trunk Road Operator and Police Scotland and the Contractor and Highland Council.

12. The erection, alteration and removal of any traffic management installation or temporary diversion on areas of road open to traffic shall not be carried out during the following hours:-

Monday to Saturday 06:30 to 09:30 hours and 15:30 to 19:30 hours, or during any local or national public holiday period or other significant local events, or any other time period specified by the Overseeing Organisation in Appendix 1/18 unless otherwise agreed by exception wih the Trunk Road Operator.

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

13. For construction of the new roadworks on the Existing A9 Trunk Road, temporary Traffic Regulation Orders, which shall allow mandatory speed restrictions, shall be implemented.

    The Contractor shall provide and maintain all necessary temporary signing with regard to the Orders.

14. "Merge in turn" layout. NOT USED.

15. Notwithstanding any other requirements of the Contract, safety zones at all temporary traffic management proposals on the Site shall be provided as per the requirements of Chapter 8 of the Traffic Signs Manual.

16. The Contractor shall not take down existing local or advance direction signs or regulatory or informatory signs without first either providing temporary signs displaying the same information or replacement permanent signs.

17. The Contractor shall ensure that while any temporary traffic management proposals are in force they are constantly monitored, any defects identified being rectified immediately to the satisfaction of the Overseeing Organisation, Police Scotland and Highland Council.

18. The Contractor shall keep a daily record of all defects in any temporary traffic management proposals, the times when they were identified or reported to him, the action taken to correct the defects, and the times when they were successfully corrected.

    A copy of this record shall be forwarded to the Overseeing Organisation on the following day.

19. In the event of a traffic accident occurring in or adjacent to any of the Works, the Contractor shall immediately contact the Trunk Road Operator, Police Scotland, Fire and Ambulance emergency services as appropriate and the Overseeing Organisation informing them of the following:

    (i) Location of the accident; and

    (ii) The seriousness of the accident and whether any persons are trapped; whether the collision involves vehicles carrying inflammable, corrosive or hazardous substances; whether there is a possibility of ignition from leaking fuel or chemicals.

20. All drivers including those delivering Constructional Plant and materials shall be given clear instructions regarding the traffic arrangements applicable at any particular time.

21. Provision for the passage of abnormal loads through the Works shall be as follows:

    (i) The Contractor shall assist Police Scotland in moving abnormal loads through the Works by modifying the signing/coning as necessary.

    Signs/cones so moved shall be replaced immediately after the abnormal loads have passed through the Works.

    (ii) The Contractor shall be responsible for the provision of holding lay-bys for abnormal loads on the A9 Trunk Road to the north and south of the Works, including appropriate signing.

    Police Scotland and the relevant Roads Authority shall be consulted with regard to the use of existing lay-bys for this purpose.

    (iii) The Contractor shall not be entitled to any further payment by the Overseeing Organisation in respect of the provisions made, measures taken or disruption caused by such abnormal loads.

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

For the purposes of this Section an abnormal load shall consist of any number of vehicles in convoy at any one time, requiring special measures to be taken in order to gain passage through the Works.

22. The Contractor shall be responsible for maintaining the running carriageway adjacent to and within the Works in a clean and safe condition at all times.

23. Heavy Goods Vehicles used on Site by the Contractor, his sub-contractors or suppliers shall be fitted with an audible reversing warning device.

24. Meetings between the Overseeing Organisation, Contractor, the Trunk Road Operator, Police Scotland and Highland Council shall be arranged by the Contractor monthly throughout the duration of the Works, at initiation or changes of traffic management layouts and at any other time deemed necessary by any of these parties. A record of this meeting shall be forwarded to the Engineer within seven days.

25. The Contractor shall ensure that his traffic management proposals take account of events and public holidays that are likely to affect traffic flows.

26. The Contractor shall accommodate roadwork schemes adjacent to the Works and shall consult and comply with the relevant Roads Authority in this respect.

27. The Contractor shall nominate two members of staff to liaise with the Traffic Scotland National Control Centre at all times. As part of the nomination information the Contractor shall provide 24 hour contact telephone numbers for the staff.

28. The contact address is: [REDACTED]. Telephone: [REDACTED]

29. The Contractor shall notify the National Control Centre, the Trunk Road Operator, Highland Council and the emergency services at least two weeks in advance of the initial implementation of any Temporary Traffic Management and any planned major changes to the traffic management layouts. The Contractor shall provide at the time of each notification an indication of the delays that are likely to occur.

30. In accordance with Appendix 1/24 of the Specification the Contractor shall within his Method Statements for Traffic Management include procedures to inform the motoring public of delays and queues on the approaches to and within the site.

31. The following organisations are to be informed of the frequencies indicated in clause 33 below:

    (i) Traffic Scotland Operations & Infrastructure Services (TSOIS) Contractor

    Telephone: [REDACTED]

32. Traffic queues shall be monitored by the Contractor at all times during periods when temporary traffic management systems are in operation for the duration of the Contract.

33. Traffic queues shall be measured by means of time delay. Queue lengths measured as being less than eight minutes shall be defined as representing *"No substantial delay".*

    Substantial delay queue lengths shall be quoted in the following bands;

Measured Delay	Quoted Delay
Up to 8 minutes	No substantial delay
Between 8 and 12 minutes	10 minute delay
Between 13 and 17 minutes	15 minute delay
Between 18 and 22 minutes	20 minute delay
subsequent 5 minute time bands	add 5 minute delay

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

When communicating a traffic queue its length is to also be quoted as a distance in miles.

For the purposes of the Contract a queue is defined as being where the speed of vehicles is less than 20 miles per hour.

Reporting Frequencies

The traffic information points of contact listed in clause 32 shall be informed by the Contractor if;

(i) A queue reaches eight minutes delay;

(ii) A queue changes by five minute band; or

(iii) Substantial delay ends i.e. delay less than eight minutes.

The Contractor shall report to TSNCC every 30 minutes when there is a queue as defined in this clause.

34. Vehicular and pedestrian access to any private premises shall not be restricted by the Works without the express prior written approval of the owner/occupier of the private premises.

35. The Contractor shall provide to the Overseeing Organisation evidence of any such written approval in advance of a restriction taking place.

36. Not used.

37. Not used

38. All traffic signs required by the Traffic Signs Regulations and General Directions 2016 that are to be reflective shall be made reflective by the application of Class 1 retroreflective material.

39. As a minimum provision the traffic management arrangements must ensure that a single lane width of at least 3.25m is available at all times.

40. All temporary traffic signs must comply with the Traffic Signs Regulations and General Directions 2016.

41. Public Roads, Private Roads and Other Ways Affected by the Works

The following public roads are under the control of Transport Scotland:-

Description	**Predicted 24 Hour Annual Average Daily Flow AADF and %age HGV**	**Estimated Eighty Five Percentile Speed of Cars (mph)**	**Speed Limit (mph) if Proposed**	**Type(s) of Traffic Control**	**Special facilities (pedestrian equestrian)**	**Whether to be Kept Open or Closed**
A9 Trunk Road	2400 - 3300 with 12% HGV (2031 data)	60	Contractor's Traffic Management proposals	Contractor's Traffic Management proposals	Where any special facility exists it shall be maintained	Open

44 (i) In addition to the minimum requirements for signing and coning under Chapter 8 of the Traffic Signs Manual the Contractor shall erect and maintain the following:

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

(a) Advanced signing two miles prior to roadworks as drawing No. (P7004 sheet 1 of 3) detailing modification to sign WBM 338.1 of Chapter 8 of the Traffic Signs Manual.

The standard two-line legend "Road Repairs" shall be replaced by "Major Roadworks".

(b) Signing erected one mile in advance of roadworks as drawing No (P) 7005 detailing modification to sign WBM 338 of Chapter 8 of the Traffic Signs Manual.

The standard two line legend shall read "Delays Possible" and a third line added to the legend indicating how long delays are possible.

At the commencement of the Contract, the additional line shall read, for example "until Autumn 2019".

At least ten working days before the end of the carriageway restrictions, the date shall be specified more precisely, for example "until 25 August 2019".

This date shall be further revised if necessary, until the restrictions are removed.

(ii) Only the following abbreviations shall be used: Jan, Feb, Mar, Apr, Aug, Sep, Oct, Nov and Dec.

(iii) Not used.

(iv) Signing to Drawing Numbers W(S) 148 and W(S) 149 shall be deposited in accordance with signs WBM 339.1 and WBM 339 respectively under Chapter 8 of the Traffic Signs Manual.

(iv) Where within all of the drawings listed above reference is made to “The Scottish Office”, it shall be deleted and replaced with “Transport Scotland” and the logo amended accordingly.

(vi) Black on yellow signs as Drawing Numbers [(P) 7004 sheet 2 of 3] and [(P) 7004 sheet 3 of 3] sited at the beginning and at 1 kilometre intervals through the Works to explain why part of the road has been coned off but no Works is, or appears to be taking place.

This signing shall comprise a frame on to which signs displaying any one of the approved messages below shall be fitted.

This equipment shall either be permanently sited, for the duration of the Works, where it is safe and convenient to do so, or kept on one side ready for display when it is required.

The signs shall be constructed and mounted in accordance with the general principles outlined in Chapter 8 of the Traffic Signs Manual.

They shall be reflectorised by the use of Class1 retroflective material.

(vii) The legends required to the Works shall follow the following variants in accordance with Chapter 8 of the Traffic Signs Manual:

WORK SUSPENDED UNSUITABLE WEATHER

LANE CLOSED TO PROTECT WORKFORCE

(viii) The minimum period of inactivity which would warrant the display of a sign is 15 minutes.

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

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

Scheme Ref.			
Sign	Ref. Road Works Sign 1	x-height	125.0
Letter colour	BLACK	SIGN FACE	
Background	YELLOW	Width	2790mm
Border	BLACK	Height	1830mm
Material	Microprismatic	Area	5.10sq.m

Notes:

1. Traffic signs to be manufactured in accordance with BS EN 12899-1:2007 in the case of Class RA signs, or BS AAMA 2005 in the case of microprismatic signs.

2. All dimensions are in millimeters unless otherwise stated.

3. Lengths, widths and spacings of route numbers, legends, blocks and borders shall be in accordance with the Traffic Signs Manual Chapter 8 as the Working Drawings for Traffic Sign Design and Manufacture Volume 1, 2 and 3.

4. The actual location of traffic signs shall be agreed with the Engineer prior to commencement.

5. The legend is from the Transport Heavy alphabet of the x-heights shown.

6. For guidance on the use and size of the Transport Scotland logo refer to the 'Motorway, Trunk Road Guidelines'

REVISIONS

July 2010

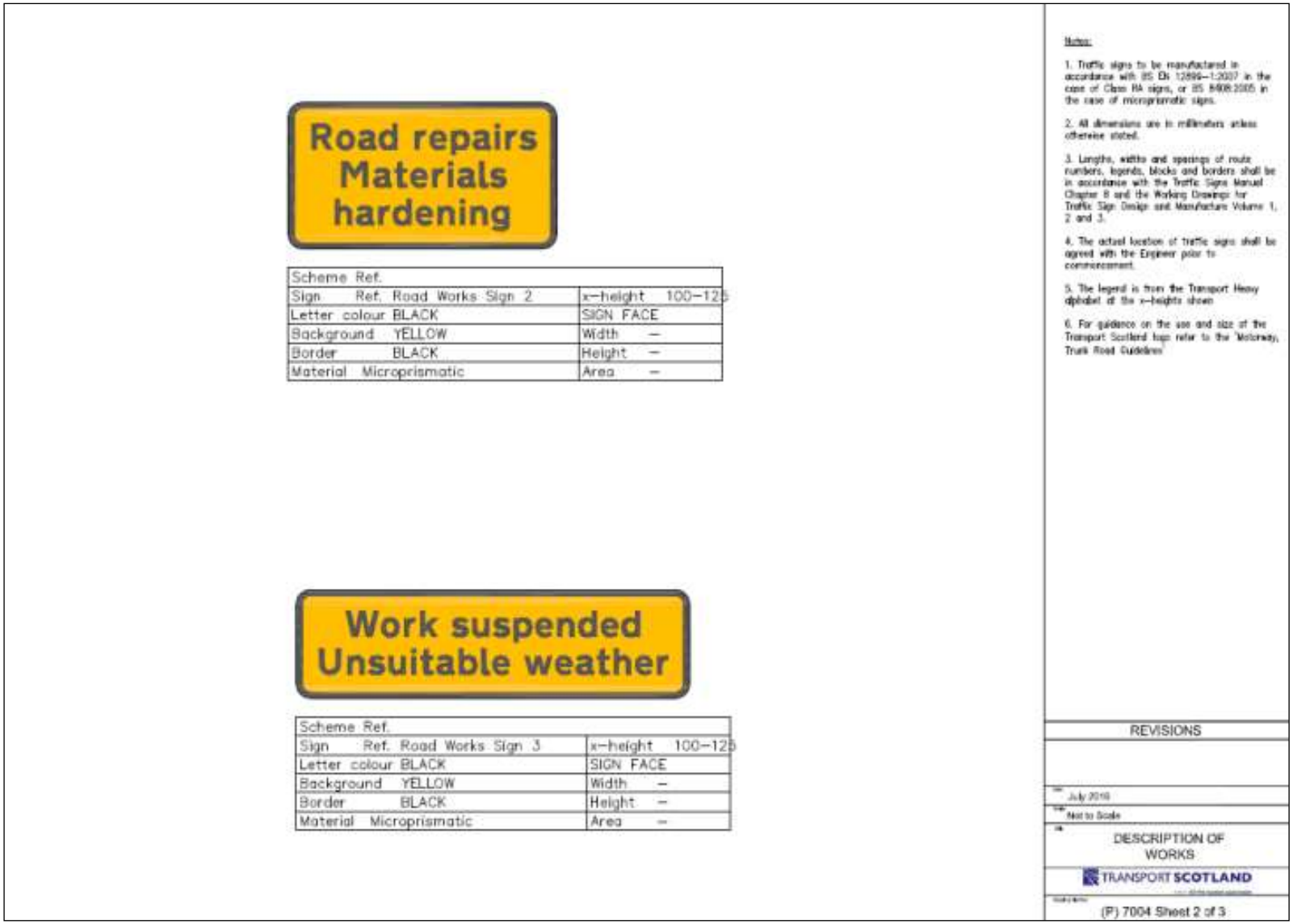
Not to scale

DESCRIPTION OF WORKS

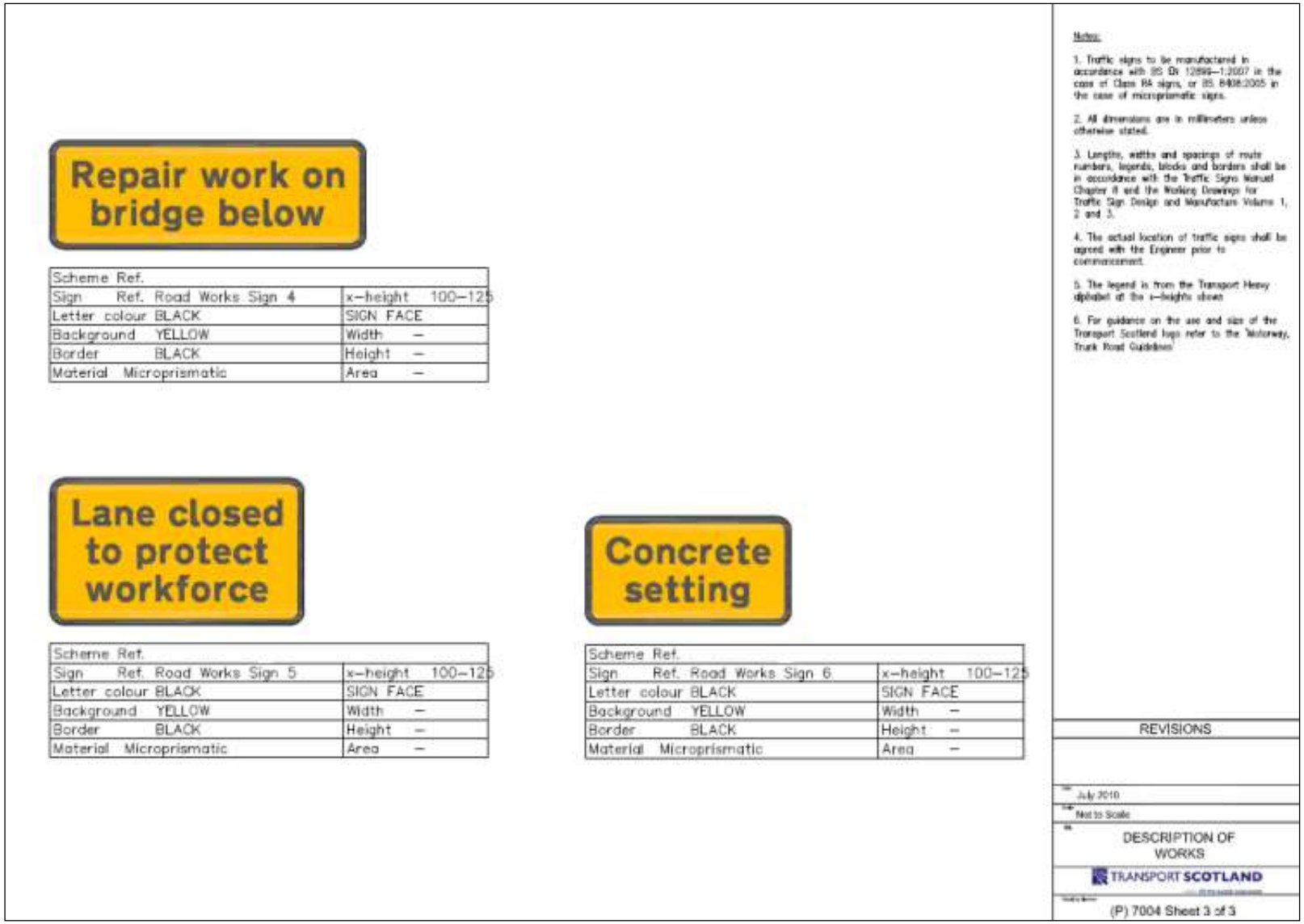
TRANSPORT SCOTLAND

(P) A0/4 Sheet 1 of 3

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



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



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

Scheme Ref.			
Sign	Ref. Road Roads Sign 7	x-height	125.0
Letter colour	BLACK	SIGN FACE	
Background	YELLOW	Width	2585mm
Border	BLACK	Height	1830mm
Material	Microprismatic	Area	4.72sq.m

Notes:

1. Traffic signs to be manufactured in accordance with BS EN 12899—1:2007 in the case of Class RA signs, or BS 8408:2005 in the case of microprismatic signs.

2. All dimensions are in millimeters unless otherwise stated.

3. Lengths, widths and spacings of route numbers, legends, blocks and borders shall be in accordance with the Traffic Signs Manual Chapter 8 and the Working Drawings for Traffic Sign Design and Manufacture Volume 1, 2 and 3.

4. The actual location of traffic signs shall be agreed with the Engineer prior to commencement.

5. The legend is from the Transport Heavy alphabet of the x-heights shown

6. For guidance on the use and size of the Transport Scotland logo refer to the 'Motorway, Trunk Road Guidelines'

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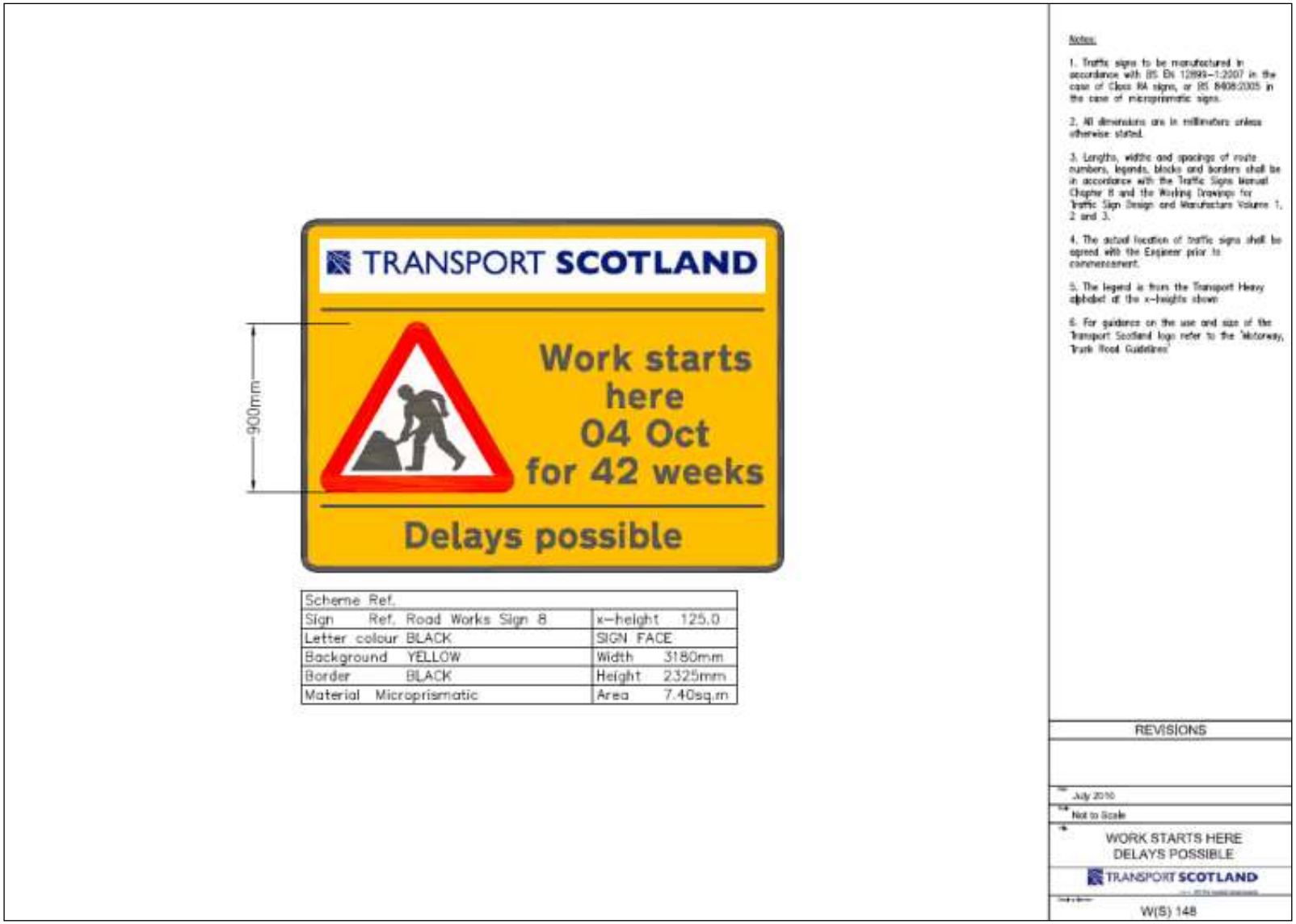
DELAY AND DISTANCE TO WORKS
TRANSPORT SCOTLAND
(P) 7005

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



Scheme Ref.			
Sign	Ref. Road Works Sign 8	x-height	125.0
Letter colour	BLACK	SIGN FACE	
Background	YELLOW	Width	3180mm
Border	BLACK	Height	2325mm
Material	Microprismatic	Area	7.40sq.m

Notes:

1. Traffic signs to be manufactured in accordance with BS EN 12899-1:2007 in the case of Class RA signs, or BS 8408:2005 in the case of microprismatic signs.

2. All dimensions are in millimetres unless otherwise stated.

3. Lengths, widths and spacings of route numbers, legends, blocks and borders shall be in accordance with the Traffic Signs Manual Chapter 8 and the Working Drawings for Traffic Sign Design and Manufacture Volume 1, 2 and 3.

4. The actual location of traffic signs shall be agreed with the Engineer prior to commencement.

5. The legend is from the Transport Heavy alphabet of the x-heights shown.

6. For guidance on the use and size of the Transport Scotland logo refer to the 'Motorway, Trunk Road Guidelines'

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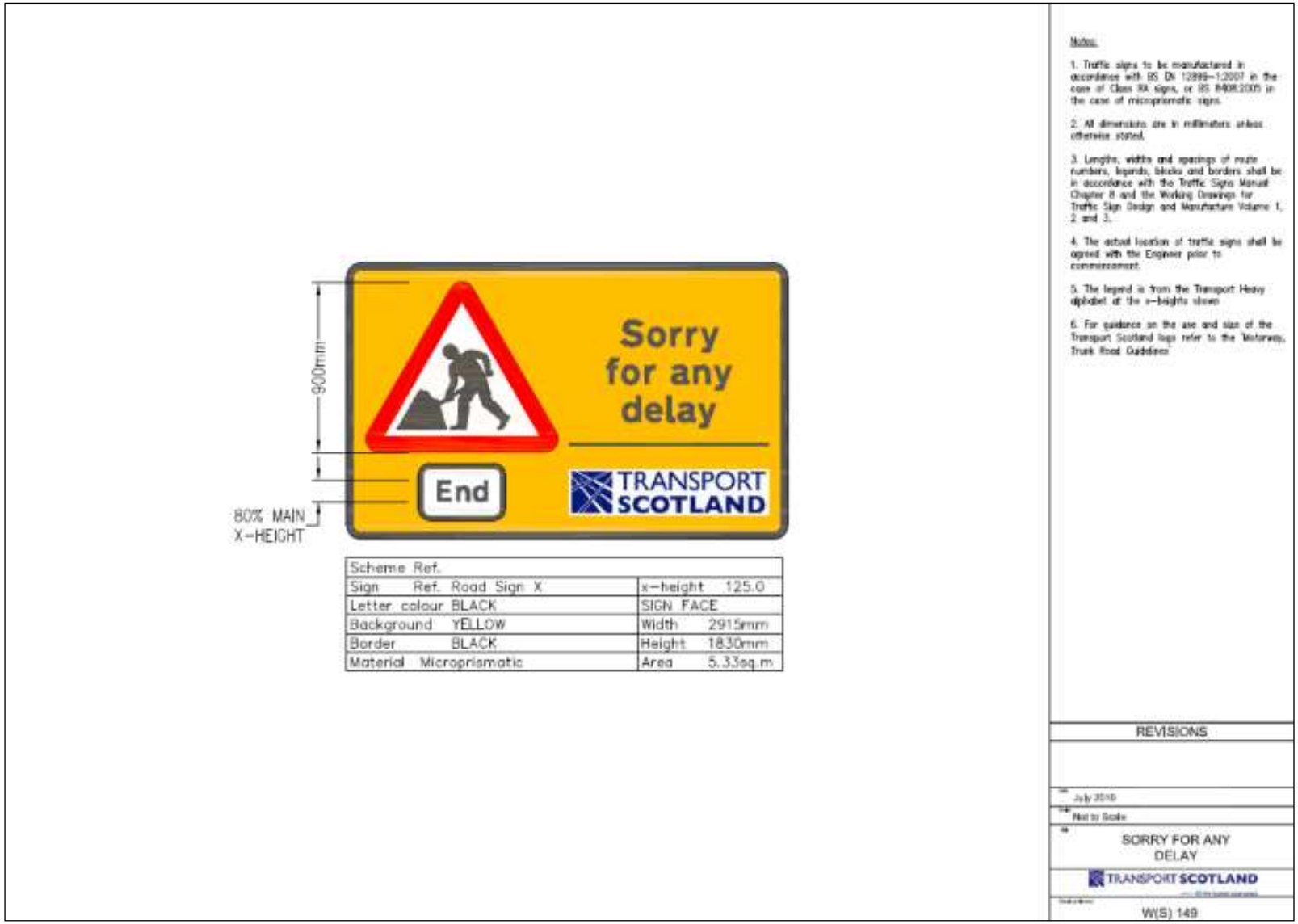
WORK STARTS HERE
DELAYS POSSIBLE

TRANSPORT SCOTLAND

W(S) 148

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



Scheme Ref.			
Sign	Ref. Road Sign X	x-height	125.0
Letter colour	BLACK	SIGN FACE	
Background	YELLOW	Width	2915mm
Border	BLACK	Height	1830mm
Material	Microprismatic	Area	5.33sq.m

Notes:

1. Traffic signs to be manufactured in accordance with BS EN 12899-1:2007 in the case of Class RA signs, or BS 8408:2005 in the case of microprismatic signs.

2. All dimensions are in millimeters unless otherwise stated.

3. Lengths, widths and spacings of route numbers, legends, blocks and borders shall be in accordance with the Traffic Signs Manual Chapter 8 and the Working Drawings for Traffic Sign Design and Manufacture Volume 1, 2 and 3.

4. The actual location of traffic signs shall be agreed with the Engineer prior to commencement.

5. The legend is from the Transport Heavy alphabet at the x-heights shown

6. For guidance on the use and size of the Transport Scotland logo refer to the 'Motorway, Trunk Road Guidance'

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Not to Scale
SORRY FOR ANY DELAY
TRANSPORT SCOTLAND
W(S) 149

APPENDIX 1/18: TEMPORARY HIGHWAYS FOR TRAFFIC

1. Safe access across the Works shall be maintained or diversions provided in accordance with the minimum standards shown in Tables A and B to this Appendix.

2. The Contractor shall provide and maintain access to all properties adjacent to the Works. Temporary diversions shall be maintained at all times.

3. The Contractor shall make all necessary arrangements with owners and occupiers of any land in addition to that provided in the Contract, which is temporarily required for the diversion of traffic.

4. The Contractor shall submit for approval to the Overseeing Organisation and Local Authority, his detailed proposals as below for the temporary diversion of traffic (including pedestrian routes) at least 6 weeks prior to the implementation date:

   (i) Phasing of the Works

   (ii) Drawings showing traffic management layouts including as follows:

      1. Position of traffic signs and signals;
      2. Width of Lanes;
      3. Working areas;
      4. Safety zones;
      5. Entry points for site vehicles, etc; and
      6. Signing.

   (iii) Making or amending traffic orders

      The Contractor shall be responsible for the payment of all charges associated with the preparation and publication of all road related orders.

5. The Contractor shall give the Overseeing Organisation at least 14 days written notice of any phased Works which require Lane or Carriageway Occupations, and shall not alter or adjust the traffic until the Overseeing Organisation has acknowledged receipt of the relevant Consultation Certificate.

6. The standard of construction and lighting of diversions shall be suitable in all respects for the class or classes of traffic using the existing carriageways. Any temporary diversion of a road shall have a bituminous or asphaltic surface.

7. All access provision shall be to a standard equivalent to that in place upon commencement of the Works.

8. Any temporary diversions shall be designed in accordance with the Design Manual for Roads and Bridges.

9. Table B gives minimum standards for diversions of traffic.

   The standards shall be used to Design temporary diversions of traffic for the road or way in question should it not be possible to maintain the required width on the existing carriageway.

10. Stage 2 and Stage 3 Road Safety Audits shall be carried out on all temporary traffic management proposals as described in Appendix 1/17 of this Specification.

APPENDIX 1/18: TEMPORARY HIGHWAYS FOR TRAFFIC (continued)

11. Notwithstanding any other requirements of the Contract any generator required for powering temporary traffic lights shall not be permitted within 100 metres of any occupied property.

Table A: Requirements of the Overseeing Organisation in the Execution of Temporary Diversions necessitated by the Works.

Description	**Requirement** **(Clause 118.2 or Amendment)**	**Remarks**
Existing A9 Trunk Road	Full closure of the A9 trunk road shall only be permitted with agreement from the Trunk Road Operator and only subject to satisfying the following criteria: • A minimum of 15 weeks notice of the proposed closure is given to the Trunk Road Operator); • Closures shall not be permitted before 7pm and must be cleared by 6am the following morning; • Access through the site must be provided at all times for emergency vehicles; • Extensive advance signage and publicity will be required and shall be agreed with the Trunk Road Operator 10 weeks in advance of the closure; • Agreement to the proposed closure must be confirmed in writing by the Engineer and; • The workplan for the closure period shall incorporate amnesty periods when waiting traffic can be escorted through the site at maximum intervals of two hours; and Two way running shall be maintained between the hours of 6am and 7pm unless otherwise agreed with the Trunk Road Operator. By exception, and with a minimum of 10 weeks notice to the Trunk Road Operator and subject to their agreement, single lane working controlled by traffic signals may be permitted.	

APPENDIX 1/18: TEMPORARY HIGHWAYS FOR TRAFFIC (continued)

Description	Requirement (Clause 118.2 or Amendment)	Remarks
Existing A9 Trunk Road (cont.)	During national holiday weekends such as Easter, spring and autumn bank holidays and during other significant local events, this exception shall not be made. Single lane width of at least 3.25 metres shall be maintained at all times on generally straight alignments. Where road alignments include sub-standard curves or sharp changes in direction the minimum width shall be agreed with the Trunk Road Operator and the Engineer, of which written approval shall be required. Traffic control by means of traffic signals will be subject to the agreement of the Trunk Road Operator and with the written approval of the Engineer. Any Works requiring traffic control shall incorporate a minimum mandatory speed limit of not less than 30 mph. Not more than one set of signals shall be permitted in connection with the Works. The positioning of traffic control points shall take account of steep topography of the site, optimising where possible the balance between controlled transit length/journey time and the greater time required to re-start heavy vehicles on steep gradients. Where traffic control is utilised, queue length and delay monitoring and reporting shall be undertaken as defined in Specification Appendix 1/17. Arrangements for taking access to the areas of the site outwith the existing trunk road shall be agreed with the Trunk Road Operator and confirmed in writing by the Engineer.	
Existing Side Roads	Traffic diversions using side roads shall not be permitted.	
Non-Motorised User Facilities	Temporary diversions of Non-Motorised Users facilities shall be agreed with Highland	

	Council.	

APPENDIX 1/18: TEMPORARY HIGHWAYS FOR TRAFFIC (continued)

Table B: Schedule of Standards for Temporary Diversion of Traffic

Route	**Parameter**	**Minimum standard**
A9 Trunk Road	General	Subject to the requirements of Chapter 8 of the Traffic Signs Manual and 'Safety at Street Works and Road Works – A Code of Practice'
	Temporary running surface on carriageway widening	The standard of construction of diversions shall be suitable in all respects for the class or classes of traffic using the existing carriageways. Any temporary diversion of a road shall have a bituminous or asphaltic surface. All temporary diversions shall be maintained at all times. Gradients shall not be greater than existing (except where otherwise agreed by the Overseeing Organisation).
Side Roads	There are no side roads available for potential traffic diversion.	

APPENDIX 1/19: ROUTEING OF VEHICLES

1. The Contractor shall submit his proposals for Site access points including access to offices and the like, at least two weeks in advance of the proposed start date for construction.

2. Access to the Site shall be taken at the following Points only:

   (i) The existing A9 Trunk Road

   Any other existing public and private roads including footways, farm and house accesses shall only be used by the Contractor with the prior agreement of the owner, the Overseeing Organisation or Highland Council, as appropriate. Any such roads or access used by vehicles engaged in the Works or any new roads which are part of the Works and which are used by traffic shall be kept clean of dirt, mud or other materials dropped by said vehicles at all times. The Contractor shall provide, maintain and keep available at all times equipment as may be necessary to keep such ways clean.

3. Bulk Haulage of material excavated within the Site shall be carried out on haul roads within the Site wherever possible.

   The use of public roads for this operation shall only be permitted subject to consultation with Transport Scotland or Highland Council, as appropriate, notwithstanding at grade crossings of public roads, which may be permitted subject to the Contractor submitting satisfactory traffic management proposals to the Overseeing Organisation.

   Sufficient information, including details of the frequency of plant crossing, loads and working period of crossings shall be supplied to the Overseeing Organisation to enable the Overseeing Organisation to consider the proposal.

   The Contractor shall minimise delays to traffic due to right turning access to the site.

4. If the proposed method of construction involves the use of any part of the permanent works by construction traffic or plant, the Contractor shall in accordance with Clause 14(3) of the Conditions of Contract and at least one week before he intends to use the Permanent Works, submit to the Overseeing Organisation sufficient information as to enable the Overseeing Organisation to consider the proposal.

   Such information should include details of location, plant, applied loads, frequency of loading, duration, calculations of stresses strains deflections and other relevant data, and also the measures to be taken to protect the Permanent Works.

5. The Contractor shall submit to the Overseeing Organisation details of proposed borrow pits and tipping areas, which are off Site and the intended routing of vehicles to and from such sites.

   The Contractor should also inform the Overseeing Organisation of the type of such vehicles to be used for transport, which should be compatible with the standard of the above routes.

6. The Contractor shall provide, erect and maintain such traffic signs, lamps and barriers etc. complying with Clause 117 of the Specification as may be required to ensure the observance of requirements and restrictions detailed in this Appendix.

APPENDIX 1/21: INFORMATION BOARDS

1. Scheme Information Boards

   (i) The Contractor shall supply and install two scheme information boards, which shall be in accordance with Traffic Signs Regulations and General Directions Diagram Number 7007.1, with the Highways England logo and Department for Transport logo replaced by the following logo

   TRANSPORT SCOTLAND

   The legend for signs shall comprise:

   Line 1: "A9 "

   Line 2: "Berriedale Braes"

   Line 3: "Improvement Scheme"

   Line 4: "Opening ……." (to be input by the Contractor)

   (ii) The scheme information boards shall be located on the approaches to the Works on the existing trunk road from both directions. The exact location of the scheme information boards shall be agreed on Site by the Overseeing Organisation.

   (iii) The Contractor shall Design, supply and construct suitable poles and foundations for the information boards.

   (iv) The legend shall have an x-height of 150 millimetres.

   (v) Not Used.

   (vi) Not Used.

2. Publicity Sign Boards

   (i) The Contractor shall supply three publicity sign boards.

   (ii) The location of the publicity sign boards shall be at locations to be agreed by the Overseeing Organisation.

   (iii) The publicity sign boards should contain information pertaining to the scope of the works and their progress.

   (iv) The progress information shall be updated by the Contractor on a monthly basis throughout the period for the construction of the Works.

   (v) The publicity sign boards shall consist of a weather tight board which shall be suitable for displaying a minimum of four A3 size pages.

3. Project Sign Board

   (i) The project sign board shall include the following information:

   - Transport Scotland logo (file TS-LRE)
   - A9 : Berriedale Braes Improvement Scheme
   - Contractor:
   - Enquiries: (telephone number to be provided by Contractor)
   - Transport Scotland logo (file TS-BS), AECOM's logo, Contractor's logo

APPENDIX 1/21: INFORMATION BOARDS (Continued)

(ii) The location of the project sign board shall be at a prominent location at the Site Compound as agreed by the Overseeing Organisation.

(iii) The project sign board shall have dimensions of 2850 millimetres by 1500 millimetres.

(iv) The A9 Berriedale Braes Improvement Scheme project sign board is shown in Figure 1/21A.

(v) A separate 'Investing in Scotland' board (file TSI-E), 2850 millimetres by 1500 millimetres shall be attached on the same poles.

Figure 1/21A – A9 : BERRIEDALE BRAES IMPROVEMENT SCHEME project sign board

APPENDIX 1/22: PROGRESS PHOTOGRAPHS

The following specification fulfils the progress photographs requirements for the whole of the Works.

1. Ground Progress Photographs

   (i) A set of ground progress photographs shall be taken prior to commencement of the Works on site and then at approximately one month intervals or as directed by the Engineer until Completion of the Works.

   (ii) A set of ground progress photographs shall comprise not less than 50 photographs.

   (iii) Each photograph shall be high-resolution and a minimum of 12 million pixels. Two copies of each set of progress photographs in high-resolution JPEG format shall also be supplied on hard drive in a standard format.

   (iv) A report shall be provided with each set of photographs detailing the date, location and direction of view for each photograph in the set.

2 Aerial Progress Photographs

   (i) A set of aerial progress photographs shall be taken at the Commencement of the Works and further sets of aerial photographs shall be taken at 3 monthly intervals during the Works. A final set of aerial progress photographs shall be taken immediately following the Date of Completion of the Works.

   (ii) A set of aerial progress photographs shall comprise a minimum of 20 photographs, taken with a Single Lens Reflex Digital Camera.

   (iii) Each photograph shall be high-resolution and a minimum of 12 million pixels. Two copies of each set of aerial progress photographs in high-resolution JPEG format shall also be supplied on hard drive in a standard format.

   (iv) Photographs shall be taken from the same height, direction and of the same viewpoint at each 3-month interval.

   (v) Viewpoints, heights & directions will be determined & detailed on an Ordnance Survey Map prior to photographs being taken.

   (vi) The choice of aircraft used for taking the shots should be such that it will maximise the accuracy of photographing the viewpoints.

3. The photographer shall be accompanied for both ground and aerial progress photographs by a member of the Overseeing Organisation, should they wish to attend.

4. Copyright of photographs shall be vested in the Overseeing Organisation.

APPENDIX 1/23: RISKS TO HEALTH AND SAFETY

1. Details of known specific or extraordinary hazards or risks that would require particular or unusual precautions and would place limitations on the methods of working include, but are not limited to:
   (i) Restrictions in relation to Site Clearance are detailed in Appendices 2/1 to 2/6 inclusive
   (ii) Restrictions in relation to Traffic Management measures are detailed in Appendix 1/17
   (iii) Restrictions in relation to working hours are detailed in Appendix 1/9

2. Details of known required actions or precautions:
   (i) The Contractor shall take all necessary precautions to prevent the spread of airborne dust to any habitable/commercial premises adjoining the Works, and shall take necessary steps to avoid creating a nuisance from dust and smoke. Sufficient plant and equipment capable of preventing dust arising from the Works shall be available at all times together with adequate water supply.
   (ii) The Contractor shall ensure all roads, accesses, rights of way etc. are kept free from mud, slurry or other hazardous substances that are deposited through operations in connection with the Works.

3. Details of notifications required to and from the Overseeing Organisation or other parties:
   (i) The Contractor shall advise the Overseeing Organisation of the measures he proposes to undertake to safeguard the general public and the owners and occupiers of properties adjacent to the Works from the effects of hazardous materials.
   (ii) The Contractor shall forward a copy of the Construction Stage Health and Safety Plan to the Overseeing Organisation for review prior to the start of the Works, and develop it throughout the length of the Contract.

4. Details of any specific monitoring requirements and submission of records to the Overseeing Organisation:
   (i) Monitoring of noise and vibrations to be undertaken by the Contractor as details in Appendix 1/9
   (ii) Depending on the substances and processes, air quality monitoring may be required where traffic, pedestrians or properties are adjacent to or close to the Works. Highland Council shall advise the requirement for air quality monitoring.

5. The Contractor shall take all necessary precautions to prevent the spread of airborne dust to any habitable/commercial premises adjoining the Works and shall take necessary steps to avoid creating a nuisance from dust and smoke. Sufficient plant and equipment capable of preventing dust arising from the Works shall be available at all times together with an adequate water supply. The Contractor shall ensure all roads, accesses, rights of way etc. are kept free from mud, slurry or other hazardous substances that are deposited through operations in connection with the Works.
6. Restrictions in relation to Traffic Management measures are detailed in Appendix 1/17.
7. Restrictions in relation to working hours are detailed in Appendix 1/9.

APPENDIX 1/23: RISKS TO HEALTH AND SAFETY (Continued)

8. The Contractor shall advise the Overseeing Organisation of the measures he proposes to undertake to safeguard the general public and the owners and occupiers of properties adjacent to the Works from the effects of hazardous materials.
9. Monitoring of noise and vibrations to be undertaken by the Contractor as detailed in Appendix 1/9.
10. The Contractor shall forward a copy of the Construction Stage Health and Safety Plan to the Planning Supervisor for review prior to the start of the Works and develop it throughout the length of the contract.
11. Depending on the substances and processes, air quality monitoring may be required where traffic, pedestrians or properties are adjacent to or close to the works. Highland Council shall advise the requirement for air monitoring.

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM

1. The Contractor shall institute, maintain and operate a Quality Management System complying with BS EN ISO 9001, BS EN ISO 14001 and OHSAS 18001 and Clause 104 of the Specification.

   The Quality Management System shall be described in a Quality Plan that shall be submitted to the Overseeing Organisation.

   For details relating to the Environmental Management Systems refer to clause 5 of this Appendix 1/24.

   The Quality Plan shall cover but not be limited to the following items:

   (i) the Contractor's organisation and management of the Contract;

   (ii) the Contractor's method statements and construction procedures for the Works;

   (iii) the Supervision of the Works;

   (iv) the Contractor's construction quality control for the Works;

   (v) the Suppliers Quality Plans. (For each of the Quality Management Schemes listed in Appendix A of the Specification for Highway Works.); and

   (vi) The Contractors deer management plan.

2. The Quality Plan shall conform with but not be limited to the requirements shown in sub-clauses 2.1, 2.2, 2.3, 2.4 and 2.5 of this Appendix, as follows:

2.1 Contractor's Organisation and Management of the Contract

This part of the Quality Plan shall include but not be limited to:

(i) the definition of the Contract and its documentation;

(ii) the organisation of the Contract including the line of command and communication links between all the parties involved in the Contract in the form of annotated chart(s);

(iii) the names, roles, responsibilities, curriculum vitae and authority of principals and key personnel involved in the Design, construction and maintenance of the Contract.

(iv) These will include the roles undertaken by the Project Director, Contracts Manager, Site Agent/Contractor's Project Manager, Management Representative for Quality, Contract Quality Manager, Management Representative for environmental protection, sustainability manager, Sub-agents, General Foreman, Foremen, Engineers, Contract Quantity Surveyor, Safety Officer, Contractor's and Designer's Supervisor(s) for the Works, Designer's Team Leader(s) and Site Representative(s), Checker's Team Leader(s), Road Safety Auditor(s), Planning Supervisor and any other principal party involved in the Design and the Works;

(v) procedures for the control of consultations, liaison and meetings with third parties including Police Scotland, Undertakers and any other companies;

(vi) the identification of the Contractor's staff responsible for overseeing each major activity including Design, Design Checks and all sub-contract activities;

(vii) procedures for the control of sub-contracts which must include the assessment of the sub-contractor's quality assurance and quality control capabilities, the identification and implementation of additional controls needed on such sub-contractors to fulfil the Contractor's obligations in respect of this Appendix and the Contract;

(viii) procedures for the control of all documentation;

(ix) a programme for submission of Design and Design Check Certificates and associated documentation, method statements and Suppliers Quality Plans.

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

(x) These shall be submitted to the Engineer at least 14 days prior to commencement of the associated activity;

(xi) the Quality Plans for sub-contractors and suppliers of work, goods and materials which are the subject of quality management schemes.

(xii) Suppliers Quality Plan(s) for schemes listed in Appendix A of the Specification for Highway Works shall be based on this Appendix;

(xiii) procedures for the preparation, review and adjustment of programmes for the effective progression and completion of the Design and the Works and the recording of same;

(xiv) procedures for the control and approval of purchases of materials;

(xv) procedures for the control of off-Site activities;

(xvi) procedures for the regular review and recording by the Contractor which demonstrates that the Design and the Works meet the requirements of the Contract;

(xvii) procedures for the control of personnel selection which demonstrate that such personnel have appropriate skill and experience for undertaking their appointed role;

(xviii) procedures for the management review/audits to monitor and demonstrate control over the implementation of the Quality Plan;

(xix) procedures for ensuring compliance with the Specification for Highway Works (SHW) Volume 1 of the Manual of Contract Documents for Highway Works (MCHW);

(xx) procedures for ensuring compliance with the Design Manual for Roads and Bridges (DMRB) and the Employer's Requirements.

(xxi) These procedures shall include verification that the relevant sections and sub-sections within the Employer's Requirements have been complied with and shall indicate whether the part of the Design;

(a) complies with the sub-section;

(b) requires a consultation certificate; or

(c) is not relevant to the sub-section

(xxii) procedures for the review of the Conceptual Design and the preparation of the Design and construction documentation;

(xxiii) procedures for the review of the Design including the frequency of and personnel responsible for such reviews; and

(xxiv) any other relevant item which may during the Contract be brought to the attention of the Contractor by the Overseeing Organisation and which shall be inserted into the Quality Plan.

2.2 Contractor's Method Statements and Construction Procedures for the Works

This part of the Quality Plan shall include but not be limited to:

(i) Detailed method statements for each major activity whether such activities are directly controlled by the Contractor or subcontracted and shall include those major activities listed in sub-clause 4 below.

The method statements shall identify hold points and invoke for all activities:

(a) work instructions;

(b) quality control procedures;

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

(c) compliance testing/inspection arrangements;

(d) work acceptance procedure; and

(e) validation of design assumptions by appropriate inspection and testing on site.

Method statements shall describe each stage of the construction, the layout of the Works, identify the Construction Plant and materials to be used, Temporary Works, safety measures, working space considerations, and where appropriate the requirements for skilled labour and/or special supervision and the like.

Where work is subject to environmental requirements, for example, temperature, noise and dust control, working hours, traffic conditions, vehicle routings, screening and the like, these shall be stated.

Hold points shall be identified at stages of work where checks are necessary before continuing. The authority for release of the hold points shall also be identified.

Method Statements and Construction Procedures submitted to the Overseeing Organisation shall be subject to a trial section(s), which may be incorporated into the Works with the consent of the Overseeing Organisation.

(a) The identification of the relevant construction procedures in the Contractor's own Quality Management System. Procedures invoked by method statements shall include, from the quality controls required by the Contractor's construction quality control: the control, identification and traceability of materials;

(b) procedures for the prevention of inadvertent use, installation or covering up of non-conforming work; and

(c) any other corporate and/or contract specific work instructions to be applied.

2.3 Supervision of the Works

This part of the Quality Plan shall include but not be limited to:

(i) a statement of the Contractor's and Designer's responsibility to supervise the Works including the duty to supervise the construction, completion and testing of the Works;

(ii) procedures for undertaking the supervision of the Works detailing:

(a) the stages of work when the inspection(s) is to be undertaken;

(b) the personnel carrying out the inspection(s);

(c) the frequency of inspection(s);

(d) the procedures to be followed when dealing with non-conforming Works; and

(e) the recording of inspection(s)

(iii) procedures for the review of the extent and frequency of supervision;

(iv) procedures for the issuing of Construction certificates;

(v) procedures for document control including the receipt, control and retention of all documents;

(vi) procedures for reporting progress and the identification of problems; and

(vii) procedures for the observation of testing and the reporting of results of testing.

2.4 Contractor's Construction Quality Control for the Works

This part of the Quality Plan shall include but not be limited to:

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

(i) a statement of the Contractor's organisation for quality control and shall identify the:

(a) responsibility for the initiation and updating of the Quality Plan;

(b) responsibility of the "Management Representative for Quality" for monitoring and ensuring compliance with the Quality Plan; and

(c) responsibility for the adequacy of the quality records produced.

(ii) procedures for the arrangements for "receiving" and "in-process" testing;

(iii) procedures for the control of test laboratories;

(iv) procedures for the control of test, measuring and inspection equipment;

(v) procedures for document control and shall include their identification, traceability requirements, control of document issues and their status. Documents recording the verification, review, approval, release and amendment of the Works shall similarly be controlled;

(vi) procedures for monitoring and recording the inspection, test and approval status of the construction/installed work including the identification of "hold points";

(vii) procedures for tests and inspections for the purpose of the Contractor certifying that prior to covering up, each part of the Works is complete and conforms to the Contract.

The procedures shall identify the proforma and/or database to be used for recording the inspection and test results, and the proforma to be used for recording the certification of compliance of all items of the Works by authorised key personnel. Each submission shall be separately identified;

(viii) procedures for the review of work submitted for review but not accepted as conforming to the Contract.

These procedures shall include options for identification of non-conforming work and proposals for reworking and remedial work; and

(ix) procedures for the collation of quality records as identified in BS EN ISO 9001, BS EN ISO 14001 and OHSAS 18001 as appropriate, including reference to those records listed in the Specification for Highway Works Appendix H.

2.5 Suppliers' Quality Plans

The Quality Plan shall include but not be limited to:

(i) a definition of the product or service which shall be provided;

(ii) annotated chart(s) showing the organisation structure of the Supplier describing the line of command and stating the name of the senior manager responsible for the contracted Work and the name of the Supplier's on-site management representative. Contact addresses, telephone numbers and the like shall be provided.

This shall address all activities, including those sub-let. Names of any sub-contractors and suppliers involved in the production shall be provided;

(iii) the identification of the relevant parts of the Supplier's Quality Management System relevant to the product or service being provided;

(iv) procedures for the control of personnel selection (at works and on Site), including special requirements for skilled personnel for example; certification of welders, training of operatives, experience requirements and the like.

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

The Suppliers shall provide evidence that the training and experience requirements given in the appropriate Quality Assessment Schedule are being met;

(v) procedures for the receipt and examination of certificates of conformity and test results for purchased products;

(vi) procedures for product identification and traceability.

Each piece or bundle of delivered product shall be indelibly marked and where appropriate, the lot identification shall be included on each package;

(vii) procedures for handling, storage, packaging and delivery to Site and storage and handling on Site, including instructions for repair of damaged products where appropriate; and

(viii) procedures for compiling Quality Records which shall include documents to demonstrate the achievement of the requirement standard for example; Site logs, record of visits, records of verification, review and release, certificates of conformity and records of all Design modifications to products and specifications.

3. Items 1(i), 1(iii) and 1(iv) of the Quality Plan shall be submitted to the Overseeing Organisation for approval not later than 21 days after the award of the Contract.

The Contractor shall submit the remaining parts of the Quality Plan to the Overseeing Organisation for approval prior to commencement of any associated work or activity and to the programme included with item 1(i).

4. Method statements shall be required inter alia for the following activities:

(i) Traffic Management;

(ii) Demolition and Site Clearance;

(iii) Fencing and Environmental Barriers;

(iv) Road Restraint Systems;

(v) Drainage and Service Ducts;

(vi) Earthworks;

(vii) Road Pavements;

(viii) Kerbs, Footways and Paved Areas;

(ix) Traffic Signs;

(x) Road Lighting;

(xi) Electrical Works;

(xii) Structures;

(xiii) Landscape Operations; and

(xiv) ITS

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

5. Environmental Management System

The Contractor shall institute and maintain, during the construction, completion and maintenance of the Works, an Environmental Management System in accordance with the requirements of BS EN ISO 14001 “Environmental Management Systems – Requirements with guidance for use”.

The environmental management system shall be described in a Construction Environmental Management Plan (CEMP) that shall be submitted to the Overseeing Organisation.

This shall define the organisational policy, structure, responsibilities, practices, procedures, processes and resources provided for environmental management and shall form part of the Quality System as detailed in this Appendix 1/24 of the Specification.

It shall be developed to avoid wherever possible environmental accidents and pollution, to encourage reduced consumption of resources, to restrict the production of waste and to promote good relationships with the relevant authorities.

Commitments made regarding mitigation, their implementation and subsequent monitoring shall be recorded.

Notwithstanding any other requirements of the Contract the Environmental Management System shall:

(i) Include Site-specific method statements for all operations where there is a risk of environmental damage. These shall show how the proposed methods of construction shall restrict impacts to the best practicable environmental option, and how contingency plans and emergency procedures shall limit damage caused by accidents, spillage or other unforeseen events.

The method statements shall include notification procedures to the relevant authorities;

(ii) Institute and maintain during the construction of the Works, a Waste Management Plan in accordance with “Waste Management - A Duty of Care - A Code of Practice” - HMSO 1991;

(iii) Ensure that the Contractor shall submit to the Overseeing Organisation details of the Environmental Management System, method statements and Waste Management Plans for approval in advance of the construction of the Works.

The Works shall not be commenced without such approvals having been obtained in writing from the Overseeing Organisation.

(iv) Include liaison with the local community during the Contract.

This shall include providing information about activities likely to give rise to complaints, and a telephone number for complaints to be registered.

A log of all complaints and follow-up actions shall be kept and made available for inspection by the Engineer.

(v) Toolbox talks and environmental awareness training shall be given to all site operatives at the start of the project before any work commences. The talks shall confirm the species and environmental receptors that may be affected by or encountered during the Works as identified in the Contractors preconstruction surveys and the scheme Environmental Statement (Appendix Q of Part 3). The tool box talks will also promote general environmental awareness at the site and detail contractor’s commitment to the environmental and ecological interests of the local vicinity.

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

5.1 Site Waste Management Plan

The Contractor shall prepare a Waste Management Plan ("WMP") as part of the Environmental Management Plan. This shall contain targets to reduce, re-use and / or recycle waste to ensure that no unnecessary waste arisings go to landfill.

As part of the WMP, the Contractor shall provide a system for tracking and recording the movement of all contaminated material and waste within the site. This shall include details of the locations from which material has been excavated and its final placement.

Notwithstanding any other provisions of the Contract the Waste Management Plan shall inter alia define:

(i) the roles and functions of :

a) the Contractor (including the members of the Contractor's site personnel and all other key personnel associated with the Works);

b) the Employer; and

c) all other sub-contractors and relevant third parties;

(ii) the execution of the Works and any other matters for which the Contractor shall be responsible under the terms of the Waste Management Plan;

(iii) the provision of records tracing the origin and location in the Site of everything incorporated in the Works;

(iv) how the Contractor and any Contractor Party shall minimise any adverse impacts that the Works have on the environment;

(v) how the design process, materials selection, construction techniques, and operational methods shall minimise any adverse impacts that the Works have on the environment;

(vi) how the Waste Management Plan shall comply with regulatory requirements; and

(vii) project-specific targets for waste recovery and reused and recycled content and for waste reduction.

The Contractor shall provide the following information to the Engineer in which the performance for construction, demolition and excavation waste streams shall be identified separately:

(i) prior to starting on site, provide a copy of the Waste Management Plan, which shall identify but not be limited to:

a) the estimated total mass of waste and the estimated recovery rate before mitigating actions, with a list of actions to reduce waste and increase the level of recovery (distinguishing construction, demolition/strip-out and excavation wastes as appropriate) and increase reused and recycled content; and

b) a revised estimate of the total mass of waste and the estimated recovery rate after mitigating actions, and forecast performance indicators for:

i. tonnes of waste sent to landfill per £[REDACTED] construction value; and

ii. tonnes of waste produced per £[REDACTED] construction value.

(ii) A monthly report identifying actual performance for waste quantities, disposal routes, and reused and recycled content used in construction, identifying the following indicators of actual performance:

a) tonnes of waste sent to landfill per £[REDACTED] construction value; and

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM (Continued)

b) tonnes of waste produced per £[REDACTED] construction value.

(iii) Upon completion of the Works, a completed Site Waste Management Plan, identifying the forecast and actual performance for waste quantities, disposal routes, and reused and recycled content used in construction, including the following indicators of actual performance:

a) tonnes of waste sent to landfill per £[REDACTED] construction value; and

b) tonnes of waste produced per £[REDACTED] construction value.

APPENDIX 1/70: SITE SAFETY

1.0 General

1.1 The Contractor at all times shall comply with the requirements of the Health and Safety at Work Etc. Act 1974 and any other Acts, Regulations or Orders pertaining to the health and safety of employees.

1.2 The Contractor shall comply with his own published Safety Policy, the Construction (Design and Management) Regulations 2015 (CDM) and the requirements of this Contract.

1.3 The Contractor shall while carrying out the works comply with the following:

- The Waste Management Licensing (Scotland) Regulations 2011
- Control of Substances Hazardous to Health (COSHH) Regulations 2002
- Environmental Protection (Duty of Care) Regulations 1991
- Electricity at Work Regulations 1989
- The Working Time Road Transport Directive (2002/15/EC) unless exempt under the Horizontal Amending Directive 203 in which case the UK domestic Driver's hours will apply.

1.4 The Contractor shall prior to complying with paragraphs 1 to 4 carry out a formal risk assessment as required by the Management of Health and Safety at Statutory Instrument No. 2951, conforming to the Code of Practice. The records of any risk assessment shall be maintained and made available for inspection by the Engineer at any time.

1.5 The Engineer may suspend the work or part thereof in the event of non- compliance by the Contractor with health and safety matters as described in the Contract. The Contactor shall not resume the work until the Engineer is satisfied that the noncompliance has been rectified. In respect of any such period of suspension, the Contractor shall not add any cost to the work price and no extra time shall be allowed for completion.

2.0 The Wearing of Safety Helmets

2.1 All sites under the jurisdiction of the Overseeing Organisation must be managed in strict accordance with the Construction (Head Protection) Regulations 1989 and supporting Health and Safety Executive guidance.

2.2 When entering into any sub-contract for the execution of parts of the Works, the Contractor shall bring this requirement to the attention of the Sub-contractor.

2.3 The Contractor shall display at appropriate locations signs as described in the HSE Guidance on Regulations (Regulation 5).

2.4 The Contractor's attention is drawn to Clause 16 of the Conditions of Contract with respect to the removal from the Site of any person who fails to conform to a particular provision set out in the Specification with regard to safety.

3.0 High Visibility Clothing

3.1 The Contractor's attention is specifically drawn to paragraph 15 of Clause 117 of the Specification regarding the wearing of high visibility clothing. It should be noted that all vests and jackets are to be long-sleeved only, with no exceptions.

3.2 The Contractor shall ensure that the clothing required to be worn is maintained to a standard that accords with its intended use.

APPENDIX 2/1: LIST OF BUILDINGS, ETC TO BE DEMOLISHED OR PARTIALLY DEMOLISHED

(i) Not Used

APPENDIX 2/2: FILLING OF TRENCHES AND PIPES

Underground and ducted cable

2.2.1 All redundant road lighting / lit signage private network cables cables, identified for removal on the Contract drawings, irrespective of depth below formation shall be taken up or down by the Contractor and removed to tip off site where practicable as part of the ongoing works, unless agreed otherwise with the Client.

2.2.2 Voids left by items that have been removed shall be backfilled immediately in accordance with the appropriate Clauses in Series 600.

APPENDIX 2/4: EXPLOSIVES AND BLASTING

1. The use of explosives and blasting within the Site shall not be permitted unless their use complies with the requirements of:

(a) Highland Council;

(b) the Trunk Road operating company;

(c) SNH; and

And any others as appropriate.

2. The Contractor's attention is drawn to the measures for the control of noise and vibration which are included in contract specific Appendix 1/9 and Section 4.2.6 of Part 2 of the Employers requirements.

APPENDIX 2/5: HAZARDOUS MATERIALS

The following shall be included as part of the Specification Appendix 2/5 to be completed by the Contractor.

1. In the event that hazardous or suspected hazardous material is found on site during the Works the Contractor shall stop Works in the vicinity and cordon the area off. He shall then instigate a contamination survey, which shall be an intrusive investigation and shall include collection of samples of soil and water for chemical testing. Only personnel experienced in this type of work shall carry out this investigation.
2. Samples collected as part of the investigation shall be subjected to chemical analysis at laboratories with UKAS and MCERTS accreditation for the tests being performed. The MCERTS accreditation extending only to those determinants listed in Annex A of Performance Standards for Laboratories Undertaking Chemical Testing of Soil published by the Environment Agency.
3. On completion of the investigation and chemical analysis the Contractor shall arrange for appropriately qualified personnel to undertake a contaminated land environmental risk assessment and prepare a remediation strategy.
4. The Contractor shall consult with and conform to the requirements of the Controlling Authorities, which shall include SEPA and Environmental Health Officer, Highland Council, for the remediation of the site.
5. The Contractor shall arrange for Type 3 pre-demolition asbestos surveys to be undertaken by experienced and fully qualified surveyors on all buildings, structures etc. listed in Appendix 2/1, in accordance with Regulation 4 of the Control of Asbestos Regulations (CAR 2012), to locate and risk assess any asbestos containing materials (ACMs) present. All surveys and sampling for suspected ACMs shall be carried out to the highest standards as required by the Health and Safety Executive guidance document 'MDHS 100'. All samples taken shall be analysed by an independent, UKAS accredited laboratory.
6. The Contractor shall arrange for the removal and disposal of any asbestos-containing materials in accordance with The Control of Asbestos Regulations 2012 by a sub-contractor that is licensed by the Health & Safety Executive.

APPENDIX 2/6: SITE CLEARANCE ENVIRONMENTAL REQUIREMENTS

1. Ecological site clearance restrictions or measures.
    a. Tree clearance must be minimised where possible to avoid destruction of potential bat roosting sites. Retention of existing trees shall be as indicated on the landscape drawings listed in Appendix 0/4.
    b. Vegetation removal must be avoided and minimised where possible. Habitat clearance work must be undertaken out with the bird breeding season of March to August inclusive. This will substantially mitigate against the potential damage and destruction of active nests and the removal of vegetation providing shelter, protection and foraging habitat for breeding birds and their young.

       If clearance work has to be undertaken during the breeding season, an ornithologist (who must be knowledgeable of bird nesting behaviour and experienced at nest finding) must check for active nests, to ensure that these were not destroyed or disturbed, and to advise accordingly. Active nests will need to be left undisturbed until the nesting attempt is complete.
    c. Further information regarding the ecological restrictions on site clearance can be found within Appendices 30/4 and 30/12 of this Specification.
2. Archaeological site clearance restrictions or measures.
    a. The Contractor shall appoint a Named Archaeologist whose duties shall include, but not be limited to, monitoring topsoil stripping.
    b. The name of the Contractor's Named Archaeologist must be communicated in writing to Highland Council as the Planning Authority not less than 14 days prior to commencement of the Works.
    c. The requirement for an archaeological watching brief is as described in Section 4.4.4.10 of Part 2 of the Employer's Requirements.
    d. The Contractor is required to ensure that the programme of archaeological works is undertaken in its entirety during the Works to the satisfaction of the Planning Authority.
3. Other measures or restrictions.
    a. Not used.

APPENDIX 3/1: FENCING, GATES AND STILES

1. Fencing and gate requirements are listed in Section 4.2.3 of the Employer's Requirements.
2. Fencing for the protection of planted areas shall be provided in accordance with sub-Clauses 306.4 (i) and 306.5 (i).
3. Where shown on the drawings wire mesh shall be attached to permanent or existing fencing in accordance with HCD Drawing Numbers H46 and H47 to protect existing planting from rabbits and hares as detailed in the Employer's Requirements and shall be in accordance with Clause 370AR.
4. Fencing for the protection of wildlife including otters, shall be located as detailed in the Employer's Requirements and shall be in accordance with Clause 370AR.
5. Temporary boundary fencing shall be erected in accordance with HCD Drawing No H1 Fencing Type 1. The Contractor shall be responsible for the maintenance and removal/disposal of this fencing.
6. All timber for temporary and permanent fencing shall be treated off site unless otherwise agreed by the Engineer.
7. No paddles shall be permitted for use for anti-glare screening.

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

1. This Appendix has been written in accordance with TD 19/06: Requirement for Road Restraint Systems.
2. Road vehicle restraint systems shall comply with the Containment Performance Class and Working Width requirements for safety barriers, vehicle parapets etc., as described in the SHW Series 400 published in TD19/06.
3. The Contractor shall be responsible for the design, selection, submission for acceptance, and installation of road vehicle restraint systems necessary for completion of the works.
4. The Contractor shall submit to the Overseeing Organisation full details of his proposed vehicle restraint systems for approval.
5. Safety barriers shall be continuous for each installation, and shall be provided with suitable transitions or connections for each safety barrier system and into proposed parapets or structures as appropriate.
6. Safety barrier posts set in bound materials in excess of 40mm thick shall be installed in sockets. The top surface of passive filler to sockets shall be finished flush with the surrounding surface. Any unused post sockets shall be fitted with caps.
7. At all changes of type of road vehicle restraint system and/or containment level, suitable transitions shall be provided in accordance with TD 19/06, Section 6.
8. Reference shall be made to Section 4.2.4 of Part 2 of the Employers Requirements

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002

The Contractor shall submit the following supporting information demonstrating compliance with BS EN 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002 to the Engineer for acceptance:

EUROPEAN COMMITTEE FOR STANDARDIZATION (CEN) COMPLIANCE

Initial submission documents to be supplied for consideration of initial type test are as follows:

1. Test reports in accordance with Section 6 of BS EN 1317-2:2010 for safety barriers (including any additional test data required under clauses 7.3 and 7.4 of DD ENV 1317-4:2002 for terminals and transitions of safety barriers) and Section 8 of BS EN 1317-3:2010 for crash cushions.
2. Video/high speed film of test annotated showing date, test number and performance class.
3. Still photographs of complete installation including anchorage points.
4. Still photographs of vehicle before and after impact.
5. Full drawings of tested items.
6. Certification from the manufacturer that the item tested complies with drawing supplied.
7. Certificate from test house accredited in accordance with the requirements of Series 400 of the MCHW.

Additional information, which will be required on acceptance of initial type test prior to installation.

8. Manufacturer's specification.
9. Installation drawings.
10. Manufacturer's installation instructions including foundation requirements and test methods to verify their performance.
11. Manufacturer's repair and maintenance manual.
12. Certificate of compliance for Quality Management Sector Scheme 1 for the Manufacture of Fencing Components [1].
13. Certificate of compliance for Quality Management Sector Scheme 2B for Vehicle Restraint Systems [1].
14. Certificate of compliance for Quality Management Sector Scheme 5 for the Fabrication and Installation of Bridge Parapets and Cradle Anchorages [2].
    (i) Sector Scheme 5A for The Manufacture of Parapets for Road Restraint Systems; and
    (ii) Sector Scheme 5B for The Installation of Parapets for Road Restraint Systems.
15. Nominal loads (direct forces, moments and co-existent shears) to be transferred from the parapet to the structure or foundations 2 & 3.

Notes:

[1] Items 12 and 13 are required for safety barrier systems and transitions.

[2] Items 14 and 15 are required for vehicle parapets.

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

SUBMISSION FOR COMPLIANCE WITH BS EN 1317-1, BS EN 1317-2, BS EN 1317-3, AND DD ENV 1317-4:2002
TYPE OF VEHICLE RESTRAINT SYSTEM:
CONTAINMENT PERFORMANCE CLASS/PERFORMANCE LEVEL/PERFORMANCE CLASS (*):
TEST REPORT NUMBER: **(Test of)**
Test Type: Primary/Complementary Test) (*)
TEST NUMBER: **TEST DATE:**
(*) delete as appropriate

COMPANY NAME: CONTACT: ADDRESS: Tel:/Fax:/E-mail: PRODUCT NAME:	

Initial submission documents to be supplied for consideration of Initial Type Test (ITT)

Item		**Comment**	**Item Received (Y or N)**	**Date requested**
1	Test report	Test reports in accordance with Section 6 of BS EN 1317-2:2010 for safety barriers (including any additional test data required under clauses 7.3 and 7.4 of DD ENV 1317-4:2002 for terminals and transitions of safety barriers) and Section 8 of BS EN 1317-3:2010 for crash cushions		
2	Video/high speed film	Of test coverage as specified in relevant part of BS EN 1317 or DD ENV 1317-4:2002 Annotated showing date, test number and performance class		
3	Still photographs	Of complete installation including anchorage points		
4	Still photographs	Of vehicle before and after impact		
5	Drawings	Fully detailed drawings of tested item		
6	Certification from the manufacturer	Confirming that the item tested complies with drawing supplied		
7	Confirmation from test house	That the test conforms to the relevant requirements of BS EN 1317-1 (and including any additional test data required under BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002)		
Additional information, which will be required on acceptance of initial type test prior to installation				
8	System specification	Manufacturer's specification		
9	Installation details	Manufacturer's drawings		
10	Installation procedures	Manufacturer's installation instructions		
11	Maintenance Manual	Manufacturer's inspection, repair and maintenance instructions		
12	Certificate of compliance	With the Quality Management Sector Scheme 1 for Manufacture of Fencing Components [1]		
13	Certificate of compliance	With the Quality Management Sector Scheme 2B for the Supply and Installation of Vehicle Restraint Systems [1]		
14	Certificate of compliance	With the Quality Management Sector Scheme 5 for the Fabrication and Installation of Bridge Parapets and Cradle Anchorages [2] 1) Sector Scheme 5A for The Manufacture of Parapets for Road Restraint Systems; and 2) Sector Scheme 5B for The Installation of Parapets for Road Restraint Systems		
15	Support loads	Nominal loads (direct loads, bending moments and shear forces)that have to be transferred from the vehicle restraint system to the supporting structure or foundation [2]		

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

Signature:	Name:
Date:	
Notes:	
1. Items 12 and 13 are required for safety barrier systems and transitions 2. Items 14 and 15 are required for vehicle parapets	

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

SUBMISSION FOR COMPLIANCE WITH BS EN 1317-1, BS EN 1317-2, BS EN 1317-3, AND DD ENV 1317-4:2002
TYPE OF VEHICLE RESTRAINT SYSTEM: Safety Barrier, Vehicle Parapet or Transition (*)
CONTAINMENT PERFORMANCE CLASS/LEVEL (*):
TEST REPORT NUMBER: (Test of)
Test Type: Primary/Complementary Test) (*)
TEST NUMBER: TEST DATE:
(*) delete as appropriate

COMPANY NAME: CONTACT: ADDRESS: Tel:/Fax:/E-mail: PRODUCT NAME:	

Initial submission documents to be supplied for consideration of Initial Type Test (ITT)

			Specified	**Actual**	**Satisfactory (Yes or No)**	**Compliance**
BS EN 1317-1, Table 1	Vehicle Details	**Impact Conditions** Total vehicle mass (kg) Speed (km/h) Angle (degrees)	 …….. (±…) …….. (0, +7%) …….. (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …….. (± 10%) …….. (± 10%) ± …..			
		Model				N/A
BS EN 1317-2, clause 4.2	Vehicle Restraint System (VRS) Behaviour	1) The safety barrier including vehicle parapet shall contain the vehicle without complete breakage of any of the principal longitudinal elements of the system. 2) All totally detached parts of the safety barrier with a mass greater than 2,0 kg shall be identified, located and recorded in the test report with their size. This information can be used to define sites where the barriers with detached parts shall not be used to provide safety for people behind the barrier. 3) Elements of the safety barrier including vehicle parapet shall not penetrate the passenger compartment of the vehicle. 4) Deformations of, or intrusions into the passenger compartment that can cause serious injuries shall not be permitted. 5) Foundations, ground anchorages and fixings shall perform according to the design of the safety barrier including vehicle parapets.				
BS EN 1317-2, clause 4.3	Vehicle Behaviour	1) During and after the impact, no more than one of the wheels of the vehicle shall completely pass over or under the safety barrier. 2) The vehicle shall not roll over (including rollover of the vehicle onto its side) during or after impact 3) For tests with HGVs and buses, not more than 5 % of the mass of the ballast shall become detached or be spilt during the test up to the time when the wheel tracks of the vehicle leaves the exit box 4) The vehicle shall leave the safety barrier including vehicle parapet after impact so that the wheel track does not cross a line parallel to the initial traffic face of the system, at a distance A (2.2m) plus the width of the vehicle plus 16 % of the length of the vehicle within a distance B (10m) from the last (namely closest to the downstream end of the barrier) point P, where the last of the vehicle wheel tracks re-crosses the original line of the traffic face of the barrier after initial impact				

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

BS EN 1317-2, clause 5.3.2	Installation	1) The length of the safety barrier or vehicle parapet tested shall be sufficient to demonstrate the full performance characteristic of any longer installation. After the test the adequacy of the length of installation shall be checked by procedure as the one in Annex B. The test lengths shall be defined by the manufacturer prior to the test so that the car test(s) demonstrates the maximum severity of impact, and the large vehicle test demonstrates the maximum dynamic deflection characteristics 2) End conditions (for example end anchorage) shall be provided in accordance with the safety barrier including vehicle parapet specification and defined by the manufacturer. If an end anchorage is used which is specifically for testing and not part of the design of the system being tested, this end anchorage shall be fully described in the test report. Any end anchorage should not restrict the maximum lateral deflection of the safety barrier. 3) Foundations shall meet the design specification 4) When testing pretensioned systems, where tension can be adjusted (for example cable barriers), the small vehicle test shall be performed with a tension corresponding to a temperature of - 10 °C and the large vehicle test with a tension corresponding to a temperature of + 30 °C. For the containment levels with only one test, the tension shall correspond to a temperature of 0 °C. The data for the recommended tensions/temperature shall be supplied by the manufacturer 5) Where a vehicle parapet is required to have infilling or other modification in order that it may function as a vehicle pedestrian parapet, this infilling or other modification shall be included in the test installation if it will affect the performance of the vehicle parapet			
BS EN 1317-2, clause 4.4	Severity Indices	**SPECIFIED** THIV Limit 33km/h PHD Limit 20g ASI Limit 1.4	**ACTUAL** THIV ……. km/h PHD ……. g ASI …….		
BS EN 1317-2, clause 5.6, Figure 4	Photo-graphic coverage	1) Photographic coverage shall be sufficient to clearly describe the barrier including vehicle parapet behaviour and the vehicle motion during and after impact 2) A known scale shall be visible in overhead camera view to assist measurement from the photographic coverage following the test. 3) High speed cameras shall be operated at a minimum of 200 frames per second 4) Normal speed cameras shall be operated at a minimum of 24 frames per second 5) As recommended in clause 5.7 and Figure 4			
	Drawings	Drawings included			
				N/A = Not Applicable	

FULLY COMPLIES WITH STANDARD: BS EN 1317-1, BS EN 1317-2, DD ENV 1317-4:2002

Signature:	Name:
Date:	

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

SUBMISSION FOR COMPLIANCE WITH BS EN 1317-1, and BS EN 1317-3
TYPE OF VEHICLE RESTRAINT SYSTEM: Crash Cushion (Redirective [R] or Non-redirective [NR] (*)
TEST REPORT NUMBER: TEST TYPE: (Primary/Complementary Test) (*)
PERFORMANCE LEVEL: VELOCITY CLASS: (Test of)
TEST NUMBER: TEST DATE:
(*) delete as appropriate

COMPANY NAME: CONTACT: ADDRESS: Tel:/Fax:/E-mail: PRODUCT NAME:	

			Specified	Actual	Satisfactory (Yes or No)	Compliance
BS EN 1317-1, Table 1	Vehicle Details	**Impact Conditions** Total vehicle mass (kg) Speed (km/h) Angle (degrees)	 …….. (±…) …….. (0, +7%) …….. (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …….. (± 10%) …….. (± 10%) ± …..			
		Model				N/A
BS EN 1317-3, clause 6.2	Crash Cushion Behaviour	1) Elements of the crash cushion shall not penetrate the passenger compartment of the vehicle. There shall be no deformations of, or intrusions into, the passenger compartment that could cause serious injuries to the occupants. 2) All totally detached parts of the crash cushion with a mass greater than 2,0 kg shall be included in the determination of the displacement classification (see 6.5 of BS EN 1317-3). 3) Foundations, ground anchorages and fixings shall perform according to the design of the crash cushion. The deformed crash cushion shall not encroach into the front surface of the obstacle.				
BS EN 1317-3, clause 6.3	Vehicle Behaviour	1) The vehicle shall not roll over (including rollover of the vehicle onto its side) during or after impact. 2) The post-impact trajectory of the test vehicle shall be evaluated by means of the exit box shown in Figures 5a and 5b as well as that detailed in Table 10, Table 11 and the full clause 6.3 of BS EN 1317-3.				
BS EN 1317-3, clause 7.3.2	Installation	1) The installation of the crash cushion for the test, including its foundations, shall comply with the structural design details and with the on-road system details as given in the design specification.				
BS EN 1317-3, clause 5.5 and Table 3	Impact Severity Indices	**SPECIFIED** Level A: THIV ≤ 44km/h (Tests 1, 2 & 3) THIV ≤ 33km/h (Tests 4 & 5) ASI ≤ 1.0 Level B: THIV ≤ 44km/h (Tests 1, 2 & 3) HIV ≤ 33km/h (Tests 4 & 5) ASI ≤ 1.4 Levels A & B: PHD ≤ 20g		**ACTUAL**		
BS EN 1317-3, clause 7.4.7, Figure 8 and Figure 9	Photo-graphic coverage	1) High speed cameras and/or high speed video cameras shall be operated at a minimum of 200 frames per second. 2) The photographic coverage shall be at minimum as indicated in Figure 8. 3) As recommended in clause 7.4.7, Figure 8 and Figure 9.				

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

	Drawings	Drawings included		
			N/A = Not Applicable	
FULLY COMPLIES WITH STANDARD: BS EN 1317-1, and BS EN 1317-3				
Signature:		Name:		
Date:				

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

SUBMISSION FOR COMPLIANCE WITH BS EN 1317-1 AND DD ENV 1317-4:2002
TYPE OF VEHICLE RESTRAINT SYSTEM: Terminal
PERFORMANCE CLASS: (Test of)
Test Type: Primary/Complementary Test) (*)
TEST TYPE NUMBER:
TEST NUMBER: **TEST DATE:**
(*) delete as appropriate

COMPANY NAME: CONTACT: ADDRESS: Tel:/Fax:/E-mail: PRODUCT NAME:	

			Specified	Actual	Satisfactory (Yes or No)	Compliance
BS EN 1317-1, Table 1 DD ENV 1317-4: 2002, clauses 7.4 and 7.5	Vehicle Details	**Impact Conditions** Total vehicle mass (kg) Speed (km/h) Angle (degrees)	 …….. (±…) …….. (0, +7%) …….. (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …….. (± 10%) …….. (± 10%) ± …..			
		Model				N/A
DD ENV 1317-4: 2002, clauses 5.4 and 5.5.2	Terminal Behaviour	1. Elements of the terminal shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into, the passenger compartment that could cause serious injuries are not permitted. 2. No major part of the terminal shall be come totally detached and come to rest outside the permanent lateral displacement zones defined in clause 5.4. 3. Anchorages and fixings shall perform to the terminal design specifications and other specified requirements as listed in the rest report.				
DD ENV 1317-4: 2002, clause 5.5.3	Vehicle Behaviour	1. The vehicle shall not overturn, although rolling, yawing and moderate pitching may be accepted. For the performance class P1 rolling onto a side may be accepted. 2. The exit box values for the specified test are as defined in Figure 5, Table 7 and Table 8 (as appropriate).				
DD ENV 1317-4, 2002 clause 7.3.2	Installation	1. The terminal and transition shall conform to the structural design details and with the system installation details as given in the design specification of the manufacturer.				
DD ENV 1317-4: 2002, clause 5.5.4 and Table 5	Impact Severity Indices	**SPECIFIED** Level A: THIV ≤ 44km/h (Tests 1, 2 & 3) THIV ≤ 33km/h (Tests 4 & 5 ASI ≤ 1.0 Level B: THIV ≤ 44km/h (Tests 1, 2 & 3) HIV ≤ 33km/h (Tests 4 & 5) ASI ≤ 1.4 Levels A & B: PHD ≤ 20g		**ACTUAL**		
DD ENV 1317-4, 2002 clause 7.7, Figure 7	Photo-graphic coverage	1. Photographic coverage shall be sufficient to describe clearly terminal/transition and vehicle motion during and after impact. 2. High speed cameras and/or high speed video cameras shall be operated at a minimum of 200 frames per second. 3. High speed cameras and one normal speed camera shall be located to record the performance of the terminal/transition. For the recommended camera schedule see Figure 7.				

APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF ROAD RESTRAINT SYSTEMS TO BS1317-1, BS EN1317-2, BS-EN 1317-3 AND DD ENV 1317-4:2002 (Continued)

	Drawings	Drawings included		
FULLY COMPLIES WITH STANDARD: BS EN 1317-1 AND DD ENV 1317-4:2002				
Signature:		Name:		
Date:				

APPENDIX 30/1: GENERAL

Sub-Clause

Notice and Liaison

3001.2 The Contractor shall give the Supervisor at least 48 hours' notice of all items in this sub-clause:

(i) Subsoil treatment.

(ii) Topsoil cultivations.

(iii) Grass or wildflower seeding or turfing

(iv) Planting

(v) Arboricultural works

(vi) Application of pesticides

(vii) Works outside the road boundary

Pesticide Application

3001.13 Pesticides Record Forms, as detailed below, are to be submitted to the Supervisor on a monthly basis

Bird Nesting Season

3001.14 If SNH require protection during the breeding season of specific birds, fish or other animals, the Contractor shall programme his Works so that disturbance to the habitat of those animals is minimised during the period required by SNH. The bird nesting season shall be determined by the Contractor after consultation with Scottish Natural Heritage.

Inspection Reports

3001.15 Landscape Works - Inspection Reports as detailed shall be submitted to the Supervisor at the following intervals:
The Contractor shall provide Inspection Reports for the activities carried out under Clauses 3007, 3009 and 3010. The reports shall identify the level of work activities undertaken for each operation. The format of the form shall be as below or otherwise have the approval of the Supervisor.
The reports shall be submitted to the Supervisor at the following intervals:

(i) Six times per year in the first two relevant 52 week periods of the Period of Establishment Maintenance.

(ii) Three times per year in the following three relevant 52 week periods of the Period of Establishment Maintenance

APPENDIX 30/1: GENERAL (Continued)

LANDSCAPE WORKS – PESTICIDE RECORD	
Contract Reference number:	Date of visit : (minimum one record per day)
Contract Name:	
Name of Contractor:	
Contractor's telephone no:	
Operations carried out	
Pesticide used	
Location of operation	
Total weed control	
Selective herbicide	
Weed control in vicinity of any burn, ditch, or open water	
Weed control around planting	
Weed control to cultivated beds	
Other	
Names of operatives on site:	Qualifications of operatives:
Supervisor	
Storeman	
Application by:	
Signed for Contractor	
Contractor's observations on damage or any other incidents:	

APPENDIX 30/1: GENERAL (Continued)

LANDSCAPE WORKS – INSPECTION REPORT	
Contract Reference number:	Date of visit : (minimum one record per day)
Contract Name:	
Name of Contractor:	
Contractor's telephone no:	
Operations carried out:	
Location of operation:	
Names of operatives on site:	Qualifications of operatives:
Contractor's observations on damage or any other incidents:	
This maintenance visit has been satisfactorily completed.	
SIGNED (for Contractor) NAME (Block Capitals) DATE.	
SIGNED (For Engineer) NAME: (Block Capitals) DATE	

APPENDIX 30/2: WEED CONTROL

Sub-Clause

General

3002.1 Weed control for all injurious weed species, including the Common Nettle and notifiable weeds such as Giant Hogweed and Japanese Knotweed shall be carried out throughout the Contract Period at sufficient frequency to eliminate them during the Works in compliance with the Contractor's Quality Plan and associated Method Statement.

Total Weed Control

3002.3 Total weed control shall apply to the following locations:

i. Bases of safety fences or barriers

ii. Around columns, posts and signs

iii. All paved areas and hardstandings

iv. Dry stone wall located in viewpoint

The Contractor shall apply herbicides at sufficient frequency to eliminate weed growth throughout the Contract Period. In any case no less than two applications shall be made each year.

3002.4 Total weed control by a non-residual translocated herbicide shall apply to the following locations:

(i) All areas prior to seeding or planting;

(ii) All stockpiles of topsoil; and

(iii) A 250mm radius around each plant station or clump of plants in all planting areas.

Application shall be frequent enough to keep the plant circles weed free, prior to Completion and thereafter, throughout the Period of Establishment Maintenance. A suitable period of time, as recommended by the herbicide manufacturer, shall be allowed to elapse between herbicide application and planting or seeding/turfing operations.

3002.5 A translocated herbicide approved for use in or near water shall be used for weed control in all filter drains, open ditches, lagoons, watercourses and drainage/filtration, ponds/basins.

Control shall be at sufficient frequency to eliminate weed growth throughout the Contract Period.

APPENDIX 30/2: WEED CONTROL (Continued)

Sub-Clause

Selective Weed Control in Grass

3002.6 The Contractor shall apply herbicide for the selective control of injurious broadleaved weeds in all verges, central reserves, planted areas and other grassed areas throughout the site. The application shall be at sufficient frequency to eliminate weed growth throughout the Contract Period.

Weed Control by Spot Application of Herbicide

3002.7 Weed control by spot application of translocated herbicide shall be applied as necessary, and in any case no less than twice a year during the Period of Establishment Maintenance, at the following locations:

i. For control of injurious weeds in grass/wildflower areas; and

ii. All woodland and shrub planting areas.

Weed Control by Pulling/Hand weeding

3002.8 The Contractor shall hand-weed as necessary and in any case no less than twice a year during the Contract Period at the following locations:

i. Areas of planting where herbicide application may cause damage;

ii. Within plant protectors to grass and weed growth; and

iii. Where necessary throughout the Site for the elimination of Ragwort and Oil Seed Rape.

(iii) (The Contractor is to remove arisings from common ragwort immediately after weed control operations.)

Weed Control by Cutting

3002.9 Weed control by cutting shall be carried out as necessary, and in any case no less than twice a year, prior to flowering during the Period of Establishment Maintenance, for control of injurious weeds only.

Arisings from Weed Control Operations

3002.10 All arisings from weed control operations shall be removed from Site. Injurious weed arisings shall be destroyed. All arisings from Common Ragwort and Japanese Knotweed shall be placed in waterproof bags, sealed and removed from the Site to controlled tips.

Any Japanese Knotweed identified on this site is classified as ‘Controlled Waste’ under the Environmental Protection Act (1990) and must be disposed of at a licensed landfill site in accordance with the Environment Protection (Duty of Care) Regulations 1991.

APPENDIX 30/3: CONTROL OF RABBITS AND DEER

Sub-Clause

General

3003.1 The Contractor shall carry out rabbit and deer ontrol throughout the Site for the duration of the Contract Period.

Control Operations

3003.5 The Contractor shall only cut areas of brambles and herbage that will interfere with the control of rabbit, hare or deer. The arisings shall be used to form habitat piles in locations within the site where they are not likely to become visually intrusive or interfere with access or maintenance.

Rabbit Control within the Site Boundary

3003.8 The Contractor shall ensure effective rabbit control for the entire duration of the five year Period of Establishment Maintenance.

3003.9 The Supervisor may request an inspection of the site with a representative of the Contractor at monthly intervals to ensure effective control has been achieved.

Clearance of Rabbits and Deer in Fenced Areas to be Planted

3003.12 The Contractor shall maintain the planting enclosures free of rabbits, rabbit burrows including exit/entry holes, and deer for the entire five year duration of the Period of Establishment Maintenance.

3003.14 The Contractor shall replace all damaged plants and maintain them for the entire five year duration of the Period of Establishment Maintenance.

APPENDIX 30/4: GROUND PREPARATION

Sub-Clause

Vegetation Clearance

3004.1 Grasses and other herbaceous vegetation on all areas to be planted or seeded (except where noxious weeds are to be treated) shall be cut to a height between 50 mm and 75 mm and the arisings removed off site.

3004.2 The Contractor shall apply a non-residual translocated herbicide in accordance with sub-Clause 3002.4 to all areas to be planted or seeded (with the exception of areas in existing woodland and other planted areas) between 21-25 days prior to planting.

Herbicides shall be biodegradable, glyphosate based, unless otherwise approved and shall be applied in accordance with the manufacturer's recommendations.

Sub Soil Treatments

3004.5 Prior to carrying out any landscape operations, all planting areas shall be surveyed to establish that there are no surface or subsurface compacted soil layers or other subsurface materials likely to impede drainage or cause other damage to the plants. Where compacted soil layers or consolidated materials are found, the ground shall be subsoiled in accordance with Sub-clauses 3004.5-6, or otherwise relieved by physical means by methods approved by the Supervisor.

In areas to be seeded with a meadow mix, topsoil shall be removed and used elsewhere on site or removed from site.

3004.6 The spacing between tine furrows used for ripping shall be 600mm

3004.8 **Final Preparation of Soils**

Breaking up of consolidated material in areas of less than 300mm of topsoil or sub-soil is to be agreed by the Supervisor.

3004.10 Finished levels of material after settlement shall be not less than 25mm and not more than 50mm above adjacent kerb level on the roadside and the same level as adjoining soil areas elsewhere.

3004.11 In order to preserve the existing seed bank, soil is to be stored in accordance with BS 3882:2015 specification for Topsoil.

Protection of existing trees -
All Works in the vicinity of trees to be in accordance with BS5837: 2012 - Trees in Relation to design, demolition and construction - Recommendations.
Trees, woodland and hedges to be retained and protected for the duration of the construction period with chestnut pale fencing if they do not fall within the Works area.

APPENDIX 30/5: GRASS SEEDING, WILDFLOWER SEEDING AND TURFING

Sub-Clause

Season

3005.1 Grass seed will be sown during the period 1 March to 31 May or 1 September to 31 October unless otherwise agreed with the Supervisor. Meadow seed will be sown during the period 1st April to mid-June or from 1st August to 30th September, unless otherwise agreed with the Supervisor.

Final Cultivations

3005.2 Immediately prior to any sowing of grass or wildflower mix, the Contractor shall reduce the upper 50mm of soil to a fine tilth by use of a chain harrow, rotovator or other suitable plant. Cultivations shall extend into adjacent grass areas to ensure full marrying in of levels.
All preparations for seeding shall comply with BS 4428:1989 and shall be carried out not less than 1 week prior to seeding. The contractor shall keep the seed bed free from weeds and rubbish during the period leading up to seeding.

Ground to be seeded with a meadow mix must not be highly fertile.

3005.3 All areas to be seeded with grass in verge areas shall have fertiliser or other soil ameliorants incorporated into the upper 50 mm of soil where it is considered necessary in compliance with the Contractor's Quality Plan and associated Method Statements at the rate considered necessary for successful seeding.

Seed

3005.4 Seed mixes for grass meadow areas shall be of Local Provenance and in accordance with the planting schedule.

3005.6 A supplier's certificate giving the composition, purity, germination year of harvest and country of origin of the individual grasses in any seed mixture shall be submitted to the Landscape Officer/ Clerk of Works a minimum of two weeks before sowing is due to take place. Seed which is vermin damaged or not to specification or certificate shall be rejected and the Contractor shall, at their own expense, replace such seed with an equivalent quantity which shall be inspected and approved by the Landscape Officer/ Clerk of Works. The seed mixture shall meet the requirements for germination and purity laid down in BS 4428:1989 Section 5.1

3005.7 The seed mixtures shall be of Local Provenance, as shown in Table 30/5.

Wildflower seeds shall be of North Scotland native origin. The Contractor shall complete and submit to the Supervisor the appropriate Wildflower Seed Provenance Certificates in the format as detailed in Appendix C of Part 3 of the Employer's Requirements.

APPENDIX 30/5: GRASS SEEDING, WILDFLOWER SEEDING AND TURFING (Continued)

Sub-Clause

Conventional Sowing

3005.8 Proposed meadow areas to be sown at a rates as below:
MG5 Meadow Mix - 3g/m²
Wet Meadow Mix – 3g/m²

Dry Meadow Mix – 3g/m²

3005.9 Areas to be seeded with grass shall be immediately followed by lightly raking the surface of the soil to cover the seeds, by use of a chain harrow or other suitable plant. Areas to be seeded with a meadow mix shall be immediately rolled after sowing to ensure good seed / soil contact.

Hydraulic Seeding

3005.10 Hydraulic seeding shall be applied to areas shown to be planted with Dry Meadow Mix. The Hydraulic seeding mixture, any speial process requirements and the rate of application shall be as described in Appendix 30/5. The mixture shall be kept constantly stirred during application to maintain homogeneous slurry.

Proposed MG5 Meadow Mix Areas:
MG5 Meadow Mix from Scotia Seeds or equal and approved.
Seeding Rate:3g/m²

Proposed Wet Meadow Mix Areas:
Wet Meadow Mix from Scotia Seeds or
equal and approved.
Seeding rate: 3g/m²

Proposed Dry Meadow Mix Areas:
Mavisbank Meadow Mix from Scotia
Seeds or equal and approved.
Seeding rate: 3g/m²

Variations to this mix are to be approved by the Supervisor.

APPENDIX 30/6: PLANTING

Table 30/6/1 Planting - The following are standard planting mixes to be used throughout the scheme.

PROPOSED SCRUB MIX

SPECIES	COMMON NAME	SPECIFICATION	% Mix
Corylus avellana	Hazel	40-60cm : 3l : root ball	30
Crataegus monogyna	Hawthorn	40-60cm : 1+1 : bare root	30
Prunus spinosa	Blackthorn	45-60cm : 1+1 : bare root	20
Rosa canina	Dog rose	40-60cm : 1+1 : bare root	10
Salix cincera	Grey willow	40-60cm : 0/1 : bare root	10

PROPOSED WOODLAND MIX

SPECIES	COMMON NAME	SPECIFICATION	% Mix
Alnus glutinosa	Alder	60-90cm : 1+1 : bare root	15
Betula pubescens	Downy birch	60-80cm : 2l : Container	20
Corylus avellana	Hazel	60-90cm : 1+1 : bare root	20
Pinus sylvestis	Scots pine	45-60cm : 2l : root ball	20
Prunus padas	Bird cherry	60-90cm : 1+1 : bare root	5
Quercus petraea	Sessile oak	60-90cm : 1+1 : bare root	10
Sorbus aucuparia	Rowan	60-90cm : 1+1 : bare root	10

Note:

1. Plant feathered trees in species of 3-50no.
2. Spacing between plants to be an average of 1.5m staggered within rows to avoid straight lines. Rows to be 1.5m apart.
3. When planting adjacent to drainage to other underground/overhead utilities the Contractor shall consult with Volume 4, NJUG Guidelines for the Planning, Installation and Maintenance of utility Apparatus in Proximity to Trees. The contractor shall also consult the Overseeing Organisation prior to any planting.

APPENDIX 30/6: PLANTING (Continued)

PROPOSED WOODLAND EDGE PLANTING

SPECIES	COMMON NAME	SPECIFICATION	Mix %
Alnus glutinosa	Alder	60-90cm : 1+1 : bare root	10
Betula pubescens	Downy birch	60-80cm : 2l : Container	30
Corylus avellana	Hazel	60-90cm : 1+1 : bare root	20
Crataegus monogyna	Hawthorn	60-90cm : 1+1 : bare root	15
Salix caprea	Goat willow	40-60cm : 0/1 : bare root	5
Sorbus aucuparia	Rowan	60-90cm : 1+1 : bare root	20

Note:

1. Plant feathered trees in species of 3-50no.
2. Spacing between plants to be an average of 1.5m staggered within rows to avoid straight lines. Rows to be 1.5m apart.
3. When planting adjacent to drainage to other underground/overhead utilities the Contractor shall consult with Volume 4, NJUG Guidelines for the Planning, Installation and Maintenance of utility Apparatus in Proximity to Trees. The contractor shall also consult the Overseeing Organisation prior to any planting.

SPECIES	COMMON NAME	SPECIFICATION	% Mix
Betula pubescens	Downy birch	RB : GIRTH 8-10cm : HEIGHT 2.5-3m	30
Prunus Padas	Bird cherry	RB : GIRTH 8-10cm : HEIGHT 2.5-3m	20
Sorbus aucuparia	Rowan	RB : GIRTH 8-10cm : HEIGHT 2.5-3m	50

Note:

1. Plant specimen trees in groups of 3-5no. of the same species
2. Spacing between trees to be average spacing of 2.0m
3. When planting adjacent to drainage or other underground/overhead utilities the Contractor shall consult with Volume 4, NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. The Contractor shall also consult the Overseeing Organisation prior to any planting.

APPENDIX 30/6: PLANTING (Continued)

Sub-Clause	
3006.3	Planting details are as specified on drawings 47066861-SHT-05-3000-CH-0001 to 47066861-SHT-05-3000-CH-0004 as listed in Appendix 0/4.
3006.5	Mycorrhizal root dip treatment to the approval of the Supervisor is to be applied to all bare root plants including feathered trees.
3006.6	All stock shall be of Scottish Highlands local provenance unless otherwise agreed by the Supervisor. The Landscape Design shall be accompanied by written confirmation from the Contractor and his landscape architect that in respect of the Design and the Works the Northern central east coast Scotland native plant species of trees, shrubs, and wildflower seeds have been sourced from the highest available preference for selecting native seed sources contained within Appendix 1 – Figures 4 & 5 of CEL:LFN. This confirmation, which shall be provided prior to the commencement of landscape planting Works, shall consist of the Contractor's completed Provenance Certificates for all trees, shrubs and grass seed and shall include certification from the supplying nurseries in respect of provenance of the plant material. For the avoidance of doubt, where there is a choice of form of plant, the highest preference shall be given to the most local provenance.
3006.7	The Contractor shall make special arrangements for the Supervisor or a representative to inspect planting stock at the nursery.
3006.10	All ties and canes, unless otherwise directed by the Supervisor, are to be removed from plants
3006.12	Tree pits shall be back-filled with MCDHW class 5A (site won) top soil. If imported topsoil is required, it shall be class 5B.
3006.13	Compost shall not be used. Slow release fertiliser shall be incorporated into backfill in accordance with sub-clause 3006.15.
3006.15	(i) Slow/controlled release fertiliser as agreed in writing with the Supervisor shall be incorporated into backfill of pits at an agreed rate. Scattering fertiliser of any description on the surface of the ground around the plants shall not be permitted
3006.16	Anti-transpiration treatments to be used if required to be agreed in writing with the Supervisor Root dips shall be applied to all bare root plants and shall be applied in strict accordance with the manufacturers' instructions. Root dips shall be applied at the following times: i. Immediately after the plants have been dug-up in the nursery; ii. On arrival at site; and iii. Immediately prior to planting if more than 3 days delay after arrival on Site. (i) Anti-desiccant sprays shall be applied on arrival of the plants at Site and immediately prior to planting if more than 3 days delay after arrival on Site.

APPENDIX 30/6: PLANTING (Continued)

Time of Planting

3006.17 The planting season for bare-root, root-balled, cell-grown and container grown plants shall be November to March inclusive unless otherwise agreed by the Supervisor.
Planting positions shall be marked out for approval. The density of plants shall be as per Indicative Planting Works drawing noted in Appendix 0/4.

Notch Planting of Trees, Shrubs and Hedges

3006.23 Plants shall be notch planted into a T-shaped opening of sufficient size for the roots of bare-root plants to be fully spread out or to accommodate a cell-grown plant without breaking the root-plug.

Planting Pits, Beds and Trenches

3006.24 Unwanted sub-soil arising from planting pits shall be retained on Site and deposited in new mounding works.

Table 30/1: Planting Pits, Beds and Trenches

LANDSCAPE SOIL REQUIREMENTS	TOPSOIL DEPTHS FOR LANDSCAPING	SUBSOIL DEPTHS FOR LANDSCAPING
Landscape Elements	**Minimum**	**Minimum**
MG5 Meadow Mix Dry Meadow Mix Wet Meadow Mix	150mm	150mm
Woodland Planting Woodland EdgePlanting Scrub Planting	300mm	600mm
Specimen Trees	400mm	700mm

3006.29 All areas with spread or existing topsoil shall be cultivated in accordance with this sub-clause prior to planting.

Soil ameliorants and slow release fertilisers shall be incorporated in planting beds, in compliance with the Contractor's Quality Plan and associated Method Statements. All planting areas with spread or existing topsoil shall be cultivated in accordance with this sub-clause prior to planting.

3006.33 All planted areas shall be watered to field capacity immediately following planting.

3006.35 No soil ameliorants shall be incorporated into backfill. No compost shall be used in the backfill.

Pits and trenches for transplants, shrubs and container-grown plants shall be back-filled with MCDHW Class 5A topsoil won from the Site and lightly firmed prior to planting.

3006.38 Root barriers shall only be required where the clearances required for underground services and drainage infrastructures affect the objective of the planting as stated in the Employer's Requirements.
The Contractor shall secure agreement with the relevant statutory undertaker(s) before employing root barriers to reduce standard clearances from their services.

APPENDIX 30/6: PLANTING (Continued)

3006.45 Feathered and Semi-mature trees to be planted as located on Landscape Design drawings 47066861-SHT-05-3000-CH-0002 and 47066861-SHT-05-3000-CH-0003 as listed in Appendix 0/4.

3006.46 Soil ameliorants where required, shall be incorporated into backfill at the rates stated in The Contractor's Quality Plan and Associated Method Statements. No compost is to be used in the backfill.

3006.49 Water in to field capacity in accordance with Landscape Institute Technical Bulletin: Watering `Restrictions and Watering Specifications (May 1996) where directed by the Supervisor.

3006.50 All Semi Mature Tree Planting will require an irrigation pipe.

3006.52 On all standard trees, individual plant protectors shall be installed in accordance with sub clause 3006.52 to plants. The protectors shall be of UV stabilised polypropylene, 600mm in height and of between 130-160mm diameter with two ties. One stake, 25mm x 25mm, of 850mm length driven 300 mm into the ground shall be used on non-staked trees and shrubs.

3006.55 No mulch shall be spread on Site unless instructed by the Supervisor. Any mulch used shall be timber mulch shall be composted wood chips or bark free of methyl bromide contamination and foreign material. It shall be matured for a minimum of 16 weeks, naturally heated by the process of decomposition to temperatures exceeding 50 degrees centigrade for a minimum period of 14 days, followed by a period of not less than 1 week of stabilisation. Individual plant protectors of minimum 750mm in height and of 73 to 105mm diameter with two ties shall be used to protect staked feathered trees.

3006.87 In addition to the requirements of Clause 3006.87 the Contractor shall replace all plants found to be defective or vandalised for the five year duration of the Period of Establishment Maintenance.

3006.89 Failed plants shall be marked with spray paint on stakes/shelters or removed at the time of the inspection.

3006.91 Following replacement planting and during establishment, sufficient water shall be applied to maintain healthy growth and in accordance with Landscape Institute Technical Bulletin: Watering Restrictions and Watering Specifications (May 1996 and reissued 2011) where directed by and to the satisfaction of the Supervisor.

3006.92 The Contractor shall carry out maintenance of new planting for the duration of the 260 weeks (five years) Period of Establishment Maintenance.

APPENDIX 30/7: GRASS, BULBS AND WILDFLOWER MAINTENANCE

Sub-Clause

General Grass Maintenance

3007.1 All existing or newly sown areas of grass and wildflower seed mix shall be maintained in accordance with clause 3007.

3007.5 No cutting shall be carried out within 250 mm of unprotected trees or within 500mm of individual plants. Strimmers shall not be used for cutting grass within unprotected planted areas.

3007.13 All Proposed Grass Seeded Areas shall be cut in accordance with sub clause 3007.13

Grass Cutting: Minimal Frequency

3007.19 Additional selective cuts to be agreed by the Supervisor within visibility splays as required to maintain adequate visibility

3007.20 Additional selective cuts to be agreed by the Supervisor within visibility splays to the front of road signs as required to maintain adequate visibility.

Wildflower Areas and Areas of Nature Conservation Value

3007.26 Areas of wildflower meadow shall be cut in accordance with 3007.26.ii Annual Summer/Autumn cut.

3007.27 To be applied to all areas of proposed wildflower meadow.

3007.28 To be applied to all areas of proposed wildflower meadow.

3007.29 Spot treatment weed control is to be carried out at least twice a year between April and September in all proposed areas of wildflower meadow in accordance with 3007.29 or as agreed with the Supervisor.

3007.30 Hand pulling of weeds that cannot effectively be controlled by chemical means without risk of damage to wildflowers shall be had weeded in at the frequency stated in 3007.29.

APPENDIX 30/8: WATERING

Sub-Clause

Establishment Watering

3008.6 The Period of Establishment Maintenance shall be as stated in the Form of Tender.

Additional Watering

3008.7 Additional watering in accordance with this sub-clause may be required for all planting and seeding during the Period of Establishment Maintenance in periods of abnormally dry conditions, as determined by the Supervisor.
Additional watering of trees shall be at rates in compliance with the Contractor's Quality Plan and associated Method Statements.

APPENDIX 30/9: ESTABLISHMENT MAINTENANCE FOR PLANTING

Sub-Clause

General

3009.1 All planting and planting areas shall be maintained for the duration of the (five year) Period of Establishment Maintenance in accordance with sub-clauses 3009.2 to 3009.25.

Stakes, Tubes, Guards and Their Ties

3009.3 Tree stakes, tubes, guards and ties shall be inspected twice per year in accordance with sub-clause 3009.3. Damaged items that are to be removed off Site are to be disposed of at the nearest recycling centre..

3009.4 Tree stakes, tubes, guards and ties that are no longer required shall be offered to the Supervisor for re-use .If not required they shall be disposed of at the nearest recycling centre.

Weed Control: Young Trees and Shrubs in Grass Plots

3009.10 Translocated herbicide shall be applied in accordance with this sub-Clause to 250mm radius circles around individual plants or clump-planting stations in all planting areas. Application shall be frequent enough to keep the plant circles weed free.

3009.11 Residual herbicide application to all planted areas once per year in January using a herbicide effective in cold weather.

Weed Control: Young Trees and Shrubs in Cultivated Beds

3009.16 Weed control is required throughout all planting areas. Weed growth within tubes to be removed by hand. Weed growth in the remaining area shall be treated with systemic, translocated, biodegradable herbicide.

Weed Control: Hedges

3009.20 A weed free area at the base of all proposed hedgerows shall be kept weed free.

Individual Trees in Urban Streets

3009.25 All Specimen tree planting shall be inspected and maintained annually throughout the 260 weeks (five year) Period of Establishment Maintenance in accordance with this sub-clause. Weed control shall be by chemical means or hand weeding.

APPENDIX 30/10: MAINTENANCE OF ESTABLISHED TREES AND SHRUBS

Sub-Clause

3010.1 All existing planting areas to be maintained and protected shall be maintained throughout the duration of the 260 weeks (five years) Period of Establishment Maintenance. Maintenance shall be in accordance with sub-clause 3010.2 to 3010.71 of the Specification and as detailed in the Contractor's management proposals to the Supervisor.

Weed Control: Trees and Shrubs in Cultivated Beds

3010.2 Grass and weed growth shall be removed by chemical means in compliance with the Contractor's Quality Plan and associated Method Statements.

Arisings from Pruning, Cutting or Felling of Woody Plants

3010.4 Healthy arisings shall be disposed of in accordance with item (i) of this sub - clause

Shrub Pruning

3010.8 Overgrown shrubs to be coppiced back in compliance with the Contractor's Quality Plan and associated Method Statements and agreed in writing by the Supervisor.

Hedge Maintenance

3010.14 Reciprocating blade cutting machinery shall be used for cutting (hedge growth shall be 3 years old prior to cutting)

Tree Felling

3010.59 The height at which the stump shall be cut shall be either:

i. As close to the ground level as possible; or

ii. Where the tree is growing in a hedge or fence line the stump shall be left level with the top of the hedge or fence.

The final cut shall leave the stump with a smooth, level surface.

3010.60 All stumps shall be treated. The Contractor shall within 24 hours of felling furrow 50% of the stump and bark and apply an approved herbicide and vegetable dye shall be applied to clearly indicate the stumps which have been treated. All applications shall be in accordance with Clause 3001.

3010.61 The Contractor shall revisit the plot in July or August following the initial stump treatment. The Contractor shall inspect all stumps and treat all re-growth from the stumps with an approved herbicide.

3010.62 Where instructed by the Overseeing Organisation, the complete root shall be removed in accordance with sub-clause 3010.62

3010.63 All arisings shall be processed immediately using a woodchipper to produce chippings in the size range 0-75mm and disposed of on site in a location agreed with the Overseeing Organisation to a depth of 75mm. Chippings which are in excess of the size requirements shall be removed off site.

APPENDIX 30/10: MAINTENANCE OF ESTABLISHED TREES AND SHRUBS (Continued)

Thinning and Coppicing

3010.65 Thinning and coppicing shall be carried out in areas of establishing and maturing woodland in accordance with Table 30/10.1 and where identified as being required by the Contractor's regular inspections.

APPENDIX 30/11: MANAGEMENT OF WATERBODIES

Sub-Clause

3011.1 The Contractor shall compile a schedule of areas and operations in accordance with Clause 3011 for the management of ponds and ditches that are part of the road drainage system.

3011.3 All inlets and outlets that form part of the Works shall be inspected in accordance with sub-clause 3011.3.

Weed Control

3011.4 The Contractor shall eliminate injurious weeds growing within or immediately adjacent to water bodies.

3011.6 Locations and methods for physical removal of vegetation to be determined in accordance with the Contractor's Quality Plan and associated Methods Statement.

Silt

3011.8 Detail of silt removal to be determined in accordance with the Contractor's Quality Plan and Associated Method Statements

APPENDIX 30/12: SPECIAL ECOLOGICAL MEASURES

Sub-Clause

3012.1 Special Ecological Measures, as contained in the Employer's Requirements, shall be maintained during the Period of Establishment Maintenance following completion.

3012.2 Special Ecological Measures Works shall be carried out in seasons to be agreed with Statutory Consultees and the Engineer.

Tunnels, Fencing and Underpasses for Wildlife

3012.4 In respect of Wildlife grilles the contractor shall consult and comply with all Statutory Consultees.

Other Habitat Creation Measures

3012.11 Other habitat creation measures are to be determined by the Contractor or as advised by the Statutory Consultees.

3012.12 Advice shall be sought from Statutory Consultees in respect of known locations of protected species or their habitats.

Breeding Birds

Nesting birds occur throughout the scheme where suitable habitat exists, suitable vegetation will be removed prior to the construction period, however, where any additional vegetation has to be cleared, nesting birds may occur.

Vegetation and tree removal must be avoided and minimised where possible. Additionally where possible habitat clearance work should be undertaken between September and February to avoid the main breeding season. This will substantially mitigate against the potential damage and destruction of active nests and the removal of vegetation providing shelter, protection and foraging habitat for breeding birds and their young.

If clearance work has to be undertaken during the breeding season, an ornithologist (who must be knowledgeable of bird nesting behaviour and experienced at nest finding) must check for active nests, to ensure that these are not destroyed or disturbed, and to advise accordingly.

Active nests will need to be left undisturbed until the nesting attempt is complete. This approach will only partially mitigate for potential disturbance, damage or destruction of nests, and removal of foraging or protective cover habitat for breeding birds and fledglings. However, this approach is often unsuccessful because it results in an increased risk of predation or nest desertion due to excessive disturbance and loss of surrounding habitat and could therefore be viewed as a breach of wildlife legislation.

Bats

Bats are known to forage within habitats present within the schemes footprint; additionally there are a number of trees present, which have the potential to support roosting / hibernating bats. No trees shall be felled without having the trees inspected by a suitably qualified ecologist.

A licence from SNH will be required for works that are likely to destroy / disturb bat roosts.

Advice shall be sought from Statutory Consultees in respect of known locations of protected species or their habitats.

APPENDIX 30/12: SPECIAL ECOLOGICAL MEASURES (Continued)

3012.13 Licence requirements for work in the vicinity of protected species shall be determined by the Contractor, in consultation with the relevant Statutory Consultees.