



# **M8 M73 M74 MOTORWAY IMPROVEMENTS**

**DBFO AGREEMENT**

**Schedule 2 - New Works Requirements**

**Part 4: Specification**

TS/MTRIPS/WKS/2011/04



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## **SCHEDULE 2 - NEW WORKS REQUIREMENTS**

### **PART 4: SPECIFICATION**

#### **CONTENTS**

PART 1:	GENERAL REQUIREMENTS
PART 2:	SPECIFIC REQUIREMENTS
PART 3:	SPECIFIC REQUIREMENTS TRAFFIC SCOTLAND EQUIPMENT
<b>PART 4:</b>	<b>SPECIFICATION</b>
PART 5:	CERTIFICATION
PART 6:	REPORTS, INFORMATION AND RECORDS
PART 7:	THIRD PARTIES
PART 8:	LIAISON PROCEDURES

## SCHEDULE 2 - NEW WORKS REQUIREMENTS

### PART 4: SPECIFICATION

<b>CONTENTS</b>	<b>Page Number</b>
Preamble to the Specification .....	6
Appendix 0/1: List of Additional Clauses, Tables and Figures.....	14
Appendix 0/2: Minor Alterations to Existing Clauses .....	68
Appendix 0/3: List of Numbered Appendices Referred to in the the Specification and Included in This Agreement.....	80
Appendix 0/4: List of Drawings for the New Works.....	88
Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers	196
Appendix 1/2: Vehicles for the Overseeing Organisation.....	226
Appendix 1/3: Communication Systems for the Overseeing Organisation .....	229
Appendix 1/5: Testing to be Carried out by the Company .....	230
Appendix 1/6: Supply and Delivery of Samples to the Scottish Ministers.....	272
Appendix 1/7: Site Extent and Limitations of Use .....	273
Appendix 1/8: Operatives for the Scottish Ministers .....	274
Appendix 1/9: Noise and Vibration Control Applicable to the New Works Site .....	275
Appendix 1/12: Setting Out and Existing Ground Levels .....	280
Appendix 1/13: Programme of Works .....	281
Appendix 1/15: Accommodation Works.....	284
Appendix 1/16: Indicative Schedule of Diversionary Works.....	317
Appendix 1/17: Traffic Safety and Management.....	499
Appendix 1/18: Temporary Diversions for Traffic .....	515
Appendix 1/19: Routeing of Vehicles .....	522
Appendix 1.20: Recovery Vehicles for Breakdowns .....	525
Appendix 1/21: Information Boards .....	536
Appendix 1/22: Progress Photographs .....	537
Appendix 1/23: Substances Hazardous to Health .....	541
Appendix 1/24: Quality Management System .....	542
Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) .....	543
Appendix 1/27: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements .....	548
Appendix 2/1: List of Buildings, etc., to be Demolished .....	550
Appendix 2/4: Explosives and Blasting .....	551
Appendix 2/5: Hazardous Materials.....	552

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<b>Appendix 4/2:</b>	<b>Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002 .....</b>	<b>553</b>
<b>Appendix 6/10:</b>	<b>Ground Anchorages, Crib Walling and Gabions .....</b>	<b>562</b>
<b>Appendix 6/11:</b>	<b>Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings .....</b>	<b>570</b>
<b>Appendix 12/1:</b>	<b>Traffic Signs - General .....</b>	<b>583</b>
<b>Appendix 12/2:</b>	<b>Traffic Signs - Marker Posts .....</b>	<b>584</b>
<b>Appendix 12/3:</b>	<b>Traffic Signs - Road Markings and Studs .....</b>	<b>585</b>
<b>Appendix 12/5:</b>	<b>Traffic Signs - Traffic Signals .....</b>	<b>587</b>
<b>Appendix 30/1:</b>	<b>Landscaping General .....</b>	<b>600</b>
<b>Appendix 30/2:</b>	<b>Weed Control .....</b>	<b>602</b>
<b>Appendix 30/3:</b>	<b>Control of Rabbits and Deer .....</b>	<b>605</b>
<b>Appendix 30/4:</b>	<b>Ground Preparation.....</b>	<b>606</b>
<b>Appendix 30/5:</b>	<b>Grass Seeding, Wildflower Seeding and Turfing .....</b>	<b>607</b>
<b>Appendix 30/6:</b>	<b>Planting .....</b>	<b>610</b>
<b>Appendix 30/7:</b>	<b>Grass, Bulbs and Wildflower Maintenance.....</b>	<b>616</b>
<b>Appendix 30/8:</b>	<b>Watering.....</b>	<b>619</b>
<b>Appendix 30/9:</b>	<b>Establishment Maintenance for Planting.....</b>	<b>620</b>
<b>Appendix 30/10:</b>	<b>Maintenance of Established Trees and Shrubs.....</b>	<b>621</b>
<b>Appendix 30/11:</b>	<b>Management of Waterbodies.....</b>	<b>623</b>
<b>Appendix 30/12:</b>	<b>Special Ecological Measures.....</b>	<b>624</b>

## 1 Preamble to the Specification

- 1.1 The Specification for the New Works shall be the Specification for Highway Works, published by The Stationery Office as Volume 1 of the MCHW current on the Reference Date, as modified and extended by the following:
- a) Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to the Agreement;
  - b) Appendix 0/2: Agreement-Specific Minor Alterations to Existing Clauses, Tables and Figures included in the Agreement;
  - c) The Numbered Appendices listed in Appendix 0/3; and
  - d) Appendix 0/5: Special national alterations of the Scottish Ministers of Scotland, Wales or Northern Ireland.
- 1.2 Appendix 0/4 contains a list of the Drawings.
- 1.3 The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates, contained in this Preamble to the Specification.
- 1.4 An Additional Clause, as indicated by a suffix 'A' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. An Additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is a Agreement-specific alteration.
- 1.5 A Substitute Clause, as indicated by a suffix 'S' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. A Substitute Clause as indicated by a suffix 'SR' in Appendix 0/1 is a Agreement-specific alteration.
- 1.6 A Cancelled Clause, as indicated by a suffix 'C' in Appendix 0/5 is an alteration originating from the Overseeing Organisation of Scotland, Wales or Northern Ireland. A Cancelled Clause indicated by a suffix 'CR' in Appendix 0/1 is a Agreement-specific alteration.
- 1.7 Insofar as any of the Numbered Appendices may conflict or be inconsistent with any provision in 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.
- 1.8 Any reference in this Part A2 to a Specification 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.
- 1.9 Where a Clause is altered any original Table / Figure referred to in the Clause shall apply unless the Table / Figure is also altered. Where a Table / Figure is altered any reference in a Clause to the original Table / Figure shall apply to the altered Table / Figure.
- 1.10 Where a Clause in the Specification relates to work, goods or materials which are not required for the New Works it shall be deemed not to apply.
- 1.11 Any Appendix referred to in the Specification which is not used shall be deemed not to apply.
- 1.12 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.

- 1.13 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.
- 1.14 The substitute National Clauses are located at the end of the relevant Series together with the additional National Clauses of the Overseeing Organisation.
- 1.15 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 Scottish Ministers.
- 1.16 Where the Specification requires the provision of documentation to the Overseeing Organisation for statutory or type approval such documentation shall be provided to the Scottish Ministers.
- 1.17 The Specification is used in conjunction with this Agreement and, the delegation of the roles and functions of the Overseeing Organisation as stated in Section 1.12 above shall be amended as follows:
- (a) If any agreement, consent or approval required to be obtained from the Overseeing Organisation impacts on the health and safety of the general public, the environment or any property or equipment not owned or operated by the Company or the New Works Contractor, such agreement, consent, or approval shall be obtained from the Scottish Ministers.
  - (b) 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 Clause 1.15 above shall exercise such decisions in accordance with the New Works Requirements stated in this Agreement.
- 1.18 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.
- 1.19 The first double digit refers to the month, and the second double digit refers to the year.
- 1.20 The following interpretations shall be applied to words or terms used in documents referred to in this Part 4:
- (a) except where the context requires otherwise, "Engineer" shall be deemed to be a reference to the "Designer" where such an interpretation is necessary for the Company to fulfil its obligations in regard to the Design.
  - (b) where a Numbered Appendix is referred to it shall mean a reference to the Numbered Appendix included in this Part 4
  - (c) all references to the "Site" shall be deemed to be references to lands and other places on, under, in, or through which the New Works shall be constructed; and
  - (d) any reference to a "British Standard" shall permit the use of an equivalent European standard.

**Schedule of Pages and Relevant Publication Dates of Specification for Highway Works**

<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
000	1	March 1998
000	3F	May 2005
000	2	November 2006
100	2	May 2001
100	W1F	May 2005
100	12 to 14, 20F	November 2005
100	1, 3 to 7, N1, N3	May 2006
100	8 to 11, 15 to 19, N2, N4	November 2006
100	N5, N6F	November 2008
200	1, 3F	May 2001
200	2	May 2004
300	1	May 2001
300	4	November 2002
300	2, 3, 5, 6F	May 2008
400	1 to 6, 8, 10 to 13F	November 2007
400	7, 9	November 2008
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



<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
<b>600</b>	33	November 2003
<b>600</b>	2, 27 to 28, 30 to 32, 34 to 36, N1	November 2005
<b>600</b>	25 to 26	November 2006
<b>600</b>	42 to 49, 51 to 68F	November 2007
<b>600</b>	37, 50	November 2008
<b>600</b>	1, 3 to 24, 29, 38 to 41, S1 to S3F, N2 to N4F	November 2009
<b>700</b>	2 to 3, 5 to 6, N1, N3 to N5F	November 2006
<b>700</b>	33 to 34F	November 2007
<b>700</b>	4, N2	August 2008
<b>700</b>	1, 7 to 32F	November 2009
<b>800</b>	1 to 25F	November 2009
<b>900</b>	2 to 5, 9 to 22, 24 to 26, 28 to 67F	August 2008
<b>900</b>	1, 6 to 8, S1F	November 2008
<b>900</b>	23, 27	May 2009
<b>1000</b>	3, 5 to 6	November 2005
<b>1000</b>	1 to 2, 4, 7 to 15, 19 to 33F	May 2006
<b>1000</b>	16 to 18	November 2006
<b>1100</b>	1, 4F	November 2004
<b>1100</b>	2, N1F	November 2006
<b>1100</b>	3	August 2008
<b>1200</b>	5	May 2001
<b>1200</b>	2 to 3, W1F	August 2003
<b>1200</b>	1, 14 to 16F	May 2004

<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
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, N1	May 2006
1400	2, N1F	May 2001
1400	1, 3 to 9F	May 2006
1500	7	May 2001
1500	2	February 2003
1500	3 to 4, 8 to 11, 13	November 2004
1500	1, 5 to 6, 12, 14 to 17F	November 2006
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	2 to 7, 10 to 15	May 2004
1700	8 to 9	May 2005
1700	1, 16 to 22F	May 2006
1800	1, 4, 6, 8 to 9	May 2004
1800	2 to 3, 5, 7, 10 to 12F	November 2005

<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
1900	17	May 2003
1900	1, 5, 8 to 14, 16, 18 to 30F, S1 to S2F	May 2005
1900	6, 7,15	May 2008
1900	2 to 4	November 2008
2000	1, 3 to 4F	May 2001
2000	2	November 2004
2100	1, 4F	March 1998
2100	2	November 2003
2100	3	November 2005
2300	1	March 1998
2300	2 to 3F	May 2001
2400	1, 4, 7F	May 2005
2400	2	May 2006
2400	3, 5 to 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

<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
<b>2600</b>	6	May 2005
<b>2600</b>	7F	November 2006
<b>3000</b>	1, 4 to 7, 10, 12 to 17, 19, 22 to 27F	May 2001
<b>3000</b>	20	November 2004
<b>3000</b>	2 to 3	May 2006
<b>3000</b>	8 to 9, 11, 18, 21	May 2008
<b>5000</b>	1, 4 to 19F, S1F	May 2005
<b>5000</b>	2 to 3	November 2008
<b>Appendix A</b>	1 to 32F	May 2008
<b>Appendix B</b>	1	May 2006
<b>Appendix B</b>	2 to 7F	November 2006
<b>Appendix C</b>	1	May 2005
<b>Appendix C</b>	2F	November 2006
<b># Appendix D</b>	1F	May 2005
<b>Appendix D(NI)</b>	N1F	March 1998
<b># Appendix E</b>	1F	May 2005
<b>Appendix E(NI)</b>	N1F	May 2005
<b>Appendix F</b>	14	November 2008
<b>Appendix F</b>	1 to 13, 15 to 56F	May 2009
<b>Appendix G</b>	1F	May 2004
<b>Appendix H</b>	1	May 2004

<b>Series/Appendix</b>	<b>Page Number</b>	<b>Publication Date</b>
Appendix H	2	November 2005
Appendix H	3	November 2006
Appendix H	4 to 9F	November 2008

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**List of Additional Clauses, Tables and Figures**

<b>Clause Number</b>	<b>Title</b>	<b>Written on Page Number following</b>
270AR	Tree Felling	
271AR	Existing Vegetation	
370AR	Rabbit, Hare, Deer and Otter Fence Specifications	
971 AR	Stone Mastic Asphalt Surface Course	
973 AR	Overband Sealing	
976AR	Pavement Cores	
1270AR	Electroluminescent Signs for Traffic and Gantry Signs	
1271AR	Solar Powered Units	
1272AR	Chart Node and Section Markers	
1273AR	Night Visibility	
1470AR	Special Tools	
1670AR	Static Load Testing of Piles	
1671AR	Clause Deleted	
1672AR	Drilling Fluid	
1673AR	Clause Deleted	
1674AR	Geotechnical Reporting	
1675AR	Geotechnical Categorisation	
1770AR	Construction Tolerances in Structural Concrete	

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

<b>Clause Number</b>	<b>Title</b>	<b>Written on Page Number following</b>
<b>1771AR</b>	Reinforcement Couplers	
<b>1772AR</b>	Concrete Repairs – General Requirements	
<b>1773AR</b>	Removal of Concrete in Areas to be Repaired	
<b>1774AR</b>	Surface Preparation	
<b>1775AR</b>	Concrete Repairs	
<b>1776AR</b>	Foamed Concrete Fill to Structures and Backfilling to Drainage Trenches	
<b>1777AR</b>	Installation of Resin Anchored Reinforcement	
<b>1778AR</b>	Early Thermal Cracking	
<b>2170AR</b>	Permanent Works Bolts	
<b>2171AR</b>	Bearing Replacement	
<b>2670AR</b>	Anti-Graffiti Coatings	
<b>3270AR</b>	Incident Response	

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**List of Substitute Clauses, Tables and Figures**

<b>Clause Number, etc</b>	<b>Title</b>	<b>Page Number</b>
<b>1801SR</b>	Structural Steelwork - General	
<b>1802SR</b>	Amendments to BS EN 1090-2:2008	
<b>1803SR</b>	Amendments to Steel Bridge Group Model Project Specification	
<b>2101SR</b>	Bridge Bearings - General	

**List of Cancelled Clauses, Tables and Figures**

<b>Clause Number, etc.</b>	<b>Title</b>	<b>Page Number</b>
<b>1501 to 1534 Inclusive</b>	Motorway Communications	



*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**Additional Clauses, Tables and Figures**

Clause Number	Title and Written Text
270AR	<p><b>1 Tree Felling</b></p> <p>1.1 Works shall be carried out in accordance with:</p> <p>(a) BS 5837: 2005 Trees in Relation to Construction. Recommendations;</p> <p>(b) BS 3998: 1989 <i>Recommendations for Tree Work</i>; and</p> <p>(c) BS 4428: 1989 Code of Practice for General Landscape Operations (excluding hard surfaces).</p> <p><b>1.2 Marking of Trees to be Removed</b></p> <p>1.2.1 The Company shall set out the New 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 Overseeing Organisation.</p> <p><b>1.3 Fencing</b></p> <p>1.3.1 Trees, bushes and undergrowth to be preserved shall be fenced off with type CW 120 cleft chestnut pale fencing complying with BS 1722, Part 4 1986, placed in accordance with BS 5837: 2005, and shall be maintained in effective condition until the New Works have been fully completed. Fences shall be erected before the New Works commence.</p> <p><b>1.4 Precautions</b></p> <p>1.4.1 Before commencing felling operations warning notices and arrangements shall be made by the Company to prevent public gaining access to the danger zone.</p> <p>1.4.2 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 New Works Site.</p> <p>1.4.3 Where felling takes place close to Site Roads the Company shall notify the relevant roads authority and the police. The Company shall comply with the Code of Practice for Safety at Street and Road Works in respect of warning signs, direction notices and traffic control.</p> <p>1.4.4 If there is a likelihood of contact with overhead telephone lines, these lines should be disconnected during the New Works by British Telecom.</p> <p>1.4.5 Where work is to be carried out within 9 metres of electricity lines suspended from wooden poles or 15 metres of lines suspended from steel towers advice from the Scottish Power Area Manager shall be sought.</p> <p>1.4.6 Position and depth of all pipes, cables and underground Structures shall be verified. The method of work shall take into account such items.</p> <p>1.4.7 Voids left after the removal of stumps and roots shall be filled with suitable</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	material and compacted in compliance with Clause 612 of the Specification.
1.4.8	Damage to trees, tree saplings, shrubs or hedges during felling shall be made good as described in BS 3998: 1989 Tree Work, paragraph 7.
1.4.9	Any bat roosts identified by the Company shall immediately be reported to the Overseeing Organisation and ecological clerk of works and no works shall be carried out on any tree in which bat roosts are located without further written instructions from the Overseeing Organisation.
1.4.10	No trees identified during the ecological surveys as containing confirmed bat roosts or having the potential for bat roosting shall be felled after 31 October unless authorised by the Scottish Government. No trees containing confirmed bat roosts shall be felled without the necessary licences having been obtained from the Scottish Government. Any licences required from the Scottish Government shall be arranged by the Overseeing Organisation once the species of bat and population size has been confirmed by a licensed bat worker.
1.4.11	The Company shall notify the Overseeing Organisation and ecological clerk of works not less than 7 days in advance of felling any trees as containing confirmed bat roosts or having the potential for bat roosting.
1.4.12	The Company 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 worker. 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 worker.
1.4.13	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 worker, 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.
1.4.14	Should any bats be found to be present in trees during felling the Company shall cease felling works in the area and immediately contact Scottish Natural Heritage (“ <b>SNH</b> ”), the licensed bat worker and the Overseeing Organisation and seek their instructions. No further works shall be undertaken on trees containing roosting bats without permission from SNH.
1.5	<b>Weather Conditions for Tree Work</b>
1.5.1	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.
1.6	<b>Grubbing up Stumps and Filling Voids</b>
1.6.1	All stumps and tree roots shall be grubbed up provided this does not damage trees which are being retained. If a stump cannot be removed it

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	shall be cut at least 300 millimetres below ground level, the hole shall be filled with soil, compacted, levelled and seeded. Refer to 270AR(1.10).
1.7	<b>Chipping of Wood and Bark</b>
1.7.1	Small timber, twigs, bark and roots not infected by honey fungus may be chipped and left on the Site to compost at agreed locations and shall be turned over at specified intervals. The Company shall remove surplus timber from the New Works Site, unless 270AR(1.10) applies.
1.8	<b>Preliminary Tree Work - BS 3998: 1989</b>
1.8.1	The Company 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.
1.8.2	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.
1.8.3	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: 1989: Page 4; 13 and Figure 1). The outline of pruned trees shall be fair and symmetrical.
1.8.4	Sealing of the cut surface with a proprietary preparation shall be carried out when there is a high risk of fungal or bacterial infection. Table 1 of Appendix C of BS 3998 lists suitable formulations which may be used. 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.
1.8.5	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.
1.8.6	In crown lifting lower branches shall be removed to a given height above ground level in a manner described.
1.8.7	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.
1.8.8	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.
1.9	<b>Timber - Stacking</b>
1.9.1	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

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>prevent the movement or slippage of timber.</p> <p>1.10 <b>Existing Woodland</b></p> <p>1.10.1 The timber from native species to be felled within or adjacent to, existing woodland shall be left within the woodland for habitat enhancement, to the approval of SNH. Stumps within woodland are not to be ground down or removed.</p>
271AR	<p><b>1. Existing Vegetation to be Protected</b></p> <p>1.1 Protection of existing vegetation which is to be retained shall be in accordance with BS 5837: 2005 and as follows:</p> <ul style="list-style-type: none"> <li>a) The Company 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 Company shall reinstate and make good such damage or loss all with the acknowledgement in writing of the Overseeing Organisation.</li> <li>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 Overseeing Organisation. The proposed extent of Site clearance works shall be submitted to the Scottish Ministers prior to the New Works starting on the New Works Site.</li> <li>c) 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 2005 shall be erected prior to commencement of the New 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.</li> <li>d) Should any tree or shrub be mistakenly uprooted, destroyed, or in the opinion of the Overseeing Organisation, be damaged beyond reasonable chance of survival in its original shape due to the Company's negligence, then the Company shall provide and plant suitable replacement trees or shrubs of a similar type and age. If such replacement trees or shrubs are not obtainable, alternative trees or shrubs, acknowledged in writing by the Overseeing Organisation, shall be provided and planted. The Company'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.</li> </ul> <p><b>2 Existing Vegetation to be Retained</b></p> <p>2.1 Existing trees within the New Works Site that are not removed as part of Site clearance and are to be protected shall be inspected by a qualified tree surgeon and shall have dead, dying or broken branches pruned back to live wood.</p> <p>2.2 Dead trees shall be felled and uprooted as required in order to complete the</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>New Works, alternatively timber and tree stumps, occurring in areas to be planted may be left in situ to re-grow or provide wildlife habitat, providing the timber is not diseased and with the acknowledgement in writing of the Overseeing Organisation.</p> <p>2.3 Pruning, shaping, trimming of existing trees shrubs and hedges, and sealing of newly cut surfaces shrubs and hedges shall be carried out in accordance with BS 3998: 1989.</p> <p>2.4 Existing shrubs shall be cut back or pruned as necessary. The outline of pruned shrubs or groups of shrubs shall be natural. Overgrown hedges shall be cut to shape. Exposed roots shall be cut back to clean wood and covered by soil.</p>
<p><b>370AR</b></p>	<p><b>1 Rabbit, Hare, Deer and Otter Fence Specifications</b></p> <p>1.1 The extent of fencing for protected fauna shall meet the requirements of SNH. The Company shall consult and comply with SNH in this respect.</p> <p><b>1.2 Rabbits and Hares</b></p> <p>1.2.1 Fences to protect planting areas from rabbits and hares shall be in accordance with the following specification:</p> <p>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 six staples per post.</p> <p><b>1.3 Deer</b></p> <p>1.3.1 Fences to protect planting areas from deer shall be in accordance with the following specification:</p> <p>a) 1.80 metres high timber post and 4 wire deer fence with rectangular wire mesh.</p> <p>b) Fence shall be constructed to the details on HCD Drawing H12 and BS1722 Parts 2 &amp; 3 with the following additions and amendments:-</p> <p>i) Top rectangular wire mesh to be type C/6/90/30.</p> <p>ii) Bottom rectangular wire mesh to be type C/8/80/15.</p> <p>iii) Timber posts and struts are to be for a 1.8 metres high fence</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>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.</p> <p>iv) Intermediate posts are to be set or driven into the ground to a depth of 0.6 metres. Straining posts shall be set into the ground to a depth of 1.0 metre.</p> <p>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.</p> <p>vi) 4 line wires complying with the requirements of Clause 2.1 BS1722 Part 2, 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 Part 2.</p> <p>vii) Intermediate posts are to be provided at intervals not exceeding 2.75 metres.</p> <p>viii) Existing ground must be trimmed to maintain the 50 millimetres distance between the ground and the bottom of the fence.</p> <p><b>1.4 Otters</b></p> <p>1.4.1 Fences shall be in accordance with the following specification:</p> <p>a) Post and mesh fences in accordance with British Standard BS 1722: Part 2 Specification for rectangular wire mesh and hexagonal wire netting fences with a wire mesh having maximum openings of 50 millimetres square, wires in accordance with British Standard BS 4102: Specification for steel wire products for fences, galvanised in accordance with British Standard BS 443: 1982 Specification for testing wire coatings on steel wire and for quality requirements with wires of not less than 3 millimetres in diameter, a height above ground level of 1.50 metres (which includes a 300 millimetre 45 degree outward splay at the top of the fence), a depth below ground of 300 millimetres, with a further 300 millimetre lap laid horizontally out from the fence and a single strand of galvanised wire of not less than 4 millimetres in diameter securely fixed to the wire mesh at ground level; (refer to CIRIA C646 – Wildlife Fencing Design Guide 2006); and</p> <p>b) Bridges and culverts designed to carry water shall incorporate a ledge or platform as specified in Section 2 of Schedule 2..</p>
971 AR	<p><b>1 Stone Mastic Asphalt Surface Course</b></p> <p>1.1 <b>General</b></p> <p>1.1.1 Stone mastic asphalt shall comply with the general requirements of BS EN 13108 Bituminous mixtures: Material specifications and MCHW Series 700 and 900 and the specific requirements of sub-Clauses 2 to 39 of this Clause.</p> <p>1.1.2 Stone mastic asphalt shall be produced in plants that shall be registered to</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text								
	<p>the BS EN ISO 9001 'Sector Scheme for the Production of Asphalt Mixes', described in Appendix A.</p> <p>1.1.3 The Design for stone mastic asphalt to Clause 970AR shall be to the general requirements of Clause 942 and shall specifically comply with the requirements for wheel tracking and sensitivity to water.</p> <p>1.1.4 The Company shall declare target aggregate gradings and binder contents prior to commencement of the Operations.</p> <p>1.1.5 The nominal installation depths shall be classified into three categories as given in the table below:</p> <table border="1" data-bbox="448 741 1437 887"> <thead> <tr> <th>Type</th> <th>Type A</th> <th>Type B</th> <th>Type C</th> </tr> </thead> <tbody> <tr> <td>Nominal installation depth (millimeter)</td> <td>&lt;18</td> <td>18 to 25</td> <td>&gt;25</td> </tr> </tbody> </table> <p>1.2 <b>Aggregates</b></p> <p>1.2.1 Coarse aggregate shall be crushed rock or crushed slag complying with Clause 901.</p> <p>1.2.2 The shape of the coarse aggregate shall comply with a maximum flakiness index of Category FI25 as defined in BS EN 13043:2002 Aggregates for Bituminous Mixtures and Surface Treatments for Roads, Airfields and Other Trafficked Areas, clause 4.1.6.</p> <p>1.2.3 Fine aggregate shall comply with Clause 901 and shall comprise crushed fine aggregate derived from, rock, slag or gravel, which may be blended with not more than 50% of natural sand.</p> <p>1.2.4 The resistance to polishing of the coarse aggregate shall have a minimum declared PSV category specified in Appendix 7/1 in accordance with BS EN 13043:2002 Aggregates for Bituminous Mixtures and Surface Treatments for Roads, Airfields and Other Trafficked Areas, clause 4.2.3.</p> <p>1.2.5 The resistance to abrasion of coarse aggregate shall have a maximum AAV specified in Appendix 7/1 in accordance with BS EN 13043:2002 Aggregates for Bituminous Mixtures and Surface Treatments for Roads, Airfields and Other Trafficked Areas, clause 4.2.</p> <p>1.3 <b>Filler</b></p> <p>1.3.1 Added filler aggregate shall be hydrated lime, crushed limestone or Portland Cement, in accordance with the requirements of BS EN 13108-4, Bituminous mixtures: Material specifications , Part 4: Hot Rolled Asphalt and shall be not less than 2% by mass of total aggregate.</p> <p>1.4 <b>Binder</b></p> <p>1.4.1 Bitumen shall comply with BS EN 12591:2000 Bitumen and Bituminous Binders: Specifications for Paving Grade Bitumens or BS 3690-3:1990 Bitumens for Building and Civil Engineering: Specification for Mixtures of Bitumen with Pitch, Tar and Trinidad Lake Asphalt, and shall be produced in plants that shall be registered to BS EN ISO 9001 'Sector Scheme for the</p>	Type	Type A	Type B	Type C	Nominal installation depth (millimeter)	<18	18 to 25	>25
Type	Type A	Type B	Type C						
Nominal installation depth (millimeter)	<18	18 to 25	>25						

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	Supply of Paving Grade Binders', described in Appendix A.
1.4.2	The said binder shall not be harder than penetration reference 50 (paving grade 40/60).
1.4.3	If the deformation resistance requirement in sub-Clause 18 of this Clause shall not be required, then the binder penetration reference shall be as specified in Appendix 7/1.
1.5	<b>Binder Modifiers</b>
1.5.1	Binder modifiers pre-blended with bitumen or binder modifiers, including but not limited to natural or man-made fibres, which shall be added or blended with base bitumen complying with BS EN 12591:2000 Bitumen and Bituminous Binders: Specifications for Paving Grade Bitumens of the stated penetration range at the mixing plant shall have a British Board of Agrément HAPAS Roads and Bridges Certificate.
1.5.2	In the event that no such certificates have been issued, binder modifiers, pre-blended modified binders or additives shall not be used without the prior written approval of the Overseeing Organisation.
1.5.3	In the event that no British Board of Agrément HAPAS Roads and Bridges Certificates have been issued, the Company shall provide with its Design a data sheet giving details of the properties of the modified binders or additives proposed including those referred to in Appendix 7/1.
1.5.4	The Company shall provide the rheological product identification data for pre-blended modified binders in accordance with Clause 956 and cohesion in accordance with Clause 957
1.6	<b>Mixture</b>
1.6.1	The binder drainage of the loose mixture at the target composition at a temperature of 175°C in accordance with BS 594987:2010 shall not be more than 0.3% by total mass of mixture.
1.6.2	The agreed binder content for the mixture shall be the target binder content $\pm 0.6\%$ .
1.7	<b>Job Mixture Approval</b>
1.7.1	Details of the proposed mixture Design from each asphalt mixing plant shall be submitted to the Overseeing Organisation.
1.7.2	<p>The information may be obtained from either a job mixture trial or from the use of the mixture on a previous contract carried out in accordance with this Clause, and shall include all the following particulars:</p> <ul style="list-style-type: none"> <li>i) bitumen penetration reference;</li> <li>ii) quantities of binder and aggregate;</li> <li>iii) aggregate source and grading;</li> <li>iv) proprietary name and generic type of binder modifier;</li> <li>v) quantity of any binder modifier, including natural or man-made fibres added at the mixer; and</li> </ul>



Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	vi) modified binder and mixture data requirements specified in Appendix 7/1.
1.7.3	If a modified binder including but not limited to any proportion of the modifier shall not be fully recovered on analysis for determination of binder content details of alterations to the test method or the correction necessary to the results together with supporting data shall be submitted to the Overseeing organisation with the proposed mixture Design for prior written consent by the Scottish Ministers to implement them.
1.7.4	<p>The mixture shall be approved in writing by the Overseeing Organisation as the job standard mixture provided that:</p> <ul style="list-style-type: none"> <li>i) the mixture Design proposed complies with sub-Clauses 1 and 3 of this Clause;</li> <li>ii) information has been submitted in accordance with sub-Clauses 9 and 10 of this Clause;</li> <li>iii) information submitted in accordance with sub-Clause 16 of this Clause has been approved in writing by the Overseeing Organisation.</li> </ul>
1.7.5	If the mix Design or constituent materials of a job standard mixture shall be changed by the Company, details of the revised mixture shall be submitted for written approval in accordance with sub-Clause 17 of this Clause.
1.7.6	Job mixture trials may be carried out on or off the O&M Works Site, however material laid for a job mixture trial on the O&M Works Site which complies with this Specification may form part of the binder/regulating course in the permanent works.
1.7.7	If carried out off site, trials may be arranged independently or in conjunction with other works.
1.8	<b>Mixing</b>
1.8.1	Unless otherwise specified by the supplier of the modified binder, stone mastic asphalt shall be mixed at a temperature in accordance with the requirements of BS EN 13108 Bituminous mixtures: Material specifications & PD 6691, for the penetration reference of the bitumen.
1.8.2	This shall be done in such manner that a homogeneous mixture of aggregate, filler, bitumen and additive results.
1.8.3	At the time of mixing, the coarse aggregate shall be in a surface dry condition.
1.9	<b>Transportation</b>
1.9.1	The transportation of stone mastic asphalt shall be in accordance with sub-Clause 901.3.
1.10	<b>Permanent Works</b>
1.10.1	When specified in Appendix 7/1, sampling and testing shall be carried out to establish compliance of material laid in the permanent works.

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.11      <b>Sampling from the Laid Material</b></p> <p>1.11.1     Samples of uncompacted material shall be taken from the paver as near to where the cores shall be taken as shall be practicable, in accordance with BS EN 12697 Bituminous mixtures: Test methods for hot mix asphalt, Part 27: Sampling.</p> <p>1.11.2     Six 200 millimetre diameter cores shall be cut, where practical from the centre of the Lane out of material from each mixing plant:</p> <p style="padding-left: 40px;">i)        from material laid specially in a job mixture approval trial;</p> <p style="padding-left: 40px;">ii)       from the first 1 kilometre length of stone mastic asphalt from a mixing plant laid in the permanent works; or</p> <p style="padding-left: 40px;">iii)      within 3 days of laying stone mastic asphalt from a mixing plant in the permanent works, where less than 1 kilometre length has been laid whichever occurs first.</p> <p>1.11.3     The 200 millimetre diameter cores shall be cut within 3 days of laying the material unless they have been cut under the requirements of sub-Clause 35 of this Clause.</p> <p>1.11.4     The cores shall be transported as soon as possible to the laboratory.</p> <p>1.11.5     If the storage period shall be less than 4 days, the storage temperature shall be within the range 0°C to 25°C.</p> <p>1.11.6     For storage beyond 4 days, the temperature shall be within the range 0°C to 5°C. Cores shall be stored on a flat face on a horizontal surface, and shall not be stacked.</p> <p>1.11.7     Site storage of cores where unavoidable and conditions of transportation shall be as close as shall be practicable to the laboratory conditions.</p> <p>1.11.8     The storage temperature and times, including whilst cores are on the O&amp;M Works Site shall be recorded.</p> <p>1.11.9     Three pairs of 150 millimetre diameter cores shall be cut at the same chainages as the 200 millimetre diameter core.</p> <p>1.11.10    One core of each pair shall be taken from the centre of the lane adjacent to the 200 millimetre diameter core and one whose centre shall be between 500 millimetre and 1000 millimetre from the edge of the mat.</p> <p>1.11.11    Cores shall be taken after the stone mastic asphalt has cooled to ambient temperature and not less than 12 hours after laying and before trafficking unless otherwise specified in Appendix 7/1.</p> <p>1.11.12    The walls and base of all holes from which core samples shall have been cut shall be painted with hot bitumen or cold applied polymer modified intermediate or premium grade bitumen emulsion containing normally 60% binder immediately prior to making good.</p> <p>1.11.13    Core holes shall be backfilled with materials compacted to refusal with a circular headed vibrating hammer in layers not exceeding 75 millimetre thick.</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
1.11.14	Hot base material shall be similar to existing pavement.
1.11.15	In the permanent works, after the first 6 cores and where the required thickness of the material exceeds 25 millimetre for material from each mixing plant not less than one pair of 200 millimetre m diameter cores shall be cut from the centre of the Lane every 1 Lane kilometre laid a day's production if less than 1 Lane kilometre shall have been laid.
1.12	<b>Tests and Calculations</b>
1.12.1	For each uncompacted sample the compositional analysis shall be carried out in accordance with BS EN 12697 Bituminous mixtures: Test methods for hot mix asphalt, Part 1: Soluble binder content & Part 2: Determination of particle size distribution corrected by any correction factor approved under sub-Clause 16 of this Clause.
1.12.2	Each six consecutive 200 millimetre diameter cores of material from the same mixing plant shall form a set of cores on a running basis.
1.12.3	For each set the wheeltracking rate and rut depth shall be determined in accordance with the procedure in BS 598-110:1998 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Methods of Test For the Determination of Wheel-tracking Rate and Depth, at the test temperature specified in Appendix 7/1.
1.12.4	For each 150 millimetre diameter core the bulk density shall be determined in accordance with the procedure in BS EN 12697 Bituminous mixtures: Test methods for hot mix asphalt, Part 6: Determination of bulk density of bituminous specimens.
1.12.5	The bulk density at a chainage shall be the mean from the two cores taken at a chainage.
1.12.6	Subsequent to determining the bulk density, the maximum density shall be determined from the pair of the cores in accordance with BS EN 12697-5:2002 Bituminous Mixtures: Test Methods for Hot Mix Asphalt: Determination of the Maximum Density.
1.12.7	<p>The air void content of each pair of 150 millimetre diameter cores shall be calculated to <math>\pm 0.1\%</math> as follows: <math>100\% \times</math> )</p> $\text{Air voids content} = (1 - \rho / \rho_{\text{Max}}) \times 100 \%$ <p>where: <math>\rho</math> shall be the bulk density in accordance with BS EN 12697 Bituminous mixtures: Test methods for hot mix asphalt, Part 6: Determination of bulk density of bituminous specimens (Mg/m<sup>3</sup>); and <math>\rho_{\text{Max}}</math> shall be the maximum density in accordance with BS EN 12697-5: Bituminous Mixtures: Test Methods for Hot Mix Asphalt: Determination of the Maximum Density (Mg/m<sup>3</sup>).</p>
1.13	<b>Compliance Requirements</b>
1.13.1	When determined in accordance with BS EN 12697 Bituminous mixtures: Test methods for hot mix asphalt, Part 1: Soluble binder content & Part 2: Determination of particle size distribution, the compositional analysis shall demonstrate compliance with following

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
1.13.2	the binder content on analysis shall not differ from the target binder content declared by the Company by more than $\pm 0.6\%$ ; and
1.13.3	the aggregate grading shall not differ from that declared by the Company.
1.13.4	Deformation resistance shall be determined in accordance with the requirements of Clause 929, which is referes to PD 6691 & BS 594987 and the deformation values specified in Appendix 7/1.
1.13.5	The air voids content shall be not more than 6% for a pair of cores at a chainage and shall be not more than 4% for the mean of any six consecutive determinations from pairs of cores from material from the same mixing plant.
1.13.6	When the stone mastic asphalt shall be being used as a regulating course at thicknesses below 30 millimetre the appropriate limiting void contents shall be 8% and 6% respectively.
1.14	<b>Reporting Results</b>
1.14.1	Where specified in Appendix 1/5 that the Company shall be responsible for testing the individual determinations including location of samples and results from all tests shall be given to the Scottish Ministers in writing within two weeks of the material having been laid.
1.15	<b>Surface Preparation</b>
1.15.1	Existing surfaces shall be prepared in accordance with the requirements of BS 594987 Asphalt for roads and other paved areas – Specification for transport, laying, compaction and type testing protocols, and Series 700 Clauses.
1.15.2	Bond coats shall be in accordance with Clause 920 except that where the thickness of the stone mastic asphalt shall be less than 20 millimetre, only polymer modified bond coats shall be used.
1.16	<b>Laying</b>
1.16.1	Unless required otherwise in Appendix 7/1, stone mastic asphalt shall be laid and compacted in accordance with the requirements of Clause 901, to the thickness stated in Appendix 7/1.
1.17	<b>Weather Conditions</b>
1.17.1	The weather conditions specified in Clause 945 shall not apply to stone mastic asphalt laid in accordance with this Clause.
1.17.2	The manufacturer's recommendations for the use of modified binders in various weather conditions for laying and compaction temperatures of the modified stone mastic asphalt shall be submitted to the Scottish Ministers with details of the modified binder required under sub-Clause 9 of this Clause and shall include information on early trafficking particularly in hot weather.
1.18	<b>Temporary Trafficking</b>
1.18.1	The Company shall ensure the pavement material has adequately cooled and hardened before it shall be subjected to temporary traffic.

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>Unless otherwise agreed in writing by the Scottish Ministers the material shall not be trafficked if its surface temperature exceeds 25°C unless the maximum temperature within the mat has fallen below 35°C.</p>
<p><b>973 AR</b></p>	<p><b>1 Overband Sealing</b></p> <p>1.1 The Company shall use systems holding Highway Authorities Product Approval Scheme certification and the system shall be applied in accordance with Highway Authorities Product Approval Scheme requirements</p> <p>1.2 The minimum skid resistance value of the overband material shall be 60 measured by the skid resistance pendulum method.</p> <p>1.3 All material removed from the cracks and joints shall be removed to a licensed waste disposal site.</p> <p>All loose material shall be removed off the Unit to a licensed waste disposal site or recycling centre.</p>
<p><b>976 AR</b></p>	<p><b>1 Pavement Cores</b></p> <p>1.1 Nominal 150 millimetre 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.</p> <p>1.2 For each core extracted a Roadside Record Sheet (RRS1) as provided in this Appendix 0/1 shall be completed in order to record the site location, coring conditions and condition of the core.</p> <p>1.3 All cores shall be labelled, protected, transported and stored according to the independent testing organisation's quality procedures.</p> <p>1.4 In the laboratory each core, prior to any testing, shall be examined, photographed and the information recorded on a Core Record Sheet (CRS1) as provided in this Appendix 0/1. 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.</p> <p>1.5 The records are to be stored within the Company's quality records and made available to the Overseeing Organisation when required.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**ROADSIDE RECORD SHEET (RRS1)**

**General**

Project Name	
Coring Date	
Core Number	
Chainage	
Road Name	
Road Type (See Note 1)	
Lane Direction (See Note 2)	
Lane Number (See Note 3)	
Weather Conditions	

**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	
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				

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**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	
<p>Insert picture of core HERE</p> <p><i>(The units of measurement should be clearly seen on the photograph)</i></p>							

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: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
1270AR	<p><b>1 Electroluminescent Signs for Traffic and Gantry Signs</b></p> <p>1.1 Sign Specifications:</p> <ul style="list-style-type: none"> <li>a) either Avery 6600T or 3M 4090T Translucent retro-reflective material must be used with See@Nite products. Failure to do so may effect the light output of the sign;</li> <li>b) patented Encapsulated Electroluminescent Lamp Pre-wired with 3.5 metre cable for connection to driver;</li> <li>c) weatherproof IP66 construction;</li> <li>d) electromagnetic compatibility and low voltage directive (“LVD”) compliant;</li> <li>e) acrylic vandal resistant sheet;</li> <li>f) operating voltage 50 -150 volts root mean squared;</li> <li>g) operating temperature -10 degrees Celsius to +25 degrees Celsius;</li> <li>h) CE marked;</li> <li>i) conforms to BS EN 12899;</li> <li>j) conforms to BS EN60598 (where applicable); and</li> <li>k) Class II double insulated construction - no earth connection required. Laminated bonded construction onto standard aluminium 11-Gauge back-plate.</li> </ul> <p>1.2 Driver Specifications:</p> <ul style="list-style-type: none"> <li>a) sealed unit for mounting inside post top;</li> <li>b) microprocessor controlled;</li> <li>c) integral IP66 photocell (set approx 70 lux);</li> <li>d) suitable for EL signs up to 1.5 x 4.5 metres (or equivalent load);</li> <li>e) EMC &amp; LVD compliant;</li> <li>f) output cables for connecting to sign and mains;</li> <li>g) CE marked;</li> <li>h) operating temperature -10 degrees Celsius to +25 degrees Celsius;</li> <li>i) weatherproof construction - IP44;</li> <li>j) tamperproof stainless steel fixings supplied;</li> <li>k) integral safety isolating transformer;</li> <li>l) input 220-240 volt AC 50 hertz 58 milliamps (typical);</li> <li>m) output 150 volt RMS, 200-600 hertz, 100 volt-amp max;</li> </ul>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	n) conforms to EN61347-2-11 Part 1;
1271AR	<p><b>1 Solar Powered signs</b></p> <p>1.1 To be proposed where a sign is over 100 metres away from the nearest supply point.</p> <p>1.2 Sign to be lit using LED lights.</p> <p>1.3 The system shall be suitable for illumination of 600 millimetre and 750 millimetre signs to category 1 specification.</p> <p>1.4 Vandal resistant.</p>
1272AR	<p><b>1 Chart Node and Section Markers</b></p> <p>1.1 Cored thermoplastic road markers shall be installed as chart nodes using the following method:</p> <ul style="list-style-type: none"> <li>a) A 100 millimetre diameter x 20 millimetre 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.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul> <p>1.2 Notwithstanding any other requirements of the Agreement, record drawings of the chart node locations at a scale of 1:500 shall be provided to the Scottish Ministers within 7 days of the issue of the Taking-Over Certificate for Section B of the New Works. The record drawings shall locate the chart nodes as a series of dimensions from carriageway features. The local and national grid co-ordinates of all chart nodes shall be detailed on the record drawings.</p>
1273AR	<p><b>1 Night Visibility</b></p> <p>1.1 Immediately after application and throughout the Defects Liability Period thereafter, the retro-reflectivity of the road marking line shall be not less than 150 millicandela/lux/square metre when measured in accordance with the method below:</p> <p><b>1.2 Apparatus</b></p> <p>1.2.1 The apparatus for measuring the retro reflectivity (SL value) of material</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>shall consist essentially of a light source and a photo detector with a geometry for observation and illumination of 1.37 degrees and 0.74 degrees respectively.</p> <p><b>1.3 Procedure</b></p> <p>1.3.1 Calibrate the instrument in accordance with the manufacturer's instructions.</p> <p>1.3.2 Air temperature shall not be below +10 degrees Celsius nor exceed +30 degrees Celsius.</p> <p>1.3.3 The area to be measured shall be 200 millimetres x 100 millimetres.</p> <p>1.3.4 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 retro reflectivity 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.</p>
<b>1470AR</b>	<p><b>1 Special Tools</b></p> <p>1.1 Duplicate sets of special tools, keys and handling devices essential for the correct running, operation and maintenance of the equipment shall be made available to the Scottish Ministers and provided to the Scottish Ministers at the end of the Defects Liability Period or Handback as appropriate.</p>
<b>1670AR</b>	<p><b>1 Static Load Testing of Piles</b></p> <p>1.1 Further to Clause 1609:</p> <p>a) The Company shall undertake a pile load testing programme that</p> <ul style="list-style-type: none"> <li>i) is consistent with section 7.5 of BS EN 1997-1:2004</li> <li>ii) is consistent with the recommendations given in section C15 of the Guidance Notes in Part C of the ICE Specification for Piling and Embedded Walls 2nd Edition</li> <li>iii) takes due account of the range of ground conditions encountered at the foundation locations</li> </ul> <p>b) As a minimum this shall include a maintained load test on at least one full size instrumented preliminary trial pile of the largest diameter proposed to at least the calculated ultimate resistance to validate the design method adopted. The preliminary trial pile(s) shall be constructed using the same equipment and techniques that are adopted for the works piles.</p> <p>1.2 Trial piles shall be instrumented with strain gauges and extensometers</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>with an appropriate degree of redundancy such that the load distribution down the pile during the test can be determined.</p> <p>1.3 Static load testing using the bi-directional method is permitted. If the Company proposes to adopt the bi-directional method full details of the design and construction of the preliminary trial pile(s) and associated instrumentation shall be given in Appendix 16/9. This shall include:</p> <ul style="list-style-type: none"> <li>a) the test procedure and load increments to be adopted;</li> <li>b) the measurements that will be made during the test; and</li> <li>c) the method to be used to interpret the results of the test.</li> </ul> <p>1.4 Preliminary trial piles shall be constructed and tested sufficiently in advance of the main works for the results to be evaluated and the design modified if necessary.</p> <p>1.5 A report on the preliminary pile tests shall be submitted which shall include all the information required in sub Clauses 36 and 37 of Clause 1609 together with an interpretation of the results and any implications for the pile design.</p> <p>1.6 Preliminary trial piles are not permitted to be incorporated into the Permanent Works.</p> <p>1.7 The Company shall complete Appendix 16/9 to include</p> <ul style="list-style-type: none"> <li>a) the overall pile testing strategy in relation to verification of the pile design and partial resistance factors and model factors to be adopted;</li> <li>b) the numbers and types of static load tests to be carried out;</li> <li>c) the proposed locations of preliminary trial piles;</li> <li>d) whether additional location specific ground investigation is required;</li> <li>e) the programme for installation and testing; and</li> <li>f) details of the instrumentation to be installed.</li> </ul>
<b>1671AR</b>	Clause Deleted
<b>1672AR</b>	<p><b>1 Drilling Fluid</b></p> <p>1.1 If drilling fluid other than water is proposed for bored piles constructed the Company shall include in Appendix 16/18 details of the methods to be adopted to avoid contamination of the ground. The use of drilling fluid other than water shall only be permitted where the Company has obtained prior approval from the Scottish Environment Protection Agency ("SEPA").</p>
<b>1673AR</b>	Clause Deleted
<b>1674AR</b>	<b>1 Geotechnical Reporting</b>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.1 The Company shall update the preliminary Ground Investigation Report(s) to include additional details providing justification for any changes made when compared to their tender stage Ground Investigation Report(s).</p> <p>1.2 The Company shall update the preliminary Geotechnical Design Reports to “for construction” status with contents as per Clause 2.8 of BS EN 1997-1:2004 along with the following additional requirements:</p> <p>a) The following is added to Clause 2.8(3) of BS EN 1997-1:2004 after “...including actions”:</p> <p>i) characteristic values of pile resistances, including justification, as appropriate;</p> <p>ii) design values of pile resistances, including justification, as appropriate; and</p> <p>iii) characteristic value of soil and rock properties, including justification, as appropriate.</p> <p>b) The modified Clause 2.8(3) of BS EN 1997-1:2004 shall be considered to be a principle in the context of the Eurocodes, i.e. 2.8(3)P.</p> <p>1.3 Following completion of construction the Company shall provide a full close-out report of the as-built Structures. The contents of the close-out report shall include, but not be limited to, the following:</p> <p>a) As-built location and geometry of all completed New Works including any Temporary Works left, with permission of the Scottish Ministers, in-situ;</p> <p>b) Construction records for all Structures;</p> <p>c) All integrity test results;</p> <p>d) All strength measurement test results on materials (concrete cylinder / cube etc) for Permanent Works and, with permission of the Scottish Ministers, Temporary Works left in-situ; and</p> <p>e) All non-conformance report and completed close out documentation.</p> <p>1.4 The close out report shall be accompanied by extracts from the geotechnical design reports as per requirements in BS EN 1997- 1:2004 Clause 2.8(6)P.</p>
<b>1675AR</b>	<p><b>1 Geotechnical Categorisation</b></p> <p>1.1 The Company shall provide a list of Geotechnical Categories (BS EN 1997-1: 2004, Clause 2.1) for all geotechnical related Structures (cuttings, embankments, retaining walls, foundations) in the project. The default Category shall be taken to be 3 unless justification for a lower category is provided.</p>
<b>1770AR</b>	<p><b>1 Construction Tolerances in Structural Concrete</b></p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

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	<p>1.1 <b>General</b></p> <p>1.1.1 Notwithstanding any tolerances stated in the DMRB, British and European Standards the following tolerances shall be adopted in the design, execution and completion of the New Works.</p> <p>1.1.2 In-Situ Concrete</p> <p>1.1.2.1 The maximum deviation of hardened concrete surfaces prior to the removal of formwork shall not be greater than three millimetres in three metres (which tolerance shall not be cumulative) nor greater than two millimetres in one metre. Of the foregoing deviations, not more than two 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.</p> <p>1.1.2.2 Where concrete surfaces are not permanently exposed, the maximum deviation of the finished concrete surfaces shall not be greater than six millimetres in three metres (which tolerance shall not be cumulative).</p> <p>1.1.3 Precast Concrete</p> <p>1.1.3.1 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 <math>28 \pm 2</math> days after casting. Unless otherwise stated, the allowable dimensional variations shall not exceed the following:</p> <table data-bbox="502 1220 1471 2056"> <thead> <tr> <th data-bbox="502 1220 1228 1265">a) Length</th> <th data-bbox="1228 1220 1471 1265">Variation</th> </tr> </thead> <tbody> <tr> <td data-bbox="502 1265 1228 1310">Up to 3 metres</td> <td data-bbox="1228 1265 1471 1310"><math>\pm 6</math> millimetres</td> </tr> <tr> <td data-bbox="502 1310 1228 1355">3 to 4.5 metres</td> <td data-bbox="1228 1310 1471 1355"><math>\pm 9</math> millimetres</td> </tr> <tr> <td data-bbox="502 1355 1228 1400">4.5 to 6 metres</td> <td data-bbox="1228 1355 1471 1400"><math>\pm 12</math> millimetres</td> </tr> <tr> <td data-bbox="502 1400 1228 1444">Additional for every subsequent 6 metres</td> <td data-bbox="1228 1400 1471 1444"><math>\pm 6</math> millimetres</td> </tr> <tr> <th data-bbox="502 1444 1228 1489">b) Cross section (each direction)</th> <th data-bbox="1228 1444 1471 1489"></th> </tr> <tr> <td data-bbox="502 1489 1228 1534">Up to 500 millimetres</td> <td data-bbox="1228 1489 1471 1534"><math>\pm 6</math> millimetres</td> </tr> <tr> <td data-bbox="502 1534 1228 1579">500 to 750 millimetres</td> <td data-bbox="1228 1534 1471 1579"><math>\pm 9</math> millimetres</td> </tr> <tr> <td data-bbox="502 1579 1228 1624">Additional for every subsequent 250 millimetres</td> <td data-bbox="1228 1579 1471 1624"><math>\pm 3</math> millimetres</td> </tr> <tr> <th data-bbox="502 1624 1228 1668">c) Straightness or bow (deviation from intended line)</th> <th data-bbox="1228 1624 1471 1668"></th> </tr> <tr> <td data-bbox="502 1668 1228 1713">Up to three metres</td> <td data-bbox="1228 1668 1471 1713"><math>\pm 6</math> millimetres</td> </tr> <tr> <td data-bbox="502 1713 1228 1758">3 to 6 metres</td> <td data-bbox="1228 1713 1471 1758"><math>\pm 9</math> millimetres</td> </tr> <tr> <td data-bbox="502 1758 1228 1803">6 to 12 metres</td> <td data-bbox="1228 1758 1471 1803"><math>\pm 12</math> millimetres</td> </tr> <tr> <td data-bbox="502 1803 1228 1848">Additional for every subsequent 6 metres</td> <td data-bbox="1228 1803 1471 1848"><math>\pm 6</math> millimetres</td> </tr> <tr> <th data-bbox="502 1848 1228 1892">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</th> <th data-bbox="1228 1848 1471 1892"></th> </tr> </tbody> </table>	a) Length	Variation	Up to 3 metres	$\pm 6$ millimetres	3 to 4.5 metres	$\pm 9$ millimetres	4.5 to 6 metres	$\pm 12$ millimetres	Additional for every subsequent 6 metres	$\pm 6$ millimetres	b) Cross section (each direction)		Up to 500 millimetres	$\pm 6$ millimetres	500 to 750 millimetres	$\pm 9$ millimetres	Additional for every subsequent 250 millimetres	$\pm 3$ millimetres	c) Straightness or bow (deviation from intended line)		Up to three metres	$\pm 6$ millimetres	3 to 6 metres	$\pm 9$ millimetres	6 to 12 metres	$\pm 12$ millimetres	Additional for every subsequent 6 metres	$\pm 6$ millimetres	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	
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Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text										
	<p>shortest dimensions exceeds the following:</p> <p>i) Length of shorter sides:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Up to and including 1.2 metres</td> <td style="text-align: right;">6 millimetres</td> </tr> <tr> <td>Over 1.2 metres but less than 1.8 metres</td> <td style="text-align: right;">9 millimetres</td> </tr> <tr> <td>1.8 metres and over</td> <td style="text-align: right;">12 millimetres</td> </tr> </table> <p>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.</p> <p>When the nominal angle is other than 90°, the included angle between check lines shall be varied accordingly.</p> <p>ii) Twist. Any corner shall not be more than the deviation stated from the plane containing the other three corners:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Up to 60 millimetres wide and up to 6 metres in length:</td> <td style="text-align: right;">6 millimetres</td> </tr> <tr> <td>Over 600 millimetres wide and for any length:</td> <td style="text-align: right;">12 millimetres</td> </tr> </table> <p>iii) Flatness. The maximum deviation from a 1.5 metre straight edge placed in any position on a nominally plane surface shall not exceed 6 millimetres.</p> <p>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.</p> <p><b>1.2 Assembly and Erection of Precast Concrete Members other than Prestressed Pretensioned Members</b></p> <p>1.2.1 The vertical alignment of the member shall not depart from the design level along the line by more than ± five millimetres nor more than three millimetres in a distance of three metres, nor greater than two millimetres in one metre.</p> <p>1.2.2 The horizontal alignment of the new member shall not depart from the design alignment along the line where accuracy is important by more than ± five millimetres nor more than three millimetres in a distance of three metres, nor greater than two millimetres in one metre.</p> <p>1.2.3 At the joints between adjacent members, the difference in level at the point where accuracy is important shall not exceed two millimetres.</p> <p>1.2.4 At the joints between adjacent members, the difference in horizontal alignment at the point where accuracy is important shall not exceed two millimetres.</p> <p>1.2.5 The width of gaps between adjacent members shall be as uniform as possible.</p>	Up to and including 1.2 metres	6 millimetres	Over 1.2 metres but less than 1.8 metres	9 millimetres	1.8 metres and over	12 millimetres	Up to 60 millimetres wide and up to 6 metres in length:	6 millimetres	Over 600 millimetres wide and for any length:	12 millimetres
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Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

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	<p>1.2.6 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.</p>
<p><b>1771AR</b></p>	<p><b>1 Couplers</b></p> <p>1.1 The use of threaded mechanical couplers is acceptable subject to:</p> <ul style="list-style-type: none"> <li>a) The Company shall submit the source and suppliers to the Overseeing Organisation for agreement;</li> <li>b) Manufacturer's and suppliers shall hold a relevant valid CARES certificate of approval unless otherwise agreed by the Overseeing Organisation;</li> <li>c) All couplers shall be covered by a relevant CARES Technical Approval or other relevant product approval from an appropriate UKAS accredited product certification body; and</li> <li>d) Concrete cover shall be maintained.</li> </ul> <p>1.2 Tensile Capacity</p> <p>1.2.1 The tensile strength of the coupled bar should exceed 540 newtons per square millimetre for BS4449:2005 grade B500B or Grade B500C hot rolled reinforcement steel.</p> <p>1.3 Slip (permanent elongation test)</p> <p>1.3.1 When a test is made of a representative gauge length assembly comprising reinforcement size, grade and profile to be used and a coupler of the precise type to be used, the permanent elongation after loading to <math>0.6f_y</math> shall not exceed 0.1 millimetres.</p> <p>1.4 Fatigue</p> <p>1.4.1 The Company shall obtain from the coupler manufacturer the fatigue design S-N curve established as defined below, which he shall furnish to the Designer, Checker and Overseeing Organisation with the Design Documentation. Existing fatigue design S-N data may be taken as an acceptable alternative.</p> <p>1.5 Performance testing</p> <p>1.5.1 The material to be used for the performance tests shall be in all respects similar to those which the Company proposes to use in the New Works.</p> <p>1.5.2 Mechanical connections shall be qualified for use in the construction on the basis of the following performance tests:</p> <p>1.6 Static tensile strength tests</p> <p>1.6.1 A minimum number of six static tensile strength tests shall be conducted considering the range of all variables. All test samples shall meet the requirements of sub Clause 1.2 above.</p> <p>1.7 Slip testing</p>



*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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	<p>1.7.1 A minimum number of two slip tests shall be conducted considering the range of variables. All test samples shall meet the requirements of sub-Clause 1.3 above.</p> <p>1.8 Fatigue testing</p> <p>1.8.1 Sampling</p> <p>1.8.1.1 Couplers shall be formed into batches of 20 bars of a single type and size, manufactured at the same time. All couplers of the same diameter should preferably be from the same melt. If not, the melt of each test specimen should be known and there should be a representative number of couplers from each melt.</p> <p>1.8.1.2 Each test specimen shall be selected at random from the batches and shall be representative of the production run.</p> <p>1.8.2 Testing</p> <p>1.8.2.1 The fatigue properties for each coupler size shall be established by a competent testing laboratory complying with the requirements Schedule 2 of the New works Requirements.</p> <p>1.8.2.2 Test specimens shall be tested in air under axial tensile loading using tapered grips and a suitable gripping medium.</p> <p>1.8.2.3 Testing shall be carried out under load control and stress shall be calculated using nominal cross-sectional area.</p> <p>1.8.2.4 Tests shall be performed for couplers for reinforcing bar diameters 25 millimetres, 32 millimetres, 40 millimetres on BS4449:2005 grade B500B or grade B500C.</p> <p>1.8.2.5 The number of load cycles per test shall be performed until failure.</p> <p>1.8.2.6 The frequency of testing shall be in the range 5 to 10 hertz.</p> <p>1.8.2.7 The samples of all diameters shall be tested at the following stress ranges (all newtons per square millimetre):</p> <table border="1" data-bbox="502 1512 1316 1758"> <thead> <tr> <th>Stress Range</th> <th>Max Stress</th> <th>Min Stress</th> <th>Mean Stress</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>450</td> <td>50</td> <td>250</td> </tr> <tr> <td>300</td> <td>400</td> <td>100</td> <td>250</td> </tr> <tr> <td>200</td> <td>350</td> <td>150</td> <td>250</td> </tr> <tr> <td>160</td> <td>360</td> <td>200</td> <td>280</td> </tr> </tbody> </table> <p>1.8.2.8 The S-N curves shall be presented as straight lines, using a log-log scale of stress versus number of cycles to failure. They shall be based upon standard statistical regression analysis methods and give the 97.5 per cent confidence of survival.</p> <p>1.8.3 Frequency of testing</p> <p>1.8.3.1 3 samples shall be tested for each bar / coupler size and stress range; giving a total number of 12 sets of tests per bar / coupler size.</p>	Stress Range	Max Stress	Min Stress	Mean Stress	400	450	50	250	300	400	100	250	200	350	150	250	160	360	200	280
Stress Range	Max Stress	Min Stress	Mean Stress																		
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*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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1772AR	<p><b>1 Concrete Repairs – General Requirements</b></p> <p><b>1.1 Storage of Materials</b></p> <p>1.1.1 All proprietary materials shall be stored in a dry weatherproof lock up store free from extremes of cold or heat in accordance with the manufacturer’s written instructions. The materials shall not be removed from the store for use until immediately prior to mixing.</p> <p><b>1.2 Records</b></p> <p>1.1.2 As repair work proceeds the Company shall keep records including date stamped photographs. Records shall be held in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers.</p> <p><b>1.3 High Pressure Water Jetting</b></p> <p>1.1.3 High pressure water jetting shall use clean and fresh potable water which complies with the requirements of BS EN 1008. The Company shall not add antifreeze agents or any other chemicals.</p>
1773AR	<p><b>1 Removal of Concrete in Areas to be Repaired</b></p> <p><b>1.1 Requirements for the Removal of Concrete</b></p> <p>1.1.1 The Company shall cut out and remove concrete from areas specifically identified following inspection and testing.</p> <p>1.1.2 Concrete shall be removed from the area until sound concrete is reached. Where reinforcement becomes exposed concrete shall be removed for a minimum distance of 25 millimetres beyond the rear face of the reinforcement. Where corroded reinforcement is identified the area of concrete removed shall be extended to expose 100 millimetres of uncorroded reinforcement in all directions.</p> <p>1.1.3 Before cutting out the Company shall determine the position and depth of the reinforcement. The perimeter of the concrete to be removed shall be saw cut perpendicularly to the face of the concrete to a depth of not less than 15 millimetres or to within 10 millimetres of the reinforcement, whichever shall be the lesser.</p> <p>1.1.4 At the upper limits of repairs to be made using repair concrete, sloping cuts may be used to avoid the entrapment of air when the concrete is poured.</p> <p>1.1.5 The saw cut edges shall be abraded by grit blasting or equivalent methods.</p> <p>1.1.6 The concrete shall be removed by the use of suitable hand or mechanical tools or high pressure water jetting. Removal of concrete by water jetting shall be carried out by firms who are registered members of the Association of High Pressure Water Jetting Companies.</p> <p>1.1.7 Where concrete is removed by high pressure water jetting a lightweight electric or pneumatic chipping hammer may be used for final trimming of the area broken out.</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

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	<p>1.1.8 Overbreak of concrete shall be made good using a concrete repair system selected from Clause 1775AR.</p> <p>1.1.9 Reinforcement damaged during concrete removal shall be made good. Existing reinforcement which has corroded or is otherwise damaged shall be removed and additional steel reinforcement shall be lapped or welded onto the existing reinforcement. All such welding shall be in accordance with Clause 1717. All loose reinforcement shall be securely tied with stainless steel tying wire.</p> <p>1.1.10 The Site shall be kept free of debris or standing water arising from the high pressure water jetting activities.</p> <p>1.1.11 On completion of removal of concrete all concrete surfaces and exposed reinforcement which shall be in contact with repair materials shall be prepared in accordance with Clause 1774AR.</p>
<b>1774AR</b>	<p><b>1 Surface Preparation</b></p> <p>1.1 General Requirements</p> <p>1.1.1 Blast cleaning - The Company shall ensure that the grade and particle shape of abrasives is adequate to achieve the appropriate standard of cleanliness. Non-metallic abrasives shall not be recycled</p> <p>1.1.2 Water for cleaning - Only clean cold water which complies with the requirements of BS EN 1008 shall be used for cleaning and rinsing.</p> <p>1.1.3 Preparation of Surfaces of Reinforcement</p> <p style="padding-left: 20px;">a) Standard - Bright steel: Removal of all detrimental contamination and corrosion products to produce a generally bright appearance overall. The surfaces shall be free of embedded abrasive particles and corrosion products when viewed through a X10 illuminated magnifying glass.</p> <p>1.2 Method</p> <p>1.2.1 Blast cleaning using dry air / abrasive system, or</p> <p>1.2.2 Wet blast cleaning using a low pressure air / water / abrasive system. The equipment shall not allow the air / water pressure to exceed 14 bar and shall incorporate a metering device to allow the abrasive quantity introduced to be adjusted from 0 to 14 bar.</p> <p>1.2.3 Within an hour of cleaning the treated reinforcement shall be pressure washed with clean water.</p> <p>1.3 Preparation of Surfaces of Concrete</p> <p>1.3.1 Standard - Concrete surfaces shall be clean and dry and free of cement laitance contaminants and loose friable material. The surface shall be wetted one hour before repair concrete is applied. There shall be no standing water. The surface shall be such that repair concrete shall flow freely into all voids and be in intimate contact with the existing concrete.</p> <p>1.4 Method</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.4.1 High Pressure Water Jet</p> <p>1.4.1.1 The surface profile after cutting out shall be irregular with aggregate particles projecting above the surrounding concrete matrix.</p> <p>1.4.2 Hand or Mechanical Tools</p> <p>1.4.2.1 All concrete surfaces to receive repair materials exposed by percussive methods using hand or mechanical tools shall be prepared by grit blasting or high pressure water jetting to remove all fractured or “bruised” concrete surfaces to expose sound aggregate particles.</p> <p>1.5 Procedure Trials</p> <p>1.5.1 The Company shall remove, cut back and prepare the surface of an area of one square metre of concrete to be repaired as a trial of the methods proposed for carrying out the work and obtain a photographic record for inspection by the Scottish Ministers.</p>
<b>1775AR</b>	<p><b>1 Concrete Repairs</b></p> <p>1.1 General</p> <p>1.1.1 Concrete repairs shall be carried out using either normal flow concrete, proprietary repair mortar, high-flow repair concrete, proprietary sprayed concrete, or a proprietary repair system proposed by the Company and subject to consent in writing by the Scottish Ministers.</p> <p>1.1.1.1 Crack repairs carried out by a resin injection system shall be proposed by the Company and subject to consent in writing by the Scottish Ministers.</p> <p>1.1.2 Proprietary repair materials and systems shall have an Agrément Board Roads and Bridges Certificate registered with the Department for Transport / Highways Agency.</p> <p>1.1.3 Proprietary repair mortars shall be used for repair areas less than or equal to 1 metre squared or repair depths less than or equal to 30 millimetres deep. Normal flow concrete or high flow concrete or sprayed concrete shall be used for repair areas greater than 1 metre squared or greater than 30 millimetres deep or as otherwise proposed by the Company and subject to consent in writing by the Scottish Ministers.</p> <p>1.2 Repairs Using Normal Flow Concrete</p> <p>1.2.1 Repair concrete shall be a designed mix for special structural concrete as defined in Clauses 1701 and 1705 of the Specification.</p> <p>1.2.2 Cement content shall be not less than 400 kilograms per cubic metre or more than 550 kilograms per cubic metre.</p> <p>1.2.3 Maximum aggregate size shall be 10 millimetres.</p> <p>1.2.4 The free water / cement ratio shall not be greater than 0.4.</p> <p>1.2.5 The minimum 28 day compressive strength shall be 40 newtons per square millimetre.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
1.2.6	Alkali – silica reaction shall be controlled as specified in Clause 1704.5.
1.3	Repairs Using Proprietary Repair Mortar
1.3.1	Prebatched polymer modified cementitious mortars incorporating a shrinkage reduction agent shall be used.
1.3.2	Mortars for hand screeding of surfaces to be waterproofed shall be sand/cement mortar containing styrene acrylate or styrene butadiene polymer bonding mixture.
1.3.3	The free water / cement ratio shall be not greater than 0.4.
1.3.4	The maximum aggregate grain size in the mortar shall be suitable for the depths of repair required.
1.3.5	Water required to mix repair mortars shall comply with the requirements of BS EN 1008.
1.3.6	The cement content shall be not less than 400 kilograms per cubic metre or more than 550 kilograms per cubic metre.
1.3.7	The total chloride ion content of the materials for repairs to prestressed or heat cured concrete shall not exceed 0.1 per cent of the weight of cement. Calcium chloride or admixtures containing chloride salts shall not be used.
1.3.8	The minimum 28 day strength of the mortar shall be 40 newtons per square millimetre. Alkali-silica reaction shall be controlled as specified in Clause 1704.5 of the Specification.
1.4	Delivery and Storage of Material
1.4.1	The Company shall supply with each batch of the material delivered to the New Works Site certificates furnished by the supplier stating:
	a) the polymer used;
	b) evidence that the chloride contents are less than specified in sub-Clause 1.3.7 above;
	c) the content of sodium oxide equivalent in the mortar;
	d) Maximum shelf life; and
	e) Handling arrangements.
1.4.2	The material shall be stored in a dry environment free from extremes of cold and heat and any specific storage requirements of the manufacturers; and
1.4.3	The materials shall not be removed from the store for use until immediately prior to mixing
1.5	Placing Repair Mortar
1.5.1	The repair shall be built up in layers in accordance with the repair mortar manufacturer's written instructions. The surface of each layer except the final layer shall be scored to provide a key for the next layer.
1.5.2	The repair mortar shall be suitable for the purpose intended i.e. for soffits

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	or vertical surfaces as appropriate.
1.5.3	Repair mortar shall not be applied when the temperature of the surface to be repaired falls below five degrees Celsius.
1.5.4	The material shall be incorporated within one hour of mixing or such lesser period as stated in writing by the manufacturer.
1.5.5	Repair mortar shall be cured in accordance with sub-Clause 1710.5 and the manufacturer's written instructions. During the curing period the temperatures of the repair mortar shall be maintained at or above five degrees Celsius by artificial means if necessary.
1.6	Surface Finish to Repair Mortar
1.6.1	Repair mortar shall be float finished to produce a dense smooth uniform surface free from float marks to the specified line and level.
1.7	Repairs Using High-Flow Repair Concrete
1.7.1	Materials
1.7.1.1	Cement shall comply with Clause 1702.
1.7.1.2	Cement content shall be not less than 400 kilograms per cubic metre or more than 550 kilograms per cubic metre.
1.7.1.3	Alkali-silica reaction shall be controlled as specified in Clause 1704.
1.7.1.4	The total chloride ion content of the materials shall not exceed 0.1% of the weight of cement. Any chloride or admixtures containing chloride salts shall not be used.
1.7.1.5	Aggregate shall be well graded with the maximum size not exceeding eight millimetres except when pumping is to be employed when the maximum size shall not exceed 6 millimetres and shall comply with sub-Clause 1702.2.
1.7.1.6	Proprietary material shall be of such composition and grading that when mixed with water a flowable concrete is produced which shall flow freely into the confined spaces to be filled and shall not be prone to segregation bleeding or cracking in either the plastic or hardened state.
1.7.1.7	Combinations and additions may comprise pulverised fuel ash ground granulated blast furnace slag microsilica plasticisers aggregate suspension agents and shrinkage reduction agents. Calcium chloride or admixtures containing chloride salts shall not be used.
1.7.1.8	Microsilica content shall not exceed five per cent of the mass of the cement. Microsilica shall comply with Table 17/70.

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text										
	<p style="text-align: center;"><b>TABLE 17/70 MICROSILICA CONTENT</b></p> <table border="1" data-bbox="510 459 1380 712"> <thead> <tr> <th data-bbox="510 459 1069 504">Item</th> <th data-bbox="1069 459 1380 504">Limit (by mass)</th> </tr> </thead> <tbody> <tr> <td data-bbox="510 504 1069 548">Silica content (SiO<sub>2</sub>)</td> <td data-bbox="1069 504 1380 548">minimum 85%</td> </tr> <tr> <td data-bbox="510 548 1069 593">Alkali content (NaO<sub>2</sub>)</td> <td data-bbox="1069 548 1380 593">maximum 2%</td> </tr> <tr> <td data-bbox="510 593 1069 638">Carbon</td> <td data-bbox="1069 593 1380 638">maximum 2%</td> </tr> <tr> <td data-bbox="510 638 1069 712">Proportion passing 50 micron sieve</td> <td data-bbox="1069 638 1380 712">minimum 99%</td> </tr> </tbody> </table> <p data-bbox="375 761 1468 2027">           1.7.1.9 Water shall comply with the requirements of BS EN 1008.            1.7.1.10 The specified minimum 28 day strength of the concrete shall be not less than 40 newtons per square millimetre. The maximum free water / cement ratio shall not exceed 0.4.            1.7.2 Delivery and Storage of Material            1.7.2.1 Records shall be kept of each batch of material delivered to the site of the New Works in accordance with the procedures in the Quality Plan and shall include:                a) formulator's name and address;                b) formulator's agent's name and address where applicable;                c) material identification;                d) batch reference number size of batch and number of containers in the delivery;                e) date of manufacture;                f) evidence that the chloride contents are less than specified in sub-Clause 7(iv) above;                g) details of the significant rock components contained in the aggregates;                h) cement content;                i) combinations and additions used; and                j) The equivalent sodium oxide content.            1.7.2.2 Containers shall be damp proof and readily emptied of their contents            1.7.2.3 Containers shall be marked with the following information:                a) material identification;                b) batch reference number;                c) formulator's name;                d) net weight; and                e) Any warnings or precautions concerning the contents.         </p>	Item	Limit (by mass)	Silica content (SiO <sub>2</sub> )	minimum 85%	Alkali content (NaO <sub>2</sub> )	maximum 2%	Carbon	maximum 2%	Proportion passing 50 micron sieve	minimum 99%
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*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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	<p>1.7.2.4 The material shall be stored in a dry environment free from extremes of cold and heat.</p> <p>1.7.2.5 Material shall not be older than three months or a lesser period specified by the formulator when used in the New Works.</p> <p>1.7.2.6 The materials shall not be removed from the store for use in the New Works until immediately prior to mixing.</p> <p>1.7.3 Formwork Site Mixing Placing and Curing</p> <p>1.7.3.1 Formwork shall be Class F3 to sub-Clause 1708.4 with the perimeter of the repair well sealed to prevent grout loss. Release agents shall be compatible with proposed surface treatments.</p> <p>1.7.3.2 Mixing in a forced action paddle mixer and placing shall be carried out strictly in accordance with the formulator's written instructions together with the following additional conditions:</p> <ul style="list-style-type: none"> <li>a) The free water cement ratio shall not exceed 0.4. The water content shall be determined during approval tests and maintained for batch tests works tests and in the New Works within <math>\pm 2</math> per cent of the agreed content.</li> <li>b) No extra water shall be added after the original mixing.</li> <li>c) The material shall be incorporated in the New Works within 20 minutes of completion of mixing or such lesser period as stated by the formulator. The concrete shall be continuously agitated after the mixing and before placing.</li> <li>d) The material shall not be mixed or placed in the New Works at ambient temperatures lower than five degrees Celsius or where the surface temperature of the concrete in the repair void is less than five degrees Celsius.</li> <li>e) The concrete when placed shall have a temperature of not less than five degrees Celsius and not more than 20 degrees Celsius.</li> <li>f) The surface temperature of the concrete shall be maintained at not less than five degrees Celsius until the concrete reaches a strength of 10 newtons per square millimetre as determined by tests on cubes cured under similar conditions to the structural concrete. Heat shall not be applied direct to any concrete.</li> <li>g) Repair concrete shall not be placed against other concrete which has been in position for more than 30 minutes unless a construction joint is formed in accordance with Clause 1710. In addition the joint surface shall be saturated for a minimum of 2 hours before concrete is placed against it. When repair concrete has been in place for four hours no further concrete shall be placed against it for a further 20 hours.</li> <li>h) Vibration shall not be used. The side shutters shall be tapped lightly with a hammer to expel surface air voids.</li> </ul>



*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.7.3.3 Immediately after placing and for 14 days thereafter concrete shall be protected against harmful effects of weather including rain, rapid temperature changes and frost and from drying out. Impregnation may be carried out in accordance with the manufacturer's written instructions and not before 14 days as described in Clause 1709. Curing membranes shall not be used.</p> <p>1.7.3.4 When the mix proportions have been determined no variations shall be made in the manufacture supply mix proportions or method of mixing of the material.</p> <p>1.7.4 Approval Tests</p> <p>1.7.4.1 Before New Works commence all properties of the proposed high-flow repair concrete shall be demonstrated by the Company and the formulator's representative by carrying out the tests specified below in an UKAS accredited laboratory. Records shall be maintained of all tests in accordance with the procedures in the Quality Plan.</p> <p>1.7.4.2 The composition of the high flow concrete including the source of water the mix proportions and the method of mixing shall be the same as that proposed for use in the New Works. The composition shall not be varied throughout the course of the tests and the material shall be obtained from the same batch.</p> <p>1.7.4.3 The tests fall into two categories: flowability and compressive strength.</p> <p>1.7.4.4 The flowability tests shall demonstrate:</p> <ul style="list-style-type: none"> <li>a) flow characteristics in a trough at five degrees Celsius and 20 degrees Celsius as specified in Note 1 below; and</li> <li>b) flow characteristics in a simulated soffit repair at five degrees Celsius and 20 degrees Celsius as specified in Note 2 below.</li> </ul> <p>Note 1: The flow characteristics of the concrete in a trough shall be assessed. For each test the concrete and trough shall be at the specified temperature. The funnel of the apparatus shall be fitted with a rubber bung and charged with 6 litres of concrete. On release of the bung the concrete shall flow along the trough and the length of the flow along the trough shall be measured. A test shall consist of three readings the flow requirements shall be deemed to be satisfied if none of the readings is below 750 millimetres in 30 seconds without signs of segregation or bleeding.</p> <p>Note 2: The flow characteristics of the concrete in a simulated soffit repair shall be tested in accordance with BD27. For each test the concrete and apparatus shall be at the specified temperature. The concrete shall be poured in one operation into the supply tube until the level of the concrete has reached 100 millimetres above the underside of the top plate. After the concrete has set the specimen shall be removed from the apparatus and sawn into two parts and the sawn concrete surfaces shall be examined. The concrete shall be homogeneous free from excessive air holes voids segregation and other defects and shall completely fill the simulated repair.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.7.5 Compressive Strength Tests</p> <p>1.7.5.1 Compressive strength tests shall be carried out to determine the compressive strength of the concrete at five degrees Celsius and 20 degrees Celsius. These shall conform to the requirements in BS 8500-2:2006.</p> <p>1.7.5.2 Test cubes shall be made in 100 millimetres metal moulds to BS EN 12390-1:2000. The moulds shall be carefully filled by pouring concrete through a funnel to produce void free specimens. There shall be no compaction. The cubes shall be cured and tested in accordance with BS EN 12390-2:2000.</p> <p>1.7.5.3 The minimum compressive strength shall be established using a set of three cubes. The requirement shall be satisfied if none of the compressive strengths obtained is lower than the specified value and the difference between the highest and lowest values is not more than 20% of the average. Identity testing where required shall be carried out in accordance with Clause 1707.</p> <p>1.7.6 Batch Acceptance Test</p> <p>1.7.6.1 Each batch of material delivered to the Sites shall be tested as follows:</p> <ul style="list-style-type: none"> <li>a) the material shall be taken at random from one or more containers from the same batch;</li> <li>b) flow trough tests shall be carried out as specified in Note 1 of sub-Clause 1.7.4.4 above at 20 degrees Celsius; and</li> <li>c) Compressive strength tests shall be carried out as specified in sub-Clause 1.7.5 above at 20 degrees Celsius.</li> </ul> <p>1.7.7 Site Tests</p> <p>1.7.7.1 Site tests shall be carried out to monitor:</p> <ul style="list-style-type: none"> <li>a) flowability; and</li> <li>b) compressive strength.</li> </ul> <p>1.7.7.2 The flowability of a sample of fresh concrete shall be determined in a trough as specified in sub-Clause 1.7.4.4 Note 1.</p> <p>1.7.7.3 The gain in strength of the repair concrete shall be monitored by testing cubes cured alongside the repaired areas at ambient temperature.</p> <p>1.7.7.4 For each days production of repair concrete six 100 millimetres cubes shall be made in accordance with sub-Clause 1.7.5 above. The cubes shall be cured for 24 hours in the moulds with the top surfaces covered by polythene sheets. After 24 hours the cubes shall be stripped and placed in polythene bags which shall be sealed. The cubes shall continue to be stored alongside the repaired areas throughout the curing period until required for testing. The cubes shall be crushed at times determined by the Company but at least two cubes shall be retained to be tested at 28 days.</p> <p>1.8 <b>Repairs Using Proprietary Sprayed Concrete</b></p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text																
	<p>1.8.1 Materials</p> <p>1.8.1.1 The proprietary material shall be pre-weighed and pre-mixed at a location off the site of the New Works.</p> <p>1.8.1.2 Cement shall comply with Clause 1702.</p> <p>1.8.1.3 Alkali-silica reaction shall be controlled as specified in Clause 1704.</p> <p>1.8.1.4 The total chloride ion content of the materials shall not exceed 0.1% of the weight of cement. Any chloride or admixtures containing chloride salts as defined by sub-Clause 1702.2 shall not be used.</p> <p>1.8.1.5 Aggregate shall be well graded with the maximum size not exceeding 3 millimetres and shall comply with sub-Clause 1702.2.</p> <p>1.8.1.6 Combinations and additions may comprise pulverised fuel ash ground granulated blast furnace slag microsilica and plasticisers. Calcium chloride or admixtures containing chloride salts and expansion agents shall not be used.</p> <p>1.8.1.7 The maximum sulphate content shall comply with sub-Clause 1704.6.</p> <p>1.8.1.8 Material shall be capable of being applied to a thickness of 100 millimetres without the requirement for additional mesh reinforcement or fibres. Once placed it shall be capable of being profiled and trowel finished (to the equivalent of formed Class F3) without detrimental effects.</p> <p>1.8.2 Performance Characteristics</p> <p>1.8.2.1 The proprietary material shall have performance characteristics as detailed in Table 17/71 which are to be verified by an independent testing authority.</p> <p style="text-align: center;"><b>TABLE 17/71: Performance Characteristics</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">TEST</th> <th style="text-align: center;">PERFORMANCE</th> </tr> </thead> <tbody> <tr> <td>Adhesion to concrete substrate</td> <td>greater than 2.0 newtons per square millimetre</td> </tr> <tr> <td>Characteristic strength of cores (28 days)</td> <td>40 newtons per square millimetre</td> </tr> <tr> <td>Tensile splitting strength (28 days)</td> <td>greater than 2.4 newtons per square millimetre</td> </tr> <tr> <td>Static Modulus of elasticity</td> <td>27000 ± 3000 newtons per square millimetre</td> </tr> <tr> <td>Shrinkage</td> <td>less than 0.002 per cent</td> </tr> <tr> <td>Coefficient of Thermal Expansion</td> <td>8 to 12 x 10<sup>-6</sup>/ degrees Celsius</td> </tr> <tr> <td>Coefficient of Chloride Ion Diffusion</td> <td>less than 700 x 10<sup>-15</sup> square metres per second</td> </tr> </tbody> </table>	TEST	PERFORMANCE	Adhesion to concrete substrate	greater than 2.0 newtons per square millimetre	Characteristic strength of cores (28 days)	40 newtons per square millimetre	Tensile splitting strength (28 days)	greater than 2.4 newtons per square millimetre	Static Modulus of elasticity	27000 ± 3000 newtons per square millimetre	Shrinkage	less than 0.002 per cent	Coefficient of Thermal Expansion	8 to 12 x 10 <sup>-6</sup> / degrees Celsius	Coefficient of Chloride Ion Diffusion	less than 700 x 10 <sup>-15</sup> square metres per second
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*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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	<p>1.8.3 Delivery and Storage of Material</p> <p>1.8.3.1 Records shall be kept of each batch of material delivered to the Site and shall include:</p> <ul style="list-style-type: none"> <li>a) formulator's name and address;</li> <li>b) formulator's agent's name and address where applicable;</li> <li>c) batch reference number size of batch and number of containers in the delivery;</li> <li>d) date of manufacture;</li> <li>e) evidence that the chloride contents are less than specified in sub-Clause 1.8.1.4 above;</li> <li>f) details of the significant rock components contained in the aggregates;</li> <li>g) cement content;</li> <li>h) additives used; and</li> <li>i) the sodium oxide equivalent content.</li> </ul> <p>1.8.3.2 Containers shall be damp proof and readily emptied of their contents.</p> <p>1.8.3.3 Containers shall be marked with the following information:</p> <ul style="list-style-type: none"> <li>a) material identification;</li> <li>b) batch reference number;</li> <li>c) formulator's name;</li> <li>d) net weight; and</li> <li>e) any warnings or precautions concerning the contents.</li> </ul> <p>1.8.3.4 The material shall be stored in a dry environment free from extremes of cold and heat.</p> <p>1.8.3.5 Material shall not be older than three months or lesser period specified by the formulator when incorporated in the New Works.</p> <p>1.8.3.6 The materials shall not be removed from the store for use in the New Works until immediately prior to mixing.</p> <p>1.8.4 Trial Mixes</p> <p>1.8.4.1 Practical tests shall be carried out on the Site by constructing test panels to confirm the suitability of the mix for the New Works. In these tests the type of Constructional Plant used for mixing and placing and the finished face to the panel shall be similar in all respects to those intended for use in the New Works.</p> <p>1.8.5 Procedure Trials</p> <p>1.8.5.1 Before work commences on the site of the New Works procedure trials shall be carried out to pre-qualify the nozzlemen proposed for use on the New Works. Nozzlemen who have not been pre-qualified shall not be</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	used.
1.8.5.2	Each nozzleman shall carry out procedure trial panels. The procedure trial panels shall have minimum dimensions of 750 millimetres x 750 millimetres x 100 millimetres deep and shall be made of plywood with 45 degrees sloped edge to permit rebound to escape.
1.8.5.3	One half of each procedure trial panel shall contain reinforcement representative of the size and spacing of the work. The second half of the procedure trial panel shall contain no reinforcement (with the exception of fibre reinforcement) to allow for the extraction of cores for testing in accordance with sub Clause 1.17.2 of this Clause.
1.8.5.4	One procedure trial panel shall be New Works Operations using each proposed mixture proportion at each proposed orientation i.e. horizontal overhead and the like.
1.8.5.5	A minimum of three 100 millimetre diameter cores shall be extracted from the location of intersecting reinforcing steel to check the adequacy of consolidation of the sprayed concrete around the reinforcement.
1.8.5.6	No sprayed concrete shall be carried out on the New Works until the procedure trial testing requirements have been met.
1.9	<b>Surface Preparation for Sprayed Concrete</b>
1.9.1	Sound surfaces which are to receive sprayed concrete shall be thoroughly cleaned and roughened by grit blasting or high pressure water jetting.
1.9.2	Grit blasted areas shall have sprayed concrete applied within 48 hours or shall be reblasted.
1.9.3	Immediately prior to spray concreting all the surfaces to be sprayed shall be thoroughly cleaned and wetted with a strong blast of oil-free air and water to comply with the requirements of BS EN 1008.
1.10	<b>Outline Definition</b>
1.10.1	The outline of the finished sprayed concrete shall be defined by screed boards guide wires or other means proposed by the Company and consented to in writing by the Scottish Ministers.
1.10.2	Guide wires shall be installed tight and true to line and in such a manner that they may be easily tightened.
1.11	<b>Mixing Sprayed Concrete</b>
1.11.1	Sprayed concrete shall be mixed in a batch type mixer complying with the requirements of BS1305 except that the water shall be delivered direct to the nozzle. The delivery equipment shall be capable of delivering a continuous even stream of uniformly mixed material to the nozzle. Water supply at the nozzle shall be maintained at a uniform pressure sufficient to ensure adequate hydration at all times. The delivery equipment and nozzle shall be thoroughly cleaned and inspected at the end of each day and parts replaced as required.

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
1.11.2	The temperature of water and cement when added to the mix shall not exceed 60 degrees Celsius and 65 degrees Celsius respectively.
1.11.3	Water used in sprayed concrete shall comply with the requirements of BS EN 1008.
1.12	<b>Reinforcement</b>
1.12.1	Welded wire mesh fabric reinforcement shall be fixed to prepared surfaces and shall be carefully bent to follow the shape of the members and held in position by anchors spaced at not less than two per square metre. The fabric shall be spaced at not less than 25 millimetres from the finished surface of the concrete.
1.13	<b>Transport and Placing Sprayed Concrete</b>
1.13.1	No concrete shall be sprayed in air temperatures less than five degrees Celsius or onto a surface temperature less than five degrees Celsius. Surfaces shall be free from standing water.
1.13.2	Sprayed concrete shall emerge from the nozzle in a steady uninterrupted flow and an uninterrupted supply of compressed air shall be provided to maintain adequate nozzle velocity. Should the flow become intermittent the nozzle shall be directed away from the work until the flow again becomes uniform.
1.13.3	Sprayed concrete shall be applied under sufficient pressure so as to give a dense and homogeneous covering to the surface in one or more layers of a thickness compatible with the mix Design constituents position of reinforcement and plane of application to ensure the placed concrete does not slump or sag.
1.13.4	Adequate precautions shall be taken to ensure that sprayed concrete rebound is not incorporated in the finished work and that any previously deposited hardened rebound which may prevent a proper bond or encasement is removed from reinforcement.
1.13.5	Adequate protection shall be given to the nozzle and application surface during high winds.
1.13.6	The final coat shall be hand screeded to a Class U3 finish in accordance with sub-Clause 1708.4
1.14	<b>Fibre Reinforced Sprayed Concrete</b>
1.14.1	The weight of steel and / or composite fibres shall not exceed five per cent by weight of the combined weight of cement and aggregate. Fibres shall be added to the mix in such a manner that the fibres are evenly distributed and not bent. Procedure trials shall be undertaken to demonstrate that the proposed methods can achieve the requirements of this sub-Clause.
1.14.2	Unless otherwise stated elsewhere in this Agreement a final 15 millimetres thick coat of unreinforced sprayed concrete shall be applied over the whole exposed surface to cover exposed fibres.
1.14.3	The gun and nozzle shall be electrically earthed.

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.15      <b>Construction Joints</b></p> <p>1.15.1    Construction joints in sprayed concrete shall be tapered at approximately 30 degrees or cut back square to the reinforcement and then tapered at 30 degrees. The construction joint shall be thoroughly cleaned and all laitance and loose material removed and the surface wetted using a strong blast of air and water prior to the placement of adjacent sprayed concrete.</p> <p>1.16      <b>Curing of Sprayed Concrete</b></p> <p>1.16.1    Freshly sprayed concrete shall be protected from rain or water until the surface is sufficiently hard to resist damage.</p> <p>1.16.2    Immediately after placing and for 14 days thereafter sprayed concrete shall be protected against harmful effects of weather including rain rapid temperature changes and frost and from drying out. Curing membranes shall not be used.</p> <p>1.16.3    Impregnation in accordance with Clause 1709 may be carried out after 14 days.</p> <p>1.17      <b>Production Testing of Sprayed Concrete</b></p> <p>1.17.1    One production test panel shall be carried out for each nozzle orientation for each day of sprayed concrete production or every 1five cubic metres of sprayed concrete whichever is the lesser.</p> <p>1.17.2    Sprayed concrete production test panels shall be made with dimensions 450 millimetres x 450 millimetres x 100 millimetres thick with 45 degrees sloped edge forms to permit escape of rebound. Production test panels shall contain no reinforcement (other than fibre reinforcement). The production test panels shall be marked cured cored and tested in compression in accordance with the appropriate parts of BS1881 and BS EN 12390. They shall be tested in a UKAS accredited laboratory. Records shall be maintained of all tests and stored at a suitable location.</p> <p>1.17.3    Routine tests shall be carried out by the Company on the finished sprayed concrete. These shall consist of taking 25 millimetres or 100 millimetres dia. cores from the finished sprayed concrete and testing them in the same manner as cores taken from the test panels or by carrying out non-destructive tests by means of a 'Schmidt' hammer or 'Windsor Probe' to determine compressive strength and testing for bond by the use of a hand hammer.</p> <p>1.18      <b>Resin Injection Repairs</b></p> <p>1.18.1    Preparation of Surfaces Around Cracks</p> <p>1.18.1.1   The concrete surface at least 50 millimetres either side of the crack shall be dry blast cleaned to a sound surface free from dirt moss salt staining and loose concrete. The full extent of the crack shall be found and the cleaned area shall extend 50 millimetres beyond the end of the crack or until the crack becomes too narrow to warrant resin injection.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>1.18.1.2 Where algae or other bacterial growth emanates from the crack it shall be removed by scrubbing with bactericide and rinsing with clean water. Health and safety precautions appropriate to the bactericide cleaning agent used shall be adopted including those recommended in writing by the manufacturers. Measures shall be taken to ensure that any adjacent water course is not contaminated and that run-off is collected and disposed of in a safe manner.</p> <p>1.18.2 Moisture in Cracks</p> <p>1.18.2.1 Where the moisture level in the crack to be resin injected is unacceptably high the crack shall be blown through with dry hot air starting at the top of the crack. A temporary crack sealant shall be applied immediately after blowing through and the resin shall be injected into the crack immediately the necessary preparations are complete.</p> <p>1.18.2.2 If for whatever reason the crack becomes damp before it is resin injected no further work shall be permitted until the temporary crack sealant is removed and the crack blown through again with dry hot air</p> <p>1.18.2.3 The temperature of the hot air shall be sufficient to dry the full depth of the crack and shall not exceed the maximum temperature specified by the equipment manufacturer.</p> <p>1.18.3 Resin Injection</p> <p>1.18.3.1 The resin to be used shall be either polyester or epoxy based and shall be mixed and injected in accordance with the manufacturer's written specification. Resin shall not be injected when the air temperature or the surface temperature concrete to be repaired is less than five degrees Celsius.</p> <p>1.18.3.2 The spacing of the nozzle positions shall be equal to the depth of the crack and shall not in any case be less than 250 millimetres.</p> <p>1.18.3.3 Injecting shall start at the bottom of the crack and work shall proceed upwards in a continuous operation throughout. Resin shall be seen extruding from the crack at the next nozzle position before the current nozzle location is locked off.</p> <p>1.18.3.4 The injected crack shall be left undisturbed for a period of at least 24 hours to allow the resin to harden.</p> <p>1.18.3.5 When the resins are sufficiently cured the cracks and any resin spillages shall be cleaned from the face of the concrete.</p> <p>1.18.4 Proving Tests</p> <p>1.18.4.1 When the resin has set, two 20 millimetres diameter proving cores shall be taken to the full depth of the crack. These shall be filled with either the resin used for injecting or with a suitable filler of a compatible thixotropic resin.</p> <p>1.19 <b>Sealing of Cracks in Concrete Bridge Decks</b></p> <p>1.19.1 The preparation of surfaces around cracks and the measures to deal with algae or other growth in cracks shall be as described in sub-Clause 1.18</p>



*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>above.</p> <p>1.19.2 Application of Sealer</p> <p>1.19.2.1 The sealing resin shall be a low viscosity polyester epoxy or acrylic polymer which shall be compatible with any proposed waterproofing system.</p> <p>1.19.2.2 The material shall be applied by pouring through a fine nozzle directly into the crack or into pre-formed dams.</p> <p>1.19.2.3 The injected crack shall be left undisturbed for a period of at least 24 hours to allow the resin to harden.</p> <p>1.19.2.4 When the resins are sufficiently cured the cracks and resin spillages shall be cleaned to the face of the concrete.</p>
1776AR	<p><b>1 Foamed Concrete Fill to Structures and Backfilling to Drainage Trenches</b></p> <p>1.1 Foamed concrete fill to arches or bridge decks shall be of density 1400 – 1600 kilograms per cubic metre. Minimum cement content shall be 350 kilograms per cubic metre. The maximum free water cement ratio shall be 0.4. The minimum compressive strength shall be eight newtons per square millimetre.</p> <p>1.2 Foamed concrete fill to drainage trenches shall comply with sub-Clause 1 above.</p>
1777AR	<p><b>1 Installation of Resin Anchored Reinforcement</b></p> <p>1.1 General</p> <p>1.1.1 Installation of resin anchored reinforcement into existing reinforced concrete shall utilise proprietary products, materials and methods suitable for highway works and for the conditions set out below.</p> <p>1.1.2 The Company shall consult and comply with the requirements of Transport Scotland with regard to all resin anchor systems. The Company shall provide the Scottish Ministers with completed Consultation Certificates in accordance with Part 5 of the New Works Requirements in respect of this requirement.</p> <p>1.1.3 The resin anchor system proposed shall be checked against the anchorage design to ensure that it is capable of resisting the design loads by means of testing. For the purposes of testing the test loading shall be the load calculated allowing for a 30 per cent increase above ULS design load and adjusted to allow group effects to be ignored.</p> <p>1.1.4 Site testing to verify the above loads is required and is specified in sub-Clause 1.2 below.</p> <p>1.1.5 Materials</p> <p>1.1.5.1 Resin adhesive grout for anchoring reinforcement shall be polyester or epoxy based and non-expansive. Grout shall be stable over the temperature range of –20 degrees Celsius to +40 degrees Celsius and be</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>resistant to mechanical and chemical degradation under normal service conditions.</p> <p>1.1.6 Workmanship</p> <p>1.1.6.1 Installation shall strictly follow the methods and working procedures specified by the proprietary product manufacturer. Adequate preparations shall be made to work involving resin grouting to avoid inconsistent results.</p> <p>1.1.6.2 Locations for the drilling of holes shall be determined by the design of the New Works. The design of the New Works shall ensure that locations can be adjusted within tolerances specified in the design of the New Works to avoid existing reinforcement. It shall be ensured that holes do not clash with existing buried reinforcement by using non-destructive test methods (e.g. cover meter) prior to commencement of drilling.</p> <p>1.1.6.3 Before and after drilling holes it shall be ensured that the existing concrete is sound, and that any significant defects such as loose fractures and voids are repaired. Any defective holes shall be repaired and not used. Alternative holes shall be re-drilled in new locations without affecting the design of the New Works.</p> <p>1.1.6.4 Holes shall be formed using rotary percussion drilling. The diameter and minimum depth shall be as required by the design of the New Works.</p> <p>1.1.6.5 After drilling, holes shall be free of all contaminants including dust and water before injecting grout. It shall be ensured that grout fills the hole entirely without air voids following insertion of the reinforcement, and that the reinforcement is fully coated by the grout. Excess grout shall be removed immediately.</p> <p>1.1.6.6 Reinforcement shall not be inserted or grout used after the gel time, and the completed installation shall not be disturbed until the grout is fully cured. Gel times and curing times as stated by the product manufacturer will depend on concrete temperature, therefore temperature shall be recorded during installation.</p> <p>1.2 Testing of Resin Anchored Reinforcement</p> <p>1.2.1 The adequacy of resin fixed reinforcement shall be verified by site testing. For each combination of bar size and embedment depth, 1 No. test shall be carried out for every 20 bars, subject to a minimum of 3 No. tests.</p> <p>1.2.2 A test rig equivalent to that shown in BS 5080 Part 1: 1993, Figure 3 shall be used. The test rig shall be capable of testing the anchor bars in situ.</p> <p>1.2.3 If, due to the shape code or spacings of the bars to be resin grouted into the deck, it is not possible to apply the test rig to a bar, the following procedure should be followed: A straight bar of the same type, diameter and embedment depth shall be tested as close to the scheduled test bar as is practical.</p> <p>1.2.4 The bars shall be capable of resisting the test loads given in sub-Clause 1.1.3 above.</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>1.2.5 A force sufficient to take up any slack in the apparatus, attachment and seating should be initially applied in accordance with BS 5080 Part 1: 1993. Readings taken at this stage will constitute the base from which subsequent relative movement shall be measured.</p> <p>1.2.6 Each tested anchor shall be loaded incrementally in tension in accordance with BS 5080 Part 1: 1993 up to the test load.</p> <p>1.2.7 Incremental loads shall be held for not less than half a minute and the test load for not less than five minutes.</p> <p>1.2.8 Readings shall be taken immediately after applying load and at the ends of the time intervals stated above.</p> <p>1.2.9 There should be no movement of the anchorage during the test and total movement should be no greater than the load / extension characteristics of the reinforcement bar being tested and the testing apparatus being used.</p> <p>1.2.10 Any evidence of slip during loading up to the test load, as demonstrated by a significant change in the slope of the load / extension curve, shall constitute a failure.</p> <p>1.2.11 Testing records shall be retained at the end of each testing day.</p>
1778AR	<p><b>1 Early Thermal cracking</b></p> <p>1.1 The Company 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.</p> <ul style="list-style-type: none"> <li>a) Peak temperature: 65 degrees Celsius</li> <li>b) Maximum temperature differential within a single pour: in accordance with Table 7.1 of CIRIA C660 for internal restraint, <math>R = 0.42</math>, 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. <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul> </li> </ul>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p><b>2 Early Thermal Cracking Trial Pours</b></p> <p>2.1 Early thermal cracking trial pours shall be performed in advance of construction for each proposed concrete mix subject to these 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.</p> <p>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.</p> <p>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.</p> <p>2.4 The following test data shall be recorded on the test certificate:</p> <ul style="list-style-type: none"> <li>a) Name and address of the test laboratory;</li> <li>b) Date and identification number of the test report;</li> <li>c) Name and address of the organisation responsible for the testing;</li> <li>d) Name and address of the concrete supplier;</li> <li>e) Date of arrival of the concrete;</li> <li>f) Composition of the concrete tested, including sources of materials;</li> <li>g) Purpose of the test;</li> <li>h) Test method;</li> <li>i) Any deviation from the test method;</li> <li>j) Name of the person who performed the test;</li> <li>k) Date of the test;</li> <li>l) Test results, including: <ul style="list-style-type: none"> <li>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;</li> <li>ii) The temperature rise; and</li> </ul> </li> <li>m) Date and signature.</li> </ul>
<b>2170AR</b>	<p><b>1 Permanent Works Bolts</b></p> <p>1.1 All Permanent Works bolts shall be vibration resistant.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text	
2171AR	1 1.1	<p><b>Bearing Replacement</b></p> <p>The design for the New Works shall allow for bearing replacement under the specified load conditions as indicated in the Structures Design Basis (Road Connections).</p>
2670AR	1 1.1 1.2 1.3 1.4 1.5 1.6	<p><b>Anti-Graffiti Coatings</b></p> <p>1.1 Anti-graffiti coatings shall be of the sacrificial type and shall be capable of being cleaned at least twice before re-coating is necessary</p> <p>1.2 The coating system shall be applied strictly in accordance with the manufacturer's written instructions.</p> <p>1.3 The application of the coating system shall not change the appearance of the substrate.</p> <p>1.4 Prior to application the surface shall be cleaned of all loose material oil grease dirt and existing graffiti. The surface shall be clean and dry before lightly abrading. All loose and flaking paintwork shall be feathered back to a sound edge. A suitable sealer / primer shall be applied to bare areas and areas of graffiti which resist cleaning and may present a problem by showing through the coating system unless sealed.</p> <p>1.5 The cleaning of the coating / removal of graffiti shall not have any detrimental effect on the substrate. Grit-blasting water jetting or the use of chemical cleaning agents likely to have long term effects on the substrate shall not be acceptable.</p> <p>1.6 Where an existing anti-graffiti coating system is of the type that requires grit-blasting water jetting or the use of chemical cleaning agents likely to affect the substrate then the Company shall consult and comply with the requirements of Transport Scotland (Contact: [REDACTED], Telephone: [REDACTED]) with regard to the methods proposed. The Company shall provide the Scottish Ministers with completed Consultation Certificates in accordance with Part 5 of the New Works Requirements in respect of this requirement.</p>
3270AR	1 1.1 1.1.1 1.1.2 1.1.3	<p><b>Incident Response</b></p> <p><b>Response Time</b></p> <p>1.1.1 The response time for attendance of the Company's initial and secondary incident response resources at the scene of an incident shall be as stated in Table 1 of Appendix 32/1, Schedule 4: Part 5.</p> <p>1.1.2 During the hours of 07.00 to 19.00 Monday to Friday the Company may use the personnel identified to respond to emergency requests for assistance on other operations or parts of the New Works in connection with this Agreement.</p> <p>1.1.3 The incident response personnel shall however be able to attend at the site of any incident on any part of the Land Made Available within the response time stated in Appendix 32/1, Schedule 4: Part 5.</p>

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*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

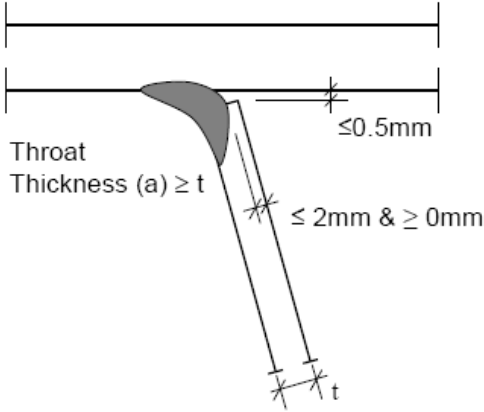
<b>Clause Number</b>	<b>Title and Written Text</b>
	1.2 <b>Resources for incident response operations</b> 1.2.1    Details of the types of resources that shall be made available by the Company to respond to incidents shall be as specified in Table 2 of Appendix 32/1, Schedule 4 Part 5.

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

**Substitute Clauses, Tables and Figures**

Clause Number	Title and Written Text
1801SR	<p><b>1 General</b></p> <p>1.1 All steelwork shall be in accordance with BS EN 1090-2:2008 and the Steel Bridge Group Model Project Specification (SCI Publication P382:2009), all as amended by Clauses 1802SR and 1803SR.</p>
1802SR	<p><b>1 Amendments to BS EN 1090-2:2008</b></p> <p>1.1 Delete section 5.6.10. Hot rivets are not permitted.</p> <p>1.2 Delete sections 10.1 and 10.2 and Annex F. Surface treatment to be in accordance with SHW Series 1900.</p>
1803SR	<p><b>1 Amendments to Steel Bridge Group Model Project Specification</b></p> <p>1.1 Insert in Section 4.101 “BS EN 1090-2 Execution of steel Structures and aluminium Structures Company to add further standards to Appendix 18/1”</p> <p>1.2 Replace Clause 4.201 with “A quality plan for the execution of the works, in accordance with NHSS 20, shall be provided and maintained.”</p> <p>1.3 Delete Clause 6.602. Hot rivets are not permitted.</p> <p>1.4 Insert in section 7.402 “Pre-production welding tests shall be carried out on complex weld configurations and highly fatigue sensitive details. These shall include but are not restricted to the trough to deck weld and the trough to transverse comb weld.”</p> <p>1.5 Replace Clause 7.505 with “Permanent backing material may only be used where the Designer has taken it into account including the joint classification for the backing material in the fatigue design and indicated it on the drawings for construction.”</p> <p>1.6 Replace Clause 8.203 with “The Structure shall not be designed to utilise the shear resistance of the unthreaded shank of bolts.”</p> <p>1.7 Delete Clause 8.701 and 8.702. Hot rivets are not permitted on this project.</p> <p>1.8 Delete Clauses 10.1, 10.2, 10.5, 10.6, 10.8 and 10.9. Surface treatment to be in accordance with SHW Series 1900.</p> <p>1.9 Replace 11.302 with, “In addition to the requirements in D.2, the following functional tolerances apply:</p>

Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement

Clause Number	Title and Written Text
	<p>a) Trough to deck plate weld:</p>  <p>The overall depth of a box section shall be within +/-5 millimetres of that shown on the drawings and within +/-3 millimetres of that of the adjacent section to which it will be joined.</p> <p>The overall width of a longitudinal girder box section shall be within +/-10 millimetres of that shown on the drawings and within +/-5 millimetres of that of the adjacent section to which it will be joined.</p> <p>1.10 Replace Clause 12.701 with,</p> <p>“Trial assembly</p> <p>a) Prior to the approval of fabricated steelwork sections trial assembly shall verify correct geometry once erected. Prior to commencement of the trial assembly the Company shall submit a plan describing the methods and procedures for measuring, recording, and controlling the geometry of the bridge deck. The procedure shall include methods for combining the survey results of each individual trial assembly to calculate and check the cumulative geometry of the complete bridge deck as trial assembly proceeds. Procedures for trial assembly shall be included in the Test plan for this part of the New Works.</p> <p>Trial assembly of bridge deck erection sections</p> <p>a) Each complete bridge deck erection section shall be trial assembled with its adjacent completed erection sections. The trial assembly may be a running trial assembly, in which at least two adjacent erection sections are aligned and temporarily held together, new erection sections being successively built on to one end of the assembly and complete welded-up erection sections removed from the other end. The assembly of a new erection section can be started before two adjacent completed erection sections are temporary held together.</p> <p>b) Each erection section shall be assembled by tack welding the components together while temporarily held to the adjacent erection section. When tack welding two components within one erection section the temperature difference between the two</p>



*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	<p>components shall not exceed two degrees Celsius. The components shall be adjusted until, with the erection sections in correct alignment, a correct fit-up is obtained at the longitudinal butt welds within the section and at the peripheral erection weld with the adjacent erection section. Accurate alignment of the stiffeners around the erection welds shall also be obtained.</p> <p>c) Trial assembly shall only take place during temperature conditions where the temperature difference between the deck and bottom panels is less than +/-2 degrees Celsius. Correlation to the reference temperature shall be made if the temperature during trial assembly deviates from the reference temperature. Precautions shall be taken to overcome the effects of differential temperature during assembly, so that the required tolerances are satisfied.</p> <p>d) During trial assembly the support conditions of the erection sections shall resemble the support conditions for the erection sections during erection. Thereby the deformed shape of the erection sections will resemble each other in the two situations. Hence a match between adjacent erection sections is established during trial assembly that later can be re-established on the bridge site. The centre of gravity shall be determined for all deck erection sections and the support reactions shall be measured for all deck erection sections. The Company shall survey and record the geometry of each trial assembly and thereby determine deviations in geometry on single sections and accumulated deviations. The survey shall be carried out using the same survey points. The survey results of each individual trial assembly shall be combined to calculate and check the cumulative geometry of the completed bridge deck assembly relative to the design vertical alignment as trial assembly proceeds.</p> <p>e) The level and profile of deck plates, which form the roadway deck, shall be checked and adjusted if necessary to bring them within tolerances.</p> <p>f) Before completed erection sections are separated, all necessary temporary connections shall be carefully positioned and welded to each section in order to ensure accurate alignment after erection. These connections shall be designed to withstand all forces which are liable to occur during erection.</p> <p>1.11 Delete Clause 12.706.</p> <p>1.12 Delete Annex F. Corrosion protection to be in accordance with SHW Series 1900.</p> <p>1.13 The Company shall complete the following Clauses by providing details in Appendix 18/1: 5.101, 5.307, 5.606, 6.501, 5.901, 6.604, 6.606, 6.1001, 7.501, 7.506, 7.508, 7.510, 7.602, 7.603, 8.204, 8.901, 8.902, 9.301, 9.302, 9.303,</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

Clause Number	Title and Written Text
	9.304, 9.401, 12.201, 12.401, 1 .504, 12.704, 12.707
2101SR	<p><b>1 Bridge Bearings – General</b></p> <p>1.1 Unless otherwise described in Appendix 21/1, bearings shall be supplied and installed in compliance with BS EN 1337 "Structural bearings" consisting of the following parts:</p> <ul style="list-style-type: none"> <li>a) Part 1 - General design rules</li> <li>b) Part 2 - Sliding elements</li> <li>c) Part 3 - Elastomeric bearings</li> <li>d) Part 4 - Roller bearings</li> <li>e) Part 5 - Pot bearings</li> <li>f) Part 6 - Rocker bearings</li> <li>g) Part 7 - Spherical and cylindrical PTFE bearings</li> <li>h) Part 8 – Guided and restrained bearings</li> <li>i) Part 9 - Protection</li> <li>j) Part 10 - Inspection and maintenance</li> <li>k) Part 11 - Transport, storage and installation</li> </ul> <p>excluding subsections relating to corrosion protection which is covered under Series 1900.</p>

*Appendix 0/1: Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to This Agreement*

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

**List of SUBSTITUTE Clauses, Tables and Figures**

<b>Clause Number</b>	<b>Title</b>	<b>Written on Page Number following</b>
None		

**List of CANCELLED Clauses, Tables and Figures**

<b>Clause Number</b>	<b>Title</b>
<b>Series NG 1800</b>	Structural Steelwork
<b>Series NG 2100</b>	Bridge Bearings
<b>Series NG 2200</b>	Parapets

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

<b>Clause Number</b>	<b>Title and Written Text</b>	<b>Page Number</b>
<b>104</b>	Standards, Quality Assurance, Agrément Certificates and Other Approvals	
<b>121</b>	Tidal, Flowing and Standing Water	
<b>201</b>	Clearing	
<b>306</b>	Fencing and Environmental Barriers	
<b>920</b>	Bond Coats, Tack Coats and other Bituminous Sprays	
<b>942</b>	Thin Wearing Course Systems	
<b>1404</b>	Change of Lighting Arrangements	
<b>1416</b>	Cut Outs, Fuse Holders, Fuses and Miniature Circuit Breakers	
<b>1601</b>	General requirements for Piling and Embedded Retaining Walls	
<b>1702.2</b>	Concrete – Constituent Materials	
<b>1711</b>	Concrete – Grouting and Duct Systems for Post-tensioned Tendons	
<b>1714</b>	Reinforcement – Fixing	
<b>Table 19/1</b>	BD 35 Quality Assurance Scheme for Paints and Similar Protective Coatings Annex A Manual of Paints for Structural Steelwork Current Paint Item Numbers	74
<b>Table 19/2A</b>	Requirements for Bridges, Parapets and Other Highway Structures Except Bearings, CCTV Masts, Cantilever Masts and Steel Lighting Columns and Bracket Arms Surface	74

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text	Page Number
	Preparation and Protective Systems.	
<b>Table 19/2B</b>	Requirements for Bridges, Parapets and Other Highway Structures Except Bearings, CCTV Masts, Cantilever Masts and Steel Lighting Columns and Bracket Arms Protective Systems	
<b>Table 19/3B</b>	Requirements for Steel in Bridge Bearings (and Metal Coated Fasteners) Protective System Type V	
<b>2001</b>	General	
<b>2006</b>	Workmanship for Waterproofing Below Ground Concrete Surfaces	
<b>2007</b>	Integrity Testing of Concrete Bridge Deck Waterproofing	
<b>2606</b>	Cored Thermoplastic Node Markers	
<b>3009</b>	Establishment Maintenance for Planting	

Clause Number	Title and Written Text
<b>104</b>	<p><b>1 Standards, Quality Assurance, Agrément Certificates and Other Approvals</b></p> <p>1.1. Sub-Clause 2, line 3 Delete “BS EN ISO 9002” and insert “BS EN ISO 9001 or BS EN ISO 9002 where appropriate and BS EN ISO 14001:1996 (Environmental Management Systems)”.</p> <p>1.2 Sub-Clause 7, line 3 Delete “BS EN ISO 9002” and insert “BS EN ISO 9001 or BS EN ISO 9002 where appropriate and BS EN ISO 14001:1996 (Environmental Management Systems)”.</p>
<b>121</b>	<p><b>1 Tidal, Flowing and Standing Water</b></p> <p>1.1 Add at end of Clause: Notwithstanding any other provisions of this Agreement, the Company</p>

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text
	shall take adequate precautions to prevent the damage and pollution of streams, waterways and water courses and shall indemnify the Scottish Minister against all claims arising from any such pollution caused by virtue of the operation during the currency of this Agreement. The Company shall make good any unnecessary damage to streams, waterways and watercourse at his own expense.
201	<p><b>1 Clearing</b></p> <p>1.1 Delete Sub-Clause 3 and insert new Sub-Clause 3:</p> <p>Disused chambers located under the road pavement, verge or central reserve 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 76 millimetre diameter (minimum) shall be made at 500 millimetre centres over the whole areas or over 10 per cent of the whole area (whichever is more onerous), of slabs basements etc., which are not removed and which are liable to hold water.</p>
306	<p><b>1 Fencing and Environmental Barriers</b></p> <p>1.1 Sub-Clause 2, second line: Delete "four" and replace it with "five".</p>
920	<p><b>1 Bond Coats, Tack Coats and other Bituminous Sprays</b></p> <p>1.1 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 Quality Plans and method statements appropriate to the project shall be submitted to the Scottish Ministers for approval."</p>
942	<p><b>1 Thin Wearing Course Systems</b></p> <p>1.1 Sub-Clause 14: Delete "for a period of two years" and insert "for a period of five years".</p>
1404	<p><b>1 Change of Lighting Arrangements</b></p> <p>1.1 Insert "written" between "prior" and "approval".</p>
1416	<p><b>1 Cut Outs, Fuse Holders, Fuses and Miniature Circuit Breakers</b></p> <p>1.1 At end of the Clause and following the additions to the Clause in Appendix</p>

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text
	<p>0/5 add the following:</p> <p>(16) Design, execution and completion of the New Works shall ensure that in normal use the unit shall function in a reliable manner and cause no danger to persons or surroundings. Construction shall be such that the unit shall resist mechanical damage when used under specified service conditions.</p> <p>The unit shall be impact resistant and shall be constructed such that it cannot readily be deformed allowing contact with live parts.</p> <p>The unit shall provide ease of access to allow electrical termination works to be carried out and also provide a positive location arrangement between separable parts.</p> <p>Any separable parts which allow access to live terminations shall be held together by slot headed bolts or screws, with lock washer.</p> <p>A removable insulating shroud shall be installed with the unit, covering all line conductors.</p> <p>(17) Creepage distances and Clearances: Shall be not less than the values given in Table 1, Clause 9, Section 2 of BS 5733.</p>
1601	<p><b>1 General Requirements for Piling and Embedded Retaining Walls</b></p> <p>1.1 Add to end of item 27.</p> <p>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.</p>
1702.2	<p><b>1 Concrete – Constituent Materials</b></p> <p>1.1 Add at the end of Clause</p> <p>The minimum testing frequency for drying shrinkage testing, as required by 4.3 of BS8500-2: 2006 shall be in accordance with table 3 of BS812: Part 120: 1989.</p>

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**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

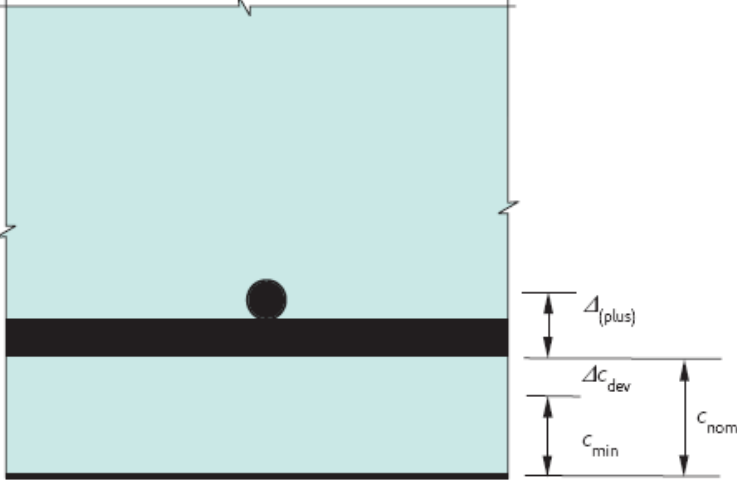
**Minor Alterations to Existing Clauses**

<b>Clause Number</b>	<b>Title and Written Text</b>
1711	<p><b>1 Concrete – Grouting and Duct Systems for Post-tensioned Tendons</b></p> <p>1.1 Add at end of Section 9</p> <p>The tests indicated in BS EN 446:2007 and TR447:2007 for Inspection Class 3 may be carried in place of those described in TR 47. However a sedimentation test shall be provided for initial type testing of grout.</p> <p>1.2 Add at end of Section 10</p> <p>11. Post tensioning systems</p> <p>In addition to the requirements above, the recommendations according to ETAG 013 must be adopted.</p>



**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text								
1714	<p><b>1 Reinforcement – Fixing</b></p> <p>1.1 At the end of sub-Clause 1 add the following: The cover survey shall be carried out by the use of an electronic covermeter with a facility for downloading to a computer. The results shall be included in the bridge maintenance manual.</p> <p>1.2 Delete the first paragraph of Sub-Clause 1714.1 and replace with the following: Reinforcement shall be secured against displacement. Unless specified otherwise, the actual concrete achieved cover shall be not less than the required minimum cover derived from the exposure class Tables in BS 8500-1, and including any allowance for longer durability required under Clause A5 of BS 8500-1. The maximum achieved cover shall not be more than the nominal cover as defined in BS 8500-1, including the stated fixing tolerance <math>\Delta c</math> plus an additional tolerance away from the concrete surface <math>\Delta</math>(plus) the value of which shall be as described below:</p>  <p><b>Notes</b></p> <ul style="list-style-type: none"> <li><math>c_{min}</math> = Minimum cover</li> <li><math>\Delta c_{dev}</math> = Allowance made in design for deviation (towards face of concrete)</li> <li><math>c_{nom}</math> = <math>c_{min} + \Delta c_{dev}</math> = nominal cover</li> <li><math>\Delta_{(plus)}</math> = Permitted deviation (away from face of concrete) – see below</li> <li><math>h</math> = Height of cross-section</li> </ul> <table border="1" data-bbox="568 1861 1279 2042"> <thead> <tr> <th>Cross-section dimension</th> <th><math>\Delta_{(plus)}</math> (mm)</th> </tr> </thead> <tbody> <tr> <td><math>h \leq 150</math></td> <td>10</td> </tr> <tr> <td><math>150 &lt; h &lt; 2500</math></td> <td>15</td> </tr> <tr> <td><math>h \geq 2500</math></td> <td>20</td> </tr> </tbody> </table>	Cross-section dimension	$\Delta_{(plus)}$ (mm)	$h \leq 150$	10	$150 < h < 2500$	15	$h \geq 2500$	20
Cross-section dimension	$\Delta_{(plus)}$ (mm)								
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$150 < h < 2500$	15								
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**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text																																																	
Table 19/1	<p><b>1 BD 35 Quality Assurance Scheme for Paints and Similar Protective Coatings Annex A Manual of Paints for Structural Steelwork Current Paint Item Numbers</b></p> <p>1.1 Add the following to Table 19/1</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Description</th> <th>Coat Type</th> <th>Build</th> <th>Applied By</th> </tr> </thead> <tbody> <tr> <td>109</td> <td>Zinc-rich epoxy</td> <td>Blast Primer</td> <td>NB</td> <td>B or AS (B to small areas only)</td> </tr> </tbody> </table>									Item	Description	Coat Type	Build	Applied By	109	Zinc-rich epoxy	Blast Primer	NB	B or AS (B to small areas only)																															
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Table 19/2A	<p><b>1 Requirements for Bridges, Parapets and Other Highway Structures Except Bearings, CCTV Masts, Cantilever Masts and Steel Lighting Columns and Bracket Arms Surface Preparation and Protective Systems</b></p> <p>1.1 Remove references to “I for Ready Access” and replace “II for difficult access” with “IIa or IIb for difficult access”.</p> <p>1.2 Replace aluminium metal spray protective system required for Area C with Item 109 or 110.</p>																																																	
Table 19/2B	<p><b>1 Requirements for Bridges, Parapets and Other Highway Structures Except Bearings, CCTV Masts, Cantilever Masts and Steel Lighting Columns and Bracket Arms Protective Systems</b></p> <p>1.1 Replace the standard Type II system with:</p> <table border="1"> <thead> <tr> <th>Type</th> <th></th> <th>Metal Coating</th> <th>1st Coat</th> <th>2nd Coat</th> <th>3rd Coat</th> <th>4th Coat</th> <th>5th Coat</th> <th>Minimum total dry film thickness of the paint system (microns)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">IIa</td> <td>Item No</td> <td></td> <td>109</td> <td>112 or 162</td> <td>112 or 162</td> <td>169</td> <td>169 or 164*</td> <td rowspan="2">400 or 390</td> </tr> <tr> <td>Minimum dry film thickness (µm)</td> <td></td> <td>50</td> <td>125</td> <td>125</td> <td>50</td> <td>50 or 40</td> </tr> <tr> <td rowspan="2">IIb</td> <td>Item No</td> <td></td> <td>110</td> <td>123</td> <td>169 or 164</td> <td>169 or 164*</td> <td></td> <td rowspan="2">525 or 515</td> </tr> <tr> <td>Minimum dry film thickness (µm)</td> <td></td> <td></td> <td></td> <td>50 or 40</td> <td>50 or 40</td> <td></td> </tr> </tbody> </table>									Type		Metal Coating	1st Coat	2nd Coat	3rd Coat	4th Coat	5th Coat	Minimum total dry film thickness of the paint system (microns)	IIa	Item No		109	112 or 162	112 or 162	169	169 or 164*	400 or 390	Minimum dry film thickness (µm)		50	125	125	50	50 or 40	IIb	Item No		110	123	169 or 164	169 or 164*		525 or 515	Minimum dry film thickness (µm)				50 or 40	50 or 40	
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<p>* On all externally exposed surfaces on the steel bridge deck the final finish coat of 50 (item number 169) or 40 (item number 164) microns shall be applied on site to ensure colour continuity. The final finish coat shall be applied using a minimum number of paint manufacturing batches applied in a controlled pattern.</p>																																																		

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text																																								
	** Applicable only for Area E and painted areas damaged during erection.																																								
<b>Table 19/3B</b>	<p><b>1 Requirements for Steel in Bridge Bearings (and Metal Coated Fasteners) Protective System Type V</b></p> <p>1.1 Replace Areas A, B, C and D with:</p> <table border="1" data-bbox="395 712 1444 1187"> <thead> <tr> <th data-bbox="395 712 517 875">Applied over</th> <th data-bbox="517 712 695 875"></th> <th data-bbox="695 712 836 875">Metal Coating</th> <th data-bbox="836 712 948 875">1st Coat</th> <th data-bbox="948 712 1043 875">2nd Coat</th> <th data-bbox="1043 712 1155 875">3rd Coat</th> <th data-bbox="1155 712 1267 875">4th Coat</th> <th data-bbox="1267 712 1444 875">Minimum total dry film thickness of the paint system (microns)</th> </tr> </thead> <tbody> <tr> <td data-bbox="395 875 517 1010">Area A and D</td> <td data-bbox="517 875 695 913">Item No</td> <td data-bbox="695 875 836 913"></td> <td data-bbox="836 875 948 913">109</td> <td data-bbox="948 875 1043 913">112</td> <td data-bbox="1043 875 1155 913">112</td> <td data-bbox="1155 875 1267 913">168</td> <td data-bbox="1267 875 1444 913">350</td> </tr> <tr> <td data-bbox="395 913 517 1010"></td> <td data-bbox="517 913 695 1010">Minimum dry film thickness (µm)</td> <td data-bbox="695 913 836 1010"></td> <td data-bbox="836 913 948 1010">50</td> <td data-bbox="948 913 1043 1010">125</td> <td data-bbox="1043 913 1155 1010">125</td> <td data-bbox="1155 913 1267 1010">50</td> <td data-bbox="1267 913 1444 1010"></td> </tr> <tr> <td data-bbox="395 1010 517 1187">Area C</td> <td data-bbox="517 1010 695 1048">Item No</td> <td data-bbox="695 1010 836 1048"></td> <td data-bbox="836 1010 948 1048">109</td> <td data-bbox="948 1010 1043 1048">112</td> <td data-bbox="1043 1010 1155 1048">112</td> <td data-bbox="1155 1010 1267 1048">168</td> <td data-bbox="1267 1010 1444 1048">350</td> </tr> <tr> <td data-bbox="395 1048 517 1187"></td> <td data-bbox="517 1048 695 1187">Minimum dry film thickness (µm)</td> <td data-bbox="695 1048 836 1187"></td> <td data-bbox="836 1048 948 1187">50</td> <td data-bbox="948 1048 1043 1187">125</td> <td data-bbox="1043 1048 1155 1187">125</td> <td data-bbox="1155 1048 1267 1187">50</td> <td data-bbox="1267 1048 1444 1187"></td> </tr> </tbody> </table>	Applied over		Metal Coating	1st Coat	2nd Coat	3rd Coat	4th Coat	Minimum total dry film thickness of the paint system (microns)	Area A and D	Item No		109	112	112	168	350		Minimum dry film thickness (µm)		50	125	125	50		Area C	Item No		109	112	112	168	350		Minimum dry film thickness (µm)		50	125	125	50	
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<b>2001</b>	<p><b>1 General</b></p> <p>1.1 At end of Sub-Clause 1 add the following:</p> <p>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.</p>																																								
<b>2006</b>	<p><b>1 Workmanship for Waterproofing Below Ground Concrete Surfaces</b></p> <p>1.1 At end of Sub-Clause 3 add the following:</p> <p>The waterproofing shall be applied strictly in accordance with the manufacturer's written instructions at the recommended rate of application.</p> <p>1.2 At end of Sub-Clause 4 add the following:</p> <p>Details of the proprietary system shall be submitted for the approval of the Scottish Ministers prior to the inclusion in the New Works.</p>																																								
<b>2007</b>	<p><b>1 Integrity Testing of Concrete Bridge Deck Waterproofing</b></p> <p>1.1 Testing of Waterproofing Membrane</p> <p>At end of Sub-Clause 1 add the following:</p> <p>The Company shall provide with all batches of material delivered to the Site a Certificate of Compliance with the Specification and Annex A.</p> <p>The Company shall provide 2 No free film samples, sprayed on to open</p>																																								

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text
	<p>moulds (at least 200 millimetres x 200 millimetres in area and minimum thickness two millimetres), for tensile strength, elongation at break to BS 903, Part A2 and tear strength to BS 903, Part 3A, Method C. The Company shall supply the Scottish Ministers with copies of the test results with the samples.</p> <p>A membrane can be applied to the surface of concrete slabs between 14 to 17 days after casting provided no water was added to the surface of the concrete during cure.</p> <p>The Company shall continuously monitor the coverage rate of the material applied to the deck and shall provide the Scottish Ministers with sheets on a daily basis showing the start / finish weights and area covered for each period of spray operation.</p> <p>The Company shall continuously monitor the wet film thickness using a gauge pin or a standard comb type thickness gauge. The Company shall provide the Scottish Ministers with sheets on a daily basis indicating the wet film thickness measured and location.</p> <p>The Company shall measure the adhesion of the fully cured membrane to the deck using Elcometer Adhesion Tester Model 106 or similar. Three tests shall be required per 500 square metres of sprayed membrane. The Company shall provide the Scottish Ministers with the test values and location of test before these areas are covered. The Company shall reinstate the test areas including primer if necessary. Test values below 0.7 newton / square millimetre shall require spraying operations to be suspended while further investigation is undertaken. The Company shall at his own expense remove and respray areas that do not meet this figure.</p> <p>The finished waterproof membrane surface shall be 'Holiday Tested' or tested by an equivalent method approved in writing by the Overseeing Organisation and any imperfections detected shall be rectified by the Company at his own expense. The Company shall make allowance in his programme of Works for such testing.</p> <p><b>High Voltage Pinhole / Holiday Detection for Bridge Deck Membranes Equipment</b></p> <p>Pinhole detection shall be carried out using suitable equipment and the results made available to the Scottish Ministers. The equipment shall have the following facilities:</p> <ul style="list-style-type: none"> <li>(a) variable DC test voltage (1 - 20 kilovolts DC);</li> <li>(b) audible and visual alarm signals;</li> <li>(c) sensitivity adjustment;</li> <li>(d) phosphor bronze or silicon rubber electrode;</li> <li>(e) earth lead connection with clip; and</li> </ul>

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text						
	<p>(f) test voltage.</p> <p>The output voltage of the pinhole detector shall be adjusted in accordance with the following table.</p> <table border="0"> <thead> <tr> <th data-bbox="491 645 810 678"><b>COATING THICKNESS</b></th> <th data-bbox="970 645 1201 678"><b>TEST VOLTAGE</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="491 696 895 730">2 millimetres to 2.5 millimetres</td> <td data-bbox="970 696 1145 730">12.5 kilovolts</td> </tr> <tr> <td data-bbox="491 748 895 781">2.5 millimetres to 3 millimetres</td> <td data-bbox="970 748 1145 781">13.5 kilovolts</td> </tr> </tbody> </table> <p>The coating thickness is the maximum expected not the average.</p> <p><b>Procedure</b></p> <p>(a) Identify a site on the bridge deck to which the earth lead connection from the pinhole detector can be fixed, i.e. a metal object imbedded in the bridge deck.</p> <p>(b) Connect the leads from the pinhole detector in accordance with the manufacturer's written instructions.</p> <p>(c) Fix the earth lead from the pinhole detector to the substrate and ensure that a good electrical contact is made.</p> <p>(d) Adjust the pinhole detector to the required test voltage in accordance with Sub-Clause (a) above.</p> <p>(e) With the pinhole detector turned OFF, connect any extension rods that may be required to the test probe handle. Connect the electrode to the end of the extension rods if fitted. A damaged electrode that does not make 100 per cent contact along its length shall not be used.</p> <p>(f) To check the pinhole detector is working correctly, touch the electrode onto the exposed substrate. The pinhole detectors alarm signal should be activated. If not, check the lead connections to the equipment and the earth lead to the substrate, also it may be necessary to adjust the sensitivity control on the equipment.</p> <p>(g) Pass the electrode over the coated surface at a maximum rate of 100 millimetres / second, paying particular attention to edges, holes and visible irregularities in the coating. The test voltage will have to be reduced if testing edges as the coating will be thin.</p> <p>(h) When a fault has been identified by the detector, the electrode shall be moved sideways in order to identify its precise location. Subsequently the fault should be ringed with a suitable marker. Such markings shall be made sufficiently distant from the coating defect to allow the repair procedure to be carried out without detriment to the adhesion of the repair material.</p> <p>(i) Continue testing and marking defects until all the coating has been tested, changing the electrode size as necessary.</p>	<b>COATING THICKNESS</b>	<b>TEST VOLTAGE</b>	2 millimetres to 2.5 millimetres	12.5 kilovolts	2.5 millimetres to 3 millimetres	13.5 kilovolts
<b>COATING THICKNESS</b>	<b>TEST VOLTAGE</b>						
2 millimetres to 2.5 millimetres	12.5 kilovolts						
2.5 millimetres to 3 millimetres	13.5 kilovolts						

**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

Clause Number	Title and Written Text
	All repaired areas shall be re-tested.
2606	<p><b>1 Cored Thermoplastic Node Markers</b></p> <p>1.1 Sub-Clause 2(i), Line 1: Delete “10 millimetres ±5 millimetres” and replace with “20 millimetres”</p> <p>1.2 At end of Clause add the following: Notwithstanding any other requirements of this Agreement, record drawings of the chart node locations at a scale of 1:500 shall be provided to the Scottish Ministers within seven days of the completion date stated within the Taking-Over Certificate for Section B issued by the Scottish Ministers pursuant to Sub Clause 10.1 of the Conditions. The record drawings shall locate the chart nodes as a series of dimensions from carriageway features. The local and national grid co-ordinates of all chart nodes shall be detailed on the record drawings.</p>
3009	<p><b>1 Establishment Maintenance for Planting</b></p> <p>1.1 Delete Sub-Clause 9 and insert: 9. Plant circles shall be defined as the area within 250 millimetre radius of an individual tree or shrub, within which weed control operations are carried out.</p>

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**Appendix 0/2: Minor Alterations to Existing Clauses, Tables and Figures Specific to This Agreement**

**Minor Alterations to Existing Clauses**

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

**LIST OF MINOR ALTERATIONS TO EXISTING CLAUSES**

<b>Clause Number</b>	<b>Alteration to be made</b>	<b>Written on Page Number</b>
None		

**MINOR ALTERATIONS TO EXISTING CLAUSES**

<b>Clause Number</b>	<b>Alteration to be made</b>
None	

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

**1 Appendix 0/3**

- 1.1 Appendix 0/3 is comprised of two lists, A and B, of numbered Appendices as follows:
- 1.2 List A is a complete list of the numbered Appendices referred to in the Specification with those not adopted marked "Not Used".
- 1.3 The responsibility for compiling/completing the numbered Appendices is indicated by the following symbols:
- E The Scottish Ministers compiles
  - E/C The Scottish Ministers partially compiles and the Company completes and returns to the Scottish Ministers.
  - C The Company compiles, completes and returns to the Scottish Ministers.
  - I For Company's information only
  - (P) This indicates the Appendix is a national proforma and the format shall not be altered.
  - T The Participant compiles, completes and returns with Tender.
- 1.4 The Company shall compile/complete the numbered Appendices in accordance with the Notes for Guidance on the Specification for Highway Works (Volume 2 of the MCHW), and provide as a minimum the information described in the sample appendices.
- 1.5 List B is not used.

**List A**

<b>Compiled/ Completed by</b>	<b>Appendix Number</b>	<b>Title</b>
<b>Introduction</b>		
E	0/1	Additional, Substitute and Cancelled Clauses, Tables and Figures specific to this Agreement
E	0/2	Minor Alterations to Existing Clauses, Tables and Figures specific to this Agreement
E	0/3	List of Numbered Appendices Referred to in the Specification and Included in this Agreement
E	0/4	List of Drawings Included in this Agreement
E	0/5	Special National Alterations of Scottish Ministers of Scotland
<b>Preliminaries</b>		
E	1/1	Temporary Accommodation and Equipment for the Scottish Ministers
E	1/2	Vehicles for the Scottish Ministers
E	1/3	Communication System for the Scottish Ministers
C	1/4	Working and Fabrication Drawings
E/C	1/5	Testing to be Carried out by the Company



**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

Compiled/ Completed by	Appendix Number	Title
<b>Preliminaries continued</b>		
E	1/6	Supply and Delivery of Samples to the Scottish Ministers
E	1/7	Site Extent and Limitations on Use
E	1/8	Operatives for the Scottish Ministers
E	1/9	Control of Noise and Vibration
Not Used	1/10	Structures to be Designed by the Company
Not Used	1/11	Structural Elements and Other Features to be Designed by the Company
E	1/12	Setting Out and Existing Ground Levels
E/C	1/13	Programme of New Works
Not Used	1/14	Monthly Statements
E	1/15	Accommodation Works
E/C	1/16	Privately and Publicly Owned Services and Supplies
E/C	1/17	Traffic Safety and Management
E	1/18	Temporary Diversion for Traffic
E	1/19	Routeing of Vehicles
E	1/20	Recovery Vehicles for Breakdowns
E	1/21	Information Boards
E	1/22	Progress Photographs
E/C	1/23	Substances Hazardous to Health
E/C	1/24	Quality Management System
C	1/25	Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic
E/C	1/26	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)
E/C	1/27	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements
<b>Site Clearance</b>		
E/C	2/1	List of Buildings, etc. to be Demolished
C	2/2	Filling of Trenches and Pipes
C	2/3	Retention of Material Arising from Site Clearance

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Site Clearances continued</b>		
E/C	2/4	Explosives and Blasting
E/C	2/5	Hazardous Materials
<b>Fencing and Environmental Barriers</b>		
C	3/1	Fencing, Gates and Stiles
C	3/70	Environmental Barriers
<b>Road Restraint Systems (Vehicle and Pedestrian)</b>		
C	4/1	Road Restraint Systems (Vehicle and Pedestrian)
E/C	4/2	Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, BS EN 1317-3 and DD ENV 1317-4: 2002
<b>Drainage and Service Ducts</b>		
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
<b>Earthworks</b>		
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 Material
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
C	6/9	Earthworks Environmental Bunds, Landscape Areas, Strengthened Embankments

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Earthworks continued</b>		
E/C	6/10	Ground Anchorages, Crib Walling and Gabions
E/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
<b>Road Pavements - General</b>		
T/C	7/1	Permitted Pavement Options
C	7/2	Excavation, Trimming and Reinstatement of Existing Surfaces
C	7/3	Surface Dressing – Performance Specification
C	7/4	Bond Coats, Tack Coats and Other Bituminous Sprays
C	7/5	In Situ Recycling: The Remix and Repave Processes
C	7/6	Breaking Up or Perforation of Existing Pavement
C	7/7	Slurry Surfacing Incorporating Microsurfacing
C	7/8	Not Used
C	7/9	Not Used
C	7/10	Worksheet Pro Forma for Results of Testing for Constituent Materials in Recycled Coarse Aggregate and Recycled Concrete Aggregate
C	7/11	Overbanding and Inlaid Crack Sealing Systems
C	7/12	Arrester Beds
C	7/13	Saw-Cut and Seal Bituminous Overlays on Existing Jointed Concrete Pavements
C	7/14	Preparation of Jointed Concrete Pavements Prior to Overlaying and Saw-Cut and Seal of the Bituminous Overlay
C	7/15	Not Used
C	7/16	Cracking and Sealing of Existing Jointed Unreinforced Concrete Pavements and CBM Bases
C	7/17	Cracking Plant and Equipment Progress Record
C	7/18	Site Specific Details and Requirements for Cold Recycled Bitumen Bound Material

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Road Pavements General continued</b>		
C	7/19	Site Specific Details and Requirements for Recycled Cement Bound Material
C	7/20	Site Specific Details and Requirements for Inducing Cracks
C	7/21	Surface Dressing – Recipe Specification
C	7/22	Repair to Potholes
<b>Road Pavements – Concrete and Cement Bound Materials</b>		
C	10/1	Plant and Equipment for the Construction of Exposed Aggregate Concrete Surface
<b>Kerbs, Footways and Paved Areas</b>		
C	11/1	Kerbs, Footways and Paved Areas
C	11/2	Access Steps
<b>Traffic Signs</b>		
E/C	12/1	Traffic Signs: General
E/C	12/2	Traffic Signs: Marker Posts
E/C	12/3	Traffic Signs: Road Markings and Studs
C	12/4	Traffic Signs: Cones, Cylinders, FTDs and Other Traffic Delineators
E/C	12/5	Traffic Signs: Traffic Signals
C	12/6	Traffic Signs: Special Sign Requirements on Gantries
<b>Road Lighting Columns and Brackets</b>		
C	13/1	Information to be Provided When Specifying Lighting Columns and Brackets
C/P	13/2	(Specification for Highway Works) Typical Lighting Column and Bracket Data Sheets 1 and 2
C/P	13/3	Instructions for Completion of Column and Bracket Data Sheets
C	13/4	Information to be Provided When Specifying CCTV Masts
C	13/5	(Specification for Highway Works) Typical CCTV Mast Data Sheet
C/P	13/6	Instructions for Completion of CCTV Mast Sheets
C	13/7	Information to be Provided When Specifying Cantilever Masts
C/P	13/8	(Specification for Highway Works) Typical Cantilever Masts Data Sheets 1 and 2
C/P	13/9	Instructions for Completion of Cantilever Masts Data Sheets

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Electrical Work for Road Lighting and Traffic Signs</b>		
C	14/1	Site Records
C	14/2	Location of Lighting Units & Feeder Pillars
C	14/3	Temporary Lighting
C	14/4	Electrical Equipment for Road Lighting
C	14/5	Electrical Equipment for Traffic Signs
<b>Motorway Communications</b>		
C	15/1	Motorway Communications
C	15/2	Cable Duct Requirements
<b>Piling and Embedded Retaining Walls</b>		
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 Through Hollow Auger Stems
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

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Structural Concrete</b>		
C	17/1	Concrete - Classification of Mixes
C	17/2	Concrete - Impregnation Schedule
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
<b>Structural Steelwork</b>		
C	18/1	Requirements for Structural Steelwork
<b>Protection of Steelwork Against Corrosion</b>		
C	19/1	(Specification for Highway Works) Form HA/P1 Paint System Sheet
C	19/2	(Specification for Highway Works) Requirements for Other Works
C	19/3	(Specification for Highway Works) Form HA/P2 Paint Data Sheet
C	19/4	(Specification for Highway Works) Form SEDD/P3 Paint Sample Despatch List, Sheets 1 and 2
C	19/5	General Requirements
<b>Waterproofing for Structures</b>		
C	20/1	Waterproofing for Concrete Structures
<b>Bridge Bearings</b>		
C	21/1	Bridge Bearing Schedule
<b>Bridge Expansion Joints and Sealing of Gaps</b>		
C	23/1	Bridge Deck Expansion Joint Schedule
C	23/2	Sealing of Gaps Schedule (Other than in Bridge Deck Expansion Joints)
<b>Brickwork, Blockwork and Stonework</b>		
C	24/1	Brickwork, Blockwork and Stonework

**Appendix 0/3: List of Numbered Appendices Referred to in the Specification and Included in This Agreement**

<b>Special Structures</b>		
C	25/1	Requirements for Corrugated Steel Buried Structures
C	25/2	Requirements for Reinforced Soil and Anchored Earth Structures
C	25/3	Requirements for Pocket-Type and Grouted-Cavity Reinforced Brickwork Retaining Wall Structures
C	25/4	Environmental Barriers
C	25/5	Requirements for Buried Rigid Pipes for Drainage Structures
<b>Miscellaneous</b>		
C	26/1	Ancillary Concrete
C	26/2	Bedding Mortar
C	26/3	Cored Thermoplastic Node Markers
<b>Landscape and Ecology</b>		
E/C	30/1	General
E	30/2	Weed Control
E	30/3	Control of Rabbits and Deer
E	30/4	Ground Preparation
E	30/5	Grass Seeding, Wildflower Seeding and Turfing
E	30/6	Planting Sheets 1 and 2
E/C	30/7	Grass, Bulbs and Wildflower Maintenance
E	30/8	Watering
E	30/9	Establishment Maintenance for Planting
E	30/10	Maintenance of Established Trees and Shrubs
E	30/11	Management of Waterbodies
E	30/12	Special Ecological Measures
<b>Maintenance Painting of Steelwork</b>		
C	50/1	(Specification for Highway Works) Form (HA/P1 (Maintenance) Paint System Sheet
C	50/2	Requirements for Other Work
C	50/3	(Specification for Highway Works) Form HA/P2 Paint Data Sheet
C	50/4SE	Form SEDD/P3 Paint Sample Despatch List
C	50/5	General Requirements

**Appendix 0/4: List of Drawings for the New Works**

Drawing Number	Title
<b>Land Made Available Drawings</b>	
M8-C-LMA-001 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 1 of 25
M8-C-LMA-002 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 2 of 25
M8-C-LMA-003 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 3 of 25
M8-C-LMA-004 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 4 of 25
M8-C-LMA-005 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 5 of 25
M8-C-LMA-006 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 6 of 25
M8-C-LMA-007 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 7 of 25
M8-C-LMA-008 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 8 of 25
M8-C-LMA-009 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 9 of 25
M8-C-LMA-010 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 10 of 25
M8-C-LMA-011 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 11 of 25
M8-C-LMA-012 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 12 of 25
M8-C-LMA-013 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 13 of 25
M8-C-LMA-014 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 14 of 25
M8-C-LMA-015 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 15 of 25
M8-C-LMA-016 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 16 of 25
M8-C-LMA-017 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 17 of 25
M8-C-LMA-018 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 18 of 25
M8-C-LMA-019 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 19 of 25



**Appendix 0/4: List of Drawings for the New Works**

M8-C-LMA-020 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 20 of 25
M8-C-LMA-021 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 21 of 25
M8-C-LMA-022 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 22 of 25
M8-C-LMA-023 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 23 of 25
M8-C-LMA-024 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 24 of 25
M8-C-LMA-025 Rev 12	Land Made Available by the Scottish Ministers for the New Works Sheet 25 of 25
<b>Reference Drawings</b>	
M8-C-REF-001 Rev 03	Reference Drawing - Sheet 1 of 25
M8-C-REF-002 Rev 03	Reference Drawing - Sheet 2 of 25
M8-C-REF-003 Rev 03	Reference Drawing - Sheet 3 of 25
M8-C-REF-004 Rev 03	Reference Drawing - Sheet 4 of 25
M8-C-REF-005 Rev 03	Reference Drawing - Sheet 5 of 25
M8-C-REF-006 Rev 03	Reference Drawing - Sheet 6 of 25
M8-C-REF-007 Rev 03	Reference Drawing - Sheet 7 of 25
M8-C-REF-008 Rev 03	Reference Drawing - Sheet 8 of 25
M8-C-REF-009 Rev 03	Reference Drawing - Sheet 9 of 25
M8-C-REF-010 Rev 03	Reference Drawing - Sheet 10 of 25
M8-C-REF-011 Rev 03	Reference Drawing - Sheet 11 of 25
M8-C-REF-012 Rev 03	Reference Drawing - Sheet 12 of 25
M8-C-REF-013 Rev 03	Reference Drawing - Sheet 13 of 25
M8-C-REF-014 Rev 03	Reference Drawing - Sheet 14 of 25
M8-C-REF-015 Rev 03	Reference Drawing - Sheet 15 of 25
M8-C-REF-016 Rev 03	Reference Drawing - Sheet 16 of 25
M8-C-REF-017 Rev 03	Reference Drawing - Sheet 17 of 25
M8-C-REF-018 Rev 03	Reference Drawing - Sheet 18 of 25

**Appendix 0/4: List of Drawings for the New Works**

M8-C-REF-019 Rev 03	Reference Drawing - Sheet 19 of 25
M8-C-REF-020 Rev 03	Reference Drawing - Sheet 20 of 25
M8-C-REF-021 Rev 03	Reference Drawing - Sheet 21 of 25
M8-C-REF-022 Rev 03	Reference Drawing - Sheet 22 of 25
M8-C-REF-023 Rev 03	Reference Drawing - Sheet 23 of 25
M8-C-REF-024 Rev 03	Reference Drawing - Sheet 24 of 25
M8-C-REF-025 Rev 03	Reference Drawing - Sheet 25 of 25
M8-C-REF-027 Rev 00	Gantry Locations
<b>Fencing Contract Drawings</b>	
M8/C/FEN/001 Rev 00	Contract Fencing: Sheet 1 of 4
M8/C/FEN/002 Rev 00	Contract Fencing: Sheet 2 of 4
M8/C/FEN/003 Rev 00	Contract Fencing: Sheet 3 of 4
M8/C/FEN/004 Rev 00	Contract Fencing: Sheet 4 of 4
<b>Reference Drawings - Structures</b>	
M8-C-SG401-001 Rev 00	Definition Drawing Portal Gantry Spanning Single Carriageway
M8-C-SG402-001 Rev 00	Definition Drawing Portal Gantry Spanning Two Carriageways
M8-C-SG403-001 Rev 00	Definition Drawing Gantry Access
<b>Lane Occupation</b>	
M8/C/LOR/001 Rev 02	Lane Occupation Reference Drawings Sheet 1 of 25
M8/C/LOR/002 Rev 02	Lane Occupation Reference Drawings Sheet 2 of 25
M8/C/LOR/003 Rev 02	Lane Occupation Reference Drawings Sheet 3 of 25
M8/C/LOR/004 Rev 02	Lane Occupation Reference Drawings Sheet 4 of 25
M8/C/LOR/005 Rev 02	Lane Occupation Reference Drawings Sheet 5 of 25
M8/C/LOR/006 Rev 02	Lane Occupation Reference Drawings Sheet 6 of 25
M8/C/LOR/007 Rev 02	Lane Occupation Reference Drawings Sheet 7 of 25
M8/C/LOR/008 Rev 02	Lane Occupation Reference Drawings Sheet 8 of 25

**Appendix 0/4: List of Drawings for the New Works**

M8/C/LOR/009 Rev 02	Lane Occupation Reference Drawings Sheet 9 of 25
M8/C/LOR/010 Rev 02	Lane Occupation Reference Drawings Sheet 10 of 25
M8/C/LOR/011 Rev 02	Lane Occupation Reference Drawings Sheet 11 of 25
M8/C/LOR/012 Rev 02	Lane Occupation Reference Drawings Sheet 12 of 25
M8/C/LOR/013 Rev 02	Lane Occupation Reference Drawings Sheet 13 of 25
M8/C/LOR/014 Rev 02	Lane Occupation Reference Drawings Sheet 14 of 25
M8/C/LOR/015 Rev 02	Lane Occupation Reference Drawings Sheet 15 of 25
M8/C/LOR/016 Rev 02	Lane Occupation Reference Drawings Sheet 16 of 25
M8/C/LOR/017 Rev 02	Lane Occupation Reference Drawings Sheet 17 of 25
M8/C/LOR/018 Rev 02	Lane Occupation Reference Drawings Sheet 18 of 25
M8/C/LOR/019 Rev 02	Lane Occupation Reference Drawings Sheet 19 of 25
M8/C/LOR/020 Rev 02	Lane Occupation Reference Drawings Sheet 20 of 25
M8/C/LOR/021 Rev 02	Lane Occupation Reference Drawings Sheet 21 of 25
M8/C/LOR/022 Rev 02	Lane Occupation Reference Drawings Sheet 22 of 25
M8/C/LOR/023 Rev 02	Lane Occupation Reference Drawings Sheet 23 of 25
M8/C/LOR/024 Rev 02	Lane Occupation Reference Drawings Sheet 24 of 25
M8/C/LOR/025 Rev 02	Lane Occupation Reference Drawings Sheet 25 of 25
<b>Utilities</b>	
<b>BT Diversions</b>	
M8/C/STATS/BT/001 Rev 03	British Telecom Indicative Undertaker Works, Sheet 1 of 20
M8/C/STATS/BT/002 Rev 03	British Telecom Indicative Undertaker Works, Sheet 2 of 20
M8/C/STATS/BT/003 Rev 03	British Telecom Indicative Undertaker Works, Sheet 3 of 20
M8/C/STATS/BT/004 Rev 03	British Telecom Indicative Undertaker Works, Sheet 4 of 20
M8/C/STATS/BT/005 Rev 03	British Telecom Indicative Undertaker Works, Sheet 5 of 20

**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/BT/006 Rev 03	British Telecom Indicative Undertaker Works, Sheet 6 of 20
M8/C/STATS/BT/007 Rev 03	British Telecom Indicative Undertaker Works, Sheet 7 of 20
M8/C/STATS/BT/008 Rev 03	British Telecom Indicative Undertaker Works, Sheet 8 of 20
M8/C/STATS/BT/009 Rev 03	British Telecom Indicative Undertaker Works, Sheet 9 of 20
M8/C/STATS/BT/010 Rev 03	British Telecom Indicative Undertaker Works, Sheet 10 of 20
M8/C/STATS/BT/011 Rev 03	British Telecom Indicative Undertaker Works, Sheet 11 of 20
M8/C/STATS/BT/012 Rev 03	British Telecom Indicative Undertaker Works, Sheet 12 of 20
M8/C/STATS/BT/013 Rev 03	British Telecom Indicative Undertaker Works, Sheet 13 of 20
M8/C/STATS/BT/014 Rev 03	British Telecom Indicative Undertaker Works, Sheet 14 of 20
M8/C/STATS/BT/015 Rev 03	British Telecom Indicative Undertaker Works, Sheet 15 of 20
M8/C/STATS/BT/016 Rev 03	British Telecom Indicative Undertaker Works, Sheet 16 of 20
M8/C/STAT/BTS/017 Rev 03	British Telecom Indicative Undertaker Works, Sheet 17 of 20
M8/C/STAT/BTS/018 Rev 03	British Telecom Indicative Undertaker Works, Sheet 18 of 20
M8/C/STAT/BTS/019 Rev 03	British Telecom Indicative Undertaker Works, Sheet 19 of 20
M8/C/STAT/BTS/020 Rev 03	British Telecom Indicative Undertaker Works, Sheet 20 of 20
<b>Cable and Wireless Diversions</b>	
M8/C/STATS/CW/001 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 1 of 7
M8/C/STATS/CW/002 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 2 of 7
M8/C/STATS/CW/003 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 3 of 7
M8/C/STATS/CW/004 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 4 of 7

**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/CW/005 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 5 of 7
M8/C/STATS/CW/006 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 6 of 7
M8/C/STATS/CW/007 Rev 02	Cable and Wireless Indicative Undertaker Works, Sheet 7 of 7
<b>Everything Everywhere Diversions</b>	
M8/C/STATS/EE/001 Rev 01	Everything Everywhere Indicative Undertaker Works, Sheet 1 of 2
M8/C/STATS/EE/002 Rev 01	Everything Everywhere Indicative Undertaker Works, Sheet 2 of 2
<b>SGN Distribution Diversions</b>	
M8/C/STATS/SGN D/001 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 1 of 9
M8/C/STATS/SGN D/002 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 2 of 9
M8/C/STATS/SGN D/003 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 3 of 9
M8/C/STATS/SGN D/004 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 4 of 9
M8/C/STATS/SGN D/005 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 5 of 9
M8/C/STATS/SGN D/006 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 6 of 9
M8/C/STATS/SGN D/007 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 7 of 9
M8/C/STATS/SGN D/008 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 8 of 9
M8/C/STATS/SGN D/009 Rev 02	Scottish Gas Distribution Network Indicative Undertaker Works, Sheet 9 of 9
<b>SGN Transmission Diversions</b>	
M8/C/STATS/SGN T/001 Rev 01	Scottish Gas Transmission Network Indicative Undertaker Works, Sheet 1 of 10

**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/SGN T/002 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 2 of 10	Indicative
M8/C/STATS/SGN T/003 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 3 of 10	Indicative
M8/C/STATS/SGN T/004 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 4 of 10	Indicative
M8/C/STATS/SGN T/005 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 5 of 10	Indicative
M8/C/STATS/SGN T/006 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 6 of 10	Indicative
M8/C/STATS/SGN T/007 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 7 of 10	Indicative
M8/C/STATS/SGN T/008 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 8 of 10	Indicative
M8/C/STATS/SGN T/009 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 9 of 10	Indicative
M8/C/STATS/SGN T/010 Rev 01	Scottish Gas Transmission Network Undertaker Works, Sheet 10 of 10	Indicative
<b>Scottish Power Distribution Diversions</b>		
M8/C/STATS/SP D/001 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 1 of 20	Indicative
M8/C/STATS/SP D/002 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 2 of 20	Indicative
M8/C/STATS/SP D/003 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 3 of 20	Indicative
M8/C/STATS/SP D/004 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 4 of 20	Indicative
M8/C/STATS/SP D/005 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 5 of 20	Indicative
M8/C/STATS/SP D/006 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 6 of 20	Indicative
M8/C/STATS/SP D/007 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 7 of 20	Indicative
M8/C/STATS/SP D/008 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 8 of 20	Indicative
M8/C/STATS/SP D/009 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 9 of 20	Indicative
M8/C/STATS/SP D/010 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 10 of 20	Indicative

**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/SP D/011 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 11 of 20	Indicative
M8/C/STATS/SP D/012 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 12 of 20	Indicative
M8/C/STATS/SP D/013 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 13 of 20	Indicative
M8/C/STATS/SP D/014 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 14 of 20	Indicative
M8/C/STATS/SP D/015 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 15 of 20	Indicative
M8/C/STATS/SP D/016 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 16 of 20	Indicative
M8/C/STATS/SP D/017 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 17 of 20	Indicative
M8/C/STATS/SP D/018 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 18 of 20	Indicative
M8/C/STATS/SP D/019 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 19 of 20	Indicative
M8/C/STATS/SP D/020 Rev 02	Scottish Power Distribution Network Undertaker Works, Sheet 20 of 20	Indicative
<b>Scottish Power Transmission Diversions</b>		
M8/C/STATS/SP T/001 Rev 01	Scottish Power Transmission Network Undertaker Works, Sheet 1 of 1	Indicative
<b>Scottish Water Supply Diversions</b>		
M8/C/STATS/SW M/001 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 1 of 18	Indicative
M8/C/STATS/SW M/002 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 2 of 18	Indicative
M8/C/STATS/SW M/003 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 3 of 18	Indicative
M8/C/STATS/SW M/004 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 4 of 18	Indicative
M8/C/STATS/SW M/005 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 5 of 18	Indicative
M8/C/STATS/SW M/006 Rev 01	Scottish Water Potable Network Undertaker Works, Sheet 6 of 18	Indicative

**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/SW M/007 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 7 of 18
M8/C/STATS/SW M/008 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 8 of 18
M8/C/STATS/SW M/009 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 9 of 18
M8/C/STATS/SW M/010 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 10 of 18
M8/C/STATS/SW M/011 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 11 of 18
M8/C/STATS/SW M/012 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 12 of 18
M8/C/STATS/SW M/013 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 13 of 18
M8/C/STATS/SW M/014 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 14 of 18
M8/C/STATS/SW M/015 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 15 of 18
M8/C/STATS/SW M/016 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 16 of 18
M8/C/STATS/SW M/017 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 17 of 18
M8/C/STATS/SW M/018 Rev 01	Scottish Water Potable Network Indicative Undertaker Works, Sheet 18 of 18
<b>Scottish Water Sewer Diversions</b>	
M8/C/STATS/SW S/001 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 1 of 17
M8/C/STATS/SW S/002 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 2 of 17
M8/C/STATS/SW S/003 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 3 of 17
M8/C/STATS/SW S/004 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 4 of 17
M8/C/STATS/SW S/005 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 5 of 17
M8/C/STATS/SW S/006 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 6 of 17
M8/C/STATS/SW S/007 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 7 of 17



**Appendix 0/4: List of Drawings for the New Works**

M8/C/STATS/SW S/008 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 8 of 17
M8/C/STATS/SW S/009 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 9 of 17
M8/C/STATS/SW S/010 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 10 of 17
M8/C/STATS/SW S/011 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 11 of 17
M8/C/STATS/SW S/012 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 12 of 17
M8/C/STATS/SW S/013 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 13 of 17
M8/C/STATS/SW S/014 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 14 of 17
M8/C/STATS/SW S/015 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 15 of 17
M8/C/STATS/SW S/016 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 16 of 17
M8/C/STATS/SW S/017 Rev 01	Scottish Water Sewer Network Indicative Undertaker Works, Sheet 17 of 17
<b>Virgin media Diversions</b>	
M8/C/STATS/V/001 Rev 02	Virgin Media Indicative Undertaker Works, Sheet 1 of 4
M8/C/STATS/V/002 Rev 02	Virgin Media Indicative Undertaker Works, Sheet 2 of 4
M8/C/STATS/V/003 Rev 02	Virgin Media Indicative Undertaker Works, Sheet 3 of 4
M8/C/STATS/V/004 Rev 02	Virgin Media Indicative Undertaker Works, Sheet 4 of 4
<b>Orders</b>	
OTG/1404/1001	The M8 (Baillieston to Newhouse) Special Road Scheme 2011
OTG-1404-3001	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011
Key Plan	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011
AP1	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011

**Appendix 0/4: List of Drawings for the New Works**

AP2	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011
AP3	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011
AP4	The M8 Special Road (Baillieston to Newhouse) Appropriation Order 2011
OTG/1404/3002	The A8 Trunk Road (Baillieston to Newhouse) Order 2011
OTG/1404/3003	The A725 Trunk Road (Baillieston to Newhouse) Order 2011
OTG-1404-3004	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
Key Plan 1	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
Key Plan 2	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR1	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR2	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR3	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR4	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR5	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR6	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR7	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR8	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR9	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR10	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011

**Appendix 0/4: List of Drawings for the New Works**

SR11	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
SR12	The M8 (Baillieston to Newhouse) Special Road (Side Roads) Order 2011
OTG-1404-3005	The M8 (Baillieston to Newhouse) Special Road (Extinguishment of Public Rights of Way) Order 2011
Key Plan	The M8 (Baillieston to Newhouse) Special Road (Extinguishment of Public Rights of Way) Order 2011
ROW1	The M8 (Baillieston to Newhouse) Special Road (Extinguishment of Public Rights of Way) Order 2011
ROW2	The M8 (Baillieston to Newhouse) Special Road (Extinguishment of Public Rights of Way) Order 2011
OTG-1404-3006	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
Key Plan	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD1	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD2	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD3	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD4	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD5	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
RD6	The M8 (Baillieston to Newhouse) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2011
OTG/1555/2	The M8, M73, M74 (Network Improvements) Special Road Scheme 2010

**Appendix 0/4: List of Drawings for the New Works**

OTG/1555/3	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
Key Plan Sheet 1	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
Key Plan Sheet 2	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
Key Plan Sheet 3	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
SR1	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
SR2	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
SR3	The M8, M73, M74 (Network Improvements) Special Road (Side Roads) Order 2010
OTG/1555/6	The M8, M73, M74 (Network Improvements) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2010
RD1	The M8, M73, M74 (Network Improvements) Special Road (Redetermination of Means of Exercise of Public Right of Passage) Order 2010
OTG/1554/1001	The M74 Special Road, (Junction 5, Raith) Special Road Scheme 2010
OTG/1554/1002	The M74 Special Road, (Junction 5, Raith) Appropriation Order 2010
OTG/1554/1	The M74 Special Road, (Junction 5, Raith) (Side Roads) Order 2010
OTG/1554/1003	The M74 Special Road, (Junction 5, Raith) (Side Roads) Order 2010
SR1	The M74 Special Road, (Junction 5, Raith) (Side Roads) Order 2010
SR2	The M74 Special Road, (Junction 5, Raith) (Side Roads) Order 2010

**Appendix 0/4: List of Drawings for the New Works**

OTG/1554/2	The M74 Special Road, (Junction 5, Raith) (Redetermination of Means of Exercise of Public Right of Passage) Order 2010
RD1	The M74 Special Road, (Junction 5, Raith) (Redetermination of Means of Exercise of Public Right of Passage) Order 2010
<b>Watercourse Notices</b>	
<b>M8 Baillieston to Newhouse</b>	
WC01	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC02	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC03	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC04	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC05	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC06	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC07	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC10	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC11	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC12	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC13	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC14	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
WC15	M8 Baillieston to Newhouse Notice of Works in Relation to Waters
<b>M8, M73, M74 Network Improvements</b>	
WC02	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters

**Appendix 0/4: List of Drawings for the New Works**

WC03	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
WC04	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
WC05	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
WC06	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
WC07	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
WC08	M8, M73, M74 Network Improvements Notice of Works in Relation to Waters
<b>Raith Junction</b>	
WC01	M74 Junction 5, Raith Notice of Works in Relation to Waters
WC02	M74 Junction 5, Raith Notice of Works in Relation to Waters
WC03	M74 Junction 5, Raith Notice of Works in Relation to Waters
WC04	M74 Junction 5, Raith Notice of Works in Relation to Waters
<b>Accommodation Works</b>	
<b>M8 Baillieston to Newhouse</b>	
M8MFJV/AW/1/002 Rev B	[REDACTED]
M8MFJV/AW/1/003 Rev 0	[REDACTED]
M8MFJV/AW/1/004 Rev A	[REDACTED]
M8MFJV/AW/1/013 Rev B	[REDACTED]
M8MFJV/AW/1/014 Rev C	[REDACTED]
M8MFJV/AW/1/016 Rev 0	[REDACTED]
M8MFJV/AW/1/017 Rev D	[REDACTED]
M8MFJV/AW/1/020 Rev 0	[REDACTED]
M8MFJV/AW/1/023 Rev C	[REDACTED]
M8MFJV/AW/1/024 Rev 0	[REDACTED]
M8MFJV/AW/1/026 Rev 0	[REDACTED]

**Appendix 0/4: List of Drawings for the New Works**

M8MFJV/AW/1/030 Rev C	[REDACTED]
M8MFJV/AW/1/033 Rev 0	[REDACTED]
M8MFJV/AW/1/034 Rev A	[REDACTED]
M8MFJV/AW/1/036 Rev 0	[REDACTED]
M8MFJV/AW/1/040 Rev 0	[REDACTED]
M8MFJV/AW/1/042 Rev A	[REDACTED]
M8MFJV/AW/1/044 Rev 0	[REDACTED]
M8MFJV/AW/1/046 sh.1 Rev 0	[REDACTED]
M8MFJV/AW/1/046 sh.2 Rev 0	[REDACTED]
M8MFJV/AW/1/046 sh.3 Rev 0	[REDACTED]
M8MFJV/AW/1/046 sh.4 Rev 0	[REDACTED]
M8MFJV/AW/1/048 Rev 0	[REDACTED]
M8MFJV/AW/1/051 Rev A	[REDACTED]
M8MFJV/AW/1/052 Rev A	[REDACTED]
M8MFJV/AW/1/054 Rev 0	[REDACTED]
M8MFJV/AW/1/057 Rev A	[REDACTED]
M8MFJV/AW/1/059 Rev A	[REDACTED]
M8MFJV/AW/1/060 Rev C	[REDACTED]
M8MFJV/AW/1/061 Rev 0	[REDACTED] )
M8MFJV/AW/1/065 Rev 0	[REDACTED]
M8MFJV/AW/1/066 Rev A	[REDACTED]
M8MFJV/AW/1/067 Rev A	[REDACTED]
M8MFJV/AW/1/068 Rev A	[REDACTED]
<b>M8 M73 M74 Network Improvements</b>	
M8MFJV/AW/4/001 Rev C	[REDACTED]
M8MFJV/AW/4/002 sh1. Rev 0	Glasgow City Council Sheet 1
M8MFJV/AW/4/002 sh2. Rev 0	Glasgow City Council Sheet 2
M8MFJV/AW/4/005 Rev 0	[REDACTED]
M8MFJV/AW/4/006 Rev 0	[REDACTED]
M8NFJV/AW/4/013 Rev A	[REDACTED]
<b>Raith Junction</b>	

**Appendix 0/4: List of Drawings for the New Works**

M8MFJV/AW/2/002 Rev B	[REDACTED]
M8MFJV/AW/2/003 Rev A	[REDACTED]
M8MFJV/AW/2/004 Rev B	[REDACTED]
M8MFJV/AW/2/007 Rev D	[REDACTED]
M8MFJV/AW/2/008 sh1. Rev A	South Lanarkshire City Council Sheet 1
M8MFJV/AW/2/008 sh2. Rev A	South Lanarkshire City Council Sheet 2
M8MFJV/AW/2/012 Rev 0	[REDACTED]
<b>Typical Details</b>	
M8MFJV-AW-001 Rev 0	Timber Post and Rail Type F1
M8MFJV-AW-002 Rev 0	Timber Post and Wire Type F2
M8MFJV-AW-003 Rev 0	F3 Rules for the selection of non structural timber for use in environmental
M8MFJV-AW-004 Rev 0	F4 Rules for the selection of non structural timber for use in environmental
M8MFJV-AW-005 Rev 0	Timber Post and Rail with Wire Type F5
M8MFJV-AW-006 Rev 0	Timber Post and Wire Mesh Type F6
M8MFJV-AW-007 Rev 0	Timber Post and Wire Mesh Badger and Otter Proof Mammal Type F7
M8MFJV-AW-008 Rev 0	Concrete Post and Chain Link Fence Type F8
M8MFJV-AW-009 Rev 0	Timber Post & Rail With Wire Mesh Stock Proof Type F9
M8MFJV-AW-010 Rev 0	Timber Post & Rail With Wire Mesh Type F10
M8MFJV-AW-011 Rev 0	Galvanised Steel Fence Type F11
M8MFJV-AW-017 Rev 0	Galvanised Steel Fence F17
M8MFJV-AW-018 Rev 0	Timber Post and Rail Type F18
M8MFJV-AW-019 Rev 0	1.8m High - Mesh Panel Type F19
M8MFJV-AW-020 Rev 0	2.4m High - Mesh Panel Type F20
M8MFJV-AW-021 Rev 0	5.2m High - Mesh Panel Type F21
M8MFJV-AW-022 Rev 0	Timber Post and Wire Mesh Rabbit proof Type F22
M8MFJV-AW-023 Rev 0	Timber Post and Wire Mesh Type F23
M8MFJV-AW-024 Rev 0	Timber Post and Wire Type F24
M8MFJV-AW-025 Rev 0	F25 Timber Post & Rail Fence
M8MFJV-AW-026 Rev 0	Timber Post and Wire Mesh Type F26
M8MFJV-AW-027 Rev 0	Timber Post and Wire Type F27
M8MFJV-AW-100 Rev 0	Timber Single Field Gate Type G1



**Appendix 0/4: List of Drawings for the New Works**

M8MFJV-AW-101 Rev 0	G2 Hinges for timber field gate Type G1
M8MFJV-AW-102 Rev 0	G3 Spring catch for timber single field gate Type G1
M8MFJV-AW-103 Rev 0	G4 Standard gate stop Type G1
M8MFJV-AW-104 Rev 0	Typical Water Gate Details Type G5
M8MFJV-AW-105 Rev 0	Galvanised steel gate Details Type G6
M8MFJV-AW-106 Rev 0	Galvanised Steel Gate Details Type G7
M8MFJV-AW-107 Rev 0	Timber Post and Rail Type G8 Kissing Gate
M8MFJV-AW-108 Rev A	Steel Single Field Gate Type G9
M8MFJV-AW-109 Rev 0	G10 Hinges For Steel Field Gate Type G9
M8MFJV-AW-110 Rev 0	G11 'D' Latch, Type G11 for Steel Single Field Gates Type G9
M8MFJV-AW-111 Rev 0	G12 Single Bolt Latch, Type G12 For Steel Single Field Gates For Type G9
M8MFJV-AW-112 Rev 0	G13 Standard Gate Stops For Type G9 And G17
M8MFJV-AW-114 Rev 0	Timber Single Field Gate with wire mesh Type G14
M8MFJV-AW-117 Rev 0	Steel Double Field Gate Type G17
M8MFJV-AW-119 Rev 0	Steel Double Field Gate With Mesh Type G19
M8MFJV-AW-120 Rev 0	Steel Double Gate with Mesh Type G20
M8MFJV-AW-200 Rev 0	Roadworks Details Access Track & Hard Standing Types R1, R2 & R3
M8MFJV-AW-201 Rev 0	Roadworks Details Access Type R4
M8MFJV-AW-301 Rev C	[REDACTED] Drainage Layout
M8MFJV-AW-302 Rev 0	[REDACTED] Drainage Details
M8MFJV-AW-303 Rev B	[REDACTED] Foul Water Drainage
M8MFJV-AW-304 Rev A	[REDACTED] Foul Water Drainage
M8MFJV-AW-500 Rev 0	Free Standing Masonry Wall Type W1
<b>Indicative Landscape Proposals</b>	
M8/C/3000/001 Rev02	Indicative landscape Layout Sheet 1 of 25
M8/C/3000/002 Rev02	Indicative landscape Layout Sheet 2 of 25
M8/C/3000/003 Rev02	Indicative landscape Layout Sheet 3 of 25
M8/C/3000/004 Rev02	Indicative landscape Layout Sheet 4 of 25
M8/C/3000/005 Rev02	Indicative landscape Layout Sheet 5 of 25
M8/C/3000/006 Rev02	Indicative landscape Layout Sheet 6 of 25
M8/C/3000/007 Rev02	Indicative landscape Layout Sheet 7 of 25

**Appendix 0/4: List of Drawings for the New Works**

M8/C/3000/008 Rev02	Indicative landscape Layout Sheet 8 of 25
M8/C/3000/009 Rev02	Indicative landscape Layout Sheet 9 of 25
M8/C/3000/010 Rev02	Indicative landscape Layout Sheet 10 of 25
M8/C/3000/011 Rev02	Indicative landscape Layout Sheet 11 of 25
M8/C/3000/012 Rev02	Indicative landscape Layout Sheet 12 of 25
M8/C/3000/013 Rev02	Indicative landscape Layout Sheet 13 of 25
M8/C/3000/014 Rev02	Indicative landscape Layout Sheet 14 of 25
M8/C/3000/015 Rev02	Indicative landscape Layout Sheet 15 of 25
M8/C/3000/016 Rev02	Indicative landscape Layout Sheet 61 of 25
M8/C/3000/017 Rev02	Indicative landscape Layout Sheet 17 of 25
M8/C/3000/018 Rev03	Indicative landscape Layout Sheet 18 of 25
M8/C/3000/019 Rev02	Indicative landscape Layout Sheet 19 of 25
M8/C/3000/020 Rev02	Indicative landscape Layout Sheet 20 of 25
M8/C/3000/021 Rev02	Indicative landscape Layout Sheet 21 of 25
M8/C/3000/022 Rev02	Indicative landscape Layout Sheet 22 of 25
M8/C/3000/023 Rev02	Indicative landscape Layout Sheet 23 of 25
M8/C/3000/024 Rev02	Indicative landscape Layout Sheet 24 of 25
M8/C/3000/025 Rev02	Indicative landscape Layout Sheet 25 of 25
M8/C/3000/026 Rev02	Ornamental Roundabout Planting Details
M8/C/3000/027 Rev02	Planting and Seeding Schedule Sheet 1
M8/C/3000/028 Rev02	Planting and Seeding Schedule Sheet 2
<b>Informatory Signs</b>	
B0524200/CD/TS	Transport Scotland Logo
B0524200/CD/JE	Scottish Minister's Representative Logo (to be inserted prior to contract award)
W(S) 135	New Road Scheme Informatory Sign Annexe A
W(S) 137	Transport Scotland Logo Annexe B

**Appendix 0/4: List of Drawings for the New Works**

1.6 Standard Drawings

Drawing Number	Sheet Number	Rev.	Title
NDX1001-01ly	3	B	Typical Overall CEC Gantry/VMS Site Layout
NDX1001-01ly	4	B	Typical Layout or CEC Gantry/VMS Site
NDX1001-02ga	3	B	Typical Cantilever Variable Message Signs Ladder Access
NDX1002-00ga	1	D	Typical HA Type 600 Cabinet Installation - Plinths
NDX1002-00dt	2	E	Typical HA Type 600 Cabinet Foundations
NDX1002-00dt	4	C	Typical HA Type 600 Cabinet Door Security Strap
NDX1002-00dt	5	D	Typical HA Type 600 Cabinet Thermostat & Heater Type 1020
NDX1002-01ga	1	C	Typical HA 600 Cabinet Modified Internal Frame
NDX1002-01dt	6	C	Typical HA 600 Cabinet Communications Cable Clamping, Earth Stud & General Earthing Detail
NDX1002-06dt	1	B	Typical Electrically Energised Communications Cabinet Labels
NDX1002-06no	2	B	Typical Electrically Energised Communications Cabinet Labels
NDX1002-07ga	1	B	Typical CEC Cabinet Installation – Hard-Standing, Plinths and Foundations
NDX1002-07dt	2	A	Typical CEC Site Layout Including Vehicle Hard-Standing
NDX1002-07dt	3	A	Typical CEC Cabinet Labels
NDX1002-08ga	1	1	Typical Scottish Type 600(S) Cabinet – General arrangement
NDX1002-08dt	2	1	Typical Scottish Type 600(S) Cabinet – Foundations/Plinth
NDX1002-08dt	3	1	Typical Type 610 Frame for Scottish Type 600(S) Cabinet
NDX1002-08dt	4	1	Typical Type 610 Skirt for Scottish Type 600(S) Cabinet
NDX1002-09dt	1	1	Typical CECR Cabinet – Foundations/Plinth
NDX1002-09sp	2	1	For Future Use

**Appendix 0/4: List of Drawings for the New Works**

<b>Drawing Number</b>	<b>Sheet Number</b>	<b>Rev.</b>	<b>Title</b>
NDX1002-10dt	1	1	Typical CECR+1 Cabinet – Foundations/Plinths
NDX1002-10dt	2	1	Typical CECR+1 Cabinet Site Layout including Vehicle hard standing
NDX1007-01cl	2	D	Typical Detector Loop Site
NDX1010-00cl	4	B	Typical 10 & 15 Metre CCTV Mast, Cabinet Base & Paved Area
NDX1011-01ga	1	E	Typical Electrical Supply & Distribution Cabinets Installation Detail
NDX1011-01dt	7	E	Typical Labels For Electrical Supply, Distribution & Other Electrical Supply Equipment Cabinets
NDX1011-06ga	1	A	Typical Layout of Termination Pillar (TP)
NDX1011-06il	2	A	Typical Item List for Layout Termination Pillar (TP)
NDX1011-06no	3	A	Typical Notes for Termination Pillar (TP)
NDX1011-06cd	4	A	Typical Circuit Diagram of Termination Pillar (TP)
NDX1011-07ga	1	A	Typical Layout of Termination Pillar/Traffic Equipment Termination Pillar (TP/TEDP)
NDX1011-07il	2	A	Typical Item List for Typical Termination Pillar /Traffic Equipment Termination Pillar (TP/TEDP)
NDX1011-07no	3	A	Typical Notes for Termination Pillar/Traffic Equipment Termination Pillar (TP/TEDP)
NDX1011-07cd	4	A	Typical Circuit Diagram of Termination Pillar/Traffic Equipment Termination Pillar (TP/TEDP)
NDX1011-08ga	1	A	Typical Layout of Traffic Equipment Termination Pillar (TEDP)
NDX1011-08il	2	A	Typical Item List for Typical Traffic Equipment Termination Pillar (TEDP)
NDX1011-08no	3	A	Typical Notes for Traffic Equipment Termination Pillar (TEDP)
NDX1011-08cd	4	A	Typical Circuit Diagram of Traffic Equipment Termination Pillar (TEDP)

**Appendix 0/4: List of Drawings for the New Works**

Drawing Number	Sheet Number	Rev.	Title
NDX1029-03ga	1	A	Typical Installation and Support Detail for Motorway Access Controller (MAC)
NDX1049-02no	1	E	Typical ERT354 General Installation Notes
NDX1049-02ga	2	C	Typical ERT354 Verge, no Safety Fence, no Kerb – Type A,N
NDX1049-02ga	3	C	Typical ERT354 Verge, no Safety Fence, with Kerb – Type B,O
NDX1049-02ga	4	C	Typical ERT354 Verge, no Safety Fence with Kerb – Type B1,O1
NDX1049-02ga	5	E	Typical ERT354 Verge with Safety Fence, no Kerb – Type C, P
NDX1049-02ga	6	E	Typical ERT354 Verge with Safety Fence with Kerb – Type D, Q
NDX1049-02ga	7	C	Typical ERT354 Verge with Safety Fence & Wheelchair Access Bay – Type D1, Q1
NDX1049-02ga	8	C	Typical ERT354 Accommodating ERT at Verge with Safety Barrier - Type L
NDX1049-02ga	9	E	Typical ERT354 Wall Mounting – Type G
NDX1049-02ga	10	C	Typical ERT354 End of Safety Fence with Kerb – Type J
NDX1049-02ga	11	E	Typical ERT354 Alternative for Existing Post 71 – Type M
NDX1049-02ga	12	E	Typical ERT354 Site Specific Design Erskine Bridge – Type M1
NDX1049-02ga	13	C	Typical ERT354 Fabricated Guard Rail
NDX1049-02dt	14	C	Typical ERT354 Standard Concrete Plinth Hand Rail
NDX1049-02dt	15	C	Typical ERT354 600 Cube Concrete Plinth
NDX1049-02dt	16	C	Typical ERT354 Cable Pit Moulding
NDX1049-02no	17	C	Typical ERT354 Stock Code List for Replacement Units & Spares
NDX1049-02ga	18	B	Typical ERT354 Accommodating ERT at Verge with Safety Barrier
NDX1049-02ga	19	B	Typical ERT354 Accommodating ERT at VMS Hard Standing
NDX1061-00dt	2	B	Typical Method of Sealing Unused Cable Ends
NDX1061-00dt	3	C	Typical Cable Identification Labels

**Appendix 0/4: List of Drawings for the New Works**

<b>Drawing Number</b>	<b>Sheet Number</b>	<b>Rev.</b>	<b>Title</b>
NDX1063-00dt	1	D	Typical Ducts
NDX1063-00dt	2	B	Typical Installation of Deep Transverse Ducts
NDX1063-00dt	3	D	Typical Duct Installation - Longitudinal
NDX1063-00dt	4	C	Typical Duct Installation - Local Ducts
NDX1063-00dt	5	C	Typical Duct Installation -Transverse Ducts
NDX1063-00dt	6	C	Typical Duct Installation – Spacers, Strapping and Longitudinal Duct Cable Allocation
NDX1063-00dt	7	D	Typical Duct Installation - Mechanical Duct Plugs
NDX1063-00cl	9	G	Typical Plan View of General Ducted System Layout- Both Verges
NDX1063-00cl	10	H	Typical Plan View of General Ducted System Layout- Single Verge
NDX1063-01ga	1	C	Typical Type A Chamber Construction Detail
NDX1063-02ga	1	C	Typical Type B Chamber Construction Detail
NDX1063-03ga	1	C	Typical Type C Chamber Construction Detail
NDX1063-04ga	1	D	Typical Type D Chamber Construction Detail Detector Loop Sites
NDX1063-04wd	2	C	Typical Loop Wiring In Roadside Chamber At Detector Loop Sites (PTC Joint)
NDX1070-01ga	1	B	Typical Site Access Steps
NDX1070-02ga	1	B	Typical Site Access Safety Handrail Detail
NDX1072-00cl	2	E	Typical Traffic Scotland Site Maintenance Hard-Standing.
NDX1097-01ga	1	B	Typical 6-lane : 2x3.5 Class 1 Piezo-loop-Piezo WiM General Site Layout - loops
NDX1097-01ga	2	B	Typical 6-lane : 2x3.5 Class 1 Piezo-loop-Piezo WiM General Site Layout - cabinets
NDX1097-01dt	3	A	Typical WiM BL Sensor Installation

**Appendix 0/4: List of Drawings for the New Works**

NDX1097-01dt	4	A	Typical WiM Induction Loop Installation
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2.1 List of Drawings Brought into the Agreement by Reference

2.1.1 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.

**List of Drawings Brought into the Contract by Reference**

Drawing Number	Title	Date	Aspect/Alternative(s) if Not Whole Drawing
MCHW Volume 3, Section 3	MCX Series of Drawings*	Various	Deleted
Various	All drawings notwithstanding the requirements of other parts of the Agreement		

\* Where an MCX standard drawing has not been replaced by an NDX standard drawing or other specific drawing with the written consent of the Traffic Scotland Manager

2.2 List of Specifications Brought into the Agreement by Reference

2.2.1 "Traffic Scotland NDS" series of documents including inter alia:-

Document Number	Title
NDS 1551	Requirements for Electricity Supply to Traffic Scotland and Associated Equipment Sites
NDS 1624	Standards and Procedures for the Preparation of Traffic Scotland Drawings
NDS 9001	Traffic Scotland Health and Safety File Requirements and Model Forms
NDS 9551	Requirements for Electricity Supply to Traffic Scotland and Associated Equipment Sites
NDS 9565	Guidance on the Use of standard Traffic Scotland Termination Pillars (TP) and Traffic Equipment Distribution Pillars (TEDP).

**Appendix 0/4: List of Drawings for the New Works**

2.2.2 Relevant Highways Agency MCG, MCH and TR specifications, and other specifications as required, including but not limited to:

<b>Document Number</b>	<b>Title/Reference</b>
TR 2130	Environmental Tests for Motorway Equipment
MCG 1022	Testing for Newly Installed Communication and Power Cable (to be read in conjunction with NDS 9593)
MCG 1055	Testing for Newly Installed Motorway Optical Fibre Communication Cable (Single mode)
MCH 1540	Installation of Loop Detectors on Motorways and All Purpose Trunk Roads
MCH 1589B	Guide to the Siting of Inductive Loop Detectors on Motorways
TR 2161	Armoured Energy Cable
TR 1100 & Associated Appendix A	(Equivalent Standards Applicable are as per TR 1100C Section 3) Modified Section for Scotland
WOEM 4421	(Transport Wales) Armoured Fibre Optic Cable
-	Disability Discrimination Act: Good Practice for Roads (Transport Scotland Publication)
British Telecom CW1128/1198 - xx	xx denotes the number of pairs – 0.9mm conductor in petroleum jelly
TRG 600	Self Certification Procedures for Statutory Approval for Traffic Control Equipment



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

The following additions, substitutions, cancellations and minor alterations shall be made:

**List of Substitute Clauses, Tables and Figures**

<b>Clause Number</b>	<b>Title</b>	<b>Page Number</b>
<b>850SE</b>	Crushed Gravel Sub-base Material Type 1	
<b>1202TS</b>	General Requirements for Permanent Traffic Signs	
<b>1204TS</b>	Posts for Permanent Traffic Signs	
<b>1218TS</b>	Detector Loops	
<b>1301TS</b>	General	
<b>1302TS</b>	Design of Lighting Columns, Brackets,	
<b>1303TS</b>	Data Sheets	
<b>1304TS</b>	Identification and Location Markings	
<b>1308TS</b>	Handling, Transport and Erection	
<b>1401TS</b>	General	
<b>1402TS</b>	As-built and operational Records	
<b>1403TS</b>	Location of Lighting Units and Feeder Pillars	
<b>1407TS</b>	Luminaires	
<b>1409TS</b>	Photo-electric Control Units	
<b>1412TS</b>	Ballasts	
<b>1416TS</b>	Cut-outs, Fuse Holders, Fuses and Miniature Circuit Breakers (MCBs)	
<b>1417TS</b>	Base Compartment Fixing Arrangements	
<b>1418TS</b>	Feeder Pillars	
<b>1419TS</b>	Wiring	
<b>1420TS</b>	Earthing	
<b>1421TS</b>	Underground and Ducted Cable	
<b>1422TS</b>	Cable Joints	

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title	Page Number
1423TS	Armoured Cable Terminations	
1424TS	Inspection and Testing to be Carried Out by the Contractor	
1501A	Introduction	
1502A	General Requirements	
1503A	Materials, Equipment and Workmanship	
1504A	Site Records	
1505A	Provision of Cabinets, Cables and Ancillary Items	
1506A	Cables	
1507A	Cable Installation	
1508A	Installation of Cabinets	
1509A	Gantries for Overhead Equipment	
1510A	Emergency Roadside Telephones	
1511A	Marker Tape	
1512A	Provision of and Installation of Ancillary Items	
1513A	Jointing and Termination of Multi-pair Communications and Feeder Cables	
1514A	Cable Connectors	
1515A	Jointing and Termination of Fibre Optic Communications Cables	
1516A	Termination and Jointing of Power Supply Cables for Communications	
1517A	Earthing and Bonding	
1518A	Cable Testing	
1519A	Labelling and Numbering	
1520A	Loading	

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

<b>Clause Number</b>	<b>Title</b>	<b>Page Number</b>
1521A	Removal and Re-siting of Existing Equipment	
1522A	Works Impacting on Operational Traffic Scotland Systems	
1523A	Loop Detectors	
1524A	Trial Pits	
1525A	Not Used	
1526A	The Inspection and Testing of Electrical Installations and Electrical Equipment	
1527A	Cable Installations at Transmission Stations	
1528A	Modifications of Existing Cabinets	
1529A	Temporary Roadside Emergency Telephones	
1530A	Cable Ducts	
1531A	Installation of Ducts	
1532A	Chambers for Traffic Scotland Cables	
1533A	Proving and Testing of Ducts	
1534A	Closed Circuit Television	
1535A	Variable Message Signs	
1536A	Traffic Monitoring Units	
1537A	SRTDb Detectors and SRTDb Equipment	
1538A	Lane Control Signalling Equipment	
1539A	Paved Areas, Access Paths, Access Steps and Hard Standings	
1540A	Required Documentation	
1541A	Journey Time Equipment	
1542A	Communications Equipment	
1543A	Specific Equipment Commissioning, Testing, Integration and Certification	

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title	Page Number
1544A	Power Supplies for Traffic Scotland Equipment	
1545A	Spares	
1546A	Meteorological Equipment	
1547A	Ramp Metering	
1548A	Enforcement Systems	
1549A	Weigh In Motion Equipment	
1550A	Damage Repair Procedures	
1911SE	Paint and Similar Protective Coatings	
1912SE	Testing of Paints	
1920SE	Additional Requirements for the Protection of Steel in Bridge Bearings	

**List of Minor Alterations Clauses, Tables and Figures**

Clause Number	Title	Page Number
1702.2	Concrete – Ordinary Structural – Constituent Materials	
N / A	Appendix A	

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

**Substitute Clauses, Tables and Figures**

Clause Number	Title														
850SE	<p data-bbox="392 465 1471 499"><b>1 Crushed Gravel Sub-base Material Type 1</b></p> <p data-bbox="392 510 1471 544"><b>Material Properties</b></p> <p data-bbox="392 562 1471 663">1.1 For the purpose of this Clause gravel is defined as aggregate derived from a natural, unconsolidated, coarse-grained sedimentary deposit consisting of water-worn rock fragments.</p> <p data-bbox="392 680 1471 815">1.2 Crushed gravel granular sub-base material Type 1 shall be derived from natural cobble-sized material (60 millimetres – 200 millimetres), or larger, crushed and screened to be well-graded and lie within the grading envelope of Table 8/50SE below.</p> <p data-bbox="392 846 1471 880"><b>TABLE 8/50SE: Sub-base Type 1 Range of Grading</b></p> <table data-bbox="528 898 1246 1227"> <thead> <tr> <th>BS sieve size</th> <th>Percentage by mass passing</th> </tr> </thead> <tbody> <tr> <td>75 millimetres</td> <td>100</td> </tr> <tr> <td>37.5 millimetres</td> <td>85 – 100</td> </tr> <tr> <td>10 millimetres</td> <td>40 – 70</td> </tr> <tr> <td>5 millimetres</td> <td>25 – 50</td> </tr> <tr> <td>600 microns</td> <td>8 – 22</td> </tr> <tr> <td>75 microns</td> <td>0 – 10</td> </tr> </tbody> </table> <p data-bbox="392 1245 1471 1312">1.3 The particle size shall be determined by the washing and sieving method of BS 812: Part 103</p> <p data-bbox="392 1330 1471 1397">1.4 The material passing the 425 microns BS sieve shall be non-plastic as defined in BS 1377: Part 2 and tested in compliance therewith.</p> <p data-bbox="528 1415 1471 1482">(i) The degree of crushing of individual particles in the mixed material shall meet the following requirements:</p> <p data-bbox="528 1500 1471 1601">(ii) not less than 90 per cent by mass of the particles passing BS 50 millimetres and retained on BS 6.3 millimetre sieve shall exhibit at least three freshly broken faces; and</p> <p data-bbox="528 1619 1471 1720">(iii) not less than 80 per cent by mass of the particles in each BS 63 specified size fraction within the size range stated at (i) above shall exhibit at least three freshly broken faces.</p> <p data-bbox="528 1738 1471 1995">(iv) The material shall satisfy the minimum CBR requirement of Appendix 7/1 when tested in accordance with Clause 7 of BS 1377 : Part 4. The material shall be tested at the density and moisture content likely to develop in equilibrium field conditions which shall be taken as being the density relating to the uniform air voids content of 5 per cent and the optimum moisture content determined in compliance with BS 5835. The specimens shall be tested in a soaked condition.</p> <p data-bbox="528 2013 1471 2047">(v) The material shall have a ten per cent fines value of 50</p>	BS sieve size	Percentage by mass passing	75 millimetres	100	37.5 millimetres	85 – 100	10 millimetres	40 – 70	5 millimetres	25 – 50	600 microns	8 – 22	75 microns	0 – 10
BS sieve size	Percentage by mass passing														
75 millimetres	100														
37.5 millimetres	85 – 100														
10 millimetres	40 – 70														
5 millimetres	25 – 50														
600 microns	8 – 22														
75 microns	0 – 10														

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>kilonewtons or more when tested in compliance with BS 812 : Part 111 except that the samples shall be tested in a saturated and surface-dried condition. Prior to testing, the selected test portions shall be soaked in water at room temperature for 24 hours without previously having been oven-dried</p> <p>1.5 The aggregate will be considered suitable if:</p> <p>(i) aggregate from the source, when tested in accordance with BS 812 : Part 121, has a soundness value greater than 65; or</p> <p>(ii) evidence can be provided to the Employer of satisfactory use of aggregate from the source as Type 1 sub-base material.</p> <p>1.5.1 The water absorption of the coarse aggregate from the source determined in accordance with BS 812 : Part 2 shall also be declared.</p> <p>1.6 <b>Transportation and Compaction</b></p> <p>1.6.1 The material shall be transported, laid and compacted to the requirements of Clause 801 at a moisture content within the range one per cent above to two per cent below the optimum moisture content determined in compliance with BS 5835 and without drying out or segregation.</p> <p>1.7 <b>Trafficking Trial</b></p> <p>1.7.1 When required by Appendix 7/1, the Contractor shall construct a trial area incorporating the crushed gravel sub-base material proposed for use in the Works. The trial area shall be constructed, trafficked and assessed in accordance with the procedure described in Appendix 7/1. The mean vertical deformation after 1000 standard axles shall be less than 30 millimetres when measured in accordance with the stated procedure.</p> <p>1.8 <b>Performance of Crushed gravel Sub-base</b></p> <p>1.8.1 A brief performance report on the behaviour of the crushed gravel sub-base is required.</p>
1202TS	<p><b>1 General Requirements for Permanent Traffic Signs</b></p> <p>1.1 Sub-Clause 1: Delete “described in Appendix 12/1” and insert “of the Contract”</p> <p>1.2 Sub-Clause 2: Delete “BS 873 : Part 1” and insert “BS EN 12899-1:2001 And insert at the end of the paragraph “Additionally, unless protected by existing safety barriers signs shall be, by preference, designated as Passively Safe and shall therefore conform to testing as BSEN12767:2007, TD89/08 and be installed in compliance with TD19/06.”</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>1.3 Sub-Clause 3: Delete whole sub-Clause text and insert “Sign panels of internally illuminated signs, transilluminated signs and luminaire face panels shall, comply with impact BS EN 12889-1:2001.”</p> <p>1.4 Sub-Clause 4: Delete “BS 873 : Part 5 unless otherwise described in Appendix 12/1” and insert “BS EN 12889-1:2001.”</p> <p>1.5 Sub-Clause 5: Delete “,unless otherwise described in Appendix 12/1,” And Delete “Contractor” and insert “Company”</p> <p>1.6 Sub-Clause 6: Delete whole sub-Clause and insert “A traffic sign housing shall be provided with vandal and weather resistant locks. Keys shall be provided to the Overseeing Organisation, in the quantities stated in Appendix 12/1. Types of lock shall be kept to a minimum and shall be as described in Appendix 12/1.”</p> <p>1.7 Sub-Clause 7: Insert at the end of the paragraph “Illuminated traffic signs shall also be labelled in accordance with Transport Scotland (TS) Guidance Note GN01/07 ‘Trunk Road Lighting Identification System’. The identifying code shall be provided by the Company responsible for the road. Contact details are provided in Appendix 12/1.”</p> <p>1.8 Sub-Clause 8: Delete whole sub-Clause and insert “Traffic signs and poles shall at all times be handled, transported and stored in accordance with the manufacturers recommendations and be at all times adequately protected to prevent damage.”</p>
<b>1204TS</b>	<p><b>1 Posts for Permanent Traffic Signs</b></p> <p>1.1 Sub-Clause 1: Delete whole sub-Clause and insert “Posts for permanent traffic signs shall be as described in Appendix 12/1 and shall comply with BS EN 12899-1:2001. The surface protection requirements shall similarly comply with BS EN 12899-1:2001 installation shall be in compliance with TD 19/06. Sign posts shall also conform to testing as BSEN12767:2007 and be constructed as to conform to the following:”</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>1.2 Sub-Clause 1(ii): Insert at the end of the paragraph “, lattice or other construction as agreed with the Overseeing Organisation. Such posts shall not include joints except at the sign head fixing”</p> <p>1.3 Sub-Clause 1(iii): Delete whole sub-Clause and insert “Concrete posts only to be used for special and specific applications. Such use shall be agreed with the Overseeing Organisation on a site by site basis.”</p> <p>1.4 Sub-Clause 2: Delete “a minimum” and insert “no greater than 120 millimetres. Posts shall be fitted with suitable permanently affixed weatherproof cap of a type capable of providing watertight protection for a minimum of 20 years.</p> <p>1.5 Sub-Clause 3: Delete “this Clause” and insert “Sub-Clause 2” And Delete “BS 873 : Part 7” and insert “BS EN 12899-1:2001</p> <p>1.6 Sub-Clause 5: Delete “access doors shall be on the side of the compartment furthest from approaching traffic” and insert “shall be installed such that the door is facing away from the oncoming traffic allowing maintenance personnel to access the door while facing the traffic. The use of other access door orientation shall only be agreed with the Overseeing Organisation at very specific locations.”</p> <p>1.7 Sub-Clause 6: Delete “Flange plates” and insert “Where Flange plates are required they”</p>
<b>1218TS</b>	<p><b>1 Detector Loops</b></p> <p>1.1 Sub-Clause 1: Insert after “with” the following “the Series 1500 National Alterations of the Overseeing Organisation of Scotland and the”</p> <p>1.2 Insert the following sub-Clauses: “2. The positioning and layout of such loops shall, where applicable, be in accordance with MCH 1589 unless otherwise described in Appendix 12/1.”</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	"3. Loops for use with Traffic Signals shall be installed in accordance with the requirements for such installations."
<b>1301TS</b>	<p><b>1 General</b></p> <p>1.1 Sub-Clause 1 (i): Delete "steel," Delete "and concrete"</p> <p>1.2 Sub-Clause 1(i) (a): Delete "20 metres" and insert "15 metres"</p> <p>1.3 Sub-Clause 1(i) (b): Delete "18 metres" and insert "15 metres"</p> <p>1.4 Sub-Clause 1(i) (c): Delete all of 1(i)(c) text and replace with "columns shall be tapered with an integral bracket. The maximum bracket outreach shall be no greater than 0.5m metres."</p> <p>1.5 Sub-Clause 1 Insert (v): For steel columns (a) post top columns not exceeding 20 metres nominal height, these columns shall be of continuously tapered folded steel construction; (b) columns with brackets not exceeding 18 metres nominal will have a maximum bracket outreach of 0.5 metres  NOTE: Only where individual columns are being replaced within an existing lighting scheme will outreaches greater than 0.5 metres be accepted. Generally only to maintain consistency in such installations can columns other than tapered folded sheet steel be used. In these situations columns of a similar design to those in the existing lighting scheme can be used.</p> <p>1.6 Sub-Clause 1(ii) (a): Insert at the beginning of the sentence: "Unless specifically specified"</p> <p>1.7 Sub-Clause 1(ii) (b): Delete "1.5 metre" and insert "0.5 metre".</p> <p>1.8 Sub-Clause 1(iv): Insert (c) bracket projections for cantilever masts not exceeding 0.25 x nominal height or three metres whichever is the lesser.  NOTE: The nominal height of a flange column or mast is taken as the</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>distance between the underside of the flange plate and the highest point of the mast. See Fig. 1. of BD88 (DMRB 2.2.13)</p> <p>1.9 Sub-Clause 2</p> <p>Insert at the end of the first paragraph: “and all other certification as described in BSEN40 and BSEN12767:2007.”</p> <p>And</p> <p>“Additionally, unless protected by an existing vehicle restraint system (“VRS”), columns shall be, designated passively safe or otherwise located so as to require no protection in accordance with TD19/06. Where passively safe columns are used they shall conform to testing as BSEN12767:2007. Installation shall always be in compliance with TD19/06.”</p> <p>1.10 Sub-Clause 3</p> <p>Insert before BS EN 40-1: “guidance document PD6547 and the requirement of”.</p> <p>1.11 Sub-Clause 6</p> <p>Delete the Clause text and insert:</p> <p>“Where lighting columns, CCTV masts and cantilever masts are installed in the vicinity of overhead power lines the Contractor shall ensure that the appropriate Electricity Authorities are notified. The Contractor shall notify and obtain written agreement on the specific clearances required and that warning notices as described in Appendices 13/1, 13/4 and 13/7 are permanently fixed to these columns prior to erection. All to conform to GS6 ‘Avoidance of danger from overhead electric power lines’ published by the Health and Safety Executive, the ILE / HSE document ‘Safety during the installation and removal of lighting columns and similar street furniture in proximity to high voltage overhead lines’ and the Overseeing Organisation guidance document LDS8001_09 ‘Trunk Road Lighting and Associated Electrical Apparatus Identification System’</p> <p>1.12 Sub-Clause 8</p> <p>Add:</p> <p>Non-hygroscopic base compartment back-board not less than 15mm thick and of a sufficient size to accept the selected cut-out and control apparatus shall be positioned internally opposite the access door. The baseboard shall be securely fixed to the inside of the column. All screws and fixings used for the attachment of apparatus and components to this wooden back-board shall be of stainless steel</p> <p>1.13 Sub-Clause 9</p> <p>Add:</p> <p>In compliance with the operational requirements of the Transport Scotland IRIS inventory and management system standards the</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Overseeing Organisation shall make access available to the Company. The Company shall provide all information generally in accordance with the Overseeing Organisation attributes as required to correctly populate and operate all required functions of the Scottish Lighting Management System. Direct on-line access to the Transport Scotland Lighting Management System is available to the Operating Companies. The Operating Companies shall provide their collected information in a format agreed with the Overseeing Organisation's requirements.</p>
1.14	<p>Sub-Clause 10</p> <p>Add:</p> <p>Aluminium lighting columns shall be manufactured with a flush mounted access door correctly positioned relative to with the integral bracket. This position to ensure that access through the door can only take place when facing the oncoming traffic.</p>
1.15	<p>Sub-Clause 11</p> <p>Add:</p> <p>The column cable entry slot, which shall be positioned on the face to the right of the column access door opening, shall have minimum dimensions of 150mm x 75mm with the lower edge of the slot 600mm below ground level. The cable entry slot shall be free from irregularities and burrs.</p>
1.16	<p>Sub-Clause12</p> <p>Add:</p> <p>Each column shall be fitted with an 8 mm (minimum) diameter earth terminal complete with two plain washers and one full nut and one locking nut. These items shall be corrosion resistant and compatible with the column material. Earth terminals shall be readily accessible through the door opening and located such as to minimise the risk of injury to persons accessing them while undertaking installation and maintenance.</p>
1.17	<p>Sub-Clause 13</p> <p>Add:</p> <p>All electrical and similar joints made onto the column structural aluminium and column access door shall be such as to eliminate or protect against corrosion resulting from contact between dissimilar metals. Operating Companies are required to adhere to such aspects of the guidance provided in PD6484 as it relates to dissimilar metals in contact with aluminium. The selection of electrical earthing components shall also comply in this and other respects with the requirements of BS 7430.</p>
1.18	<p>Sub-Clause 14</p> <p>Add:</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>The flush fitting weatherproof single access door shall provide protection no less than IP33 and shall be free from any irregularities, burrs or sharp edges likely to cause injury. Unless specifically required by the Contract each column access door shall have two locks using a triangular type key The number of column door keys shall be supplied shall be 10% of the number of columns erected subject to a minimum of three keys. All column access door keys shall be manufactured from metal and be of an adequately size.</p>
1.19	<p>Sub-Clause 15</p> <p>Add:</p> <p>On completion of the installation, all door locking components shall be coated with an application of suitable corrosion inhibitor grease providing lubrication and protection from seizure and general deterioration.</p>
1.20	<p>Sub-Clause 16</p> <p>Add:</p> <p>Lighting column access doors shall be retained by stainless steel chain or braided stainless steel wire. Such retaining chain or wire shall be compatible with the column material and be held captive by fixings similarly manufactured from compatible material. Chains shall be a minimum gauge of 4mm and be long enough to allow the column access door to be rested completely on the ground whilst removed. All removable access doors shall be interchangeable with access doors of similar columns without the need for adjustment. All access doors shall be fitted with a bonding earth conductor marginally longer than the retaining chain or wire. Termination of the bonding earth conductor shall use components manufactured from compatible material.</p>
1.21	<p>Sub-Clause 17</p> <p>Add:</p> <p>Where columns are mounted on structures and behind parapets, the access doors shall be positioned such that the access opening is fully accessible above the upper height of the protective parapet and facing the maintenance personnel.</p>
1.22	<p>Sub-Clause 18</p> <p>Add:</p> <p>Flange plate columns shall be set vertical on the foundation bases prepared for them. To ensure the column is set vertical compatible metal shims shall be used. The nuts and exposed bolts shall be made suitably tight and then coated with protective paste and tape. All fixings shall be compatible with the column material.</p>
1.23	<p>Sub-Clause 19</p> <p>Add:</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Where the column flange is not in accordance with BS EN 40-2 the Company shall liaise with the Company responsible and agree details of the flange sizes and fixing centres. The Company shall implement a design based upon the agreed flange fixing and provide the design to the column manufacturer.</p> <p>1.24 Sub-Clause 20 Add: Where separate bracket arms are used such bracket arms shall be of compatible material to the column and fixed in accordance with the manufacturer's written instructions to prevent rotation using an anti-rotational device.</p> <p>1.24 Sub-Clause 21 Add: Road lighting columns and brackets shall be manufactured, located and erected in compliance with this Series, the 1400 Series and all relevant requirements.</p> <p>1.26 Sub-Clause 22 Add: Where wall brackets and associated service boxes are installed they shall, where applicable, match existing items.</p>
1302TS	<p><b>1 Design of Lighting Columns, Brackets, CCTV Masts, Cantilever Masts, Foundations, Anchorages and Attachment Systems</b></p> <p>1.1 Sub-Clause 1 Delete whole Sub-Clause text and insert: For all new installations it is a requirement of the Overseeing Organisation that lighting columns shall be continuous taper, be manufactured from aluminium, the column root to be protected by an inner and outer polymer thermally bonded sheath to a height of 250mm from the bottom of the column, the columns to have an integral 0.5m outreach and flush access doors. Sign support posts shall be of tubular aluminium or aluminium lattice construction.</p> <p>Lighting columns, brackets, CCTV masts, cantilever masts, the foundations of both planted columns and columns and masts with flange plates, and the anchorages and attachment systems for columns and masts with flange plates shall be designed to comply with the requirements of Standards BD 94 (DMRB 2.2.1), BD 83 (DMRB 2.2.11), BD 88 (DMRB 2.2.13) and the technical approval scheme adopted by the Overseeing Organisation. The Contractor shall similarly comply with PD6547 and the referenced standards within it. The</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Contractor shall use the soil type information as described in Appendices 13/1 and 13/7. The Contractor shall design foundations for all columns and masts detailed in the Contract and drawings.</p> <p>(i) The Contractor shall be responsible for the design of all:</p> <p>(a) anchorages and attachment systems for columns and masts with flange plates to foundation or bridge deck; and</p> <p>(b) foundations for columns and masts with flange plates; as described in Appendices 13/1, 13/4 and 13/7.</p> <p>(ii) The Contractor shall submit to the Overseeing Organisation a copy of all design calculations, variations, certification and supporting information at least two weeks prior to delivery and shall include with such records confirmation that such records have been checked by a competent person to ensure compliance with the required standards and check certificates issued for lighting columns, brackets, CCTV masts, cantilever masts and foundations. The design of the foundations shall be appropriate to the soil types encountered on site, as identified in Appendices 13/1, 13/4 and 13/7.</p> <p>(iii) The Contractor shall establish the soil types on site and submit, to the Overseeing Organisation for its acceptance, lighting column foundation details appropriate to the conditions found and in accordance with the requirements of BS EN 40.</p> <p>(iv) The excavation to accommodate planted root columns shall not exceed a diameter greater than twice the diameter of the column root. Where a separate bracket is used for compatibility with existing columns the column shall be erected without the bracket in place and placed centrally in the excavation.</p> <p>(vi) Alternative foundations can be used with the prior written agreement of the Overseeing Organisation.”</p> <p>1.2 Sub-Clause 2</p> <p>Insert at the end of the paragraph:</p> <p>“Where required to be incorporated into an existing scheme the lighting column silhouette must use the same or near similar bracket angle and generally be compatible with existing equipment.</p> <p>Where fold-down columns greater than 8 metres high are installed these should be hydraulically raised and lowered.”</p>
1303TS	<p><b>1 Data Sheets</b></p> <p>1.1 Insert new Sub-Clause:</p> <p>“3 The Contractor shall within one month of the commencement of the Works and prior to placement of any orders for materials, submit to the Overseeing Organisation for approval, triplicate</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	copies of completed Appendix 13/2 Data sheets for each type lighting column.”
<b>1304TS</b>	<p><b>1 Identification and Location Markings</b></p> <p>1.1 Sub-Clause 1. Insert at the end of the paragraph: “Also all such masts, columns and brackets shall be correctly labelled with the CE mark confirming conformance with the appropriate directive(s). “</p> <p>1.2 Sub-Clause 2 Delete the text and replace with: “The column and mast identification marks shall be permanent and legible and be made clearly visible in one of the following ways: (i) on a permanent fixed label; or (ii) hard stamped; or (iii) formed into the material of the column / mast external face only. For hard stamped identifiers, the mark shall be located immediately above the access door and for label identification this shall be placed immediately inside the base compartment: it shall not be located on the door. All hard stamping shall be carried out in a manner that will not induce any stresses into the material of the column / mast”</p> <p>1.3 Sub-Clause 3 Delete the text and replace with: “Where separate brackets are approved for use by the Overseeing Organisation the bracket identification mark shall also be permanent and legible and be either: (i) hard stamped; or (ii) formed into the material of the bracket arm and on either the luminaire spigot or the underside of the bracket arm adjacent to the column shaft or the wall or pole mounting plate. The mark will be on an external face only.”</p> <p>1.4 Sub-Clause 5 Delete the text and replace with: “In addition, location / identification labels for compliance with DMRB requirements and electrical regulatory inspection and maintenance purposes shall be applied to each lighting column as described in the</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Overseeing Organisation guidance document LDS8001_09 'Trunk Road Lighting and Associated Electrical Apparatus Identification System'. The identifying code for use on the labels shall be provided by the appropriate Contractor and agreed with TS. To enable the Contractor to provide the ID codes the Contractor shall provide the Contractor with site design layout drawings and electrical schematics. All records relating to the lighting columns shall include this identifying code."</p>
<p><b>1308TS</b></p>	<p><b>1 Handling, Transport and Erection</b></p> <p>1.1 Sub-Clause 4</p> <p>Delete the text and replace with:</p> <p>"Columns and masts shall be installed in accordance with the manufacturer's instructions and all requirements of the design specification and the Overseeing Organisation."</p> <p>1.2 Sub-Clause 6</p> <p>Add:</p> <p>All verge located lighting columns shall be installed such that the door is facing away from the oncoming traffic allowing maintenance personnel to access the door while facing the traffic. The use of other access door orientation shall only be agreed with the Overseeing Organisation at very specific locations. Where agreement for such alternative orientations is to be sought this must form part of the initially proposed project design.</p>
<p><b>1401TS</b></p>	<p><b>1 General</b></p> <p>1.1 Sub-Clause 1</p> <p>Delete text and insert:</p> <p>"The lighting installation shall not be energised until the Contractor has complied with the Electricity at Work Regulations 1989 and provided to the Overseeing Organisation all completed BS7671 Inspection and Testing Certificates. In addition to the provision of the BS7671 Inspection and Testing Certificates the Contractor shall provide a written record to the Overseeing Organisation stating that these Certificates have been audited for correct and full completion by a resource competent to undertake such audits.</p> <p>Materials equipment and workmanship required under the Contract shall comply with BS 7671 Regulations for Electrical Installations (the IEE Wiring Regulations) and the applicable regulations of the Distribution Network Operator (DNO) providing the supply. The installation and maintenance of electrical apparatus and cabling for road lighting and illuminated traffic signs shall comply with the quality management scheme detailed in Appendix A Volume 1 of the MCHW.</p> <p>The Contractor shall ensure that only competent persons that are</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>registered with the Highway Electrical Registration Scheme (HERS) or are registered with another approving body, such as SELECT or NICEIC shall be employed on Works that fall within the scope of this series. In addition Authorised Persons shall be registered as specified in the 'Handbook for the Highway Electrical Industry Scheme for the Registration of Authorised Persons, Highway Electrical, Highway Electronic &amp; Associated Highway Works'.</p> <p>The Contractor shall incorporate into work procedures the contents of Engineering Recommendation G39/1 'Model Code of Practice covering Electrical Safety in the Planning, Installation, Commissioning and Maintenance of Public Lighting and Other Street Furniture'.</p> <p>The Contractor shall employ only competent personnel each of whom holds a 'Competent Persons Authorisation Certificate' in accordance with the model form in Appendix B of the above document G39/1. For this purpose G39/1 shall be modified as specified below. The modified document shall be duly completed by the Contractor and authorised by a designated responsible person in the authority or company as defined in Clause 2 of G.39/1, all in accordance with Clause 10 of G.39/1. The form of certificate as specified above shall be modified on page B2 of G.39/1 by insertion of the following after the space for 'Name and Address of Employer':</p> <p>"Name of authority or company ....."</p> <p>In addition to the requirements of Sub-Clauses 10.2 and 10.3 of G.39/1, each Competent Person as defined in G.39/1, Clause 2, shall be provided by the Contractor with not less than one copy of the above certificate, duly completed and signed as approved. Such certificate(s) shall be retained and be available at all times for inspection on request by the Overseeing Organisation. A formal work allocation record shall be kept by the Contractor to enable work carried out by individual operatives and the responsible supervisor to be identified. All operatives and supervisors shall hold a valid Electrotechnical Certification Scheme (ECS) identity card. Notification of the details of all such cards shall be submitted to the Overseeing Organisation 14 days prior to commencement of the Works.</p> <p>The Contractor and Designer are required to pay particular attention to those sections, detailed within this National Alteration, where the Transport Scotland requirements differ from those of the standard Manual of Contract Documents for Highway Works (MCHW) and other Highways Agency documents.</p> <p>The Contractor and Designer shall comply with the statutory regulations of the Electricity at Work Regulations 1989."</p> <p>1.2 Sub-Clause 2 (iv) Delete text and insert (i) A Road Lighting Unit shall consist of the following, as described in</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>the Contract, column, bracket, wall mounting, internal wiring and the electrical apparatus as defined in (iv) below.</p> <p>(ii) An illuminated (lit) Sign Unit shall consist of a traffic sign requiring an electricity supply and electrical apparatus and wiring as in (i) above for its illumination.</p> <p>(iii) The term Road Lighting Unit applies inter alia to lighting assemblies on road lighting columns and wall brackets, bollards, illuminated signs, underpass lighting, bulkhead lighting, and lighting at/in bus shelters, service/ administration buildings and all similar equipment provided for the illumination of roadside assets, road surface and other publicly accessible assets.</p> <p>(iv) Electrical apparatus for Road Lighting Units shall include but not be limited to the following or as otherwise described in the applicable contract: luminaires, photo-electric control units (PECUs), shorting plugs, lamps (including Light Emitting Diodes (LED)), time switches, magnetic and electronic ballasts, LED drivers, ignitors, starters, capacitors, cut-outs, fuses, fuse holders, miniature circuit breakers (MCBs), luminaire mounted modules, sub-assemblies and other roadside apparatus forming part of an Intelligent Lighting Control System (ILCS) / Central Management System (CMS) and Light Emitting Diodes (LED) and their associated drivers.</p> <p>(v) The Network is the electrical distribution network installed by the Company from the DNO cut-out to the Lighting Units. This will include inter alia feeder pillars, cabinets, housings and similar enclosures that form part of the installed electrical distribution network.</p> <p>(vi) Roadside Electrical Assets (REA) are those items included and forming part of the Scottish Road Network electrical equipment inventory held in the IRIS.</p> <p>(vii) Lighting Management System, also known as Lighting Management Function is that part of the Transport Scotland IRIS inventory and management system covering lighting and Roadside Electrical Assets (REA).</p> <p>(viii) The Transport Scotland Intelligent Lighting Control System (ILCS) also known as Lighting Central Management System (CMS) shall be considered as the combined total of all systems installed on the Scottish Trunk Road network to allow for the some form of remote control and monitoring of the Transport Scotland Road Lighting and lit assets. The Company shall refer to S1.10.3 of Schedule 2 Part 2 of the New Works Requirements for additional requirements concerning the Intelligent Lighting Control System (ILCS)</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1.3	<p>Sub-Clause 3</p> <p>Delete text and insert</p> <p>“Each network shall operate on a nominal single phase 230 volt AC, -6 per cent to +10 per cent or 3-phase 400 volt -6 per cent to +10 per cent. It will be the Contractor’s responsibility to ensure that the equipment supplied will operate correctly at the voltage available at the point of use and ensure that the voltage at the point of use is within the requirements of the BS 7671 Regulations. The Contractor shall obtain a declaration from the DNO, provided in accordance with the Electricity Safety, Quality and Continuity Regulations in which the nominal voltage and frequency of the supply shall be specified along with the permitted tolerances.</p> <p>Following on from this the following should be noted:</p> <ul style="list-style-type: none"> <li>(i) TN-C distribution shall not be used for any part of any new road lighting electrical distribution network;</li> <li>(ii) Where a 3-phase (400 volt) supply has been provided by the Supplier this 3-phase supply shall not be distributed within the network as a 3-phase supply but only as three separate single phase supplies; and</li> <li>(iii) The single phase supplies derived from a 3-phase electricity supply shall not under any circumstances be defined as being an ‘individual’ or ‘separate’ single phase supply. They shall not be used to supply equipment other than road lighting related circuits. Road lighting circuits include any anti-condensation heaters and maintenance sockets and similar housed within lighting pillars.”</li> </ul>
1.4	<p>Sub-Clause 4</p> <p>Delete text and insert:</p> <p>“The Contractor shall provide sufficient access and area within electrical equipment to allow the electricity supplier to install their service connection and associated cut-out. This shall be considered as the origin of the circuit. “</p>
1.5	<p>Sub-Clause 5</p> <p>Delete text and insert:</p> <p>“This dedicated feeder pillar shall be provided for the Overseeing Organisation’s lighting network. Distribution feeder pillars shall be also provided as required. Unless otherwise approved by the Overseeing Organisation supplies provided to electrical equipment for third parties, internal and external to the Overseeing Organisation, shall not be connected to the Overseeing Organisation’s Network. Any such supplies so provided shall conform to the Overseeing Organisation’s specific instructions as specified in the Overseeing Organisation guidance document LDS8006_09 ‘Electricity Supply to Roadside</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Electrical Equipment and Lighting sites'. Before making any form of electrical connection into any part of the Overseeing Organisation's lighting network a completed Appendix A form shall be submitted and approved by the Overseeing Organisation 21 days prior to the connection being made.</p> <p>If temporary lighting is required it shall provide no less luminance than existing lighting over the area of the carriageway. Mounting heights for this lighting shall be the same as the existing lighting. The installation of temporary lighting shall comply with the relevant Acts and Regulations (for example Electricity at Work Regulations 1989 and BS 7671:2008). It shall not form a hazard to motorists. No existing street lighting shall be disconnected until it has been replaced by either the new permanent lighting or a temporary lighting system to the written consent by the Overseeing Organisation. The temporary lighting shall remain operative until the new permanent lighting is brought into use. Temporary lighting arrangements shall have written consent by the Overseeing Organisation before the commencement of any affected work."</p>
1.6	<p>Sub-Clause 6</p> <p>Add:</p>
	<p>The Company shall fit ID labels and conspicuity bands in accordance with the Overseeing Organisation guidance document LDS8001_09 "Trunk Road Lighting and Associated Electrical Apparatus Identification System"</p>
1.7	<p>Sub-Clause 7</p> <p>Add:</p>
	<p>This document shall be read in conjunction the DMRB Technical Directives TD 19/06 (Road Restraint Systems), BS EN12767 Use of Passively Safe Signposts, Lighting Columns and Traffic Signal Posts), TD 23/99 (Inspection &amp; Maintenance of Road Lighting) and TD 25/01 (Inspection of Traffic Signs).</p>
1.8	<p>Sub-Clause 8</p> <p>Add:</p> <p>Other relevant documents include:</p> <ul style="list-style-type: none"> <li>(i) Electricity at Work Regulations 1989.</li> <li>(ii) The Electricity Safety, Quality and Continuity Regulations 2002 (amended 2006,2009)</li> <li>(iii) Waste Electronic and Electrical Equipment (amendment) Regulations 2006.</li> <li>(iv) Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008 (the "RoHS Regulations").</li> </ul>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<ul style="list-style-type: none"> <li>(v) IET Wiring Regulations 17<sup>th</sup> Edition: British Standard (BS) 7671:2008 Requirements for electrical installations. Incorporating Note No1 - 2011</li> <li>(vi) BS 7430: Code of practice for earthing.</li> <li>(vii) BS EN 50110 Part 1 &amp; 2: Operation of Electrical Installations.</li> <li>(viii) HSE Publication HSR25: Memorandum of Guidance on the Electricity at Work Regulations 1989.</li> <li>(ix) HSE Publication GS6: Avoidance of Danger from Overhead Electric Lines.</li> <li>(x) HSE Publication HSG85: Electricity at Work – Safe Working Practices.</li> <li>(xi) HSE Publication HSG47: Avoiding danger from underground services</li> <li>(xii) Institution of Lighting Engineers (ILE) Code of Practice for Electrical Safety in Highway Electrical Operations</li> <li>(xiii) Energy Networks Association (ENA) Engineering Recommendation G39/1: Model Code of Practice, covering electrical safety in the planning, installation, commissioning and maintenance of public lighting and other street furniture.</li> <li>(xiv) ENA Technical Specification 43-8: Overhead Line Clearances.</li> <li>(xv) County Surveyors' Society (CSS) Publication: Guidance Notes on Electrical Safety on the Highway to Achieve Compliance with the Electricity at Work Regulations, 1995.</li> <li>(xvi) CSS Publication: Code of Practice for the Installation and Operation of Seasonal Decorations on or above the Public Highway, 1995.</li> <li>(xvii) National Joint Utilities Group (NJUG) Publication 1: Recommendations on the avoidance of danger from underground electricity cables.</li> <li>(xviii) NJUG Publication 3: Cable Locating Devices</li> <li>(xix) Well Lit Highways. Code of Practice for Highway Lighting Management</li> </ul>
<b>1402TS</b>	<p><b>1 As-built and operational Records</b></p> <p>1.1 Sub-Clause 1</p> <p>Insert at the end of the paragraph:</p> <p>(i) The Company shall amend drawings whenever any part of the installation shall be amended or extended. Test certificates pertaining to the part of the installation that has been modified shall be completed</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>and passed to the Scottish Ministers for approval. Locations of Constructional Plant and apparatus shall be referenced in accordance with the Trunk Road Network Referencing System.</p> <p>1.2 Sub-Clause 2 Delete the text and insert: “As built drawings shall be produced by the Contractor the (private) network and all lighting units in accordance with this Clause. The Contractor shall complete the as-built drawings in AutoCAD™ format and provide them to the Employer in accordance with the as-built requirements in Part A1.”</p> <p>1.3 Sub-Clause 3 Delete text and insert: “As-built drawings shall include both geographical and schematic drawings: (i) a schematic distribution layout drawing indicating the distribution arrangement of each private cable network; (ii) a schedule of abandoned cables including location; (iii) duct and cable location offsets taken at 20 metre intervals where cables maintain a steady line, and at 5 metre intervals where the line of the cable varies. Cable records shall be determined from kerb lines or fence lines; and (iv) the geographical and schematic drawing shall detail the ID label attached to pillars and lighting units. The geographical drawing shall detail the accurate location of all lighting units, duct location (including size and number), cable runs (including cable size), pillars, all chambers and the electricity supply location. The DNO ‘supply point ID No.’ must be obtained from the electricity supplier and included on the drawing. Every lighting unit shall be marked in a manner such that it can be determined what the column height, material lantern type, lamp wattage, illuminated sign TRGD ref. No., type and wattage of sign lighting unit.”</p> <p>1.4 Sub-Clause 4 Delete text and insert: “Operational Records shall include: (i) maintenance or operating manuals for installed equipment; (ii) inspection and test certificates in accordance with BS 7671; and (iii) Data required for inventory purposes in the format stipulated in the Scottish Ministers.”</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title	
1403TS	<p><b>1</b></p> <p>1.1</p>	<p><b>Location of Lighting Units and Feeder Pillars</b></p> <p>Delete Sub-Clause 1 and 2.</p> <p>Insert the following:</p> <ol style="list-style-type: none"> <li>1) Unless otherwise described in Appendix 14/2, electrical isolation pillars shall, where required, be provided on the network at the maintenance boundary fence. Final positioning of such pillars shall be with the prior agreement of the Overseeing Organisation.</li> <li>2) In cases where the location of an item, already determined, is subsequently changed due to underground obstruction or similar difficulties, then any excavation already made shall be back-filled and reinstated to its original condition.</li> <li>3) Unless described in Appendix 14/2 the location of feeder pillars shall be in accordance with the Contractor's submitted design. The Contractor's design shall fully consider all relevant requirements including inter alia such arrangements as to ensure safe maintenance access to the pillar. The exact location will be agreed on site before commencement of any related ground works. The Contractor shall be responsible for recording and documenting all aspects of the final site layout and the as-installed equipment.</li> <li>4) Protection of feeder pillars and other above-ground electrical enclosures shall conform to the requirements of TD19/06 and where appropriate fulfil the requirements relating to unprotected equipment in terms of passive safety.</li> <li>5) The location of cabinets or pillars provided to house the Electricity Supply Company's equipment shall be agreed with the Overseeing Organisation prior to its installation.</li> <li>6) In general all such housings shall be lighting feeder pillars and other above-ground electrical enclosures relative to electrical and communications enclosures installed by others shall fully comply with the proximity and electrical bonding requirements described in Clause 1420TS.</li> <li>7) Unless otherwise described in Appendix 14/2 the number, rating, type and location of all road lighting units shall form part of the Contractor's lighting design."</li> </ol>
1407TS	<p><b>1</b></p> <p>1.2</p>	<p><b>Luminaires</b></p> <p>Delete Sub-Clause 1, 2 and 3.</p> <p>Insert the following:</p> <ol style="list-style-type: none"> <li>1) Luminaires fitted with integral control gear or driver circuits which shall be fitted with a fuse holder, incorporating direct touch protection, adjacent to the luminaire terminal block and other potentially exposed components.</li> </ol>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Unless otherwise agreed with the Overseeing Organisation preference shall always be given to designs incorporating LED luminaires. Other high efficiency devices may be optionally proposed for specific situations.</p> <p>All luminaires and lighting components shall be, as agreed with the Overseeing Organisation, suitable for use with intelligent lighting control system (“ILCS”) control and communications modules and other similar sub-assemblies. Suitability will include features for the correct fitting and housing of any such additional components and allow for the ready access to them for maintenance. Suitability will also cover the interface arrangements of the electronic DALI compatible, enabled and accredited ballast or LED Driver assembly. Luminaires and lighting components shall be considered as including but not limited to road lighting, illuminated signs and lit bollards and assets covered by Clause 1401TS 2. (iii) above.</p> <p>Unless agreed otherwise with the Overseeing Organisation, each luminaire shall be fitted with a control and monitoring module incorporating DALI compatible, enabled and accredited lighting control and monitoring circuitry and wireless radio frequency communication technology allowing secure data exchange with the roadside base stations. The control and monitoring module shall be directly powered from the same mains supply as the asset it is controlling.</p> <p>Roadside base stations shall be provided by the Company in accordance with the functional requirements of Transport Scotland’s existing ILCS. Transport Scotland will be responsible for any charges associated with data communication for the operation of the ILCS.</p> <ol style="list-style-type: none"> <li>1) .</li> <li>2) Luminaires for road lighting shall comply with BS EN 60598-2-3, and be as described as or better than specified in this Clause; <ol style="list-style-type: none"> <li>(i) the mounting arrangement shall provide for a close fitting between the luminaire and the column, making use of a two or more bolt, fixing arrangement;</li> <li>(ii) tilt angle adjustment shall be integral to the luminaire and shall apply to both top and side fixing arrangements. The adjustment shall allow for a minimum of three tilt angles including 0, +5 and +10 degrees;</li> <li>(iii) unless otherwise specified in Appendix 14/4 the internal arrangement of the luminaire shall consist of separate control gear and lamp compartments. These compartments shall be arranged to provide for the separate sealing of the optical system (lamp housing) and control gear compartment. Both compartments shall have a degree of</li> </ol> </li> </ol>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>external sealing and sealing between each other no less than IP66;</p> <p>(iv) unless otherwise specified in Appendix 14/4 only the luminaire to be used for group control shall be fitted with a NEMA socket and this shall be located in the canopy. The control column shall be sited immediately adjacent to the control pillar and a PECU fitted into the NEMA socket;</p> <p>(v) Luminaires to be controlled by the ILCS shall be fitted with a compatible control and monitoring module;</p> <p>(vi) meet the structural design and aesthetic approval requirements of Clause 1302. Unless otherwise specified in Appendix 14/4 the external finish shall be to BS4800 RAL9007 Silver;</p> <p>(vii) a range of luminaires of varying rating shall be available in a common style / design;</p> <p>(viii) For High Intensity Discharge (HID) Lighting, unless otherwise specified in Appendix 14/4 only curved glass manufactured from toughened safety glass shall be used. Flat glass HID luminaires shall only be used in the vicinity of railways, airfields and navigable waterways or by agreement with the Overseeing Organisation. Luminaires shall be of the full-cut-off/low-threshold increment type as agreed with the Overseeing Organisation. For LED luminaires Flat Glass is acceptable in all locations and luminaires shall have a minimum G4 classification;</p> <p>(ix) unless otherwise specified in Appendix 14/4 Elexon approved electronic ballast units shall be provided in luminaires. Luminaries using electronic ballasts shall be limited to the use of 250 Watt lamps, however LED based luminaires have no similar restriction allowing LED luminaires rated as equivalent to 400 Watt to be used.</p> <p>(x) Ballasts shall be suitable for operation over the input voltage range of 210 – 250 volts. Electronic ballasts shall incorporate over-temperature protection and have a power factor no less than unity. Prior to delivery of any luminaire using electronic control gear the Overseeing Organisation shall be provided, by the supplier, with a 'statement of compatibility'. This statement shall detail and confirm that the electronic control gear being supplied is capable of operating over the temperatures range to which it will be exposed in use within the luminaire housing and that the lamp and control gear are fully compatible with each other. The "Statement of Compatibility" shall describe the testing regime used to ensure such compability.</p> <p>(xi) conventional ballast units shall have a power factor no less</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>than 0.85;</p> <p>(xii) luminaires shall incorporate some form of anti-condensation vent or similar measures to minimise moisture build-up within the luminaire;</p> <p>(xiii) all luminaires shall operate correctly over the temperature range of -20 degrees Celsius to +35 degrees Celsius;</p> <p>(xiv) luminaires may be:</p> <p>Class I where the luminaire has an integral earth terminal linked to all exposed metalwork</p> <p>This allows an earth connection to be made to the metalwork of the supporting Structure and to the earth conductor of the supply cable. Fortuitous earth connection provided by connection to mechanical fixings shall not be relied upon.</p> <p>Or</p> <p>Class II where there is no earth terminal provided for connection of the luminaire's exposed metalwork to the circuit protective conductor;</p> <p>(xv) safe access to the lamp and control gear enclosures for maintenance purposes shall require a tool. Doors shall be hinged and include a safety catch. and incorporate an automatic disconnection of the incoming supply when opened;</p> <p>(xvi) unless otherwise specified in Appendix 14/4 the luminaire housing shall be manufactured from corrosion resistant die-cast aluminium. suitable for use in their intended environments. This shall include locations directly adjacent to the sea, e.g. at ferry terminals and similar salt-laden locations;</p> <p>(xvii) Any electrical wiring that could be subjected to heat shall be fitted with additional heat insulating sleeving;</p> <p>(xviii) Luminaires with remote control gear shall not be used unless previously agreed with the Overseeing Organisation; and</p> <p>(xix) Luminaires shall conform to the requirements of the appropriate sections of the ROHS and WEEE Regulations.</p> <p>3) Traffic sign luminaires shall comply with BS EN 12899 and meet the minimum requirements expressed in this Clause. Furthermore traffic sign luminaires shall conform to the following Sub-Clauses as well any additional requirements described in Appendix 14/4:</p> <p>(i) luminaires shall use low energy, high efficiency lamps with electronic control gear. Unless otherwise agreed with the Overseeing Organisation preference will always be given to designs including LED based lamps;</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<ul style="list-style-type: none"> <li>(ii) traffic sign luminaires shall be manufactured from cast aluminium unless otherwise specified;</li> <li>(iii) the external finish shall be to BS4800 RAL7000. External sealing shall be to no less than IP54. The construction shall be suitable for use in all environments including locations directly adjacent to the sea at ferry terminals and in similar salt-laden locations;</li> <li>(iv) for the overhung illumination of a sign: <ul style="list-style-type: none"> <li>(a) the mounting arrangement of the luminaire(s) shall incorporate a vandal and wind loading resistant anti-rotational support fixing capable of accommodating all commonly used post diameters;</li> <li>(b) the sign lighting luminaire(s) shall provide efficient illumination of the sign;</li> <li>(c) all luminaires shall include integral control gear which shall be mounted on a single readily removable tray; and</li> <li>(d) suitable arrangements must be incorporated to prevent un-necessary light spillage;</li> </ul> </li> <li>(v) for up-lighter illumination of a sign: <ul style="list-style-type: none"> <li>(a) the mounting arrangement of the luminaire(s) shall incorporate a vandal and wind loading resistant anti-rotational support;</li> <li>(b) the sign lighting luminaire(s) shall provide efficient illumination of the sign;</li> <li>(c) all luminaires shall include integral control gear; and</li> <li>(d) suitable arrangements must be incorporated to prevent un-necessary light spillage;</li> </ul> </li> <li>(vi) for internally illuminated 'light box' and electroluminescence signs: <ul style="list-style-type: none"> <li>(a) the signs shall conform to all applicable standards in relation to their use including background light intensity;</li> <li>(b) access doors into lamp and control gear compartments on all luminaire types shall be hinged and tamperproof;</li> <li>(c) unless otherwise stated in Appendix 14/4 the mean sign luminance shall be Category I of BS EN 12899 and use high efficiency lamp(s);</li> <li>(d) unless otherwise stated in Appendix 14/4 impact strength shall be Category 1 of BS EN 12899; and</li> </ul> </li> </ul>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p style="text-align: center;">(e) sign lighting luminaires shall conform to the requirements of the appropriate sections of the ROHS and WEEE Regulations.</p> <p>4) Illuminated Traffic Bollards shall generally comply with or exceed the requirements of this Clause and may be of either a rigid or flexible design. Furthermore these bollards shall conform to the following Sub-Clauses as well any additional requirements described in Appendix 14/4:</p> <ul style="list-style-type: none"> <li>(i) all graphics shall be high profile 'moulded-in' with a minimum life for such graphics of 5 years;</li> <li>(ii) all bollard units shall be date coded;</li> <li>(iii) the bollard body shall be interchangeable with other industry standard base equipment in all important physical and electrical parameters;</li> <li>(iv) the access cover on the base unit shall be fitted with stainless steel hinges and locking mechanism. Unless otherwise specified in Appendix 14/4 the base unit lens shall be manufactured from UV stabilised polycarbonate;</li> <li>(v) the base unit shall be cast aluminium construction with sealing to no less than IP67. The unit shall be suitable for use in all environments including directly adjacent to the sea at ferry terminals;</li> <li>(vi) the bollard base unit shall incorporate high efficient lamps compatible with the electronic control gear; and</li> <li>(vii) the bollard shall conform to the requirements of the appropriate sections of the ROHS and WEEE Regulations.</li> </ul>
<p><b>1409TS</b></p>	<p><b>1 Photo-Electric Control Units (PECUs)</b></p> <p>1.1 Delete Sub-Clauses 1, 2, 3 and 4.</p> <p>Insert the following:</p> <p>"1 Photo-electric control units (PECUs) shall comply with BS 5972 1980 BS2011 for vibration and certified to EN 50081-1 EMC Emissions and to EN 50082-1. The PECU shall incorporate synchronous switching technology.</p> <p>The PECUs shall:</p> <ul style="list-style-type: none"> <li>(i) be protected against mains borne surges and spikes;</li> <li>(ii) unless otherwise agreed with the Overseeing Organisation, have NEMA type mounting sockets only;</li> <li>(iii) be of electronic type with a switching level of 70 lux with switching differential ratio of 1:0.5 negative. The photoelectric sensor shall have zero sensor shift over a five year period;</li> </ul>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<ul style="list-style-type: none"> <li>(iv) have a power consumption of no more than 0.25 watts with a uniform operating temperature range of –20 degrees Celsius to +50 degrees Celsius;</li> <li>(v) where used to control contactors, be able to switch a continuously rectified circuit of less than 20 watts;</li> <li>(vi) date stamped and have a manufacturer’s guarantee of at least 6 years; and</li> <li>(vii) be designed so that in the event of a fault occurring in the unit they cause the load to be switched ‘on’.</li> </ul> <p>2 PECUs shall:</p> <ul style="list-style-type: none"> <li>(i) be secured as appropriate to the: <ul style="list-style-type: none"> <li>(a) road lighting luminaire canopy;</li> <li>(b) top of pole located close to feeder pillar;</li> <li>(c) top of sign post;</li> <li>(d) internally illuminated sign housing; or</li> <li>(e) luminaire of externally illuminated sign;</li> </ul> </li> <li>(ii) include a delay device to prevent the lamp being switched in response to transient changes in light conditions;</li> <li>(iii) be indelibly marked with the <ul style="list-style-type: none"> <li>(a) manufacturer’s identification mark;</li> <li>(b) model number; and</li> <li>(c) switch on level;</li> </ul> </li> <li>(i) be provided with a gasket or grommet to maintain the IP protection rating of the luminaire; and</li> <li>(ii) be installed to the manufacturer’s instructions.</li> </ul> <p>3 Single and multi-bracket lighting circuits shall be group switched under the control of the group PECU. Such control shall include provision for remotely switched or time switched lighting control e.g. 20 miles per hour signs at school.”</p>
1412TS	<p><b>1 Ballasts</b></p> <p>1.1 Sub-Clause 1:</p> <p>Insert the following at the end of the paragraph:</p> <p>“Lantern control gear shall be rated at 300 volts, thermally protected with super imposed pulse ignitor. Electronic ballasts and LED Driver circuits shall be capable of operating over a range of input voltages 210-250 Volts without any form of tap selection”</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1416TS	<p><b>1 Cut-outs, Fuse Holders, Fuses and Miniature Circuit Breakers (MCBs)</b></p> <p>1.1 Delete Sub-Clause 1, 2, 3, 4, 5, 6 and 7.</p> <p>Insert the following:</p> <ol style="list-style-type: none"> <li>1 Cut-outs, fuse holders and MCBs shall have moulded plastic drip-proof housing to IP34 or above. This requirement applies to the device when installed in a normal operational orientation and fully assembled. Protection of circuits shall be by MCB's unless agreed with the Overseeing Organisation</li> <li>2 Cut-outs shall be double pole and comply with BS7654.</li> <li>3 Terminals shall be sufficient size to accommodate the conductors as required by the installation design. All terminals shall be clearly labelled to differentiate circuits and phases.</li> <li>4 When fuses are intended to be used as isolating devices, no special tools shall be necessary to extract the fuse from its carrier to achieve disconnection. However some method of then securing the device in the disconnected (OFF) condition must be provided. To achieve full isolation the fuse carrier shall incorporate the means of neutral disconnection.</li> <li>5 Fuse links shall comply with the requirements of BS EN 60269-1, BS EN 60269-2, BS 646/BS 2950, or BS 1361. They shall be of high rupture capacity (HRC) type and be of a rating as specified in Sub-Clause 15 below.</li> <li>6 Miniature circuit breakers shall be in accordance with BS EN 60898 for use on the specified operating voltage of the network at single or three phase as appropriate. Their short circuit current rating shall be no less than 16 KA unless back-up protection is provided allowing the short circuit current rating to be no less than 10KA. The Contractor shall ensure by enquiry of the Electricity Supply Company that the prospective short circuit current rating, of the supply is no greater than 16 KA.</li> <li>7 Thermal or magnetic overcurrent tripping devices shall be provided with a mechanism to ensure that the contact cannot be held closed against a fault. Circuits shall be designed such that devices are operated within the ratings specified by the manufacturer.</li> <li>8 Where MCBs are intended to be used as isolating devices, a 'lock off' facility shall be provided to allow the device to be secured in the disconnected (OFF) condition.</li> <li>9 All single phase road lighting cut-outs shall be double-pole ensuring both phase and neutral is broken by the removal of the fuse carrier. An earth terminal shall be provided within the cut-out enclosure. The continuity of the earth path will not be broken by</li> </ol>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title									
	<p>the removal of the cut-out fuse carrier.</p> <p>10 The cut-out gland plates shall be an integral part of the cut-out and be capable of terminating XLPE / PVC SWA cables up to 25 square millimetres and have the capacity for looping in-out. The gland plate shall typically accommodate up to 3 No cables; however, additional armoured cable termination and cut-out capacity shall be provided at multi-headed columns, at columns where the group PECU is fitted and at locations where spur supplies are provided.</p> <p>11 At columns fitted with more than one luminaire, each luminaire shall be wired and fused separately. Where a PECU is fitted to any of the luminaires then the cut-out for that luminaire shall carry the fuse for the PECU and provide simultaneous isolation of both PECU and luminaire. Each cut-out shall be clearly marked indicating the luminaire or device that it protects.</p> <p>12 The design of the cut-out shall be such that it is possible to incorporate facilities, integral within the unit, to feed additional spur(s) to sundry equipment such as lit bollards and signs. The supply to each spur shall have its own dedicated circuit protection and be individually isolated by a separate fused cut-out. Where spurs are required for supplies to third parties then reference should also be made to Cl. 1401S.6.</p> <p>13 The fused cut-out shall be to BS7654:1997 (ESI 12-19).</p> <p>14 The design of the cut-out shall be such that when the fuse carrier / neutral link is removed no live parts are accessible i.e. have a minimum rating of IP2X. Any protective cover exposed by the removal of the fuse link shall be designed so it cannot be separated from the main housing without the use of a key or tool.</p> <p>15 Circuit protection on lamp circuits shall be provided by high rupturing capacity (HRC) fused links complying with BS 88 category of duty 300 AC 16 rating Q1 and shall be rated to suit the lamp circuit type.</p> <p>Typical fuse rating for High Pressure Sodium and Metal Halide lamp types are:</p> <table data-bbox="683 1684 1193 1818"> <tr> <td>6 amps</td> <td>for</td> <td>70 – 150 watts</td> </tr> <tr> <td>10 amps</td> <td>for</td> <td>151 – 250 watts</td> </tr> <tr> <td>16 amps</td> <td>for</td> <td>251 – 400 watts”</td> </tr> </table>	6 amps	for	70 – 150 watts	10 amps	for	151 – 250 watts	16 amps	for	251 – 400 watts”
6 amps	for	70 – 150 watts								
10 amps	for	151 – 250 watts								
16 amps	for	251 – 400 watts”								
1417TS	<p><b>1 Base Compartment Fixing Arrangements</b></p> <p>1.1 Sub-Clause 1.</p> <p>Delete text and insert:</p> <p>“Electrical equipment described in Clauses 1411 to 1416 installed within the base compartment of columns or posts shall be positioned</p>									

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	and fixed in accordance with manufacturers' instructions and secured with corrosion resistant fixing screws."
1418TS	<p><b>1 Feeder Pillars</b></p> <p>1.1 Delete Sub-Clause 1, 2, 3, 4, 5, 6, 7, 8 and 9.</p> <p>Insert the following:</p> <p>1 Feeder pillars, forming part of a road lighting installation, are required to inter alia:</p> <ul style="list-style-type: none"> <li>(i) house the DNO service connection facilities;</li> <li>(ii) provide the electrical distribution to individual circuits and their associated circuit protection;</li> <li>(iii) provide circuit energisation where applicable under the control of an intelligent lighting control system ("ILCS") PECUs or time-clocks.</li> </ul> <p>Note: Where time-clocks are used these shall be housed within the feeder pillars. PECUs shall be mounted on an immediately adjacent column or post as per Clause 1409TS 2(i).</p> <p>2 Feeder pillars shall be constructed in the materials described in Appendix 14/4 and shall comply with IP54. They shall include a securely installed full sized backing board at least 15 millimetres thick manufactured from varnished marine plywood or other suitable non-hygroscopic material. Alternatively a purpose-designed equipment mounting system may be used. Cable entry shall be via the root only.</p> <p>3 The distribution MCB or fuse enclosures shall have sufficient spare capacity to accommodate at least one extra circuit. (e.g. 1 single phase spare way on a single phase distribution unit) and there shall be at least 25 per cent usable spare space on the backing board. All MCBs, fuses, isolators, switches, contactors, bus-bars and similar parts shall be clearly identified by correctly fitted permanent labels.</p> <p>4 The feeder pillar shall be fitted with a suitably rated single or 3-phase and neutral switch disconnecter / isolator and the circuit fused in accordance with BS7671 using fuses to BS EN 60947-3 rated as appropriate for the consumer circuits.</p> <p>5 Feeder pillar distribution boards shall be provided with an external earth, be phase barriered, and correctly colour coded. They shall be fitted with the same number of live and neutral bus-bar terminals as there are outgoing circuits plus at least one spare way. The main earthing terminal in each feeder pillar shall be</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>connected to earth in accordance with BS 7671 and BS 7430.</p> <p>6 Unless otherwise stated in Appendix 14/4, feeder pillars shall be mounted typically on a 150 millimetre thick foundation of ST2 concrete in compliance with Clause 2602. However, where special ground conditions exist the foundations shall be adjusted to accommodate such conditions. Foundations for pillars considered as 'passively safe' shall be constructed in accordance with all specific guidance for such pillars. Such pillars will typically have larger foundations than normally required.</p> <p>After completion of the cabling the feeder pillar base shall be filled to 25 millimetre below the door with pea gravel conforming with Table 2 of BS EN 12620, 4/14 aggregate with a grading category of GC90/15. Prior to the addition of pea gravel all duct ends entering the pillar shall be cut back no greater than 25 millimetre below the finished level of the infill. Under no circumstances shall sharp gravel be used. Prior to the addition of the pea gravel the duct ends shall be completely sealed with expanded foam.</p> <p>7 Lighting feeder pillars shall be used for the energising of the lighting equipment and associated electrical circuits only.</p> <p>8 Feeder pillars shall be constructed from stainless steel, hot dipped galvanised steel or aluminium to the required standard. The enclosure shall be adequately ventilated by a suitable method preventing the ingress of water, snow or foreign bodies.</p> <p>9 The feeder pillars shall carry a nameplate showing the manufacturers name or trade mark and the type designation or identification number of the product.</p> <p>10 Where a feeder pillar is erected on a grass verge, an area of hard standing of minimum size 900 x 600 millimetre shall be provided. The hard standing shall be set into the ground at a level such as to allow grass cutting to be readily undertaken.</p> <p>11 Access to the external enclosure shall be by means of close fitting hinged door(s) opening to a full 180 degrees at the front. Hinges shall be of stainless steel construction or similar approved materials. Means shall be provided to secure the door(s) in the open condition during maintenance visits.</p> <p>12 The door frame shall be fitted with a heavy duty non-perishable gasket to provide a minimum rating of protection against ingress of foreign materials of IP54.</p> <p>13 The external pillar door locking shall be by means of tamperproof wedge type locks, with the actuator protected by plastic sealing plugs. 2 No sets of keys are to be provided per feeder pillar. The locks shall be fitted with triangular actuators operated by a single key. All hinges and locks shall be of stainless steel unless otherwise agreed with the Overseeing Organisation.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>14 Door locks on the wedge side should have a generous application of suitable inhibitor grease applied when installed to inhibit the effects of moisture and corrosion / rust.</p> <p>15 A durable warning sign indication 'Danger 415 Volts' or 'Danger 230 Volts' shall be fixed to the front of the feeder pillar door and the inner panel door where applicable to comply with the Health and Safety (Safety Signs &amp; Signals) Regulations and the Electricity at Work Regulations 1989. In compliance with these regulations these warning labels shall be triangular and no less than 75 millimetres wide.</p> <p>16 Circuit details, including details of the supply circuit shall be provided in each feeder pillar. The details / diagram shall be laminated or similarly protected from moisture and held in a purpose made pocket attached to the inner face of the pillar door. The electrical details must include a circuit schematic.</p> <p>17 All equipment fitted within the feeder pillars shall be securely fixed to the back board.</p> <p>18 All ducts leaving the root of the pillar shall extend beyond the immediate concrete foundation of the pillar. A separate black duct shall be provided for the Supply Authority's incoming cable.</p> <p>19 The main earth terminal size M8 x 32 millimetre long shall be provided at a readily accessible location within the cabinet section of the pillar. The earth terminal shall be supplied complete with one full nut, two half nuts and two washers all manufactured in material compatible with the pillar material.</p> <p>20 The bonding conductor cross-sectional area for all lighting feeder pillars shall be not less than 10 square millimetre Tri-rated.</p> <p>21 The inner enclosure should contain the following equipment;</p> <ul style="list-style-type: none"> <li>(i) A single phase double pole / 3-phase &amp; neutral isolator to BS5419;</li> <li>(ii) A single phase single pole / 3-phase contactor rated at BS 5424;</li> <li>(iii) A push button operated test switch accessible from within the outer enclosure and providing a timed over-ride of the photocell;</li> <li>(iv) A DIN rail fitted with BS EN 60898 miniature circuit breakers / Modular fuse holders fitted with fuses to BS 88-2.1. The control circuit fuse shall normally be rated at 6 amps with any spare output circuit fuses rated at 20 amps, unless agreed with the Overseeing Organisation; and</li> <li>(v) A neutral rail and an earth rail to accept the installed wiring with at least one spare termination provided on each rail.</li> </ul> <p>Note: within the inner enclosure all electrical apparatus shall be</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	shrouded to a minimum of IP2X including the neutral rail and all neutral connections / terminals.”
1419TS	<p><b>1 Wiring</b></p> <p>1.1 Delete Sub-Clause 1, 2, 3, 4, 5, 6, 7, 8 and 9.</p> <p>Insert the following:</p> <ol style="list-style-type: none"> <li>1 All wiring and installation of components within the column, post, illuminated sign, bollard or pillar shall conform to the requirements of the Contract and be as described within this Clause.</li> <li>2 The wiring between the luminaire and the components in the base of the column or sign unit shall be PVC insulated ‘arctic grade’, 3-core 2.5 square millimetre flexible cable. This cable shall generally be to BS6500 and be suitable for use over the temperature range -20 to +70 degrees Celsius. The circuit protective conductor within this cable shall connect the earth terminal on the luminaire to the main earth terminal associated with the column cut-out in the base compartment.  NOTE: Under no circumstances shall domestic grade flat ‘Twin and earth’ cable be used for any purpose within lighting installations.</li> <li>3 All wiring / cables shall be correctly colour coded throughout their length and labelled appropriately at all points of termination.  NOTE : The Contractor’s attention is drawn to BS7671:2008 with regard to harmonized wiring colours and the warning notices required should ‘old’ and ‘harmonized’ wiring colours form part of a single installation.</li> <li>4 Unsupported lengths of cable shall be kept to a minimum and shall not be allowed to come into contact with components by their freedom of movement. Where there is more than one cable they shall be secured together at one metre intervals throughout the unsupported length. Vertical cables within posts or columns shall be adequately anchored and supported along their length and at the top of the cable run. Correctly selected and fitted plastic glands shall protect and seal all cable penetrations.</li> <li>5 Wiring shall, wherever possible, be housed inside columns, wall brackets and posts or stiffening members. Where it is external it shall be secured using appropriate methods and in accordance with BS7671. Connections between conduit and sign housings, switchboxes and other components shall be sealed to no less than IP66. Internal surfaces in contact with such cables shall be smooth. Only plastic conduit, rigid or flexible, shall be used.</li> </ol>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>6 All unused cores shall be cut to a suitable length for safe, unobtrusive stowage and the ends sealed and insulated.</p> <p>7 Under no circumstances shall wiring, cables and cable tails come into direct contact with the inner surfaces of access doors or be located adjacent hinges, sharp metal edges, fixing screws or similar items. Installers shall, at all times ensure that conductor insulation is protected from being penetrated, cut, abraded, or crushed or in any other way physically damaged as a result of contact with such items.”</p>
<p><b>1420TS</b></p>	<p><b>1 Earthing</b></p> <p>1.1 Delete Sub-Clause 1, 2, 3, 4 and 5.</p> <p>Insert the following:</p> <p>1 Circuit protective and equipotential bonding conductors shall be installed in accordance with BS7671 and BS7430 and shall be green / yellow PVC or XLPE insulated or sleeved. Where bolted connections are required, these shall be terminated in accordance with manufacturers' instructions in correctly sized purpose made lugs. Such connections shall be made using brass or stainless steel or other compatible non-ferrous nuts, bolts and washers.</p> <p>2 A separate circuit bonding conductor not less than 10 square millimetre cross-sectional area shall connect the earth terminal of the luminaire to the adjacent earth stud of the column / bracket.</p> <p>3 All extraneous conductive parts, as described in BS 7671, and including doors to feeder pillars, lighting columns and lit sign units, shall be bonded to the main earth terminal using an equipotential bonding conductor of 10 square millimetre cross-sectional area. When the earth conductor forms part of a 3-core cable the equipotential bonding conductor can be reduced to a size equal to the other cores but not less than 2.5 millimetre cross-sectional area. Earthing of lighting equipment in general and the design and installation of earth electrodes in particular shall all be in accordance with BS7674 and BS7430.</p> <p>4 Where lighting pillars, columns, signs are adjacent to the same or separately supplied electrical equipment i.e. equipment fed from different electrical supply pillar and these are located within three metres of each other, then they shall be bonded together in accordance with BS7671 Reg. 411.3.1. However in accordance with BS7671 Reg. 559.10.3.1(v) bonding is not required to adjacent metallic structures such as safety fences, handrails and similar however where lightning protection is to be provided the bonding shall satisfy BS EN 62305.</p> <p>5 It should also be also noted that:</p> <p>(i) with the exception of Sub-Clause 4 above, no lighting</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>infrastructure equipment shall be located within 5 metres of metallic conductive parts forming part of a separately supplied electrical equipment, such as Traffic Scotland (NADICS) and similar equipment. Bonding between the metal parts of such equipment is specifically excluded by this note in accordance with BS7671 Reg. 542.1.8; and</p> <p>(ii) where an electrical supply is required to permanently power third party equipment located at the same site then this shall be accommodated through the provision of a separate feeder pillar housing, with its own electricity suppliers cut-out. If this second housing is located within three metres of a road lighting pillar then the 2 pillars shall be bonded together in accordance with BS7671 Reg. 411.3.1.</p> <p>6 The main earthing conductor within the feeder pillar shall be of copper and be of a size no less than the supplier's phase conductor. Where the supplier's phase conductor is greater than 16 square millimetres the main earth conductor is 16 square millimetres. The main earth conductor shall connect the main earthing terminal to the incoming supply earth.</p> <p>NOTE: Under no circumstances shall fortuitous contact via mechanical fixings be relied upon as a conductive path in place of a specific, correctly selected, rated, terminated and installed earthing conductor.</p> <p>Crimp connections for earth conductors shall meet the performance criteria suggested in BS 7609 using a matching tool, die set and connector i.e. the first and second barrels shall crimp the conductor, the third set shall crimp the insulating, and facilitating stress relief and allowing for increased movement of the conductor. All bolted earth connection shall be made between two plain washers manufactured using material compatible with the equipment metalwork.</p> <p>7 Earth electrodes shall be fitted to all lighting electrical installations both adjacent to the electricity supply pillar and at the end of each circuit. The acceptable resistance to earth of these electrodes shall be selected in accordance with the requirements of BS7671 and BS7430. Unless lightning protection is required typical values are likely to be no greater than 20 ohm for each individual electrode used as part of a TN-S circuit. For circuits energised by TN-C-S type electricity supply the typical electrode resistance to earth shall be as specified in Table 9.3 of BS7671 Guidance Note 5 where the circuit wattage sets the maximum resistance allowed. Lightning protection typically requires electrode resistances below 10 ohms. For the avoidance of doubt the electrode resistance values referred to above are provided for guidance only and must be confirmed by the designer before use.</p> <p>8 Where there are exposed metal casings of capacitors / ignitors</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>these shall be directly connected to earth. Reliance on the earthing of security clips shall not be acceptable. All bonding conductors shall terminate at a common point.”</p>
<p><b>1421TS</b></p>	<p><b>1            Underground and Ducted Cable</b></p> <p>1.1           Sub-Clause 14.</p> <p>                Insert at the beginning of the Sub-Clause the following:</p> <p>                “Metallic trace marker tape shall be laid above the duct or cable to permit cable detection by electronic route tracing equipment and shall be “</p>
<p><b>1422TS</b></p>	<p><b>1            Cable Joints</b></p> <p>1.1           Sub-Clause 1</p> <p>                Insert the following text at the beginning of the paragraph:</p> <p>                “Cable joints, other than for short term remedial work, shall not be permitted for underground cables supplying road lighting. Lighting installations shall be designed to employ a loop in - out arrangement without joints.”</p> <p>1.2           Sub-Clause 2</p> <p>                Delete the following text:</p> <p>                “Prior to any cable laying, the Contractor shall provide evidence to the Overseeing Organisation of the jointer’s competence in the use of the adopted cable joint kit.”</p> <p>1.3           Sub-Clause 3</p> <p>                Delete the following text:</p> <p>                “Cable joints shall be made where described in Appendix 14/4. Additional joints shall not be provided on cables in duct or trough.”</p> <p>1.4           Sub-Clause 6</p> <p>                Delete the following text:</p> <p>                “Where described in Appendix 14/4,”</p>
<p><b>1423TS</b></p>	<p><b>1            Armoured Cable Terminations</b></p> <p>1.1           Delete Sub-Clause 1, 2, 3 and 4.</p> <p>                Insert the following text:</p> <p>                1        Cables shall be individually terminated and existing cables re-terminated, and secured at switches, cut-outs and other electrical apparatus by means of a compression type gland and, where not provided as part of the apparatus, a gland plate compatible with the equipment material and complying with ‘BS 6121-1, BS EN 50262’. All as described in Appendix 14/4.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>2 Earth connection to the cable armouring shall be made to the gland plate. At least one non-ferrous earthing terminal compatible with the equipment shall be provided on the gland plate.</p> <p>3 PVC sleeves shall be of the same colour as the PVC over sheath. All of the conductors within the cable shall be terminated with cable lugs.</p> <p>4 Cable glands shall be manufactured in brass to BS 2874.</p>
<p><b>1424TS</b></p>	<p><b>1 Inspection and Testing to be Carried Out by the Contractor</b></p> <p>1.1 Delete Sub-Clause 1, 2, 3, 4, 5, 6 and 7.</p> <p>Insert the following text:</p> <p>1 Every Lighting Unit and Network, on completion and before being energised, shall be inspected and tested to verify that the requirements of BS 7671 have been met. The method of testing shall be such that no danger to persons or property or damage to equipment can occur even if the circuit tested is defective.</p> <p>2 Unless otherwise agreed by the Overseeing Organisation, three months prior to commencing testing the Contractor shall submit an inspection and testing method statement, risk assessments, and the extent and limitations statement, forming part of the BS7671 electrical installation certificate initial verification. The extent and limitations statement shall include inter alia:</p> <ul style="list-style-type: none"> <li>(i) a description of the electrical aspects of the lighting units including the class of the luminaires to be used i.e. Class I or Class II together a statement of the testing regime to be adopted for these items;</li> <li>(ii) the extent of the network fixed wiring covered by BS7671 including the point of termination within the lighting units and the point of supply (origin) for the installation; and</li> <li>(iii) any specific issues relating to the inspection and testing of the particular electrical installation.</li> </ul> <p>The method statement shall detail all tests and items of inspection to be undertaken, the sequence of tests, how each test will be undertaken and what records will be recorded and what values for each test will prove compliance with BS7671. The method statement shall include the lighting installation design drawings and schematics. The schematic shall be suitable for inclusion within the pillars and cabinets forming part of the circuit described. Such included schematics shall be laminated or otherwise protected against damage by moisture or handling during use.</p> <p>The Contractor shall undertaken all required aspects of the electrical installation is sufficiently and correctly inspected and tested as required by BS7671 Part 6 and as further described in</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>IEE Guidance Note 3 titled 'Inspection and Testing'. Without reduction to the importance of any other aspect of BS7671 Inspection and Testing the attention of persons undertaking this work is particularly drawn to the following:</p> <ul style="list-style-type: none"> <li>(i) a cable over-sheath insulation test shall be carried out prior to any other testing of the network cables;</li> <li>(ii) continuity testing of protective conductors within the Network circuits, including main and supplementary equipotential bonding conductors, shall be carried out and the values of R1+R2 with respect to the circuit origin recorded. These measurements shall be carried out in a way that excludes any 'parallel paths';</li> <li>(iii) the resistance of all earth electrodes shall be measured and recorded;</li> <li>(iv) for Periodic Testing Class I luminaires a 500 volt insulation test shall be carried out between the phase and neutral cores connected together relative to the earth core and metalwork of the lighting unit. The initial commissioning testing being carried out on each individual core. Insulation resistance shall not be less than 1 megaohm in either case;</li> <li>(v) for Periodic Testing Class II luminaires a 500 volt insulation test shall be carried out between the phase and neutral cores connected together relative to the metalwork of the lighting unit. The initial commissioning testing being carried out on each individual core. Insulation resistance shall not be less than 2 megaohm in either case;</li> <li>(vi) For the Periodic Testing of Network cables a 500 volt insulation test shall be carried out, with the phase and neutral cores connected together, relative to the earth core and the metalwork of the lighting column. The initial commissioning and testing being carried out on each individual core. Insulation shall not be less than 6 megaohm regardless of cable length. This test shall be carried out with cables in place and connected to the supply side of the lighting units cut-outs. During the testing all luminaires shall be isolated on the consumer side of the cut-out;</li> <li>(vii) The Contractor shall ensure that a voltage reading is taken at each feeder pillar and at the terminals of the last current-consuming equipment on each circuit, with all equipment energised. Where a spur is created from the main circuit to energise a bollard, sign or similar the voltage at all such spurs shall also be recorded. The voltage measured at the last current consuming piece of equipment on a given circuit shall not be below 223.1 volts (3 per cent of 230 volts; BS7671:2008) at full load;</li> </ul>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>(viii) The Contractor shall record the earth fault loop impedance at the suppliers cut-out at every lighting unit with all earth conductors and earth electrodes in place in accordance with Guidance Note 3 para. 2.7.14. Values of Zs measured for any circuit shall not exceed those given in BS7671 Tables 41.2 and 41.3 for 0.4 second disconnection; and</p> <p>(ix) The Contractor shall ensure that inspection and testing undertaken shall be sufficient to fulfil the requirements of the Electricity at Work Regulations 1989; Regulation 4(1) and other relevant Statutory Regulations.</p> <p>3 On conclusion of the inspection and testing, submission of the results to the Overseeing Organisation shall take place within 7 days of the completion of each circuit inspection and testing. If, in the opinion of the Overseeing Organisation, the inspection and testing is not considered adequate or the installation is not considered correct then all such necessary remedial work and repeated inspection and testing shall be undertaken by the Contractor and all corrected results submitted to the Overseeing Organisation.</p> <p>4 The cable sheath insulation test shall be carried out using an insulation tester. The insulation resistance test of 1000 volts, direct current, shall be applied and maintained for not less than one minute between the continuous cable armouring or earth conductor and the general mass of earth. The measured insulation resistance shall not fall below 1.0 megaohm for the full duration of the test. The cable sheath insulation test shall be carried out after the cable has been laid and the trench back-filled, but before jointing has taken place.</p> <p>5 The Contractor shall provide and maintain an installation, inspection and testing programme. The programme shall be provided to the Overseeing Organisation at least 14 days prior to any installation work being undertaken and shall be updated and provided to the Overseeing Organisation when the programme changes from that previously provided to the Overseeing Organisation. The programme shall detail duct laying, cable pulling, column erection, inspection and testing. The programme will include dates when records will be provided.</p> <p>6 The Contractor shall furnish the Overseeing Organisation with two copies of a certificate verifying compliance with BS 7671 upon satisfactory completion of the inspection and tests. The layout of the BS7671 Certificate shall conform to the NICEIC Certificate as provided in the 'Guidance Notes for BS7671 Electrical Certificates'. The separate certificate as described in the same Guidance Note and covering the testing of the luminaires and similar items considered outside of the scope of BS7671 shall also be submitted.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>7 The value of Ze provided by the electricity supplier at the electrical origin shall be no greater than 0.35 ohm for TN-C-S supplies and 0.8 ohm for TN-S supplies. The Overseeing Organisation shall not accept values that exceed these Ze maximum values. The Contractor shall ensure the Ze values are achieved by the DNO prior to acceptance of the supply on behalf of the Overseeing Organisation.</p> <p>8 The Contractor shall ensure that all test instruments have been calibrated and adjusted in accordance with BS EN ISO 9001 and come complete with calibration certificates to verify that BS EN ISO 9001 has been complied with.</p>
<b>1501A</b>	<p><b>1 Introduction</b></p> <p>1.1 Motorway and Trunk Road Communications for the Scottish Trunk Road Network shall be referred to as Traffic Scotland Equipment. The Traffic Scotland Equipment is provided to support the provision of Traffic Scotland service and forms part of the Scottish Minister's Intelligent Transport System. All work relating to the design provision, uplifting, diversion, relocation, construction, installation, connection, testing, commissioning, integration, documentation and handover of Traffic Scotland Equipment shall comply with this Series. This Series supersedes all previously published versions of this Specification Series. For the purposes of this Series unless otherwise described in the Scottish Ministers the word "provide" or "provision" means design, uplift, divert, relocate, construct, install, connect,, test, commission, integrate, document and handover to maintenance and operations.</p> <p>1.2 This document serves as the outline specification for the provision of Traffic Scotland Equipment which shall typically consist inter alia of the following elements :</p> <ul style="list-style-type: none"> <li>(a) ducting and chambers and cable management systems;</li> <li>(b) cables and all cable fittings;</li> <li>(c) cabinets and all ancillary items;</li> <li>(d) Emergency Roadside Telephones ("<b>ERT</b>");</li> <li>(e) Closed Circuit Television ("<b>CCTV</b>") cameras;</li> <li>(f) vehicle (Traffic Scotland) detection equipment – 3 classification levels;</li> <li>(g) Scottish Roads Traffic Database ("<b>SRTDb</b>") vehicle detection – EuroVI classification levels;</li> <li>(h) Variable Message Signs ("<b>VMS</b>");</li> <li>(i) Lane and Speed Control Signalling;</li> <li>(j) Motorway Access Control ("<b>MAC</b>");</li> <li>(k) Journey Time ("<b>JT</b>") equipment;</li> </ul>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<ul style="list-style-type: none"> <li>(l) Ramp Metering (“<b>RM</b>”);</li> <li>(m) not used;</li> <li>(n) not used;</li> <li>(o) enforcement systems;</li> <li>(p) Weigh-in-Motion (“<b>WIM</b>”) systems;</li> <li>(q) communications infrastructure;</li> <li>(r) mains power supply and distribution infrastructure;</li> <li>(s) Instation equipment;</li> <li>(t) hard landscaping;</li> <li>(u) transmission stations;</li> <li>(v) structural infrastructure on which Traffic Scotland equipment is mounted on.</li> </ul> <p>1.3 The Overseeing Organisation is Transport Scotland, an agency of the Scottish Government. The representative of the Overseeing Organisation is the Traffic Scotland Manager who is responsible for all aspects of the Traffic Scotland Equipment. Contact details for the Traffic Scotland Manager are provided in the Scottish Ministers.</p> <p>1.4 The Traffic Scotland Equipment and system are unique and differ in many respects from other driver information and control systems operating within the UK such as those operated by the Highways Agency. The Company shall ensure that all parties working on any Traffic Scotland element of the Agreement take cognisance of the differences as expressed in this Series 1500 and other relevant documents.</p> <p>1.5 This Series 1500 is applicable to all work undertaken under any Agreement that includes Traffic Scotland Equipment and structural infrastructure on which Traffic Scotland Equipment is mounted.</p> <p>1.6 Roadside verges on or into which Traffic Scotland infrastructure or equipment is to be provided shall be of an adequate width and topology acceptable to Traffic Scotland. The Traffic Scotland roadside sites shall be of suitable for future maintenance activities and if required access by ERT user and shall either be finished horizontal or be of an appropriate minor single gradient.</p> <p>1.7 The design and construction of any works adjacent to a Traffic Scotland Equipment location shall be such as to adequately route surface water away from the Traffic Scotland Equipment.</p> <p>1.8 The design of safety fences, barriers and works directly adjacent to Traffic Scotland Equipment shall ensure that such works are achievable and are undertaken without the adjacent Traffic Scotland Equipment being damaged or the service provided by that Traffic Scotland Equipment being adversely affected.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>1.9 There are requirements for all Traffic Scotland Equipment to be located and suitably protected from collision and either vehicle restraint systems or passively safe infrastructure shall be provided in accordance with all relevant requirements and specifications relating to vehicle restraint systems or passively safe equipment</p>
<b>1502A</b>	<p><b>1 General Requirements</b></p> <p>1.1 The Company shall carry out all such work as required by the Agreement in such a way as to comply with this 1500 Series and the Scottish Ministers.</p> <p>1.2 The NDX drawings are typical/none site specific representing the Overseeing Organisation's preferred arrangements. The Company is required to develop a design based on the principles laid down in these drawings.</p> <p>1.3 Traffic Scotland Equipment that is issued by the Overseeing Organisation is referred to as Scottish Ministers Issued Equipment in this Series 1500. Scottish Ministers Issued Equipment is listed in the Scottish Ministers. The Company, unless otherwise described in the Scottish Ministers, shall be responsible for the collection and loading of Scottish Ministers Issued Equipment from the Overseeing Organisation's stores. The general location of the Overseeing Organisation's stores is given in the Scottish Ministers. The Company shall be responsible for all effort associated with the uplifting of Scottish Minister Issued Equipment. The operating hours of the Overseeing Organisation's stores are standard office opening hours unless given within the Scottish Ministers.</p> <p>1.4 The Company shall be responsible for the management, maintenance, safe handling and safe keeping of all Traffic Scotland Equipment whether supplied by the Company or supplied as Scottish Ministers Issued Equipment from the point in time that the equipment is uplifted by the Company from the Scottish Ministers Nominated EIE Store or delivered by the Scottish Ministers to the Company's TSE Assembly Point, until the Taking Over Certificate is issued. Where Traffic Scotland Equipment is not being directly installed following it coming into the Company's possession, the Company shall store all equipment within a secure, safe, pest proof, dry ambient warehouse environment. At the time of Scottish Ministers Issued Equipment uplift the Overseeing Organisation shall provide a record stating that the Scottish Ministers Issued Equipment is operationally compatible with the Scottish Ministers' Traffic Scotland Equipment. The Company shall prepare and issue a report and method statements detailing proposals associated with the management, maintenance and safe keeping of all Traffic Scotland Equipment.</p> <p>1.5 The Company shall provide a written request detailing what Scottish Ministers Issued Equipment is required, its type, and configuration, required date for delivery to or uplift by the Company. All Scottish</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Ministers Issued Equipment shall be uplifted in accordance with the arrangements agreed with the Traffic Scotland Manager and the organisation responsible for the Overseeing Organisation's stores at the times and in the manner described in the Scottish Ministers. The Company shall adjust the requested uplift time as reasonably requested by the organisation responsible for the Overseeing Organisation's stores. The Company shall retain a record of all documentation associated with requesting and uplifting Scottish Ministers Issued Equipment as described in the Scottish Ministers and such records shall form part of the records and documentation in compliance with Clauses 1504SR and 1540SR.</p> <p>1.6 Unless otherwise stated in the New Works Information, the Company shall be responsible for providing written notice within 24 hours and documented evidence within three days, of any defects or damage to equipment received or uplifted from the Overseeing Organisation's store.</p> <p>1.7 The Company shall be responsible for undertaking all works associated with repairing and replacing any Traffic Scotland Equipment damaged or missing after purchase by the Company or uplifted from the Overseeing Organisation's stores. In compliance with the Agreement the Company shall be responsible for the Company's and Overseeing Organisation's costs associated with repairing and replacing any Traffic Scotland Equipment damaged or missing after purchase by the Company or uplifted from the Overseeing Organisation's stores. The period for which the Company shall be responsible and all associated costs for replacement and repairing of Traffic Scotland Equipment shall be in compliance with the Agreement.</p> <p>1.8 Prior to commencing any site work the Company shall supply to the Overseeing Organisation written information and confirmation of compliance with the Agreement for all Company supplied Traffic Scotland Equipment and Traffic Scotland related materials that will be incorporated in the New Works. This information shall include the following details;</p> <ul style="list-style-type: none"> <li>(i) Detail of the manufacturer</li> <li>(ii) The specification, safety regulations and statutory requirements the equipment is compliant with</li> <li>(iii) The manufacturers' product number</li> <li>(iv) A specification sheet</li> <li>(v) Transportation, handling and storage requirements</li> <li>(vi) Installation instructions,</li> <li>(vii) Safety information for installation and operation</li> <li>(viii) Maintenance requirements.</li> <li>(ix) Operational Instructions</li> </ul>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>(x) De-commissioning information</p> <p>1.9 The Company shall provide all self certification, production acceptance testing and factory testing documentation and test results for each item of active/operational Traffic Scotland Equipment that the Company has to provide in accordance with the Scottish Ministers. The testing undertaken shall be no less than that detailed in the Scottish Ministers.</p> <p>1.10 In order to allow time for the integration, testing and commissioning of the Traffic Scotland Equipment, the Company shall programme the New Works or sections thereof so that the Traffic Scotland Equipment is available for integration, testing and commissioning for a period of time before the New Works or sections thereof is open to the road user and such period of time shall be in compliance with the testing requirements highlighted within the Scottish Ministers.</p> <p>1.11 The Company shall provide information, access and appropriate facilities for and to the Electricity Supply Company and communication suppliers as required by them to fulfil their obligations to undertake service connections, disconnections, repairs and reconnections, in compliance with the Agreement. The Company shall provide information, access and facilities for and to the Scottish Ministers and other Traffic Scotland Service providers as required by them to fulfil their appropriate obligations associated with the New Works in compliance with the Agreement. The Company shall provide site supervision resources at all times.</p> <p>1.12 The Company shall provide all drawings, documentation and certification in compliance with the Agreement</p> <p>1.13 The Company shall only employ personnel, sub-contractors and consultants qualified and experienced in the provision of Intelligent Transport Systems and associated Internet Protocol (IP) communications systems. The Company shall provide the Overseeing Organisation with full details of the qualifications and experience of all personnel, sub-Contractors and consultants whom he proposes to employ. Such details shall be provided in writing, 56 days prior to the commencement of any Traffic Scotland Equipment work or at any earlier date as required to comply with the Scottish Ministers.</p> <p>1.14 The Company shall be responsible for the appropriate disposal of all waste, existing equipment and materials, in compliance with TR1100, the WEEE Regulations and any additional obligations required for compliance with the Scottish Ministers. The Company shall maximise recycling of all forms of waste arising from existing equipment materials and shall detail such recycling measures in the Project Environmental Plan.</p> <p>1.15 The Company shall comply with all energy generation requirements as detailed in the Scottish Ministers.</p> <p>1.16 Unless stated otherwise in the Agreement, the Company shall prepare specific method statements for all work to be undertaken under the</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	Agreement and provide such method statements to the Overseeing Organisation for comment at least 28 days prior to the specific type of work commencing that the method statement refers to.
<b>1503A</b>	<p><b>1 Materials, Equipment and Workmanship</b></p> <p>1.1 The Company's Electrical workmanship, materials and equipment supplied shall comply with current BS 7671 Requirements for Electrical Installations (IEE Wiring Regulations), the Electricity at Work Regulations and the Electricity Safety, Quality and Continuity Regulations (ESQCR).</p> <p>1.2 Unless otherwise described in the Scottish Ministers, Traffic Scotland Equipment shall not share any electricity supply with any other equipment.</p> <p>1.3 All Traffic Scotland Equipment provided by the Company shall comply with TR1100, and subsequent Scottish amendments to TR1100 and shall be fitted with such mounting, support and access arrangements to allow for compliant installation, maintenance and operation within the Traffic Scotland Equipment cabinet space or on post, mast, bracket or gantry as made available by the Overseeing Organisation or Company.</p> <p>1.4 The Company shall take full account of future maintenance requirements of all Traffic Scotland Equipment to be undertaken by the Scottish Ministers. When taking account of future maintenance the Company shall comply with the requirements of Construction (Design and Management) Regulations 2007, or subsequent revisions, and the need for the Overseeing Organisation to maintain journey time reliability through minimising traffic management and meet all specific objectives of the Traffic Scotland Service as described in the Scottish Ministers.</p> <p>1.5 The minimum general technical and Quality Control requirements for work carried out on the Traffic Scotland Equipment shall be as those set out in the document TR1100 and subsequent Scottish amendments to TR1100 and within the Company's Quality Plan and method statements. The method statements shall ensure outputs are delivered that are in compliance with this Series 1500 and the Scottish Ministers. The Company's Quality Plan shall include reference to a recognised and current workmanship standards document and the Company shall comply with such workmanship standards and the Company's method statements.</p> <p>1.6 A listing of Standard Drawings and other Specifications to be supplied to the Company and used for this Agreement is given in Appendix 0/4 of this Series 1500. The Scottish Ministers details all Agreement specific drawings and documents applicable to this Agreement.</p>
<b>1504A</b>	<p><b>1 Site Records</b></p> <p>1.1 The Company shall keep a daily record in duplicate in a clear and</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>legible form of all work carried out for Traffic Scotland Equipment as it proceeds. One copy of the daily records shall be kept available on site for inspection by the Overseeing Organisation during the Agreement and shall form part of the overall documentation package as detailed in the Scottish Ministers to be handed to the Overseeing Organisation for record purposes. All design phase records and design information shall be kept available on site for inspection by the Overseeing Organisation during the Agreement and shall form part of the documentation as detailed in the Scottish Ministers to be handed to the Overseeing Organisation for record purposes. As a minimum the following information shall be recorded by the Company:</p> <ul style="list-style-type: none"> <li>(i) Duct locations including depth, offset from carriageway edge, number and size of ducts and duct material, duct joints/seals used, ducted network layout, infill material used, record sheets showing dates and results of mandrelling and pressure testing</li> <li>(ii) Chamber locations including type, depth, incoming and outgoing ducts, type of chamber cover, and duct plugs or duct sealing method used</li> <li>(iii) Cabinet locations, configuration and type</li> <li>(iv) Cabinet and cable identifiers</li> <li>(v) Route, length and type and cable drum number of each individual length of installed cable</li> <li>(vi) Position of Electricity Supplier supply points together with Electricity Supplier name and Electricity Supplier provided information as detailed in NDS9551 "Requirements for Electricity Supply to Traffic Scotland and Associated Equipment Sites"</li> <li>(vii) Position of any private communications interfaces together with private wire supplier name, type identifying no, circuits records, capacity and capability.</li> <li>(viii) Within an electronic spreadsheet all Traffic Scotland Equipment within the Site shall be logged and contain the Traffic Scotland Operational ID, the Ordinance Survey grid reference of all Traffic Scotland Equipment, configuration, addressing and serial numbers, site reference/Operational ID and Traffic Scotland marker post reference and cross sectional position with kerblines offsets of all installed Traffic Scotland equipment including all equipment within cabinets, racks and buildings. This will form part of an overall Traffic Scotland Equipment Inventory. The means of establishing the identifier for Traffic Scotland Equipment is described in the Scottish Ministers. Both the Company's identification method and final chainage/Traffic Scotland Operational ID shall be provided within the same document.</li> <li>(ix) Details regarding the removal only and removal and re-siting of existing Traffic Scotland Equipment. These records shall detail</li> </ul>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>the original location, the date it was made disused and the method of disposal of any Traffic Scotland Equipment.</p> <p>(x) Details of all works undertaken in the Traffic Scotland Control Centre (TSCC), transmission stations and any other location where Traffic Scotland Equipment is provided so that the necessary as built records can be prepared and in compliance with the Scottish Ministers.</p> <p>(xi) Any additional requirements detailed in the Scottish Ministers.</p> <p>(xii) The Company shall maintain an up to date record of all equipment and cable provided by the Overseeing Organisation as detailed in the Scottish Ministers.</p> <p>(xiii) At a minimum, in an electronic spreadsheet, a record of requests for, uplift, storage and installation, integration, commissioning, testing and handover of Scottish Ministers Issued Equipment and Company supplied Traffic Scotland Equipment so that there is an up to date understanding of the current status of all Traffic Scotland Equipment</p> <p>(xiv) Current and historic equipment calibration records.</p>
<p><b>1505A</b></p>	<p><b>1 Provision of Cabinets and Ancillary Items</b></p> <p>1.1 All cabinets shall be manufactured using aluminium or stainless steel unless described otherwise in the New works Information and shall be painted using a paint system suitable for the cabinet material and complying with the 1900 Series. The top coat exterior colour shall be Slate Grey RAL 7015. Ancillary Items shall be provided as detailed in the Scottish Ministers.</p> <p>1.2 All locking mechanisms shall be stainless steel and shall use a form of lock and key that is compatible with existing Traffic Scotland Equipment cabinets. Where dissimilar materials will be encountered, suitable barriers or gaskets shall be supplied to prevent corrosion or galvanic action resulting from the direct contact of dissimilar metallic materials.</p>
<p><b>1506A</b></p>	<p><b>1 Cables</b></p> <p>1.1 Traffic Scotland cable types shall be in compliance with the Scottish Ministers.</p> <p>1.2 Other than cables used for internal wiring of cabinets and equipment, non-armoured communications cables and mains power cable shall not be used. Cables that are only located within cabinets and racks shall be referred to as wiring.</p> <p>1.3 Unless otherwise described in the Scottish Ministers, the Company shall be required to submit reasons to the Overseeing Organisation for any installations requiring the use of mains power cable with conductors</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>larger than 25mm<sup>2</sup>. If such reasons are justifiable the Overseeing Organisation shall approve the use of conductors larger than 25mm<sup>2</sup> otherwise the request shall be rejected and a compliant design shall be made by the Company.</p> <p>1.4 Each drum of cable delivered to the Site shall have quality inspection certificates attached to each flange in accordance with the relevant cable specification. The Company shall ensure that the certificate relates to the cable to which it is attached. The certificate shall form part of the Site Records and a copy shall be given to the Overseeing Organisation prior to the installation of the cable. Before installing armoured communication cables, the Company shall test and accept the integrity of the sheath in accordance with cable test specification MCG1022 (for copper cables) or MCG1055 (for fibre cables). All cable test results shall form part of the Site Records (Clause 1504) of and a copy of all cable test result shall immediately, on completion of each cable test, shall stored with the Site Records and be provided to the Overseeing Organisation. The Company shall include the necessary hold points within the Quality Plan for the immediate provision of cable test results. The location in the ground of cable lengths by reference to their drum numbers shall be kept with the daily records in compliance with Clause 1504.</p> <p>1.5 All underground Traffic Scotland Equipment cables shall be installed in ducts.</p> <p>1.6 The outer sheath of all Traffic Scotland Equipment cables shall be coloured black.</p> <p>1.7 The Company shall return part used drums of cable to the Company's site compound area for subsequent use. Part used drums shall be clearly marked and kept separate from unused drums. The Company shall keep and maintain a register of all cable drums; the register shall for each cable drum include the cable drum number, cable size and the length(s) of cable removed. Surplus cable lengths shall be neatly coiled or drummed as appropriate and the Company shall record the length and other details as for drummed cable specified above. Cable ends will be sealed in accordance with NDX Drawing NDX1061-00.</p> <p>1.8 The Company shall be responsible for arranging with the cable supplier for the collection of empty cable drums where the cable supplier offers such a service. The Company shall provide a record of all drums collected. Where no collection of empty cable drums is offered by the supplier the Company shall then offer the empty cable drums to the cable supply industry otherwise the Company shall dispose of the empty cable drums in an environmentally friendly manner and shall confirm the method of disposal to the Overseeing Organisation.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1507A	<p><b>1 Cable Installation</b></p> <p>1.1 All cables shall be laid in accordance with this Clause.</p> <p>1.2 Cables shall only be laid when the ambient temperature is above 0° C on a rising thermometer, and the cable has been stored for at least the previous 24 hours at a temperature greater than 0° C.</p> <p>1.3 Sufficient length of cable shall always be installed to allow for correct cable termination and provision of service loops all in accordance with Clause 1507.18SR. When termination does not proceed immediately following the installation of the cable, the cable ends shall be protected from damage and sealed against the ingress of moisture in accordance with drawing NDX1061-00.</p> <p>1.4 The Company shall not install cables into ducts until the duct mandrel testing and pressure tests have been completed and stored with the daily records as described in Clause 1504SR. The Company shall make the completion of the mandrel and pressure test a hold point in the Company's quality plan. Furthermore the Company shall satisfy himself that ducts are, in all respects, suitable for cable installation prior to the installation of cables.</p> <p>1.5 No cable shall be left exposed at the end of any work period.</p> <p>1.6 In the event of any damage whilst cables are being installed, the whole of the length of cable shall be removed, replaced or repaired, reconnected and re-tested at the Company's expense prior at the earliest possible date. All cable repairs shall be at the discretion and to the satisfaction of the Overseeing Organisation.</p> <p>1.7 Every cable shall be permanently labelled using plastic cable markers (Critchley type or equivalent) to identify the destination of the cable in accordance with the drawing NDX1061-00 to ensure its unambiguous identification immediately following its installation. The cable markers shall be near to the cable terminations and visible within the cabinet.</p> <p>1.8 The Overseeing Organisation shall be provided with the opportunity to witness the installation of all cables and the Company shall provide an indication to the Overseeing Organisation of where cable installation will take place at least 14 days prior to the cable installation unless otherwise detailed in the New Works Requirements.</p> <p>1.9 For duct installations cables shall be drawn into cable ducts and chambers that have been installed in compliance with Clauses 1530SR, 1531SR and 1532SR. For cable tray or similar cable management installations the cable installation shall be in accordance with this Clause 1507SR.</p> <p>1.10 Unless otherwise described in the Scottish Ministers, power supply cables shall not share the ducts with longitudinal communications cables. For power supply cable runs less than 50 metres, a relaxation has been permitted to allow shared ducts for power and communications cables. For power cable runs greater than 50 metres a</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>separate duct shall be installed for the power cable which at no point is less than 0.5 metres from the ducts containing communications cabling.</p>
1.11	<p>Cables shall be installed from a central chamber point outwards using a static mechanical winch fitted with an adjustable clutch, the setting of which shall ensure that at no time during the drawing of cables will the maximum longitudinal mechanical cable loading be exceeded. A copy of the current calibration certificate relating to the winch shall be provided to the Overseeing Organisation prior to use and shall also be held with the daily records in compliance with Clause 1504SR.</p>
1.12	<p>The ducts shall be lubricated during installation using a suitable water based, biodegradable lubricant. Such lubricant shall be compatible with all elements of the installed cable and duct infrastructure. The draw cord shall not be used for cable installation. The Company shall use the draw cord to pull through a purpose made cable pulling rope which shall then be used for cable installation. The cable pulling rope shall be attached to the cable by means of a pulling eye fitted to a stocking (copper and power cable) or a pulling eye attached directly to the central strength member (fibre cable). In all cases the Company shall attach a swivel between the cable pulling rope and the pulling eye.</p>
1.13	<p>Purpose made bell-mouths shall be fitted to the exit and entry of every duct, including all intermediate points, prior to the commencement of cable installation. A purpose made cable chute shall be used at the cable entry point to the network. Also, during cable laying purpose made rollers shall be temporarily secured to the chamber cover frame to ensure the cable sheath is protected from contact with the frame metal. Cable guides shall be used to support the cable at all intermediate chambers through which the cable is being installed.</p>
1.14	<p>Where intermediate chambers exist on a cable route, the cables shall where practical, be installed through these chambers in one operation; the Company shall ensure that an operative is present at every such chamber to ensure the safe installation without damage to the cable. Where cables pass through intermediate chambers, the Company shall, immediately after installation, label each cable with the destination of the cable and chamber or equipment reference as appropriate approximately 150 mm from the entry and exit points of the chamber. The type of labelling to be used shall comply with drawing NDX1061-00.</p>
1.15	<p>Where more than one cable is to be installed in a duct, before the second cable is pulled the Company shall ensure that the duct is unobstructed and the cable pulling rope to be used does not pass around the existing cable. If the Company cannot ensure the cable pulling rope is not around the existing cable the Company shall introduce a new pulling rope by using rods or other means independent of the existing draw rope. Where multi-pair copper and optical fibre cables are to be installed into the same duct, the multi-pair copper cable(s) shall be installed first.</p>
1.16	<p>Optical fibre cables shall additionally be marked at intervals of 500 mm</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>along their length, inside chambers. If the cable sheath is not indelibly marked during manufacture the marking shall be added using 25 mm wide, yellow PVC adhesive tape or alternative fit for the purpose.</p> <p>1.17 Cables shall not be bent to an internal radius of less than 12 times the external diameter of the cable or the radius recommended by the manufacturer, whichever is greater.</p> <p>1.18 Unless otherwise described in the Scottish Ministers, all fibre optic and copper communications cables shall be provided with service loops. These service loops shall be installed in a Type 'C' chamber located at each copper or fibre termination pillar of sufficient dimensions to ensure the cable is not exposed to bends below the minimum bending radius. Each loop shall be made of a minimum of 3 metres of each cable and comply with drawing NDX1063-03.</p> <p>1.19 Unless otherwise described in the Scottish Ministers or required by the Overseeing Organisation, no uncoated metal cable supports shall be fitted within the chambers. All metal supports shall be plastic coated or similar.</p> <p>1.20 The Company shall ensure that on completion of the cable installation works a draw cord is installed in each duct and both ends secured within the terminating chambers or enclosure.</p> <p>1.21 The use of verge located cable troughs shall not permitted without the specific written authority of the Overseeing Organisation unless used in temporary situations to provide continuity of service. Such written authority shall only be provided where the Company can provide evidence of constraints that would prevent the installation of ducts.</p> <p>1.22 In above ground situations cables shall be installed on cable management systems such as ladder type cable trays or trunking or troughs. The cable management systems shall prevent the cables being bent to a diameter less than that specified in Clause 1507.17SR. No cables in an external environment shall be left exposed and cable tray lids and trunking covers shall be provided to protect the cables from physical and environmental damage. All cable tray lids and trunking covers shall be positively retained using suitable fixings. In situation where the cable management system covers and lids could fall and cause injury or damage the covers and lids shall be provided with stay chains or wires to prevent the covers and lids falling. On horizontal cable management systems the cables shall be tied to the cable management system at intervals not exceeding 5 metres and at points where the cables change direction. On vertical cable management systems the cables shall be tied to the cable management system at intervals not exceeding 500mm and shall be tight enough to provide cable strain relief. The support and attachment mechanisms for the cable managements systems shall be of sufficient strength to support the calculated cable mass and the spacing of the support and attachment mechanisms shall be at intervals that will only allow a maximum deflection of 10mm in the cable tray or trunking. All cable</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>management system parts, fittings supports and attachment mechanisms shall be protected from corrosion and shall be fit for purpose for at least 30 years within the environment they are installed.</p> <p>1.23 Cables shall be routed within masts and posts.</p>
<b>1508A</b>	<p><b>1 Installation of Cabinets – General items</b></p> <p>1.1 Cabinet types shall be those as described in the Scottish Ministers.</p> <p>1.2 The Company shall provide and install paved areas around cabinets together with access paths, steps and hard standings in accordance with Clause 1539. With the cabinet door fully open a minimum 700mm clearance shall be provided between any the edge of the cabinet door and any retaining wall, fence, embankment or cutting. The 700mm clearance does not take into account the required working width and access requirements and such requirements shall be included in the overall clearance between cabinets and adjacent features.</p> <p>1.3 The Company shall install foundations and erect cabinets in accordance with the appropriate NDX or Agreement Specific Drawing.</p> <p>1.4 Unless otherwise described in the Scottish Ministers or where Common Equipment Cabinets (CECs) are utilised, cabinets shall be situated in groups located in a consistent sequence as shown typically in NDX1063-00.</p> <p>1.5 Cabinet doors shall be orientated to provide the safest possible environment for roadside maintenance staff and wherever possible cabinets shall be orientated so when the doors are open they provide protection from spray from vehicles. Cabinet doors shall be capable of opening and closing without being fouled by paved area or access paths or steps.</p> <p>1.6 Where cabinets are to include a resin seal then after completion of the terminations and testing, but before the addition of gravel, the entry and exit ducts into the base of the cabinets or below the cabinets shall be sealed with expanded foam to prevent the ingress of soil, pea gravel and water into the duct ends. The internal void within the plinth or base shall then be filled with 6mm-pea gravel to the level shown on the relevant cabinet drawing. Furthermore the base of each cabinet shall additionally be resin sealed typically in accordance with drawing NDX1002-01 or specific Agreement Drawing. To achieve the required resin seal the duct ends shall be above the finished level of the resin seal by a minimum of 10mm and a maximum of 30mm. The resin seal shall be poured to provide a waterproof seal to all cables and finished to provide a smooth and level surface.</p> <p>1.7 For CEC cabinets and similar where cable entry takes place via penetrations through a suspended metal base plate then correct and compatible glands shall be used in accordance with the cabinet manufacturer’s instructions.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>1.8 The Company shall keep the interior of cabinets free from moisture and dirt. The Company shall ensure that the doors of each cabinet are closed and properly secured after the installation of Traffic Scotland Equipment in the cabinet and after the completion of any other work.</p> <p>1.9 The Company shall ensure that all enclosures and cabinets, following the drilling cutting or removal of cable entry knockouts, maintain the manufacturer's quoted IP Classification ratings and are cleaned of all waste, swarf and surplus material prior to any further work being undertaken. Where such drilling and modification of an enclosure and cabinet causes removal or damage to any protective coating, the coating shall be made good in accordance with the manufacturer's instructions and/or in accordance with Series 1900.</p> <p>1.10 The Company shall ensure that power is available and all cabinet environmental control equipment is tested, commissioned and operational before any Active Equipment is installed in the cabinet.</p> <p>1.11 Power supply distribution and protection circuits shall be housed in cabinets. The power supply cabinets are as detailed in drawings NDX1011-06, NDX1011-07 and NDX1011-08. The layout of the supply distribution and protection circuits shall be as detailed in the drawings. The circuits detailed on the NDX Drawings are shown for example only and the Company shall provide power schematic layout drawings in a format as agreed with the Overseeing Organisation. The Company shall also ensure that this work conforms to the requirements of the BS7671.</p> <p>1.12 Where cabinet type 600(S) is used, they shall be installed as shown on drawings in NDX1002 series. The Company shall install such wiring and supports to accommodate equipment to be housed in accordance with the Agreement. Where a termination frame arrangement is required, the frame shall be wired using 0.5 mm single stranded copper twisted jumper wire for the links. Where appropriate the frame can be wired off-site. All wiring shall be mechanically supported and retained using suitable ties or cord and terminations shall conform to the relevant sub-clause of Clause 1513 and shall satisfy the requirements of the applicable Workmanship Standards Manual that forms part of the Quality Plan.</p> <p>1.13 Where specialist cabinets or CECs are used, they shall be installed in accordance with the Agreement Drawings and/or manufacturer specific installation requirements.</p>
<b>1509A</b>	<p><b>1 Gantries for Overhead Equipment</b></p> <p>1.1 Where required to be installed, the Company shall provide Gantries in compliance with the Scottish Ministers.</p>
<b>1510A</b>	<p><b>1 Emergency Roadside Telephones</b></p> <p>1.1 The Company shall install HA type 354 Emergency Roadside Telephones including foundations, posts housings and handsets in</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>compliance with this Series 1500 and the Scottish Ministers. NDX Drawing NDX1049-02 provides further information about the provision of Emergency Roadside Telephones. The layout for each site shall be agreed by the Overseeing Organisation.</p> <p>1.2 All non-operational Emergency Roadside Telephones shall be covered with purpose made bags displaying the words 'Not in Use' until such time as the telephones have been commissioned and are available for use by the public.</p>
<b>1511A</b>	<p><b>1 Marker Tape</b></p> <p>1.1 All ducts installed underground shall have their position indicated by the use of detectable marker tape. Unless otherwise described in the Scottish Ministers such marker tape, as described below, shall be buried in the trench above the cable/duct as detailed in NDX1063-00.</p> <p>1.2 Marker tape shall be manufactured from self coloured thermoplastic material not less than 150 mm wide; it shall have a metallic insert or backing which will allow detection by electronic route tracing equipment. The detectable metallic component and the form of tape construction shall be either:</p> <ul style="list-style-type: none"> <li>(i) Stainless steel wire or wires with a minimum total cross sectional area of 0.30 mm sq. laid in a sinusoidal wave form or stainless steel strip with minimum dimensions of 10 mm wide and 100 micron thick. The stainless steel wire or strip shall be sandwiched in between two layers of thermoplastic tape with a combined minimum tape thickness of 150 micron or bonded to one layer of thermoplastic tape with a minimum thickness of 150 micron.</li> <li>(ii) Aluminium foil with minimum dimensions of 50 mm wide and 9 micron thick totally enclosed in between two layers of thermoplastic tape. The combined thickness of the two tape layers shall be a minimum of 400 micron.</li> </ul> <p>1.3 Joints between successive lengths of tape shall be made using crimps or clamps such that the electrical continuity and tensile strength of the tape is maintained. The joint shall be protected from corrosion and attack from ground chemicals.</p> <p>1.4 The wording on the marker tape shall read "CAUTION COMMUNICATIONS/ POWER CABLES BELOW". The wording shall occur at intervals up to a maximum of 1m apart. The letters of the wording shall be a minimum of 30 mm high with a minimum of 5 mm line thickness</p> <p>1.5 Marker tape shall be yellow in colour, with wording in black.</p>
<b>1512A</b>	<p><b>1 Provision of and Installation of Ancillary Items</b></p> <p>1.1 Unless otherwise described in the Scottish Ministers, the Company shall provide all ancillary items forming part of the Traffic Scotland</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Equipment as required to complete the New Works.</p> <p>1.2 The Company shall be responsible for all provision associated with ancillary items of Traffic Scotland Equipment at all locations where such ancillary items are required unless otherwise described in the Scottish Ministers.</p>
<p><b>1513A</b></p>	<p><b>1 Jointing and Termination of multi-pair communications and feeder Cables</b></p> <p>1.1 No permanent multi-pair communications cable underground joints are permitted on Traffic Scotland installations. Temporary above and below ground joints in damaged operational cables shall be allowed until the full length of damaged cable is replaced. Repairs to operational cables shall be undertaken immediately after the damage has occurred. Cable replacement shall take place as soon as possible. Unless otherwise described in the Scottish Ministers the Company shall be responsible for all cable repairs and replacement.</p> <p>1.2 All permanent multi-pair communication cables joints and terminations shall take place with a cabinet except in the loop tail to feeder cable joints as described in Clause 1513.3.</p> <p>1.3 The Company shall use the type of cable joints between detector loops tails and feeder cables shall be as detailed in NDX1063-04 and shall comply with Clause 1523 of this 1500 Series. The loop tail and feeder cable joints shall be installed in loop roadside chambers in accordance with NDX1063-04. The conductors shall be secured by tightening the screws with a torque screwdriver to within the range 0.4 to 0.6 Nm. The conductors shall be of sufficient length to facilitate routine maintenance and allow for four subsequent re-terminations. Care shall be taken at all times to maintain correct pairing. The Company shall using proprietary cable markers clearly identify all cables and cable cores by using correctly fitting labels at both ends. To terminate multi-pair cables in cabinets, the outer SWA shall be removed at the gland plate and the inner sheaths at the highest point within the frame. This shall be carefully removed from the cable ends to reveal the pairs of insulated conductors. All surplus jelly shall be removed by the use of a clean dry cloth taking care not to stretch the insulation, and any fluid substance to aid the cleaning process shall have had the prior approval of the cable manufacturer and be shown to have no detrimental effect on the cable or, if applicable, the jointing system.</p> <p>1.4 Cables shall be glanded and dressed neatly and routed within the cabinet with proprietary pair ties and pair identification markers in a neat and orderly manner and shall be terminated in compliance with the pair allocation tables as detailed in the Scottish Ministers. The Company shall route the incoming and outgoing cables to vertically align the cables gland plate position with the point they enter/leave the cabinet</p> <p>1.5 The lay of the cable shall be maintained up to the termination position. All conductor pairs shall be identified by means of a numbered plastic</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>sleeve or collar.</p> <p>1.6 Conductors shall be terminated in terminal blocks complying with Clause 1514. The conductors shall be secured by tightening the screws with a torque screwdriver to within the range 0.4 to 0.6 Nm. The conductors shall be of sufficient length to facilitate routine maintenance and allow for four subsequent re-terminations. Care shall be taken at all times to maintain correct pairing. The Company shall clearly identify all links by using correctly fitting labels at both ends.</p> <p>1.7 Where the Company is required to joint or terminate cables onto existing operational cables, the Company shall comply with clause 1522.</p> <p>1.8 Links shall be installed and connected using, as appropriate, the insulated conductors of multi-pair/0.9 mm cable with its outer sheath, armour and inner sheath removed. The links shall be of sufficient length to facilitate routine maintenance and allow for four subsequent re-terminations and shall not obstruct any other accessory. The Company shall maintain multi-pair colour coding so that colour code duplication does not occur. Care shall be taken at all times to maintain correct pairing. Unused ends of all conductors shall be neatly tied back.</p> <p>1.9 Where the Company requires to terminate multi-pair communication cables in existing multi-pair communication cable termination cabinets or cabinets which contain operational Traffic Scotland Equipment the Company shall comply with Clause 1522.</p>
<b>1514AA</b>	<p><b>1 Cable Connectors</b></p> <p>1.1 Cable connectors shall be as described within the Scottish Ministers and be of a suitable industry standard for the cable type and intended use. Where required, the connectors shall be provided with suitable retaining clips to prevent vibration causing loosening of the connection.</p>
<b>1515A</b>	<p><b>1 Jointing and Termination of Fibre Optic Communications Cable</b></p> <p>1.1 Fibre Optic Communication cables shall be jointed and terminated in Common Equipment Cabinets (CEC), Type 600(S) or within transmission stations using standard 1U 19" termination units and associated break out boxes.</p> <p>1.2 Within existing Transmission Stations, the Company shall use the existing fibre optic cable jointing and termination facilities or provide the same as existing fibre optic cable jointing and termination facilities if the existing facilities do not have the capacity to accommodate the fibre optic cable being provided in compliance with the Scottish Ministers.</p> <p>1.3 Where fibre optic cables are required to terminate within a non environmental enclosure then the cables shall be terminated in an approved hermetically sealed box containing silica gel to prevent damage due to the occurrence of moisture. The fibres shall be fusion spliced and protected from mechanical strain. The fusion splicing shall</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>not cause losses greater than that detailed in MCG 1055</p> <p>1.4 Unless required for equipment connection, all joints shall be permanent, fusion spliced type.</p>
<p><b>1516A</b></p>	<p><b>1 Termination and Jointing of Power Supply Cables for Traffic Scotland Equipment</b></p> <p>1.1 Underground joints may in limited circumstances be permitted on Scottish Motorways Communications system but only with the specific approval of the Overseeing Organisation and in compliance with NDS 9565 "Guidance on the use of standard Traffic Scotland termination pillars"</p> <p>1.2 Termination of power supply cables shall be undertaken in accordance with good working and recognised electrical engineering practices. Prior to commencing with power supply terminations the Company shall deliver to the Overseeing Organisation method statements and a Scottish Ministers Issued Equipment power cabinet fully terminated and complete as evidence of the workmanship that will be provided as part of the Works</p> <p>1.3 Where the Company requires to terminate power supply cables in existing power supply cabinets or cabinets which contain operational Traffic Scotland Equipment the Company shall comply with Clause 1522.</p>
<p><b>1517A</b></p>	<p><b>1 Earthing and Bonding</b></p> <p>1.1 The earthing and bonding of the Traffic Scotland installations shall comply with the recommendations contained in BS7671 and BS7430. Where required, further details of the earthing and bonding requirements may also be given in the Scottish Ministers.</p> <p>1.2 The area of gland plates or boxes, which will come into contact with a cable gland shall be cleaned prior to fitting of all paint and, in existing equipment any corrosion, before a cable gland is fitted. Once the gland is fitted, exposed metalwork of gland plates or enclosures where required, shall be suitably treated to protect against corrosion. Furthermore an appropriate earth tag forming part of the gland kit, and retained by the gland fixing nut, shall also be installed and connected to the main earth bonding point within the cabinet using correctly sized cable and crimps as required by the Electricity Safety, Quality and Continuity Regulations. This bonding cable shall be copper and have insulation coloured green/yellow – also see Clause 1517.5SR below.</p> <p>1.3 All connections to bolted fixtures shall be made through crimped type lugs and using correctly sized bolts with appropriate washers and lock nut all as NDX1002-01</p> <p>1.4 All Traffic Scotland Equipment cabinets grouped in close proximity shall be effectively earth bonded together in accordance with the requirements of BS7671 Requirements for Electrical Installations. The</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Company shall introduce correct and adequate earth bonding arrangements particularly when the cabinet group includes lighting or similar cabinets energised by a different Electricity Supply Company supply to the Traffic Scotland Equipment. It is the Company's responsibility to design the installation to ensure no high fault currents from earth faults on other systems enter the Passive Network.</p> <p>1.5 In all Traffic Scotland Equipment cabinets all SWA gland earth tags shall be installed within the cabinet and bonded together and to the cabinet earth stud using green/yellow insulated bonding wire unless otherwise required by applicable Regulations. This requirement applies to all SWA Communications and Power Supply cables.</p> <p>1.6 At all equipment sites where a power supply is installed it is a requirement that an earth rod be installed as follows:</p> <p>(a) If the Termination Pillar contains the DNO's cut out, then an earth rod will be installed adjacent to the Termination Pillar in accordance with the requirements of BS7671 and BS7430 to act as the Electricity Supply local protective earth.</p> <p>(b) Where Traffic Scotland equipment includes a mast or support introducing an increased risk of damage by lightning then a earth rod shall be installed adjacent to the cabinet as a communications local earth. The earth impedance of the earth rod shall be no greater than 10 ohms.</p> <p>1.7 All pillar, cabinet and Signal pole doors shall be earth bonded to the main structure chassis using a flexible 6 mm sq. green/yellow insulated conductor cable reference. The bonding conductor shall be sufficiently long as not to be strained when the doors are fully extended. Where crimp terminals are used these shall be sound in assembly and protected from strain typically using an insulated clip or similar retaining arrangement.</p>
1518A	<p><b>1 Cable Testing</b></p> <p>1.1 Armoured communications cables shall be tested by the Company in accordance with the Specifications MCG1022 (for multi-pair communications cable) and MCG1055 (for optical fibre cable). The Company shall undertake tests on cables as detailed in this document and the Specification for Highway Works. Appendix 1/5. Scottish modifications to the MCG1022 are as follows :</p> <p>(a) Communications cables to MCE1173 shall be tested to MCG1022C paragraphs. 2.3.1. 2.3.3.(a), 2.3.4.(a) and 3.1. corrected as 1518.2</p> <p>(b) Communications cables to CW1128/1198 shall be tested to MCG1022C paragraphs. 2.3.3.(a) , 2.3.4.(a) and 3.1. corrected as 1518.2</p> <p>(c) Power cables to BS6346 (3- core SWA) shall be tested to</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1.2	<p>MCG1022C paragraphs. 2.3.2., 2.3.3.(b), 2.3.4.(b) and 3.2.</p> <p>Modifications to MCG1022C are as follows;</p> <p>(a) Para 1.5.2.</p> <p>i. delete "loading patterns</p> <p>ii. delete "attenuation" and "impedance" diagrams in Appendix 2</p> <p>(b) Para. 3.1.</p> <p>i. Attenuation measurements shall be on all pairs at all listed frequencies.</p> <p>ii. No loading will be installed - all pairs treated as identical (600 ohms)</p> <p>iii. Graphs shall be produced to cover all pairs</p> <p>(c) Para. 3.1.5. Measurement of Near End cross talk with 600 ohm termination only.</p> <p>(d) Para. 3.1.6 Not undertaken</p> <p>(e) Para. 3.1.7. To be carried out on all pairs.</p> <p>(f) Para. 3.1.8 Not undertaken</p> <p>(g) Para. 3.1.9 Not undertaken</p> <p>(h) Para. 3.1.10 Not undertaken</p> <p>(i) Para. 3.1.11 Not undertaken</p> <p>(j) Telephone pair test: Measure loop resistance to telephone and note value. (Max. 29ohms/Km) and using 600 ohm termination measure attenuation at 800Hz to telephone and note value. (Max. 0.74dB/Km).</p>
1.3	<p>All Cables, both optical fibre and copper, supplied by the Company to specification shall be tested in accordance with MCH1221 at the manufacturer's works prior to delivery to ensure compliance with those specifications and the testing shall be witnessed by a specialist consultant appointed by the Company.</p>
1.4	<p>Loop detector and feeder cables shall be tested in accordance with Clauses 1523 and 1537.</p>
1.5	<p>Power cable testing shall be carried out in accordance with both MCG1022 and BS7671 and Clause 1526. The Overseeing Organisation may appoint by a specialist consultant to witness all testing.</p>
1.6	<p>No site cable tests shall be carried out until the cable trench containing the cable duct has been back-filled and the ground above the cable reinstated and the cable ends have been installed (un-terminated) in the respective termination cabinets. No site cable tests shall be carried out</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>until all the cables to be installed in one duct have been installed. No site cable tests shall be carried out until adjacent work, which may damage the cable have been completed.</p> <p>1.7 Cable test result documentation shall be in compliance with clause 1504 and Clause 1540. The cable being tested and the instruments being used to complete the test shall be clearly marked on each cable test result.</p> <p>1.8 The Company shall provide all safety equipment, display warning notices, erect barriers and ensure trained personnel are present at all points where dangerous voltages may be present during testing.</p> <p>1.9 All test instruments requiring calibration shall have a current calibration certificate. Copies of the calibration certificate covering the whole period of cable testing shall be provided with the cable test results.</p> <p>1.10 The Company shall give at least 14 days' notice, in writing, to the Overseeing Organisation of his intention to test any cable and shall be provided with the opportunity to witness the installation of all cables.</p> <p>1.11 In the event of the Company drawing further cables through a duct after cables have been tested, then all cables in the duct shall be re-tested.</p> <p>1.12 Any cable damage identified shall be rectified by the Company in accordance with sub-clause 1550. and re-tested.</p>
<b>1519A</b>	<p><b>1 Labelling and Numbering</b></p> <p>1.1 All Traffic Scotland equipment when detailed in drawings and documentation prepared by the Company shall be numbered in accordance with the Traffic Scotland Equipment numbering scheme in the NDX series drawings and the Scottish Ministers. The Company shall not use any other equipment numbering at anytime.</p> <p>1.2 Cabinets, Emergency Roadside Telephones, Signals, and cables shall be numbered and labelled, in accordance with the relevant NDX drawings, using Traffic Scotland labelling procedures and, unless specified otherwise in the Scottish Ministers, it shall be the responsibility of the Company to provide such manufactured labels. All equipment labels shall be attached in accordance with the NDX series drawings unless otherwise described in the Scottish Ministers.</p> <p>1.3 The Company shall not leave cables unlabelled at any time and shall provide temporary labelling accordingly to facilitate testing and termination prior to the implementation of permanent labelling.</p> <p>1.4 All cabinets containing power shall be labelled to indicate the source of supply, destination, circuit arrangements and details of testing in accordance with the BS7671 regulations. Cabinets shall also include a copy of the applicable electrical schematic.</p> <p>1.5 All cabinets containing Traffic Scotland Equipment shall have the circuit diagrams of both the cabinet and the external cable circuits stored</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>within the cabinet so that the maintenance engineer can understand the cable connections and cable routing. These circuit diagrams should be an extract of the as built drawings and should be supplied in a modifiable electronic form to the Overseeing Organisation as part of the documentation requirements.</p> <p>1.6 All records contained within cabinets shall be waterproof and version controlled.</p> <p>1.7 Where the Company carries out modification work to existing cabinets, new labels shall be fitted where appropriate and shall update the existing records in compliance with the Scottish Ministers.</p> <p>1.8 All standard warning labels shall be supplied by the Company and installed on cabinet doors.</p>
<b>1520A</b>	<p><b>1 Loading</b></p> <p>1.1 Not used.</p>
<b>1521A</b>	<p><b>1 Removal and Re-siting of Existing Equipment</b></p> <p>1.1 Prior to existing Traffic Scotland Equipment being removed/re-sited as determined by the design, the Company shall provide a report titled "The Strategy for Delivery of the ITS works for Traffic Scotland Equipment" in accordance with the Scottish Ministers.</p> <p>1.2 Unless otherwise described in the Scottish Ministers, the Company shall remove and dispose of all existing equipment in compliance with this 1500 Series.</p> <p>1.3 Where required in accordance with "Strategy for Delivery of the ITS works for Traffic Scotland Equipment", as prepared by the Company under Clause 1521.1SR, the disconnection and reconnection of Traffic Scotland Equipment shall either be witnessed or undertaken by the Traffic Scotland Term Contractor for Maintenance and General Works in compliance with Clause 1522SR.</p> <p>1.4 All Traffic Scotland Equipment that has not to be disposed of shall be stored by the Company until required or returned to Overseeing Organisation stores. The Company shall store equipment to be returned to the Overseeing Organisation for a period of up to 3 months or as otherwise detailed in the Employers Requirements.</p> <p>1.5 Items of equipment to be re-sited shall be unbolted from their plinths or supports together with their holding down bolts, stored, and removed or re-sited. Where any foundations, support infrastructure and hard landscape associated with existing site is not required in the future the Company shall undertake all necessary site clearance in compliance with Clause 201 of the Specification.</p> <p>1.6 Conductors shall be disconnected from the equipment in which they are terminated, the terminal screws and glands re-tightened and the cable withdrawn clear of the equipment.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>1.7 Where cables are to be recovered, they shall be carefully withdrawn, and the Company shall comply with the requirements for duct sealing, cleaning and roping. Recovered cables shall be coiled onto drums at the time of removal and transferred to the Company's site storage area for subsequent re-use or removal to the Overseeing Organisation's Store, unless otherwise detailed in the Scottish Ministers.</p> <p>1.8 The sites of cabinets, plinths and cable trenches shall be reinstated to the level of the surrounding ground as in Clause 201 of the Specification, unless otherwise described in the Scottish Ministers.</p> <p>1.9 All re-used cables shall be tested in accordance with Clause 1506SR and 1507SR.</p> <p>1.10 Where cables are being disconnected, or being disconnected and left in situ, the operation shall be carried out in a safe manner which does not form a hazard to maintainers, operators or Users and shall be in compliance with the Scottish Ministers.</p>
<b>1522A</b>	<p><b>1 Works Impacting on Operational Traffic Scotland Systems</b></p> <p>1.1 All works shall be programmed and planned to prevent any detrimental impact on the operation of Traffic Scotland Equipment and systems in accordance with the Overall Strategy for Delivery of the ITS works for Traffic Scotland Equipment document which forms part of the Scottish Ministers. The details of the works to mitigate the impact on the Traffic Scotland Service or part thereof shall be prepared by the Company and made available to the Overseeing Organisation and the relevant Traffic Scotland Service providers prior to the start of such works. Notification of any such mitigating arrangements shall, unless otherwise stated within the Scottish Ministers be no less than 28 days prior to the works commencing.</p> <p>1.2 Detrimental impact may include but not be limited to loss of service due to cable damage, loss of electrical supply or communications link or damage to equipment and similar.</p> <p>1.3 Mitigating arrangements may include temporary equipment housing, temporary electrical supply, temporary communications link by copper cable, optical fibre cable, line-of-sight microwave or similar or combinations of these.</p> <p>1.4 Where no alternative is available, the Company shall provide documentation detailing all the investigated alternatives.</p> <p>1.5 Where migrating arrangements introduced by the Company fail to correctly protect the operation and integrity of the Traffic Scotland systems and equipment the Scottish Ministers shall, at his own discretion, seek to claim damages in accordance with Scottish Ministers.</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1523A	<p><b>1 Loop Detectors</b></p> <p>1.1 Where required and unless otherwise described in the Scottish Ministers, the Traffic Scotland Loop detectors shall be installed in accordance with Specification MCH1540 and NDX 1097.</p> <p>1.2 The roadside loop chamber as described in Clause 1532 shall be installed prior to the detector loops being installed and at the completion of detector loop installation all loop tails shall located within the roadside loop chamber and each tail shall be labelled.</p> <p>1.3 Slots for the detector loops shall be cut from within the base course level.</p>
1524A	<p><b>1 Trial Pits</b></p> <p>1.1 Trial pits shall be excavated by the Company to determine the location of Traffic Scotland Equipment located below the surface. The use of mechanical digging methods is prohibited.</p>
1525A	<p><b>1 Not Used</b></p>
1526A	<p><b>1 The Inspection and Testing of Electrical Installations and Electrical Equipment</b></p> <p>1.1 The Company shall carry out all works associated with the Inspection and Testing of Electrical Installations in compliance with BS7671 and Guidance Note 3 for BS7671 and for equipment not forming part of the fixed installation be in accordance with the latest edition of "Code of Practice for In-service Inspection and Testing of Electrical Equipment" published by the IET. The Company shall provide paper copies of the Inspection and Completion Certificates to the Overseeing Organisation in accordance with BS 7671 and also in 'soft copy'. Both paper and softcopy shall generally conform with the NICEIC format for BS7671 Certificates and be compatible with Industry standard archiving software.</p> <p>1.2 Where the Inspection/Tests show that existing cabinets or electrical circuits, or the earthing arrangements do not meet with the requirements of BS 7671, the Company shall make the installation safe and carry out all such works to make the installation compliant with BS7671. When designing the electrical installation, the Company shall take fully into account all aspects of access for maintenance. Also, where the Company considers safety and operational risks associated with quarterly testing of a Residual Current Device (RCD) to be unacceptable an alternative design must be provided.</p> <p>1.3 For the purposes of carrying out the Tests the Company shall use appropriate instruments which shall be tested and calibrated at six monthly intervals. Copies of the test/calibration certificates shall be forwarded to the Overseeing Organisation with the first certificate dated within three months of the Commencement Date. The Earth Loop</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>Impedance testing instrument shall be of the digital display type and shall operate from zero to 19.99 Ohms (Accuracy <math>\pm 1\%</math> ES. <math>\pm 1.5\%</math> Reading) with 0.01ohm Resolution. Where alternating current measurements are required, testing instruments shall be of the digital display type and shall be capable of operation with an accuracy of <math>\pm 1\%</math> in the useable ranges.</p> <p>1.4 Where appropriate and prior to testing the installation in accordance with the requirements of BS7671 all extent and limitations to be applied must be agreed with the Overseeing Organisation. The agreed extent and limitations must include consideration of all cables and equipment making up the installation that may be required to be excluded from the testing of the fixed electrical installation.</p> <p>1.5 Such electrical equipment not forming part of the fixed wiring of the installation shall be disconnected while carrying out BS7671 testing on the electrical installation. Items so excluded from the BS7671 inspection and testing shall be inspected and tested in accordance with the HSE publication "Maintaining portable and transportable electrical equipment" HSG107 and the "Code of Practice for In-service Inspection and Testing of Electrical Equipment" or as otherwise agreed with the Traffic Scotland Manager. The frequency of the inspection and testing of such equipment shall be appropriate for the equipment type, its frequency of use and environment in which it is used.</p> <p>1.6 The frequency of inspection and testing of fixed installations shall be;</p> <ul style="list-style-type: none"> <li>(a) Periodic BS7671 Inspection and Testing – 5 yearly</li> <li>(b) Routine Check as BS7671 Guidance Note 3 – Annually</li> <li>(c) Where RCDs are an integral part of the installation earth fault protection then the RCDs shall be tested quarterly. TT supplies shall not form part of the permanent electrical supply infrastructure. RCDs shall be tested at minimum load.</li> </ul> <p>1.7 The Company shall provide all safety equipment, display warning notices, erect barriers and ensure personnel with suitable skill and ability are present at all points where dangerous voltages may be present during testing.</p>
<b>1527A</b>	<p><b>1 Cable Installation at Transmission Stations</b></p> <p>1.1 Cables shall be installed into and terminated within Transmission Stations in compliance with the Scottish Ministers.</p> <p>1.2 Work shall not be undertaken in active Transmission Station by the Company until the Company is in compliance with Clause 1522.</p>
<b>1528A</b>	<p><b>1 Modification of Existing Cabinets</b></p> <p>1.1 The Company shall terminate new cables, terminate diverted cables, install Traffic Scotland Equipment and undertake such other modifications to existing Traffic Scotland Equipment cabinets in</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>compliance with the Scottish Ministers and this 1500 Series.</p> <p>1.2 The Company shall, prior to laying any underground duct or cable to or from the existing Traffic Scotland Equipment cabinets, locate, by electronic means, the position of all cabling and ducting, expose all cables and ducts by careful hand excavation and identify the type, size and designation of each cable found.</p> <p>1.3 The Company shall as required undertake any or all of the following as required to comply with the Scottish Ministers</p> <ul style="list-style-type: none"> <li>(a) remove, retain for re-use, and replace the cabinet base pea gravel</li> <li>(b) remove and relay any hard standing;</li> <li>(c) remove all redundant materials and make good soft landscaping</li> <li>(d) excavate to expose cable remake loop,</li> <li>(e) excavate duct and cable routes;</li> <li>(f) re-route cable to gain sufficient lengths for the proposed modification;</li> <li>(g) reinstate duct and cable trenches;</li> <li>(h) break open and re-seal resin filled base;</li> <li>(i) disconnect and reconnect, undo existing gland and re-gland, including the provision of new gland assemblies and cable termination ancillaries where required;</li> <li>(j) withdraw and reinstall cables at cabinet base</li> <li>(k) un-terminate, re-terminate and terminate cables</li> <li>(l) remove and or relocate existing Traffic Scotland Equipment and install new Traffic Scotland Equipment and connect internal wiring</li> <li>(m) reroute and provide new internal wiring to create a tidy wiring and incoming outgoing cable layout</li> <li>(n) modify power distribution unit by adding or removing out going circuits and adding or altering the electrical distribution protection devices</li> <li>(o) remove all waste and redundant material and clean out the cabinet</li> <li>(p) renew external label</li> <li>(q) undertake any works such as painting, replacing locks, hinges and general cabinet maintenance works such as oiling and greasing the hinges, adding a document holder</li> <li>(r) updating records and inserting records to be held in cabinet</li> </ul> <p>1.4 All existing direct buried cables exposed during modification of existing Traffic Scotland Equipment shall be installed in ducting laid in compliance with Clauses 1530SR and 1531SR. Also where remake</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	loops in direct buried cables are exposed, Type C chambers shall be constructed to accommodate the remake loop.
1529A	<p data-bbox="395 568 1481 600"><b>1 Temporary Roadside Emergency Telephones</b></p> <p data-bbox="395 613 1481 882">1.1 Temporary Emergency Roadside Telephones shall be installed for use by the public when it would be necessary to cross either a live traffic lane or construction site to use the nearest working Roadside Emergency Telephone. When not in use temporary Roadside Emergency Telephones shall either be removed or covered with purpose made bags displaying the words 'Not in Use' until such time as the telephones have been commissioned and are available for use by the public.</p> <p data-bbox="395 904 1481 1061">1.2 The direction to the Temporary Emergency Roadside Telephones shall be indicated in a manner approved by the Overseeing Organisation at 100 metre intervals. The location and orientation of temporary Roadside Emergency Telephones shall be agreed with the Overseeing Organisation.</p> <p data-bbox="395 1084 1481 1151">1.3 Telephone instruments and posts shall be supplied by the Scottish Ministers unless otherwise described in the Scottish Ministers.</p> <p data-bbox="395 1173 1481 1330">1.4 Cable for temporary Emergency Roadside Telephones shall be identified at 20 metre intervals in a suitable manner. Cables shall be laid in existing ducts to cross the carriageway and on the surface elsewhere when suitable protection from damage can be reliably provided.</p> <p data-bbox="395 1352 1481 1487">1.5 Cable for temporary Emergency Roadside Telephones shall be connected to the nearest Copper Termination Pillar or equivalent on the live communications network. A loop of cable of 3 metres length shall be coiled on the ground adjacent to the cabinet or pillar.</p> <p data-bbox="395 1509 1481 1711">1.6 Connections and disconnections from the live communications network shall be carried out by the Overseeing Authorities' Transport Scotland Operations and Infrastructure Services Contractor. The Company shall give at least two week's written notice of the need for such work. The need for this work shall be identified in advance in the Company's programme and agreed with the Overseeing Organisation.</p> <p data-bbox="395 1733 1481 1868">1.7 The Company shall install, place in position, maintain, cover up, uncover, reposition, re-cable and remove temporary Emergency Roadside Telephones and associated work as necessitated by the progress of any New Works.</p> <p data-bbox="395 1890 1481 2040">1.8 Maintenance of temporary Emergency Roadside Telephones connected onto the network shall only be undertaken by the Overseeing Authorities' Transport Scotland Operations and Infrastructure Services Contractor. The Company must allow, at all times, access arrangements to any Overseeing Authorities' Traffic Scotland</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	Maintenance Contractor and Traffic Scotland Operator.
<b>1530A</b>	<p data-bbox="392 564 1474 600"><b>1 Cable Ducts</b></p> <p data-bbox="392 609 1474 680">1.1 The term cable duct used in this Series describes the ducts used for Traffic Scotland Equipment communication and power cables.</p> <p data-bbox="392 689 1474 896">1.2 Longitudinal ducts are those ducts forming the longitudinal route of ducts installed generally parallel to the carriageway. Transverse ducts are those ducts linking the longitudinal ducts and installed underneath and at right angles to the carriageway. Local ducts are those ducts installed from chambers forming part of the longitudinal duct network to the cabinets and Traffic Scotland Equipment</p> <p data-bbox="392 904 1474 976">1.3 The ducts installed to this specification are used for all types of Traffic Scotland cables</p> <p data-bbox="392 985 1474 1128">1.4 The ducts shall comply with this Series and the Scottish Ministers. The Company shall be responsible for ensuring that all components used within the ducts are compatible with each other, with the cable and with existing ducts to which they may be connected.</p> <p data-bbox="392 1137 1474 1317">1.5 The ducts shall comply with the general requirements of BS EN 50086-1 and in particular requirements of BS EN 50086-2-4. The ducts shall have a current British Board of Agreement Roads and Bridges Certificate or equivalent in accordance with Clause 104 of the Specification.</p> <p data-bbox="392 1326 1474 1532">1.6 The ducts shall be manufactured from thermoplastic material. The internal bore shall be smooth and even. The external surface shall be even or corrugated in the longitudinal section. The ducts shall be twin walled. Non homogeneous ducts with honeycomb or foam filled construction between the inner and outer surfaces shall not be permitted.</p> <p data-bbox="392 1541 1474 1747">1.7 The longitudinal, transverse and local ducts shall meet BS EN 50086-2-4 and be classified as "Normal duty" and rigid. These ducts will be supplied and laid in lengths no greater than 6 metres and be jointed using compatible couplers, sealing rings and lubricant. Rigid smooth walled pre-formed bends and junctions shall be used. Pliable or flexible ducting shall not be used to provide a continuous route.</p> <p data-bbox="392 1756 1474 1863">1.8 The nominal sizes of the ducts shall be as described in the Scottish Ministers. The minimum internal diameters shall be 150 mm, 100 mm and 50 mm.</p> <p data-bbox="392 1872 1474 1980">1.9 The external wall of the ducts shall be coloured black for all Traffic Scotland installations regardless of whether they contain power or communications cable.</p> <p data-bbox="392 1989 1474 2063">1.10 The materials from which the duct and fittings are made shall be treated so that they are protected from the deleterious effects of short term</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>exposure to ultra violet light and shall be resistant to degradation by acids, alkalis, common chemicals, bacteria, fungi, and moulds occurring in soils. The Company shall protect the duct and fittings on site in accordance with the supplier's recommendations.</p> <p>1.11 Each duct shall be fitted with a pigmented, stranded polypropylene or equivalent rot-proof material draw cord of 5kN breaking load and having a design life of not less than 20 years, the ends of which shall be secured within the chamber or enclosure to which the duct is terminated. Draw cords shall be secured to the duct plugs where fitted. Draw cords shall not be knotted within ducts; where a joint is required it shall be a spliced joint.</p> <p>1.12 The duct network shall be sealed in compliance with Clause 1533.</p> <p>1.13 Ducts containing Traffic Scotland cables or power cables for motorway communications systems installed on motorways shall be clearly and permanently marked with the legend "MOTORWAY COMMUNICATIONS /POWER" in two, diametrically opposite, planes. The ducts shall be installed such that the legend is uppermost. The method of marking shall not affect the integrity of the duct. This marking is in addition of the markings required in the BS EN 50086 series. The method marking and the durability test shall comply with the BS EN 50086 series.</p> <p>1.14 Each duct shall be fitted with a proprietary branded duct insert as shown in NDX1063-00.</p> <p>1.15 Four and six way ducts shall be supplied with purpose made spacers and strapping as indicated on drawing NDX1063-00. The strapping shall bind the ducts tightly in the specified formation during installation, back-filling and for the whole life of the duct. The spacing of the strapping shall be such that the ducts shall not separate by more than 50 mm; this spacing would typically be 1m. The contact area between spacer and duct shall be large enough to ensure that the spacer cannot penetrate or distort the walls of the duct.</p>
1531A	<p><b>1 Installation of Ducts</b></p> <p>1.1 Ducts shall be laid at the level as shown in NDX1063-00 and at a typical offset of 2 metres from the edge of the carriageway. Longitudinal ducts shall generally be run parallel to the edge of the hard shoulder. Transverse ducts shall run at right angles to the carriageway. The exact location of the ducts shall be in accordance with the drawings or where applicable the Company's Design. All ducts shall terminate in an access chamber. Excavations shall comply with Clauses 502 and 602. Immediately following the excavation of the trench, the ducts shall be jointed and laid on the bedding material. Newly laid ducts shall not deviate unnecessarily from straight such as to cause undue loading on the cables during installation. The deviation in level from that specified at any point shall not exceed 50mm</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1.2	Ducts and fittings shall be examined for damage and the joint surfaces and components shall be cleaned immediately before laying. Measures shall be taken to prevent soil or other material from entering ducts, and to anchor each duct to prevent movement before the work is complete.
1.3	Cable ducts shall comply with the appropriate British Standard and shall be tested in accordance with Clause 1533. Ducts with push-fit joints shall have a register and clear markings to ensure that the duct joint is fully engaged.
1.4	Cable duct configurations, bedding, haunching and surround shall be as shown on drawing NDX1063-00.
1.5	Backfilling shall be undertaken immediately after the required operations preceding it have been completed.
1.6	Trenches for the cable ducts shown on drawing NDX1063-00 shall be backfilled with Class 8 lower trench fill material, as described in Table 6/1 and in compliance with the 600 Series, which shall be placed above the surround material. The Class 8 material shall extend to within 150 mm of ground level. The material shall be spread and compacted evenly without dislodging, disturbing or damaging the ducts. Power hammers shall not be used within 300 mm of the ducts.
1.7	For ducts shown on drawing NDX1063-00, top soiling, grass seeding and/or turfing as described in Clause 618 and 3005 shall be placed in the top 150 mm of the cable duct trench unless otherwise specified in the Scottish Ministers.
1.8	For ducts shown on drawing NDX1063-00 marker tape shall be laid within the trench excavation at a depth of 150 mm or at the class A/topsoil interface whichever is the greater. The marker tape shall comply with Clause 1511.
1.9	Prior to mandrelling, the Company shall swab through each duct to clear all debris.
1.10	Ducts that are laid across or within the filter drains (French drains) shall be surrounded with 150 mm of mix ST2 concrete in compliance with Clause 2602. In the event that the route of a duct comes within 500mm of the line of a filter drain then either an alternative line shall be determined or precautions taken to ensure that the granular infill used to surround the ducting cannot, over time, compromise the integrity of the filter drain by migration of the infill material into the drain. Any damage caused by the Company to any drain shall be repaired to the satisfaction of the Overseeing Organisation and at no cost to the Scottish Ministers.
1.11	<p>Unless otherwise described in the Scottish Ministers the Traffic Scotland Equipment duct network comprises of :</p> <p>(a) quad 100mm inside diameter sealed longitudinal communication ducts installed along both verges terminating at each roadside longitudinal Type A chamber constructed at each equipment site</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>and at transverse duct locations and additional location such that no duct run is greater than 250m. A nominal spacing of Type A chambers shall be 250m centres. Additional Type A chambers shall be provided where changes of level or direction occur.</p> <p>(b) Six way 100mm inside diameter sealed communication ducts at carriageway cross connection points terminating at each roadside longitudinal Type A chamber at frequencies detailed in the Scottish Ministers and at both extents of entry/exit slip roads.</p> <p>(c) single 100mm inside diameter local ducts as typically shown in NDX1063-00;</p> <p>(d) Single 50mm inside diameter local ducts as NDX1063-00 to provide for cables connecting to the Roadside Emergency Telephones.</p> <p>(e) Single 150 mm inside diameter local power ducts for power cable connection from Termination Pillar to Traffic Equipment Distribution Pillars where not local to the CEC.</p>
1532A	<p><b>1 Chambers for Traffic Scotland Cables</b></p> <p>1.1 Chambers shall be either a Type A, B, C or Loop chamber (Type D). Chambers Type A, B and C are rectangular in plan with a standard plan size and are constructed so that their covers are raised 50mm above the level of the adjacent ground. Type A and B are shown in the drawings NDX1063-01 and NDX1063-02. Type C is shown on NDX1063-03. The construction of the Detector Loop roadside chamber is shown in NDX1063-04.</p> <p>1.2 Chambers shall be used solely for Traffic Scotland Equipment.</p> <p>1.3 Unless otherwise described in the Scottish Ministers, the following chamber types shall be installed at the locations as follows:</p> <p>(a) Type A chambers shall be placed between 400m and 500m intervals along the length of the longitudinal ducts in both verges. The chambers shall be installed at the same chainage in both verges. Additionally, six way transverse ducts installed at gantry locations and at 400-500m intervals.</p> <p>(b) Type A intermediate chambers shall also be installed in both verges along the longitudinal ducts midway between chambers detailed in the sub clause 1532.3SR (i) so providing duct access at between 200 and 250m intervals. At these intermediate chambers no transverse ducts are required to be installed. .</p> <p>(c) A cable stowage Type C chamber shall be constructed adjacent to all individual or group of communications cable termination cabinets and at other locations where cable service loops are required.</p> <p>(d) Additional Type A chambers where Traffic Scotland Equipment</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>site is not adjacent to the Type A chambers detailed in sub clause 1523.3SR (i) and (ii)</p> <p>(e) Additional Type A chambers for cable access shall also be constructed wherever the associated ducts change level or direction;</p> <p>(f) Type A or Type B chambers shall also be constructed as required to accommodate local ducting containing Electricity supply or Private wire interface cables.</p> <p>1.4 Roadside Loop Chambers shall be installed in the verge adjacent to each Traffic Scotland vehicle detection site and each SRTDb vehicle classification detection site.</p> <p>1.5 Foundations to chambers shall be of mix ST4 concrete in accordance with Clause 2602.</p> <p>1.6 Brickwork shall comply with the 2400 Series and be built with mortar designation (i) in English bond. The joints of brickwork where exposed shall be finished as specified for un-pointed joints in Clause 2412. The ends of all ducts shall be neatly built into the brickwork and finished flush with mortar designation (i).</p> <p>1.7 Chambers not exceeding 1.3 metres in depth to invert may be constructed from complete plastic units or other units in equivalent material. Where the units do not meet the loading requirements of BS 5911: Part 200, they shall be surrounded by 150 mm of mix ST4 concrete. Where preformed plastic chambers are used with duct entries then correctly located round duct access holes shall be core cut to provide a clearance fit on each duct. The outer surface of the ducts shall be sealed against the chamber wall using epoxy putty or similar as required by the manufacturer's instructions. No more than 6 off 100mm diameter ducts shall enter on a single wall. Unless otherwise agreed with the Overseeing Organisation plastic chambers shall be installed in accordance with, the manufacturer's instructions and this Series 1500.</p> <p>1.8 Where the depth of invert of chambers exceeds 900 mm below the finished surface of the carriageway or the adjacent ground, manhole steps complying with BS 1247: Part 1 or Part 2 shall be built in as specified in BS 5911: Part 200. Steelwork fittings shall comply with BS 970: Part 1 and be galvanised in compliance with Clause 1909 after fabrication. Threaded components shall be galvanised in compliance with Clause 1909. The depth of chambers shall not exceed the dimensions given in the NDX series drawings.</p> <p>1.9 Excavation around chambers shall be backfilled with general fill materials as described in Table 6/1 and compacted in compliance with Clause 612. Where mechanical compaction is impracticable, the excavation shall be backfilled with mix ST2 concrete complying with Clause 2602. Where there are pre-cast concrete access shafts to pre-cast or similar concrete chambers, the shafts shall be surrounded by a minimum thickness of 150 mm of mix ST4 concrete, and the remaining</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>excavation backfilled with general fill material as described in Table 6/1 compacted in compliance with Clause 612 of the Specification.</p> <p>1.10 Chamber covers and frames shall be suitable for purpose to comply with BS EN 124 and be agreed by the Overseeing Organisation. Special duty covers for use in carriageways and other special situations shall be as agreed with the Overseeing Organisation.</p> <p>1.11 A concrete apron shall be provided at all Traffic Scotland chambers in accordance with the NDX Drawings. Such aprons shall be constructed to provide adequate surface run-off and should generally be arranged to form a continuous and level hard standing area joining with the access pathway and other such adjacent paved or concrete aprons. Under no circumstances should the chamber apron form any part of safety fence foundations or similar civils construction.</p> <p>1.12 Four sets of lifting keys as described in shall be delivered to the Overseeing Organisation for each type of cover supplied. Additionally, a suitable cover lifter shall be delivered to the Overseeing Organisation.</p> <p>1.13 Frames for chamber covers shall be set in cement mortar designation (i) complying with Clause 2404 or a suitable proprietary quick setting mortar of equivalent strength.</p> <p>1.14 Chambers shall be constructed with a sump as shown NDX Drawings. This sump shall be constructed to drain into a soak away immediately below the chamber. It is a requirement of this specification that the chamber drainage is adequate to minimise the accumulation of water in the chamber. Under no circumstances should running water be allowed to drain through the chambers.</p> <p>1.15 Chambers shall be clearly identified by the legend "MOTORWAY COMMUNICATIONS"; the lettering shall be 25 mm high and shall be embossed into each cover. Where covers have a concrete infill a plate manufactured from a non-corrodible metal or steel, galvanised in accordance with Clause 1909, shall be cast into the concrete flush with the concrete surface.</p>
1533A	<p><b>1 Proving and Testing of Ducts</b></p> <p>1.1 Longitudinal and transverse ducts shall be proved by drawing a wooden or plastic mandrel as shown on HCD Drawing I2 through the ducts. Local ducts shall be proved by drawing through each length of completed duct a spherical mandrel of a diameter 10% less than the nominal bore of the duct. On the successful completion of each mandrel pull the Company shall certify compliance of the duct and immediately plug the duct in accordance with Clause 1530.</p> <p>1.2 All longitudinal and transverse ducts shall be tested in sections, e.g. between chambers, by means of the air test described in sub-Clause 3 of this Clause after backfilling. On the successful completion of each test the Company shall certify compliance of the duct and immediately</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>plug the duct in accordance with Clause 1530.14</p> <p>1.3 To undertake the air test, air shall be pumped into the duct by suitable means until a stable pressure of 100 mm head of water is indicated in a U-tube connected to the system. The air pressure shall not fall to less than 75 mm head of water during a period of five minutes without further pumping, after an initial period to allow for stabilisation.</p> <p>1.4 A register of mandrel and air test certificates shall be maintained by the Company and handed to the Overseeing Organisation on the successful completion of the ducting work.</p> <p>1.5 Unless otherwise described in the Scottish Ministers, the Company shall provide and install in the end of every duct at every point of entry into cabinets, purpose made push fit duct inserts/end caps. These inserts/end caps will be installed in a fashion to allow the polypropylene draw cord to pass through. NDX drawing 1063-00 sheet 7 of 10 refers.</p>
<b>1534A</b>	<p><b>1 Closed Circuit Television</b></p> <p>1.1 Closed Circuit Television (CCTV) typically consists of cameras, associated masts, Pan Tilt and Zoom (PTZ) units, camera mast cables and video transmission equipment.</p> <p>1.2 At sites remote from gantry locations, the Company shall design and install a camera mast foundation in accordance with the standards detailed in the mast manufacturer's instructions, the Scottish Ministers and typically described in the NDX1010 Series Drawings.</p> <p>1.3 All Sites shall be designed and configured to enable safe maintenance and access.</p> <p>1.4 At gantry locations, the Company shall design and install a camera mast fixing arrangement in accordance with the standards detailed in the mast and CCTV manufacturer's instructions, the Scottish Ministers and the Agreement Drawings.</p>
<b>1535A</b>	<p><b>1 Variable Message Signs</b></p> <p>1.1 Variable Message Sign equipment will consist of a variation of Sign types and mounting arrangements as stated within the Scottish Ministers.</p> <p>1.2 Where the Company provides and installs VMS foundations and associated infrastructure these shall be in accordance with the standards and requirements detailed in the Agreement Documents. NDX1001-02 describes a typical ladder arrangement to satisfy the access requirements of the equipment to be installed.</p> <p>1.3 Cabinet types shall be in line with typical gantry requirements.</p> <p>1.4 Any ducting required to pass through the foundation shall comply with the New works Information.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1536A	<p><b>1 Traffic Monitoring Units</b></p> <p>1.1 Traffic Monitoring Units shall be installed in the types of cabinets as described in the New Works Information.</p> <p>1.2 Cabinets housing TMU's shall be co-located at other Traffic Scotland Equipment sites. The length of feeder cable connecting the loop tails to the TMU shall not exceed 200 metres. Within the cabinet housing the TMU the loop feeder cables shall be terminated in terminal blocks complying with Clause 1514, secured to the equipment frame. Terminal screw tightness shall be within the range 0.4 to 0.6 Nm. Each feeder cable shall have a minimum of 3 metre of cable coiled in the chamber adjacent to the Cabinet housing the TMU to allow for subsequent re-terminations. Each feeder cable shall be individually identified in compliance with NDX1061-00.</p> <p>1.3 Where a standalone TMU site is required the Company shall provide all power and hard landscape in compliance with that required of any Traffic Scotland Equipment site and detailed in the New Works Information.</p>
1537A	<p><b>1 SRTDb Detectors and SRTDb Equipment</b></p> <p>1.1 A SRTDb site comprises of loop detectors providing vehicle parameters for all lanes and hard shoulders in both directions and SRTDb vehicle count equipment. Unless otherwise described in the Scottish Ministers SRTDb sites shall be installed in addition to Traffic Scotland vehicle detection sites but shall be co-located with a Traffic Scotland Equipment site unless specifically required to be standalone.</p> <p>1.2 Where a standalone SRTDb site is required the Company shall provide all power and hard landscape in compliance with that required of any Traffic Scotland Equipment site and detailed in the Scottish Ministers.</p> <p>1.3 The SRTDb Detectors and SRTDb equipment shall be provided as described in the Scottish Ministers and this 1500 series.</p> <p>1.4 SRTDb equipment shall be installed within a specialist Scottish Ministers Issued Equipment cabinet, suitably located and protected in full compliance with TD19.</p> <p>1.5 A D type chamber shall be provided adjacent to the cabinet for loop tail stowage.</p> <p>1.6 The distance between where the loop tails enter the verge and the detector unit shall not be more than 200 metres including any stowed loop tails.</p>
1538A	<p><b>1 Lane Control Signalling Equipment</b></p> <p>1.1 Lane Control Signalling Equipment shall be provided and installed as described in the Scottish Ministers and within the Agreement Drawings.</p> <p>1.2 Lane Control Signalling Equipment will consist of a combination of Enforceable and Non-Enforceable Lane Control Units (LCUs) and</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	Motorway Access Control (MAC) units with the capacity to display aspects on accordance with MCX1031.
<p><b>1539A</b></p>	<p><b>1 Paved Areas, Access Paths, Access Steps and Hard standings</b></p> <p>1.1 Paved areas, access paths, access steps, handrails and hard standings shall be provided at each existing and new Traffic Scotland equipment site that the Company shall require to modify or provide. Each existing and new equipment site is unique and the Company shall provide and install paved areas, access paths, access steps, handrails and hard standings appropriate to each new and existing site.</p> <p>1.2 The general requirements for paved areas, access paths, access steps and handrails shall be as typically shown on NDX Drawings and detailed within the New Works Information.</p> <p>1.3 Hard standings shall be of a size and construction to provide safe parking of a vehicle off the hard shoulder. Such an arrangement shall be contiguous with the access pathway to the Traffic Scotland equipment and provide safe access for the maintenance engineer. Unless installed adjacent to an Emergency Roadside Telephone installation, the hard standing shall be constructed from open cementitious block and be typically as shown in the NDX1072-00.</p>
<p><b>1540A</b></p>	<p><b>1 Required Documentation</b></p> <p>1.1 TR1100, and subsequent Scottish Amendments to TR1100 shall be considered as a general guide to Traffic Scotland deliverable documentation requirements. The final overall documentation package relating to the Traffic Scotland Equipment shall reflect inter alia the contents, requirements, structure and format as described in the Traffic Scotland NDS9001 'Traffic Scotland Health and Safety File Requirements and Model Forms'. Any significant changes with respect to this requirement shall be agreed with the Overseeing Organisation.</p> <p>1.2 All final As-Built Documentation as required by this Clause 1540SR forming all or part of the Traffic Scotland deliverable documentation shall be provided in accordance with the New Works Information.</p> <p>1.3 Documentation shall be made available to the Overseeing Organisation on request relating to Traffic Scotland Equipment until issue of the Performance Certificate.</p> <p>1.4 The Company shall provide new Traffic Scotland documentation in a style and format identical to the existing Traffic Scotland documentation as indicated in the Traffic Scotland Equipment Manual, the Traffic Scotland Maintenance Manual and the Traffic Scotland drawings. Where the Company is required by the Agreement to update existing Traffic Scotland documentation the Overseeing Organisation shall release the necessary Traffic Scotland documentation to the Company and the Company shall update the documentation. All such updated</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	<p>documentation shall be presented to the Overseeing Organisation for approval.</p> <p>1.5 The Company shall use current versions of AutoCAD™ computer software and Microsoft Word/Excel to provide or modify all Traffic Scotland Equipment documentation. All soft versions shall be supplied without any software restriction and shall be capable of being modified by the Overseeing Organisation. The standards and procedures for all CAD Drawings provided under the requirements of this Agreement shall comply with the New Works Information. All test results and test certificates shall be produced in a suitable software format or by an industry standard software package.</p> <p>1.6 An up to date Drawing/Document Register will at all times be maintained reflecting issue, revision dates, status and application. All changes to drawings, or documents, shall be indicated by a change of issue.</p> <p>1.7 Location measurements shall be taken of the underground equipment to the nearest 100mm from the nearest edge of the carriageway or fence line. Offsets to the cables/ducts shall be recorded at 20 metre intervals and at every change of direction along the line of the cable/duct. Offsets shall be defined longitudinally by distance from a permanent highway feature, a marker post or other point and agreed with the Overseeing Organisation. All details shall ensure compliance with the requirements of the Agreement relating to the NRSWA.</p>
<b>1541A</b>	<p><b>1 Journey Time Equipment</b></p> <p>1.1 Journey time equipment shall be as described in the New Works Information</p>
<b>1542A</b>	<p><b>1 Communications Equipment</b></p> <p>1.1 Communications equipment shall be as described in the New Works Information.</p>
<b>1543A</b>	<p><b>1 Specific Equipment Commissioning, Testing Integration and Certification</b></p> <p>1.1 Specific equipment commissioning, testing, integration and certification shall be as described in the New Works Information.</p>
<b>1544A</b>	<p><b>1 Power Supplies for Traffic Scotland Equipment</b></p> <p>1.1 Power supplies shall be provided in accordance with the New Works Information.</p> <p>1.2 All Electrical supplies shall be single phase and in accordance with NDS9551 "Requirement for electricity supply for Traffic Scotland and associated sites."</p> <p>1.3 Earthing and bonding shall be as Clause 1517SR.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	1.4 Inspection and Testing shall be to Clause 1526SR.
<b>1545A</b>	<p><b>1 Spares</b></p> <p>1.1 Unless otherwise stated in the New Works Information, spares shall be as described within NDS9001 "Traffic Scotland Health and Safety File Requirements and Model Forms"</p>
<b>1546A</b>	<p><b>1 Meteorological Equipment</b></p> <p>1.1 Meteorological Equipment does not normally form part of the Traffic Scotland Equipment. However where Meteorological equipment (weather stations) are required the meteorological equipment shall be located within a Traffic Scotland Equipment site and will consist of a combination of sensors and inputs at a roadside location which will include a roadside CEC/600 Cabinet type. The equipment type and layout shall be manufacturer specific and details will be provided by the Overseeing Organisation.</p> <p>1.2 Meteorological Equipment shall be provided and installed as described in the New Works Information and within the Agreement Drawings.</p>
<b>1547A</b>	<p><b>1 Ramp Metering</b></p> <p>1.1 The Company shall install Ramp Metering and all ancillary support in accordance with the requirements of the Agreement. This will be in accordance with the Agreement Drawings and as described in the New Works Information.</p>
<b>1548A</b>	<p><b>1 Enforcement Systems</b></p> <p>1.1 The Company shall install the necessary enforcement systems, mountings, power and communications in accordance with the requirements of the Agreement. This will be in accordance with the Agreement Drawings and as described in the New Works Information.</p>
<b>1549A</b>	<p><b>1 Weigh In Motion Equipment</b></p> <p>1.1 Weigh in Motion Equipment will consist of a series of specialist detectors providing detection for all lanes and both directions where required combined with a standalone detection unit.</p> <p>1.2 Weigh in Motion equipment shall be installed within a specialist Scottish Ministers Issued cabinet, suitably located and protected in accordance with TD19/06.</p> <p>1.3 The Company shall install Weigh in Motion Equipment and all ancillary support systems in accordance with the requirements of the Agreement. This will be in accordance with the Agreement Drawings and as described in the New Works Information.</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	1.4 Typical site layout and cabinet arrangement is shown in NDX1097-01.
1550A	<p><b>1</b>      <b>Damage and Repair Procedures</b></p> <p><i>Reserved for completion by Traffic Scotland. Contact the Traffic Scotland Manager</i></p>
1911SE	<p><b>1</b>      <b>Paint and Similar Protective Coatings</b></p> <p>1.1      The term “paint” shall be deemed to refer also to similar protective coatings including specialist coatings such as grease paints.</p> <p>1.2      Where a registered paint is specified, the Contractor shall ensure that the paint conforms with the formulation which has been registered by the manufacturer with the Highways Agency on or before the date entered at Part 2 of Appendix 19/1 Form HA/P1 (Works) paint system sheet.</p> <p>1.3      All paints shall be supplied in sealed containers of not more than 5 litre capacity and these shall be used in order of delivery. Each container shall be of the completely removable lid type and be clearly marked on the side to show the name of the manufacturer, registered description of the material (including purpose, e.g. whether primer, undercoat or finish), colour, Item No, paint manufacturer’s reference number, batch number and date of manufacture. Where date of manufacture is coded, the Contractor shall provide the code key.</p> <p>1.4      The Company shall ensure that the properties of the paints he has selected are suitable for the conditions in the shops and on site, including temperature and humidity, and that he is able to apply the paints satisfactorily to all parts of the Structure in these conditions.</p> <p>1.5      Unless otherwise described in Appendix 19/5, all paints forming any one protective system, or overlapping systems, shall be obtained from the same manufacturer, as named by the Contractor in Form HA/P1 (Works) Paint System Sheet.</p> <p>1.6      The requirements of Sub-Clauses #1911.3, 7, 8, 9, 10 and their respective tables shall apply in Scotland.</p>



**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
1912SE	<p><b>1 Testing of Paints</b></p> <p>1.1 Unless otherwise described in the this Contract, the Contractor shall provide unopened 5 litre samples, known as 'A' samples, of each type of paint to be used in the Works for testing for quality assurance purposes. 'A' samples shall be taken from the first batch of each type of paint delivered to the fabricator's shop or site. In addition, during the painting work, the Contractor shall supply 500 millilitre samples, known as 'B' samples taken from painters' kettles or from nozzles of airless spray guns directly into clean new tins. For 2-pack systems separate samples of the base and activator shall be dispatched by the Contractor to the testing authority.</p> <p>1.2 Depending upon the importance of the proposed painting application, the Employer may elect to have 'A' samples sent for limited testing by a local paint testing firm or other agency specified by the Employer. Appropriate forms for use in connection with limited testing shall be derived from the standard paint forms and shall be agreed with the Employer.</p> <p>1.3 The Contractor shall supply paint in sufficient time to allow for sampling and testing of 'A' samples before the start of application. The Contractor shall be responsible for handling, provision of clean tins for samples, packing as necessary and prompt despatch and transit of all samples for testing.</p> <p>1.4 'A' and 'B' samples are tested for paint composition and / or properties against the original formulation issued by the paint manufacturer at the registration with HA.</p> <p>1.5 The requirements of Sub-Clauses #1912.10, 11 and 12 shall apply in Scotland.</p> <p>1.6 Except for procedure trials painting shall not start until the first of the 'A' samples are confirmed as satisfactory.</p>
1920SE	<p><b>1 Additional Requirements for the Protection of Steel in Bridge Bearings</b></p> <p>1.1 <b>Applicable Clauses</b></p> <p>1.1.1 Unless otherwise described in this Contract, the work described in this Clause shall be carried out in compliance with Appendix 19/1 and with Clauses 1901 to 1919 inclusive.</p> <p>1.2 <b>Supply of Coatings</b></p> <p>1.2.1 Information, including the name of the paint manufacturer, required for completing Form HA/P1 (Works) Paint System Sheet, for the bearings, shall be obtained by the Contractor from the bearing manufacturer.</p> <p>1.2.2 Item 155 and MIO Epoxy paints when required for application on site shall be obtained from the manufacturer of the shop applied coats. Paint applied to the bearings on site to match the bridge steelwork paint</p>

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

Clause Number	Title
	system shall be obtained from the manufacturer of that system.

**Appendix 0/5: Special National Alterations of the Scottish Ministers**

**List of Minor Alterations Clauses, Tables and Figures**

Clause Number	Title
1702.2	<b>1 Concrete – Ordinary Structural – Constituent Materials</b> 1.1 At end of <b>Clause</b> add the following: The minimum testing frequency shall be in accordance with Table 3 of BS812: Part 120: 1989.
N/A	<b>1 Appendix A, Page 8</b> 1.1 Delete Note 2 and replace with the following: The implementation date of this scheme is the Base Date.

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## **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

### **1 Accommodation Required**

#### **1.1 Office Accommodation for Period 1.**

- 1.2 An integrated office building facility, on no more than two levels, comprising accommodation for shared occupation by the Scottish Ministers and the Company shall be provided by the Company as the principal office with single joint entrance and reception area, including shared conference room and messing facilities, car parking and security arrangements.
- 1.3 The principal office and hall accommodation shall accommodate up to thirty five staff (Scottish Ministers staff). Should the Company elect to utilise any satellite office remote from the principal office, accommodation and equipment shall also be provided within each such satellite office for six Scottish Ministers' staff.
- 1.4 The office buildings shall be constructed of secure 'anti-vandal' steel shell office-accommodation units or any system deemed suitable for temporary accommodation of this nature which is acceptable to the Scottish Ministers. If proprietary units are proposed the Company shall provide a certificate from the manufacturer stating that the units have a design life of more than 10 years.
- 1.5 The office building facilities shall be connected to existing mains water, 240 volt AC electricity supply, and telecommunication utilities for provision of water, heating, lighting, telephone and broadband. The office building facilities may be connected to existing mains gas, should the Company wish to use gas, for cooking or heating purposes.
- 1.6 Sewage disposal shall be either direct to existing piped mains facility or specially provided septic tank which shall be regularly serviced.
- 1.7 The office buildings 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 the case of equipment and furnishing of rooms in the office buildings. The buildings and access routes shall also comply with the Disability Discrimination Act 2005 and the Equality Act 2010.
- 1.8 Prior to occupation the Company shall have the buildings appropriately certified by the local authority and Fire and Rescue Services as suitable for occupation and use intended.
- 1.9 The office accommodation for the use of the Scottish Ministers and all facilities to be shared with the Company shall be to a high standard of, including but not limited to, structural integrity, aesthetics, internal finishing, equipment and furniture as described below.
- 1.10 The location and layout of the integrated office facilities shall be wholly acceptable to the Scottish Ministers whilst conveniently located in close proximity to, and possibly overlooking, the construction works. The integrated office building facilities shall be set apart from the Company's site operations plant store and depot and routes used by construction traffic. Car parking areas shall be set apart from plant, machinery and construction vehicle storage / parking areas.
- 1.11 The office buildings 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 Scottish Ministers and Company when either visiting or returning from the New Works Site for purpose of changing into or removing/cleaning and storing boots and safety gear.

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### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- 1.12 Doorway entrances and access-ways to the office buildings shall comply with the Disability Discrimination Act 2005 and shall be provided with suitable handrails.
- 1.13 The Company shall form a 3 metre wide access from the public road and provide car parking at the principal office allowing space for 35 number Scottish Ministers vehicles and 5 number visitor's cars. Parking space for the Scottish Ministers for six cars shall be provided at any satellite offices.
- 1.14 Fire exit routes from the office buildings shall be in accordance with relevant safety standards and shall be approved by the Fire and Rescue Services. Exit routes shall, as a minimum, be of concrete slabs or bituminous surface free from steps and other obstacles and shall be constructed so as to enable rapid and efficient drainage.
- 1.15 All road surfaces and access to the public road connected with the office buildings shall be constructed on prepared ground and covered with bituminous surfacing and have positive drainage.
- 1.16 The access roads and car park areas shall have a bituminous surface and the access roads shall be kept clear of snow, ice, frost, mud and debris and shall not be used by construction plant. Car parking areas shall be kept clean. Cleaning shall generally be undertaken at times when vehicles used by the Employer, his staff and visitors are not present.
- 1.17 The Company shall consult and comply with the Scottish Ministers with regard to the entire integrated layout and specification of the office building facilities that the Company intends to provide, based on the requirements stated in this Appendix.
- 1.18 The Company shall provide a Consultation Certificate in accordance with the Certification Procedure in respect of this requirement, prior to commencement of any work in connection with these building facilities.
- 1.19 The integrated office building (or units) facilities shall be adequately guarded at all times to ensure no unlawful or unauthorised entry.
- 1.20 The integrated office buildings (or units) facilities shall fulfil the following construction requirements and operational conditions as a minimum requirement:
- (a) The office buildings shall be erected on pre-prepared under-building of brick or concrete dwarf walls founded on concrete strip-footings with damp-proof course.
  - (b) The underside of the external walls and floors of the office-building shall not be less than 400 millimetres above surrounding ground level.
  - (c) Floors of the office shall be of tongue and groove timber, lined with hardboard or plywood and covered with vinyl floor covering\* (\*Wall to wall carpet overlay shall be provided in particular rooms occupied by the Scottish Ministers and Scottish Ministers' Representative as indicated in the list below. The carpet overlay shall be a tufted loop high wear material suitable for an office environment. It shall be treated to prevent stains and water ingress and shall have a wear life of over 10 years).
  - (d) The buildings shall comply with part L2 of the Building Regulations
  - (e) External walls shall provide a minimum u-value of 0.35 watts per square metre per kelvin. Internal walls shall be smooth with coloured sustainable paint finish.
  - (f) Headroom shall be not less than 2.25 metres.

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- (g) Ceilings shall be plasterboard and finished with two coats of white sustainable paint. They will provide a minimum u-value of 0.35 watts per square metre per kelvin.
- (h) The office buildings 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.
- (i) All windows shall be fitted with external roller-blinds operated internally for purpose of security and Venetian-type blinds shall be fitted internally.
- (j) All pipe-work shall be suitably lagged and/or insulated to prevent freezing.
- (k) All internal doors to rooms shall be fitted with mortice-locks and one set of keys per occupant plus one spare set for rooms occupied by the Scottish Ministers and Scottish Ministers' Representatives shall be handed over to the Scottish Ministers.
- (l) The Company shall record the distribution of all room-keys and control additional issue of room-keys.
- (m) The external doors shall be fitted with draught excluders and mortise 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.
- (n) The Company shall provide smart-cards for use by individuals in the Scottish Ministers' staff and shall record the distribution of all smart-cards.
- (o) The offices shall be provided 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.
- (p) The offices shall be adequately provided with heating and lighting in accordance with Section 9 below.
- (q) Within the integrated office building facilities, the Company shall provide individual office space / rooms for the sole use of the Scottish Ministers' staff excepting in cases where staff and /or representatives of the Scottish Ministers and the Company are carrying out comparable duties in which case such office space and rooms shall be occupied by the Scottish Ministers and the Company.
- (r) The office building facilities including both individual office space/rooms and the jointly occupied office space/rooms and facilities provided for use by the Scottish Ministers shall include furniture, fixtures and fittings, equipment, stores, protective clothing, and surveying equipment and supplies as listed below, for the Scottish Ministers exclusive use and shall be regarded as the minimum requirement.
- (s) All furniture, fixtures and fittings, equipment, stores, protective clothing, surveying equipment, computers, computer peripherals software and all supplies for the Scottish Ministers' exclusive use shall be new and unused
- (t) 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 Scottish Ministers as described below.
- (u) All the telecommunication lines and facilities provided for use by the Scottish Ministers as described below, shall be completely independent of the Company's facilities, shall ensure privacy and confidentiality and shall be as a separate account.

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- (v) The layout and particular room requirements of that part of the office building facility occupied by the Scottish Ministers and Scottish Ministers'
- (w) Representatives shall have minimum floor areas as listed in the table below:

Room Description	Reference	Area (square metres)	Particular Requirements
Scottish Ministers	A	30	Floor to be fitted with wall to wall carpet
Reception (with waiting area)	C	30	Shared / managed by Company.  Seated waiting area with padded seating for 5 people, including two low height tables; water dispenser, brochure display stand and notice board (min 2 metres by 1 metre).  Receptionist and security desk.
Scottish Ministers' Representative	E <sub>1</sub>	20	Floor fitted with wall to wall carpet  Adjoining Room F/accessed through Room F
Deputy Scottish Ministers' Representative	E <sub>2</sub>	20	
Deputy Scottish Ministers' Representative	E <sub>3</sub>	20	
Traffic Police Officer	E <sub>4</sub>	20	
Scottish Ministers' Secretary / Administration	F	16	Floor fitted with wall to wall carpet  Located near Reception
Room for photocopier	G	10	Room adjoining Room F but with common access off corridor and not accessed through Room F.
Engineer (2 number)	H <sub>1</sub>	24	Shared
Engineer (2 number)	H <sub>2</sub>	24	Shared
Engineer (2 number)	H <sub>3</sub>	24	Shared
Assistant Engineer (4 number) and Inspectors (2 number)	M <sub>1</sub>	50	Shared open plan

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Room Description	Reference	Area (square metres)	Particular Requirements
Assistant Engineer (4 number) and Inspectors (2 number)	M <sub>2</sub>	50	Shared open plan
Assistant Engineer (4 number) and Inspectors (2 number)	M <sub>3</sub>	50	Shared open plan
Storage room	N	12	
<b>General Shared Facilities</b>			
Conference Room	D	40	Shared/managed by Company. Located near main entrance and reception Floor to be fitted with wall to wall carpet
Kitchen	O	20	Cooking and dish washing facilities shared with Company
Dining Area	P	20	Shared with Company
Lobby Area / Boot Room	Q	10	Shared with Company
Male Toilet Facilities	R	15	Shared with Company Linked with Room S
Male Shower Closet and changing area	S	5	Shared with Company Accessed via Room R
Female Toilet Facilities	T	10	Shared with Company Linked with Room U
Female Shower Closet and changing area	U	5	Shared with Company Accessed via Room T

- 1.21 A regularly serviced (or mains fed) supply of chilled drinking water and dispensing device with an adequate supply of plastic tumblers shall be provided in the Kitchen/Dining Area at each office and the reception area and conference rooms at the principal office and at any satellite office(s).
- 1.22 The management and administration system implemented by the Company shall include for effective and advance allocation of the shared conference room facility to meet the requirements of both the Scottish Ministers and the Company.
- 1.23 The office buildings 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 working hours but not without presence of office security or other authorised personnel. The Company shall provide at appropriate locations within each site office, and arrange for regular emptying of, recycling bins for paper, plastics and metals in accordance with Site Waste Management Plan Regulations 2008.



### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- 1.24 A high quality durable sign board shall be erected in a prominent location on the approach to the principal offices and satellite office(s) by the Company at a position agreed with the Scottish Ministers having the text below in 50 millimetres x-height letters. The Scottish Ministers shall provide appropriate artwork for the organisation logos and wording:

<p><b>SCOTTISH GOVERNMENT – TRANSPORT SCOTLAND</b></p> <p><b>MAJOR TRANSPORT INFRASTRUCTURE AND PROFESSIONAL SERVICES</b></p> <p><b>M8 M73 M74 MOTORWAY IMPROVEMENTS DBFO CONTRACT</b></p> <p><b>MOUCHELF AIRHURST JOINT VENTURE</b></p> <p><b>Scottish Ministers' Representative Office</b></p>
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- 1.25 **Temporary Initial Accommodation**
- 1.25.1 Temporary initial accommodation shall be made available if the principal office is not ready, from the Commencement of the New Works and for a maximum of 4 weeks thereafter.
- 1.25.2 The temporary accommodation shall consist of the following, as a minimum:
- 1.25.3 Appropriate office accommodation with furnishings and fittings for 6 persons including an administrative assistant and shall have at least 6 rooms with a minimum of 6 square metres per person.
- 1.25.4 Male and Female toilets shall be provided over and above the room and space requirements.
- 1.25.5 A telephone system shall be provided with adequate telephone lines and telephones to cater for all personnel at all times.
- 1.25.6 Broadband shall be provided to allow unrestricted internet access for the Scottish Ministers and appropriate internet cables and ancillary equipment shall be provided to cater for all personnel.
- 1.25.7 Computer equipment, comprising laptops and PCs (number of each to be specified by the Scottish Ministers following the Commencement Date) in accordance with Sections 4.2 and 4.3 of this Appendix 1/1;
- 1.25.8 Colour printer as per Section 4.6.2 of this Appendix 1/1
- 1.25.9 The Company shall provide 6 mobile telephones for the use of the Scottish Ministers' staff, in accordance with Appendix 1/3 of this Specification.
- 1.25.10 Car parking for 6 cars shall be provided on granular sub-base material Type 1 to Clause 803 of the Specification of suitable thickness.
- 1.26 **Office Accommodation for Period 2 of the Works.**
- 1.26.1 A reduced office requirement shall be provided for use by the Scottish Ministers for Period 2 over the duration stated in Section 12 of this Appendix while maintaining equal standard of provision and service as for Period 1.

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

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

<b>Room Description</b>	<b>Reference</b>	<b>Area (square metres)</b>
Scottish Ministers	A	20
Office	E	20
Office	F	16
Room for photocopier	G	10
Office	H typical	12
Storage room	N	12
Kitchen facilities	O	Shared with Company
Male Toilets	R	Shared with Company
Female Toilet	T	Shared with Company

#### **1.27 Accommodation Requirements Relating to Monitoring the Assembly and Testing etc. of Traffic Scotland Equipment**

1.27.1 The Company shall provide accommodation for the Scottish Ministers at the Company's Traffic Scotland Equipment Assembly Point during the periods that any Works are being undertaken at the Assembly Point associated with the assembly, testing and certification of the Traffic Scotland Equipment.

1.27.2 The accommodation may be shared with the Company's accommodation and shall comprise an office with two desks, two chairs and appropriate lighting, heating and electrical sockets. The Company shall provide welfare facilities which shall be shared for use by the Scottish Ministers' staff and the Company's staff.

## **2 Furnishings and Fitments**

### **2.1 Entrances, Reception and Hallways**

<b>Quantity</b>	<b>Item</b>
	Principal Entrance, Reception and Hallway. Furnishings as described in Room Reference C in the table attached to 1.20.9 above. Mats to be provided at all entrances.
1	Concrete entranceway with boot scraper and washing facilities
As per Regs	Number fire extinguishers, wall mounted to be regularly serviced
As required for area to be lit.	Adequate 500 watt sun flood lamps to light hard standings including any emergency exits, with internal switch and external passive infra red detector and time switch operation.
1	Maximum and minimum thermometer

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

1	Notice board 2 metres x 1 metre (minimum dimensions)
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**2.2 Principal Office**

**2.2.1 Room A: Scottish Ministers**

Quantity	Item
2	Independent telephone and ISDN line
2	Telephone extension connected to switchboard and connection to Company
1	Conference call speaker phone connected to telephone system
2	1.8 metres by 1.6 metres ergonomic L-shaped desk with two pedestals with locking drawers and side unit with veneered surface.
2	5 point swivel wheeled desk armchair fully adjustable
1	Meeting table; 2 metres long by 1 metre wide or similar with veneered surface with 6 padded chairs
2	Lockable 4 drawer, steel filing cabinet, each drawer complete with file hangers 1.3 metres high by 1 metre wide.
1	Lockable steel cupboard with 3 adjustable height shelves, 1.8 metres high by 1.2 metres wide
4	Coat hooks – wall mounted
2	Wastepaper bin
2	Paper punch and stapler
2	Set of 3 tier filing trays
2	1.5 metres by 1 metre white marker board with appropriate non-permanent dry markers and whiteboard eraser. White marker board to be attached to wall as directed by the Scottish Ministers.
1	Framed cork or fibreboard panelling wall board mounted 1.5 metres by one metre
2	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers' own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers' office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
1	Laptop as per Section 4.2 below - with Port Replicator and A4 black and white laser printer
2	Desk lamp.
1	Name plate on door (names as advised by the Scottish Ministers).

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

2	Desk fan
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2.2.2 Room D: Conference Room

Quantity	Item
1	Table with veneered surface of sufficient size to accommodate 20 persons comfortably; table to be formed from multiple units to allow to be collapsed to clear the floor for theatre style seating.
20	Conference chairs
1	1m deep framed cork or fibre board mounted on length of one wall at appropriate height
1	White Marker Board 1 metre x 1.5 metres (with supply markers) mounted on wall at appropriate position.
4	CAT 6 (RJ45) surface mounted boxes – connected to LAN. An additional terminal will be required if the Company provides a network-based telephone system.
1	Telephone extensions connected to switchboard
1	Conference call speaker phone connected to telephone system
2	Wastepaper baskets
20	Coat hooks – wall mounted
1	Window mounted powered extractor fan
1	Free standing fan
1	Flip chart stand and replacement paper pads.
1	Wall or overhead mounted retractable screen with overhead mounted dedicated electronic projector and wall mounted connection for a laptop.
2	1.8 metres by 1 metre side table / unit (for tea / coffee)
1	Cupboard for conference room crockery. Can be incorporated under the side table.
1	Crockery to cater for 20 persons - set of tea / coffee cups, saucers, side plates and tea spoons.
2	Milk jugs and sugar bowls, with milk and sugar provided as necessary
1	Chilled water dispenser with supply of plastic tumblers.
1	Wall mounted clock
1	Name plate on door (name as advised by Scottish Ministers).

The Company shall provide and store separately an additional 20 stackable padded chairs for use during any presentations in a 'theatre-style' seating arrangement. The Company shall provide adequate storage for the chairs when not in use.

## **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

### 2.2.3 ROOM E<sub>1</sub>: (Scottish Ministers' Representative)

<b>Quantity</b>	<b>Item</b>
1	Telephone extension connected to switchboard and connection to Company
1	1.8 metres by 1.6 metres ergonomic L-shaped desk with two pedestals with locking drawers and 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 6 padded chairs
1	Plan chest A0 size with 6 drawers or vertical plan-file
1	Lockable steel cupboard with 3 adjustable height shelves, 1.3 metres high by 1 metre wide
2	Lockable 4 drawer fire resistant steel filing cabinet, each drawer complete with hangers as required, 1.3 metres high by 1 metre wide
1	Framed cork or fibreboard panelling wall board mounted 3.0 metres by 1 metre
1	1.5 metres by 1 metre white marker board with appropriate non-permanent dry markers and whiteboard eraser. White marker board to be attached to wall as directed by the Scottish Ministers.
1	Glass fronted bookcase 1.5 metres wide by 1 metre high
6	Coat hooks – wall mounted
1	Wastepaper bin
1	Paper punch and stapler
2	Set 3 tier filing trays
1	3 metres of 225 millimetres by 25 millimetres shelving
2	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers' own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers' / Consultants' organisation office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
1	Laptop as per Section 4.2 below - with Port Replicator and A4 black and white laser printer.
1	Desk lamp
1	Desk fan
1	Name plate on door (name as advised by the Scottish Ministers).

### 2.2.4 ROOMS E<sub>2</sub>, E<sub>3</sub> and E<sub>4</sub> (Deputy Scottish Ministers' Representative / Traffic Police Officer)

#### **QUANTITIES LISTED PER ROOM**

<b>Quantity</b>	<b>Item</b>
1	Telephone extension connected to switchboard and connection to Company

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item
1	1.8 metres by 1.6 metres ergonomic L-shaped desk with two pedestals with locking drawers and 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 6 padded chairs
1	Plan chest A0 size with 6 drawers or vertical plan-file
1	Lockable steel cupboard with 3 adjustable height shelves, 1.8 metres high by 1.2 metres wide
2	Lockable 4 drawer fire resistant steel filing cabinet, each drawer complete with hangers as required, 1.3 metres high by 1 metre wide
1	Framed cork or fibreboard panelling wall board mounted 3.0 metres by 1 metre
1	1.5 metres by 1 metre white marker board with appropriate non-permanent dry markers and whiteboard eraser. White marker board to be attached to wall as directed by the Scottish Ministers.
1	Glass fronted bookcase 1.5 metres wide by 1 metre high
6	Coat hooks – wall mounted
1	Wastepaper bin
1	Paper punch and stapler
2	Set 3 tier filing trays
1	3 metres of 225 millimetres by 25 millimetres shelving
2	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers' own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers' / Consultants' organisation office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
1	Laptop as per Section 4.2 below - with Port Replicator
1	Desk lamp
1	Desk fan
1	Name plate on door (name as advised by the Scottish Ministers).

2.2.5 ROOM F (Secretary / Administration)

Quantity	Item
1	1.8 metres by 1.6 metres ergonomic L-shaped desk with two pedestals with locking drawers and side unit with veneered surface.
2	5 point swivel wheeled armchair fully adjustable
1	Work -table 2 metres x 1 metre wide with veneered surface
3	Office chairs

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item
2	Lockable steel cupboard with 3 adjustable height shelves, 1.8 metres high by 1.2 metres wide
8	Lockable 4 drawer fire resistant steel filing cabinet, each drawer complete with hangers as required, 1.3 metres high by 1 metre wide
1	Framed cork or fibreboard panelling wall board mounted 3 metres x 1 metre
6	Coat hooks – wall mounted
2	Wastepaper bin
2	Paper punch and stapler
4	Set of 3 tier filing tray
2	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers' own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers' / Consultants' organisation office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
1	PC as per Section 4.3 below
1	Laser printer A4 black and white as per section 4.6.2 below
1	Laser printer A3/A4 colour as per section 4.6.2 below
1	Scanner with a minimum resolution of 2400 x 2400 dpi (non-interpolated)
1	Document shredder - business type cross-cut fully mounted with disposal container, 60 litre bin capacity (to be maintained as required).
1	Caller-connect telephone terminal with two outside lines and capable of handling up to 12 extensions, plus a connection to the Company's main office. All telephones shall have caller connect and announcement facility
1	Plain paper fax machine, complying with CCITT Group 2,3,4. The equipment shall have full BABT approval for direct connection to the public telephone system
1	Outside phone line with direct connection to exchange (PSTN) for use with the fax machine only
Supply of	A4 and A3 copying paper as required for photocopier and word processing for duration of Period. Copying material, toner/ink, cartridges and paper shall be replenished as required for document copies, fax and printers.
1	6 metres of 225 millimetre x 25 millimetre shelving
2	First Aid kit
1	Desk fan
1	Name plate on door (name as advised by the Scottish Ministers).

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

2.2.6 ROOM G (Scottish Ministers' Representative Photocopier Room) (Principal Office)

Quantity	Item
1	Photocopier / multi-function device as per Section 4.6.2 below
1	Plotter as per Section 4.6.2 below
2	Lockable steel cupboard with 6 adjustable height shelves, 2.2 metres by 1 metre
1	Work table 2 metres by 1 metre with veneered surface
2	CAT 6 (RJ45) surface mounted boxes – connected to LAN.
1	Name plate on door (name as advised by the Scottish Ministers).

2.2.7 ROOM H<sub>1</sub>, H<sub>2</sub> and H<sub>3</sub> - Engineers

**QUANTITIES LISTED PER ROOM**

Quantity	Item
2	Telephone extension connected to switchboard
2	1.8 metres by 1 metre double pedestal desk with locking drawers and side unit with veneered surface
2	5 point swivel wheeled armchair fully adjustable
1	Table / bench 3 metres by 1 metre 1 metre above floor level
1	Plan chest A0 size with 6 drawers or vertical plan-file
2	Lockable steel cupboard with 3 adjustable height shelves, 1.8 metres high by 1.2 metres wide
2	Lockable 4 drawer fire resistant steel filing cabinet, each drawer complete with hangers as required, 1.3 metres high by 1 metre wide
1	Framed cork or fibreboard panelling mounted on wall 3 metres x 1 metre, 1 metre above floor
2	Glass fronted bookcase 1.5 metres wide by 1 metre high
1	Set of four coat hooks – wall mounted
2	Wastepaper bins
2 sets	6 metres of 225 millimetres by 25 millimetres shelving



**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item
4	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers’ own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers’ / Consultants’ organisation office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
2	PC as per Section 4.3 below
2	Paper punch and stapler
1	Desktop pencil sharpener
2	Desk fan
2	Set of 3 tier filing tray
1	Name plate on door (names as advised by the Scottish Ministers).

The Scottish Ministers may arrange desks opposite each other. The Company shall provide sufficient desk mounted screens to be provided on desks which are facing each other, approximately 0.4 metres high, and shall fix these to the desks, as requested by the Scottish Ministers.

2.2.8 ROOM M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub> - Assistant Engineers and Inspectors

**QUANTITIES LISTED PER ROOM**

Quantity	Item
8	Telephone extension connected to switchboard
8	1.8 metres by 1 metre double pedestal desk with locking drawers and side unit with veneered surface
8	5 point swivel wheeled armchair fully adjustable
2	Table / bench 3 metres by 1 metre 1 metre above floor level
3	Plan chest A0 size with 6 drawers or vertical plan-file
4	Padded office arm chairs
2	Lockable steel cupboard with 3 adjustable height shelves, 1.8 metres high by 1.2 metres wide
6	Lockable 4 drawer fire resistant steel filing cabinet, each drawer complete with hangers as required, 1.3 metres high by 1 metre wide
2	Vertical Plan file (open hangers)
2	Framed cork or fibreboard panelling mounted on wall 3 metres x 1 metre, 1 metre above floor
2	Glass fronted bookcase 1.5 metres wide by 1 metre high

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item
4	Sets of four coat hooks – wall mounted
4	Wastepaper bins
4 sets	6 metres of 225 millimetres by 25 millimetres shelving
12	CAT 6 (RJ45) surface mounted boxes – connected to LAN. Note – one terminal is to allow direct connection of Scottish Ministers' own computer equipment to the broadband system to allow connection via VPN to Scottish Ministers' / Consultants' organisation office IT systems. An additional terminal will be required if the Company provides a network-based telephone system.
2	Laptop as per Section 4.2 below
6	PC as per Section 4.3 below
6	Paper punch and stapler
2	Desktop pencil sharpener
6	Desk fan
1	First Aid kit
8	Set of 3 tier filing tray
1	Name plate on door (names as advised by the Scottish Ministers).

The Scottish Ministers intend to arrange desks in pods of 4 desks adjacent to each other. The Company shall provide sufficient desk mounted screens to be provided on desks which are facing each other, approximately 0.4 metres high, and shall fix these to the desks, as requested by the Scottish Ministers.

The Company shall install a photocopier / multi-function device, specification as per Section 4.6.2 below, in one of the rooms of Type M, as requested by the Scottish Ministers.

The Company shall install a CAD-PC, specification as per Section 4.4 below, instead of a PC in two of the rooms of Type M, as requested by the Scottish Ministers.

2.2.9 ROOM N Storage Room

Quantity	Item
1	10 metres shelving
2	Sets of four coat hooks – wall mounted
1	Storage racks for survey equipment
3	Lockable steel cabinet 1 metres wide by 2.0 metres high with 6 adjustable height shelves
1	Name plate on door (name as advised by the Scottish Ministers).

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

2.2.10 ROOMS O and P Kitchen and Dining Area

Quantity	Item
1	4 plate electric cooker with grill and oven
1	Stainless steel sink with draining board, complete with under cupboards and Formica worktop, hot and cold water supply, drainage rack and utensil holder
1	'King size' waste bin complete with supply of liners (replenished as necessary)
1	Wall mounted cupboard minimum of 4 metres long to suit number of staff including the Company's staff.
1	Base unit minimum of 4 metres long with drawers and cupboards complete with Formica worktop
1	Wall mounted clock
2	3 pint electric kettle with automatic switch-off
1	3 pint teapot
1	3 pint coffee pot
2	Toaster
1	Minimum 6 cubic feet refrigerator to suit number of staff including the Company's staff.
1	800 watt large microwave with turntable
1	Chilled water dispenser with supply of plastic tumblers.
1	Fire extinguisher (dry powder)
1	Fire blanket
1	Window or external wall mounted powered extractor fan
1	First aid kit complying with relevant regulations.
4 sets	Crockery, cutlery and cooking utensils for 6 persons or as required by the Scottish Ministers (to be replaced as required)
-	Supply of tea, coffee, milk and sugar (replenished as required)
-	Supply of tea towels (replenished and laundered during periods)
-	Dispenser with paper hand towels (replenished as required)
-	Supply of paper kitchen towels, kitchen cloths and scourers (replenished as required)
-	Bottle of washing up liquid (replenished as required)
2	Liquid soap dispensers with supply of liquid soap, or supply of soap (replenished as required)
Min 2 sets	Table and 6 chairs

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

2.2.11 ROOM Q Lobby Area / Boot Room

Quantity	Item
2	Timber bench (or fixed seating) 2 metres long
15	Personal 1.8 metre high metal lockers minimum area of 450x450 millimetres
1	Clothes drying rack with tubular heater and 15 number coat hooks
-	Supply of large disposable plastic overshoes and dispenser (replenished as necessary)

2.2.12 ROOMS R and S Male Toilet Facilities and Shower Unit:

Quantity *	Item
3	WC suites with coat hooks
3	Toilet roll holders and supply of toilet rolls (replenished when required)
3	Bowl type urinals complete with sustainable flush system
3	Wash-hand basins complete with taps and hot and cold water supply
2	Towel dispensers with towels (laundered and replenished when required)
2	Liquid soap dispensers with supply of liquid soap, or supply of soap (replenished when required)
1	Dispensers with selection of barrier creams, sunscreens (high factor) and heavy duty hand cleaner (replenished when required)
1	Electric wall-mounted hand drier (low energy use)
1	Wall mirror 800x600 millimetres
1	Set of four coat hooks – wall mounted
1	Window or external wall mounted powered extractor fan
1	Shower room and changing area (Room S) with electrical socket points in separate compartment with door off main toilet area

\* Numbers to be as required by relevant standards / regulations to service number of personnel at office

2.2.13 ROOMS T and U Female Toilet Facilities:

Quantity **	Item
2	WC suites with coat hooks and sanitary bin.
2	Toilet roll holders and supply of toilet rolls (replenished when required)
2	Wash–hand basins complete with taps and hot and cold water supply
1	Towel dispensers with towels (laundered and replenished when required)
1	Electric wall-mounted hand drier (low energy use)

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

<b>Quantity **</b>	<b>Item</b>
1	Dispensers with selection of barrier creams, sunscreens (high factor) and heavy duty hand cleaner (replenished when required)
2	Liquid soap dispensers with supply of liquid soap, or supply of soap (replenished when required)
2	Wall mirrors 800x600 millimetres
1	Set of four coat hooks – wall mounted
1	Window or external wall mounted powered extractor fan
1	Shower room and changing area (Room U) with electrical socket points in separate compartment with door off main toilet area

\*\* Numbers to be as required by relevant standards / regulations to service number of personnel at office

### **3 Weather Recording Apparatus**

3.1 The Company shall set up and maintain, at a position to be determined by the Scottish Ministers, apparatus comprising: maximum/minimum thermometer in a standard shelter and a rain gauge for daily reading. The Company shall supply and maintain a portable anemometer provided with tripod and recording device. The Company shall record daily readings on the rain gauge and anemometer in a format to be agreed with the Scottish Ministers and shall provide the readings to the Scottish Ministers on a weekly basis, or as when requested by the Scottish Ministers.

### **4 Computer Equipment**

#### **4.1 General Requirements**

4.1.1 All the equipment listed below shall be provided new when the principal offices are provided and shall be installed in the respective rooms described above in the preceding Section 2. The computer equipment specified in Section 1.21 above for use in the temporary accommodation forms part of the overall computer equipment requirements defined in Section 2 and shall be relocated to the principal offices by the Company and installed, as requested by the Scottish Ministers.

4.1.2 All the equipment listed below shall be maintained by the Company up to the issue of the Final Completion Certificate plus 12 months unless otherwise stated. The equipment shall be installed and commissioned by a reputable quality assured supplier (BS EN ISO 9001). The equipment shall be covered by a hardware maintenance contract with an eight hour maximum response time for repair or replacement.

4.1.3 The Company shall maintain and replace computer equipment as necessary. The Company shall provide software support for all equipment until the end of Period 2 unless otherwise stated.

4.1.4 The equipment in this Section is indicative of the specification and standard of equipment required by the Scottish Ministers. The Scottish Ministers considers the equipment in this Section to be mid range equipment in March 2012. The Company shall provide computer equipment which is acceptable to the Scottish Ministers as being appropriate mid range equipment at the Commencement Date.

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- 4.1.5 The Company shall update computer operating systems and software when updated by the vendor.
- 4.1.6 Notwithstanding the requirement of Section 4.14 above, the Company shall upgrade the operating systems and software on the computer equipment to the most up to date versions three years after the Commencement Date.
- 4.1.7 Any equipment that is replaced during the period of use by the Scottish Ministers shall be replaced with equipment which is acceptable to the Scottish Ministers as being appropriate mid range equipment at the time.

**4.2 Laptop/notebook computers**

- 4.2.1 Laptop / notebook computers shall be retained by the allocated users for the duration of the New Works plus 5 years
- 4.2.2 Laptop / notebook computers shall not be configured in such a manner as to restrict or permit use only on site when connected to the network. Laptops shall be configured to permit use outside of the offices. All laptops / notebooks shall be wifi enabled.
- 4.2.3 The equipment shall all 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 Scottish Ministers:

Dell Latitude E6410 or similar approved mid range laptop	Intel Core i5 Mobile Processor – Intel Core i5, 2.53GHz (minimum)
	4 GB RAM (minimum)
	14.1 inch Wide Screen WXGA
	160GB 5400 rpm HD,
	Optical Drive CD/DVD-RW
	nVIDIA Quadro NVS Graphics Card (minimum)
	Integrated Wireless Intel PRO/Wireless Network 802.1n
	Microsoft® Windows® 7 Professional 64 bit
	Separate 19 inch flat screen monitor for connecting within office
	Optical wheel mouse
	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.
	Separate full size keyboard
	Spare power pack and cables
Car charging lead	
Carrying case - Backpack	

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

	Maximum Weight 2.2kg
	Extended battery

**4.3 Desktop Personal Computers (PC's)**

4.3.1 Personal Computers shall 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 Scottish Ministers:

Dell Optiplex 780 or similar approved mid-range PC	Intel Core 2 Duo, 3.00GHz (minimum)
	8 GB RAM (minimum)
	250 GB Hard Drive 7200rpm
	Optical Drive 16X DVD+/-RW Drive (DVD+RW)
	nVidia Quadro FX Graphics Card (minimum)
	Onboard Sound Card
	Ethernet Intel PRO/1000 Gigabit
	Full Size Keyboard
	Optical Wheel Mouse
	Tower case
	Microsoft® Windows® 7 Professional 64 bit
19 inch flat screen monitor	

**4.4 Desktop CAD Personal Computers (CAD-PCs)**

4.4.1 CAD Personal Computers shall 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 Scottish Ministers:

Dell Precision T3500 or similar approved performance PC	One Intel® Xeon®, 2.80GHz (minimum)
	8 GB RAM (minimum)
	250GB Hard Drive 7200rpm
	Optical Drive 16X DVD+/-RW Drive
	nVidia Quadro FX Graphics Card 512Mb (minimum)
	Onboard Sound Card
	Ethernet Intel PRO/1000 Gigabit
	Full Size Keyboard

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

	Optical Wheel Mouse
	Tower case
	Microsoft® Windows® 7 Professional 64 bit
	Two 19 inch flat screen monitors

**4.5 Network**

4.5.1 The Company shall provide the following:

- (a) An Asynchronous Digital Subscriber Line (ADSL) or ISDN line for six concurrent users
- (b) All routers, hubs, cabling and connections required to connect six concurrent users to the ADSL/ISDN line and also to the network server.
- (c) Wi-Fi enabled routers or such other equipment as required to enable wireless internet connection throughout the principal office.
- (d) 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.
- (e) The network shall be installed by the Company to facilitate free access to internet and enable inter-office communication via email.

**4.6 Ancillary Equipment**

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

4.6.2 The following software shall be installed on each computer, but not be limited to, while each full set of the disks and documentation shall be supplied for each set of software installed to the Scottish Ministers.

- (a) Full installation of Microsoft Office Professional 2010 onwards;
- (b) Full installation of Microsoft Sharepoint or similar document management system which provides full remote access to files through secure internet connections for all users;
- (c) PC Security packages (Antivirus, firewall, Anti-Spyware etc) with daily updates or as updated by the vendor (Symantec Endpoint Protection 11.0 or similar);
- (d) CD / DVD authoring / writing software on all computers;
- (e) Adobe Reader 9.4 (on all computers except those with Adobe Acrobat 9 Pro);
- (f) CutePDF Writer or similar to allow creation of PDFs with no watermark or software labelling (on all computers except those with Adobe Acrobat 9 Pro);
- (g) DWG Viewer (Autodesk DWG Trueview 2010 or similar); and
- (h) encryption software using an industry standard encryption tool (TrueCrypt or similar). The keyfile shall be stored in a secure location.

4.6.3 In addition to the software to be installed on each computer, the Company shall install the following on computers as requested by the Scottish Ministers:

- (a) Adobe Acrobat 9 Pro (3 copies to be provided);



### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- (b) AutoCAD 2010 (2 copies to be provided);
- (c) Microsoft Project 2010 (4 copies to be provided);
- (d) Primavera P6 Professional Project Management (4 copies to be provided); and
- (e) CorelDraw Graphics Suite X5 (3 copies to be provided)

#### **4.6.4 Printers**

4.6.4.1 The following are required to be installed in the respective rooms described in Sections 2:

- (a) Lexmark C762DN colour laser printer or similar approved;
- (b) Lexmark T630 black and white laser printer or similar approved.
- (c) Canon LBP5970 colour A3 printer or similar as approved with extended warranty;
- (d) Plotter – Canon image PROGRAF iPF720 large format printer or similar as approved with extended warranty; and
- (e) Photocopier / multi-function device – Canon iR6880Ci or similar capable of A3 / A4 colour and black and white printing, as approved with extended warranty.

4.6.4.2 All equipment shall be provided new and installed and commissioned by a reputable Quality Assured supplier (BS EN ISO 9001). The equipment shall be covered by a hardware maintenance contract with an eight hour maximum response time for repair or replacement.

4.6.4.3 All photocopiers, printers and plotters shall be connected to the computer network (LAN) and shall have associated network software and cabling to allow use by all Scottish Ministers' staff.

4.6.4.4 The photocopier / multi-function devices shall be capable of photocopying, printing from computers linked to the network, scanning / emailing documents, document stapling, faxing etc.

4.6.4.5 The Company shall maintain and replace all photocopier / multi-function devices, colour printers and plotter as necessary.

4.6.4.6 The Company shall provide paper as required for the photocopiers, printers and plotters until the end of Period 2. Copying material, toner/ink, cartridges and paper shall be replenished as required

#### **4.6.5 Photographic and Video Equipment**

4.6.5.1 The following equipment shall be provided, installed, maintained, and replaced where required, by the Company:

- (a) 20 digital cameras, also capable of recording video clips, and peripheral equipment including carry case (minimum specification as follows: Sensor resolution of 12 megapixels, optical zoom of 10x and 2 high speed memory cards, each of size of 8 GB) along with the associated software and cables for downloading pictures onto PCs and printing; and
- (b) 1 digital camcorder utilising HDD disc media and peripheral equipment including carry case (minimum specification as follows: 2 megapixel CCD, optical zoom of 10x, digital zoom of 200x and screen size of 2.5 inches) along with the associated software and cables for downloading onto PCs. Additional disc media to be provided by the Company as requested by the Scottish Ministers.

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

4.6.5.2 All photographic and video equipment shall be retained by the Scottish Ministers for the duration of the New Works plus 5 years.

#### **4.6.6 Projector**

4.6.6.1 The projector mounted in Room Type D shall be compatible with the laptops specified in Section 4.2. The projector shall have a minimum resolution of SVGA 800x600 native.

4.6.6.2 In addition to the projectors specified in Room Type D, the Company shall provide a stand alone projector of the same specification but of suitable size to allow easy transportation, together with carrying case, cables and other ancillary items.

### **5 Schedule of Surveying and Other Equipment**

5.1 The following equipment shall be for the exclusive use of the Scottish Ministers and his staff, and shall be as described, or equivalent. The Company shall be responsible for the supply of labour and materials for cleaning and maintaining the equipment throughout the period of the New Works:

<b>Quantity</b>	<b>Item</b>
1	<p>Robotic Total Station with the following equipment and specifications:</p> <p>(a) Fitted with absolute angle encoder with diametrical reading with standard deviation (DIN 18723) of 3" and minimum reading of 1" of arc. Distance accuracy of 1 millimetre + 2ppm (ISO 17123-4) with capability of measuring to 2.5 kilometres to a single prism. Capable of measuring to all types of prism targets including retro tape. Fitted with optical plummet. Servo drives with speed of not less than 115 degrees a second. Must support both passive locking to prisms and active tracking of prisms with infrared diodes. Typical search time to locate prisms should be specified at 2-10 seconds. The unit must be able to be fully controlled from the pole and be entirely cable-free.</p> <p>(b) 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, free station, stakeout, reference line / arc, area calculations, measure rounds, traverse adjustment 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). An optional monitoring program should be available as an upgrade if required.</p> <p>(c) Heavy duty wooden tripod, tribrach, 3 internal batteries, (4400Ah each), detail pole and large 360°circular prism fitted with 8 channel IR diodes run from an internal battery.</p> <p>(d) Half transverse kit comprising a heavy duty wooden tripod, tribrach, prism base, optical plummet and prism.</p> <p>If GPS technology is being used on the contract then the Company must supply a GPS(GNSS) receiver to meet the following specifications:</p> <p>Completely cable-free 220 channel GNSS rover capable of tracking GPS frequencies (L1, L2, L2C &amp; 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.</p> <p>Accuracy (RMS) in Kinematic mode of 8 millimetres+1ppm in plan and 15</p>

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item	
	<p>millimetres +1ppm in height. Accuracy (RMS) in Network RTK mode of 8 millimetres +0.5ppm in plan and 15 millimetres +0.5ppm in height.</p> <p>Initialisation reliability should be &gt;99.9% and standard time for initialisation should be less than 10 seconds.</p> <p>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).</p> <p>Heavy duty wooden tripod, tribrach, GPS Tribrach adapter, 2 internal batteries, (2400Ah each) and detail pole.</p> <p>If a local transformation or calibration is being used by the Company, the parameters must be supplied.</p> <p>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.</p> <p>The Company shall provide training as requested by the Scottish Ministers on the operation and use of the Total Station</p>	
1	<p>Automatic level with minimum specification as follows: 30x magnification, accuracy per 1 kilometre double levelling of 0.8 millimetres, single measurement accuracy of 1.2 millimetres at 30 metres.</p> <p>Aluminium tripod with cover and strap for carrying.</p> <p>Aluminium staff and detachable staff bubble.</p> <p>Notwithstanding the above requirements, the automatic level shall not be to any lesser specification than that used by the Company's staff.</p> <p>The Company shall provide training as requested by the Scottish Ministers on the operation and use of the automatic level.</p>	
1	Electronic cover meter (with facility for downloading to computer)	
4	30 metre measuring steel tape	To be renewed by the Company as requested by the Scottish Ministers
1	50 metre measuring fibron tape	
2	30 metre measuring fibron tape	
25	5 metre pocket measuring tapes	
10	Bricklayers string lines	
3	Universal straight edge with wedge gauge for measuring depressions	
3	0.9 metre electric spirit level with batteries as required	
1	20 inch colour Tele-video machine combining 20 inch screen with DVD recorder.	

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Quantity	Item	
	Recordable DVD's, supplies to be renewed by the Company as and when required.	
6	Flashlights with batteries – replaced as and when required	
-	Waterproof marking chalk in various colours.	Supplies to be renewed by the Company as and when required
-	Sustainable spray paint in various colours.	
-	Nails and survey nails as and when required.	
	Wooden posts, stakes and planks as and when required	
6	Claw hammer	
1	Lump / club hammer (4 pound)	
4	Maximum and minimum thermometers in weatherproof case	
2	Sewer inspection lamp with supply of batteries or chargers	
1	Set of gas detection apparatus with charger	
1	Noise Monitoring Equipment CEL Noise measuring equipment, or similar approved, including suitable tripods and an all weather enclosure and consisting of: 1 No CEL 162E Environmental noise analyser in carrying case 1 No CEL 177 acoustic calibrator complete with couplers 1 No GR 1560 - 9522, 0.5 inch microphone windshield 1 No Battery charger 2 No Set of rechargeable batteries for CEL 162E above 1 No Spare microphone windshield compatible with CEL 162E above. 1 No CEL 193 precision integrating impulse sound level meter. 1 No 12 millimetres foam microphone windshield compatible with CEL 193.	

5.2 The Company shall make available to the Scottish Ministers the use of any other survey equipment on the New Works Site as required.

**6 Supply of Documentation**

6.1 The Company shall supply and maintain for the sole use of the Scottish Ministers one copy, on compact disk from the Stationary Office (licensed for use by and up to 20 users), suitable for display on the equipment specified in Sections 4 of Appendix 1/1 of this Specification, the following documents:

- (a) The Manual of Contract Documents for Highway Works;

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- (b) Design Manual for Roads and Bridges;
- (c) Eurocodes;
- (d) Traffic Signs Manual Chapter 8 Parts 1 and 2;
- (e) Current British Standard and Code of Practice or computerised equivalent all as referred to or cross referenced in this Contract, the Code of Construction Practice or used in the Design. Alternatively provision of access to an online electronic database for the Employer and staff e.g. IHS UK; and
- (f) Relevant Road Notes.

6.2 All documents shall be current at the Reference Date.

## **7 Safety and Protective Clothing**

7.1 Sets of the following shall be supplied new by the Company within 4 weeks after commencement of the New Works in sizes as required by the Scottish Ministers.

<b>Quantity</b>	<b>Item</b>
40 pairs	Wellington boots with steel toe cap and mid-sole
40 pairs	Protective safety boots with steel toe cap and mid-sole (type to be as agreed by Scottish Ministers' Representative)
40	Fleece jacket (colour black) 380g/m with 2 zipped pockets and draw cord hem
40	Two band and brace high visibility yellow coats made from high performance waterproof and breathable fabric conforming to EN471 Class 3 and EN343 3,3. (GORE-TEX or equivalent type as agreed with the Scottish Ministers' Representative). Jackets shall have Transport Scotland's logo on the back (large size logo) with Transport Scotland and MOUCHELF AIRHURST JV company logos on the front left chest area (small size logo).
40 pairs	Waterproof overtrousers with High Visibility bands
50	Safety helmets with comfort band chin straps and detachable ear defenders with Transport Scotland and MOUCHELF AIRHURST JV company logos on the front.
40 pairs	Latex grip gloves with nylon back
40 pairs	Textured latex grip gloves with knitted back
40	Long sleeved high visibility vests to BS 6629 : Class 'A' : Appendix G Plus
60 pairs	Seaboot stockings
40 pairs	Safety glasses / goggles
As required	Disposable gloves (latex or other suitable material)

7.2 The Company shall provide an additional 8 sets of wellington boots, safety boots, fleece jackets, high visibility yellow coats, waterproof overtrousers, safety helmets, industrial rubber gloves, industrial logger gloves, long sleeved high visibility vests, seaboot

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### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

- stockings, and safety glasses or goggles each year as requested by the Scottish Ministers.
- 7.3 The Company shall make provision for replacing worn, damaged or lost safety and protective clothing or other PPE as requested by the Scottish Ministers throughout the project.
- 7.4 Additional protective clothing for up to 15 visitors shall be made available on request, for periods of up to one day, comprising 15 sets of high visibility waterproof anorak and safety helmets and safety boots.
- 7.5 The Company shall provide to the Scottish Ministers any other safety and protective clothing or other PPE deemed necessary by the Company's safe method of working or conditions arising during the execution of the New Works e.g. encountering contaminated land.

## **8 Health and Safety Equipment**

- 8.1 Health and Safety Publications to be provided by the Company:
- (a) Health and Safety Information for Employees Regulations 1989 (Poster and 20 leaflets with the address of the local enforcing authority of the Health and Safety Executive and the Employment Medical Advisory Service office filled in);
  - (b) First aid poster giving the location of first aid facilities and the name and location of the trained first aiders and the appointed person or first aider who deputises in their absence;
  - (c) Electric Shock first aid placard (20 copies) C200: 09/06;
  - (d) Skin Cancer caused by Pitch & Tar (20 copies) - HSE MSB4: 9/98;
  - (e) Leptospirosis (20 copies) Health and Safety Executive leaflet IND 84: 08/06;
  - (f) BI.510 National Insurance Accident Record Book;
  - (g) Forms 2508 as required for reporting dangerous occurrences and accidents to the Health and Safety Executive;
  - (h) Managing Health and Safety in Construction, Approved Code of Practice HSE L144;
  - (i) The Safe Use of Vehicles on Construction Sites HSE;
  - (j) Safe work in Confined Spaces, Approved Code of Practice HSE L110;
  - (k) Electrical Safety on Construction Sites Guidance HS(G) 141;
  - (l) The Work at Heights Regulations 2005: A brief Guide INDG401;
  - (m) Essentials of Health and Safety at Work HSE;
  - (n) Memorandum of Guidance on the Electricity at Work Regulations 1989 HSE HSR25;
  - (o) Safety at Streetworks and Road Works, A Code of Practice DTLR;
  - (p) Simple Guide to the Lifting Operations and Lifting Equipment Regulations 1998 INDG 290; and
  - (q) Other guides or codes of practice or the like relevant to the legislation listed in Section 3.13 of the Code of Construction Practice.

### **Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

Note: The most recent edition of each publication shall be supplied and any other required.

- 8.2 The Company shall arrange and supply appropriate health and safety training for the Scottish Ministers' staff regarding its safety procedures.
- 8.3 The Company shall provide adequate first aiders and fire wardens for the offices and shall provide training and equipment as necessary for any Scottish Ministers personnel to be designated as first aiders or fire wardens.
- 8.4 The Company shall arrange for regular safety drills at the New Works Site and the offices, including, but not limited to safety drills relating to incidents that may arise during the execution of the New Works, involving the emergency services in the safety drills as necessary.

### **9 Initial Consumable Stores**

- 9.1 The Company shall provide regular supplies of consumable items including, but not limited to, those identified in the list below as required for the sole use of the Scottish Ministers; the quantity stated for each item in the list below shall be supplied immediately or within reasonable time after commencement of the New Works.

<b>Quantity</b>	<b>Description</b>
50	A4 lever arch files with dust covers
50	A3 ring binder files
50	Set A4 file indices (plastic) (A - Z or 1 – 20)
10	Set A3 file dividers
20	A4 fold over clipboards
100	A4 pads ruled feint and margin (200 sheets)
2	A4 pads graph paper
2	A3 pads graph paper
40	Ruled all weather cover Asixtebook
40	Ruled hard cover A4 books
12	Standard office stapler and supply of staples
2	Heavy duty stapler (200 sheet capacity) and supply of staples (various
12	2-hole paper punch
2	Heavy duty 2-hole paper punch (65 sheet capacity)
1	Heavy duty 4-hole paper punch (150 sheet capacity)
5	Box DVD-R (10 per box)
5	Box CD-R 650 MB 74 min recordable disc (25 per box)
10	Box 25 millimetres paper clips
10	Box large drawing pins

**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

10	Bottle white correction fluid
100	Ball point pens (black)
100	Ball point pens (blue)
100	Ball point pens (red)
50	Felt tip pens (Fineliner or equivalent) (black)
20	Felt tip pens (Fineliner or equivalent) (red)
20	Felt tip pens (Fineliner or equivalent) (green)
50	Pencils (HB) Propelling
10	Box coloured pencils (12 assorted)
10	Pack highlighter marker pens (6 assorted)
5	Pack marker pens (various colours) for use on flip charts
20 sets	Dry whiteboard markers in various colours
200	A4 manila envelopes
200	DL gummed envelopes
10	Stick adhesive (Pritt stick or equivalent)
10	Roll Sellotape or equivalent with dispenser (25 millimetres wide)
10	Roll invisible tape with dispenser (25 millimetres wide)
40	"Post it" note pads or equivalent 76 x 127 millimetres
4	Roll drafting tape
2	Time and date received dial stamp (self inking)
2	"Uncontrolled" Stamp (self inking)
50	Foolscap document wallet
200	A4 clear plastic file pockets (top opening)
100	A4 clear plastic file pockets (top and side opening)
250	Suspension files with tabs and inserts
100	Plastic slide binders (9 millimetres)
1	Spiral/coil binding machine
100	Binding comb ring coils (various sizes 6 millimetres – 25 millimetres)
1	A1 paper trimmer and stand
40	Filing trays with risers (in addition to the filing trays specified in room types)
1	A3 laminator
100	A3 laminating pouches
200	A4 laminating pouches



**Appendix 1/1: Temporary Accommodation and Equipment for the Scottish Ministers**

20	Boxes A4 photocopier / printer paper, ream wrapped, 5 reams per box
20	Reams A3 photocopier / printer paper
1	Box A4 photocopier / printer paper (blue), ream wrapped, 5 reams per box
1	Box A4 photocopier / printer paper (green), ream wrapped, 5 reams per
1	Pack of card (160gsm), 250 sheets, white
4	Rolls paper for plotter
40	Small fold back binder clips
40	Medium fold back binder clips
5	Packs thin rubber bands
5	Packs large rubber bands
20	Erasers
1	Pack of clear report binding covers, 100 sheets
1	A4, one day to a page diary, provided in December of each year for use

**10 Office Insurance**

10.1 The Company shall provide for the insurance against all risks, of the contents of the offices including the property of the Scottish Ministers and his staff together with any staff of the Scottish Ministers 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 Scottish Ministers.

**11 Heating and Lighting**

11.1 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.

**12 Required Time Duration for Providing and Maintaining Accommodation and Equipment**

12.1 Period 1: Period 1 means

12.1.1 The Principal Offices including their contents, access roads and hard-standings thereto, shall be available for occupation within 4 weeks of the Commencement of New Works and shall be maintained and serviced until 12 weeks after the issue of the Final Completion Acceptance Notice..

12.2 Period 2: Period 2 means

12.2.1 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 Final Completion Acceptance Notice..

## Appendix 1/2: Vehicles for the Scottish Ministers

### 1 Vehicles for the Scottish Ministers

- 1.1 The following specification fulfils the vehicle requirements for the New Works.
- 1.1.1 The vehicles shall be provided new and shall be maintained by the Company throughout the period required for the New Works as defined in Section 1.11 below. The Company shall supply all fuel and consumables throughout the period defined in Section 1.11 below. The vehicles shall be returned to the Company at the end of the period defined in 1.1.11 below.
- 1.1.2 Vehicles shall be provided for the exclusive use of the Scottish Ministers.
- 1.1.3 The Company shall ensure that replacement vehicles are provided for those being maintained or serviced or made unavailable to the Scottish Ministers for any other reason.
- 1.1.4 Vehicles shall be cleaned inside and outside by the Company once per week or as otherwise requested by the Scottish Ministers.
- 1.1.5 The Company shall provide secure parking for the vehicles when the vehicles are not in use.
- 1.1.6 The Company shall indemnify the Scottish Ministers, Scottish Ministers' representatives and their respective staff authorised to drive the vehicles against claims in respect of damage to vehicles including claims from passengers, claims in respect of damage and personal injury or death.
- 1.1.7 The Company shall allow for all vehicles provided for the Scottish Ministers to be used off the New Works Site on regular journeys between the New Works Site and other locations for purposes related to the Project. Such locations shall include, but not be limited to Scottish Government offices; local authority offices; offices of other statutory bodies (e.g. SNH, SEPA etc), homes or offices of landowners or their agents, any locations or premises used by the Company adjacent to, or in the vicinity of the New Works; travel between the New Works Site and local transport interchanges, any other venues or locations as agreed with the Company, and the like.
- 1.1.8 The Company shall allow for the authorised use of vehicles outside the Scottish Ministers' working hours.
- 1.1.9 The Company shall provide training for driving vehicles on the New Works Site for Scottish Ministers' staff, as requested by the Scottish Ministers.
- 1.1.10 All vehicles provided for the Scottish Ministers shall bear the legend "Motorway Maintenance" and retro-reflective red and fluorescent yellow chevron markings at the rear of the vehicle. All vehicles provided for the Scottish Ministers shall be free from markings identifying any company associated with the Agreement.
- 1.1.11 The following vehicles of EU manufacture shall be provided:

Type	Number Required	Period Required
A	1	Period 1 and 2 as defined in Appendix 1/1 Section 10.
B	12	Period 1 as defined in Appendix 1/1 Section 10

### Appendix 1/2: Vehicles for the Scottish Ministers

Type	Number Required	Period Required
C	1	Periods 1 and 2 as defined in Appendix 1/1 Section 10

- 1.1.12 The minimum requirements of the above vehicle types shall be as defined in Sections 1.14 – 1.16 below.
- 1.1.13 Where the Company wishes to provide equivalent vehicles to the example named vehicles below, the specification of the vehicles provided shall include all equipment and features provide as standard on the example named vehicles plus those additional requirements specified for each below.
- 1.2 Type A – 7 seat Station Wagon, min 2500cc (Land Rover Discovery 4 or equivalent approved by the Scottish Ministers)**
- 1.2.1 This vehicle shall be suitable for on and off-road use, have 4-wheel drive, power steering and be supplied in light colour. The vehicle shall be free from markings identifying any company associated with this Agreement. Equipment to be provided with the vehicle shall include: fire extinguisher, first aid kit, hazard flashing unit, full size spare wheel, fuel filler cap lock, bonnet lock and spare wheel lock, link mats front and rear, tow rope, towing hooks front and rear, sign boards reading “Motorway Maintenance” in accordance with Diagram 7404 of Schedule 12, Part V of the *Traffic Sign Regulations and General Directions 2002* on the rear of the vehicles (the lettering shall be the largest x height that can be accommodated out of the following heights: 37.5, 50, 62.5, 75 millimetres), retroflective red and fluorescent yellow chevrons on the rear of the vehicle and a roof-mounted amber flashing light bar comprising at least 2 light sources in accordance with Section O5.3 of Chapter 8 of the Traffic Signs Manual and the *Road Vehicle Lighting Regulations and General Directions 2002* and 5 (minimum) rear seats.
- 1.3 Type B – 4 seat Short Wheelbase Station Wagon, min 2000cc (Land Rover Freelander 2 or equivalent approved by the Scottish Ministers)**
- 1.3.1 This vehicle shall be suitable for on and off-road use, have 4 wheel drive, power steering and be supplied in light colour. The vehicle shall be free from markings identifying any company associated with this Agreement.
- 1.3.2 Equipment to be provided with the vehicle shall include: fire extinguisher, first aid kit, hazard flashing unit, full size spare wheel, fuel filler cap lock, bonnet lock and spare wheel lock, link mats front and rear, tow rope, towing hooks front and rear, sign boards reading “Motorway Maintenance” in accordance with Diagram 7404 of Schedule 12, Part V of the *Traffic Sign Regulations and General Directions 2002* on the rear of the vehicles (the lettering shall be the largest x height that can be accommodated out of the following heights: 37.5, 50, 62.5, 75 millimetres), retroflective red and fluorescent yellow chevrons on the rear of the vehicle and a roof mounted amber flashing light bar comprising at least 2 light sources in accordance with Section O5.3 of Chapter 8 of the Traffic Signs Manual and the *Road Vehicle Lighting Regulations and General Directions 2002* and 2 (minimum) rear seats.
- 1.4 Type C – 5 door Estate car, 1800 cc (Ford Focus or equivalent approved by the Scottish Ministers)**
- 1.4.1 This vehicle shall have a carrying capacity of at least 0.25 tonne, a minimum clearance (unladen) of 150 millimetres and independent suspension. The vehicle shall be supplied in light colour and shall be free from markings identifying any company associated with this Agreement.

### **Appendix 1/2: Vehicles for the Scottish Ministers**

- 1.4.2 Equipment to be provided with the vehicle shall include: full size spare wheel, fire extinguisher, first aid kit, tow rope, luggage straps suitable for carrying survey equipment, sign boards reading "Motorway Maintenance" in accordance with Diagram 7404 of Schedule 12, Part V of the *Traffic Sign Regulations and General Directions 2002* on the rear of the vehicles (the lettering shall be the largest x height that can be accommodated out of the following heights: 37.5, 50, 62.5, 75 millimetres), retroflective red and fluorescent yellow chevrons on the rear of the vehicle and a roof mounted amber flashing light bar comprising at least 2 light sources in accordance with –Section O5.3 of Chapter 8 of the Traffic Signs Manual and the *Road Vehicle Lighting Regulations and General Directions 2002*.

## **Appendix 1/3: Communicating Systems for the Scottish Ministers**

### **1 Mobile Telephones**

- 1.1 The communications equipment shall be provided new and shall be maintained by the Company throughout the period of the New Works and replaced as required. Each of the Scottish Ministers' personnel that will be on Site until the end of Period 2 shall retain a mobile telephone until the end of Period 2 as defined in Section 10 of Appendix 1/1. All other mobile telephones shall be returned to the Company at the end of Period 1 as defined in Section 10 of Appendix 1/1.
- 1.2 The equipment shall comprise 30 hand portable mobile telephones for designated users from the Scottish Ministers' personnel, complete with carrying case, and charger. Spare chargers shall be provided for 15 of the telephones, as directed by the Scottish Ministers. 6 mobile telephones for the use of the Scottish Ministers' personnel shall be supplied if Temporary Initial Accommodation is required in accordance with Section 1.21 Appendix 1/1 of this Specification.
- 1.3 The Company shall provide an additional 5 hand portable mobile telephones for use as 'pool-phones' by the Scottish Ministers' staff who may visit and work at the Site for short periods.
- 1.4 The Company shall allow for all calls from each of the mobile telephones and shall bear all costs associated with each phone that is supplied for the use of the Scottish Ministers.
- 1.5 The Company shall replace any mobile telephones that are lost, damaged or require replacement and shall arrange for the maintenance of mobile telephones as required.
- 1.6 The Company shall allow for 10 of the mobile phones provided in accordance with Section 1.2 above, for users as directed by the Scottish Ministers, to permit international calls to be received and made from the UK and to have international roaming facilities allowing calls to be received and made overseas.
- 1.7 The Company shall provide a mobile for each of the Scottish Minister's personnel involved in monitoring of any off Site Works, such as casting and fabrication Works. All of the telephones shall permit international calls to be received and made from the UK and overseas.
- 1.8 The Company shall not be responsible for the cost of any non-project related calls made by the Scottish Ministers' personnel on mobile phones provided in accordance with this Appendix and shall forward to the Scottish Ministers on a monthly basis details of any calls it considers may not be business related. The Scottish Ministers shall confirm to the Company within 4 weeks of receipt of said details any non-project related calls made by the Scottish Ministers' personnel. The Company shall operate a system to allow reimbursement to the Company by individual members of the Scottish Ministers' personnel of the cost of any non-project related calls made.

## **Appendix 1/5: Testing to be Carried out by the Company**

### **1 Notes:**

- 1.1 Unless otherwise stated below, all sampling and testing in this Appendix shall be undertaken by the Company.
- 1.2 Tests comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Company (See sub-clause 105.4 of the Specification)
- 1.3 (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.
- 1.4 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.
- 1.5 Cube strengths are not required for concrete complying with Clause 2602 of the Specification.
- 1.6 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.
- 1.7 The Company's attention is drawn to the Requirements for additional testing requirements.
- 1.8 The Company shall incorporate in the schedule of tests required under Clause 36 of the Conditions of Agreement as a minimum the tests detailed in the following table together with all additional tests required by the Agreement.
- 1.9 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 Scottish Ministers.
- 1.10 The photographs, together with corresponding RRS1 and CRS1 Forms included in Clause 976AR of Appendix 0/1, shall be delivered to the Scottish Ministers within seven days of the sampling on site.
- 1.11 All reference to FWD within this Appendix shall mean Falling Weight Deflectometer as described in HD29 of the DMRB.
- 1.12 All references to LWD within this Appendix shall mean Light Weight Deflectometer as described in Clause 895 of Interim Advice Note 73/06. The use and interpretation of the LWD shall be in accordance with Interim Advice Note 73/06 and the "LWD Good Practice Guide" (2009) produced by Loughborough University.
- 1.13 Where supplier declaration is required for material properties then this shall be in accordance with the factory production control system outlined in Annex C and D respectively of BS EN 13285.

**Appendix 1/5: Testing to be Carried out by the Company**

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) (BS3470)		
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.
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 402.6 (iii)		
		Production testing (Manufacturer's tests)	As required in sub-Clause 402.6(iv)		
	Welded joints	Destructive testing			
403	Anchorage and attachment systems for use in drilled holes.	Ultimate tensile load (Manufacturer's tests).		Required	To provide well attested and documented evidence.
404	Anchorage in drilled holes	On-site tensile load test	As required in Appendix 4/1	Required	
	Post foundations				
406	Vehicle Parapets.			Required	Quality Management Scheme applies
407	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence.

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 400 continued					
409	Vehicle parapet posts	Production testing as specified in BS 6779-1 1998 (Amd No 14290, 21 March 2003)  (Manufacturer's tests)		Required	Certification in accordance with Clause 409 is required
410	Anchorage in drilled holes	On site tensile load test	As required in Appendix 4/1	Required	



**Appendix 1/5: Testing to be Carried out by the Company**

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	
		Vitrified clay				
		Concrete - PC/SRC	not exceeding 900mm diameter	(Manufacturer's tests)		Required (AASHTO)
		Concrete - Pre-stressed				
		Iron - cast				
		Iron - ductile				
		PVC-U				
		GRP				
		Plastics. See Table 5/1				
		Corrugated steel				
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 sulphate (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			

**Appendix 1/5: Testing to be Carried out by the Company**

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 sulphate (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
	Manhole steps				
	Steel fitments				
	Covers, grates and frames				Product certification scheme applies
Cover bolts					Quality management scheme applies

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 continued					
508	Gullies and pipe junction				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 sulphur compounds
		Water-soluble sulphate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
513	Permeable backing to earth retaining structures	Plastic index (N)	1 per source	Required	
		Water-soluble sulphate (WS) content (N)	5 per source	Required	
		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	

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 500 continued						
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 sulphate (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 (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		
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 Company**

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600						
601, 631 to 637, 640	Acceptable material				Required	
	Class	General Description				
	1	General granular fill	Grading/uniformity coefficient	Twice a week		
			mc/MCV (N)	2 per 1000 m <sup>3</sup> up to max of 5 per day		
			SMC of chalk (N)	Twice a week		
		1C only	Resistance to fragmentation (N)	Weekly		
	2	General cohesive fill	Grading	Twice a week	Required	
			mc/MCV/PL Undrained shear strength (N)	2 per 1000 m <sup>3</sup> up to max of 5 per day		
			SMC of chalk (N)	Twice a week		
			Bulk density (pfa) (N)	2 per 1000 m <sup>3</sup> up to max of 5 per day		
	3.	General chalk fill	mc(N)	2 per 1000 m <sup>3</sup> up to max of 5 per day	Required	
			SMC (N)	Daily		
	4.	Landscape fill	Grading/mc/MCV (N)	Daily		
	5.	Topsoil	Grading	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			
SMC (N)			Weekly			
omc/mc, mc or MCV (N)			1 per 400 tonnes			

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 continued					
601, 631 to 637 640 cont	6 (cont'd)	Selected Granular fill (cont'd)	Organic matter/water soluble (WS) sulphate content (N)	Weekly	Required
			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	
	6F4 and 6F5	Selected Granular fill	Size designation and overall grading category	1 per week	
			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 BS EN 13242	
			Laboratory dry density and optimum water content		
			Water content		
	7.	Selected cohesive fill	Grading/mc/MCV/ bulk density (N)	1 per 400 tonnes	Required
			SMC of chalk (N)	Twice a week	
PI/LL (N)			Daily		
Organic matter/total or water soluble (WS) sulphate content (N)			Twice a week or daily when sulphates are expected		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 600 continued					
601, 631 to 637 640 cont	7. cont'd	Selected cohesive fill cont'd	Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	Twice a week or daily when sulfides are expected	Required
			pH/chloride ion content (N)	Weekly	
			Resistivity (N)	As required	
			Undrained and drained shear parameters (N)	As required	
			Permeability (N)	As required	
	8.	Miscellaneous fill	mc/MCV (N)	Daily	
	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	
	Furnace bottom ash		Grading	1 per 300 tonnes	
	Fill adjacent to cementitious material or metallic items		Water-soluble sulphate (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) Off site source				1 every four months
	(ii) On Site source				1 per source
609 621	Geotextiles		Tensile load	1 per 400 square metres	Required
			Permeability		
			Pore size		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 600 continued						
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		
615	Lime stabilisation to form capping	Rate of spread of lime	1 per 500 square metres of lime spread	Required		
641		Available lime content	Each source of lime weekly during stabilisation operation			
643						
622	Earthworks for reinforced soil and anchored earth structures	Redox potential	5 locations within the affected area	Required		
638		Drainage layers	Grading		1 per 400 tonnes	
			Chemical analysis			
639		Reinforcing elements	Coeff. of friction		Each type of element with each type of fill	
		Anchor elements	Adhesion			
624	Ground anchorages	Proof loading	As required in Appendix 6/10	Required		
626	Gabions			Required		
	Fill	Grading	1 per 400 tonnes			
		10% fine values (N)				
	Geomesh		1 per 400 square metres			
PVC coated wire			Required (ASTM G23)			
631	Subgrade	LWD tests augmented by independently verified dynamic Plate Bearing Tests	1 No. LWD test at each hardstanding area. 1 No. Dynamic Plate Bearing at each hardstanding area		Subgrade Surface Modulus	
	Capping or Stabilised Materials	Falling Weight Deflectometer Testing (FWD) augmented by independently verified dynamic Plate Bearing Tests	1 No. FWD test at each hardstanding area. 1 No. Dynamic Plate Bearing at each hardstanding area		Stiffness Modulus	
642	Earthworks materials for corrugated steel	Constrained soil modulus (M*)	3 on each side of each structure	Required		



**Appendix 1/5: Testing to be Carried out by the Company**

	buried structures				
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**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 700					
710	Constituent materials in recycled aggregate and recycled concrete aggregate	Quality control	Checks are to be carried out by the Company in accordance with the 'Quality Protocol for the production of aggregates from inert waste' and the requirements of Clause 710	Required	The quality control procedure should be in accordance with the 'Quality Protocol for the production of aggregates from inert waste' and the @producers compliance checklist' published by Waste and Resources Action Programme (WRAP) 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 Company**

Series 800					
801	General requirements for Unbound Mixtures for 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	
803		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes		
804					
805					
806					
	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			
		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		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments		
Series 800 (continued)							
821, 822, 823, 830, 831, 832, 834, 835, 840	Cement and other Hydraulically Bound Mixtures (HBM)	Tests for control and checking of HBM	Tests specified in table 8/14 and Table 8/15	Required			
		Coefficient of linear expansion					
		Tests for laboratory mixture design	Test specified in Clause 880				
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)		Monthly		
		Resistance to freezing and thawing (durability)	Soundness (N)		1 per source		
			Water absorption (N)		As required		
		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		
			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)		1 per source		
			Resistance to surface abrasion (AAV) (N)		1 per source		
		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 Scottish Ministers
			Softening part (N)		1 per 750 tonnes		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
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		National quality management sector schemes apply
		Binder Content (N)			
929	Base and Binder Course Asphalt Concrete (Design Mixtures)	In situ air void content (N)	As required	Required	
		Refusal air void content (N)			
		Binder volume (N)			
		Grading (N)			
		Binder content (N)			
		Deformation Resistance			
		Deformation Resistance (Design)	As required	Required	The test certificate is the CE Mark for the mixture
Stiffness (Design)					
930	EME 2	In situ air void content (N)	As required	Required	
		Binder volume (N)			
		Grading (N)			
		Binder content (N)			
		Richness modulus (design)	As required	Required	The test certificate is the CE Mark for the mixture
		Duriez (design)			
		Deformation Resistance (Design)			
Stiffness (Design)					
911	Hot Rolled Asphalt surface course (Design Mixtures)	Design Binder content	1 per source	Required	The test certificate is the CE Mark for the mixture
915	Coated chippings for application to Hot Rolled Asphalt Surfacing	Grading (N)	1 per stockpile	Required	
		Binder content (N)	1 per stockpile		
		Flakiness Index (N)	1 per source		
		Resistance to polishing PSV (N)	1 per source		
		Resistance to surface abrasion (AAV)(N)	1 per source		
		Hot sand test (N)	1 per source		
		Rate of spread (N)	As required		National quality management sector schemes apply

**Appendix 1/5: Testing to be Carried out by the Company**

921	Surface macrotexture	Volumetric Patch (N)	BS EN 13036-1	Required	
924	High friction surfaces	Quality control checks	As required in sub-Clause 924.5	Required	BBA HAPAS Roads and Bridges certification (or equivalent) applies
		System coverage	As required in sub-Clause 924.6		
	Aggregate	Resistance to polishing PSV (N)	1 per source and as required for coated chippings in Clause 915.3	Required	

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 continued					
937	Stone mastic asphalt (SMA) binder course and regulating course	In situ air void content (N)		Required	
		Deformation resistance			
		Binder drainage test		Required	The test certificate is the CE Mark for the mixture
		Deformation resistance (design)			
938	Porous asphalt surface course				National quality management sector scheme applies
		Relative hydraulic conductivity	In accordance with Clause 938		
		Modified binder storage stability	In accordance with Clause 941		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.
		Binder drainage test	In accordance with BS DD 232 2005		
942	Thin surface course systems				National quality management sector scheme applies. BBA certification (or equivalent) applies.
		Binder drainage test	In accordance with BS DD 232 2005		
943	Hot Rolled Asphalt surface course and binder course (performance-related design mix)	In situ air void content (N)	As required	Required	National quality management sector scheme applies
		Deformation resistance			
		Grading (N)			
		Binder content (N)			
		Density (N)			
		Wheel tracking rate (N)			
		Wheel tracking rut depth (N)			
		Deformation resistance (design)	As required		The test certificate is the CE Mark for the mixture

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments			
Series 900 (continued)								
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 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 25°C and 5°C (N)	Every manufactured batch		Manufacturer's QA test results may be submitted		
		Aggregates	Flakiness index (N)	1 per source	Required			
			Resistance to polishing (PSV) (N)	Source approval	Required			
			Resistance to surface abrasion (AAV) (N)	Source approval	Required			
			Grading (N)	1 per 200 tonnes	Required			
		System	TAIT or BBA/HAPAS		Required			
		920	Bond coats, tack coats and other bituminous sprays	Binder	Product identification	1 per product per source	Required	Tests are expected to be repeated every two years
					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 25°C and 5°C (N)	Every manufactured batch					Manufacturer's QA test results may be submitted		



**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
919 922	Surface Dressing				National quality management 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 sprayer 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 25°C and 5°C (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
		Flakiness index (N)	1 per 200 tonnes	Required	
		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 lane per site
	System	TAIT or BBA/HAPAS		Required	
	Rollers	Spray bars working	Before work starts and daily during works		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments			
Series 900 (continued)								
950	Depressions				BBA HAPAS Roads and Bridges Certification (or equivalent) applies.			
Series 1000								
1001	Cement			Required	Quality management and product certification schemes apply			
1030								
1044				Portland cement CEM I			Required (BS6610)	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				
				Portland cement with microsilica				
				Pulverised - fuel ash			Required	BBA Roads and Bridges Certificate required for microsilica
				Ground granulated blast furnace slag				
	Admixtures							
	Mixing water	Sulphate content (N)	Monthly		Tests and test certificates are required. Product certification schemes apply to pfa and slag.			
	Aggregates	Resistance to freezing and thawing - magnesium sulphate soundness (N)	1 per source	Required				
		Water absorption (N)	As required					

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
1001 1030 1044 cont'd	Aggregates cont'd	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 sulphur (TS) and acid-soluble sulphate (AS) content (N)	Every 6 months		
	Flint coarse aggregate containing white flints	Water absorption (N)	3 per source thereafter weekly	Required	Not required for CBM aggregate
	Sand (i.e. Fine aggregate)	Acid-soluble material (N)	Monthly		
	Blastfurnace slag	Bulk density (N)	Every 6 months		
		Dicalcium silicate disintegration (N)	Every 6 months		
		Iron disintegration (N)	Every 6 months		
		Total sulphur (TS) and acid-soluble sulphate (AS) content (N)	Every 6 months		
	Pulverised-fuel ash			Required (BS3892: Part 2)	

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 1000 continued						
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 Compactability (Compaction Index) (N)	As required in Table 10/10	Required		
		Vebe (N)				
		Slump (N)				
1011 1012	Dowel bars Tie bars			Required (BS4449)	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
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			

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 continued					
1016 1017 cont.	Compression seals			Required (ASTM D2628)) (BS2752)(BS 4443:Part 4) Method 10 and BS EN ISO 2440) (BS EN ISO 1856) (BS903: Part A16 or BS IS) 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 <sup>3</sup>	Required	
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			

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1100 continued					
1104	Precast concrete flags	Bending strength	Minimum of 8 per 1000 m <sup>2</sup> of each product (BS EN 1339)	Required	
	Bedding	Granular material			
	Mortar				
1107	Concrete block paving	Compressive strength	Minimum of 8 per 1000 m <sup>2</sup> of each product (BS EN 1338)	Required	
1108	Clay pavers	Bending strength	Minimum of 8 per 1000 m <sup>2</sup> of each product (BS EN 1344)	Required	
		Skid resistance	Minimum of 8 per 1000 m <sup>2</sup> of each product (BS EN 1344)		
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

**Appendix 1/5: Testing to be Carried out by the Company**

		Glass Heads	Arsenic trioxide content, Lead content and Antimony content (N)	One per contract and/or per specific source of supply	Required	
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Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200 continued					
1214	Permanent traffic cones and traffic cylinders			Required	Certification that permanent traffic cones and cylinders have been tested and comply with BS873:Part 8 is required
		Test specified in BS873:Part 8	2 of each size and category/type		
	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.
1217	Traffic signals				Quality management scheme applies. Statutory type approval of equipment applies.
	Cables				Product certification scheme applies
	Controllers <i>[Other equipment]</i>	Test specified in Appendix 12/5	Each controller before delivery to Site and again after installation		
	Cabling	Tests a, b, c, e, f, g, h, j as defined in sub-Clause 1424.2	Each traffic signals installation	Required	Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200 continued					
1218	Detector loops				
	Cable			Required	Certification that completed cables comply with specification TR 2029 is required
	Epoxy resin			Required	Certification that the epoxy resin complies with specification MCH 1540 is required
	Feeder cable			Required	Certification that completed cables comply with specification TR 2031 is required.
	Joints	Pull test (4 kgf)	Each crimp		
	Installation	Series resistance		Each loop	Required
Insulation resistance					
Inductance					
Series 1300					
1305	Anchorage for use in drilled holes	Tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence
1306	Anchorage in drilled holes to columns and masts with flange plates	Loading test on site	As required		
1310	Welding	Welding procedures (Manufacturer's tests)	(Every seven years)		Quality management scheme applies
		Welder qualification (Manufacturer's tests)	(Sub-clauses 1310.1 and 1310.2 (7.1.3.))		Quality management scheme applies
		Production testing (Manufacturer's tests)	(Sub-Clauses 1310.1 and 1310.2 (7.1.4))		
	Welded joints	Destructive testing	(Sub-Clause 1310.1 and 1310.2 (7.1.5))		
1313	GFRP laminates	Loss of ignition	1 per 50 production columns		
		Colour fastness	1 per batch		
		Electric strength			



**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1300 continued					
1313 cont.	GFRP laminates cont'd	Water absorption	1 per batch		
		Impact strength			
1314	Brackets for laminated GFRP lighting columns  Polyurethane foam	Bulk density	1 per batch	Required	
		Surface hardness			
		Apparent bulk density	2 per batch		
		Impact strength			
		Flexural stress			
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
Series 1500					
1506	Copper communications cable			Required	Certification that each completed cable complies with specification TR2150 or TR 2158, as appropriate, is required
	Optical fibre communications cable			Required	Certification that each completed cable complies with specification TR2151 or TR 2159, as appropriate, is required
	Coaxial communications cable				Certification that each completed cable complies with specification TR2152 or TR 2160, as appropriate, is required
	Energy cable			Required	Certification that each completed cable complies with specification TR2153 or TR 2161, as appropriate, is required

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1500 continued					
1513	Cable joint enclosures	Test specified in Clause 1513.12	Each CJE	Required	Certification that CJE satisfies the air pressure test is required
1518	Coaxial and copper Communications and power cable	Tests specified in specification MCG 1022 or MCG 1099, as appropriate	Each cable (Stage 1) As required in Appendix 15/1 (Stage 2)		Results to be reported in accordance with MCG 1022 or MCG 1099, as appropriate
	Optical fibre communications cable	Tests specified in specification MCG 1055 or MCG 1099, as appropriate	Each cable (Stage 1) As required in Appendix 15/1 (Stage 2)		Results to be reported in accordance with MCG 1055 or MCG 1099, as appropriate
1522	Motorway System				
	Steel posts			Required (BS 6323)	
1526	Electrical installations	Tests specified in BS 7671	Each installation	Required	Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required
1530	Cable ducts	Tests specified in BS EN 50086-1, 2 and 4	Each supplier	Required	Current British Board of Agrément Certificate is required
1533	Cable ducts				
	Mandrel test	Tests specified in Clause 1533	Each duct	Required	Certificate that each length of duct between chambers satisfies the mandrel test is required
	Air test	Tests specified in Clause 1533	Each duct	Required	Certificate that each length of duct between chambers satisfies the air test is required
Series 1600					
1601	Soil samples			Required	
	In situ soil tests				
1602 to 1606	Concrete Grout Reinforcement Prestressing			Required	
1610 to 1615	Steelwork Welding Protection against corrosion				
1606	Coatings for protection against corrosion	Adhesion	As required in Appendix 16/6		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1600 continued					
1607	Reduction of friction on piles				
1608	Integrity testing				
1616	Dynamic testing				
1609	Static load testing of piles			Required	
1612	Self hardening slurry mixes			Required	
1617	Instrumentation			Required	
1618	Support fluids	To be proposed by the Company			See Appendix 16/18
Series 1700					
1702 1704	Cement types as stated in sub-Clause 1702.1			Required	Certificate to be provided monthly for each type of cement.  Quality management and product certification schemes apply.
	Cements (all types)	Chloride content	Monthly		Tests to be carried out by the manufacturer and results included on the test certificates required above
	Pulverised-fuel ash	Sulfate content	Monthly		
	Ground granulated blast furnace slag	Acid-soluble alkali content	Daily (PC) Weekly (pfa ggbfs)		
	Aggregates	Grading and fines content	1 per delivery (per source)		Results of routine control tests from the factory production control system operated by the producer to be provided - see Annex H of BS EN 12620
		Shell content (N)	Monthly		
		Flakiness index (N)	Monthly		Product certification scheme applies
		Resistance to fragmentation (N)	Monthly		
		Drying shrinkage (N)	1 per 5 years		
		Chloride content (N)	1 per week or as otherwise agreed		
		Sulphate Content (N)	Yearly		
		Blastfurnace slag	Bulk density (N)	Every 6 months	
	Stability (N)		Every 6 months		
	Sulphur content (N)		Every 6 months		
	Water	Tests specified in BS EN 1008	As required		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1700 continued					
1702 1704 cont	Water cont	Chloride content	Monthly		
		Sulphate content	Monthly		
		Acid-soluble alkali content	Weekly		
	Admixtures	Chloride Content	1 per consignment	Required (BS-934-2)	
		Sulphate content	1 per consignment	Required	
		Acid-soluble alkali content	1 per consignment		
1707	Concrete	Cube strength (N)	Pre stressed concrete two cubes from 12 m <sup>3</sup> or 2 batches whichever represents the lesser volume	Required	Company to cast and test sufficient additional cubes to demonstrate cube strength before transfer
			Reinforced concrete two cubes from 24 m <sup>3</sup> or 4 batches whichever represents the lesser volume		
			Mass concrete - two cubes from 50 m <sup>3</sup> or 50 batches whichever represents the lesser volume		
			Additional cubes for special purposes		
		Cube strength - identity testing as described in Appendix 17/4 (N)	2 cubes from each of 2 samples of each batch		
		Density	As required		
		Modus of elasticity			
	Fresh concrete	Consistence (slump or compacting factor or Vebe) (N)	Each batch	Required	
		Air content	Each batch		
		Cement content	As required		
Water/cement ratio					

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1709	Silane			Required for each delivery	Certification that the silane complies with Clause 1709 is required
		Refractive Index	Three samples		
		Trial panels, where required in the Contract			
1710	Concrete packing Mortar packing Epoxy resin bonding agent				
	Precast concrete manufactured off Site	Cube strength (Manufacturer's tests)			Company to make available records of tests by the manufacturer
1711	Grouting and Duct Systems for Post-tensioned tendons				CARES Scheme for supply and installation of Post-tensioned Systems In Concrete Structures or an equivalent scheme is required.  Quality management and product certification schemes for cement apply.
		Full scale trials, where required in the Contract			See sub-clause 1711.1 and Appendix 17/6
		Air pressure tests			See sub-clause 1711.3 and Appendix 17/6

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1711 cont'd	Grouting and Duct Systems for Post-tensioned tendons cont'd	Duct assembly verification tests			See sub-clause 1711.3 and Appendix 17/6
		Wall thickness of ducts after tensioning			See sub-clause 1711.3 and Appendix 17/6. Company should provide evidence of testing
		Fluidity	See Table 17/4		See sub-clause 1711.8 and sub-clause 1711.9 and Table 17/5
		Bleeding			
		Volume change			
		Cube strength			
		Sieve			
		Sedimentation			
	Admixtures			Required	Quality management and product certification schemes apply.  Data on their suitability, including previous experience should be made available.  See sub-Clause 1711.10
1712	Reinforcement	Steel bars		Required (BS4449)	Product certification scheme applies
		Steel wire		Required (BS4482)	
		Steel fabric		Required (BS4483)	
		Stainless Steel		Required (BS6744)	
1713	Fabricated reinforcement			Required	Certification that fabricated reinforcement complies with the routine inspection / testing requirements of BS 8666 shall be required if the fabrication is not covered by a product certification scheme listed in Appendix B
1716	Reinforcement jointing systems	Permanent elongation Characteristic strength (Manufacturer's test)		Required for each type of connection	BBA Roads and Bridges certificate or CARES certificate of product assessment or fully equivalent scheme apply

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1717	Reinforcement metal arc welding	Welding procedure approval (BS7123)	As required in BS7123		Tests should be carried out by an independent testing body specified in BS 8666
		Welder approval (BS7123)			
1718	Prestressing tendons	Steel wire		Required (BS5896)	Product certification scheme applies
		Steel bar		Required (BS4486)	
		Seven-wire strand		Required (BS5896)	
	Prestressing steel (all types)	Proof load Breaking load Elongation Ductility Relaxation Modulus of elasticity	As required	Required (BS5596) (BS4486)	
	Super strand to BS5896 or other than lowest strength 3-7 millimetres dia wires to BS5896	0.1% proof load Breaking load	Each reel		
1724	Post-tensioning anchorages	Tests in accordance with BS EN 13391 (Manufacturer's tests)		Required (BS EN 13391)	Product certification scheme applies
1726	Stainless steel bar			Required (BS6744)	Product certification scheme applies
1727	Inspection and testing of structures and components				
Series 1800					
1801 1803	Structural steels to BS EN 10025-1 to -4 and , BS EN 10025-6, BS EN 10210			Required	
	Structural steels to BS 7668			Required (BS7668)	
	Stainless steels to BS 970,BS EN 10084, BS EN 10087, BS EN 10095,			Required (BS 970, BS EN 10084, BS EN 10087, BS EN 10095)	

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 continued					
1801 1803 cont'd	Stainless steels to BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10258, BS EN 10259.			Required (BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10258 and BS EN 10259)	
	Steel plate	Ultrasonic testing	As required		
	Bolts, nuts and washers				Quality management scheme applies
	All types except high strength friction grip	Test specified in BS 4395: Part 2	As required in BS 4395: Part 2		
	High Strength Friction Grip	Test specified in BS 4395: Part 1 or Part 2	As required in BS 4395: Part 1 or Part 2		
	Tension Control Bolts	Test specified in JSS II-09-1996 or BS 4395	As required in JSS II-09-1996 or BS 4395		
	Welding electrodes				
	Covered steel			Required (BS EN 499)	
	Wire			Required (BS EN 756, BS EN 760)	
	Welding				
	Welding procedures	Tests specified in BS EN ISO 15614-1	As required in BS ISO 15614-1 and Appendix 18/1		Results to be reported in accordance with Annex A of BS EN ISO 15614-1
	Welder qualification	Tests specified in BS EN 287: Part 1	As required in BS EN 287: Part 1 for each welder	Required (BS EN 287: Part 1)	Certificate to be in accordance with Annex B of BS EN 287: Part 1
	Butt weld 'run-off' plates	Destructive tests specified in BS 5400: Part 6	As required in BS 5400: Part 6		
	Butt welds and adjacent areas of steelwork	Non-destructive tests using methods to be agreed	As required in BS 5400: Part 6		
	Fillet welds	Non-destructive tests			



**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 continued					
1801	Welding (cont'd)				
1803 cont'd	Flame cutting and shearing	Tests to demonstrate procedures comply with BS5400: Part 6 and Appendix 18/1	As required in Appendix 18/1		
	Stud shear connectors	Fixing (BS 5400: Part 6)	Each stud		
		Bending (BS5400: Part 6)	As required		
Series 1900					
1903	Abrasives	Grading	As required		
		Hardness			
1909	Galvanised coatings	Test specified in BS EN ISO 1461	As required		
	Aluminium and zinc spray coatings	Test specified in BS EN 22063	As required		Areas to be tested to be in accordance with Clause 1910
	Aluminium coating material			Required (BS EN 1301-1)	
	Zinc coating material			Required (BS EN 1179)	
	Sherardized coatings	Test specified in BS 4921	As required		
	Zinc electroplated coatings	Test specified in BS 3382: Part 2	As required		
	Plating to high strength friction grip and tension control bolts				
1910	Metal spray coatings	Tensile test specified in BS EN 22063	As required		
		Grid test specified in BS EN 22063	As required		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1900 continued					
1911	Paints	'A' and 'B' Samples	Specific gravity		Samples will be selected in accordance with Clause 1911SE
			Colour match		
			Composition		
			Application characteristics		
Series 2000					
2003	Permitted waterproofing systems				Registration and BBA Roads and Bridges Agreement certification apply
	Additional bituminous protection	Tests specified in BS594: Part 1	1 per 15 tonnes		Sampling to comply with BS594: Part 1
	Stability value	Test specified in BS598: Part 107	1 per 15 tonnes		
2004	Tar	Tests specified in BS76	1 per source		Sampling to comply with BS76
	Cut back bitumen	Tests specified in BS3690: Part 1	1 per source		Sampling to comply with BS3690: Part 1
Series 2100					
2101	Bridge bearings	Elastomeric bearings	Hardness	As required	Required (BS5400: Section 9.2)
			Tensile strength		
			Elongation		
			Ageing		
			Compression set		
			Ozone resistance		
	Complete bearings	Tests specified in Appendix 21/1	As required in Appendix 21/1		

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2400					
2401	Masonry cement			Required (BS EN 413-1)	Quality management scheme applies
		Chloride content	Monthly	Required	Test to be carried out by the manufacturer and results included on the test certificate
2402	Sand			Required per consignment (BS EN 13139)	
		Chloride content	Monthly		Test to be carried out by the manufacturer and results included on the test certificate
2403	Water	Tests specified in BS EN 1008	As required		
2404	Mortar admixtures			Required (BS EN 934-3)	
2405	Lime			Required (BS EN 459-1)	
2406/ 2417	Bricks				
		Clay	(Soluble salt content Efflorescence Comprehensive strength  Water absorption Initial rate of suction) (BS EN 771-1/TRL Report 447)		
		Calcium silicate		Required (BS 187)	
	Concrete			Required (BS 6073-1/BS EN 772-2)	
2407	Blocks				
		Concrete		Required (BS6073-1/BS EN 772-2)	

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2400 continued					
2408	Reconstituted stone				
2410 2411	Stainless steel				
	Wire/fabric			Required (BS EN 10088-1)	
	Bars			Required (BS6744)	
	Ready mixed mortars			Required (BS4721)	
	Mortars	Tests specified in Appendix A1 of BS EN 10521-1	1 set of tests per mix		
Series 2500					
2501	Materials for corrugated steel buried structures exceeding 900 mm clear span or internal diameter				Type approval applies
	Steel components			Required as appropriate to the standard or specification listed in the type of approval Certificate	
	Zinc coating				
	Protective coating				
	Paved invert system				BBA Roads and Bridges Certification applies
2502	Materials for reinforcing elements, prefabricated facing and capping units, and washers				BBA Roads and Bridges Certification applies
	Carbon steel strip			Required (BS1449: 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 (BS4449)	Tests scheduled under Clauses 1717 and 1909 are required for welding and galvanising of anchor elements

**Appendix 1/5: Testing to be Carried out by the Company**

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2500 continued					
2502 cont'd	Materials for fasteners	Stainless steel		Required (BS EN 10088-1 (BS EN ISO 3506-1 and 3506-2)	
		Bolts, screws and nuts		Required (BS EN ISO 898, 4016, 4018, 4034)	Tests scheduled under Clause 1909 are required for hot dip galvanising
2503	Materials for pocket type reinforced brickwork retaining wall structures	Clay bricks	(Soluble salt content Efflorescence Compressive strength  Water absorption  Initial rate of suction) (BS 3921/TRL Report 447) (N)	1 set of tests per type of brick	
2504	Environmental barriers	Timber			Quality management scheme applies
		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			Product certification scheme applies
		Concrete PC/SRC	(Manufacturer's test)		See sub-clause 2506.28
		Iron			
		Corrugated steel	(Manufacturer's test)		Type Approval Certificate and BBA Roads and Bridges Certificate apply

**Appendix 1/5: Testing to be Carried out by the Company**

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
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	
Series 5000					
5003	Abrasives	Grading	As required		
		Hardness			
5005	Aluminium and zinc spray coatings	Test specified in BS EN 22063	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)	

**Appendix 1/5: Testing to be Carried out by the Company**

Series 5000 continued					
Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
5005 cont	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 Scottish Ministers**

When required by the Scottish Ministers, the Company shall provide samples of any material proposed to be incorporated in the New Works



## **Appendix 1/7: Site Extent and Limitations of Use**

### **1 New Works Site Extent**

- 1.1 The New Works Site extent is detailed in the Agreement of these New Works Requirements and comprises:
- (b) The Land Made Available by the Scottish Ministers for the New Works as detailed in the Land Made Available by the Scottish Ministers for the New Works Drawings listed in Appendix 0/4; and
  - (c) Any further land acquired by or conveyed to the Scottish Ministers (from any persons, including the Company) from time to time for the purposes of the Design and the New Works.
- 1.2 The Company shall make provision for carrying out work on private land as required under this Agreement for example Accommodation Works, traffic signing, road lighting, drainage works and otherwise.

### **2 Limitations on the Use of the New Works Site**

- 2.1 The New Works Site shall be used solely for the construction and completion of the New Works.
- 2.2 The Company shall not use areas of land with a temporary right of access for any purpose other than the construction and completion of the New Works.
- 2.3 When carrying out Accommodation Works on land not made available by the Scottish Ministers for the New Works, the Company shall minimise the area of land occupied to that which is essential for the safe construction and completion of such part of the New Works.
- 2.4 The Company 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.
- 2.5 Road access to the New Works Site shall be gained solely via roads as detailed by Appendix 1/19.
- 2.6 The Company may gain entry to the New Works Site via private land only with the prior express agreement in writing of the landowner and occupier/tenant. Any access to private land from a public road shall be to the satisfaction of the Relevant Authority. The Company shall bear full responsibility for negotiation, paying for and bearing all costs relating to these accesses and for any matters arising with parties who consider themselves to be affected by these accesses.
- 2.7 The Company shall erect appropriate signs to show accesses and restricted routes.
- 2.8 The Company shall comply with the restrictions imposed by Network Rail for all New Works to be carried out within or adjacent to Network Rail property.
- 2.9 The Company shall not cross any watercourses via the river banks and bed and shall take all necessary measures to avoid any disturbance of the banks and bed.
- 2.10 The Company's attention is drawn to the Special Requirements detailed in these New Works Requirements.

**Appendix 1/8: Operatives for the Scottish Ministers**

**1 Operatives for the Scottish Ministers**

1.1 The following specification fulfils the operative requirements for the New Works.

1.2 The Company shall provide the following operatives:

<b>Operative</b>	<b>Number</b>	<b>Period Required</b>
Survey/Driver/Handyman	1	Period 1 as defined in Appendix 1/1
Survey/Driver/Handyman	1	Periods 1 and 2 as defined in Appendix 1/1
Office Attendant	1	Period 1 as defined in Appendix 1/1
Traffic Police Officer	1	Period 1 as defined in Appendix 1/1 – see Note 1

1.3 The Company shall allow the sum of £[REDACTED] per annum to cover the cost of providing the Traffic Police Officer, who will be seconded on a full time basis from Strathclyde Police.

## **Appendix 1/9: Noise Control Applicable to the New Works Site**

### **1 Noise Control Applicable to the New Works Site**

1.1 The Company shall consult and comply with the requirements of:

Glasgow City Council;  
North Lanarkshire Council; and  
South Lanarkshire Council

as appropriate, prior to commencement of work on the New Works Site.

These requirements, together with the Company's proposed methods of work and Constructional Plant, shall be discussed and agreed in writing by:

Glasgow City Council;  
North Lanarkshire Council; and  
South Lanarkshire Council

as appropriate, prior to commencement of the relevant activities.

The Company shall provide Consultation Certificates in accordance with the Certification Procedure in respect of these requirements.

1.2 The Company shall comply with the contents and recommendations of British Standard 5228: 'Noise and Vibration Control on Construction and Open Sites', together with the specific requirements of this Appendix 1/9.

Further to this, the company shall refer to the Department for Environment, Food and Rural Affairs 'Update of Noise Database for Prediction of Noise on Construction and Open Sites' which is an update to the existing construction plant noise database, contained in Annex C, Part 1 of British Standard 5228 'Noise and Vibration Control on Construction and Open Sites'.

1.3 All Constructional Plant used for the New 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.

In this respect, the Company shall refer to the Department for Environment, Food and Rural Affairs 'Update of Noise Database for Prediction of Noise on Construction and Open Sites', which contains details of typical Constructional Plant noise levels that the Scottish Ministers shall use as a basis prediction.

All Constructional Plant shall be operated and maintained in accordance with the manufacturer's written recommendations including the use and maintenance of any specific noise reduction measures.

1.4 Where the Design requires a diversion for traffic which places the traffic temporarily closer to adjacent properties, the Company shall carry out an assessment of the predicted noise levels associated with the construction and completion of the New Works (either temporary or permanent) and the use by traffic. If this assessment indicates an increase in the ambient noise levels at any properties of more than 3dBLA10(18hr), a suitable noise barrier (temporary or permanent) shall be provided as a minimum for the duration of the diversion works and diversion, and shall be placed prior to the commencement of any such work.

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### **Appendix 1/9: Noise Control Applicable to the New Works Site**

- 1.5 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 affective sound reducing enclosures to ensure all Constructional Plant used in connection with the New Works operates with the minimum of noise.

The Company shall ensure that any piling works are kept to a practicable minimum and that machinery and vehicles are switched off when not in use.

- 1.6 Subject to the other requirements of this Agreement, the normal working hours within the New Works Site shall be Monday to Friday between 0700 and 1900 hours and Saturday between 0800 and 1300 hours, with no working on Sundays and public holidays.

Permissible construction noise levels for these periods in relation to pre-construction ambient noise levels are detailed in Table 9/1 below. Consent for work outside these hours may be given by Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate.

The Company shall have written permission to operate at the relevant permissible noise levels for each area, within the normal working hours, from Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate.

The Company shall apply, in writing, for consent to work outside normal working hours to Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate, at least 14 days in advance of the proposed work.

The granting of such consents shall be dependent, amongst other things, on the Company demonstrating to the satisfaction of Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate in their application that:

- (a) it is not reasonably practicable to carry out the work during standard working hours;
- (b) the Company has considered all mitigation measures and has implemented appropriate measures;
- (c) all interested parties have been consulted; and
- (d) all alternative means to reduce the amount of work to be undertaken outwith standard working hours has been explored.

Written confirmation of consent shall be required for each and every occasion when the Company proposes to work outwith standard working hours.

In the event of written permission being granted, the Company shall provide the Scottish Ministers with a copy of the written permission at least 48 hours prior to commencing the work.

The Company shall also arrange for leaflets to be delivered to residents within 200 metres of the proposed New Works, giving a full description of the proposed Works, their duration, and of the sources, character and levels of noise expected to arise, including a named contact to respond to any noise or vibration concerns or nuisance.

Operating times and noise levels for Sundays and public holidays shall be subject to the agreement and written consent of Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate.

- 1.7 A pre-construction ambient noise assessment shall be undertaken by the Company, using an appropriately qualified acoustician who is a member of the Institute of Acoustics for agreement with Glasgow City Council, North Lanarkshire Council and South

### **Appendix 1/9: Noise Control Applicable to the New Works Site**

Lanarkshire Council as appropriate within 100 metres of where the New Works shall be undertaken, before the commencement of the New Works.

The noise assessment shall demonstrate the typical pre-construction ambient noise levels at representative properties adjacent to the New Works Site.

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 noise levels for that particular area, and shall be directly compatible with the noise levels given in Table 9/1 below for LAeq, 2hr (0800 – 1000) and LAeq 2hr (1900 – 2100).

The Company’s acoustician shall be required to undertake additional assessments or noise measurements at locations and methods agreed previously in writing with the Scottish Ministers, Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as necessary.

- 1.8 The pre-construction ambient noise levels, as detailed in paragraph 1.7 above, shall be used to calculate maximum permissible construction noise levels.

Any measured construction noise level shall not exceed any appropriate level, given in Table 9/1 below when compared to the pre-construction ambient noise level. The permissible construction noise level shall not be exceeded at any property in the surrounding area of the New Works.

In exceptional circumstances, permission may be granted to carry out works which exceed the levels given in Table 9/1 below with the agreement of the Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate, provided that the Company can demonstrate that all possible mitigation measures shall be implemented.

- 1.9 Notwithstanding the specific requirements of this Appendix 1/9, the Company shall comply with the contents of Scottish Office Roads Directorate Office Section Instruction 2/92, The Noise Insulation (Scotland) regulations 1975.

- 1.10 Notwithstanding the requirements of clause 1.7, noise monitoring shall be undertaken at 7 Brooklands Avenue, Uddingston and 18 Burnacre Gardens, Uddingston.

**Appendix 1/9: Noise Control Applicable to the New Works Site**

**TABLE 9/1: PERMISSIBLE CONSTRUCTION NOISE**

Typical Pre-Construction Ambient Noise as appropriate	Permissible Construction Noise Levels							
	Weekday working Monday to Friday excluding Public Holidays							
	Day (07.00-19.00) <i>*L<sub>Aeq,12hr</sub></i>	<i>L<sub>Amax</sub></i> (Fast)	Evening (19.00-22.00) <i>*L<sub>Aeq,3hr</sub></i>	<i>L<sub>Amax</sub></i> (Fast)	Night Hours (22.00-07.00)	Saturday (08.00-13.00) <i>*L<sub>Aeq, 5hr</sub></i>	<i>L<sub>Amax</sub></i> (Fast)	Sunday and public holidays
35	65	86	55	65	Given on request	65	86	Given on request
40	65	86	55	65		65	86	
45	65	86	60	70		65	86	
50	70	92	60	70		70	92	
55	75	96	65	75		75	96	
60	75	96	65	75		75	96	
65	75	96	65	75		75	96	
70	80	101	80	90		80	101	
75	80	101	80	90		80	101	

*\*All permissible levels should be façade.*

**Notes**

- (i) The pre-construction ambient noise level shall be the total *L<sub>Aeq</sub>* as determined from the pre-construction ambient noise assessment from all the noise sources at the measurement location over the specified period.
- (ii) Maximum sound level shall be the highest value indicated on a sound level meter. New sound level meters shall comply with EC 61672-1:2002 (BS EN 61672-1:2003 Electroacoustics; Sound Level Meters; Specifications), Class 1 or 2. For all others, compliance with BS EN 60651:1994 or its equivalents, and also to BS EN 60804:1994 if either *Leq* or *SEL* is available, to Types 0, 1 or 2.
- (iii) The measurement location shall be representative such that the measurements are representative of the noise which is experienced by the neighbouring properties and the microphone shall not be subject to any unusual screening.

**2 Vibration Control**

2.1 The Company shall consult and comply with the requirements of, Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate prior to commencement of New Works.

These requirements, together with the Company's proposed methods of work and Constructional Plant to be used shall be discussed and agreed in writing by Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate, prior to commencement of the relevant activities on Site.

### **Appendix 1/9: Noise Control Applicable to the New Works Site**

The Company shall provide Consultation Certificates in accordance with the Certification Procedure in respect of this requirement.

- 2.2 The maximum permitted peak particle velocity generated by continuous construction of the New Works shall be 5 millimetres/second measured at the property closest to the operations being carried out and applies to all operations.

Where the Construction of the Work is intermittent, the maximum permitted peak particle velocity generated shall be no greater than 10 millimetres/second.

- 2.3 Ground vibration at any Structure, property or building and otherwise affected by blasting, shall be kept within the levels given in BS 7385: Part 2. Evaluation and Measurement for Vibration in Buildings; Guide to Damage Levels From Groundbourne Vibration.

The maximum peak component particle velocity measured next to any Structure under construction shall be:

- (a) Equal to or less than a zero to peak displacement of 0.6mm/s at frequencies less than 4Hz;
- (b) Less than 15mm/s at 4Hz, rising to less than 20mm/s at 15Hz; and
- (c) Less than 20mm/s at 15Hz, rising to less than 50mm/s at 40Hz or above.

With regard to vibration, the level for up to a maximum of three blasts per day, should be 8.5mms, Monday to Friday between 10.00 hours and 16.00 hours. At any other times it should be 2.8mms.

- 2.4 The Company shall provide written details of the proposed method and periodicity of monitoring of the Vibration Dose Value, to Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council as appropriate.

### **2.5 Vibration Monitoring Equipment**

- 2.5.1 The type of instrumentation suitable for monitoring vibration shall be a digital seismograph having the following minimum specification:

- (a) Minimum sampling rate 1000 samples/second/channel;
- (b) Capable of recording Peak Particle Velocity (Directly), Peak Acceleration (Calculated), Peak;
- (c) Displacement (Calculated), Frequency at the Peak Velocity (Calculated);
- (d) Dual Mode instrument having (a) Self Triggering Mode and (b) Continuous Monitoring Mode;
- (e) Transducer - 3 orthogonally mounted transducers on one mounting unit;
- (f) Frequency Range - 4.5 to 200 Hertz;
- (g) Minimum Resolution - 0.05 millimetres/second, velocity;
- (h) Range - 0 to 100 millimetres/second, velocity;
- (i) Record of Events - hard copy printout and storage on solid state memory or disc for subsequent printout; and
- (j) Power - 240 volt mains for continuous unattended operation plus internal battery with minimum of 24 hours capacity.

## **Appendix 1/12: Setting Out and Existing Ground Levels**

### **1 Setting Out and Existing Ground Levels**

- 1.1 The Company shall be responsible for the establishment of a grid of permanent ground survey stations throughout the New Works Site.
- 1.2 The Company shall supply setting out information, including a schedule of coordinated ground survey stations to the Scottish Ministers whenever information is available, updated or revised.
- 1.3 The Company shall erect clearly marked chainage markers at 50 metre intervals at suitable locations for the duration of the New Works.
- 1.4 Before commencement of any earthworks, the Company shall establish permanent survey stations within the New Works Site for the setting out and checking of the New Works



## **Appendix 1/13: Programme of Works**

### **1 Form of Programme**

- 1.1 The Company shall provide the Construction Programme in the form of a time chainage chart supported by bar charts as follows:
- (a) The work required for the Design and the New Works shall be subdivided into individual distinct operations which shall be illustrated in the time chainage chart and the bar charts.
  - (b) The time chainage chart shall be ruled in columns and rows using a horizontal scale of chainage (minimum 1:10,000, that is, 10 millimetres wide column per 100 metres) and a vertical scale of time (minimum 5 millimetres high row per week). On the time chainage chart the Company shall plot its programmed start (date/chainage point) and finish (date/chainage point) for each milestone, and shall draw a line (the "milestone line") connecting each start point to the corresponding finish point for that operation. The milestone line shall be taken as a representation of the Company's programmed average rate of progress of that operation from its start to its finish by reference to the date and chainage at intermediate (date/chainage) points along the milestone line. At the request of the Scottish Ministers the Company shall provide further details by sub-dividing operations and showing the corresponding operation lines for each sub-division.
  - (c) Where at a particular part of the New Works there is a local concentration of individual distinct operations which cannot be satisfactorily represented by milestone lines (for example at an interchange, Structure and otherwise) such operations shall be shown on the time chainage chart as a rectangular box (the "operations box") whose diagonal is the operation line for all operations required for that part of the New Works considered en bloc. Each operations box shall be named to identify the part of the New Works to which it refers and shall show the number of the bar chart (refer below) on which these operations are illustrated.
  - (d) The time chainage chart shall show along its top a diagrammatic plan (the "diagram") showing, suitably annotated, the features of the parts of the New Works represented by the chart. The diagram shall be drawn to the same horizontal scale as the time chainage chart, and be aligned with the chainage columns of the chart in vertical projection.
  - (e) At the request of the Scottish Ministers, the Company shall provide a bar chart for any part of the New Works. Bar charts shall list the location and description of operations to which they refer and show for each listed operation a horizontal bar indicating the start, duration and stop date of that operation plotted to a horizontal scale of time. Bar charts shall be provided by the Company for all operations contained in the operations boxes. The Scottish Ministers shall have the right to require the Company to introduce additional operation boxes into the time chainage chart and the Company shall supply to the Scottish Ministers the amended time chainage chart and bar charts.
  - (f) The Company shall also provide in writing, for the Scottish Ministers, a general description of the arrangements and methods of construction which the Company proposes to adopt for carrying out the New Works, together with a detailed resources allocation histogram showing all plant labour (including site and head office staff) and materials the Company proposes to use in the construction of the New Works.

### **Appendix 1/13: Programme of Works**

1.2 The level of detail should not be less than the following:

1.2.1 Level 1

(i) DESIGN

(a) For each Structure:

- (i) Foundation;
- (ii) Substructure;
- (iii) Superstructure;

(b) Horizontal alignment:

- (i) Vertical alignment;
- (ii) Finished road levels;
- (iii) Drainage systems;
- (iv) Earthworks;
- (v) Road pavement;
- (vi) Road markings, signing, lighting and Traffic Scotland;
- (vii) Planting

(ii) CONSTRUCTION

(a) Each Structure;

(b) Earthworks - each cutting and embankment;

(c) Road works - in length not exceeding 1.0 kilometre for the Motorway and Trunk Roads, Side Roads and New Means of Access:

- (i) Fencing;
- (ii) Site clearance;
- (iii) Topsoil strip;
- (iv) Drainage (pre-earthworks and second stage);
- (v) Sub-base;
- (vi) Sub-grades improvement layer;
- (vii) Road base or concrete paving;
- (viii) Surfacing;
- (ix) Soiling and seeding

(d) Major alterations to privately and publicly owned services and supplies;

(e) Traffic management measures including operation of site accesses, plant crossing and temporary diversions;

(f) Accommodation Works;

(g) Planting

1.2.2 Level 2

(i) At least four weeks before the commencement of any item of work:

**Appendix 1/13: Programme of Works**

- (a) For each Structure;
    - (i) Piling (where appropriate);
    - (ii) Substructure;
    - (iii) Superstructure;
    - (iv) Finishes;
  - (b) Roadworks;
    - (i) As for Level 1 but intervals not exceeding 200 metres and including lighting, signing, soiling, seeding and planting, roadmarking, cabling and Traffic Scotland equipment;
    - (ii) All public alterations and additions to privately and publicly owned services and suppliers;
    - (iii) Planting to individual areas;
- 1.2.3 Level 3
- (i) Further breakdown of items and other details as may be required.
- 1.3 Schedule of Constraints
- 1.3.1 The Schedule of Constraints shall include, but shall not be limited to, the following:
- (i) compliance with technical approval procedures and Design and Design checking procedures in relation to Structures designed by the Company, including awaiting approvals, re-submissions, modifications and checking;
  - (ii) consultation and compliance with the requirements of SEPA regarding approval / consent procedures; and
  - (iii) compliance with the requirements of the Statutory Orders.

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## **Appendix 1/15: Accommodation Works**

### **1 Accommodation Works**

- 1.1 Accommodation Works that have been agreed are shown on the attached schedules and their locations on the Accommodation Works Drawings as listed in Appendix 0/4.
- 1.2 The Company shall complete Accommodation Works as early as possible after the date of commencement of the New Works and in such a manner as to minimise inconvenience and disruption to landowners and occupiers/tenants.
- 1.3 Notwithstanding this, private access shall be provided across the New Works 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.
- 1.4 The Accommodation Works Access Tracks at the various locations defined in the following schedules shall be designed to comply with the following parameters:
- i) minimum horizontal radius and curve widening to suit agricultural vehicle use. The Design shall allow for use by a tractor and trailer combination and modern combines in transportation configuration;
  - ii) access track and other surfacing shall be in accordance with paragraph 1.7.4 to Part 2 of these New Works Requirements; and
  - iii) maximum vertical gradient shall be 8 percent with the exception of Accommodation Works Access Track 11, which shall be a maximum of 11% gradient.
  - iv) The fencing and gate types in the Accommodation Works Schedules are shown on the Standard Detail drawings as listed in Appendix 0/4 or in Volume 3 of the MCHW.
  - v) Where Accommodation Works fencing is indicated along the boundary of the Land Made Available by the Scottish Ministers for the New 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 Scottish Ministers for the New Works.
  - vi) Accommodation Works fencing shall be connected to adjacent existing fencing or permanent fencing to ensure continuity of the fence.
  - vii) Where water supplies shall be provided as part of the Accommodation Works, the Company 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 and otherwise.
  - viii) The exact location of all gates, water troughs, holding pens and otherwise shall be agreed with the relevant landowner and occupier/tenant prior to installation.
  - ix) Where watercourses shall be piped as part of the Accommodation Works, the Company shall carry out the Design in accordance with these New Works Requirements.
  - x) All drains and field drains severed by the New Works shall be reconnected and a plan showing depths and sizes submitted to the relevant landowner and copied to the Scottish Ministers. All drainage and ditch systems shall be reinstated and properly tied into roadside drainages as appropriate.

**Appendix 1/15: Accommodation Works**

- xi) Where existing water troughs are removed by the New Works, or fields are severed from their water supply, the Company shall ensure that a suitable water supply and trough are provided to the satisfaction of the landowner and occupier/tenant at all times.
- xii) The installation of valve connections at public mains to provide water supplies to livestock drinking supplies shall be made by the Relevant Authority. Connections from these valves to the water supply locations shall be made by the Company using 50mm internal diameter plastic feeder pipes. These pipes shall be buried to a depth of 600mm below original or finished ground level as appropriate. The ground shall be reinstated to its original condition after the pipes are laid.
- xiii) The location of permanent fencing and accommodation works shall be in accordance with Schedule 2: Part 1 paragraph 8.3 of these New Works Requirements

**Appendix 1/15: Accommodation Works**  
**M8 Baillieston to Newhouse**

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. Owner
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/002 Rev B**

2/1	[REDACTED]
2/2	[REDACTED]
2/3	[REDACTED]
2/4	[REDACTED]
2/5	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/003**

3/1	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**Appendix 1/15: Accommodation Works**

<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/004 Rev A</b>	
4/1	[REDACTED]
4/2	[REDACTED]
4/3	[REDACTED]
4/4	[REDACTED]
4/5	[REDACTED]
4/6	[REDACTED]
4/7	[REDACTED]
4/8	[REDACTED]
4/9	[REDACTED].
4/10	[REDACTED]
4/11	[REDACTED]
4/12	[REDACTED]
4/13	[REDACTED]
4/14	[REDACTED]
4/15	[REDACTED]

**Appendix 1/15: Accommodation Works**

4/16	[REDACTED]
4/17	[REDACTED]
4/18	[REDACTED]
4/19	[REDACTED]
4/20	[REDACTED]
4/21	[REDACTED]
4/22	[REDACTED]
4/23	[REDACTED]
4/24	[REDACTED]
4/25	[REDACTED]
4/26	[REDACTED]
4/27	[REDACTED]
4/28	[REDACTED]
4/29	[REDACTED]
4/30	[REDACTED]
4/31	[REDACTED]
4/32	[REDACTED]



**Appendix 1/15: Accommodation Works**

4/33	[REDACTED]
4/34	[REDACTED]
4/35	[REDACTED]
4/36	[REDACTED]
4/37	[REDACTED]

<p><b>Owner:</b> 1. [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
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**Appendix 1/15: Accommodation Works**

<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/013 Rev B</b>	
13/1	[REDACTED]
13/2	[REDACTED].
13/3	[REDACTED]
13/4	[REDACTED]
13/5	[REDACTED]
13/6	[REDACTED]
13/7	[REDACTED]
13/8	[REDACTED]
13/9	[REDACTED]
13/10	[REDACTED].

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**Appendix 1/15: Accommodation Works**

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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/014 Rev C**

14/1	[REDACTED]
14/2	[REDACTED]
14/3	[REDACTED]
14/4	[REDACTED]
14/5	[REDACTED]
14/6	[REDACTED]
14/7	[REDACTED]
14/8	[REDACTED]
14/9	[REDACTED]

**Appendix 1/15: Accommodation Works**

14/10	[REDACTED]
14/11	[REDACTED]
14/12	[REDACTED]
14/13	[REDACTED]
14/14	[REDACTED]
14/15	[REDACTED]
14/16	[REDACTED]

<p><b>Owner:</b> [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/016**

16/1	[REDACTED]
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**Appendix 1/15: Accommodation Works**

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<p><b>Owner:</b> 1. [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/017 Rev D**

17/1	[REDACTED]
17/2	[REDACTED]
17/3	[REDACTED]
17/4	[REDACTED]
17/5	[REDACTED]

**Appendix 1/15: Accommodation Works**

17/6	[REDACTED]
17/7	[REDACTED]
17/8	[REDACTED]
17/9	[REDACTED]
17/10	[REDACTED]
17/11	[REDACTED]
17/12	[REDACTED]
17/13	[REDACTED]
17/14	[REDACTED]
17/15	[REDACTED]
17/16	[REDACTED]
17/17	[REDACTED]
17/18	[REDACTED]
17/19	[REDACTED]
17/20	[REDACTED].
17/21	[REDACTED]
17/22	[REDACTED]
17/23	[REDACTED]
17/24	[REDACTED]

**Appendix 1/15: Accommodation Works**

17/25	[REDACTED]
17/26	[REDACTED]
17/27	[REDACTED]
17/28	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. Owner
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/020</b>	
20/1	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. Owner
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/023 Rev C</b>	
23/1	[REDACTED]
23/2	[REDACTED]
23/3	[REDACTED]
23/4	[REDACTED]
23/5	[REDACTED]
23/6	[REDACTED]

**Appendix 1/15: Accommodation Works**

23/7	[REDACTED]
23/8	[REDACTED]
23/9	[REDACTED]
23/10	[REDACTED]
23/11	[REDACTED]
23/12	[REDACTED]
23/13	[REDACTED]
23/14	[REDACTED]
23/15	[REDACTED]
23/16	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1.[REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/024**

24/1	[REDACTED]
24/2	[REDACTED]
24/3	[REDACTED]
24/4	[REDACTED]



**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. Owner
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/026</b>	
26/1	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**Appendix 1/15: Accommodation Works**

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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/030 Rev C**

30/1	[REDACTED]
30/2	[REDACTED]
30/3	[REDACTED]
30/4	[REDACTED]

**Appendix 1/15: Accommodation Works**

30/5	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/033**

33/1	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/034 Rev A**

34/1	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/036**

36/1	[REDACTED]
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**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/ST3/AW/1/040</b>			
40/1	[REDACTED]		

<b>Owner:</b> 1. [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/042 Rev A</b>			
42/1	[REDACTED]		
42/2	[REDACTED]		
42/3	[REDACTED]		

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/044</b>	
44/1	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/046 Sheets 1 - 4</b>	
46/1	[REDACTED]
46/2	[REDACTED]
46/3	[REDACTED]
46/4	[REDACTED]
46/5	[REDACTED]
46/6	[REDACTED]
46/7	[REDACTED]
46/8	[REDACTED]
46/9	[REDACTED]

**Appendix 1/15: Accommodation Works**

46/10	[REDACTED]
46/11	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1.[REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/048**

48/1	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/051 Rev A**

Note:	[REDACTED]
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<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/052 Rev A**

52/1	[REDACTED]
52/2	[REDACTED]
52/3	[REDACTED]
52/4	[REDACTED]

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/054</b>			
54/1	[REDACTED]		

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/057 Rev A</b>			
57/1	[REDACTED]		

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/059 Rev A</b>			
59/1	[REDACTED]		
59/2	[REDACTED]		

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/060 Rev C</b>	
60/1	[REDACTED]
60/2	[REDACTED]
60/3	[REDACTED]
60/4	[REDACTED]
60/5	[REDACTED]
60/6	[REDACTED]
60/7	[REDACTED]
60/8	[REDACTED]
60/9	[REDACTED]
60/10	[REDACTED]
60/11	[REDACTED]
60/12	[REDACTED]



**Appendix 1/15: Accommodation Works**

60/13	[REDACTED]
60/14	[REDACTED]
60/15	[REDACTED]
60/16	[REDACTED]
60/17	[REDACTED]
60/18	[REDACTED]
60/19	[REDACTED]
60/20	[REDACTED]
60/21	[REDACTED]
60/22	[REDACTED]
60/23	[REDACTED]

<p><b>Owner:</b> [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
<p><b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/061</b></p>	
61/1	[REDACTED]

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW//1/065</b>			
65/1	[REDACTED]		

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/066 Rev A</b>			
66/1	[REDACTED]		
66/2	[REDACTED]		
66/3	[REDACTED]		
66/4	[REDACTED]		
66/5	[REDACTED]		
66/6	[REDACTED]		

**Appendix 1/15: Accommodation Works**

<p><b>Owner:</b> [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
<p><b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/067 Rev A</b></p>	
<p>Note:</p>	<p>[REDACTED]</p>

<p><b>Owner:</b> [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
<p><b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/1/068 Rev A</b></p>	
<p>68/1</p>	<p>[REDACTED]</p>
<p>68/2</p>	<p>[REDACTED]</p>

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**Appendix 1/15: Accommodation Works**

**M75 Junction 5, Raith**

<p><b>Owner:</b> 1. [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
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**Appendix 1/15: Accommodation Works**

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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/002 Rev B**

2/1	[REDACTED]
2/2	[REDACTED]
2/3	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1[REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/003 Rev A**

3/1	[REDACTED]
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<b>Owner:</b> 1. [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**Appendix 1/15: Accommodation Works**

<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/004 Rev B</b>	
4/1	[REDACTED].
4/2	[REDACTED]
4/3	[REDACTED]
4/4	[REDACTED]
4/5	[REDACTED]
4/6	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. [REDACTED]
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**Appendix 1/15: Accommodation Works**

<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/007 Rev D</b>	
7/1	[REDACTED]
7/2	[REDACTED]
7/3	[REDACTED]
7/4	[REDACTED]
7/5	[REDACTED]
7/6	[REDACTED]

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/008 Rev A</b>			
8/1	[REDACTED]		
8/2	[REDACTED]		
8/3	[REDACTED]		

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/2/012</b>			
12/1	[REDACTED]		



**Appendix 1/15: Accommodation Works**

**M8 M73 M74 Network Improvements**

<p><b>Owner:</b> [REDACTED]</p>	<p><b>Occupier:</b> 1. [REDACTED]</p>
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/4/001 Rev C**

1/1	[REDACTED]
1/2	[REDACTED]
1/3	[REDACTED]
1/4	[REDACTED]
1/5	[REDACTED]

**Appendix 1/15: Accommodation Works**

<b>Owner:</b> Glasgow City Council, City Chambers George Square Glasgow G2 1DU		<b>Occupier:</b> 1. Owner 2. Occupied by Glasgow City Council as local roads authority. Interest not being acquired 3. Occupied by the Scottish Ministers as roads authority. Interest currently held by the acquiring authority	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/4/002 Sheets 1 - 2</b>			
2/1	Provide and erect approximately 107 metres of new fence type F1 along the new field boundary. To be tied into the new fence to the West and new fence to the East.		

<b>Owner:</b> [REDACTED]		<b>Occupier:</b> 1. [REDACTED]	
<b>1. List of Works Required. Refer to Drawing No. M8MFJV/AW/4/005</b>			
5/1	[REDACTED]		

**Appendix 1/15: Accommodation Works**

5/2	[REDACTED]
5/3	[REDACTED]
5/4	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> [REDACTED]
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/4/006**

6/1	[REDACTED]
6/2	[REDACTED]
6/3	[REDACTED]
6/4	[REDACTED]
6/5	[REDACTED]
6/6	[REDACTED]

<b>Owner:</b> [REDACTED]	<b>Occupier:</b> 1. Owner
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**1. List of Works Required. Refer to Drawing No. M8MFJV/AW/4/013 Rev A**

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**Appendix 1/15: Accommodation Works**

13/1	[REDACTED]
13/2	[REDACTED]

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## **Appendix 1/16: Indicative Schedule of Diversionary Works**

### **1 Indicative Schedule of Diversionary Works**

- 1.1 Notwithstanding any information provided in this Appendix 1/16 'Indicative Schedule of Diversionary Works' for the design, construction and completion of the New Works, the Company shall consult and comply with the requirements of all Undertakers, owners of private apparatus and others affected by the New Works as necessary to determine the effect of the design, construction and completion of the New Works on Apparatus, and to arrange any Diversionary Works which, in the opinion of the Undertakers or owners of privately owned apparatus, may be necessary for or resulting from the design, construction and completion of the New Works.
- 1.2 The Company shall make arrangements with Undertakers, owners of privately owned apparatus and others affected by the New Works for the co-ordination and phasing of the design, construction and completion of the New Works with all other Undertakers works and works of others which are required to be carried out concurrently with the design, construction and completion of the New Works.
- 1.3 The Company shall make arrangements with Undertakers, owners of privately owned apparatus and others affected by the New Works for the phasing of all Diversionary Works.
- 1.4 The Company shall consult and comply with the requirements of all Undertakers, owners of private apparatus and others affected by the New Works in connection with diversion routes, road closures, and interruptions to supplies and the like while Diversionary Works are being carried out.
- 1.5 The Company shall comply with any periods of notice being given by Undertakers and owners of privately owned apparatus. Any such compliance by the Company shall not relieve the Company of any other obligations under this Agreement.
- 1.6 The Company shall satisfy itself as to the exact location of all Apparatus prior to carrying out work in any part of the Site.
- 1.7 Apparatus to individual properties have not generally been shown on the drawings listed in Appendix 0/4 to the Specification.
- 1.8 The Company shall satisfy itself that the design, construction and completion of the New Works takes account of all existing Apparatus whether or not such existing Apparatus is shown on any drawings listed in Appendix 0/4 to the Specification.
- 1.9 Disconnected Apparatus shall only be removed where the prior written consent of the Undertaker or relevant owner of private apparatus has been obtained by the Company, or where otherwise approved by the Scottish Ministers in writing.
- 1.10 The names, addresses and telephone numbers of the Undertakers and owners of privately owned apparatus with existing 'known' Apparatus in the locality of the Site include, but are not limited to, those described in Table 1/16A below as 'Known owners of Apparatus'.
- 1.11 Notwithstanding the names, addresses and telephones numbers of the known owners of Apparatus in the locality of the Site described in Table 1/16A below, or the owners of Apparatus referred to elsewhere in this Agreement, the Company shall satisfy itself as part of the design, construction and completion of the New Works that it has consulted and complied with the requirements of all Undertakers, owners of privately owned apparatus, and any others affected by the design, construction and completion of the New Works.

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## **Appendix 1/16: Indicative Schedule of Diversionary Works**

### **2 General**

- 2.1 It shall be the responsibility of the Company to agree the location of service connections or access chambers for Apparatus with the relevant Undertaker or owner of privately owned apparatus and the Scottish Ministers.
- 2.2 Wherever practical the Company shall ensure that no service connections or access chambers for Apparatus, except Traffic Scotland Equipment ("TSE"), shall be situated within the motorway boundary as delineated by the permanent motorway fence and within the trunk road boundary.
- 2.3 Wherever practical the Company shall ensure that no Apparatus, except TSE, shall be situated longitudinally within the motorway boundary as delineated by the permanent motorway fence and within the trunk road boundary.
- 2.4 The Company shall be responsible for the protection of all Apparatus during the construction and completion of the New Works and shall comply with the Special Requirements of the affected Undertakers, owners of privately owned apparatus and any other person affected by the New Works, as described in these New Works Requirements subject to approval of that Undertaker, owner of privately owned apparatus or other person affected by the New Works.
- 2.5 In respect of existing Apparatus, the Company shall raise, lower or relocate the covers of existing manholes, chambers, catchpits, gullies or otherwise where necessary and / or where resulting from the design, construction and completion of the New Works.
- 2.6 The Company shall ensure that all privately owned apparatus to be diverted shall be diverted to a standard equivalent to that which would be provided by an equivalent Undertaker or to a higher standard where this existed prior to the New Works commencing. Except for TSE, ducting, chambers and drawpits shall be provided by the Company as required to allow the service, supply or otherwise to be accessed and maintained from points wholly outwith the New Works wherever possible.
- 2.7 The Company shall be responsible for all traffic management associated with the New Works in connection with all Diversionary Works required to be carried out in accordance with this Agreement, unless otherwise agreed with the appropriate Undertaker or owner of privately owned apparatus. Provision of traffic management shall be in accordance with the requirements of Appendix 1/17.
- 2.8 Table 1/16B only lists those works to existing Apparatus that are necessary for the design, construction and completion of the New Works (Diversionary Works (Type 1)).**
- 2.8.1 The 'Design Period' and 'Design and Material Order Period' as relevant, shown in Table 1/16B shall commence when the relevant Undertaker has received the associated C6 (or equivalent) notice from the Company. The 'Duration of Material Order and Notification to Attend Site' and the 'Notification Period to Attend Site' as relevant, shown in Table 1/16B shall commence when the relevant Undertaker has received notification from the Company. It shall be the Company's responsibility to confirm all timescales with the Undertakers and others concerned.
- 2.8.2 The 'Main Works by Company' items identified for each diversion contained in Table 1/16B are those items which the Company shall design, execute and complete to enable the Diversionary Works (Type 1) identified within this Appendix 1/16 to be completed.

### **Appendix 1/16: Indicative Schedule of Diversionsary Works**

- 2.8.3 The 'Works by Undertakers' items identified for each diversion contained in Table 1/16B are those items which shall be carried out by the Undertakers, owners of privately owned apparatus, or their third party contractors to enable the Diversionsary Works (Type 1) identified within this Appendix 1/16 to be completed..
- 2.8.4 Notwithstanding the provisions of Table 1/16B, the Company shall carry out all works required in order to consult and comply with the requirements of Undertakers, owners of privately owned apparatus and others concerned, and the other provisions of the Agreement.
- 2.9 The Company shall provide setting out instructions to Undertakers and owners of privately owned apparatus, and supervise works as necessary to avoid any delay with regard to the positioning of Apparatus.
- 2.10 The Company shall notify the Scottish Ministers of all meetings between the Company and any Undertaker or owner of privately owned apparatus at least seven days in advance of such meetings to allow the Scottish Ministers the opportunity to attend the meeting as an observer.
- 2.11 The Company shall supply copies of all correspondence between the Company and any Undertaker or owner of privately owned apparatus within seven days of issue or receipt as appropriate.

**Appendix 1/16: Indicative Schedule of Diversionary Works**

**Table 1/16A – Known owners of Apparatus**

<b>Name</b>	<b>Address</b>	<b>Contact Name(s)</b>	<b>Telephone Number</b>
BT - Openreach	BT Diversionary Works PP630A Tradeston TE 72 Nelson Street Glasgow G5 8EN	[REDACTED]	[REDACTED]
Cable & Wireless	Cable & Wireless Worldwide Fibre Services - Design & Build 1 Hunter Road Kirkton Campus South Livingston EH54 7DH	[REDACTED]	[REDACTED]
Everything Everywhere	2 Masterton Way Tannochside Business Park, Uddingston Glasgow, G71 5PT	[REDACTED]	[REDACTED]
	Harlequin Limited Suite L Kirkton Business Centre Kirk Lane Livingston EH54 7AY	[REDACTED]	[REDACTED]
Scotland Gas Networks - Distribution	Scotland Gas Networks Axis House 5 Lonehead Drive Newbridge Edinburgh EH28 8TG	[REDACTED]	[REDACTED]
Scotland Gas Networks -	Scotland Gas Networks	[REDACTED]	[REDACTED]



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Name	Address	Contact Name(s)	Telephone Number
Transmission	6 Axwell House 2 Westerton Rd, East Mains Industrial Estate Broxburn West Lothian EH52 5AU		
Scottish Power - Distribution	Scottish Power Energy Networks 55 Fullerton Drive Cambuslang G32 8FA	[REDACTED]	[REDACTED]
Scottish Power - Transmission	SP Energy Networks Transmission Policy Regulation New Alderston House Dove Wynd Bellshill, ML4 3FF	[REDACTED]	[REDACTED]
Scottish Water - Sewer	Scottish Water Service Relocation Team 419 Balmore Road Glasgow G22 6NU	[REDACTED]	[REDACTED]
Scottish Water - Water	Scottish Water Service Relocation Team 419 Balmore Road Glasgow G22 6NU	[REDACTED]	[REDACTED]
Virgin Media	Virgin Media Unit 7	[REDACTED]	[REDACTED]

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**Appendix 1/16: Indicative Schedule of Diversionary Works**

Name	Address	Contact Name(s)	Telephone Number
	Bothwell Park Industrial Estate  Uddingston  G71 6NZ		

**Appendix 1/16: Indicative Schedule of Diversionary Works**

**Table 1/16B –Schedule of Diversionary Works (Type 1)**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
British Telecom – Openreach (BT)							
BT01 (BT Ref 8931A)	A89 Coatbridge Road, Bargeddie Roundabout.  Provide new 90 millimetre outer diameter 12 way duct line and associated chambers from New A89 Coatbridge Road Roundabout South verge to North verge and following new roundabout to existing A89 Coatbridge Road and crossing over to South side verge to maintain connections to Bargeddie for a length of approximately 265 metres.  Divert all copper coax and fibre cables.	UG		Design diversions.	12 weeks	4 weeks	8 Weeks
			Review diversion design.	Review diversion design.			
				Procure apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting works associated with new A89 Coatbridge Road Roundabout.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable.  Abandon Existing Apparatus.				
BT02 (BT Ref 8921B)	Rhindhouse Road  Rhindhouse Road Protection measures required to safeguard existing underground Apparatus for a total length of approximately 90 metres on the existing Rhindhouse Road and A89 Coatbridge Road. Protection measures may include concrete protection slab.	UG	Agree measures to safeguard existing apparatus with Undertaker.  Consult and comply with Undertaker's requirements.	Discuss measures to safeguard existing apparatus with Contractor.  Carry out any Undertaker Works required. Inspect and supervise.	12 weeks	4 weeks (Combined BT 02 & BT 03)	4 weeks (Combined BT 02 & BT 03)
BT03 (BT Ref 8921B)	New Swinton Roundabout  Provide new 90 millimetre outer diameter 12 way duct line and associated chambers from existing tie-	UG		Design Diversions.  Review diversion design.  Procure Apparatus for diversion.	12 weeks	4 weeks (Combined BT 02 & BT 03)	4 weeks (Combined BT 02 & BT 03)

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	in west side of new Swinton Roundabout following new roundabout to east side verge for a total length of approximately 300 metres.  Divert all existing cables into the new duct.		.	Install new ducts and chambers.  Inspect and supervise.  Install new cables. Undertake jointing, reinstatement and connection Works.  Testing and commissioning.  Recover or demolish redundant ducts.  Demolish redundant chambers. Recover redundant cable.  Abandon Existing Apparatus.			
BT04 (BT Ref 8921C)	New Cutty Sark Accommodation Bridge.  Provide new 90 millimetre outer diameter 12 way duct line and associated	UG		Design Diversions.  Review diversion design.  Procure Apparatus	12 weeks	4 weeks (Combined BT 04 & BT 05)	2 weeks (Combined BT 04 & BT 05)

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>chambers from alignment of Cutty Sark Accommodation Bridge south access track and splitting to 6 way ducts on east and west verges of accommodation bridge tying into existing connection for a total length of approximately 420 metres.</p> <p>Divert existing cables into the new duct.</p>			for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new Cutty Sark Accommodation Bridge.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works. Recover redundant cable.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
BT05 (BT Ref 8921C)	<p>New Cutty Sark Accommodation Bridge.</p> <p>Provide new 90 millimetre outer diameter 8 way duct line and associated chambers on east verge of Cutty Sark Accommodation Bridge north access track following new eastbound A8 APR verge and tie-ing into existing connection for a total length of approximately 230 metres.</p> <p>Divert existing cables into the new duct.</p>	UG		Design Diversions.	12 weeks	4 weeks (Combined BT 04 & BT 05)	2 weeks (Combined BT 04 & BT 05)
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new Cutty Sark Accommodation Bridge.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
	Demolish redundant chambers. Recover redundant cable.						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			Abandon Existing Apparatus.				
BT06 (BT Ref 8921E)	New A752 Aitkenhead Road Underbridge.  New A752 Aitkenhead Road Underbridge Protection measures required to safeguard existing west side underground Apparatus for a total length of approximately 55 metres on the northbound section of the new A752 Aitkenhead Road Underbridge Protection measures may include concrete protection slab.	UG	Agree measures to safeguard existing apparatus with Undertaker.	Discuss measures to safeguard existing apparatus with Contractor.	12 weeks	4 weeks (Combined BT 06, BT 07 & BT 08)	2 weeks (Combined BT 06, BT07 & BT 08)
			Consult and comply with Undertaker's requirements.	Carry out any Undertaker Works required. Inspect and supervise.			
BT07 (BT Ref 8921E)	New A752 Aitkenhead Road Underbridge.  Protection measures required to safeguard existing east underground Apparatus for a total length of approximately 55 metres on the northbound section of the new A752 Aitkenhead	UG	Agree measures to safeguard existing apparatus with Undertaker.	Discuss measures to safeguard existing apparatus with Contractor.	12 weeks	4 weeks (Combined BT 06, BT 07 & BT 08)	2 weeks (Combined BT 06, BT07 & BT 08)
			Consult and comply with Undertaker's requirements.	Carry out any Undertaker Works required. Inspect and supervise.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Road Underbridge. Protection measures may include concrete protection slab.						
BT08 (BT Ref 8921E)	Old Monkland South Access Road. Provide new 90 millimetre outer diameter singleway way duct line and associated chambers from existing A752 Aitkenhead Road tie-in following Old Monkland South Access Road to tie-in North of Bankhead Farm for a total length of approximately 735 metres. Divert existing cables into the new duct.	UG		Design Diversions.	12 weeks	4 weeks (Combined BT 06, BT 07 & BT 08)	2 weeks (Combined BT 06, BT07 & BT 08)
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with Old Monkland South Access Road.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
	Testing and						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT09 (BT Ref 8921G)	New Shawhead Junction.  Provide new 90 millimetre outer diameter 6 way duct line and associated jointing chambers from existing A725 North Road tie-in following eastbound merge and diverge of new A8 APR total length of approximately 430 metres.  Provide new 90 millimetre outer diameter 6 way duct line and associated chambers crossing new A8 APR following the verge of the Carnbroe Pedestrian/Cycle Route and then following new North Road Side Road verge for a total length of approximately	UG		Design Diversions.	12 weeks	8 weeks	10 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new Shawhead Junction.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	780 metres. Divert copper and coax cables.			Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT10 (BT Ref 8921H)	North Eurocentral Junction. Provide new 90 millimetre outer diameter 8 way duct line and associated jointing chambers from new Eastbound A8 APR merge slip road verge to new roundabout for a total length of approximately 465 metres. Divert copper and coax cables.	UG		Design Diversions.	12 weeks	8 weeks	10 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new North Eurocentral Junction.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT11 (BT Ref 8921H)	North Eurocentral Junction. Provide new 90 millimetre outer diameter 8 way duct line and associated jointing chambers from new Eastbound A8 APR diverge slip road verge to new roundabout for a total length of approximately 470 metres.  Divert copper and coax cables.	UG		Design Diversions.	12 weeks	8 weeks	10 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new North Eurocentral Junction.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish	Install new cables.						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			redundant ducts.	Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT12 (BT Ref 8921H)	North Eurocentral Junction.  Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from tie-in on north side of retained Eurocentral Overbridge to new roundabout for a total length of approximately 140 metres.  Divert copper and coax cables.	UG		Design Diversions.	12 weeks	8 weeks	10 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new North Eurocentral Junction.	Install new ducts and chambers.			
Inspect and supervise.	Inspect and supervise.						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT13 (BT Ref 8921i)	South Eurocentral Junction. Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from tie-in on south side of retained Eurocentral Overbridge crossing Overbridge and following new roundabout junction from new A8 APR westbound diverge to Parklands Avenue Junction for a total length of approximately 165 metres. Divert copper and coax cables.	UG		Design Diversions.	12 weeks	4 weeks	6 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new South Eurocentral Junction.	Install new ducts and chambers.			
Inspect and	Inspect and						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			supervise.	supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT14 (BT Ref 8921i)	South Eurocentral Junction. Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from new Parklands Avenue access south verge to new roundabout junction and tie-into new works (Ref BT13) for a total length of approximately 115 metres. Divert copper and coax cables.	UG		Design Diversions.	12 weeks	4 weeks	6 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new South Eurocentral Junction.	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT15 (BT Ref 8921i)	South Eurocentral Junction. Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from new tie-in of BT013 and BT 014 following new roundabout junction to new Townhead Avenue dual carriageway south verge and tie-ing into existing connection on west side of Townhead Avenue dual carriageway for a total length of approximately 270	UG		Design Diversions.	12 weeks	4 weeks	6 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new South Eurocentral	Install new ducts and chambers.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	metres. Divert copper and coax cables.		Junction				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT16 (BT Ref 8931j)	Chapelhall Junction. Provide new 90 millimetre outer diameter 8 way duct line and associated jointing chambers from new tie-in BT 010 following new A8 APR eastbound verge to new North Chapelhall Junction roundabout. Provide new 90 millimetre outer diameter 8 way duct	UG		Design Diversions.	12 weeks	8 weeks	12 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	line and associated jointing chambers from continuation of new tie-in from New North Chapelhall Junction roundabout to new North B799 Bo'Ness roundabout with three crossings and following east verge of new B799 Bo'Ness Road to new South B799 Bo'Ness roundabout.  A total length of approximately 2485 metres for all diversions associated with BT 016.  Divert all copper and coax cables.		associated with new Chapelhall Junction.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT17 (BT Ref 8931j)	Chapelhall Junction.  Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from continuation of new tie-in at BT016 following existing north	UG		Design Diversions.	12 weeks	8 weeks	12 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	verge of Rowantree Avenue to existing west verge of Lauchope Road and tie-ing in with south side of M8 duct crossing for a total length of approximately 1065 metres.  Divert all copper and coax cables.		management.				
			Consult and comply with the requirements of BT in relation to ducting Works associated with new Chapelhall Junction.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT18 (BT Ref)	B799 Bo'Ness Road Junction.  Provide new 90 millimetre	UG		Design Diversions.  Review diversion design.	12 weeks	12 weeks	16 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate	
8931k)	outer diameter 4 way duct line and associated jointing chambers from continuation of new tie-in at BT016 and BT017 at new south B799 Bo'Ness Road roundabout and three associated crossings to existing north verge of existing McNeil for a total length of approximately 375 metres.  Divert all copper and coax cables.			Procure Apparatus for diversion.				
				Install new ducts and chambers.				
				Inspect and supervise.				
				Recover or demolish redundant ducts.				Install new cables. Undertake jointing, reinstatement and connection Works.
								Testing and commissioning.
Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.								
BT19 (BT Ref 8931k)	B977 Bo'Ness Road Junction.  Provide new 90 millimetre outer diameter 4 way duct line and associated jointing chambers from west verge of existing B799 Bo'Ness	UG		Design Diversions.	12 weeks	12 weeks	16 weeks	
				Review diversion design.				
				Procure Apparatus for diversion.				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Road south of new south B977 Bo'Ness Road roundabout to new tie-in at BT018 for a total length of approximately 65 metres.  Divert all copper and coax cables.			Install new ducts and chambers.  Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT20 (BT Ref 10823)	New Bothwellpark Road Bridge.  Provide new 90 millimetre outer diameter singleway way duct line and associated chambers for east verge of new Bothwellpark Road Bridge for a total length of approximately 300 metres.  Divert all copper and fibre	UG		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	cables.		associated with new Raith Interchange.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT21 (BT Ref 10823)	Raith Interchange. Provide new 90 millimetre outer diameter duct line and associated boxes from existing tie-in at west verge of Bellshill Road continuing northwards and crossing M74 Motorway Northbound Merge following new Raith Interchange Roundabout over M74 Motorway and crossing A725 Diverge and	UG		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	continuing on west verge of A725 and crossing A725 and new pedestrian/cycleway to east verge and continuing southwards to new Raith Interchange roundabout for a total length of approximately 1475 metres.  Divert all copper and coax cables.		associated with new Raith Interchange.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT22 (BT Ref 8931L)	Orchard Farm and Orchard Farm Road Overbridge  Provide new jointing chamber and associated boxes from existing tie-in north west of Orchard Farm and south of new Orchard Farm Road Overbridge.  Divert all copper and coax cables necessary.	UG		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to ducting Works	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			associated with new Raith Interchange.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT23 (BT Ref 8931M)	New Access Road at Chapelhall Junction. Woodhall Cottage Road  Provide new temporary cabling between existing poles located north of existing M8 Motorway and continuing northwards to Woodhall Cottage. Recover overhead cabling.	UG		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to	Install new ducts and chambers.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Provide new 90 millimetre outer diameter duct line and associated boxes from Woodhall Cottage continuing eastwards south verge of new Woodhall Cottage alignment at Chapelhall Junction and tie into new proposed works BT16 (BT Ref 8931J) for a total length of approximately 625 metres.</p> <p>Divert all copper and coax cables.</p>		ducting Works associated with new Raith Interchange.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT24 (BT Ref 8931P)	<p>Raith Junction and Strathclyde Country Park</p> <p>Provide and erect new overhead apparatus and poles away from new access track north of Strathclyde Country Park and tie into existing overhead cabling for a total length of approximately 125 metres. Recover overhead</p>	OH		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of BT in relation to	Install new ducts and chambers.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	cabling.		ducting Works associated with new Raith Interchange.				
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT 25 (BT Ref: 8931Q)	Showcase Cinema Build footway chambers and temporarily divert armoured cable along fence line	UG		Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
				Install new ducts			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT26 (BT Ref: 19426)	Shawhead Junction.  Temporarily divert all existing copper and fibre cables into temporary duct route laid by contractor around Shawhead Junction.  This duct will be abandoned on completion of permanent diversion.			Design Diversions.	12 weeks	4 weeks	8 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply	Install new ducts			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			with the requirements of BT in relation to ducting Works associated with Shawhead Junction.	and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
BT27	Blantyre Farm Road Uddingston. Six way duct line in footpath to be protected	UG	Provide protection to BT Duct		TBC	TBC	TBC
BT28	West of Ballieston. 4 No. 150mm ducts located	UG	Provide protection to BT Duct		TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	in eastbound side embankment to be protected						
Cable and Wireless							
CW01	<p>Raith Interchange.</p> <p>Provide two new 90 millimetre outer diameter ducts and associated chambers in west verge of Bellshill Road following north side of new Raith Interchange and continuing on north verge of Bellshill Road crossing existing railway bridge to diverge slip road to Hamilton Road for a length of approximately 370 metres.</p> <p>Provide new chambers along length of new ducts at road crossings and at changes in direction of 90 degrees or more.</p>	UG		Design Diversions.	8 weeks	TBC	20 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of CW in relation to ducting Works associated with new Raith Interchange.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works. Demolish redundant chambers. Recover						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				redundant cable.			
CW02	<p>Shawhead Junction.</p> <p>Phase 1</p> <p>Provide new 90 millimetre outer diameter ducts and associated chambers in west verge of existing A725 and continuing on west verge of temporary A725 road and tie-ing in with existing A725 roundabout connection for a length of approximately 1125 metres.</p> <p>Phase 2</p> <p>Provide new 90 millimetre outer diameter ducts and associated chambers in west verge of existing A725 and continuing on west verge of new A725 Diverge Slip Road to M8 Motorway and crossing A725 Diverge Slip Road to west verge of A725 road and tie-ing in with existing A725 roundabout connection for a length of</p>	UG		Design Diversions.	8 Weeks	TBC	20 Weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of CW in relation to ducting Works associated with new Shawhead Junction Interchange.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works. Demolish redundant chambers. Recover redundant cable.						
	Testing and						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	approximately 1200 metres. Provide new chambers along length of new ducts at road crossings and at changes in direction of 90 degrees or more.		Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.	commissioning.			
CW03	B799 Bo'Ness Road Roundabout and McNeil Drive  Provide new 90 millimetre outer diameter ducts and associated chambers in verge of existing B977 Bo'Ness Road and continue on Bo'Ness Road Roundabout and tie into existing network on McNeil Drive. For a length of approximately 465 metres.  Provide new chambers along length of new ducts at road crossings and at changes in direction of 90 degrees or more.	UG		Design Diversions.	8 weeks	TBC	20 weeks
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of CW in relation to ducting Works associated with new Shawhead Junction Interchange.	Install new ducts and chambers.			
	Inspect and supervise.	Inspect and supervise.					
CW04	Shawhead Junction	UG		Design Diversions.	8 weeks	TBC	20 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Provide diversion of existing cabled route on the B7070/A725 which is routed through the proposed Virgin Media temporary diversion and permanent diversions respectively.  Provide installation of 1no. optical fibre cable, testing, change over of traffic to new cable and recovery of redundant cable when all changeovers are completed.		Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of CW in relation to ducting Works associated with new Shawhead Junction Interchange.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
			Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works. Demolish redundant chambers. Recover redundant cable.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover				



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			redundant cable. Abandon Existing Apparatus.				
CW05	Eurocentral Junction  Provide new 90 millimetre outer diameter ducts and associated chambers in the east verge of the new realigned Townhead Avenue from the exiting tie in at the existing Townhead Avenue Roundabout to the southside of the new Eurocentral Junction and around the new southside Eurocentral Junction roundabout tie-ing in to the existing cable and wireless appartus within the existing Eurocentral bridge. For a length of approximately  Provide new chambers along length of new ducts at road crossings and at	UG		Design Diversions.	TBC	TBC	TBC
			Review diversion design.	Review diversion design.			
				Procure Apparatus for diversion.			
			Provide traffic management.				
			Consult and comply with the requirements of CW in relation to ducting Works associated with new Shawhead Junction Interchange.	Install new ducts and chambers.			
			Inspect and supervise.	Inspect and supervise.			
Recover or demolish redundant ducts.	Install new cables. Undertake jointing, reinstatement and connection Works. Demolish redundant chambers. Recover						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	changes in direction of 90 degrees or more			redundant cable.			
				Testing and commissioning.			
			Demolish redundant chambers. Recover redundant cable. Abandon Existing Apparatus.				
Everything Everywhere							
EE01	Between Eurocentral Junction and Chapelhall Junction on the North side of the new M8 motorway.  Provide new mast with associated cabling and connections North of existing mast STR0148 located in the field North of the new M8 motorway between Eurocentral and Chapelhall Junctions.  Abandon/ decommission existing apparatus located	UG/OH		Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)  Provide traffic management.  Install new mast and cables	<b>Indicative timescale - circa 15/18 months</b>		
			Inspect and supervise.				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	North of the new M8 motorway between Eurocentral and Chapelhall Junctions.			Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
				Abandon/ decommission existing apparatus			
EE02	To the East of Newhouse Junction on the South side of the new M8 motorway.  Provide new mast with associated cabling and connections South West of existing mast STR0039 located in the field South of the new M8 motorway to the East of Newhouse Junction.  Abandon/ decommission existing apparatus located South of the new M8 motorway to the East of	UG/OH		Review design diversion.			<b>Indicative timescale - circa 15/18 months</b>
				Obtain necessary wayleaves/ purchase land (where required)			
				Install new mast and cables			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Newhouse Junction.			Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
				Abandon/ decommission existing apparatus			
<b>Scottish Power Distribution</b>							
SPD01 (Scottish Power Ref: QAS 46754 Sheet 1)	Bargeddie Roundabout and A89 Coatbridge Road Provide two High Voltage ST Joints and provide 185 High Voltage cable diversion around north side of new Bargeddie roundabout and connect into existing Scottish Power High Voltage cable on A89 Coatbridge Road for a length of approximately 205 metres. Any existing apparatus to be	UG		Design diversion	16 weeks	12 weeks	8 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic	Undertake			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	abandoned. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.		Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD02 (Scottish Power Ref: QAS 46754	Bargeddie Roundabout and A89 Coatbridge Road Provide two ST Joints and 12pr pilot joints. Provide two 185 High	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
Sheet 1)	Voltage cable diversion around south side of new Bargeddie roundabout and provide four 12pr Pilots within five 150 millimetre ducts installed by the contractor and connect into existing Scottish Power High Voltage cable on A89 Coatbridge Road for a length of approximately 255 metres and the other High Voltage cable connecting into new High Voltage Terminal Pole for a length of approximately 185 metres.  Any existing apparatus to be abandoned.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.			required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				jointing works			
				Testing and commissioning			
SPD03 (Scottish Power Ref: QAS 46754 Sheet 1 and Sheet 2)	Bargeddie Roundabout, A8 APR and new M8 Motorway  Provide new 11Kv overhead line diversion from new High Voltage Terminal Pole on Eastbound Slip Road verge to new A8 APR crossing new A8 APR and new M8 Motorway in High Voltage cable with 150 millimetre duct line provided and installed by the contractor.  Diversion cabling continues along existing access track with new up-over pole with fuses provided as well as High Voltage Joint on existing cable at Electric Substation on south side of Junction.  Diversion approximately 610	OH		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated			

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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	metres in length. Any existing apparatus to be abandoned. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.		Scottish Power Distribution.	equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SP04 (Scottish Power Ref: QAS 46754 Sheet 2)	New Bredisholm Road Overbridge Provide 185 High Voltage cable diversion from new up-over pole with fuses at existing access road to new Bredisholm Road overbridge and tie into existing network at existing railway bridge with a High Voltage ST Joint for a length of approximately	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			



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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	330 metres. Any existing apparatus to be abandoned. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.			Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD05 (Scottish Power Ref:	New M8 Motorway Provide 185 High Voltage cable diversion from south	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
QAS 46754 Sheet 2)	side of existing railway bridge along westbound verge of new M8 motorway to connection at A8 lighting terminal for approximately 165 metres in length.  Any existing apparatus to be abandoned.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.			section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				jointing works			
				Testing and commissioning			
SPD06 (Scottish Power Ref: QAS 46754 Sheet 2)	New M8 Motorway and Cutty Sark South Access Road  Provide 185 High Voltage cable diversion from A8 Lighting Joint provided at south side of existing railway bridge along westbound verge of new M8 motorway and Cutty Sark south Access Track crossing A752 Aitkenhead Road and provide new High Voltage Overhead line over North Calder. Provide 25kVaa 1ph Pmtx and 95 (3) W/form cable and tie into existing network at dog kennels.  Diversion approximately 1230 metres in length.  Any existing apparatus to be	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			

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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	abandoned. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.			Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD07 (Scottish Power Ref: QAS 46754 Sheet 2)	New M8 Motorway Provide 95(3) W/form cable diversion from existing A8 Lighting Joint on south side of new M8 Motorway and crossing over new M8 Motorway for approximately 110 metres in length. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic	Undertake			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Any existing apparatus to be abandoned.		Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and As SPD01supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD08 (Scottish Power Ref: QAS 46754 Sheet 2)	New M8 Motorway and Rosebank House Provide 95(3) W/form cable diversion from new Rosebank House 50kVa 3ph Pmtx Joint on south	UG		Design diversion Obtain necessary wayleaves and section 37 consents. (where required)	As SPD01	As SPD01	As SPD01

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>side of new M8 Motorway and new M8 Motorway and immediately east of existing Aitkenhead Road crossing the new M8 Motorway and tie-ing into existing network for Rosebank House for approximately 100 metres in length.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned.</p>		<p>Review diversion design</p>	<p>Review diversion design</p>			
				<p>Procure Apparatus for diversion</p>			
			<p>Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.</p>	<p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p>			
				<p>Inspect and supervise</p>			
				<p>Abandon/ decommission any existing apparatus</p>			
				<p>Undertake connection and jointing works</p>			
				<p>Testing and</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				commissioning			
SPD09 (Scottish Power Ref: QAS 46754 Sheet 2)	<p>New M8 Motorway</p> <p>Provide 185 High Voltage cable diversion from new main line (SPD06) and tying into existing network south over North Calder Water for approximately 95 metres in length.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned.</p>	UG		Design diversion	As SPD01	As SPD01	As SPD01
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
	Inspect and supervise						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD10 (Scottish Power Ref: QAS 46755 Sheet 3)	New M8 Motorway and Accommodation Bridge for Bankhead Farm  Provide new 50kVa PTE to a new terminal pole, stays and earthing and terminate existing Low Voltage conductor and xlpe crucifix for new High Voltage cable on westbound verge of new M8 motorway and provide a new High Voltage Terminal pole, crucifix, 2no. stays and earthing on north side of M8 motorway at access bridge for Bankhead Farm.	UG		Design diversion	16 weeks	12 weeks	16 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate	
	<p>Dismantle and recover existing Low Voltage conductor poles and stays.</p> <p>Excavate unmade Road verge and lay 185 (3) xlpe and 150 millimetre diameter duct at M8 motorway road crossing (Accommodation Bridge for Bankhead Farm) and westbound verge on new access road for approximately 490 metres in length.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned.</p>		Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment				
				Inspect and supervise				
					Abandon/ decommission any existing apparatus			
					Undertake connection and jointing works			
					Testing and commissioning			
SPD11 (Scottish Power Ref:	New M8 Motorway and Shawhead Farm Provide new High Voltage	OH		Design diversion Obtain necessary wayleaves and	As SPD10	As SPD10	As SPD10	

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
QAS 46755 Sheet 3)	L10 overhead line from new High Voltage terminal pole at north side of M8 motorway at access bridge for Bankhead Farm and continuing eastwards towards Shawhead Farm for approximately 620 metres in length.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned.			section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				jointing works			
				Testing and commissioning			
SPD12 (Scottish Power Ref: QAS 46755 Sheet 3)	Shawhead Farm Provide new 50Kva pte (Rosepark C/B) to new pole location one span back to replace existing PTE for new M8 motorway layout. Terminate 95(3)wf to 200A fuse. Provide new terminal pole, 4no. stays and earthing.  Dismantle and recover existing Low Voltage conductor, poles and stays.  Excavate agricultural track and lay 95(3)wf joint onto existing Low Voltage underground service feeding Shawhead Farm for approximately 105 metres in length.  Scottish Power to undertake excavation for any High	UG		Design diversion	As SPD10	As SPD10	As SPD10
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned.		Distribution.				
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD13 (Scottish Power Ref: QAS 76911 Sheet 4)	Shawhead Junction and Kirkshaw Road  Provide new 33kV cable, 2no.33kV cable circuits installed along carriageway and joint 2no. new 33kV cables to existing circuits on	UG/OH		Design diversion	16 weeks	12 weeks	12 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Kirkshaw Road and Hagmill Crescent for approximately 1050 metres in length crossing North Road.</p> <p>Construct new 33kV Overhead Lines across existing A8 and new M8 motorway and install 2no. new 33kV Terminal Poles and 2no. Angled Section Poles on westbound verge of new M8 motorway and tie in to existing overhead lines for approximately 720 metres in length.</p> <p>Disconnect and remove existing 33kV Overhead Line that crosses through new Shawhead Junction.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and</p>		<p>Review diversion design</p>	<p>Review diversion design</p>			
				<p>Procure Apparatus for diversion</p>			
			<p>Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.</p>	<p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p>			
				<p>Inspect and supervise</p>			
				<p>Abandon/ decommission any existing apparatus</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	install any duct for cabling. Any existing apparatus to be abandoned.			Undertake connection and jointing works			
				Testing and commissioning			
SPD14 (Scottish Power Ref: QAS 76911 Sheet 4)	New M8 motorway and North Road  Provide Joint 2no. new 33kV cable circuits and 2no. new 19pr pilot cables to existing circuits at existing northbound verge of North Road crossing North Road and new M8 motorway and connect to existing circuits west of North Calder Water for approximately 350 metres in length.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and	UG		Design diversion	As SPD13	As SPD13	As SPD13
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	install any duct for cabling. Any existing apparatus to be abandoned.		requirements of Scottish Power Distribution.	equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD15 (Scottish Power Ref: QAS 76911 Sheet 4)	New M8 Motorway and Carnbroe Road  Provide/Divert High Voltage Overhead Lines at Carnbroe Road for approximately 175 metres and relocate Borebridge PTE and reconnect Low Voltage Overhead Line and crossing New M8 motorway and tie-	OH		Design diversion	As SPD 13	As SPD13	As SPD 13
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>ing into existing Low Voltage service to Carnbroe Mains Farm for approximately 180 metres in length.</p> <p>Disconnect and remove High Voltage Overhead Line.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned.</p>			Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD16 (Scottish Power Ref:	Carnbroe Footpath and Orchard Farm Provide new L10 Overhead	UG/OH		Design diversion	16 weeks	12 weeks	2 weeks
				Obtain necessary wayleaves and			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
QAS 46758 Sheet 5 Part 1)	Line next to new Carnbroe Footpath for approximately 290 metres in length. Erect new High Voltage Terminal pole and stays, terminating existing High Voltage conductor and providing a new conductor connecting at start of diversion. Provide a new High Voltage terminal and terminate 95(3)xlpe cable where new cable is to be laid.  Excavate unmade Road verge at Carnbroe Footpath and lay 95(3)xlpe and pull through duct at railway bridge for approximately 250 metres in length.  Terminate the new 95(3)xlpe of existing New Mount PTE at Orchard Farm.  Remove existing Low Voltage poles, conductor and stays that cross the A8 APR and connect to			section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Orchard Farm. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling. Any existing apparatus to be abandoned.			jointing works Testing and commissioning			
SPD17 (Scottish Power Ref: QAS 46758 Sheet 5 Part 1)	Carnbroe Road Excavate 2no. of blacktop jointbays and 2no. of Low Voltage breach joints at A8 Slip Road to Carnbroe Road and excavate approximately 40 metres of blacktop track and lay 185(4)wf cable. Provide Low Voltage Blacktop jointbay and Low Voltage breach joint. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling. Any existing apparatus to be	UG		Design diversion	As SPD16	As SPD16	As SPD16
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	abandoned.		accordance with the requirements of Scottish Power Distribution.	associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD18 (Scottish Power Ref: QAS 46758 Sheet 5 Part 2)	Eurocentral Junction Provide new 50kVA PTE pole and earth north of Eurocentral Junction and terminate 2no. 185(3)x1pe and 1no. 95(3)wf for unmetered supplies. Excavate approximately 250 metres in length of unmade road verge around west side	UG		Design diversion	16 weeks	8 weeks	2 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>of North Eurocentral Junction Roundabout and lay 185(3)wf cable. Provide High Voltage Unmade Road Verge Jointbay and High Voltage Straight Joint.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned</p>			Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD19 (Scottish Power Ref:	Eurocentral Junction Provide new 50kVA PTE pole and earth north of	UG		Design diversion	As SPD16	As SPD16	As SPD16
				Obtain necessary wayleaves and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
QAS 46758 Sheet 5 Part 2)	Eurocentral Junction and terminate 2no. 185(3)x1pe and 1no. 95(3)wf for unmetered supplies. Excavate approximately 230 metres in length of unmade road verge around west side of North Eurocentral Junction Roundabout and lay 185(3)wf cable. Provide Low Voltage Unmade Road Verge Jointbay, Low Voltage Breech Point and Low Voltage Potend. Provide 2no. 50 millimetre duct where diversion crosses road at 3no. locations. Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling. Any existing apparatus to be abandoned			section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				jointing works			
				Testing and commissioning			
SPD20 (Scottish Power Ref: QAS 46758 Sheet 5 Part 3)	Townhead Avenue and Parklands Avenue  Provide and excavate approximately 600 metres of unmade Road Verge track and lay 2no. 185(3)xlpe cable along Townhead Avenue providing 2no. unmade Road Verge jointbays and 2no. High Voltage Straight Joints. Diversion continues along South side of new Eurocentral South Roundabout and ties into Parklands Avenue providing 2no. unmade road Verge Jointbays and 2no. High Voltage Straight Joints.  Lay 150 millimetre duct at road crossing over Townhead Avenue.  Scottish Power to undertake	UG		Design diversion	16 weeks	8 weeks	4 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
	Inspect and supervise						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned			Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD21 (Scottish Power Ref: QAS 46758 Sheet 5 Part 4)	Townhead Avenue and Woodside Roundabout  Provide 2no. Blacktop Jointbays, 1no. Pilot Joints and 1no. High Voltage Joint on verge of Townhead avenue for connection to existing network. Provide and excavate approximately 65 metres in length of 2no. blacktop track and lay 300(3)xlpe and 7pr pilot cable respectively on verge of Townhead Avenue Road.  Provide 2no. Blacktop Jointbays, 1no. High Voltage Straight Joint and	UG		Design diversion	As SPD20	As SPD 20	As SPD20
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay	Undertake excavation and lay ducts outwith LMA. Install new poles,			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>1no. Pilot Joint connecting into existing network on verge of Townhead Avenue Road.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned</p>		ducts.	<p>cables and associated equipment</p> <p>Inspect and supervise</p> <p>Abandon/ decommission any existing apparatus</p> <p>Undertake connection and jointing works</p> <p>Testing and commissioning</p>			
SPD22 (Scottish Power Ref: QAS 46758 Sheet 5 Part 4)	<p>Townhead Avenue and Woodside Roundabout</p> <p>Provide 2no. Blacktop Jointbays, 1no. Pilot Joints and 1no. High Voltage Joint on verge of Townhead Avenue for connection to existing network.</p> <p>Provide and excavate approximately 65 metres in</p>	UG	<p>Review diversion design</p>	<p>Design diversion</p> <p>Obtain necessary wayleaves and section 37 consents. (where required)</p> <p>Review diversion design</p>	As SPD20	As SPD20	As SPD20



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>length of 2no. blacktop track and lay 300(3)xlpe and 7pr pilot cable respectively on verge of Townhead Avenue Road.</p> <p>Provide and excavate 2no. 40 metres in length of 150 millimetre of duct</p> <p>Lay 1no. 300(3)xlpe and 1no. 7pr cable crossing over Townhead Avenue and connect back into existing network.</p> <p>Diversion connects back into existing network providing 2no. Blacktop Jointbays, 1no. Pilot Joints and 1no. High Voltage Joint on opposite verge of Townhead avenue.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be</p>			<p>Procure Apparatus for diversion</p> <p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p>			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	abandoned						
SPD23 (Scottish Power Ref: QAS 50703 Sheet 6)	<p>Chapelhall Junction and B799 Bo'Ness Road</p> <p>Provide 3no. unmade road verge Jointbays and 1no. High Voltage Joint, 2no. Pilot Joints at verge of Woodhall Mill Road to existing connection.</p> <p>Provide and excavate unmade track and lay 1no. 185(3)xple and 2no. 19pr pilot cables. Pull through ducts at road crossings. Continue diversion around new Chapelhall Junction Roundabouts and crossing new M8 motorway on Chapelhall Junction Overbridge for approximately 1250 metres in length. Provide ducts where diversion crosses new road at Junction. Diversion to tie-in to existing network at verge on existing</p>	UG		Design diversion	16 weeks	12 weeks	8 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
	Inspect and supervise						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>B799 Bo'Ness Road providing 2no. unmade road verge Jointbays and 2no. Pilot Joints.</p> <p>At new M8 motorway diversion crossing on Eurocentral Junction Overbridge provide and excavate unmade road verge and lay 95(3)wf cable, 2no. svc joints and cable for SLCP. Pull through ducts at road crossing.</p> <p>Erect a new 50kVA PTEto replace existing Ashlea Mine PTE. Terminate 1no. High Voltage and Low Voltage Terminal and install earth and stays.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned</p>			<p>Abandon/ decommission any existing apparatus</p> <p>Undertake connection and jointing works</p> <p>Testing and commissioning</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SPD24 (Scottish Power Ref: QAS 46759 Sheet 7 Part 1)	<p>A8 APR and Howden Avenue</p> <p>Provide and excavate 2no. High Voltage unmade Road verge Jointbays and 2no. High Voltage Straight Joints on eastbound verge of A8 APR to connect existing network and supply 150 millimetre duct and pull through 2no. 185(3)xlpe cable for approximately 80 metres in length.</p> <p>Continue diversion by excavating approximately 2no. 60 metres in length of unmade Road verge and lay 2no. 185(3)xlpe cable parallel to Howden Avenue and connect into existing network by excavating 2no.High Voltage unmade Road verge Jointbays and 2no. High Voltage Straight Joints.</p> <p>Scottish Power to undertake excavation for any High</p>	UG		Design diversion	12 weeks	8 weeks	3 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
	Abandon/ decommission any						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned			existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD25 (Scottish Power Ref: QAS 46759 Sheet 7 Part 1)	A8 APR and Howden Avenue  Provide 1no. Low Voltage Unmade Road Verge Jointbay and 1no. Low Voltage Potend High Voltage on eastbound verge of A8 APR to connect existing network and pull through 1no. 185(3)xlpe cable in new 150 millimetre duct for approximately 80 metres in length.  Continue diversion by excavating approximately 30 metres in length of unmade Road verge and lay 185(3)wf cable parallel to Howden Avenue and	UG		Design diversion	As SPD24	As SPD24	As SPD24
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	connect into existing network by providing 1no. Low Voltage unmade Road verge Jointbay, 1no. Low Voltage Breech Joint and 1no. Low Voltage Potend.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned			equipment  Inspect and supervise  Abandon/ decommission any existing apparatus  Undertake connection and jointing works  Testing and commissioning			
SPD26 (Scottish Power Ref: QAS 46759 Sheet 7 Part 2)	Rowantree Row  Provide and excavate approximately 60 metres of unmade Road verge and lay 185(3)xlpe cable from new PTE to start of the new M8 motorway. Terminate 185(3)xlpe cable to existing Rowantree Row PTE.  Supply 150 millimetre duct crossing new M8 motorway	UG		Design diversion  Obtain necessary wayleaves and section 37 consents. (where required)  Review diversion design  Procure Apparatus for diversion	As SPD24	As SPD24	As SPD24

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	and pull through approximately 110 metres in length of 185(3)xlpe cable to other side of road verge. Excavate approximately 40 metres in length of unmade road verge and lay 185(3)xlpe cable and connect into existing network providing High Voltage Road Verge Jointbay and High Voltage Straight Joint.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned		Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD27 (Scottish Power Ref: QAS 46759	Rowantree Row  Provide and excavate 3no. Pilot unmade Road Verge Jointbays and 3no. Pilot Joints at verge of new M8	UG		Design diversion	As SPD24	As SPD24	As SPD24
				Obtain necessary wayleaves and section 37 consents. (where			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
Sheet 7 Part 2)	<p>motorway.</p> <p>Supply 150 millimetre duct crossing new M8 motorway and pull through approximately 110 metres in length of 1no. 4pr pilot cable and 2no. 12pr pilot cable to other side of road verge. Connect diversion into existing network providing 3no. Pilot unmade Road Verge Jointbays and 3no. Pilot Joints.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned</p>			required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Testing and commissioning			
SPD28 (Scottish Power Ref: QAS 46760 Sheet 8)	A73 Bellside Road and Newhouse Junction  Install and provide new High Voltage Loop Pole and associated cabling on verge of A73 Bellside Road and relocate Newhouse Roundabout PTE.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned	UG/OH		Design diversion	16 weeks	12 weeks	4 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
	Inspect and						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD29 (Scottish Power Ref: QAS 46760 Sheet 8)	A73 Bellside Road, Newhouse Junction and Budshaw Farm Road  Provide new 3no. 33kV cable, 8Pr Pilot cable and 2no. 11kV 185(3)xple cable to be Jointed to existing circuits at Budshaw Farm Road and run along verge of A73 Bellside Road and around Newhouse Junction where additional 3no. 33kV cable is introduced from being jointed to existing circuits around roundabout	UG		Design diversion	As SPD28	As SPD28	As SPD28
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and	Undertake excavation and lay			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	and connecting into existing network on A73 Bellside Road approximately 700 metres in length.  Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned.		where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD30 (Scottish Power Ref: QAS 46760 Sheet 8)	New M8 Motorway and Newhouse Junction  Provide and install new 50kVA PTE to replace Road Sign No.1 New PTE also to supply masts situated in	OH		Design diversion	As SPD28	As SPD28	As SPD28
				Obtain necessary wayleaves and section 37 consents. (where required)			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>westbound verge of new M8 motorway east of new Newhouse Junction.</p> <p>Provide new 11kV Overhead Line on westbound verge of new M8 motorway and install 2no. High Voltage Terminal Poles crossing the new M8 motorway and continue west of Fairybank Cottage and connect into existing network for approximately 675 metres in length.</p> <p>Provide new length of 95 millimetre 3/c Low Voltage cable from new connection on westbound verge of new M8 motorway for approximately 100 metres in length.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main</p>			<p>Review diversion design</p> <p>Procure Apparatus for diversion</p> <p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p> <p>Inspect and supervise</p> <p>Abandon/ decommission any existing apparatus</p> <p>Undertake connection and jointing works</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Contractor to excavate and install any duct for cabling.  Any existing apparatus to be abandoned.			Testing and commissioning			
SPD31 (Scottish Power Ref: QAS 76915 Sheet 9)	B799 Bo'Ness Road Roundabout and McNeil Drive  Provide 2no. 33kV Joints, Low Voltage Straight Joint and Pilot Joints on verge of McNeil Avenue existing new Bo'Ness Road Roundabout with excavation undertaken by Scottish Power.  Provide 2no. 185 High Voltage Cable, 300 High Voltage Cable, 6no. 500 1c 33kV xlpe cable, 300 Low Voltage W/F cable and 2no. 19pr Pilot cables for approximately 275 metres in length around new Bo'Ness	UG		Design diversion	16 weeks	12 weeks	4 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Roundabout with excavation undertaken by Scottish Power.</p> <p>Supply 6no. 150 millimetre and 15no. 100 millimetre ducts supplied by Scottish Power and installed by main contractor over existing B977 Bo'Ness Road.</p> <p>Provide 2no. 33kV Joints and Pilot Joints on verge in close proximity to Rowantree Avenue connecting into existing connection.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>Any existing apparatus to be abandoned.</p>		<p>accordance with the requirements of Scottish Power Distribution.</p>	<p>associated equipment</p>			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD32 (Scottish)	New M8 motorway and Westerhouse Road	UG		Design diversion	16 weeks	16 weeks	6 weeks
				Obtain necessary			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
Power Ref: QAS 38639 Sheet G34)	<p>Provide High Voltage St Joints connecting back into existing network on eastbound and westbound verges of new M8 motorway.</p> <p>Provide 2no. 300 High Voltage cables and 4no. Ducts for approximately 75 metres in length under new M8 motorway in close proximity to Westerhouse Road.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install duct for cabling over M8 motorway.</p> <p>Any existing apparatus to be abandoned.</p>			wayleaves and section 37 consents. (where required)			
				Review diversion design			
				Procure Apparatus for diversion			
				Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				connection and jointing works			
				Testing and commissioning			
SPD33 (Scottish Power Ref: QAS 38639 Sheet G34)	New M8 motorway and Kildermorie Road Provide High Voltage St Joints connecting back into existing network on Kildermorie Road verge and westbound verge of new M8 motorway. Provide 3no. 300 High Voltage cables and 6no. Ducts for approximately 70 metres in length under new M8 motorway from Kildermorie Road to near Ware Road.	UG		Design diversion	As SPD32	As SPD32	As SPD32
				Obtain necessary wayleaves and section 37 consents. (where required)			
				Review diversion design			
				Procure Apparatus for diversion			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install duct for cabling over M8 motorway.</p> <p>Any existing apparatus to be abandoned.</p>			<p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p> <p>Inspect and supervise</p> <p>Abandon/ decommission any existing apparatus</p> <p>Undertake connection and jointing works</p> <p>Testing and commissioning</p>			
SPD34 (Scottish Power Ref: QAS 38639 Sheet	<p>New M8 motorway and Ware Road</p> <p>Provide High Voltage St Joints connecting back into existing network near Struie Street and Ware Road</p>	UG		<p>Design diversion</p> <p>Obtain necessary wayleaves and section 37 consents. (where required)</p>	As SPD32	As SPD32	As SPD32

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
G34)	<p>verges of new M8 motorway.</p> <p>Provide 1no. 300 High Voltage cables and 2no. Ducts for approximately 275 metres in length under new M8 motorway from Struie Street and following alignment of Ware Road.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install any duct for cabling.</p> <p>over M8 motorway.</p> <p>Any existing apparatus to be abandoned.</p>			<p>Review diversion design</p> <p>Procure Apparatus for diversion</p> <p>Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment</p> <p>Inspect and supervise</p> <p>Abandon/ decommission any existing apparatus</p> <p>Undertake connection and jointing works</p> <p>Testing and commissioning</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SPD35 (Scottish Power Ref: QAS 71706)	<p>New Bothwell Park Farm Road Bridge</p> <p>Provide 1no. 300 High Voltage through new Bothwell Park Farm Road Bridge for approximately 255 metres in across M74 motorway and tie in to existing network west and east of M74 motorway.</p> <p>Scottish Power to undertake excavation for any High Voltage cable and Main Contractor to excavate and install duct for cabling over M8 motorway.</p> <p>Any existing apparatus to be abandoned.</p>	UG		Design diversion	12 weeks	8 weeks	3 weeks
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
SPD36 (Scottish Power Ref: QAS 79115)	Belshill Road and New M74 Motorway  Scottish Power to undertake disconnection of low voltage cable in north verge of existing Bellshill Road.	UG		Design diversion	12 weeks	8 weeks	1 week
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion	Review diversion			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Scottish power will carry out the excavation and reinstatement of jointhole and carry out jointing.</p> <p>Any existing apparatus to be abandoned.</p>		design	design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
				Abandon/ decommission any existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SPD37 (Scottish Power Ref: QAS 78858)	Raith Junction and A725 Bellshill Road  Scottish Power to undertake disconnection of 11kV High voltage cable west of A725 Bellshill Road near pumping station and south of new proposed Raith Junction. Scottish power to remove associated apparatus between the two disconnected connections which includes overhead apparatus.  Any existing apparatus to be abandoned.	UG/OH		Design diversion	12 weeks	8 weeks	1 week
				Obtain necessary wayleaves and section 37 consents. (where required)			
			Review diversion design	Review diversion design			
				Procure Apparatus for diversion			
			Provide Traffic Management and where applicable excavate and lay ducts, all in accordance with the requirements of Scottish Power Distribution.	Undertake excavation and lay ducts outwith LMA. Install new poles, cables and associated equipment			
				Inspect and supervise			
	Abandon/ decommission any						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				existing apparatus			
				Undertake connection and jointing works			
				Testing and commissioning			
<b>Scottish Power Transmission</b>							
SPT01 <sup>2</sup>	In between Chapelhall and Newhouse Junctions, just North of the new M8 motorway.  Provide new tower (XX46A), carrying 275KV power cables, approximately 40 metres North of existing tower (XX46) including associated cabling and connections, located in the field North of the new M8 motorway in between Chapelhall and Newhouse Junctions.  Abandon existing tower (XX46) located in the field North of the new M8	UG/OH	Review design diversion.	Review design diversion.	TBC	TBC	11 weeks
				Obtain necessary wayleaves/ purchase land (where required)			
				Confirm network outage			
				Procure apparatus for diversion.			
				Install new transmission tower and cables			
				Inspect and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	motorway in between Chapelhall and Newhouse Junctions.			supervise.			
				Undertake jointing, connection and reinstatement works.			
					Testing and commissioning.		
				Abandon existing apparatus			
Scotland Gas Networks Distribution							
SGND01	Shawhead Junction Temporary Diversion.  Provide new 315 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe for a length of approximately 950 metres, from the tie-in West of Shawhead Junction just South of the existing A8 APR to the tie-in East of the proposed B7070 (South of the new M8 motorway).	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	8 weeks	16 weeks	20 weeks
				Procure apparatus for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Abandon existing apparatus between the tie-in West of Shawhead Junction just South of the existing A8 APR to the tie-in East of the proposed B7070 (South of the new M8 motorway).		Consult and comply with SGN regarding pipeline requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND02	Shawhead Junction Permanent Diversion  Provide new 315 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe for a length of approximately 600 metres, from where Shawhead Temporary Diversion (SGN01) connects to	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	8 weeks	16 weeks	13 weeks
			Procure apparatus for diversion.				
	Provide traffic	Undertake					

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>existing apparatus on B7070 North Road and continues to Pressure Reduction Station (PRS).</p> <p>For details of Pressure Reduction Station (PRS) refer to SGNT03.</p> <p>Concrete protection sleeves will be required where the pipes pass under the proposed B7070 North Road and Carnbroe Footpath to PRS.</p> <p>Abandon existing apparatus of the temporary diversion (SGND01).</p>		<p>management.</p> <hr/> <p>Consult and comply with SGN regarding piping requirements.</p> <hr/> <p>Consult and comply with SGN regarding reinstatement requirements.</p> <hr/> <p>Abandon existing apparatus</p>	<p>excavation works associated with diversions.</p> <hr/> <p>Install new pipes and associated apparatus.</p> <hr/> <p>Inspect and supervise.</p> <hr/> <p>Undertake jointing, connection and reinstatement works.</p> <hr/> <p>Testing and commissioning.</p>			
SGND03A	<p>Chapelhall Junction Temporary Diversion</p> <p>Provide new temporary 355 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe in the east verge of existing Bo'ness Road and continue</p>	UG	<p>Review design diversion.</p> <hr/>	<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p> <hr/> <p>Procure apparatus</p>	8 weeks	16 weeks	12 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	westwards to west verge of new Bo'ness Road and run parallel southwards until tying back into existing Bo'ness Road at Newhouse Industrial Estate for a length of approximately 490 metres			for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
				Abandon existing apparatus			
SGND03	Chapelhall Junction. Provide new 125 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe in the South verge of	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land	8 weeks	16 weeks	26 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>the new Woodhall Mill Road for a length of approximately 650 metres including 3 number crossings, from the tie-in to the West of Woodhall Mill Road just South of Woodhall Football Ground to the tie-in with the proposed 355 millimetre PE.M.P pipe within the East verge of Bo'Ness Road.</p> <p>Provide new 125 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe in the North verge of Woodhall Cottage Road for a length of 120 metres including 1 number crossing, from the tie-in with Woodhall Cottage to the tie-in with the 125 millimetre diameter PE.M.P pipe located within the North verge of Woodhall Mill Road.</p> <p>Provide new 315 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P)</p>			(where required)			
				Procure apparatus for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>pipe in the East verge of new Bo'Ness Road for a length of approximately 1120 metres including 3 number crossings, from the tie-in within the East verge of Bo'Ness Road North of Bo'Ness North Roundabout to the tie-in within the North verge of McNeil Drive West of Bo'Ness Road South Roundabout.</p> <p>Provide new 125 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe in the East verge of existing Bo'Ness Road for a length of approximately 40 metres from the tie-in East of existing Bo'Ness Road North of Rowantree Avenue to the tie-in with the proposed 355 millimetre PE.M.P pipe within the East verge of new Bo'Ness Road.</p> <p>Abandon existing apparatus within the North verge of existing Woodhall Cottage</p>						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Road, East verge of existing Bo'Ness Road including associated connections and the North verge of existing McNeil Drive.						
SGND04	<p>Raith Junction.</p> <p>Provide new 250 millimetre diameter Poly Ethylene Low Pressure (PE.L.P) pipe for a length of approximately 800 metres including 5 number crossings, from the tie-in in the North verge of Raith Junction Roundabout to the tie-in on the West verge of Bellshill Road to the South of Raith Junction Roundabout.</p> <p>Abandon existing apparatus from the tie-in in the North verge of Raith Junction Roundabout to the tie-in on the West verge of Bellshill Road to the South of Raith Junction Roundabout.</p>	UG	<p>Review design diversion.</p>	<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p>	8 weeks	16 weeks	13 weeks
				Procure apparatus for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding	Undertake jointing, connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			reinstatement requirements.	reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND05	Bothwellpark Road Bridge Stage 1  Provide new temporary 90 millimetre diameter Poly Ethylene Low Pressure (PE.L.P) pipe in the west side of the existing Bothwellpark Bridge and continue westwards and tie-ing into existing apparatus at Olifard Avenue for a length of approximately 250 metres.  Abandon existing apparatus from the tie-in on west side of Bothwellpark Bridge and along the East verge of Bothwellpark Road until	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	8 weeks	16 weeks	12 weeks
				Procure apparatus for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Road heads west and tie-in to existing apparatus.		Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND06	Bothwellpark Road Bridge Stage 2  Provide new permanent 90 millimetre diameter Poly Ethylene Low Pressure (PE.L.P) pipe in the east side of the new proposed Bothwellpark Bridge across M74 Motorway and continue within west verge of Bothwellpark Road and tying into existing apparatus when road heads west for a length of approximately 250 metres.	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	8 weeks	16 weeks	12 weeks
				Procure apparatus for diversion.			
			Provide traffic management.	Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Abandon existing apparatus within existing Bothwellpark Bridge.			Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND07	<p>Eurocentral Junction, Townhead Avenue</p> <p>Provide new 90 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe in the west verge of the existing road Townhead Avenue crossing the road and continuing on the east verge of the new Townhead avenue northwards and tying into existing apparatus south of new proposed</p>	UG	Review design diversion.	<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p>	8 weeks	16 weeks	8 weeks
				Procure apparatus for diversion.			
			Provide traffic management.				
				Undertake excavation works associated with			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	access for Dakota Hotel for a length of approximately 510 metres.  Abandon existing apparatus within existing east verge of Townhead Avenue.			diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND08	Daldowie Crematorium, A721  Provide new 315 millimetre diameter Poly Ethylene Low Pressure (PE.L.P) pipe in the east verge of the new proposed Roundabout at	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	8 weeks	16 weeks	12 weeks
				Procure apparatus for diversion.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Hamilton Road continuing southwards on A721 crossing M73 Northbound Merge and tie-ing into existing apparatus on approach to Daldowie Overbridgel for a length of approximately 120 metres.  Abandon existing apparatus within existing east verge of A721.		Provide traffic management.				
				Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND09	Bellshill Road and M74 Motorway  Provide new 180 millimetre diameter Poly Ethylene Low	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/	8 weeks	16 weeks	6 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate	
	<p>Pressure (PE.L.P) pipe in the south verge of the existing Belshill Road and continue westwards passing under the new M74 Motorway and tie-ing into existing apparatus on the south verge of the existing Belshill Road at the Bothwell Park Industrial Estate for a length of approximately 300 metres.</p> <p>Abandon existing apparatus within existing south verge of Belshill Road.</p>			purchase land (where required)				
				Procure apparatus for diversion.				
				Provide traffic management.				
					Undertake excavation works associated with diversions.			
				Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
					Inspect and supervise.			
				Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
					Testing and commissioning.			
				Abandon existing				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			apparatus				
SGND10	<p>Daldowie Crematorium, A721/ M74 Motorway</p> <p>Provide new 315 millimetre diameter Poly Ethylene Low Pressure (PE.L.P) pipe connecting to existing apparatus north of slip road from M74 to Daldowie continuing southwards crossing M74 slip, M74 Motorway and M74 Merge and tie-ing into existing apparatus south of M74 merge for a length of approximately 150 metres.</p> <p>Abandon existing apparatus crossing existing M74 Motorway.</p>	UG	Review design diversion.	Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	TBC	TBC	TBC
				Procure apparatus for diversion.			
			Provide traffic management.				
				Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding piping requirements.	Install new pipes and associated apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding	Undertake jointing, connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			reinstatement requirements.	reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
SGND11	<p>West of Baillieston</p> <p>Provide new 500 millimetre diameter Poly Ethylene Medium Pressure (ME.L.P) pipe connecting to existing apparatus north of slip road from M8 northwards following parallel to Glasgow to Coatbridge Railway Line on south side and continuing southwards in west verge of Netherhouse for a length of approximately 440 metres.</p> <p>Abandon existing apparatus on north verge of proposed</p>	UG	<p>Review design diversion.</p>	<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p>	TBC	TBC	TBC
				Procure apparatus for diversion.			
			Provide traffic management.				
				Undertake excavation works associated with diversions.			
			Consult and comply with SGN regarding	Install new pipes and associated			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	slip road to Baillieston Junction from M8 Motorway.		pipng requirements.	apparatus.			
				Inspect and supervise.			
			Consult and comply with SGN regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
			Abandon existing apparatus				
Scotland Gas Networks Transmission							
SGNT01	East of Baillieston Interchange.  Provide new 300 millimetre diameter steel pipe for a length of approximately 435 metres from the tie-in	UG		Review design diversion.  Obtain necessary wayleaves/ purchase land (where required)	TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>located in the field between the proposed A8 APR and Bargeddie (North of the new M8) to the tie-in south of new Bredisholm Road access track (South of the new M8).</p> <p>Provide new 450 millimetre diameter steel pipe for a length of approximately 440 metres from the tie-in located in the field between the proposed A8 APR and Bargeddie (North of the new M8) to the tie-in south of new Bredisholm Road access track (South of the new M8).</p> <p>Works will include the provision of stopple and vents at either tie-in as well as a proposed block valve. Concrete protection slabs will be required where the pipe passes under the proposed A8 APR.</p> <p>Abandon existing apparatus</p>			<p>Procure apparatus for diversion.</p> <p>Undertake excavation works associated with diversions.</p> <p>Install new pipes and associated apparatus</p> <p>Inspect and supervise.</p> <p>Undertake jointing, connection and reinstatement works.</p> <p>Testing and commissioning.</p> <p>Abandon existing apparatus</p>			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	between the tie-in located in the field between the proposed A8 APR and Bargeddie (North of the new M8) to the tie-in south of new Bredisholm Road access track (South of the new M8).						
SGNT02	<p>Shawhead Farm.</p> <p>Provide new 250 millimetre diameter steel pipe for a length of approximately 320 metres from the tie-in East of the Bankhead Farm accommodation bridge (South of the new M8) to the tie-in West of Shawhead Farm accommodation bridge (North of the new M8).</p> <p>Provide new 250 millimetre diameter steel pipe for a length of approximately 30 metres from the tie-in West of Shawhead Farm accommodation bridge</p>	UG		<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p> <p>Procure apparatus for diversion.</p> <p>Undertake excavation works associated with diversions.</p> <p>Install new pipes and associated</p>	TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>(North of the new M8) to the East of Shawhead Farm accommodation bridge (North of the new M8)</p> <p>Concrete protection slabs will be required where the pipe passes under the proposed M8 and the Shawhead accommodation access track.</p> <p>Abandon existing apparatus between the tie-in East of Bankhead Farm accommodation bridge (South of the new M8) to the tie-in West of Shawhead Farm accommodation bridge (North of the new M8) and between the tie-in West of Shawhead Farm accommodation bridge (North of the new M8) to the East of Shawhead Farm accommodation bridge (North of the new M8)</p>			<p>apparatus</p> <p>Inspect and supervise.</p> <p>Undertake jointing, connection and reinstatement works.</p> <p>Testing and commissioning.</p> <p>Abandon existing apparatus</p>			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SGNT03	<p>Shawhead Junction</p> <p>Provide new 250 millimetre steel pipe for a length of approximately 675 metres, from the tie-in West of Shawhead Junction just South of the existing A8 APR to the tie-in East of the proposed B7070 (North of the new M8 motorway).</p> <p>The 355 millimetre diameter Poly Ethylene Medium Pressure (PE.M.P) pipe forms part of the Distribution network and as such is referred to in SGND01.</p> <p>Provide new Pressure Reduction Station (PRS) located on the Eastern side of Shawhead Junction to the East of the proposed B7070 (North of the new M8 motorway).</p> <p>Concrete protection sleeves will be required where the pipes pass under the proposed A725 and the slip</p>	UG		<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p> <p>Procure apparatus for diversion.</p> <p>Undertake excavation works associated with diversions.</p> <p>Install new pipes and associated apparatus</p> <p>Inspect and supervise.</p> <p>Undertake jointing, connection and reinstatement works.</p>	TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>road from the existing A8 APR to Shawhead Junction.</p> <p>A Concrete protection slab will be required where the pipes pass under the Carnbroe Footpath.</p> <p>Abandon existing apparatus between the tie-in West of Shawhead Junction just South of the existing A8 APR to the tie-in East of the proposed B7070 (North of the new M8 motorway).</p> <p>Demolish existing PRS located in the field between the proposed A725 and the proposed B7070 following completion of the main works.</p>			<p>Testing and commissioning.</p> <p>Abandon existing apparatus</p>			
SGNT04	<p>Carnbroe Mains Farm, North access track.</p> <p>Provide new 250 millimetre diameter steel pipe for a length of approximately 515</p>	UG		<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land</p>	TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	metres, from the tie-in West of the North Carnbroe Mains Farm access track (North of the new M8 motorway) to the tie-in East of the North Carnbroe Mains Farm access track (North of the new M8 motorway).  Works will include the provision of stopple and vents at the tie-in on the East of the North Carnbroe Mains Farm access track (North of the new M8 motorway).  Abandon existing apparatus between the tie-in West of the North Carnbroe Mains Farm access track (North of the new M8 motorway) to the tie-in East of the North Carnbroe Mains Farm access track (North of the new M8 motorway).			(where required)			
				Procure apparatus for diversion.			
				Undertake excavation works associated with diversions.			
				Install new pipes and associated apparatus			
				Inspect and supervise.			
				Undertake jointing, connection and reinstatement works.			
				Testing and commissioning.			
				Abandon existing apparatus			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SGNT05	<p>Raith Junction.</p> <p>Provide new 250 millimetre diameter steel pipe for a length of approximately 1010 metres, from the tie-in North West of Raith Junction Roundabout (North of the flood compensation storage area) to the tie-in North East of Raith Junction Roundabout (North of Strathclyde Country Park, Caravan Park).</p> <p>Works will include the provision of stopple, bag and vents at either tie-in.</p> <p>Concrete protection slabs will be required where the pipe crosses under the proposed access tracks and the proposed slip road to the A725 from Raith Junction roundabout.</p> <p>Abandon existing apparatus between the tie-in North West of Raith Junction Roundabout (North of the</p>	UG		<p>Review design diversion.</p> <p>Obtain necessary wayleaves/ purchase land (where required)</p> <p>Procure apparatus for diversion.</p> <p>Undertake excavation works associated with diversions.</p> <p>Install new pipes and associated apparatus.</p> <p>Inspect and supervise.</p> <p>Undertake jointing, connection and reinstatement works.</p> <p>Testing and</p>	TBC	TBC	TBC

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	flood compensation storage area) to the tie-in North East of Raith Junction Roundabout (North of Strathclyde Country Park, Caravan Park).			commissioning. Abandon existing apparatus			
Scottish Water Sewer							
SWS01	Rhindhouse Road Provide CCTV works before and after construction at Rhindhouse Road. No diversion necessary. Manhole covers and ironwork to be raised to match new road levels.	UG		Design diversion. Review design. Safeguard existing apparatus Procure apparatus for works. Raise manhole covers and associated equipment.	4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Inspect and supervise.			
SWS02	A89 Coatbridge Road/A752 Langmuir Road Junction Provide CCTV works before and after at A89 Coatbridge Road/A752 Langmuir Road junction. No diversion necessary. Manhole covers and ironwork to be raised to match new road levels.	UG		Design diversion.	4 weeks	TBC	1 week
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for works.			
				Raise manhole covers and associated equipment.			
Inspect and supervise.							
SWS02a	A752 Langmuir Road Manhole covers and ironwork to be raised to match new road levels at west verge of A752	UG		Design diversion.	8 weeks	TBC	3 weeks
				Review design.			
				Safeguard existing apparatus			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Langmuir Road.			Procure apparatus for works.			
				Raise manhole covers and associated equipment.			
				Inspect and supervise.			
SWS03	Bargeddie Replacement/Accommodation Bridge  Provide approximately 500 metres in length of new 1500 millimetre outer diameter of reinforced concrete open cut sewer pipe by open cut and tunnel under existing railway line and construct new manholes to outfall in proximity of North Calder Water.	UG		Design diversion.	26 weeks	TBC	39 weeks
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for diversion.			
				Install new pipes			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS04	Not used						
SWS05	A752 Aitkenhead Road and Luggie Burn  Provide approximately 99 metres in length of 900 millimetre outer diameter reinforced concrete sewer pipe by offline tunnel from south of new Aitkenhead footpath crossing river to	UG		Design diversion.	26 weeks	TBC	26 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Luggie Burn and construct new manholes.			Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and reinstatement works.  Test and commissioning.  Abandon existing apparatus.			
SWS06	Luggie Burn Provide approximately 116 metres in length of 600 millimetre outer diameter reinforced concrete sewer pipe at Luggie Burn south of	UG		Design diversions.  Review diversion design.  Safeguard existing apparatus	26 weeks	TBC	26 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	new M8 motorway and install combined sewer overflow and outfall. Construct and move manholes.			Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS07	M8 motorway and SUDS Pond Access Road  Provide refurbishment and realign section of 825 millimetre outer diameter sewer pipe under existing	UG		Design diversions.  Review diversion design.  Safeguard existing apparatus	26 weeks	TBC	26 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	A8 road and provide approximately 365 metres in length of 825 millimetre outer diameter of reinforced concrete sewer pipe westbound verge of new M8 motorway under new SUDS Pond access Road and construct new manholes respectively.			Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS08	Kirkwood Footpath Undertake CCTV sewer works for connections on the westbound embankment of new M8 motorway. Provide approximately 155 metres in length of 900	UG		Design diversions.	20 weeks	TBC	16 weeks
				Review diversion design.			
				Safeguard existing apparatus			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	millimetre outer diameter of reinforced concrete sewer pipe parallel to new westbound M8 motorway embankment. Provide new manholes and rebuild manholes to new road level.			Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS08a	Kirkwood Footpath Undertake CCTV sewer works between manholes connections and grade assessment within eastbound verge of existing	UG		Design diversion.	4 weeks	TBC	2 weeks
				Review design.			
				Safeguard existing apparatus			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	A8 Glasgow to Edinburgh Road and new Kirkwood Footpath and provide new manhole.			Procure apparatus for works.			
				Raise manhole covers and associated equipment.			
				Inspect and supervise.			
SWS09	Kirshaw Road and Haghill Road  Undertake CCTV sewer works between manholes connections and grade assessment within existing Kirshaw Road verge existing Haghill Road and provide new manhole.	UG		Design diversion.	4 weeks	TBC	1 week
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for works.			
				Raise manhole covers and associated equipment.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Inspect and supervise.			
SWS10	Not Used						
SWS11	Not Used						
SWS12	Not Used						
SWS13	Not Used						
SWS14	A725 Bellshill Road Undertake CCTV sewer works before and after scheme construction under existing A725 immediately north of North Calder River for condition assessment. Sewer pipe may require reline/refurbishment.	UG		Design diversions. Review diversion design. Safeguard existing apparatus Procure apparatus for diversions. Install new associated equipment. Inspect and supervise.	12 weeks	TBC	10 weeks



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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
SWS14a	A725 Bellshill Road Undertake CCTV sewer works before and after scheme construction under existing A725 immediately north of North Calder River for connections and condition assessment. Sewer pipe may require reline/refurbishment.	UG		Design diversions.	12 weeks	TBC	10 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				works.			
				Test and commissioning.			
SWS15	A725 Bellshill Road Undertake CCTV before and after sewer works for connections and condition assessment. Provide approximately 180 metres in length of two 600 millimetre outer diameter of reinforced concrete sewer pipe west of the A725. Provide new manholes at start and finish of diversion and at A725 crossing points.	UG		Design diversions.	26 weeks	TBC	26 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Test and commissioning.			
				Abandon existing apparatus.			
SWS16	<p>Eurocentral Junction</p> <p>Provide approximately 230 metres of new 450 millimetre outer diameter reinforced concrete sewer pipe crossing new Eurocentral westbound merge slip road to new A8 APR Road, new M8 Motorway and A8 APR road eastbound diverge slip to new Eurocentral Junction. Construct new manholes respectively.</p> <p>Provide approximately 100 metres of new 450 millimetre outer diameter reinforced concrete sewer pipe parallel to new SUDS pond access track and tying in with existing network. Construct new manholes</p>	UG		<p>Design diversions.</p> <p>Review diversion design.</p> <p>Safeguard existing apparatus</p> <p>Procure apparatus for diversions.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and</p>	39 weeks	TBC	39 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	respectively.			reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS16a	Eurocentral Junction Undertake CCTV before and after works between new Eurocentral westbound merge slip road to new A8 APR Road, new M8 Motorway and A8 APR road eastbound diverge slip to new Eurocentral Junction. No works to commence before condition assessment received. May require relining/ refurbishment.	UG		Design diversions.	26 weeks	TBC	10 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new associated equipment.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
SWS17	<p>Eurocentral Junction</p> <p>Provide approximately 135 metres in length of 600 millimetre outer diameter of reinforced concrete sewer pipe across new M8 motorway and associated slip and merge roads at Eurocentral Junction.</p> <p>Provide approximately 110 metres in length of 525 millimetres outer diameter reinforced concrete pipe on slip road verge to new Eurocentral Roundabout Junction from new M8 Motorway. Construct new manholes respectively.</p>	UG		<p>Design diversions.</p> <p>Review diversion design.</p> <p>Safeguard existing apparatus</p> <p>Procure apparatus for diversions.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p>	39 weeks	TBC	39 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS18	Woodhall Mill Road Provide approximately 466 metres in length of relining and refurbishment of existing network at Woodhall Cottage Road and new Woodhall Mill Road. Undertake CCTV after works.	UG		Design diversions.	6 weeks	TBC	10 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS19	B799 Bo'Ness Road Provide relining and refurbishment of existing network between B799 Bo'Ness Road and new SUDS Pond. Undertake CCTV after works.	UG		Design diversions.	26 weeks	TBC	2 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new associated equipment.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
SWS20	A725 Bellshill Road Provide approximately 50 metres in length of relining and refurbishment of existing network across A725 Bellshill Road. Provide CCTV after works and rebuild manhole to suit new levels.	UG		Design diversions.	10 weeks	TBC	6 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS20a	A725 Bellshill Road and Kilmallie House Access Road  Provide approximately 247 metres in length of new 500 millimetre outer diameter rising main works crossing new Kilmallie House Access Road to westbound embankment of A725 Bellshill Road with ancillary works at existing connections with three 45 degree bends with thrust blocks.	UG		Design diversions.	26 weeks	TBC	26 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS21	A725 Bellshill Road and Kilmallie House Access Road  Undertake CCTV before works to confirm condition grade. If necessary reline/refurbish approximately 110 metres in length of 375 millimetre outer diameter concrete sewer pipe parallel with Kilmallie House Access Road. Rebuild manhole to new road levels. Provide CCTV after works are completed.	UG		Design diversions.	26 weeks	TBC	12 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new associated equipment.			
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Undertake connection and reinstatement works.			
				Test and commissioning.			
SWS22	A725 Bellshill Road and Kilmallie House Access Road  Undertake CCTV before works to confirm condition grade. If necessary reline/refurbish approximately 90 metres in length of 450 millimetre outer diameter concrete pipe sewer parallel with Kilmallie House Access Road. and crossing access. Rebuild manhole to new road levels. Provide CCTV after works are completed.	UG		Design diversions.	6 weeks	TBC	6 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			
				Install new associated equipment.			
				Inspect and supervise.			
				Undertake connection and			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				reinstatement works.			
				Test and commissioning.			
SWS23	A725 and B7071 Bellshill Road  Provide approximately 150 metres in length of 1200 millimetre outer diameter of reinforced concrete main sewer pipe crossing A725 Bellshill Road and approximately 294 metres in length of 900 millimetre outer diameter of reinforced concrete main sewer pipe crossing B7071 Bellshill Road. Construct new manholes respectively.	UG		Design diversion.	26 weeks	TBC	30 weeks
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for diversion.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Test and commissioning.			
				Abandon existing apparatus.			
SWS24	A725 Bellshill Road Provide CCTV works before and after construction across A725 Bellshill Road Diverge Slip Road. No diversion necessary. Manhole covers and ironworks to be raised to match new road levels.	UG		Design diversion.	4 weeks	TBC	1 week
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for works.			
				Raise manhole covers and associated equipment.			
Inspect and supervise.							
SWS25	Langside Road Provide CCTV works before	UG		Design diversion.	4 weeks	TBC	1 week
				Review design.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	and after construction under existing Langside Road. No diversion necessary. Manhole covers and ironworks to be raised to match new road levels.			Safeguard existing apparatus Procure apparatus for works. Raise manhole covers and associated equipment. Inspect and supervise.			
SWS26	Not Used						
SWS27	Plans indicate pipes may have been moved when motorway was built. Provide survey to determine if diversions are required.	UG			4 weeks	TBC	1 week
SWS28	Plans indicate pipes may have been moved when motorway was built. Provide survey to determine if diversions are required.	UG			4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
SWS29	M74 Motorway to A721 Hamilton Road Slip Road  Existing 1575 millimetre outer diameter reinforced concrete pipe across M74 motorway is at 8.5 metre depth. Pipe much shallower than level indicated.	UG		Design diversion.	26 weeks	TBC	26 weeks
				Review design.			
				Safeguard existing apparatus			
SWS29a	M74 Motorway to A721 Hamilton Road Slip Road  Extend 1575 millimetre outer diameter reinforced concrete sewer pipe clear of slip road from M74 to A721 Hamilton Road and provide 900 millimetre outer diameter sewer pipe. Construct new manholes.	UG		Design diversion.	26 weeks	TBC	26 weeks
				Review design.			
				Safeguard existing apparatus			
				Procure apparatus for diversion.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
SWS30	Access track South of Maryville Interchange Undertake CCTV survey works of 275 metres in length of 900 millimetre outer diameter reinforced concrete sewer pipe for condition. If necessary refurbish and reline existing	UG		Design diversions.	26 weeks	TBC	6 weeks
				Review diversion design.			
				Safeguard existing apparatus			
				Procure apparatus for diversions.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	sewer pipe.			Install new associated equipment. Inspect and supervise. Undertake connection and reinstatement works. Test and commissioning.			
SWS30a	Access track South of Maryville Interchange Undertake CCTV survey works of 270 metres in length of 1375 millimetre outer diameter reinforced concrete sewer pipe for condition. If necessary refurbish and reline existing	UG		Design diversions. Review diversion design. Safeguard existing apparatus Procure apparatus for diversions.	26 weeks	TBC	6 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	sewer pipe.			Install new associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
SWS31	Not Used						
SWS32	Not Used						
SWS33	No Diversion planned at present. Investigation works to be carried out.						
SWS34	Not Used						
SWS35	Not used						
SWS36	Not used						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
Scottish Water Supply							
W1a	<p>A89 Coatbridge Road at Rhindhouse Road</p> <p>Provide protection measures to safeguard existing apparatus under new road connection from Rhindhouse Road. Levels remain approximately the same.</p> <p>The existing mains will need to be protected during the road construction works. Ironwork to be adjusted to match new road surface.</p>	UG	Agree measures to safeguard existing apparatus with Undertaker.	Discuss measures to safeguards existing apparatus with contractor.	4 weeks	TBC	1 week
			Consult and comply with Undertaker's requirements. Undertake any required protection works.	Inspect and supervise.			
W1b	<p>A89 Coatbridge Road at Electric Sub Station</p> <p>Provide protection measures to safeguard existing apparatus under new road alignment at A89</p>	UG	Agree measures to safeguard existing apparatus with Undertaker.	Discuss measures to safeguards existing apparatus with contractor.	4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Coatbridge Road. Levels remain approximately the same.  The existing mains will need to be protected during the road construction works. Ironwork to be adjusted to match new road surface.		Consult and comply with undertaker's requirements.  Undertake any required protection works.	Inspect and supervise.			
W2	A89 Coatbridge Road Roundabout  Provide new cross connection between existing 7 inch and 5 inch outer diameter mains pipe and tie into new 250 millimetre outer diameter HPPE main pipe linking to existing 250 millimetre diameter DIL main pipe at new A89 Coatbridge Road roundabout for approximately 67 metres.  Associated equipment including chambers, air	UG		Design diversion.  Review diversion design.  Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and reinstatement	8 weeks	TBC	3 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	valves, and stop valves to be provided as required.  Existing Apparatus on existing Coatbridge Road central reserve to be abandoned.			works.  Test and commissioning.  Abandon existing apparatus.			
W3 (T)	Temporary Supply to Kirkhill  Provide new temporary 250 millimetre outer diameter HPPE main over a length of approximately 129 metres prior to the construction of new slip road in 300 millimetre outer diameter millimetre an ID protective sheath at 4 metres depth (900mm below new road level) under slip road.  Associated equipment including chambers, air valves, and stop valves to be provided as required.	UG		Design diversion.  Review diversion design.  Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and reinstatement works.  Test and	6 weeks	TBC	3 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				commissioning.			
W3	<p>A8 Access Road from Coatbridge Road Roundabout</p> <p>Provide new 250 millimetre outer diameter HPPE main over a length of approximately 372 metres along footway of new road at roundabout and tie into existing 9 inch main at air valve from W3 (T).</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>	UG		Design diversion.	6 weeks	TBC	10 weeks
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.	Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
	Test and commissioning.						
W4	Showcase Cinema	UG		Design diversion.	26 weeks	TBC	4 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Provide 250 millimetre outer diameter HPPE main pipe at corner of Showcase cinema car park to accommodate new footbridge over a length of approximately 125 metres. Exact line of diversion to be determined when bridge design complete.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p> <p>Existing Apparatus in the corner of Showcase Cinema to be abandoned.</p>			<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p> <p>Abandon existing apparatus.</p>			
W5(T)	<p>Cemetery Bridge</p> <p>A Temporary access bridge will be installed for access to Bankhead farm.</p>	UG		<p>Design diversion.</p> <p>Review diversion design.</p>	8 weeks	TBC	6 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Provide temporary 63 millimetre outer diameter main pipe wrapped in 75 millimetre insulation through duct in Cemetery Bridge until permanent access bridge and road to farm is complete for a length of approximately 384 metres.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p> <p>Existing Apparatus to be abandoned.</p>		Provide Traffic Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				
W5	<p>Cemetery Bridge</p> <p>Provide 63 millimetre outer diameter main pipe wrapped in 75 millimetre insulation through duct in new bridge.</p> <p>Provide 90 millimetre outer</p>	UG		Design diversion.	26 weeks	TBC	10 weeks
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.				



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	diameter HPPE main pipe in section underneath existing A8 thrust bored in 125 millimetre sheath.  Associated equipment including chambers, air valves, and stop valves to be provided as required.  Existing Apparatus to be abandoned.			Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				
W6 Phase 1	Carnbroe Road  Provide new 32 millimetre outer diameter supply connecting to existing Carnbroe Mains Farm supply. Connections at W8, W10, W11, W12 and W14 have to be completed.  Associated equipment	UG		Design diversion.	4 weeks	TBC	2 weeks
				Review diversion design.			
				Install new pipes and associated equipment.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	including chambers, air valves, and stop valves to be provided as required.			Inspect and supervise. Undertake connection and reinstatement works. Test and commissioning.			
W6 Phase 2	Carnbroe Road  Cut and cap main at fire hydrant and junction to Coatbridge supply - leave connection such that 225 millimetre HPPE main can be easily connected (Phase 3)  Slipline 63 millimetre for supply to farm- leave connection such that 225 millimetre HPPE main can be easily connected (Phase 3)  Associated equipment including chambers, air	UG		Design diversion.  Review diversion design.  Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and	4 weeks	TBC	2 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	valves, and stop valves to be provided as required			reinstatement works.			
				Test and commissioning.			
W6 Phase 3	<p>Carnbroe Road</p> <p>Provide new 225 millimetre HPPE main in new embankment and across duct in new bridge. Pipe to be wrapped in 75 millimetre insulation.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required</p> <p>Existing Apparatus to be abandoned.</p>	UG		Design diversion.	6 weeks	TBC	6 weeks
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.	Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
W7a	Near Hagmill Road  Provide new 200 millimetre PRV required because existing PRV will be bypassed by diversion of W8 near Hagmill Road.  Associated equipment including chambers, air valves, and stop valves to be provided as required.	UG		Design diversion.	26 weeks	TBC	10 weeks
				Review diversion design.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
W7b	Near Hagmill Road  Piece through Tee to avoid loading on main from abandoned apparatus.  Provide protection	UG		Discuss measures to safeguards existing apparatus with contractor.	4 weeks	TBC	2 weeks
				Inspect and supervise.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>measures to safeguard existing apparatus from overburdening of new road. Levels remain approximately the same.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>			<p>Undertake any required protection works.</p> <p>Design diversion.</p> <p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W7c	Carnbroe Road	UG		Design diversion.	39 weeks	TBC	4 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>Slipline existing 12 inch main with 225 millimetre outer diameter HPPE SDR11 pipe for a length of approximately 609 metres between existing and new Carnbroe Road. Cut and cap end at 12 inch main and install new hydrant.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p> <p>Existing apparatus to be abandoned.</p>		Review diversion design.	Review diversion design.			
			Provide Traffic Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				
W7d	Carnbroe Road	UG		Design diversion.	4 weeks	TBC	1 week

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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>To avoid Water Quality issues transfer feed to 'Envirotyres' compound to Carnbroe DMA.</p> <p>Change DMA Boundary by opening and closing valves.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>			<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W7e	<p>Carnbroe Road</p> <p>Existing PRV to be permanently bypassed to allow reversal of flow at Carnbroe Road.</p> <p>Close off PRV and open bypass valve.</p> <p>Associated equipment</p>	UG	<p>Review diversion design.</p> <p>Provide Traffic Management.</p>	<p>Design diversion.</p> <p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and</p>	4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	including chambers, air valves, and stop valves to be provided as required.			supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
W8	12 inch mains to Bellshill and McNeil Drive  Provide new 355 millimetre outer diameter HPPE SDR diversion mains pipe from Carnbroe Road through fields, with directional drilling under railway lines to Eurocentral providing two 250 millimetre outer diameter mains with nylon spacers sleeved in 400 millimetres.  Then through plantation (fire	UG		Design diversion.	39 weeks	TBC	48 weeks
				Review diversion design.			
				Install new pipes and associated equipment.			



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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	break), vacant industrial estate land and along existing McNeil Drive in Eurocentral Industrial Estate to tie up with existing mains of two 450 millimetre outer diameter mains for approximately 2,863 metres.  Associated equipment including chambers, air valves, and stop valves to be provided as required.			Inspect and supervise.  Undertake connection and reinstatement works.  Test and commissioning.			
W9	Eurocentral Estate  Provide new Terminal Hydrant. Cut and cap main beyond Dakota Hotel ensuring hydrant in park is still connected.  Associated equipment including chambers, air valves, and stop valves to be provided as required.	UG		Design diversion.  Review diversion design.  Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and	4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				reinstatement works.			
				Test and commissioning.			
W9a	<p>Eurocentral Estate</p> <p>Provide new 180 millimetre outer diameter HPPE diversion for approximately 23 metres in length.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>	UG		<p>Design diversion.</p> <p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>	26 weeks	TBC	2 weeks
W10	Not used						

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Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
W11	<p>Rowantree Avenue</p> <p>Provide 300 millimetre Aquamaster meter on 300 millimetre bypass and connect to logger chamber and aerial marker post for approximately 40 metres in length.</p> <p>Meter installed to replace meter to be abandoned in Greenside Road</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p> <p>Existing Apparatus to be abandoned.</p>	UG		Design diversion.	26 weeks	TBC	10 weeks
				Review diversion design.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
W12	<p>Greenside Road</p> <p>Provide 355 millimetre outer</p>	UG		Design diversion.	26 weeks	TBC	12 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>diameter HPPE diversion main pipe across Rowantree Avenue and lay in verge, across Greenside Road and tie into existing 200 millimetre outer diameter mains pipe for approximately 173 metres in length.</p> <p>Cut and cap main when diversions W11 and W14 are completed and connection proved. Leave connection at Bo'Ness Road such that W13 can be easily connected.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>			<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W13	<p>New Chapelhall Link Road</p> <p>Provide new 355 millimetre</p>	UG		Design diversion.	4 weeks	TBC	12 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>HPPE main for approximately 926 metres in length. This main provides backfeed for Chapelhall which is not presently in use (Closed control valve at A8) but needs to be reinstated across new bridge.</p> <p>This main is laid over new road and two bridges before final tie in at Lancaster Road which includes crossing that road.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>		<p>Review diversion design.</p> <p>Provide Traffic Management.</p>	<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W14	<p>Chapelhall South Roundabout</p> <p>Provide 600 millimetre outer</p>	UG		Design diversion.	6 weeks	TBC	26 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>diameter and 450 millimetre outer diameter HPPE main diverted around south side of new roundabout to tie in with 450 millimetre diameter mains pipe on west side near limit of works for approximately 236 metres in length.</p> <p>Provide 250 millimetre outer diameter HPPE cross connection to 250 millimetre diameter MDPE main pipe on north side of McNeil Drive for approximately 19 metres in length and install hydrant.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>			<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W15a	<p>Howden Avenue</p> <p>Provide 90 millimetre outer</p>	UG		Design diversion.	10 weeks	TBC	2 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>diameter HPPE mains pipe parallel to Greenside Road for approximately 40 metres in length. May be possible to tie into existing meter, otherwise new 25 millimetre meter will be required.</p> <p>Wait until W16 diversion is complete before works can be carried out.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>			<p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>			
W15b	<p>Howden Avenue</p> <p>Provide terminal valve hydrant on 15 inch main next to line valve. Location is ditch adjacent to A8 parallel to Howden Avenue.</p> <p>Associated equipment</p>	UG		<p>Design diversion.</p> <p>Review diversion design.</p> <p>Install new pipes and associated</p>	4 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	including chambers, air valves, and stop valves to be provided as required.			equipment. Inspect and supervise. Undertake connection and reinstatement works. Test and commissioning.			
W15c	Howden Avenue Provide terminal valve hydrant on 15 inch main next to line valve. Location is ditch adjacent to A8 parallel to Howden Avenue.  Associated equipment including chambers, air valves, and stop valves to be provided as required.	UG		Design diversion. Review diversion design. Provide Traffic Management. Install new pipes and associated equipment. Inspect and supervise. Undertake connection and reinstatement	4 weeks	TBC	1 week



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
				works.			
				Test and commissioning.			
W15d	Lancaster Avenue  Provide terminal valve hydrant on 15 inch main next to line valve. Location is at the junction between Lancaster Avenue and York Road.  Associated equipment including chambers, air valves, and stop valves to be provided as required  The diversion is necessary because the new road cuts through the existing main.	UG		Design diversion.	4 weeks	TBC	1 week
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.	Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
W16	Organon	UG		Design diversion.	4 weeks	TBC	10 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Provide 180 millimetre outer diameter HPPE diversion main pipe to Organon Factory for approximately 173 metres in length. This main to be laid in LMA, close to line of new road. New meter may be required.  Associated equipment including chambers, air valves, and stop valves to be provided as required			Review diversion design.  Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and reinstatement works.  Test and commissioning.			
W17	Dalmacoulter/Daer Trunk Main  Provide 600 millimetre outer diameter mains linking into existing network and thrust bore two 450 millimetre outer diameter mains diversions in a new 100	UG		Design diversion.  Review diversion design.	26 weeks	TBC	16 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	metre reinforced concrete culvert under existing A8 which will involve construction in 4 phases for approximately 261 metres in length.  Associated equipment including chambers, air valves, and stop valves to be provided as required			Install new pipes and associated equipment.  Inspect and supervise.  Undertake connection and reinstatement works.  Test and commissioning.			
W18	Biggar Road  Provide terminal valve hydrant on 14 inch main next to line valve and connect supply pipe to existing farm supply keeping within LMA boundary. Location is at Biggar Road.  Associated equipment including chambers, air	UG		Design diversion.  Review diversion design.  Install new pipes and associated equipment.	26 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	valves, and stop valves to be provided as required  The diversion is necessary because the new road cuts through the existing main.			Inspect and supervise.  Undertake connection and reinstatement works.  Test and commissioning.			
W19	Not used.						
W20	Newhouse Roundabout  Provide new 355 millimetre outer diameter HPPE main for approximately 298 metres in length diversion onto footway of new roundabout connecting existing main under existing A8 overbridge.  Diversion is necessary because the new roundabout cuts across the	UG		Design diversion.  Review diversion design.  Provide Traffic Management.  Install new pipes and associated equipment.	26 weeks	TBC	10 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	existing 12 inch main pipe. Associated equipment including chambers, air valves, and stop valves to be provided as required. Existing Apparatus to be abandoned.			Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				
W20a	Newhouse Roundabout and A73 Bellside Road Provide protection measures to safeguard existing apparatus under new road connection from heavy plant and machinery from construction of SUDS pond at access road on Bellshill Road and Newhouse Roundabout. Levels remain approximately the same.	UG		Discuss measures to safeguards existing apparatus with contractor.	4 weeks	TBC	1 week
				Inspect and supervise.			
				Undertake any required protection works.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	The existing mains will need to be protected during the road construction works. Ironwork to be adjusted to match new road surface						
W21	<p>Newhouse Roundabout and A73 Bellside Road</p> <p>Provide terminal valve hydrant on 12 inch main next to line valve north of Newhouse Roundabout in close proximity to the A73 Bellside Road.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required</p> <p>The diversion is necessary because the new road cuts through the existing main.</p>	UG		<p>Design diversion.</p> <p>Review diversion design.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p> <p>Test and commissioning.</p>	26 weeks	TBC	1 week

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
W22	<p>Broomhouse Road and Hamilton Road</p> <p>Provide new 150 millimetre outer diameter DIL diversion main pipe from existing main at Hamilton Road along new footway path and connecting to existing main at 150 millimetre outer diameter coupling.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required</p> <p>Provide protection measures to safeguard existing apparatus under new road connection at Hamilton Road. Levels remain approximately the same.</p> <p>The existing mains will need to be protected during the road construction works. Ironwork to be adjusted to</p>	UG	.	Discuss measures to safeguards existing apparatus with contractor.	4 weeks	TBC	4 weeks
				Undertake any required protection works.			
				Inspect and supervise.			
				Design diversion.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	match new road surface.  Existing apparatus to be abandoned.			Review diversion design.			
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
W23	Bothwell Park Farm Road  The diversion is necessary because existing Bridge is being demolished for Road Widening  Provide new 90 millimetre	UG		Design diversion.	10 weeks	TBC	6 weeks
			Review diversion design.	Review diversion design.			
			Provide Traffic				



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>outer diameter HPPE wrapped in 75 millimetre foam insulation and laid in duct in new bridge at Bothwell Park Farm Road and connect into existing main.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required</p> <p>Existing apparatus to be abandoned.</p>		Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
				Abandon existing apparatus.			
W24	<p>Woodhall Cottage Road</p> <p>Woodhall Cottage Road is being extensively rebuilt. Main currently in road will be severed.</p> <p>Provide new 90 millimetre</p>	UG		Design diversion.	6 weeks	TBC	6 weeks
				Review diversion design.			

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>outer diameter HPPE main in new verge of re-aligned Woodhall Cottage Road for approximately 529 metres in length.</p> <p>Provide terminal valve hydrant on connection to Football Pavilion and Crogalgen.</p> <p>Provide terminal valve hydrant on existing 3 inch main.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>		Provide Traffic Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
W25	Not used						
W26	Not used						
W27	Not used						
W28	Not used						
W29	Not used						

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
W30	Not used						
W31	Not used						
W32	Not used						
W33	Not used						
W34	<p>Strathclyde Park Hotel and Kilmallie House</p> <p>Provide new 180 millimetre outer diameter HPPE main to feed Kilmallie House, Caravan Park, Strathclyde Park Hotel and recreational area along verge of new Access road.</p> <p>Provide terminal valve hydrant and abandon existing 4 inch uPVC main.</p> <p>Tie in new main through 100 millimetre PRV.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p>	UG		<p>Design diversion.</p> <p>Review diversion design.</p> <p>Provide Traffic Management.</p> <p>Install new pipes and associated equipment.</p> <p>Inspect and supervise.</p> <p>Undertake connection and reinstatement works.</p>	26 weeks	TBC	2 weeks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Existing apparatus to be abandoned.			Test and commissioning.			
			Abandon existing apparatus.				
W35	A725 Bellshill Road Cut and cap 12 inch main and provide new terminal valve hydrant. Associated equipment including chambers, air valves, and stop valves to be provided as required. Existing apparatus to be abandoned.	UG		Design diversion.	4 weeks	TBC	1 week
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
			apparatus.				
W36	<p>A725 Bellshill Road Backfeed</p> <p>Provide new 355 millimetre SDR11 main through Raith junction and Strathclyde Park to tie in at railway bridge at Kilmallie House for approximately 1783 metres in length.</p> <p>Provide protection measures to safeguard existing apparatus under new road connection at Bellshill Road in close proximity to junction with Hamilton Road.</p> <p>Associated equipment including chambers, air valves, and stop valves to be provided as required.</p> <p>Abandon existing 12 inch and 9 inch mains</p>	UG		Design diversion.	26 weeks	TBC	26 weeks
			Review diversion design.	Review diversion design.			
			Provide Traffic Management.				
				Install new pipes and associated equipment.			
				Inspect and supervise.			
				Undertake connection and reinstatement works.			
				Test and commissioning.			
			Abandon existing apparatus.				
Virgin Media							

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
VM01	<p>Proposed Shawhead Junction</p> <p>Temporary diversion works to the main fibre cables feeding Cumbernauld, Coatbridge and Airdrie are likely to be required within the West verge of the existing A725/ B7070 to maintain Virgin Media service.</p> <p>Provide four new 96 millimetre diameter PVC ducts accommodating four new fibre cables in the East verge of the new A725 and in the West verge of the new B7070 including 3 number crossings, from the tie-in on the East verge of Whifflet Street to the tie-in on the West verge of the existing B7070. Approximately 8-10k of cable have to be re-routed. Provide new chambers along length of new ducts at 96 metre intervals, at road crossings</p>	UG	<p>Review design diversion.</p>	<p>Review design diversion.</p>	6-10 weeks	1-2 weeks	104 weeks
			<p>Provide traffic management.</p>	<p>Procure apparatus for diversion.</p>			
			<p>Consult and comply with Virgin Media regarding ducting requirements.</p>	<p>Install new cables and associated equipment.</p>			
				<p>Inspect and supervise.</p>			
			<p>Consult and comply with Virgin Media regarding reinstatement requirements.</p>	<p>Undertake jointing, connection and reinstatement works. Recover redundant cable</p>			
				<p>Testing and commissioning.</p>			
			<p>Abandon existing apparatus</p>				

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>and at changes in direction of 90 degrees or more.</p> <p>Upgrade of existing apparatus on the East verge of Whifflet Street may be required to accommodate improvements under the main works.</p> <p>Abandon existing apparatus between the tie-in with Whifflet Street and the B7070.</p>						
VM02	<p>Proposed Chapelhall Junction</p> <p>Temporary diversion works are likely to be required especially around Bo'Ness Road North and South roundabouts.</p> <p>Provide two new 90 millimetre diameter PVC ducts accommodating four new fibre cables in the East verge of the new B799 Bo'Ness Road and in the</p>	UG	<p>Review design diversion.</p> <p>Provide traffic management.</p> <p>Consult and comply with Virgin Media regarding ducting requirements.</p>	<p>Review design diversion.</p> <p>Procure apparatus for diversion.</p> <p>Install new cables and associated equipment.</p> <p>Inspect and supervise.</p>	6-10 weeks	1-2 weeks	As VM01

**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	<p>North verge of McNeil Drive including 5 number crossings, from the tie-in on the East verge of the existing B799 Bo'Ness road to the tie-in on the South verge of the existing McNeil Drive. Approximately 8k of cable has to be re-routed. Provide new chambers along length of new ducts at 180 metre intervals, at road crossings and at changes in direction of 90 degrees or more.</p> <p>Abandon existing apparatus between the tie-in with existing B799 Bo'Ness Road and the tie-in with existing McNeil Drive</p>		Consult and comply with Virgin Media regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works. Recover redundant cable			
				Testing and commissioning.			
				Abandon existing apparatus			
VM03	<p>Daldowie Junction</p> <p>Apparatus affected by Junction improvements works on Hamilton Road.</p>	UG	Review design diversion.	Review design diversion.	6-10 weeks	1-2 weeks	As VM01
				Procure apparatus for diversion.			



**Appendix 1/16: Indicative Schedule of Diversionary Works**

Reference	Location and Description	UG or OH <sup>1</sup>	Main Works by Company	Works by Undertakers	Design and Material Order Period	Notification Period to Attend Site	Works Period Estimate
	Lowering and/or diversion of existing apparatus. Diversion to follow existing line. 2 No. separate sections of 4 way duct.		Provide traffic management.				
			Consult and comply with Virgin Media regarding ducting requirements.	Install new cables and associated equipment.			
				Inspect and supervise.			
			Consult and comply with Virgin Media regarding reinstatement requirements.	Undertake jointing, connection and reinstatement works. Recover redundant cable			
				Testing and commissioning.			
			Abandon existing apparatus				

**Table 1/16B Notes**

1. UG – Underground; OH – Overhead
2. Current programme for relocation: Summer 2016 – to be confirmed by Company in consultation Scottish Power Energy Networks

**Appendix 1/16: Indicative Schedule of Diversionary Works**

## **Appendix 1/17: Traffic Safety and Management**

### **1 General Requirements**

- 1.1 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 Company shall demonstrate to the satisfaction of those consulted as given in Part 1 of these New Works Requirements that his traffic management proposals have been developed such that they include all necessary measures to minimise delays, disruptions and diversions to traffic. This shall include traffic modelling measures as appropriate using micro-simulation measures and the like. Consultation Certificates shall be submitted in accordance with the Certification Procedure.
- 1.2 Subject to the other requirements of this Agreement the Company shall comply at all times with the requirements of Chapter 8 of the Traffic Signs Manual 2009 and any relevant Transport Scotland Publication including those detailed in the DMRB.
- 1.3 The Company shall submit details of its proposed traffic management programme to the Scottish Ministers at least 6 weeks before the date for commencement of the New Works. The programme shall identify the Temporary Traffic Management Scheme associated with each construction operation, and the duration of each phase of the programme. The scheme or schemes proposed shall take into account the information contained in this Appendix 1/17 and in Appendices 1/18, 1/19 and 1/20, and be consistent with any traffic management measures and construction operations being undertaken on adjacent roads.
- 1.4 All applications relating to Traffic Orders and/or authorisation of signs and/or signals shall be submitted to the Overseeing Organisation in writing and require the following notice:
- i) amending or making temporary traffic orders - 8 weeks;
  - ii) authorisation of temporary traffic signals - 3 weeks;
  - iii) authorisation of non prescribed signs – 1 week.
- 1.5 For advance notice of requirements for diversions, occupations and works occupations refer to Appendix 1/18.
- 1.6 The Company shall be responsible for the payment of all charges associated with the preparation and publication of all road related orders.
- 1.7 The Company shall undertake Stage 2 and Stage 3 Road Safety Audits and submit Road Safety Audit Certificates in respect of the Temporary Traffic Management Schemes in accordance with Part 1 of these New Works Requirements and the Certification Procedure.
- 1.8 Prior to any New Works starting on the New Works Site, the Company shall supply to the Overseeing Organisation details of traffic management proposals including, but not limited to, the following:
- i) phasing of Works;
  - ii) drawings showing traffic management layouts including, but not limited to, the following:
    - (a) position of traffic signs, signals and cones;
    - (b) width of lanes;
    - (c) working areas;
    - (d) safety zones;

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### **Appendix 1/17: Traffic Safety and Management**

- (e) details of temporary barriers for the protection of personnel;
  - (f) entry and exit points for site traffic;
  - (g) provisions for emergency vehicles;
  - (h) provisions for vehicle recovery;
  - (i) provisions for wide loads; and
  - (j) crossovers;
- iii) timing of Operations;
- 1.9 Sufficient information to demonstrate the objectives stated in paragraph 1 of this Appendix 1/17 can be achieved.
- 1.10 Names and telephone numbers of a minimum of 3 personnel who can be contacted by the Police 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 New Works Site is closed.
- 1.11 The erection and removal of any traffic management installation, temporary diversion or Stage 3 Road Safety Audit shall not be carried out during the following hours and at any other time periods specified by the Overseeing Organisation:
- 1.12 Monday to Saturday – 06:00 to 09:30 hours inclusive and 16.00 (15.30 on Fridays) to 20:00 hours inclusive and on any local or national public holiday unless agreed in writing by the Relevant Authority, or on specific instructions from the Police.
- 1.13 Where the Company proposes to carry out the erection and removal of any traffic management installation, temporary diversion or Stage 3 Road Safety Audit on a Sunday, they shall give at least 7 days notice of their proposals to the Police and shall not carry out such work without the approval of the Police.
- 1.14 Temporary crossovers shall be designed for a minimum Design speed (85 percentile speed) of 70kph, or a minimum of 60kph where it can be demonstrated to the Overseeing Organisation that it is necessary in the interests of safety.
- 1.15 Where required by the Police, the Company shall supply, erect, maintain and remove on completion of the New Works, speed detection cameras for use by the Police at Temporary Traffic Management Schemes. The Police shall advise the Company as to the type and number of speed detection cameras required and also to the locations where the cameras should be deployed.
- 1.16 The Company shall maintain access across the New Works Site to the requirements and standards in Table 1/18 of Specification Appendix 1/18.
- 1.17 The Company shall ensure that while any Temporary Traffic Management Schemes are in force they are inspected and constantly monitored, any Defects identified being rectified immediately to the satisfaction of the Overseeing Organisation, the Police and Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as appropriate.
- 1.18 Frequency of inspections and maximum response times shall be as follows:

**Appendix 1/17: Traffic Safety and Management**

<b>Location</b>	<b>M8 ,M73, M74, A8 &amp; A725</b>		<b>All other Roads</b>	
	<b>Frequency of inspection per 24 hour period</b>	<b>Maximum Response Time</b>	<b>Frequency of inspection per 24 hour period</b>	<b>Maximum Response Time</b>
<b>Advance Signing</b>	4	60 minutes	2	60 minutes
<b>Taper</b>	12	15 minutes	6	15 minutes
<b>Lane Closure</b>	6	30 minutes	3	30 minutes
<b>End Signing</b>	4	60 minutes	2	60 minutes

- 1.19 During the period when traffic restrictions are imposed on any road, the Company shall provide a minimum of two responsible and appropriately experienced operatives with an appropriate vehicle on a 24 hour day, 7 days a week basis whose sole responsibility shall be for the operational supervision of the Temporary Traffic Management Scheme.
- 1.20 The operatives shall be equipped with a mobile cellular telephone and mobile message pager to enable direct communication with them at all times. They shall be empowered to accept instructions from the Police and Roads Authority personnel with regard to the layout of the Temporary Traffic Management Scheme for which they are responsible.
- 1.21 The Company shall keep a daily record of all Defects in any Temporary Traffic Management Schemes, 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.
- 1.22 A copy of this record shall be forwarded to the Overseeing Organisation on the following day.
- 1.23 In the event of a traffic accident occurring in or adjacent to the New Works Site, the Company shall immediately contact the Police, 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.
- 1.24 The Company shall attend such accidents in accordance with the requirements for recovery set out in Specification Appendix 1/20.
- 1.25 The Company shall remove any debris from the road to restore the road surface to a serviceable condition and shall then carry out any interim repairs or reinstatement that is required to reinstate the traffic control to its original layout. In any event complete reinstatement shall be made within 24 hours of the accident.
- 1.26 The Company shall ensure that sufficient personnel and a sufficient stock of spare signs and cones etc, are available at all times to make good damage to any traffic control layout.
- 1.27 When a contraflow is in operation an emergency lane shall, where practicable, be provided at all times for emergency vehicles. The emergency lane shall be kept free of materials, plant and stationary vehicles but it may be used for site access. The route shall be signed and delineated in order to ensure easy and free flow of any emergency vehicle.

### **Appendix 1/17: Traffic Safety and Management**

- 1.28 The needs and safety of non motorised users shall be considered at all times.
- 1.29 The Company shall comply with the advice of paragraph D3.10.4-6 and O3.13 of Chapter 8 of the Traffic Signs Manual 2009.
- 1.30 All non motorised users diversions shall have a hard surface and adequate drainage to prevent flooding or ponding. They shall be kept clean and free from all materials, Construction Plant and stationary vehicles.
- 1.31 Excessively long lengths should be avoided where possible to avoid 'shortcuts'. Care shall be taken to avoid crossing areas regularly traversed by heavy plant.
- 1.32 No at-grade crossings of the Existing A725 Trunk Road, Existing A8 All purpose road, New M8 Motorway, Existing M73 Motorway or the Existing M74 Motorway shall be permitted.
- 1.33 All diversions of pedestrian routes which are normally lit shall be provided with a standard of lighting at least equal to that of the original route.
- 1.34 Refer to the standards given in Table 1/18B of Appendix 1/18.
- 1.35 Works required to Pedestrian Underpasses shall be undertaken in such a way that the non motorised access provided by adjacent Underpasses is not restricted at any one time.
- 1.36 All drivers including those delivering Constructional Plant and materials shall be given clear instructions regarding the traffic arrangements applicable at any particular time.
- 1.37 Provision for the passage of abnormal loads through the New Works shall be as follows:
- i) The Company shall assist the Police in moving abnormal loads through the Works by modifying the signing/coning as necessary; and
  - ii) Signs/cones so moved shall be replaced immediately the abnormal loads have passed through the New Works.
- 1.38 For the purposes of this Appendix, 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 New Works.
- 1.39 Meetings between the Overseeing Organisation, the Company, Police and Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as appropriate, shall be arranged by the Company monthly throughout the duration of the New Works, at initiation or changes of traffic management layouts and at any other time deemed necessary by any of these parties.
- 1.40 The Company shall ensure that his traffic management proposals take account of events and public holidays which are likely to affect traffic flows.
- 1.41 The Company shall accommodate roadwork schemes adjacent to the New Works and shall consult and comply with the Relevant Authority in this respect.
- 1.42 No restrictions to traffic operations shall be permitted to the traffic lanes or hardshoulders of the motorway and trunk road network, including the M8, M73, M74, A8 and A725, including motorway link roads and slip roads, for a period from 13 July 2014 until 6 August 2014, both dates included.'

## **2 Monitoring of Roadworks**

- 2.1. The Company shall nominate two members of staff to liaise with Traffic Scotland at all times.

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### **Appendix 1/17: Traffic Safety and Management**

- 2.2. The Company shall inform the National Network Control Centre (NNCC), Transport Scotland, AA Roadwatch, RAC, Radio Scotland, local radio, local press, South East Management Unit, South West Management Unit, East Dunbartonshire Council, North Lanarkshire Council and Falkirk Council and the emergency services at least two weeks in advance of any planned major changes to the traffic management layouts, including any plans to reduce the number of lanes in accordance with paragraph 5.2.
- 2.3. In accordance with Appendix 1/24 the Company 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 New Works Site.
- 2.4. The following organisations shall be informed of the frequencies indicated in the reporting frequencies section of paragraph 3.0 below:
- i) National Network Control Centre;
  - ii) AA Roadwatch;
  - iii) Radio Scotland;
  - iv) Local Radio Networks;
  - v) Traffic Link; and
  - vi) any other organisations as specified by the Overseeing Organisation
- 2.5. Traffic queues shall be monitored at all times during periods when Temporary Traffic management Systems are in operation for the duration of this Agreement.
- 2.6. Traffic queues shall be measured by means of time delay.
- 2.7. Queue lengths measured as being less than eight minutes shall be defined as representing “no substantial delay”.
- 2.8. Substantial delay queue lengths shall be quoted in the following bands;
- | <b>Measured Delay</b>          | <b>Quoted Delay</b>  |
|--------------------------------|----------------------|
| 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 minutes        |
- 2.9. When communicating a traffic queue its length shall also be quoted as a distance in miles.
- 2.10. For the purposes of this Agreement, a queue is defined as being where the speed of vehicles is less than 20 miles per hour.

### **3 Reporting Frequencies**

- 3.1 Traffic Information Outlets shall be informed if:
- i) a queue reaches eight minutes delay;
  - ii) a queue changes by five minute band;
  - iii) substantial delay ends i.e. delay less than eight minutes; and
  - iv) the Company shall report to NNCC every 30 minutes irrespective of traffic conditions.
- 3.2 The Company shall not open any area to traffic unless the following requirements are met:

## **Appendix 1/17: Traffic Safety and Management**

- i) appropriate road markings have been laid or removed;
- ii) the carriageway has been fully swept and cleared of all items of Construction Plant, personnel, materials and debris;
- iii) adjacent road restraint systems, where required, have been erected and tensioned;
- iv) the Company shall not have to impose future traffic restrictions on the section of carriageway to undertake New Works which could have reasonably been completed under the preceding traffic control period; and
- v) all temporary or permanent signing and lighting is in place.

### **4 Traffic Safety and Control Officer**

4.1 The Company shall appoint a senior member of its staff to act as Traffic Safety and Control Officer. This person shall be responsible for all traffic safety and control during the construction of the New Works and shall liaise with the Relevant Authorities as required. The Traffic Safety and Control Officer shall take instructions direct from the Scottish Ministers and, in the case of emergency, from the Police where they have assumed control. Radio contact should be maintained at all times with the Traffic Safety and Control Officer.

4.2 The responsibilities of the Traffic Safety and Control Officer shall include the following:

- i) All traffic management measures associated with the New Works;
- ii) Ensuring that all equipment is in place and in full working order at all times;
- iii) Enforcement of all relevant Health and Safety directives, relating to operations and live traffic;
- iv) Enforcement of site access requirements;
- v) liaison with the Scottish Ministers and the Relevant Authorities and continued monitoring of the traffic management measures adopted; and
- vi) Arranging for watchmen and other staff so that the New Works Site is patrolled and inspected at all times and equipment attended to and maintained and in the case of accidents have replacement signs, cones, bollards and lights and the like erected without delay.

4.3 The Company shall notify the Scottish Ministers and the Relevant Authorities with the name and 24 hour contact telephone number of the Traffic Safety and Control Officer appointed.

### **5 Lane Occupations**

5.1 Notwithstanding other provisions of this Agreement, one lane for use by all permitted classes of vehicles and one narrow lane for the use of cars and other light vehicles shall be provided in each direction on the mainline carriageway of the Existing M8 Motorway, Existing M73 Motorway, Existing M74 Motorway, Existing A725 trunk road, Existing A8 trunk and the New M8 Motorway during the New Works, as a minimum requirement.

5.2 The Company shall apply to the Scottish Ministers for written approval to reduce the Lane provisions described in paragraph 5.1 above to a minimum of one Lane for use by all permitted classes of vehicle in each direction on the mainline carriageway of the Existing M8 Motorway, Existing M73 Motorway, Existing M74 Motorway, Existing A725 trunk road and the Existing A8 trunk road between the hours 2000 and 0600 Monday to Friday and



### **Appendix 1/17: Traffic Safety and Management**

- 2000 and 0800 Saturday and Sunday, during the New Works. In exceptional circumstances the Company shall apply to the Scottish Ministers for written approval to reduce the Lane provisions described in paragraph 5.1 above to a minimum of one lane for use by all permitted classes of vehicle in each direction on the mainline carriageway of the Existing M8 Motorway (D2M), Existing M73 Motorway (D2M), Existing M74 Motorway (D2M), Existing A725 trunk road and the Existing A8 trunk road all day Saturday and Sunday during the New Works.
- 5.3 The Company shall demonstrate to the Scottish Ministers that such applications are necessary in terms of either buildability or health and safety.
- 5.4 Applications shall be made a minimum of 4 weeks in advance of any planned reduction to the provision of paragraph 5.1 above during the New Works.
- 5.5 In very exceptional weather circumstances, such as very heavy snow, or in other very exceptional circumstances necessary for the carrying out of the New Works and approved by the Scottish Ministers, (which shall not be unreasonably withheld) a minimum of one Lane for use by all categories of vehicle in each direction shall be provided on the mainline carriageway of the Existing M8 Motorway (D2M), Existing M73 Motorway (D2M), Existing M74 Motorway (D2M), Existing A725 trunk road and the Existing A8 trunk road.
- 5.6 A minimum of one Lane for use by all permitted classes of vehicles shall be provided in each direction of the mainline carriageway of the Existing M73 Motorway (D2M) at all times.
- 5.7 Reduction to the provision of paragraph 5.1 above shall not be permitted during the following periods, except in the case of emergencies:
- i) Christmas and New Year holidays (24 December to 2 January inclusive);
  - ii) Good Friday to Easter Monday inclusive;
  - iii) between Friday and Monday inclusive on any local Bank holiday or public holiday weekend during May or September;
  - iv) between the 23rd July and 3rd of August 2014 inclusive for the duration of the 2014 Glasgow Commonwealth Games
  - v) the weekends at the start and end of the Glasgow Fair holiday; and
  - vi) as directed by the Police.
- 5.8 On Side Roads reduction to the existing provision of Lanes shall be subject to the prior written approval of the Relevant Authorities or land owners or occupiers and a temporary replacement route or temporary diversion is in operation.
- 5.9 The Company shall provide Consultation Certificates in accordance with Paragraph 1.8 to Part 4 of this Schedule 2 in respect of this requirement.
- 5.10 A minimum of one Lane and one Footway shall be provided to accommodate both directions of traffic on Bothwell Park Access Road during the demolition and reconstruction of S204 Bothwell Park Accommodation bridge.
- 5.11 A minimum of one Lane and one Footway shall be provided to accommodate both directions of traffic on Bredisholm Road – crossing the existing A8, during the demolition and reconstruction of ST104 Braehead Farm accommodation bridge for a maximum of 8 months.

### **Appendix 1/17: Traffic Safety and Management**

5.12 A minimum of one Lane and one Footway shall be provided to accommodate both directions of traffic on Bredisholm Road – crossing the existing M73, during the demolition and reconstruction of ST103 Bredisholm Road bridge for a maximum of 8 months.

5.13 Lane Occupation charges shall be applied in accordance with Schedule 6.

#### **6 Safety of Personnel**

6.1 Notwithstanding any other requirements of this Agreement, safety zones at all Temporary Traffic Management Schemes on the New Works Site shall be a minimum of 1.2 metres wide unless the Company shall as part of the Temporary Traffic Management Schemes incorporate a safety barrier in lieu of other means of demarcation allowed under the other requirements of this Agreement.

6.2 No personnel or items of plant (other than that required for signing and coning operations) shall enter a newly closed off area until such times as the traffic has been satisfactorily diverted.

6.3 The Scottish Ministers have the right to instruct the Company's workmen on any matter relating to the safety of personnel and traffic safety and control, including signing and coning.

6.4 All drivers including those delivering plant and materials shall be given clear instructions regarding the traffic management arrangements applicable at that particular time.

6.5 All personnel working on or adjacent to trafficked roads shall be issued with printed copies of appropriate safety instructions and receive training as necessary.

#### **7 Requirements for Vehicles used on the New Works**

7.1 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 construction 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 6 "Type C Works" in Chapter 8 of the Traffic Signs Manual shall be painted in non-reflectorised yellow (Colour No 355 to BS 381 C or similar).
  - ii) Similarly all vehicles engaged in New 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.
  - iii) All other vehicles undertaking New 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.
  - iv) Vehicles shall have a sign board reading "Highway Maintenance" (to Diagram 740A of Schedule 12 Part V of the Traffic Signs Regulations and General Directions 1994) fixed at the rear.
  - v) 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.
  - vi) The lettering shall be black capital letters from the alphabet described in the Traffic Signs Regulations and General Directions 2002 Schedule 13 Part II on a yellow non-reflectorised background in accordance with BS 381C, Colour No 355.
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## **Appendix 1/17: Traffic Safety and Management**

- vii) Heavy goods vehicles shall be fitted with an audible reversing warning device.
  - viii) All vehicles entering the New Works Site for any purpose shall comply fully with the requirements of Specification Appendix 1/19.
- 7.2 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.
- 7.3 All warning lamps shall be switched on when the vehicle or plant is manoeuvring into or out of the location of the New Works, operating at low speed on the carriageway or hardshoulder open to vehicles or standing on a carriageway or hard shoulder open to vehicles.
- 7.4 Hazard warning lights are not an acceptable alternative to roof mounted flashing lamps, but may be used in addition.
- 7.5 All vehicles and plant shall be free from oil and fuel leaks and if refuelled on the New Works Site care shall be taken to prevent spillage.
- 7.6 Side tipper vehicles shall be used where such shall limit turning manoeuvres alongside trafficked lanes.
- 7.7 No vehicle shall be permitted to stop on a live section of any carriageway to load or unload materials or personnel unless specifically and unavoidably for traffic management purposes.
- 7.8 During the hours of darkness no vehicle under the control of the Company shall be driven towards oncoming traffic on a closed section of the New Works Site adjacent to live traffic.

## **8 Temporary Traffic Signs**

- 8.1 The Company 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.
- 8.2 All traffic signs required by the Traffic Signs Regulations and General Directions 2002 to be reflective shall be made reflective by the application of Class 1 retroreflective material.
- 8.3 All temporary traffic signs shall comply with the Traffic Signs Regulations and General Directions 2002.
- 8.4 In addition to the minimum requirements for signing and coning under Chapter 8 of the Traffic Signs Manual the Company shall erect and maintain the following:
- i) Advanced signing two miles prior to roadworks as drawing No (P) 7004 sheet 1 of 3) detailing modification to sign WBM 338.1 of Chapter 8 of the Traffic Signs Manual.
  - ii) The standard two-line legend "Road Repairs" shall be replaced by "Major Roadworks".
  - iii) 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.
  - iv) The standard two line legend shall read "Delays Possible" and a third line added to the legend indicating how long delays are possible.
  - v) At the commencement of the roadworks, the additional line shall read, for example "until July 09".

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### **Appendix 1/17: Traffic Safety and Management**

- vi) At least ten working days before the end of the carriageway restrictions, the date shall be specified more precisely, for example "until 25 June 2009".
- vii) This date shall be further revised if necessary, until the restrictions are removed.
- viii) Only the following abbreviations shall be used: Jan, Feb, Mar, Apr, Aug, Sep, Oct, Nov and Dec.
- ix) Traffic calming chevrons shall be provided within the left hand lane prior to the Works commencing at the end of the right hand Works coning splay over a length of 10 metres. See Drawing Number 100/1 illustrating traffic calming chevrons to be provided.
- x) 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.
- xi) Where within all of the drawings listed above reference is made to "The Scottish Office", it shall be deleted and replaced with "Transport Scotland".
- xii) 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.
- xiii) This signing shall comprise a frame on to which signs displaying any one of the approved messages below shall be fitted.
- xiv) 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.
- xv) The signs shall be constructed and mounted in accordance with the general principles outlined in Topic 3 of Chapter 8 of the Traffic Signs Manual.
- xvi) They shall be reflectorised by the use of Class1 retroreflective material.
- xvii) The legends required to the works are:
  - (a) WORK SUSPENDED
  - (b) UNSUITABLE WEATHER
  - (c) ROAD REPAIRS
  - (d) MATERIALS HARDENING
  - (e) LANE CLOSED FOR SAFETY
  - (f) CONCRETE SETTING
  - (g) LANE CLOSED TO PROTECT WORKFORCE
  - (h) FURTHER WORKS AHEAD
  - (i) LANE REMAINS CLOSED FOR SAFETY PURPOSES

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



Appendix 1/17: Traffic Safety and Management

Drwg. No.  
**(P) 7004** sheet  
2 of 3

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NOTES:-

- The legends are from the Transport Heavy alphabet at the x-heights shown.
- The outlines of the tiles do not form part of the signs.
- Colours:- BS.873:Part 6 (Black & White- Table 5 Legend, Borders and Underline--- Black Background----- Yellow)
- Illumination:- Internal or external lighting or reflectorised in accordance with the Traffic Signs Regulations and General Directions.
- Dimensions :- x-heights are in millimetres, all other dimensions are in stroke widths (4sw = x-height).
- The signs shall comply with the current edition of BS.873.

FIRST ISSUED: 18.6.92
REVISIONS:
THIS ISSUE: 18.6.92 Drawn: R.M. Approved:
Title: Roadworks <b>DESCRIPTION OF WORKS</b>
DEPARTMENT OF TRANSPORT
Drwg. No. <b>(P) 7004</b> sheet 2 of 3

P7004-2

Before using this drawing, confirm that it has not been superseded.

**Appendix 1/17: Traffic Safety and Management**

Drwg.No.  
**(P) 7004** sheet  
3 of 3

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NOTES:-

1. The legends are from the Transport Heavy alphabet at the x-heights shown.
2. The outlines of the tiles do not form part of the signs.
3. Colours:- BS.873:Part 6 (Black & White- Table 5  
Legend & Borders- Black  
Background----- Yellow)
4. Illumination:-  
Internal or external lighting or reflectorised in accordance with the Traffic Signs Regulations and General Directions.
5. Dimensions :-  
x-heights are in millimetres, all other dimensions are in stroke widths (4sw = x-height).
6. The signs shall comply with the current edition of BS.873.

**P7004-3**

Before using this drawing, confirm that it has not been superseded.

**FIRST ISSUED: 18.6.92**

REVISIONS:

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**THIS ISSUE: 18.6.92**  
Drawn: R.M. Approved:

Title: Roadworks  
**DESCRIPTION OF WORKS**

DEPARTMENT OF TRANSPORT

Drwg.No.  
**(P) 7004** sheet  
3 of 3





**Appendix 1/17: Traffic Safety and Management**

3000

2000  
900

THE SCOTTISH OFFICE

WORK STARTS  
HERE  
16 AUG  
FOR 2 WEEKS

DELAYS POSSIBLE

50 x-height

125 x-height

125 x-height

100 x-height

100 x-height

125 x-height

**REFERENCE DRAWINGS:**  
W(S)137: The Scottish Office logo  
WM564 ; Warning Sign - Road Works

**NOTES:**

1. © Crown copyright. This drawing must NOT be reproduced. Further copies may be obtained from The Scottish Office Roads Directorate.
2. All dimensions are given in millimetres.
3. The outlines of the tiles do not form part of the sign.
4. Where not dimensioned design rules apply see Scottish Development Department Circular R332.
5. The signs shall comply with the current edition of B.S.873.
6. The signs will be reflectorised by the application of Class 1 material on Trunk Roads.
7. The legend shall be from the Transport Heavy alphabet at x-heights shown.
8. The logo as shown , with "THE SCOTTISH OFFICE" in Friz-Quadrata alphabet at the equivalent of 50 x-height.
9. Details of "THE SCOTTISH OFFICE" logo crest is as shown on drawing no. W(S) 137.
10. Colours: BS873 Part 6  
Legend, Borders and The Scottish Office logo = Black, Background = Yellow  
WM564 Warning Sign; Border = Red, Symbol = Black, Background = White
11. The illumination of the sign must accord with the requirements of the current "Traffic Signs Regulations and General Directions".  
Regulations 15-19 as they apply to: diags 564.
12. Details of the Road Works triangle and the Scottish Office logo are given on WM564 and W(S)137.

REVISIONS
DATE: February 1994
SCALE: 1/20
"WORK STARTS HERE, DELAYS POSSIBLE"
The Scottish Office Roads Directorate
Drawing No. <b>W(S) 148</b>

GF150

**Appendix 1/17: Traffic Safety and Management**

2100

37.5 x-height

1800

750

100 x-height

400

150 x-height

150 x-height

150 x-height

1400

WM645

**REFERENCE DRAWINGS:**  
W(S)137: The Scottish Office logo  
WM564 : Warning Sign - Road Works  
WM645: Supplementary plate - End

**NOTES:**

1. © Crown copyright. This drawing must NOT be reproduced. Further copies may be obtained from The Scottish Office Roads Directorate.
2. All dimensions are given in millimetres.
3. The outlines of the tiles do not form part of the sign.
4. Where not dimensioned design rules apply see Scottish Development Department Circular R332.
5. The signs shall comply with the current edition of B.S.873.
6. The signs will be reflectorised by the application of Class 1 material on Trunk Roads.
7. The legend shall be from the Transport Heavy alphabet at x-heights shown.
8. The logo as shown , with "THE SCOTTISH OFFICE" in Friz-Quadrata alphabet at the equivalent of 37.5 x-height.
9. Details of "THE SCOTTISH OFFICE" logo crest is as shown on drawing no. W(S) 137.
10. Colours: BS873 Part 6  
Legend, Borders and The Scottish Office logo = Black, Background = Yellow  
WM564 Warning Sign; Border = Red, Symbol = Black, Background = White
11. The illumination of the sign must accord with the requirements of the current "Traffic Signs Regulations and General Directions".  
Regulations 15-19 as they apply to; diags 564.
12. Details of the Road Works triangle, supplementary plate and the Scottish Office logo are given on WM564, WM645 and W(S)137.

REVISIONS
DATE: February 1994
SCALE: 1/20
"SORRY FOR ANY DELAY"
The Scottish Office Roads Directorate
Drawing No. <b>W(S) 149</b>

GF1504

## **Appendix 1/18: Temporary Diversions for Traffic**

### **1 Design Of Temporary Diversions For Traffic**

- 1.1 Safe access across the New Works shall be maintained or diversions provided in accordance with the minimum standards shown in Tables 1/18A and 1/18B to this Appendix.
- 1.2 The Company shall Design temporary diversions for traffic and the associated traffic management measures as required to suit the construction staging, methods of work and Undertakers diversions.
- 1.3 The Company shall provide and maintain access to all properties adjacent to the New Works. Temporary diversions shall be maintained at all times.
- 1.4 Where existing central reserve crossovers shall be used for temporary diversion of traffic such crossovers shall require to be upgraded in advance to current design standards detailed in the DMRB.
- 1.5 The Company shall construct temporary diversion ways wherever the New Works interfere with existing public or private roads or other ways over which there is a public or private right of way for traffic, whether vehicular or non motorised user.
- 1.6 The Company shall submit for approval to the Overseeing Organisation his detailed proposals as below for the temporary diversion of traffic (including non motorised user routes) at least 6 weeks prior to the implementation date:
  - i) Phasing of the diversion works including all concurrent diversions;
  - ii) Drawings showing traffic management layout including as follows:
    - (a) position of traffic signs, signals and cones;
    - (b) width of lanes;
    - (c) working areas;
    - (d) safety zones;
    - (e) details of temporary barriers for the protection of personnel;
    - (f) entry and exit points for site traffic;
    - (g) provisions for emergency vehicles;
    - (h) provisions for vehicle recovery;
    - (i) provisions for wide loads; and
    - (j) crossovers.
  - iii) Making or amending traffic orders.
  - iv) The Company shall be responsible for the payment of all charges associated with the preparation and publication of all road related orders.
  - v) The standard of construction and lighting of diversions shall be suitable in all respects for the class or classes of traffic using the existing ways. Any temporary diversion of a road shall have a bituminous or asphaltic surface. All access provision shall be to a standard equivalent to that in place upon commencement of the New Works.
  - vi) Temporary diversions of the Trunk Roads and Motorways shall be designed in accordance with the DMRB to a minimum Design speed of 70kph.

### **Appendix 1/18: Temporary Diversions for Traffic**

- vii) Any temporary diversions of Slip Roads and Side Roads shall be designed to a minimum Design speed of 50kph.
- viii) The Company shall give the Scottish Ministers at least 14 days written notice of any phased Works which require Lane Occupations.
- ix) Table 1/18B gives minimum standards for diversions of traffic.
- x) 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.
- xi) Notwithstanding any other requirements of this Agreement any generator required for powering temporary traffic lights shall not be permitted within 100 metres of any occupied property.

## **2 Maintenance**

- 2.1 Temporary diversions are deemed to be temporary works and are the responsibility of the Company. They shall be maintained such that the routes are available and in a suitable condition for public use at all times while the diversion is in operation.
- 2.2 The Company shall make all necessary arrangements with owners and occupiers of any land, in addition to that provided in this Agreement, which is temporarily required for the diversion of traffic.
- 2.3 No revised arrangement affecting the bus stops as a consequence of the Design or the construction of the New Works shall be permitted without the prior written approval of the Relevant Authority. The Relevant Authority shall require a minimum of 3 weeks notice to consider such approval.
- 2.4 Temporary diversion signing shall be maintained in good order and covered or removed when the diversion is not in operation.

**Appendix 1/18: Temporary Diversions for Traffic**

**Table 1/18A: Requirements of the Overseeing Organisation in the Execution of Temporary Diversions Necessitated by the New Works.**

Description	Requirements	Remarks
Existing M8 Motorway (D3M) Existing M73 Motorway (D3M) Existing M74 Motorway (D3M)	To be kept open at all times. One lane for use by all permitted classes of vehicles and one narrow lane for the use of cars and other light vehicles shall be maintained as a minimum in each direction except between the hours 2000 and 0600 Monday to Friday and 2000 and 0800 Saturday and Sunday where one Lane may be maintained as a minimum in each direction if approval is granted in accordance with Paragraph 5.2 of Appendix 1/17.	Refer to Appendix 1/17
Existing A8 trunk road	To be kept open at all times. One lane for use by all permitted classes of vehicles and one narrow lane for the use of cars and other light vehicles shall be maintained as a minimum in each direction except between the hours 2000 and 0600 Monday to Friday and all day Saturday and Sunday where one Lane may be maintained as a minimum in each direction if approval is granted in accordance with Paragraph 5.2 of Appendix 1/17.	Refer to Appendix 1/17. Non motorised user access shall be provided at all times.
Existing M8 Motorway (D2M), Existing M73 Motorway (D2M) Existing M74 Motorway (D2M)	To be kept open at all times. One lane for use by all permitted classes of vehicles and one narrow lane for the use of cars and other light vehicles shall be maintained as a minimum in each direction except between the hours 2000 and 0600 Monday to Friday and all day Saturday and Sunday where one Lane may be maintained as a minimum in each direction if approval is granted in accordance with Paragraph 5.2 of Appendix 1/17.	Refer to Appendix 1/17

**Appendix 1/18: Temporary Diversions for Traffic**

Description	Requirements	Remarks
All Existing Slip Roads.	Single Lane width of minimum 3.0 metres shall be kept open at all times unless otherwise agreed in writing with the Scottish Ministers and North Lanarkshire Council or South Lanarkshire Council, as appropriate.	Except where Slip Roads shall be closed permanently.
Existing A725 Trunk Road.	To be kept open at all times. One lane for use by all permitted classes of vehicles and one narrow lane for the use of cars and other light vehicles shall be maintained in each direction except between the hours 2000 and 0600 Monday to Friday and all day Saturday and Sunday where one Lane may be maintained as a minimum in each direction if approval is granted in accordance with Paragraph 5.2 of Appendix 1/17.	Refer to Appendix 1/17. Non motorised user access shall be provided at all times.
Westerhouse Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
Halliburton Footbridge	To be kept open at all times unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
Wardie Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
Easterhouse Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
Bredisholm Road crossing the existing A8 Trunk Road	To be kept open at all times until such time that a suitable alternative right of way has been provided, unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.

**Appendix 1/18: Temporary Diversions for Traffic**

Description	Requirements	Remarks
A752 Aitkenhead Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
B802 Woodhall Mill Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
B799 Bo'Ness Road	To be kept open at all times until such time that a suitable alternative route has been provided, unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
A73 Bellside Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Bothwellsheid Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Bredisholm Road crossing the Existing M73 Motorway	To be kept open at all times until such time that a suitable alternative right of way has been provided, unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
B7578 Blanrye Farm Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
B7071 Glasgow Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Old Mill Road crossing the existing M74	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.

**Appendix 1/18: Temporary Diversions for Traffic**

Description	Requirements	Remarks
B756 Bellshill Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Fallside Road crossing the existing M74	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Bothwellpark Road crossing the Existing M74 Motorway	To be kept open at all times until such time that a suitable alternative right of way has been provided, unless agreed in writing with the Scottish Ministers and Glasgow City Council	Non motorised user access shall be provided at all times.
B7071 Bellshill Road	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Spindlehowe Pedestrian Underpass	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.
Cadzow Pedestrian Underpass	To be kept open at all times unless agreed in writing with the Scottish Ministers and North Lanarkshire Council	Non motorised user access shall be provided at all times.



**Appendix 1/18: Temporary Diversions for Traffic**

**Table 1/18B: Schedule of Standards for Temporary Diversions of Traffic**

<b>Route</b>	<b>Parameter</b>	<b>Minimum Standard</b>
Existing A725 Trunk Road, Existing A8 Trunk Road, New A8 All Purpose road, New M8 Motorway, Existing M73 Motorway and Existing M74 Motorway including Slip Roads	General	Subject to the requirements of Chapter 8 of the Traffic Signs Manual.  No diversion outwith the limits of the Trunk Roads or Motorways shall be permitted.
	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 6 per cent (except where otherwise agreed by the Overseeing Organisation)
	Central reserve crossing for contraflow operations	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. Length of crossing shall not be less than 40 metres, with a maximum crossfall of 7 per cent.
Side Roads	Construction	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, with a maximum gradient compatible with the existing side road.

## **Appendix 1/19: Routeing of Vehicles**

### **1 General**

- 1.1 The Company shall submit his proposals for New Works Site access points including access to offices etc. at least four weeks in advance of the proposed start date for construction.
- 1.2 Access to the New Works Site for the Company's vehicles of over 3 tonnes unladen weight shall be taken at the following points only:
- i) Existing M8 Motorway;
  - ii) Existing A8 Trunk Road;
  - iii) Existing M73 Motorway Motorway;
  - iv) Existing A725 Trunk Road;
  - v) Existing M74 Motorway;
  - vi) Existing A89 Coatbridge Road subject to the written approval of Glasgow City Council;
  - vii) Existing A89 Coatbridge Road subject to the written approval of North Lanarkshire Council;
  - viii) Existing A752 Aitkenehead Road subject to the written approval of North Lanarkshire Council;
  - ix) Existing B802 Woodhall Mill Road subject to the written approval of North Lanarkshire Council;
  - x) Existing B799 Boness Road subject to the written approval of North Lanarkshire Council and;
  - xi) Existing B7011 Bellshill Road subject to the written approval of South Lanarkshire Council
- 1.3 Any other existing public and private roads including footways, farm and house accesses shall only be used by the Company with the prior agreement of the owner, the Overseeing Organisation and Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as appropriate.
- 1.4 The Company shall provide, maintain and keep available at all times equipment as may be necessary to keep such ways clean.
- 1.5 The Company shall appraise itself of the standards of such routes with regard to height, weight or other restrictions by which its Operations may be limited or affected.
- 1.6 Any strengthening work required shall be carried out by the Company to the approval of the Scottish Ministers, Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as appropriate.
- 1.7 All other possible access points to the New Works from existing roads shall be signed with the 'NO ACCESS TO CONSTRUCTION TRAFFIC' sign (layout to be approved by the Scottish Ministers).
- 1.8 The access and egress points shall be kept clear at all times and shall be constructed to a suitable standard to achieve a suitable gradient and running surface to permit a smooth access and egress of vehicles in a forward direction.
-

### **Appendix 1/19: Routeing of Vehicles**

- 1.9 All accesses shall comprise a minimum paved width of 6.5 metres for a distance of 20 metres from the public road.
  - 1.10 All accesses shall incorporate a suitable wheel wash on the exit side.
  - 1.11 All roads and accesses within the New Works Site, including existing public and private roads, footpaths, bridleways, farm field and house accesses used by any vehicles engaged on the New Works or any new roads which are part of the New Works and which are being used by traffic shall be kept clean and clear of all dirt, mud or other materials dropped by the said vehicles.
  - 1.12 The Company shall provide, maintain and keep available equipment, such as a vehicle incorporating a suction device and a road brush, as may be necessary to keep the roads clean.
  - 1.13 All egresses shall incorporate a suitable wheel wash on the exit side.
  - 1.14 Bulk Haulage of material excavated within the New Works Site shall be carried out on haul roads within the New Works Site wherever possible.
  - 1.15 The use of public roads for this operation shall only be permitted subject to consultation with the Scottish Ministers or Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as appropriate, notwithstanding at grade crossings of public roads, which may be permitted subject to the Company submitting satisfactory traffic management proposals to the Overseeing Organisation.
  - 1.16 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.
  - 1.17 If the proposed method of construction involves the use of any part of the permanent New Works by construction traffic, the Company shall take any necessary measures to protect such permanent New Works.
  - 1.18 The Company shall submit to the Overseeing Organisation details of proposed borrow pits and tipping areas, which are off New Works Site and the intended routing of vehicles to and from such sites.
  - 1.19 The Company 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.
  - 1.20 The Company 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.
  - 1.21 At-grade right turns or U-turns to and from or on the New or Existing Trunk Roads and Motorways shall be prohibited at all times.
  - 1.22 Right turn manoeuvres shall only be permitted at grade separated interchanges.
  - 1.23 Persistent infringement of the foregoing restrictions shall be deemed a Company Event of Default in terms of this Agreement.
  - 1.24 If the Company wishes to make use of existing laybys as access points to the New Works Site, approval shall be obtained from the Relevant Authorities and, where required, an alternative layby provided for the duration of the New Works, to accommodate bus services, breakdown situations and police traffic monitoring operations.
  - 1.25 Any work which necessitates machinery and plant crossing public roads shall only be permitted with the prior written approval of the Relevant Authority.
-

### **Appendix 1/19: Routeing of Vehicles**

- 1.26 Notwithstanding such approval being granted all such work shall be in compliance with the requirements of Chapter 8 of the Traffic Signs Manual and Traffic Signs Regulations and General Directions 2002.

## **2 Movement of Machinery and Plant across Public Roads**

- 2.1 The Company shall not move excavated material across public roads unless written authorisation has been obtained from the Relevant Authorities.
- 2.2 Any plant crossing shall be traffic signal controlled and shall meet the requirements of Section 4.5 of Chapter 8 of the Traffic Signs Manual.
- 2.3 The Company shall keep the crossing area in a safe condition and as good a condition at all times as the road surface on either side of it. The Company shall take such action as is necessary to protect and maintain the surface of the public road crossed by Constructional Plant.

## **3 Temporary Structures for the Diversion of Public Roads or for Construction Traffic Spanning Areas used by the Public**

- 3.1 For any temporary structures which may be required for temporary diversions of public roads or for spanning areas used by the public, the following criteria shall apply:
- i) The Company shall follow the technical approval procedures contained in BD2 of the DMRB for the design of all temporary structures required to carry public roads or to span areas used by the public.
  - ii) The Company shall provide copies of the Design and Design Check Certificates in accordance with the Certification Procedure.
  - iii) For temporary Structures spanning the New and Existing Trunk Roads and Motorways, the headroom shall be not less than 5.7 metres, excepting where the road below is designated a 'High Load Route' , where the minimum headroom shall be 6.45 metres
  - iv) Notwithstanding the provisions of BD 2, all temporary structures for the diversion of public roads or spanning areas used by the public shall be designated as Category 3 structures.
  - v) Designs shall be undertaken in accordance with the DMRB and Transport Scotland's Interim Amendments.

## Appendix 1/20: Recovery Vehicles for Breakdowns

### 1 Recovery Vehicles to be Provided

#### 1.1 Heavy Recovery Vehicles

1.1.1 A minimum of one number heavy recovery vehicle shall be provided on the New Works Site at all times available for roadworks to the New and Existing Trunk Roads and Motorways.

1.1.2 The heavy recovery vehicle shall comply with the following:

- i) Be a 3 axled vehicle capable of suspend towing a fully laden 44 tonne vehicle up a slope of 4 per cent and shall comply with all appropriate current legislation including Road Vehicles (Construction and Use) Regulations, Road Transport Act and Road Traffic Act. The vehicle shall be fitted with either a 10 tonne single power winch or two power winches of not less than 8 tonnes each. All equipment shall be power-operated with safe working load ("SWL") indicated and with operating levers/buttons clearly marked for operational use.
- ii) Be equipped with chains, wire ropes and shackles suitable for the recovery a fully-laden 44 tonnes gross vehicle weight ("GVW") vehicle. All chains, wire ropes and shackles shall have test certificates and/or stamped showing the SWL, be free from snags, excess stretch and wear.
- iii) Have seating for not less than two adult passengers (in addition to the recovery operatives).
- iv) Be conspicuous, for example, by marking with suitable tape (not less than 125 mm wide) to sides and rear of the vehicle.
- v) The heavy recovery vehicle shall be fitted with the following as a minimum requirement:

Quantity	Item
1	Amber lightbar to comply with The Road Vehicles Lighting Regulations 1989
2	Fully adjustable lights to illuminate both sides and rear of the vehicle
2	Fire extinguishers (1 Number 6 kilograms (net) dry powder; 1 Number 9 litre (net) aqueous film forming foam
1	1-10 person first aid kit to include disposable surgical gloves
2	10 metres 12 tonne nylon straps
2	30 metres by 13 millimetres polypropylene rope
1	44 tonne straight tow pole
1	44 tonne cranked tow pole
10	Highway cones 750 millimetres high
1	Proof load tested crane. (Overlift proof test – static 7.5 tonnes, underlift proof test –static 7.0 tonnes.);
1	Suitable socket set including AF/Metric and BA sizes
1	Suitable tool kit

**Appendix 1/20: Recovery Vehicles for Breakdowns**

Quantity	Item
2	12 tonne bottle jacks
1	Suitable wheelbrace to fit Heavy Goods Vehicles in common use and a torque wrench
1	Suitable jump leads (24 volt)
1	Explosion and flame proof hand lamp
1	Crowbar
1	Copper hammer
	The necessary fittings for connection, from air braking system of a broken down or accident damaged vehicle, to the air braking system of the heavy recovery vehicle
2	Wheel chocks of Heavy Goods Vehicle size
4	Suitable lengths of wood block skidding
1	Rear lighting board incorporating 'ON TOW' legend in lettering of not less than 70 millimetres on conspicuously coloured background to conform with the size, colour and type illustrated by Diagram 5, Section B, Schedule 19 of the Roads Vehicles Lighting Regulations, 1989. The board shall be fitted with lights, reflectors and indicators. When required the recovery vehicle index number or trade license plate shall be fitted
1	Sledge hammer – 7lbs minimum
	ADR (HAZCHEM) chart
50kg	Dry fine sand stored in a waterproof container

vi) The heavy recovery vehicle shall also carry as a minimum requirement;

Quantity	Item
4	(a) 'D' shackles SWL 12 tonnes each
4	(b) 'D' shackles SWL 3 tonnes each
2	(c) Suitable length chains SWL 12 tonnes each
2	(d) Suitable length chains SWL 5 tonnes each
2	(e) Suitable length chains SWL 3 tonnes each

NOTE: All lifting chains and equipment shall be fully certified by an independent competent person to comply with all current legislation. Shackles listed in (vi) (a) and (b) should be stamped with the appropriate SWL. Equivalent wire ropes may be substituted for chains listed in (vi) (c), (d) and (e).

vii) The heavy recovery vehicle shall carry, and use when necessary, equipment designed and manufactured for the purpose of locking the steering of the broken-down or accident damaged vehicle in order to tow in a reverse direction.

viii) The heavy recovery vehicle shall carry equipment to enable the recovery crew to remove the drive line or shafts of the broken down or accident damaged vehicle.

### **Appendix 1/20: Recovery Vehicles for Breakdowns**

- ix) The heavy recovery vehicle shall carry blocks with a SWL of 8 tonnes, 1 number per winch and 2 number on boom (crane) wires.

#### 1.2 Light Recovery Vehicle

1.2.1 A minimum of two number light recovery vehicles shall be provided on the New Works Site at all times available for roadworks to New and Existing Trunk Roads and Motorways.

1.2.2 The light recovery vehicle shall comply with the following:

- i) be capable of carrying or towing, by means of an underlift, a vehicle weighing 2800kg up a slope of 4° and shall comply with all appropriate current legislation including Road Vehicles (Construction and Use) Regulations, Road Transport Act and Road Traffic Act.
- ii) Be capable of recovering motor cycles.
- iii) Be capable of recovering trailers (ie caravans, boat trailers, horse boxes, etc.)
- iv) Have seating capacity for four adult passengers (in addition to the recovery operatives).
- v) Be conspicuous, for example, by marking with suitable tape (not less than 125 mm wide) to sides and rear of the vehicle.
- vi) The light recovery vehicle shall be fitted with the following as a minimum requirement:

Quantity	Item
1	Amber lightbar to comply with The Road Vehicles Lighting Regulations 1989
2	Fully adjustable lights to illuminate both sides and rear of the vehicle
2	Fire extinguishers (1 Number 6 kilograms (net) dry powder; 1 Number 9 litre (net) aqueous film forming foam)
1	1-10 person first aid kit to include disposable surgical gloves
1	30 metres by 13 millimetres polypropylene rope
1	6 tonne straight tow pole
10	Highway cones 750 millimetres high
1	Proof load tested winch and/or spectacle lift
1	Suitable socket set including AF/Metric and BA sizes
1	Suitable tool kit
1	3 tonne bottle or trolley jack
1	Suitable wheelbrace to fit cars and Light Goods Vehicles in common use
1	Suitable jump leads (24 volt)
1	Explosion and flameproof hand lamp
1	Crowbar
1	Quick change towing hitch suitable for 50 millimetres, 2 inch or jaw type fittings
1	Broom and shovel

### **Appendix 1/20: Recovery Vehicles for Breakdowns**

Quantity	Item
1	Wheel chocks of Light Commercial size
2	Suitable lengths of wood block skidding
1	Rear lighting board incorporating 'ON TOW' legend in lettering of not less than 70 millimetres on conspicuously coloured background to conform with the size, colour and type illustrated by Diagram 5, Section B, Schedule 19 of the Roads Vehicles Lighting Regulations, 1989. The board shall be fitted with lights, reflectors and indicators. When required the recovery vehicle index number or trade licence plate shall be fitted
	Total lift facility – 2800kg slideback deck (7.6 metres minimum) or heavy duty dollies
50kg	Dry fine sand stored in a waterproof container

vii) The light recovery vehicle shall also carry as a minimum requirement:

Quantity	Item
4	(a) 'D' shackles SWL 3 tonnes each
2	(b) suitable length wire ropes SWL 3 tonnes each
2	(c) ratchet jackets SWL 6 tonnes each, or hydraulic equivalent
2	(d) suitable towing trolley

NOTE: All lifting chains and equipment shall be fully certified by an independent competent person to comply with all current legislation. An equivalent chain may be substituted for the wire rope listed in (vii) (b).

viii) The light recovery vehicle shall carry, and use when necessary, equipment designed and manufactured for the purpose of locking the steering of the broken-down or accident damaged vehicle in order to tow in a reverse direction.

## **2 Inspection Requirements**

### **2.1 The Vehicle**

2.1.1 The Company shall ensure that all recovery vehicles are maintained in such condition that at all times the vehicles conform to the Road Traffic Act and Regulations made thereunder (Construction and Use and Road Vehicle Lighting Regulations) so as to be fit to be used on the road. The Company shall provide to the Scottish Ministers evidence of this roadworthiness of the Company's recovery vehicles by successful completion of an inspection by the Vehicle Inspectorate or Freight Transport Association, conducted not less than 14 days nor more than 28 days before the vehicles are required.

2.1.2 The Company shall arrange for all recovery vehicles to be inspected by the Vehicle Inspectorate or Freight Transport Association at not less than 6 monthly intervals and shall provide evidence of inspection and testing results to the Scottish Ministers when necessary.

### **2.2 Lifting equipment**



### **Appendix 1/20: Recovery Vehicles for Breakdowns**

2.2.1 All lifting equipment shall be fully certified by an independent competent person to comply with all current legislation.

#### **2.3 Reports**

2.3.1 A copy of each inspection report shall be:

- i) provided to the Scottish Ministers.
- ii) kept in the relevant recovery vehicle.

#### **2.4 Record form**

2.4.1 The Company shall submit weekly to the Scottish Ministers duplicate record forms which log the regular checks made on each recovery vehicle. A sample form is given in Sheet 2 of this Appendix.

### **3 Location for Recovery Vehicle(s)**

3.1 Locations of vehicle shall be determined by the Company and agreed with the Scottish Ministers prior to commencement of each stage of the New Works.

3.2 The recovery vehicles shall be located within easy access to any Temporary Traffic Management Scheme.

### **4 Communication System**

4.1 In addition to the requirements of Appendix 1/3, the Company shall:

- i) provide a secondary 'back up' communications system (e.g. mobile telephone, 2-way radio link or land line) between the recovery base station and all recovery vehicles, and
- ii) provide an emergency telephone and direct land line between the recovery base station(s) and the police.

4.1.1 The Company shall be responsible for all associated equipment and payment of fees to operate the system which shall be established and fully tested prior to the start of the New Works.

### **5 Location(s) for Vehicle Removal**

5.1 At all times when the New or Existing Trunk Roads and Motorways have traffic management due to the New Works, the Company shall be responsible for the removal of shed loads and vehicles that are stationary due to mechanical breakdowns, accident damage or abandoned in the trafficked road. The Company shall accept the instructions of the Scottish Ministers or the Police in connection with this service but generally shall be required to remove the obstruction clear of the New Works, such that the running carriageway is cleared in the shortest possible time. Should the Police be unavailable then the driver's consent shall be obtained in writing if possible prior to such removal.

5.2 Broken down or accident damaged vehicles shall be removed to a safe location with public telephone facility on the local road network.

5.3 If a vehicle cannot be moved immediately and, in the opinion of the Police, the traffic flows are heavy enough to justify such action, the Company shall direct traffic onto an emergency route.

## **Appendix 1/20: Recovery Vehicles for Breakdowns**

5.4 The Company shall make no charge for this recovery service to the owner or driver of the recovered vehicle.

### **6 Explanatory Leaflet**

6.1 The Company shall ensure that the recovery vehicle operatives issue leaflets to the drivers of vehicles requiring assistance, before recovery commences. These shall have been prepared in liaison with the Police and in accordance with Sheet 3 of this Appendix, and have been approved by the Scottish Ministers before issue to the recovery firm.

### **7 Limits of Service**

7.1 The service shall operate within the limits of the New Works Site.

### **8 Requirements for Recovery Personnel**

8.1 Suitability: It is the responsibility of the Company to ensure that all personnel involved with vehicle recovery are suitable to work with 'vulnerable' motorists.

8.2 Training: The Company shall ensure that all personnel involved with vehicle recovery shall hold a certificate certifying successful completion of an appropriate vehicle recovery course recognised by either the Institute of the Motor Industry (IMI) or the Motor Industry Training Standards Council (MITSC). A copy of each certificate shall be provided to the Scottish Ministers not less than 14 days before the commencement of the New Works.

8.3 Personal Protective Equipment: In addition to the provisions identified in the Health and Safety risk assessment conducted by the Company, the following items shall be provided for each crew member of the recovery vehicle:

- i) Safety helmet CE marked to EN 397:1995 Specification for Industrial Safety Helmets;
- ii) Reflective safety garment complying with sub-Clause 117.18 of the Specification;
- iii) Boots with steel reinforcement toecaps and/or safety footwear in accordance with BSEN 345;
- iv) Suitable gloves with the appropriate CE mark; and
- v) Protective goggles in accordance with BS 2092.

Note: All personal protective equipment should be stored and maintained in good, clean condition.

8.4 Identification: The Company shall ensure that all personnel involved with vehicle recovery are issued with the following:

- i) An identity card which incorporates the name of the recovery Company (or the Company), and the name and a photograph of the holder. This card shall be available for inspection at all times and a copy shall be submitted to the Scottish Ministers prior to commencement of the operative working.
- ii) A reflective safety garment (referred to in 2.13.2 above) which prominently displays the Company's name.
- iii) Working hours: Recovery vehicles shall be provided 24 hours a day during the New Works. Recovery operatives shall be on duty for a maximum of 12 hours

### **Appendix 1/20: Recovery Vehicles for Breakdowns**

with the provision that no work should be undertaken in the following 12 hour period.

#### **9 Record Form**

- 9.1 The Company shall submit weekly to the Scottish Ministers completed duplicate record forms which log the assistance given by the recovery vehicle and their operatives. Sample forms are given in Sheet 4 of this Appendix.

**Appendix 1/20: Recovery Vehicles for Breakdowns**

**SHEET 2: FORM FOR 'RECOVERY VEHICLE DAILY CHECK SHEET'**

<b>RECOVERY VEHICLE DAILY CHECK SHEET</b>							
Week Commencing:.....							
Driver's Name:				Vehicle Number:	Type/Registration	Mileage:	
Driver to initial against check list below:							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
OIL LEVEL							
WATER							
ENGINE							
CLEANLINESS-interior							
CLEANLINESS-exterior							
WIPER/WASHERS							
TYRES							
LIGHTS							
Driver's Report (detail any problems):							
Action Taken (to solve above problems):							
Date:				Supervisor's Signature:			
<b>COMPLETED SHEET TO BE RETURNED TO SCOTTISH MINISTERS EACH WEEK</b>							

## **Appendix 1/20: Recovery Vehicles for Breakdowns**

### **SHEET 3: LEAFLET FOR ISSUE BY RECOVERY VEHICLE OPERATIVES TO DRIVERS OF ALL BROKEN DOWN OR ACCIDENT-DAMAGED MOTOR VEHICLES**

**Name of Scheme: M8 M73 M74 Motorway Improvements**

**Vehicle Recovery Service – Explanatory Leaflet authorised by Transport Scotland for issue to drivers of broken-down and accident-damaged motor vehicles within the above works.**

Leaflet to be distributed by recovery vehicle operatives of the appointed recovery firm on behalf of Transport Scotland.

The roadworks operations commence at the 'Roadworks Ahead – 3 miles' sign and end at the 'Roadwork End' sign.

The recovery service provided along the extent of the roadworks operation is free.

Vehicles will be recovered clear of the roadworks operations to a safe location on the local network unless otherwise directed by the police.

It will then be at the discretion of individual drivers of broken-down or accident damaged vehicles requiring assistance to arrange for assistance or the removal of their vehicle to a garage of their choice. The operators of the free recovery service do not make such arrangements.

Useful contact numbers are given below:

- (a) Local Garage
- (b) AA
- (c) RAC
- (d) Greenflag

Assistance will also be given by telephoning

If a motorway emergency telephone is used, the police will assist.





## **Appendix 1/21: Information Boards**

### **1 Information Boards**

- 1.1 The Company shall provide and erect 4number of each type of display board detailed below in accordance with Scottish Office Technical Memorandum SH3/91 'Trunk Road Schemes Under Construction – Display Signs' which is available from:

HMSO

71 Lothian Road

Edinburgh EH3 AA2

Telephone: 0131-228-4181

- 1.2 The legends shall consist of:

THE M8 M73 M74 MOTORWAY IMPROVEMENTS DBFO CONTRACT

ROAD OPENING [            ]

- 1.3 The Company shall determine and insert the anticipated opening date as appropriate.



## **Appendix 1/22: Progress Photographs**

### **1 Progress Photographs**

1.1. The Company shall employ a professional photographer to undertake the progress photographs who shall be approved by the Scottish Ministers. Prior to the approval of a professional photographer submission of samples of previous work shall be made to the Scottish Ministers.

1.2. Prints shall be delivered and mounted in albums to the approval of the Scottish Ministers and labelled as per sub-Clause 122.2 of the Specification.

1.2.1 Proof prints shall be made available to the Scottish Ministers within seven days of exposure and any which are unacceptable shall be retaken immediately.

1.2.2 All photographs shall also be supplied in Kodak Photo CD standard format or equivalent.

1.3. The following specification fulfils the progress photographs requirements for the New Works.

#### **1.3.1 Ground Progress Photographs**

(i) A set of ground progress photographs shall be taken prior to commencement of the New Works on site and then at approximately one month intervals or as directed by the Scottish Ministers until completion of the New Works;

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

(iii) For each photograph, two 254 millimetres x 204 millimetres colour prints shall be supplied;

(iv) Two copies of each set of progress photographs shall also be supplied on compact disc in a standard format;

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

#### **1.3.2 Aerial Progress Photographs**

(i) A set of aerial progress photographs shall be taken at the commencement of the New Works and further sets of aerial photographs shall be taken at 2 month intervals during the New Works. A final set of aerial progress photographs shall be taken immediately following the completion of the New Works;

(ii) A set of aerial progress photographs shall comprise a minimum of 10 photographs, taken with a single lens reflex digital camera;

(iii) Two 254 millimetres x 204 millimetres colour prints shall be supplied for each photograph;

(iv) Two copies of each set of aerial progress photographs shall also be supplied on compact disc in a standard format;

(v) Photographs shall be taken from the same height, direction and of the same viewpoint at each 2-month interval;

(vi) Viewpoints, heights and directions shall be determined and detailed on an Ordnance Survey map prior to photographs being taken; and

### **Appendix 1/22: Progress Photographs**

- (vii) The choice of aircraft used for taking the shots should be such that it shall maximise the accuracy of photographing the viewpoints.
- 1.3.3 The prints and compact discs arising from 1.6 and 1.7 above shall be supplied to the Scottish Ministers in suitable albums / cases.
- 1.3.4 The photographer shall be accompanied for both ground and aerial progress photographs by a member of the Scottish Ministers' Personnel, should they wish to attend.

## **2 Timelapse Photography and Website Use**

### **2.1 General**

- 2.1.1 The Company shall arrange to produce a high quality visual record of the construction of the New Works.
- 2.1.2 In addition to the progress photographs detailed above, the Company shall arrange for timelapse photographs to be taken throughout the construction period. The Company shall propose the location and number of cameras for approval of the Scottish Ministers within one month of the Commencement Date.
- 2.1.3 In order to obtain the best quality output, cameras shall be set to obtain an image every 10 minutes.
- 2.1.4 The Scottish Ministers shall retain the rights to all images obtained by the Company. The Company may use the images in promotional material if approved so by the Scottish Ministers, such approval shall not be unreasonably withheld.

### **2.2 Quality**

- 2.2.1 The Company shall propose the most suitable make and type of camera for each location for the approval of the Scottish Ministers.
- 2.2.2 Cameras, lenses and sensors shall be of a professional grade and from a reputable supplier.
- 2.2.3 The camera resolution shall be high enough to allow the final film to be rendered as 1080p HD with a minimum resolution of 2816x1880.
- 2.2.4 The optical parameters of the proposed system shall be capable of adjustment from a remote location.
- 2.2.5 The image interval shall be capable of being adjusted remotely to obtain additional detail during specific activities.
- 2.2.6 The cameras shall be mounted on a stable structure that prohibits movement of the camera as a result of external influences such as wind or vibration.
- 2.2.7 Cameras shall be capable of working at night without significant grain or noise (0.002 lux).

### **2.3 Reliability**

- 2.3.1 Each camera location shall have a suitable power and telecoms supply and a back up system shall be available to ensure that there is no loss of data.

### **Appendix 1/22: Progress Photographs**

- 2.3.2 At each camera location, suitable security measures shall be taken to prevent theft of the equipment.
- 2.3.3 Each camera shall be capable of being remotely monitored to ensure that it is working correctly or as a minimum it should be physically checked daily.
- 2.3.4 The system should be set to automatically restart after a power failure to ensure there is minimal loss of data.
- 2.3.5 All recorded images shall be backed up to a site remote from the camera. This shall be either automatic or undertaken on a daily basis to avoid loss of data.
- 2.3.6 Each camera shall be at least IP65 weather protected.
- 2.3.7 The controlling computer shall have storage facilities for 6 years time lapse shooting with offsite backup facilities of the original image without further compression or adjustment.
- 2.3.8 All cameras, computer control systems and backup systems shall be regularly maintained throughout the Works.

### **2.4 Post Production**

- 2.4.1 All images shall be catalogued and stored on a secure site with a suitable back up facility.
- 2.4.2 All images shall be time stamped and catalogued in a calendar format for retrieval by the Scottish Ministers.
- 2.4.3 Images from the cameras shall be available to be uploaded by the Company to a project website where the general public can monitor the progress of the New Works. The web image shall be updated every 10 minutes. Any images on the public website shall allow zooming and panning around the still image without pixellation.
- 2.4.4 The images obtained through the Works shall be used to provide a record of the project with a complete film duration of between 20 and 30 minutes duration. To obtain a full record of the construction, sequences may be shown from different cameras. In addition due to the nature of the speed of the construction, the rate of progress may be accelerated at a different rate depending on the particular activity.
- 2.4.5 The Company shall supply a story board style post production plan outlining how the final film will look for the approval of the Scottish Ministers prior to work on the final film.
- 2.4.6 Due to the overall length of the project the Company shall allow for the production of an additional annual film of 10 minutes duration.

## **3 Web cams**

### **3.1 General**

- 3.1.1 The Company shall provide four high definition web cams, which shall provide multidirectional footage of the New Works throughout the construction period.
- 3.1.2 The exact location for each web cam shall be agreed by the Scottish Ministers and the chosen locations shall reflect the New Works being undertaken during a particular time period in the construction process. The Company shall be responsible for the relocation of each web cam following such a request being made by the Scottish Ministers.

**Appendix 1/22: Progress Photographs**

- 3.1.3 The web cams shall be active 24 hours per day, 7 days per week and shall be linked through a secure telecommunication system to the main construction compound. Only authorised representatives of the Scottish Ministers and the Company shall be given the security rights to view and alter the orientation of the images being gathered.
- 3.1.4 The web cams shall not be able to be viewed by the general public via the world wide web, unless made available by the Scottish Ministers via the project website. Where a web-based system is proposed this shall be provided via a secure internet site. The use of such a facility shall be subject to the approval of the Scottish Ministers.
- 3.1.5 The Company shall be responsible for the maintenance and where necessary, the replacement, of all web cam components. The Company shall also be responsible for the provision of all connections, including power, and the computer software required to operate the web cams from the main construction compound.

## **Appendix 1/23: Substances Hazardous to Health**

### **1 Substances Hazardous to Health**

1.1 The Company shall take all reasonably practicable steps to prevent members of the public being affected, due to its Operations, by substances hazardous to health (as defined in Clause 124 of the Specification), such, as inter alia, silane, bridge deck waterproofing systems, and paints.

#### **1.2 Restrictions in Relation to Traffic Management Measures**

1.2.1 The Company shall maintain vehicle and pedestrian access to the standards detailed in Appendix 1/18, on existing roads, as well as access to and from properties directly affected by or adjacent to the New Works, when planning measures to protect the public from substances hazardous to health.

1.2.2 If the Company proposes to carry out silane and deck waterproofing treatments for bridges over public roads without an enclosure, the Company shall arrange with the Relevant Authority an overnight closure of the road to allow these operations to proceed.

#### **1.3 Restrictions in Relation to Working Practices**

1.3.1 The Company shall make available all necessary personal protection equipment and other safety equipment necessary for the protection of all persons who may be exposed to substances hazardous to health in connection with the New Works. The Company shall ensure that all of its staff and sub-contractors' staff requiring such protection are fully trained in the use of the equipment and that the appropriate equipment is used by such persons when there is a risk of exposure to substance hazardous to health.

1.3.2 The Company shall submit detailed method statements, to the satisfaction of the Scottish Ministers, stating how the Company will ensure that the public are not affected by substances hazardous to health which may be used during the construction of the New Works. Such method statements shall state the proposed methods to prevent, control and monitor exposure of the public to the above substances when used or generated in or about the New Works.

#### **1.4 Measures to be taken to protect members of the public.**

1.4.1 Where the Company is using or generating substances hazardous to health in its operations, the work must be carried out within a fully screened enclosure, otherwise a temporary diversion shall be provided for vehicular and pedestrian traffic. The Company should take account of the weather conditions, and if any change in these conditions renders either the enclosure or traffic diversions provided unsuitable, any work involving the use or generation of substances hazardous to health shall cease immediately.

1.4.2 If the Company employs temporary diversions as a method of protecting the public from substances hazardous to health, it shall Design all appropriate signing in accordance with chapter 8 of the Traffic Signs Manual 1991.

#### **1.5 Monitoring to be undertaken by the Company.**

1.5.1 The Company shall prepare and maintain a register of all substances hazardous to health which are brought on to the New Works Site. The Company shall operate a documented system to control the issue and use of such material in connection with the New Works subject to the approval of the Scottish Ministers.

1.6 Compliance with the requirements of this Appendix shall not in any way relieve the Company of its statutory obligations.

**Appendix 1/24: Quality Management Systems**

The Company shall institute and operate a quality management system complying with Schedule 5 to this Agreement

**Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)**

[REDACTED]

**Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)**

[REDACTED]



**Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)**

[REDACTED]

**Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)**

[REDACTED]

**Appendix 1/26: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)**

[REDACTED]

**Appendix 1/27: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements**

[REDACTED]

**Appendix 1/27: Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements**

[REDACTED]

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## **Appendix 2/1: List of Buildings etc. to be Demolished**

### **1 List of Buildings, etc., to be demolished**

1.1 The following buildings and structures shall be demolished;

- (1) The bridge structure carrying the existing A8 Glasgow and Edinburgh Road eastbound over the M73 northbound to M8 westbound slip road lying to the west of Baillieston Interchange (Transport Scotland structure ref; M8S 8-8 50)
- (2) the bridge structure carrying the existing A8 Glasgow and Edinburgh Road westbound over the M73 northbound to M8 westbound slip road lying to the west of Baillieston Interchange (Transport Scotland structure ref: M8S 8-8 40)
- (3) the overbridge structure carrying the access road from Bredisholm Road over the existing A8 from Bargeddie to the east of Baillieston Interchange (Transport Scotland structure ref: A8-100)
- (4) the brick farmhouse steading and associated out buildings at Braehead Farm
- (5) the brick structure at Shawhead Junction, as part of advance works
- (6) the overbridge structure carrying the B7070 North Road over the southbound A725 (Transport Scotland structure ref: A725-260)
- (7) the brick structure on the west side of Woodhall Mill Road adjacent to the A8
- (8) the overbridge structure carrying the B799 Bo'ness Road over the existing A8 (Transport Scotland structure ref: A8-30)
- (9) the overbridge structure carrying the Ellismuir Farm access road over the southbound M73 (Transport Scotland structure ref: M73-1-2 70)
- (10) the overbridge structure carrying the Bothwell Park Farm access road over the M74, North of Junction 5, Raith. (Transport Scotland structure ref: M74-5-4 15)
- (11) the 5 motorway gantries on the Eastbound M8 between reference points A1 and A5
- (12) the 6 motorway gantries on the southbound M73 between reference points A17 and A23
- (13) the 4 motorway gantries on the northbound M73 between reference points A25 and A17
- (14) the motorway gantry on the southbound M73 to M74 northbound interchange link
- (15) the motorway gantry on the northbound M74 to northbound M73 interchange link
- (16) the 6 motorway gantries on the southbound M74 between reference points A26 and A40
- (17) the 8 motorway gantries on the northbound M74 between reference points A40 and A26.
- (18) Barn structure at Orchard Farm.

## **Appendix 2/4: Explosives and Blasting**

### **1 Explosives and Blasting**

- 1.1 The use of explosives and blasting within the New Works Site shall comply with the requirements of the Environmental Health Sections of Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, as outline in Section 1/9 to the Specification.

## **Appendix 2/5: Hazardous Materials**

### **1 Hazardous Materials**

- 1.1 The following shall be included as part of Appendix 2/5 to the Specification to be completed by the Company.
- (i) In the event that hazardous or suspected hazardous material is found on site during the New Works the Company shall stop work 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.
  - (ii) 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.
  - (iii) On completion of the investigation and chemical analysis the Company shall arrange for appropriately qualified personnel to undertake a contaminated land environmental risk assessment and prepare a remediation strategy.
  - (iv) The Company shall consult with and conform to the requirements of the Controlling Authorities, which shall include SEPA and Environmental Health Officer, Glasgow City Council, North Lanarkshire Council and South Lanarkshire Council, for the remediation of the site.



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**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

**1 Information Required**

1.1 The Company 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 Scottish Ministers for acceptance:

**2 EUROPEAN COMMITTEE FOR STANDARDISATION (CEN) COMPLIANCE<sup>1</sup>**

2.1 Initial submission documents to be supplied for consideration of initial type test are as follows:

- (a) test report in accordance with BS EN1317-1, Clause 9 (and including any additional test data required under BS EN 1317-3, Clauses 7.3 and 7.4 and DD ENV 1317-4:2002, Clauses 7.3 and 7.4);
- (b) video / high speed film of test annotated showing date, test number and performance class;
- (c) still photographs of complete installation including anchorage points;
- (d) still photographs of vehicle before and after impact;
- (e) full drawings of tested items;
- (f) certification from the manufacturer that the item tested complies with drawing supplied; and
- (g) certificate from test house accredited in accordance with the requirements of Series 400 (MCHW 1.400).

2.2 Additional information, which will be required on acceptance of initial type test prior to installation:

- (a) manufacturer's specification;
- (b) installation drawings;
- (c) manufacturer's installation instructions including foundation requirements and test methods to verify their performance;
- (d) manufacturer's repair and maintenance manual;
- (e) certificate of compliance with the Quality Management Scheme 1 for the Manufacture of Fencing Components<sup>2</sup>;
- (f) compliance with the Quality Management Sector Scheme 2 - Supply and Installation of Fences:
  - (i) Sector Scheme 2B for Vehicle Restraint Systems<sup>3</sup>;
- (g) certificate of compliance for the Quality Management Sector Scheme 5 for the Fabrication and Installation of Bridge Parapets and Cradle Anchorages<sup>4</sup>:
  - (i) Sector Scheme 5A for The Manufacture of Parapets for Vehicle restraint systems; and
  - (ii) Sector Scheme 5B for The Installation of Parapets for Vehicle restraint systems; and
- (h) nominal loads (direct forces, moments and co-existent shears) to be transferred from the parapet to the Structure or foundations<sup>5</sup>.

**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

**Notes**

- <sup>1</sup> All documents are to be supplied in English.
- <sup>2</sup> Item 1.2.2(e) is required for safety barrier systems and transitions.
- <sup>3</sup> Item 1.2.2(f) is required for safety barrier systems and transitions.
- <sup>4</sup> Item 1.2.2(g) is required for vehicle parapets.
- <sup>5</sup> Section 1.2.2(h) is required for vehicle parapets, safety barrier systems and transitions

**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

Sheet 1 of 4

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	In accordance with BS EN 1317-1, Clause 9 (and including any additional test data required under BS EN 1317-3, Clauses 7.3 and 7.4 and DD ENV 1317-4:2002, Clauses 7.3 and 7.4)		
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	of With the Quality Management Scheme 1 for Manufacture of Fencing Components 2		
13	Certificate of compliance	of With the Sector Scheme 2B for the Supply and Installation of Fences Vehicle Restraint Systems 2		
14	Certificate of compliance	of With the Quality Management Schemes 5 for the Fabrication and Installation of Bridge Parapets and Cradle Anchorages 3  Sector Scheme 5A for The Manufacture of Parapets for Vehicle restraint systems; and  Sector Scheme 5B for the Installation of Parapets for Vehicle 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 3		
Signature:			Name:	

**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

Date:

Sheet 2 of 4

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 (kmh)	..... (0, +7 per cent)		
		Angle (degrees)	..... (-1, +1.5)		
		Centre of Gravity			
		Vertical height (m)	..... (± 10 per cent)		
		Longitudinal (m)	..... (± 10 per cent)		
		Lateral (m)	± .....		
		Model			N/A
BS EN 1317-2, Clause 4.2	Vehicle Restraint System (VRS) Behaviour	The VRS shall contain and redirect the vehicle without breakage of principal longitudinal elements of the system No major part of the VRS shall become totally detached or present undue hazard to other traffic, pedestrians or personnel in a work zone Elements of the VRS shall not penetrate the passenger compartment that can cause serious injuries are not permitted Ground anchorages and fixings shall perform according to the design of the VRS			
BS EN 1317-2, Clause 4.3	Vehicle Behaviour	The centre of gravity (CG) of the vehicle shall not cross the centreline of the deformed system The vehicle shall remain upright during and after impact, although moderate rolling, pitching and yawing are acceptable The vehicle shall leave the VRS after impact so that the wheel track does not cross a line parallel to the initial traffic face of the VRS, at a distance A (2.2 metres) plus vehicle width + 16 per cent of the length of the vehicle within a distance B (10 metres) from the final intersection (break) of wheel track with the initial traffic face of the VRS			

**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

BS EN 1317-2, Clause 5.3.2	Installation	The length of the VRS shall be sufficient to demonstrate the full performance characteristics of the system  If the VRS has to develop tension, end anchorages shall be provided in accordance with the VRS specification. Post foundation shall meet the design specification			
BS EN 1317-2, Clause 4.4	Severity Indices	<p>SPECIFIED</p> <p>THIV Limit 33km/h</p> <p>PHD Limit 20g</p> <p>ASI Limit 1.4</p>	<p>ACTUAL</p> <p>THIV ..... km/h</p> <p>PHD ..... g</p> <p>ASI .....</p>		
BS EN 1317-2, Clause 5.7, Figure 3	Photo graphic coverage	<p>Photographics coverage shall be sufficient to clearly describe behaviour and vehicle motion during and after impact</p> <p>High speed cameras shall be operated at a minimum of 200 frames per second and stills</p> <p>As recommended in Clause 5.7 and Figure 3</p>			
	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 Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

Sheet 3 of 4

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	Vehicle Details	Impact Conditions					
		Total vehicle mass (kg)	..... (±...)				
		Speed (kmh)	..... (0, +7 per cent)				
		Angle (degrees)	..... (-1, +1.5)				
		Centre of Gravity					
		Vertical height (m)	..... (± 10 per cent)				
		Longitudinal (m)	..... (± 10 per cent)				
		Lateral (m)	± .....				
		Model				N/A	
BS EN 1317-3, Clause 6.2	Crash Cushion Behaviour	Elements of the crash cushion 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.  No major element of the crash cushion, having a solid mass greater than or equal to 2.0 kg, shall become totally detached, unless this is required by the working of the crash cushion. No major element of the crash cushion shall impede the path of adjacent traffic. The final position of the detached element shall be considered to determine the displacement classification.					
BS EN 1317-3, Clause 6.3	Vehicle Behaviour	1) The vehicle shall remain upright during and after the collision although yawing and moderate rolling and pitching are acceptable. The post-impact trajectory of the test vehicle shall be controlled by means of the exit box shown in Figure 2 and specified as detailed in Tables 11 and 12.					
BS EN 1317-3, Clause 7.3.2	Installation	1) The installation of the crash cushion for the test shall comply with the structural design details and the on-road system details as given in the design specification.					

**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

BS EN 1317-3, Clause 5.4 and Table 4	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 7.7, Figure 4	Photo graphic coverage	High speed cameras and / or high speed video cameras shall be operated at minimum of 200 frames per second. Stills. As recommended in Clause 7.7 and Figure 4.			
	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 Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

Sheet 4 of 4

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 (kmh)	..... (0, +7 per cent)		
		Angle (degrees)	..... (-1, +1.5)		
		Centre of Gravity			
		Vertical height (m)	..... (± 10 per cent)		
		Longitudinal (m)	..... (± 10 per cent)		
		Lateral (m)	± .....		
		Model			N/A
DD ENV 1317-4: 2002, Clauses 5.4 and 5.5.2	Terminal Behaviour	<p>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.</p> <p>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.</p> <p>Anchorage and fixings shall perform to the terminal design specifications and other specified requirements as listed in the rest report.</p>			
DD ENV 1317-4: 2002, Clause 5.5.3	Vehicle Behaviour	<p>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.</p> <p>The exit box values for the specified test are as defined in Figures 5.6 and 7 (as appropriate).</p>			
DD ENV 1317-4, 2002 Clause 7.3.2	Installation	The terminal shall conform to the structural design details and with the system			



**Appendix 4/2: Information Required to Demonstrate Compliance of Vehicle Restraint Systems to BS 1317-1, BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002**

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	Photographic coverage shall be sufficient to describe clearly terminal and vehicle motion during and after impact  High speed cameras and / or high speed video cameras at a minimum of 200 framer per second.  Stills.			
	Drawings	Drawings included			
FULLY COMPLIES WITH STANDARD: BS EN 1317-1 AND DD ENV 1317-4:2002					
Signature:			Name:		
Date:					

## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

### **1 Permanent Soil Nailing**

#### **1.1 General**

- 1.1.1 This specification for soil nailing is provided as the minimum acceptable standard for soil nailing forming part of the New Works. The Designer may propose more stringent protective measures if these are considered necessary. If the Company wishes to propose any modifications to this Specification then supporting information shall be provided to the Scottish Ministers demonstrating that an equivalent quality of product will be provided.
- 1.1.2 Soil nails shall comprise both nail tendon and soil nail head components. Concrete pad soil nail heads shall be used.
- 1.1.3 Soil nail design shall be carried out in line with DMRB HA68/94 and CIRIA C637 Soil Nailing: Best Practice Guidelines taking cognisance where required of Geoguide 7 (Geotechnical Engineering Office, Civil Engineering Department, Government of the Hong Kong Special Administrative Region) for soil nail head design.
- 1.1.4 Corrosion protection for permanent soil nails shall be based on a detailed assessment of degradation risk, in line with CIRIA C637 Soil Nailing: Best Practice Guidelines. As a minimum, hot dip galvanised steel shall be used for tendon and head. In light of long term corrosion of the steel bar tendons, the Contractor shall allow for a reduction in effective diameter in the design of the soil nails.
- 1.1.5 Soil nails shall be fabricated and installed by a specialist contractor experienced in soil nail installation, using suitably trained personnel and to a method statement approved by the Designer.
- 1.1.6 The Company shall make every effort to create a green vegetated finish to soil nailed slopes including the use of recessed soil nail head assembly, with both erosion control fabric and mesh to encourage vegetation growth.

#### **1.2 Method Statement**

- 1.2.1 Soil nailing works shall be carried out in accordance with a detailed method statement, which is to be approved by the Designer. Approval by the Designer shall be sought at least four weeks prior to installing the first soil nails or carrying out associated earthworks. The approved method statement shall be forwarded to the Scottish Ministers two weeks prior to installing the first soil nails or carrying out associated earthworks. The method statement shall provide details of:
- (a) earthworks including maximum unsupported excavation width and depth;
  - (b) method of nail installation, including measures to ensure minimum ground movements above the soil nailed slope and maximum standing time between drilling of holes to insertion of nail tendons;
  - (c) soil nail head assembly details, including method of recessing soil nail heads concrete pads;
  - (d) method of forming the facing, where appropriate;
  - (e) method of connecting the nail head assembly to the facing, where appropriate;
  - (f) methods of performing field tests;
  - (g) method of assessing damage to protective coatings where appropriate;
  - (h) grouting procedures including details on bleed, flowcone and strength testing;

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

- (i) temporary support of slopes;
  - (j) the time after installation before a nail is considered to be fully operational;
  - (k) maximum exposure period for untreated sections of excavation;
  - (l) form of the test records; and
  - (m) steel bar certificates; coupler, steel plate and nuts certificates; reinforcement bar certificates.
- 1.2.2 Soil nailing on existing slopes shall be undertaken without any risk of reducing the existing slope stability. Any proposed temporary excavation or placing of fill on the slope shall be agreed in advance with the Designer and detailed within the Company's method statement. Any such temporary works shall be reinstated to the original slope profile, or as otherwise agreed with the Designer, without damage or displacement of the soil nailing system.
- 1.3 **Alterations**
- 1.3.1 Once approval has been given to the method statement, details shall not be amended without prior approval of the Designer.
- 1.4 **Company Design**
- 1.4.1 Soil nails forming part of the New Works shall be designed by the Company to satisfy the requirements of this specification.
- 1.5 **Sources of Material Supply**
- 1.5.1 The proposed source of supply of the soil nails and such other materials as covered by this Specification shall be submitted by the Company for approval by the Designer prior to the commencement of the New Works. Sources of supply shall not be changed without prior approval by the Designer.
- 1.5.2 Details shall be provided to the Designer of the proposed soil nail reinforcement, splicers / couplers, centralisers, sheaths, load spreading plates, wedge washers, collar nuts, head assembly components and protective coatings for approval prior to the commencement of the Works. Details shall include:
- (a) galvanised steel bars
    - (i) galvaniser's certificate;
    - (ii) tensile test results;
    - (iii) bend test and rebend test results; and
    - (iv) galvanised coating (BS EN ISO 1461).
  - (b) couplers, steel plates, nuts for couplers
    - (i) galvaniser's certificate;
    - (ii) permanent elongation and tensile test results;
    - (iii) galvanised coating (BS EN ISO 1461)
- 1.5.3 Materials shall be delivered to site in an undamaged condition and shall be handled, stored and protected in such a manner as to avoid corrosion or physical damage. Any soil nails or other such materials covered by this Appendix not conforming to these requirements shall be notified to the Designer for acceptance or rejection. Rejected materials shall be removed promptly from the site.

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

### **1.6 Reinforcement**

- 1.6.1 High yield steel soil nails shall comply with BS 4449 or equivalent European national standard. The characteristic yield strength of the nail reinforcement shall be a minimum of 460 newtons per square millimetre.
- 1.6.2 The permanent soil nails shall have long term corrosion protection in the form of full length hot dip galvanising. This shall be applied in accordance with BS EN ISO 1461.
- 1.6.3 All permanent soil nails shall be of solid thread bar type.
- 1.6.4 The galvanised mild steel ("**GMS**") lock off plate shall be high yield steel conforming to BS 4449 or other equivalent Eurocode national standard. They shall be hot dip galvanised according to BS EN ISO 1461.

### **1.7 Splicers / Couplers**

- 1.7.1 Splicers and couplers used in the works which require the removal or repair to damaged coatings shall not be permitted for use in the New Works. Only nails greater than 4 metres in length may be spliced or coupled using a mechanical splicer or coupler. The tensile, bearing and shear strength of a splice or coupler shall be not less than 90 percent of the soil nail when considering the influence of the combination of stresses.
- 1.7.2 Bolts, screws and nuts shall comply with one of the following:
  - (a) BS EN ISO 898 and BS EN ISO 4016, BS EN ISO 4018 and BS EN ISO 4034, hot dip galvanized in compliance with Clause 1909 of the Specification for Highway Works. The property class of the bolts and screws shall be not less than 4.6, while the property class of the nuts shall not be less than 4.0; and
  - (b) stainless steel to BS EN ISO 3506-1 and BS EN ISO 3506-2 grade A4-70.
- 1.7.3 Plain washers shall be of either Form A or Form E complying with BS 4320 and shall be made from one of the following:
  - (a) cold rolled carbon steel strip CS4 complying with BS 1449: Part 1.1 hot dip galvanized in compliance with Clause 1909 of the Specification for Highway Works; and
  - (b) stainless steel strip designation 1.4401 or 1.4436 complying with BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10258 and BS EN 10259.

### **1.8 Centralisers**

- 1.8.1 The Company shall provide a minimum of four centralisers shall be provided at suitable intervals over the total length of the nail. The centralisers shall be spaced at centres not exceeding 1.5 metres with the last centraliser 0.3 metres to 0.5 metres from the end of each nail.
- 1.8.2 The centralisers shall be fabricated from materials that have no deleterious effects on the soil nailing system. The centralisers shall be suitably robust to ensure they suffer no damage during installation, and maintain an appropriate grout cover to the nails and couplers.
- 1.8.3 Centralisers shall be designed to ensure that they permit the free flow of grout but retain the correct centralising function. Where soft or loose soils are encountered during nail installation, centralisers should be installed at closer spacing to ensure that the nails maintain the appropriate amount of minimum cover.

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

### **1.9 Grout**

1.9.1 Unless otherwise approved by the Designer, grout for soil nails shall comprise a cement grout consisting of a pumpable mixture of Portland cement and water that can reach a minimum compressive strength of 40 newtons per square millimetre in 28 days. A minimum of four grout cubes per day shall be made and tested according to BS 1881. The water cement ratio shall not exceed 0.45 to reduce loss of grout into surrounding ground. The grout shall not be subject to bleeding in excess of 2 percent after 3 hours. Admixtures that can control, bleed or retard the set of the grout shall be used only when approved in writing by the Designer. Their use shall be strictly according to the manufacturer's instructions. Flow cone tests, bleed tests and cube strength tests shall be completed on all grout to be used in soil nailing on site and results of each batch are provided to the Designer prior to use.

### **1.10 Soil Nail Head Design**

1.10.1 Soil nail head design shall be carried out to ensure both stability of the front face of the slope and design loads that may be applied under soil mobilisation. Sizing of soil nail heads shall be based on Highways Agency HA 68/94 Figure E.2(a) or Geoguide 7 (Geotechnical Engineering Office, Civil Engineering Department, Government of the Hong Kong Special Administrative Region) (Figure 5.4). Concrete pad soil nail head recessed into the slope shall be used (see Geoguide 7. These recessed pads shall be covered by hessian grow bags or similar and shall allow for a fully vegetated slope upon completion. A double layer of mesh and erosion control matting shall be fixed to the face to allow vegetation growth.

1.10.2 Concrete Pad: The concrete pad construction shall comprise excavation of the head, steel fixing and concreting. Reinforcement shall comprise a minimum of 3 T16 U bars in both directions. A minimum of 50 millimetres concrete cover around the reinforcing bars shall be provided. The number of T16 U bars in both directions shall be dependent upon the required head pad dimensions.

### **1.11 Limitations on Construction Plant**

1.11.1 All vehicles and construction plant having a mass more than 1000 kilograms shall be kept at least two metres behind soil nailed facing or external boundaries. Where appropriate, fill within two metres from the facing shall be compacted with compaction plant suitable for the class of fill material having a mass not more than 1000 kilograms.

### **1.12 Constructing Soil Nailed Slopes**

1.12.1 The Company shall construct soil nailed slopes from the top down as the soil in front of the cut slope is removed and the nails are installed and grouted at each level as approved in the method statement. The excavation shall be progressively formed in 'lifts' of not more than 2 metres height. Each lift shall be secured with any facing placed and secured in place before the subsequent lift is excavated.

1.12.2 The slope shall be excavated over the required width and depth as approved in the method statement. The excavated lift shall not be exposed for a period in excess of 24 hours or as specified in the method statement without prior approval of the Designer. Excavation shall proceed in stages exposing the minimum amount of soil which will allow the practical and expeditious installation of facing and soil nails while assuring stability of the excavated face and minimising ground movements. In all cases the maximum unsupported slope height shall not exceed 2 metres. Temporary surface protection shall be used for all cut faces exposed to inclement weather.

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

- 1.12.3 In anticipation of installing facing, the Company shall clean surfaces of all loose material and other foreign matter.
- 1.12.4 Where seeding of soil nailed slope faces is required seeding shall take place prior to topsoiling to reduce the risk of seed being washed away. Topsoiling and seeding shall be completed to within a maximum of 2 lifts above the working platform prior to the formation of a new lift. Erosion control matting shall be used for hydroseeding protection.
- 1.12.5 Adjacent panels of slope facing shall be joined together as instructed by the Designer.
- 1.12.6 Facing shall be terminated at the top and bottom of soil nailed slope as instructed by the Designer and detailed on the earthworks drawings.
- 1.13 **Drilling**
- 1.13.1 The Company shall drill holes for soil nails to the depth, diameter, alignment and position shown on the Designer's proposed earthworks drawings. Holes shall have a maximum deviation from the position shown on the drawings of +/- 50 millimetres. The maximum deviation of the drill holes from the specified horizontal alignment shall be +/- five degrees.
- 1.13.2 Casing shall not normally be required for soil nail holes. However, if the ground conditions are considered to be loose or of poor quality, casing may be considered. If casing is used, the method shall not promote mining and loosening of the soil at the perimeter of the drill hole or fracture soils with weak stratification planes by use of high pressures. Debris will need to be cleaned out of the hole prior to installation of the tendon.
- 1.13.3 Where the drill holes are located in such a way that debris can fall into the hole from the ground surface the drill hole shall be temporarily covered unless the soil nail is installed and grouted directly on completion of the drilling operation.
- 1.13.4 The drilled holes shall not be left open for more than 24 hours prior to the installation of the nail tendon and grouting, to prevent collapse of the holes. Nails should be grouted the same day.
- 1.13.5 Where soil nails are to be embedded into bedrock and bedrock level is found to be poorly defined the Company shall immediately inform the Designer and provide relevant draft drilling records to the Designer. The Designer shall then confirm bedrock level and hence required nail length prior to nail installation at that location. In all instances the decision of the Designer shall be final.
- 1.13.6 If heavily fractured bedrock material is encountered during drilling for soil nails to be embedded into bedrock the Contractor shall immediately inform the Designer and provide relevant drilling records to the Designer. The Designer shall then confirm whether longer nail lengths or additional nails are required prior to nail installation.
- 1.14 **Grouting**
- 1.14.1 Prior to grouting works, all plant, batchers, mixers, pumps, materials etc must be approved by the Designer. Calibration certificates shall be provided by the Company to the Designer and the Scottish Ministers within 1 week of commencement of the grouting works.
- 1.14.2 The soil nails shall be installed in each drilled hole prior to grouting. The installation equipment and its operation shall be such as to minimise disturbance of the soil being treated. The maximum deviation of individual soil nails from the required angle of inclination shall be 1 in 30 unless otherwise specified. Each soil nail shall have a maximum departure from the positions shown on the drawings of +/- 50 millimetres.

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

- 1.14.3 Mixing equipment shall be used that produces a grout of homogenous consistency and shall be capable of providing a continuous supply to the injection equipment. The injection equipment shall be capable of continuous operation at a constant delivery pressure. The injection equipment shall include a system for recirculating the grout during pauses in the grouting operation.
- 1.14.4 Suitable grout testing shall be carried out (flowcone tests, bleed tests, strength tests, refer section 1.9.1 above.)
- 1.14.5 Grouting of drilled holes shall be carried out during withdrawal of the grout tube fixed onto the soil nail, or during the withdrawal of casing using tremie pipes, using hydrostatic, gravitational, or pressure grouting. Where pressure grouting is used the grout shall be injected at a pressure not exceeding 15 kilonewtons per square metre in soil and 20 kilonewtons per square metre per metre depth of ground above the hole. Grout shall be injected at the lowest point of the drill hole to ensure that the drill hole is filled without introducing air voids. Grout shall be injected slowly and progressively from the bottom to the top until the hole is completely filled without interruption in the grouting process and clean grout of the same consistency as that injected is seen to run from the top of the hole.
- 1.14.6 For uncased holes, grout pipes shall be fixed to the tendon of the nail to ensure grout cover commences at the lowest end of the nail and grout should be pumped into the hole at a continuous and steady rate, slow enough to prevent entrapping air and to prevent voids forming.
- 1.14.7 Excess quantities of grout should be reported to the Designer to ensure adequate control of grout and prevent grout migration into service ducts, etc.
- 1.14.8 Grouting shall be discontinued if the ambient temperature falls below three degrees Celsius or if the grout temperature falls below five degrees Celsius. When the grout has developed a strength not less than 80 percent of that specified for the 28 day strength, the Contractor shall install the nail head assembly. The small galvanised mild steel (“**GMS**”) lock-off plate shall be bedded down and the nail tensioned by applying torque that induces a nominal load of 10 kilonewtons. The Company’s programme of operations shall include sufficient time for these requirements prior to further excavation of the slope face.
- 1.14.9 In the case of soil nailed slopes the grout shall fill the hole flush with the slope face. The holes shall be checked after three to five days to check for any grout loss which shall be made good.
- 1.15 **Damage to Installed Nails**
- 1.15.1 If a soil nail or connection to slope facing or wall is damaged during installation it shall be replaced at the Company’s expense unless otherwise instructed in writing by the Designer.
- 1.16 **Records**
- 1.16.1 The Company shall keep daily records of the soil nails installed. Copies of these shall be submitted to the Designer within three days following the installation of each soil nail. The records shall show:
- (a) date of installation;
  - (b) grid and area reference of each soil nail;
  - (c) position (chainage and slope length above or below a fixed point or berm), length and inclination of each soil nail;
  - (d) length of nail installed into competent strata (based on drillers log observations);

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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

- (e) (date and time of key installation activities (commencing drilling, completing drilling, commencing grouting and completing grouting);
  - (f) apparent nature and cause of obstructions (other than drilling in bedrock) and delays including time to resolve;
  - (g) grout loss;
  - (h) torque force applied to soil nail;
  - (i) number and type of tests carried out;
  - (j) readings from relevant instrumentation;
  - (k) relevant calibration certificates; and
  - (l) soil nail head dimensions and details.
- 1.16.2 Any unforeseen conditions encountered and reported shall be noted in the records.
- 1.17 **Testing of soil nails**
- 1.17.1 Prior to the installation of permanent soil nails, a minimum of six pull-out test nails shall be installed at locations agreed with the Designer and tested accordingly. Pull-out test numbers shall be around three per cent of the total number of working nails, ensuring that all soil types and levels in the slope are tested. In addition, proof testing of permanent nails shall be carried out at a rate of three tests per 100 installed soil nails at locations selected by the Designer and consistent with the progress of soil nailing operations.
- 1.17.2 Soil nails subjected to pull-out tests shall not form part of the Permanent Works. Any protrusions from the drill hole shall be cut flush with adjacent ground surfaces and the drill hole filled by grouting.
- 1.18 **Test Equipment**
- 1.18.1 Displacement measuring gauges that can measure to 0.1 millimetres or better and are mounted on an independent reference frame shall be used to measure movement of the soil nail being tested. The frame shall be securely installed so that readings are not affected by vibration or soil movements. Drilling and other plant movements next to test nails shall be stopped during soil nail testing. The load frame shall ensure that the load is applied in the same direction as the nail and shall not be permitted to within one metre radius of the centre of the drilled hole.
- 1.18.2 Hydraulic equipment capable of inducing pull-out failure of any selected nail, together with a pressure gauge, calibrated as a unit shall be used to apply the test load. Alternatively the applied load may be monitored utilising a suitably calibrated load cell. The load measuring system shall be capable of measuring the load increments to an accuracy of one per cent of the design load or better.
- 1.19 **Pull-out Testing**
- 1.19.1 Unless instructed otherwise by the Designer, pull-out test nails are to be tested to 150 per cent of the design working loads of the nail or 90 per cent of the ultimate tensile stress of the steel bar, or until pull-out failure occurs, whichever is the lesser. The grouted portion of the test nail can vary, from the lower 2 metres of the bond length to the full bond length as specified by the Designer. The test nails shall be installed in accordance with the proposed construction methodology for the permanent soil nails. The nominal diameter of the drill hole shall be the same as for the permanent soil nails.
- 1.19.2 The Designer's approval of pull-out test results shall be obtained prior to installation of permanent soil nails for the Works. Unacceptable pull-out test results may result in the need to modify the nail lengths, testing and construction procedure or construction



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## **Appendix 6/10: Ground Anchorages, Crib Walling and Gabions**

- details. Such modifications shall be approved by the Designer and shall require the verification testing procedures to be repeated.
- 1.19.3 Pull-out test nails shall be grouted in place as part of a regular production grouting process. After grouting, the nail shall not be loaded until the minimum required 28 day compressive strength of the grout (40 newtons per square millimetre) has been proven by cube tests.
- 1.19.4 The pull-out tests shall be made by incrementally loading and unloading each nail over three cycles. Test loads shall be applied in accordance with testing pro-forma as proposed by the Company but with the approval of the Designer.
- 1.19.5 Pull-out failure is defined as movement in excess of 0.1 per cent of the tested bond length over the full test period or as confirmed by the designer. Movement shall be checked against possible extension of the steel tendon, movement between steel and grout as well as between grout and soil / rock.
- 1.20 **Proof Testing**
- 1.20.1 Permanent soil nails selected by the Designer shall be proof tested during the main soil nail works. Unless otherwise specified by the Designer these shall be tested by loading to 1.5 times the design working load or until pull-out failure, whichever is the lesser.
- 1.20.2 The proof testing procedure shall be similar to the requirements of Section 1.19 above for pull-out test nails, with the exception that the nails will be loaded and unloaded for only two cycles.
- 1.20.3 If earlier soil nail proof test results are accepted but subsequent tests fail to meet the acceptance criteria the Company shall inform the Designer without delay. All nails installed subsequent to the last successful test shall be proof load tested and if failed replaced.
- 1.20.4 Nails not meeting the acceptance criteria, or any nails identified by the Company or the Designer as being potentially defective shall be recorded by the Company along with the Company's proposals for treatment. These records shall be forwarded within 24 hours from testing to the Designer for comment.
- 1.21 **Records of Tests**
- 1.21.1 The Company shall keep records of all soil nail tests carried. Field sheets from soil nail tests shall be provided to the Designer within one hour of completion of each test and final copies of the test results provided within three days. The test records shall describe:-
- (a) the date of test;
  - (b) the area and location of test;
  - (c) the number of tests carried out;
  - (d) any variations from the specified procedure;
  - (e) details of the test results (including graphical result plots of load against displacement);
  - (f) any unforeseen conditions encountered; and
  - (g) any test procedure problems and how they will be resolved.
- 1.21.2 Test records shall be presented in the format as specified in the agreed method statement.
- 1.22 **Temporary Soil Nails**
- 1.22.1 To be completed by the Company
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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

**1 Work not Required**

- 1.1 Any Sections in this Appendix which relate to work or materials not required by the Contract shall be deemed not to apply.

**2 General Safety**

- 2.1 The Company shall be aware of the danger from gas which may be present whilst undertaking the New Works at and around mineworkings and shafts. The Company shall take all possible precautions in this respect including the supply, maintenance and operation, in accordance with the manufacturer's recommendations, of suitable equipment for monitoring the emissions of flammable or noxious gases. The Company shall consult and comply with the requirements of the Coal Authority on matters relating to the problems and method of treatment of gas which may arise from the presence of abandoned mineworkings.
- 2.2 The Company shall be aware of the hazards associated with the respective constituent grout materials and take every precaution necessary in the delivery, storage and use of these materials in the Works to protect the health, safety and welfare of person, animals and the environment.
- 2.3 The Company shall provide with his method statement details of the safety measures he proposes to implement in order to comply with the requirements of this Appendix. The Company shall take all necessary safety precautions to safeguard his equipment, employees and the public from all risks.
- 2.4 Grouting works shall be carried out in accordance with a detailed method statement, which is to be approved by the Designer. Approval by the Designer shall be sought at least four weeks prior to commencement of drilling the first hole or carrying out associated probe drilling works. The approved method statement shall be forwarded to the Scottish Ministers two weeks prior to commencement of drilling. The method statement shall provide details of:
- (a) the proposed layout of the consolidation treatment works including details of the depth to and size of workings to be consolidated and angle of drill holes;
  - (b) the method of drilling holes and associated casing requirements and materials;
  - (c) the proposed flush medium and methods for monitoring flush returns and arisings;
  - (d) the proposed drilling plant;
  - (e) method of monitoring for mine gas;
  - (f) method of mixing, batching and placement of grout;
  - (g) source of grout materials and proposed grout mix design;
  - (h) grout properties including strength, flow properties and bleed capacity;
  - (i) method of testing grout properties;
  - (j) limitation on placement of grout;
  - (k) method of monitoring grouting pressure;
  - (l) maximum allowable grouting pressures;
  - (m) methods of performing pressure injection test holes;

### **Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- (n) measures to minimise noise pollution and to prevent flush arising from drilling works and grout spillage running into existing drainage or watercourses;
- (o) form of the daily records and test records; and
- (p) material test certificates and equipment calibration records.

### **3 Pollution Control**

- 3.1 The Company shall be aware of the hazards from contaminated minewater to persons, animals and the environment. The Company shall consult and comply with the requirements of SEPA and the Coal Authority on matters relating to the hazards from contaminated minewater, its treatment and disposal. The Company shall take every precaution to contain and dispose of contaminated minewater, and to prevent contamination of the drainage system and the surrounding environment.
- 3.2 The Company shall be aware of the hazards from grout residues to surface-water courses. The Company shall consult and comply with the requirements of SEPA on matters relating to the hazards from grout residue. The Company shall take every precaution to prevent contamination of surface-water systems and the surrounding environment.
- 3.3 All works shall be carried out without unreasonable noise and disturbance to the site and its environs and shall comply with the noise control requirements of Appendix 1/9.

### **4 Services**

- 4.1 The Company shall take every precaution to avoid damage to or interference with apparatus and supplies, whether privately-owned or owned by Statutory Undertakers or local authorities and shall at his own expense rectify any damage done. He shall relieve the Scottish Ministers of all claims in respect of any interruption or loss arising from such damage.
- 4.2 The Company shall carry out closed circuit television surveys of the sewers and ducts in the vicinity of the consolidation works before commencement and after completion of the Works.
- 4.3 The survey shall identify the existing condition of the sewers and ducts and their condition upon completion of the grouting works. A written report supported by a copy of the survey on DVD shall be supplied to the Scottish Ministers by the Company within 7 days of the completion of each survey. The pre-condition report shall identify any defects within the sewers and ducts and provide proposals to protect them during the grouting works. The post-condition report shall identify any changes in condition of the sewers and ducts since commencement of the grouting works and provide proposals to remedy any defects.
- 4.4 The Company shall remedy any defects or damage to adjacent properties, apparatus and supplies caused by the grouting operations, as determined by the Scottish Ministers.

### **5 Method**

- 5.1 In respect of mineworkings and subsurface voids where more than one seam is to be treated then the uppermost seam shall be treated first and thereafter subsequent seams shall be treated in descending order, drilling through previously treated ground.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- 5.2 Where artesian groundwater conditions are encountered measures shall be taken to ensure that no permanent connection / pathway exists between the artesian water source and ground surface.
- 5.3 Drilling, batching, mixing, injecting, testing and the other various operations included in the Works shall be carried out in accordance with this Appendix.
- 5.4 After the area has been treated, it shall be tested by the sinking of further boreholes to confirm the adequacy of the works. The test procedure contained within this Appendix 6/11 shall then be followed.

**6 Drilling**

- 6.1 Boreholes shall be drilled by rotary or rotary percussive techniques to intercept the mineworkings and subsurface voids and penetrate into the rock 1.0 metre below seam pavement level.
- 6.2 All boreholes shall be cased using steel casing within the drift deposits. The casing shall be sealed at an appropriate depth into rockhead so that there is no loss of grout to any superficial deposits during grout injection. Holes shall be cased in rock where soft, loose or broken strata are encountered below rockhead.
- 6.3 All boreholes shall be kept open over their full depth to enable them to be used for the injection of pea gravel and / or grout under pressure into the mineworkings and sub-surface voids and also into all breaks and fissures in the overlying rock strata. Collapsed or obstructed holes shall be redrilled, including the insertion of casing through the obstruction or zone of unstable / collapsing ground if necessary.
- 6.4 Where soft, loose or broken strata encountered below rockhead are associated with the mineworkings or with related void migration or racking then these strata shall also be consolidated by injecting grout under pressure. If the soft, loose or broken strata have been cased then the casing shall be withdrawn above these strata once the borehole has been grouted and pressurised and the grouting process shall be repeated in accordance with this Appendix.
- 6.5 Casing shall not be withdrawn until the grouting works are complete in any given borehole.
- 6.6 Drilling shall not take place within 18 metres of mineworkings that have been grouted within the preceding 24 hours.
- 6.7 **Perimeter Drilling (Optional)**
- 6.7.1 If required as part of the Company's design of the Works, vertical and inclined boreholes of 100 millimetres minimum diameter shall be drilled around the perimeter of the area of the grouting works, to be consolidated, as required, at not more than 3 metre centres at the seam pavement level.
- 6.7.2 Drilling of perimeter boreholes shall commence at the point where the worked seam is deepest and shall progress in both directions around the boundary of the grouting works.
- 6.8 **Infill Drilling**
- 6.8.1 When infilling the mineworkings and sub-surface voids, vertical and inclined boreholes of 50 millimetres minimum diameter, shall be drilled to the Company's grid pattern at seam pavement level.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

**7 Grouting**

- 7.1 Immediately prior to grouting each hole, the Company shall check that it is clear of obstructions over its full length and capable of being grouted down to the required grouting depth.
- 7.2 Grout shall be injected into the mineworkings and sub-surface voids via a steel pipe placed to the bottom of borehole or as otherwise agreed with the Scottish Ministers. Injection pressures, measured at ground level, should not exceed the lesser of 10 kilonewtons per square metre per metre of overburden or a maximum pressure of 200 kilonewtons per square metre. If one of these criteria is reached quickly, the grout pipes shall be lifted to check that a local obstruction is not preventing the flow of the grout into the strata. A suitably graduated pressure gauge with an appropriate full scale deflection shall be incorporated within the grout line near the top of the hole. The applied pressure shall be monitored on this gauge, care being taken to reduce any risk of ground heave. The grout pipe is to be raised during progress of injection as limiting pressures are reached or as grout appears at the borehole surface.
- 7.3 As soon as the grout appears at the point of injection, then final pressurisation shall take place using a pressure gauge and grout connection fitted directly to the top of the casing.
- 7.4 During grout testing, limiting pressures shall be used. The use of a lower pressure during grouting and pressurising shall not relieve the Company of the responsibilities laid down in this Appendix relating to testing of treated areas.
- 7.5 The Company shall be responsible for ensuring that no damage to watercourses, existing Structures and existing Public Utilities results from the Grouting Works.
- 7.6 Should the injection pipe become blocked then it shall be removed immediately and cleared.
- 7.7 Immediately before commencing or re-commencing grouting of any borehole the Company shall ensure that it remains open over its full depth and that no collapse has taken place. Where an obstruction is encountered the borehole shall be redrilled and, if necessary, cased through the blockage.
- 7.8 Casing shall not be withdrawn until grouting of any given borehole is complete.
- 7.9 No grout injection shall take place within 18 metres of drilling operations. Infill grouting shall not be carried out until at least seven days have elapsed since the completion of any perimeter boreholes within 10 metres of the proposed infill borehole. Distances shall be measured at the pavement of the seam being treated.
- 7.10 Boreholes shall be topped-up to ground level during or immediately after withdrawal of the casing in such a manner as to prevent the overburden collapsing in the hole and to ensure the structure and strength of the grout column. Bores shall be completely filled so that no settlement will occur, or subsequent depression form, in the superficial deposits.
- 7.11 Care shall be taken to ensure that uplift pressures do not develop under any adjacent buildings or structure, including services, during grout injection. Where nearby buildings or structures may be affected by the grouting works, the Company shall take extra care and shall employ special monitoring techniques to record ground movement. Additionally, the Company shall monitor ground levels by precise levelling at intervals, both prior to and during operations.
- 7.12 The Company shall make every effort to remove any metal casing used. If the abandonment of any casing, or part of any casing, is unavoidable then the casing shall be grouted and cut a minimum of two metres below ground level. The location shall be

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## **Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

permanently recorded by the Company and details included in the Operations and Maintenance Manuals and other relevant documentation.

### **7.13 Perimeter Grouting**

7.13.1 Grout introduced into the mineworkings and sub-surface voids via perimeter boreholes shall be capable of setting quickly without undue spread and in such a way that an efficient barrier is formed in the worked seam around the perimeter of the grouting works. The rate of injection shall be limited to 1.5 tonnes of dry materials per hour per borehole.

7.13.2 A maximum of 7 tonnes shall be injected into one hole during any consecutive twelve hour period. In boreholes where cavities in excess of one metre high or interconnecting cavities in excess of 0.5 metres in height are encountered the Company will be required to simultaneously place pea gravel with the grout in the ratio 1:1 by weight using an approved hopper device. Consideration shall be given in the design to the addition of a thixotropic or accelerating agent.

### **7.14 Infill Grouting**

7.14.1 For infill holes injection is to be carried out in such a way that all the mineworkings and sub-surface voids underlying the Site, together with all spaces, breaks and fissures therein and also in the overlying rock strata, are completely and tightly filled with grout.

7.14.2 If the limiting pressure is not achieved or grout has not appeared at the point of injection after 15 tonnes of grout materials have been placed, the grout tube or pipe shall be removed from the hole and the injection suspended. After a period of at least 12 hours, up to a further 10 tonnes of materials shall be injected. If grout has still not surfaced up the bore, injection shall again be suspended for at least 12 hours and the process shall be repeated with further quantities of 5 tonnes. If the hole is still accepting grout after a total of 50 tonnes of materials have been injected without any sign of the hole being completed the Company shall consult the Designer to determine whether the injection is to be continued or other measures, such as secondary or test holes are required.

7.14.3 Final tightening of each borehole shall be carried out by pumping an approved grout at a pressure, measured by a gauge at ground level, that should not exceed the lesser of 10 kilonewtons per square metre per metre of overburden or a maximum pressure of 200 kilonewtons per square metre to fill all joints and fissures in the rock strata overlying mineworkings and sub-surface voids. Mineral strops encountered during drilling shall be treated in the same manner after being drilled to pavement level.

## **8 Grout Mixing, Batching and Pumping Plant**

8.1 The grout mixer shall be capable of producing a homogenous mix with all particles thoroughly wetted and with no segregation.

8.2 It is essential that the mixer is fitted with a reliable automatic weigh batching device capable of consistently measuring the weight of component materials in the approved proportions.

8.3 Water supply to the mix shall be properly monitored by means of a suitable metering device incorporated in the mixer in order to ensure accurate control of the mixing water fed into each batch of dry materials.

8.4 After mixing the grout shall be fed into storage tanks fitted with powered agitators sufficient to ensure that no segregation of component materials occurs and that a continuous flow of grout is maintained at the insertion point.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- 8.5 Injection of the pre-mixed grouts shall be by means of positive displacement pumps and suitable pressure gauges shall be incorporated in the system to facilitate control of pressures.
- 8.6 Three valves shall be provided at each junction point to provide means for diversion of the grout away from the injection point when necessary and to prevent undue wastage of grout during transfer of the delivery line from one injection point to another.
- 8.7 The Company shall include within the relevant method statement details of the proposed methods of all New Works.

**9 Grout materials**

- 9.1 Cement shall be ordinary Portland cement and shall comply with British Standard Specification BS EN 197 having a compressive strength class (Table 2) of 42.5 newtons per square millimetre or greater. The cement shall be suitably stored to prevent damage from the weather.
- 9.2 Sand for grouting shall comply with the requirements of BS EN 12620 and be of a suitable grading suitable for use in the Company's plant.
- 9.3 Pulverised fuel ash ("PFA") shall be fine grained complying with BS 3892: Part 3 Specification for PFA for use in grouts, be of a type suitable as a constituent for grout, meet grout workability and pumpability requirements and obtained from an approved supplier. PFA in storage shall be protected by tarpaulins, other covering or stored in a suitable container to prevent contamination with dust, protect the material from the effects of weather and prevent it becoming an airborne hazard.
- 9.4 Pea gravel shall be single sized 10 millimetres natural gravel and comply with requirements of BS EN 12620.
- 9.5 Bentonite shall be Fulbent 570 as supplied by the Fuller's Earth Contractor Limited, or approved equivalent.
- 9.6 Water:
- (a) All water used in the Works shall be clean, fresh water, free from impurities and obtained from a public water supply.
  - (b) The Company shall pay the appropriate charges for water and shall make all arrangements to ensure a proper and sufficient supply for the duration of the Contract. A hydrant connection will not be accepted.
- 9.7 All mixes shall be appropriate for the groundwater conditions and groundwater chemistry encountered in the abandoned mineworkings.
- 9.8 The Company shall conduct moisture content and grading tests on materials supplied to the Site and shall provide the Scottish Ministers with copies of the results of these tests. The frequency and the results of these tests shall be verified for compliance with the design before any grouting is commenced.
- 9.9 All materials shall be kept free from contamination with deleterious matter. Stockpiles of materials shall be kept adequately separated from one another
- 9.10 Unless otherwise directed, all materials shall be in accordance with the appropriate Clauses of the most recent applicable British Standard (or other) and all workmanship shall be in accordance with the appropriate Clause of the most recent British Standard Code of Practice (or other).

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

**10 Grout Mixes**

- 10.1 The Company shall check for each proposed grout mix that 7, 14 and 28 day cube strength test results and flow test results comply with the design of the Works.
- 10.2 The minimum 28 day crushing strength shall be 1 meganewton per square metre.
- 10.3 All grout used in connection with the Contract shall contain cement.
- 10.4 Grout introduced at the perimeter probe hole locations shall have a cement content of between 120 and 150 kilograms per cubic metre of mixed volume.
- 10.5 Grout introduced at infill hole locations shall have a cement content of between 80 and 100 kilograms per cubic metre of mixed volume.
- 10.6 Using a "Colcrete" Flowmeter the following criteria shall apply with regard to grout flow properties.
- (a) Perimeter and additional probe grout shall flow within the limits 300 millimetres to 400 millimetres.
  - (b) Infill grout shall flow within the limits 400 millimetres to 600 millimetres.
- 10.7 The Company shall undertake testing of grout mix proportions and materials. Results of these tests shall be verified for compliance with the design before any grouting is commenced.

**11 Grout Tests**

- 11.1 Throughout the course of grouting works the Company shall take cubes with 100 millimetre sides in sets of six at the rate of one set per day. The cubes shall be cured and crushed at a UKAS accredited laboratory. The cubes shall be uplifted and transported to the laboratory within 36 hours of their casting. One cube shall be crushed at 7 days, one at 14 days and two at 28 days. The test will be taken as conforming if both 28 day strengths exceed the minimum requirement contained in this Appendix. The Company shall permanently and clearly mark cubes for identification, and shall keep records which shall indicate exactly the location of the grout or concrete, the flow test readings of the mix, the date of placing and mix reference. The marking of cubes, handling, storage and testing shall be in accordance with BS 1881.
- 11.2 The Company shall test the flow properties of each batch of mixed grout in accordance with this Appendix relating to grout mixes before it is injected and shall carry out such additional random tests as may be required to ensure compliance with the design of the Works.

**12 Testing of Infilled Grout**

- 12.1 On completion of the grouting works the Company shall sink probe test holes into the filled mineworkings and subsurface voids (minimum of one probe per 500 square metres) and shall carry out grout injection tests to establish the adequacy of the works already completed. The Company shall provide details of numbers and locations of test holes to be undertaken to the Scottish Minister's Representative. Testing shall not be undertaken until a minimum of 48 hours has elapsed since the completion of treatment in the area to be tested.
- 12.2 These tests shall consist of injecting grout into the test holes in the normal fashion and noting the quantity required to produce an injection pressure of 200 kilonewtons per square metre or such lower pressure as specified in the design of the Works. When this



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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

injection pressure has been reached the injection pump shall be switched off and a suitable valve at the top of the hole closed to isolate any line pressure. The test shall be deemed successful where the quantity of grout injected is less than 0.5 tonnes or such higher quantity as specified in the design and where the pressure has not dropped by more than 10 per cent in three minutes.

- 12.3 The Company shall ensure that a good seal is maintained at rockhead during the test. Losses of grout and hence pressure at rockhead or into poorly consolidated fissures shall cause the test to fail if the conditions of the above Section are not met.
- 12.4 The Designer may in addition require core samples to be taken by rotary coring to check the adequacy of the grouting operation. Rotary coring shall be carried out in accordance with the MCHW, Volume 5, Section 3, Part 4.
- 12.5 Should any of the tests reveal incomplete grouting works or other defect, the Company shall make good such works in order to comply with the requirements of the Contract.

**13 Cold Weather**

- 13.1 When the temperature of the air is near or below the freezing point of water, grouting works shall only be permitted at the entire risk of the Company, who shall take precautions to ensure that the materials are free from frost and to protect the grout or concrete from freezing.
- 13.2 The Company shall make good any works which may be damaged by frost. For the purpose of recording the air temperature a reliable maximum / minimum thermometer is to be located on the New Works Site. Precautions against cold weather conditions shall be such as to ensure that the grout shall, at no time during mixing, depositing, delivery to a point of injection or setting reach a temperature of, or below, five degrees Celsius.
- 13.3 The Company shall be deemed to have included for all measures necessary to comply with the aforementioned requirements.

**14 Records**

- 14.1 The Company shall prepare a daily drilling journal and a separate daily grouting record for individual boreholes including test boreholes, providing the information in Section 14.2 below and this shall be provided to the Scottish Ministers the day after the date the records relate to.
- 14.2 Daily drilling journals shall include:
- (a) job name, location, borehole reference number and date;
  - (b) O.D. level at borehole location;
  - (c) date;
  - (d) contractors name;
  - (e) staging level - embankment boreholes;
  - (f) inclination of borehole;
  - (g) plant in use, type of flush and crew details;
  - (h) method of boring or drilling, flushing medium and type of drill bit;
  - (i) type / diameter and depth of all casing used;
  - (j) diameter and depth of hole at beginning and end of each working day/shift;

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- (k) depth of each change of stratum;
  - (l) rate of penetration;
  - (m) details of any loss of flush;
  - (n) occurrence of voided, soft or broken ground or packed waste;
  - (o) delays, breakdowns and / or obstructions with accompanying reason;
  - (p) details of underground services or drains located;
  - (q) daily and cumulative length drilled;
  - (r) details of any settlement or ground heave;
  - (s) description, with identification of the stratum and whether it is broken or intact;
  - (t) depth at which groundwater is encountered (if apparent);
  - (u) depth / description of any contaminated material or groundwater encountered;
  - (v) details of any emission of gas, water, foul air etc;
  - (w) depth of completed hole; and
  - (x) gas monitoring results.
- 14.3 Grouting records shall include:
- (a) location and borehole reference number;
  - (b) contractors name;
  - (c) date and times of grouting and grout crew details;
  - (d) details of type of injection and grout line dimensions (e.g. tremmie injection through 5 millimetre diameter line);
  - (e) grout materials employed;
  - (f) grout pressures recorded, with the corresponding depths;
  - (g) weight of grout mix accepted including the water / cement ratio and weights of the constituent components of the mix;
  - (h) the accurate position, inclination and orientation of abandoned casing; and
  - (i) delays and breakdowns with accompanying reason.
- 14.4 All daily drilling journals and grouting records shall be included in the as-constructed records.
- 14.5 The Company shall within three months of completion of the grouting works prepare typical drawings and sections to indicate where and how much grout was placed. He shall prepare a report on the grouting works outlining the conditions encountered and the final treatment carried out. A copy of this report shall be included in the as-constructed records.
- 15 Setting Out and Labelling**
- 15.1 For ease of reference, each borehole used in the grouting works shall be clearly marked on the Site with its reference number, depth and inclination. This labelling shall remain legible until the casing has been withdrawn and the bore is complete.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- 15.2 Setting out stations and reference lines used in the location of borehole positions shall be established on the New Works Site by means of permanent markers, clearly visible at all times.
- 15.3 A system shall be employed to record those boreholes which are completed and those which continue to accept grout. This system shall operate both at the borehole and in the Company's office.

**16 Personnel for Grouting Works**

- 16.1 The Company, Designer and the Checker shall employ personnel who have relevant experience of grouting works.
- 16.2 The Company and the Designer shall have in charge of the grouting works a suitable number of engineer(s) experienced in the methods being employed and in underground mining conditions and the said engineer(s) shall be present at the Site at all times when drilling, grouting or testing is in progress.

**17 Treatment of Abandoned Mineshafts / Adits**

- 17.1 The Company shall inform the Scottish Ministers immediately upon identification of any abandoned mineshaft or adit.
- 17.2 Abandoned mineshafts located beneath or within influencing distance of earthworks shall have a reinforced concrete cap constructed at rockhead level or as otherwise agreed with the Scottish Ministers. The cap shall be designed to accommodate all imposed loadings. Any open shafts shall be backfilled with granular material prior to capping. A description of the granular material shall be provided to the Scottish Ministers Representative.
- 17.3 Abandoned mineshafts are potentially dangerous. Their infilling and the ground immediately surrounding the top of a shaft is liable to collapse without warning. They may contain noxious and inflammable gases. The Company shall take all necessary safety precautions to safeguard his machinery, employees and the public from all risks.
- 17.4 The Company shall erect safety barriers and warning signs where the public have access to the vicinity of the shaft works.
- 17.5 Any mineshaft which is either open or becomes open during the course of the New Works shall as a matter of urgency and as soon as is reasonably practicable be:
- (a) Covered over with a substantial cover of metal or timber or other suitable material so as to prevent any person or material from falling into the shaft.
  - (b) Surrounded by a temporary (not less than 1.0 metre high) fence, the perimeter of which shall be not less than 5 metres from the edge of any ground settlement related to the shaft.
  - (c) Provided with a warning notice board or boards erected not more than 1 metre inside the temporary surrounding fence.
  - (d) The temporary fence, notice board and covering shall be maintained in good order at all times until permanent treatment works take place.
- 17.6 If any shaft is in close proximity to areas of normal public access, the area around the shaft shall be surrounded by a substantial fence not less than 1.8 metres high, the perimeter of which shall not be less than 5 metres from the edge of any ground settlement related to the shaft. Notices shall be placed around the fenced area warning of the presence of a mineshaft.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- 17.7 The Company shall not discharge nor permit to be discharged into any mineshaft water, effluent or other liquid matter and shall take all precaution necessary to prevent any such discharge from occurring from any other part of the Works.
- 17.8 Prior to infilling of any open shafts the Company shall ascertain the depth to solid bottom in the shaft, depth to standing water and if any water is contained therein. A copy of this information shall be provided to the Scottish Ministers Representative.
- 17.9 If material is discharged into the shaft directly from transport vehicles or by plant operating in close proximity to the shaft, the Company shall erect a suitable barrier around or adjacent to the shaft mouth delineating a "safe working zone" that is of sufficient size and strength and so positioned as to prevent vehicles and / or tipping equipment or other infilling plant from falling into the shaft or causing a collapse of the shaft mouth.
- 17.10 All filling materials placed within an open shaft from a depth of not less than 10 metres from the surrounding ground level up to the mouth of the shaft shall be self compacting.
- 17.11 Water raised in and / or displaced from a shaft by the placement of infilling shall be adequately drained away from the shaft mouth so as to maintain the shaft mouth and adjoining ground in a clean and dry condition.
- 17.12 As far as is practicable infilling shall be completed in one continuous operation. Where this is not possible, a temporary fence, cover and warning notice board, as specified above, shall be erected around and over the shaft mouth and maintained in good order at all times until works is resumed.
- 17.13 Upon completion of infilling a temporary fence and warning notice board shall be provided as specified above, and maintained in good order at all times until further treatment measures are carried out.
- 17.14 In the event of the infill settling in the shaft after completion of initial infilling and before further stabilisation measures are carried out, further filling shall be placed in the shaft. Any temporary fencing and / or warning notice boards removed or damaged either by the settlement of infilling or the placing of further infilling shall be reinstated or replaced upon completion.
- 17.15 The Company's attention is drawn in particular to the possibility of the collapse of fill material into the shaft or of the shaft itself whilst probe drilling operations are being carried out. During such operations a drilling platform must be used and where deemed necessary such a platform shall be anchored at a safe distance away from the shaft position.
- 17.16 The drilling platform or staging shall:
- (a) be of overall dimensions not less than three times the diameter of the shaft;
  - (b) be of metal construction and be of sufficient strength to carry the full weight of the drilling rig in the event of a collapse of the shaft mouth or surrounding ground; and
  - (c) be suitably covered by planking or plating so as to provide a safe working platform for all personnel engaged in operating the drilling rig and ancillary equipment.
- 17.17 The ground for the reinforced concrete slab shall be prepared by excavating the shaft lining, shaft infill and surrounding soil down to firm rockhead, or, where this is impractical, to a suitable and stable horizon. The base of the excavation shall be prepared clean and level by hand prior to construction of the slab.

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**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- 17.18 Excavation for shaft caps should normally be undertaken using a track mounted back acting excavator. Any works carried out by operatives within any excavations so formed – hand finishing of the excavation, fixing of shuttering or reinforcement, etc., should only be undertaken with appropriate safety considerations. A minimum requirement in this connection will be the provision and use of appropriate safety harnesses anchored outwith the zone of influence.
- 17.19 Excavations deeper than nominally 1.0 metre shall have the upper parts battered to a safe angle to ensure stability of the excavation.
- 17.20 The concreting of shaft caps shall be carried out in one continuous operation without interruption. Construction joints will not be permitted.
- 17.21 The method of infilling the excavation above the slab shall be as follows:
- (a) batter the side excavation to a nominal gradient of 1 in 3 and replace excavated material or imported material under controlled conditions of spreading, in compacted layers of not exceeding 150 millimetres.
- 17.22 The Company shall maintain a record of all site works on a daily basis. The daily journal for the works included in this particular portion of the Specification shall include the following items using appropriate metric units where applicable:

**Requirement of Daily Journal – Capping of Mineshafts**

- (a) Contractor's name;
- (b) Contract name and location;
- (c) Shaft number and location;
- (d) Date of work;
- (e) Plant and equipment in use;
- (f) Crew employed;
- (g) Weather;
- (h) Hours of work;
- (i) Standing time or delays or breakdowns;
- (j) Dimensions of excavation;
- (k) Stability of excavation;
- (l) Brief description of strata;
- (m) Groundwater encountered and rate of flow;
- (n) Standing water level, at beginning and end of shift;
- (o) Gas monitoring results;
- (p) Details of services or drains encountered;
- (q) Dimensions of cap;
- (r) Construction of cap;
- (s) Quantity of steel, concrete placed etc.;
- (t) Details of backfilling;
- (u) Ground settlement or heave;

**Appendix 6/11: Grouting Works (Swallow Holes and Other Naturally Occurring Cavities and Disused Mineworkings)**

- (v) Materials delivered;
  - (w) Equipment delivered;
  - (x) Visitors to site and any instructions given;
  - (y) Any other relevant remarks; and
  - (z) Metric dimensions and units are to be used throughout.
- 17.23 The Company shall provide the Scottish Ministers with the recorded position of any treated shafts, including each corner of the shaft and cap reported as National Grid Co-ordinates and information on the condition, infilling and lining of any shaft encountered during the Works. The Contractor shall also provide plans showing the location of any shaft in relation to the Works, the ground level of the cap (mAOD) and the ground level of rockhead if encountered (mAOD).
- 18 Waste Management (Pulverised Fuel Ash)**
- 18.1 The Company is responsible for supplying appropriate grout constituent materials.
- 18.2 PFA, a typical constituent of grout, is now regarded by the Environment Agency to be a waste material and, accordingly, its use in these sorts of works comes under the various waste management regulations and legislation.
- 18.3 If the Company proposes to use PFA in the New Works then he will be responsible for discharging any liabilities and responsibilities in this respect and shall indemnify the Scottish Ministers against any associated claims.
- 18.4 Copies of relevant correspondence, licences, permits and similar that may be required to discharge these responsibilities are to be copied to the Scottish Ministers before use of PFA will be permitted.
- 18.5 As an alternative to using PFA, a suitable substitute material, or pre-bagged product may be used in the new Works, subject to approval by the Designer.

## **Appendix 12/1: Traffic Signs: General**

### **1 Traffic Signs – General**

- 1.1 As part of the New Works the Company shall erect 5 advance direction traffic signs for Showcase Leisure Park. The signs shall contain the legend, “Showcase Leisure Park”
- 1.2 The signs shall be designed and located in accordance with the following:
- (a) Sign 1 shall be positioned on the westbound verge of the New M8 Motorway between 1mile and 1/2mile in advance of the Junction 6 diverge. The sign shall be designed to Diagram Number 2215 of the Traffic Sign Regulations and General Directions 2002.
  - (b) Sign 2 shall be positioned on the eastbound verge of the New M8 Motorway between 1mile and 1/2mile in advance of the Junction 8 diverge. The sign shall be designed to Diagram Number 2215 of the Traffic Sign Regulations and General Directions 2002.
  - (c) Sign 3 shall be positioned on the verge of the verge of the eastbound diverge slip of M8 Junction 8, in advance of the diverge to the A89. The sign shall be designed to Diagram Number 2215 of the Traffic Sign Regulations and General Directions 2002.
  - (d) Sign 4 shall be positioned in the eastbound verge of the A89 in advance of the the New A89 / A8 APR roundabout. The sign shall be designed to Diagram Number 2218 of the Traffic Sign Regulations and General Directions 2002.
  - (e) Sign 5 shall be positioned on the splitter island of the A8 All Purpose Route on the new A89 / A8 roundabout. The sign shall be designed to Diagram Number 2203 of the Traffic Sign Regulations and General Directions 2002.
- 1.3 As part of the New Works the Company shall erect appropriate signage for existing tourist destinations which are currently signed on the road network. These include, but are not limited to the following tourist destinations;
- (i) ‘New Lanark’
  - (ii) ‘Strathclyde Country Park’
  - (iii) ‘Scotlands Theme Park’
  - (iv) ‘Drumpellier Country Park’
  - (v) ‘Summerlee Heritage Park’
  - (vi) ‘Calderglen Country Park’
  - (vii) ‘David Livingstone Center’
  - (viii) ‘Kittochside’
  - (ix) ‘Time Capsule’
  - (x) ‘Hamilton Park Racecourse’
  - (xi) ‘Mackinnon Mills’
- 1.4 As part of the New Works the Company shall erect a sign at reference point E62 displaying the notation “Local Access Only” in black text on a white background. This sign will have an x-height of 75mm.

## **Appendix 12/2: Traffic Signs - Marker Posts**

### **1 Hazard Marker Posts**

- 1.1 Hazard marker posts shall be capable of being overrun by vehicles so that they deflect and spring back to an upright position without shattering in all weather conditions and with little or no vehicular damage.
- 1.2 Hazard marker posts shall be fitted with anti-removal tabs below the ground
- 1.3 The reflectors shall be of Class 1 retro reflective sheet material to comply with Diagram 561 of Traffic Signs Regulations and General Directions 1994. The retro reflective sheeting shall be protected from damage from over-running vehicles by raised edges or other acceptable methods.
- 1.4 The hazard marker post shall have the main body self-coloured black with a highly visible weather resistant white band to the sizes quoted in Figure 4.84 in Chapter 4 of the Traffic Signs Manual.
- 1.5 The top of the hazard marker post shall be installed so that the top of the post is 750mm-1000mm above ground level.



## **Appendix 12/3: Traffic Signs - Road Markings and Studs**

### **1 Road Markings**

- 1.1 The colour location and material type for permanent or temporary road markings shall be specified as part of an order for road marking.
- 1.2 Ribbed road markings shall be formed of hot applied thermoplastic formulated to allow the formation of transverse ribs. The transverse ribs shall not be less than 8mm and not greater than 10mm in depth and shall be at 500mm spacing except on slip roads where the spacing shall be reduced to 250mm.
- 1.3 All road markings shall provide a skid resistance level of 55.
- 1.4 Temporary road markings shall be laid in accordance with BSI document BD 6518 1985.
- 1.5 Where existing road markings shall be required to be covered over the cover application shall comply with BS 7962: 2000.

### **2 Road Studs**

#### **2.1 General Requirements**

- 2.1.1 Any road stud which has become displaced from its socket or is loose or broken shall be removed from the carriageway immediately and the resulting socket shall be filled with bituminous instant repair material as described in Clause 970AR.
- 2.1.2 Replacement road studs shall not be installed in old sockets. New road studs shall be placed in new sockets with a clearance of at least 300mm from the original sockets. Existing or refurbished road stud sockets may be re-used but in all cases shall be fitted with new inserts.
- 2.1.3 Road studs inserts shall be replaced when failing to meet the requirements of Schedule 2 to the Agreement.
- 2.1.4 Road studs to be used for this Agreement shall be as follows

#### **2.2 Red White and Green Studs**

- 2.2.1 All red white and green studs shall comply with Clause 1213.3. Red and green reflectors shall be uni-directional. White reflectors shall be bi-directional.
- 2.2.2 Where installation of road studs shall be the subject of a traffic regulation order at new locations Method No 1 as detailed in Paving Instruction 1984 Edition (Red) shall be used. This shall be Installation Method No 1.

#### **2.3 Amber Studs**

- 2.3.1 Amber studs shall be of the corner-cube reflection type and shall be fixed in accordance with the manufacturer's written recommendations. (Installation Method No 4)

#### **2.4 Temporary Road Marking Studs shall be either**

- 2.4.1 Hot melt adhesive type.
- 2.4.2 Self adhesive type.
- 2.4.3 Fixing of studs shall be in accordance with manufacturer's written recommendations with respect to whether the studs shall be fixed to existing or new surfacing.

### **Appendix 12/3: Traffic Signs - Road Markings and Studs**

#### **2.5 Existing metal CHART node studs**

2.5.1 Existing metal CHART node studs shall be removed to ensure minimum damage to carriageway. Reinstatement shall be carried out using filled bitumen or bituminous instant repair material.

#### **2.6 Cored thermoplastic road markers to be installed as CHART node points**

2.6.1 Cored thermoplastic road markers to be installed as CHART node points shall use the following method (Method No 5)

(i) a 100mm diameter x 20mm deep pocket shall be formed using a central pilot bit surrounded by an annular bit

(ii) the base of the pocket after breaking out the surfacing material shall be left jagged

2.6.2 the pocket shall be filled with hot thermoplastic material to the uppermost edge of the pocket projecting slightly above the road surface and the material allowed to cool and set to form a stud.

2.6.3 The material shall consist of a plastic resin with white filler and reflective glass particles to BS 3262.

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

### **1 Permanent Traffic Signals**

1.1 All traffic signal equipment supplied must be of a type approved by the Scottish Ministers and comply with the latest edition of the relevant British Standards, TR Specifications, The Traffic Signs Regulations and General Directions, The Zebra, Pelican and Puffin Pedestrian Crossing Regulations and General Directions and IEE Wiring and "Electricity at Work" Regulations. The Design and method of maintenance must meet the above regulations.

1.2 Statutory Approvals must be in place for all traffic signs and signals (including associated control equipment) and copies of letter of acceptance must be submitted to the Scottish Ministers prior to construction.

1.3 All lanterns, including nearside red man/green man lanterns, must be compatible with the proposed controller for fault monitoring, including full red lamp monitoring for installations with controlled pedestrian facilities.

1.4 Where required in the Contract to supply and install traffic signal heads and other traffic signal equipment, the Company shall provide equipment complying with the following requirements:

#### **1.5 Signal Heads**

1.5.1 Traffic Signal heads shall conform to TR2206 Specification of Road Traffic Signals, BS EN 12368 Traffic Control Equipment, Signal Heads, BS EN 50556 Road Traffic Signal Systems.

#### 1.5.2 LED Signal Heads

Aspect Types:- 200 mm diameter red, yellow and green roundels. 200 mm green left, right and straight on arrows.

Signal heads shall comply with the following BS EN 12368 Classes:

Optical Characteristics:- Luminous Intensity Class 3/2  
Luminous Distribution Table 4  
Phantom Class 5  
Colour (inc. combined Colour) Compliant  
Luminance Uniformity =1:10

#### 1.5.3 LED Pedestrian Heads

Aspect Types:- 200 mm diameter red and green pedestrian symbols.

Signal heads shall comply with the following BS EN 12368 Classes:

Optical Characteristics:- Luminous Intensity Class 3/2  
Luminous Distribution Table 4  
Phantom Class 5  
Colour (inc. combined Colour) Compliant  
Luminance Uniformity =1:10

#### 1.5.4 Push Button

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- Operating Voltage:- All push buttons for pedestrian lights shall operate on a low voltage, 48 V, 40 W supply.
- Push Buttons shall incorporate a “tactile cone” indicator at the base of the unit. (A tactile cone indicator serves to assist visually impaired pedestrians in identifying when it is safe to use a pedestrian crossing, by rotating when the pedestrian phase is in operation)
- 1.6 Nearside Units for Puffin and Toucan & Demand Units**
- 1.6.1 Nearside units will comply with the latest version of TR2511 Performance specification for Nearside Signal and Demand Units.
- 1.6.2 All nearside and demand units must be installed in accordance with the manufactures instructions.
- 1.6.3 Nearside and demand units will be aligned in accordance with the approved site specific traffic signal drawings.
- 1.6.4 Demand units shall incorporate a “tactile cone” indicator at the base of the unit. (A tactile cone indicator serves to assist visually impaired pedestrians in identifying when it is safe to use a pedestrian crossing, by rotating when the pedestrian phase is in operation).
- 1.7 Tactile Equipment**
- 1.7.1 Tactile cones and associated equipment will comply with the latest version of TR2508 Performance Specification for Tactile Equipment for use at Pedestrian Crossings.
- 1.8 Audible Equipment**
- 1.8.1 Where it is proposed to install Audible units they shall comply with the latest version of TR2509 Performance Specification for Audible Equipment for use at Pedestrian Crossings.
- 1.9 Traffic Signal Controller Cabinets**
- 1.9.1 Foundations for traffic signal controller cabinets shall be located in positions such that when the access doors of the installed cabinet are in the open position they cause minimal obstruction of the footway. It shall be possible to open the access doors fully and consideration must be given to the safety of operatives and Non Motorised Units during maintenance operations. If it is necessary to site the cabinet adjacent to the kerb then it shall not be possible for the access doors to be opened over the carriageway and the cabinet shall be sited at least 0.5m from the kerb edge.
- 1.9.2 The cabinet shall be positioned so that it does not obstruct the view of pedestrians waiting at traffic signal controlled crossings or motorists on their approach to the crossing. Where ever possible, the cabinet shall be sited at the downstream side of signal controlled pedestrian crossings. Cabinets shall be positioned such that a traffic engineer can view the operation of the signals whilst standing at the front of the cabinet.
- 1.9.3 Case root base cabinets shall have the root located on one or more paving slabs which are themselves securely bedded and properly levelled at the appropriate depth. A bed of ST4 concrete shall be laid over the base of the root and paving slab(s). The top of the bed, when finished, shall be 1/3 of the way up the legs of the root and the site of the bed smoothed. That part of the excavation within the case root shall be back filled with compacted dry fine sand or pea gravel and topped with dry fine sand after the ducting has been installed and the cables have been terminated. The remainder of the excavation around the cabinet is to be backfilled with cement bound material to base course level

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- and the surrounding area reinstated in accordance with the requirements of Clause 706 of the Specification.
- 1.9.4 A layer of epoxy resin 6 mm thick is to be laid on top of the sand to prevent ingress of gas and moisture into the cabinet through the root and to provide a seal with the case.
- 1.9.5 Pole mounted cabinets are to be mounted on poles correctly aligned in vertical positions. The excavation shall be adequate to allow the pole to be planted to the depth recommended by the manufacturer, typically 650 mm. The bottom of the hole around the pole is to be filled with at least 300mm of ST4 concrete to the bottom of the cable entry slot. When cable laying and testing is complete, the remainder of the backfilling shall be completed. The cable entry to the cabinet shall be effectively sealed against ingress of moisture into the unit.
- 1.9.6 Once the electronic modules are installed in the cabinet, the door seals and locks shall be checked and the base sealed as soon as possible to stop any moisture ingress to the modules.
- 1.9.7 When a cabinet is mounted on a verge of unmade ground a concrete pad, which may consist of paving slabs, shall be laid around the controller to a minimum width of not less than one metre on those sides to which access to the equipment is required.
- (i) All controllers and auxiliary cabinets shall be supplied with a metal case with a hinged main access door, with locking facilities.
- (ii) Cabinets shall be IP55 rating.
- 1.10 **Controller Equipment**
- 1.10.1 The Company shall ensure that all controllers are fully UTMC compliant allowing fault monitoring equipment such as an Outstation Monitoring Unit (O.M.U), Outstation Transmission Unit (O.T.U) or MOVA Unit to be supplied by any manufacturer.
- 1.10.2 The Company shall install an Outstation Monitoring Unit (OMU) or Outstation Transmission Unit (O.T.U) of a type approved by the Overseeing Organisation.
- 1.10.3 The Company will install a MOVA unit in the controller at locations agreed with the Overseeing Organisation.
- 1.10.4 ELV and LV controllers will conform to the latest version of TR2500 Specification for Traffic Signal Controller and BS EN 12675 Traffic Signal Controller Functional Safety Requirements.
- 1.11 **Traffic Signal Poles**
- 1.11.1 The Company shall comply with DMRB Volume 8 Section 2 Part 2 TA 89/08 Use of Passively Safe Signposts, Lighting Columns and Traffic Signal Posts to BS EN 12767.
- 1.11.2 The Company shall be responsible for specifying which performance class is required.
- 1.11.3 All poles shall be installed in accordance with the manufacturer's recommendations, or as otherwise instructed by the Overseeing Organisation.
- 1.11.4 Poles shall NOT be supplied with pre drilled holes for nearside and demand units.
- 1.11.5 All poles shall numbered in accordance with the numbering system used on the site specific drawings with appropriate labels, labels to be approved by the Overseeing Organisation.
- 1.11.6 All poles shall be numbered on the footway side at right angles to the traffic lantern brackets and immediately below the top cap; where all lantern fixings are allocated the numbering shall be placed below the bottom fixing bracket.

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- 1.11.7 The areas of the pole on which the labels are to be impressed shall be cleaned/degreased before application.
- 1.11.8 The Company's proposed pole retention system shall be subject to the approval of the Overseeing Organisation. The retention system shall be of cast iron design and shall incorporate a pole locking system contained within an integral locking chamber. The design shall allow the pole to be aligned in any orientation with the cable installed, prior to the locking device being activated. The design shall not allow signal poles to rotate once fixed in position. Sockets shall be installed flush with the final surface. Flush sealing plugs shall be available for use when the signal pole is not present. The proposed system shall be adaptable to allow for a minimum insertion depth of 300 mm. The design of the pole retention system shall incorporate appropriate features to accommodate easy installation and replacement of signal poles and cables. The sockets and poles shall be installed in accordance with the manufacturer's instructions.
- 1.12 Electrical Disconnection Equipment for Passively Safe Traffic Signal Poles**
- 1.12.1 The system must comply with BS EN12767 (Disconnection of Roadside Structures within 0.4s of Impact).
- 1.12.2 The system shall be housed within a suitably sized cabinet to house all isolation equipment, such as circuit breakers and monitoring units. This cabinet will be located alongside the signal controller cabinet.
- 1.12.3 The system shall include a self checking system, with an output to indicate system malfunction.
- 1.12.4 In normal operation the system must give a visual indication that it is operational, heartbeat or similar.
- 1.12.5 If the system is activated it must provide a positive visual indication of this and also indicate the location.
- 1.12.6 The isolation will be so designed that on impact all LV and ELV live and neutral circuit conductors are disconnected from the signal pole, together with any sensor voltages.
- 1.12.7 It must not be possible to re-energise a circuit that has been tripped.
- 1.12.8 The system will provide outputs to indicate a) Activation by impact, b) Activation by signal equipment fault, c) Isolation system malfunction and d) Isolation system power failure.
- 1.12.9 The isolation system must also be capable of isolating a whole signal pole due to a signal equipment fault; this facility is to be switchable by pole.
- 1.12.10 The sensors are to be mounted by the most appropriate means, ideally behind the base door if available. The location shall be agreed with the Overseeing Organisation before fitting.
- 1.12.11 The cabling to the sensors is to be run in separate ducts to LV cables, using orange PVC sheathed SWA 2 core 2.5mm cable, traffic signal loop feeder cable.
- 1.12.12 The sensor cable is to be terminated using a CET cable gland or equivalent, with the armouring being taken to Earth.
- 1.12.13 Sensors are to be IP64 rated for mounting in the structure. The sensor must provide a means of testing the system operation during commissioning and routine maintenance.
- 1.13 Duct Systems**
- 1.13.1 Duct links between chambers and individual signal poles or equipment cabinets shall provide the appropriate number of ducts to accommodate the number of cables required

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- to service the item. The layout shall be such that any tactile paving area is kept free of inspection chambers.
- 1.13.2 All duct work provided by the Company between Traffic Signal controllers and Traffic Signal poles or other equipment shall form a continuous route.
- 1.13.3 Traffic signal, communication, power and loop detector ducts and duct accessories shall comply with the latest version of BS EN 61386 - 24 and be orange in colour. All ducts, unless otherwise specified, shall be thick walled (5mm) high density polyethylene. The ducts shall be smooth walled (inner and outer) with a nominal internal diameter of 100mm unless otherwise stated and coloured orange with the words "Traffic Signals" printed in white along their length at intervals of not more than one metre. When laid, the wording shall be displayed uppermost. All lengths shall be jointed or sleeved. Spurs to signal poles shall generally be 100mm in diameter.
- 1.13.4 Telecommunication Service Provider's ducts and duct accessories shall comply with BS EN 61386 - 24 and be black in colour. Ducts shall comprise a high density polythene twin walled (inner wall smooth, outer wall corrugated) system with an internal diameter of 100mm and unit lengths of 6.0 metres. Every length shall be supplied with a push-fit coupler.
- 1.13.5 The Mechanical Properties of the ducts shall be that associated with "Normal Duty". For Resistance to Bending, both rigid and pliable ducts are acceptable provided that the ducting requirements of the particular installation are met and that the correct accessories are used. The category for Protection against Ingress shall be a minimum of IP 30 and the Resistance to Chemical Attack classification shall be "With Protection".
- 1.13.6 Yellow PVC marker tape, with the wording "CAUTION ELECTRICITY DUCT BELOW" printed along its full length so as to occupy not less than 75% of its available length and occurring at a minimum of 1.0 metre intervals, shall be laid 250mm above all duct-lines. The tape shall be a minimum of 150mm wide and 0.1mm thick.
- 1.13.7 Where normal cover to communication ducts for traffic signals cannot be obtained, e.g. on structures or due to underground obstructions such as concrete road foundation slabs, 32mm internal diameter galvanised steel pipes may be laid at shallow depth, with couplings and joints complying with the latest Version of BS 1387 Class H, all as directed by the Overseeing Organisation.
- 1.13.8 All service ducts shall be fitted with a draw rope in accordance with Clause 501.8. The rope shall extend at least 3.0 metres from each end of the duct and this length of rope shall be tidily looped and either tied to the draw rope of a parallel duct or secured to a marker block when no adjacent duct is available. In either case, unless ducts terminate at cabinets, mounting posts, columns or main duct chambers, their ends shall be marked with marker blocks or marker posts as detailed in HCD I1. Immediately after laying, ducts shall be sealed with removable split or solid plugs which can accommodate the specified draw rope.
- 1.13.9 A secondary draw cord shall be installed following any cable installation such that a serviceable cord is available at all times.
- 1.14 **Access Chambers**
- 1.14.1 Access chambers, installed in footpaths and verges, shall comprise proprietary high density polyethylene segmental chambers with pre-formed "knockout" duct accesses. Chambers shall be twin walled, be capable of withstanding a 12.5 tonne wheel load and shall have a 150mm thick Class ST4 concrete surround. Chambers shall typically have a clear opening of 600 mm x 600 mm.

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- 1.14.2 Chamber covers and frames shall comply with the requirements of BS EN 124:1994 and be Class B125 in footways and Class D400 in carriageways, hardshoulders and hard standings. Chamber covers for footways shall be manufactured from a high strength polyester composite material and shall be located in a 2.5mm thick galvanized steel frame which will allow height and tilt adjustment.
- 1.14.3 Chamber covers shall provide skid resistance greater than the minimum advisory limits.
- 1.14.4 Frames for chamber covers in footways shall be set in designation (i) cement mortar or a proprietary quick setting mortar of equivalent strength. The use of any quick setting mortar shall be subject to the approval of the Overseeing Organisation prior to use. Frames for chamber covers in the carriageway shall be set in epoxy mortar. All new, adjusted and replaced chamber frames and covers shall be set flush with the surrounding surface in hard landscaped, footway and carriageway areas. In soft verge chamber cover level shall be 25 mm above finished level. The finished thickness of the mortar bed to the frame shall be between 10 and 25 mm. Any additional adjustments beyond this shall be achieved by modifying the chamber structure or by using a frame of a suitable depth in accordance with Clause 507.18 of the Specification.
- 1.14.5 Horizontal and vertical alignment of the ducts shall be such that cables may be pulled directly through the chambers.
- 1.14.6 Ends of ducts shall protrude 25 mm through the inside of the chamber wall.
- 1.14.7 Chamber covers shall be clearly identified by the legend of the Overseeing Organisation such as "GCC-TS" or "SLC-TS" as appropriate. The lettering shall be 25 mm high and shall be embossed on each cover.
- 1.15 Trench Reinstatements**
- 1.15.1 Reinstatements shall be made in accordance with the requirements of this document, Clause 706 of the Specification and those prescribed in the Highway Authorities and Utilities Committee (HAUC) "Specification for the Reinstatement of Openings in Highways" (ISBN 0 11 551143 1). Should there be any conflict then the requirements of this document shall take precedence.
- 1.15.2 The reinstatement method shall be an "All Permanent Reinstatement". The sub-base, base course and wearing course, or equivalent, shall be reinstated to a permanent standard at the first visit. In all cases the final surface of the reinstatement shall comply with the requirements given in Section S6.4.
- 1.16 Cables and Routes**
- 1.16.1 All traffic signal and paired feeder cables shall conform to BS6346/87.
- 1.16.2 All traffic signal cables for LV and ELV will be orange PVC/SWA multi-core 1.5mm CSA cable.
- 1.16.3 All traffic signal paired feeder cable will be orange PVC/SWA 1.5mm CSA one or two pair cable.
- 1.16.4 Multi-core and paired feeder Cables should be armoured and the outer sheath colour Orange PVC in accordance with NJUG Volume 1.
- 1.16.5 Cable routes and core allocations for traffic signals and associated equipment to be carried out by the Contractor.
- 1.16.6 Cables shall not be jointed throughout their length from origin to destination.



### **Appendix 12/5: Traffic Signs - Traffic Signals**

- 1.16.7 Approximately one metre of spare length for each cable run shall be coiled at the main duct chamber adjacent to the controller, in addition in intermediate chambers addition spare shall be provided where capacity permits.
- 1.16.8 Cable cores/pairs shall be neatly routed within the cabinet and its connection frame and tie-wrapped in looms, with due regard to accessibility of maintainable items.
- 1.16.9 All Spare cores including ELV should not be connected to Earth until Earth Impedance Tests have been completed.
- 1.16.10 All cables shall be run in ducts.
- 1.16.11 Traffic Signal Cable must be separately ducted from Utility, Communication and other Services Cable.
- 1.16.12 Mains cable between the controller and ETP will be black in colour in accordance with NJUG Volume 1 and comprise 3 cores 6mm sq csa SWA cable
- 1.16.13 The mains cable must be installed through ducting running directly from the ETP to the controller and not via the controller access chamber.
- 1.16.14 Cabling between poles will not be acceptable unless prior agreement has been received from the Overseeing Organisation.
- 1.17 **Electrical Termination Pillar (ETP)**
  - 1.17.1 The ETP shall house a double poled lockable fused isolator, fused appropriately which must comply with the latest edition of the IEE wiring regulations.
  - 1.17.2 The base of the ETP shall be sealed with a layer of epoxy resin 6 mm thick which is to be laid on top of a sand base to prevent ingress of gas and moisture into the ETP.
  - 1.17.3 The Contractor shall obtain approval of the proposed type of ETP from the Overseeing Organisation.
- 1.18 **Detection**
  - 1.18.1 All slot cutting shall be designed and equipment installed to meet the latest version of MCH1540 - Specification for the Installation of Detector Loops on Motorways and All Purpose Trunk Roads, MCE0108 – Siting of Inductive Loops for Vehicle Detecting Equipment at Permanent Road Traffic Signals and TR 2512 – Performance Specification for Below Ground Detection Equipment.
  - 1.18.2 MOVA Loops shall be designed and installed to meet the latest Version of MCH1542 – Installation of MOVA.
  - 1.18.3 All loop tails shall be labeled in the nearest loop box to identify the loop identity which must relate the site specific approved drawings. The labels must be marked with a permanent marker.
  - 1.18.4 All loop feeder cable joints to be re-usable to IP68 Cat 1.
  - 1.18.5 All above ground detector units must be installed, configured and aligned in accordance with the manufactures instructions.
  - 1.18.6 Above ground traffic detection will comply with the latest version of TR2505 – Performance Specification for Above Ground Vehicle Detector Systems for use at Permanent Traffic Signal Installations.
  - 1.18.7 Kerbside Detectors will comply with the latest version of TR2507 – Performance Specification for Kerbside Detection Systems for Use with Nearside Signals and Demand Units.

## **Appendix 12/5: Traffic Signs - Traffic Signals**

1.18.8 On-Crossing Detectors will comply with the latest version of TR2506 - Performance Specification for Above Ground On-Crossing Pedestrian Detection System.

### **1.19 Factory Acceptance Testing (FAT)**

1.19.1 The Company will be responsible for the factory acceptance testing of the controller(s) with a representative of the Traffic Signal Contractor, the Scottish Ministers and the Overseeing Organisation.

1.19.2 The Company will give two weeks notice prior to the FAT to all attendees.

1.19.3 The Company shall provide a testing schedule for approval of the Scottish Ministers and Overseeing Organisation which shall cover all of the required testing to be undertaken during the FAT. This schedule will be generic and shall cover all modes of operation with a site specific schedule being developed if required.

### **1.20 Electrical testing**

1.20.1 The Scottish Ministers / Overseeing Organisation shall be given a minimum of seven days notice before commencement of all electrical tests preceding final site commissioning. These tests shall be witnessed by the Scottish Ministers / Overseeing Organisation at their discretion.

1.20.2 Electrical Testing is to be carried out by a Traffic Signal Contractor Engineer.

1.20.3 Earth Test Certificate to be provided before the Installation is Commissioned Electrical Testing to conform to BS7671 Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition.

1.20.4 The test certificate shall be handed to the Scottish Ministers / Overseeing Organisation prior to the commencement of the final site acceptance.

1.20.5 Electrical Completion Certificate and Test Results are to be provided before the Installation is Commissioned – BS7671 Regulation 741-01-01. This record shall be handed to the Employer / Overseeing Organisation at the commencement of the final site acceptance.

1.20.6 The Company shall only arrange the final commissioning/acceptance of the site when the installation is complete.

1.20.7 The Company shall be responsible for all aspects of achieving a working installation operating to the satisfaction of the Scottish Ministers / Overseeing Organisation.

### **1.21 Completion of the Installation**

1.21.1 The Company should supply 2 copies all the Documentation including a copy for site prior to the Switch On to confirm that the Traffic Signal Site meets all statutory requirements.

- Controller Test Schedule
- Controller Specification
- MOVA dataset
- MOVA Specification
- Statutory Approvals and copies of letter of acceptance
- Loop Test Schedule
- Earth Test Certificate

## **Appendix 12/5: Traffic Signs - Traffic Signals**

- Electrical Completion Certificate and Test Results (To be provided before the Installation is Commissioned – BS7671 Regulation 741-01-01)
- As Installed Site Layout Diagram
- As built Cable layout / Schedules inclusive of Electrical Isolation cabinets.

1.21.2 Prior to final acceptance of the installation;

- (a) Where redundant traffic signal equipment still remains it must be removed and any old ducts abandoned. Any redundant duct runs must be blocked off at the duct end with expanding foam or similar to the approval of the Overseeing Organisation.
- (b) All redundant equipments shall be recycled or disposed of as per the Environmental Management Plan.

### **1.22 Final Commissioning and Acceptance**

- 1.22.1 The Company will be responsible for organising the site acceptance testing of Controller(s) and the associated installation with a representative of the Traffic Signal Contractor, the Scottish Ministers and the Overseeing Organisation.
- 1.22.2 The Company shall give the Scottish Ministers / Overseeing Organisation two weeks notice of switch on of any new traffic signal installation so that the Scottish Ministers / Overseeing Organisation can complete its signal inspections and inform the Police and local representatives.
- 1.22.3 The Company shall liaise with the Scottish Ministers / Overseeing Organisation with respect to agreeing the methodology for bringing the site into operation.
- 1.22.4 Completion Certificate will be furnished by the Company duly made out and briefly describing the completed Works. There will be sufficient space for the Scottish Ministers / Overseeing Organisation comments and endorsements. A copy will be available to the Scottish Ministers / Overseeing Organisation for their records immediately following completion.
- 1.22.5 Any minor defects and/or omission, which do not prevent the Installation from functioning in a safe and efficient manner, shall be recorded on the Completion Certificate.
- 1.22.6 The Company will ensure a Traffic Signal Engineer will be in attendance during switch on and final commissioning. The Traffic Signal Engineer will assist the Traffic Signal Installation team if any problems arise during switch-on.
- 1.22.7 The Company will provide a specialist MOVA Engineer to validate and commission the MOVA operation to the satisfaction of the Scottish Ministers / Overseeing Organisation.
- 1.22.8 The Company shall give the Scottish Ministers and Overseeing Organisation two weeks notice of switch on of any new traffic signal installation so that the Scottish Ministers / Overseeing Organisation can complete its signal inspections and inform the relevant organisations such as Police and local representatives.

## **2 Temporary Traffic Signals**

- 2.1 The Company shall note the requirements of Appendix 1/17.
- 2.2 The use of Portable traffic signals used to control traffic shall comply with Department of Transport Specifications TR2502B Performance Specification for Portable Traffic Signal Control Equipment for Use at Road Works and TR 2405A Performance Specification for Vehicle Detection Equipment for Vehicle Actuated Portable Traffic Signals. In addition TR

## **Appendix 12/5: Traffic Signs - Traffic Signals**

2503B Performance Specification for Pedestrian Facilities at Temporary Stand Alone Traffic Signals shall comply where there is a requirement for pedestrians, the latest version of The Traffic Signs Regulations and General Directions, TAL 2/11 Portable Traffic Signals for the Control of Vehicular Traffic and TAL3/11 Signal Controlled Pedestrian Facilities at Portable Traffic Signals and Chapter 8 of the Traffic Signs Manual. Haul route crossings shall be in accordance with Chapter 8 of the Traffic Signs Manual.

- 2.3 The Company shall obtain the prior written consent of the Scottish Ministers for multiphase temporary traffic signals.
- 2.4 The Company shall provide to the Scottish Ministers a drawing to a scale of 1:500 with the position of the signals indicated by a dot and an arrow from the dot indicating the direction of the lights and a key to symbols used shall be shown. The position of signals shall be accurate to within 2 metres. The proposed stage arrangement, signal timings inclusive of all red periods together with location of the generator shall also be provided.
- 2.5 The Company shall consult and comply with the requirements of the emergency services (Fire, Ambulance and Police). Passenger transport operators shall also be informed if the Operations affect any of their routes.

### **3 Controlled and Uncontrolled Crossings**

- 3.1 Replacement of surfaces of controlled and uncontrolled crossings shall match that already existing unless otherwise the subject of a traffic regulation order.

### **4 General Safety**

- 4.1 Live cables may be present in the ducting system and at the pole tops and due care must therefore be taken at all times.
- 4.2 On new installations all primary, secondary signal heads shall be covered with an orange cover, approved by the Overseeing Organisation until the site is brought into service, to prevent any misunderstanding to the motorist.
- 4.3 On all new installations all Pedestrians push button panels or nearside demand units are to be covered with "Pedestrian Crossing Not In Use" sign approved by the Overseeing Organisation, until the site is brought into service.
- 4.4 Particular care to protect the work force and the general public shall be taken where duct chamber lids are removed and/or cables are being installed.
- 4.5 The attention of the Company is brought to the potential danger of gas build-up within duct and chamber systems.
- 4.6 Appropriate equipment and tools, including those recommended by the equipment manufacturer(s), shall be used.
- 4.7 Special care shall be taken to ensure the electrical integrity of any temporary works.

### **5 Controlled Crossings**

- 5.1 As per section 1 above.

### **6 Traffic Signal Assessments and Design**

#### **6.1 Traffic Signal Modelling**

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## **Appendix 12/5: Traffic Signs - Traffic Signals**

- 6.1.1 The Company shall develop Linsig models utilising the latest version of software for the operation and performance all of the proposed traffic signal junctions and signalised roundabouts to assess the Practical Reserve Capacity and queues / delay for individual links. The models shall be based on the specimen design layout drawings.
- 6.1.2 Linsig models shall include AM, PM and an interpeak periods, the results for each periods are to be issued to the Scottish Ministers for approval prior to undertaking Paramics modelling in relation to Appendix F - Procedure for Demonstrating Compliance with the Junction Requirements and Junction Performance Indicators requirements & Appendix G – Contract Junction Compliance Traffic Models and Associated Instructions and Analysis Spreadsheet.
- 6.2 **Traffic Signal Design**
- 6.2.1 All Traffic Signal Designs shall be in compliance with the Scottish Government guidelines, Scotland Transport Cycling by Design 2010, The Design Manual for Roads and Bridges, Transport Scotland Disability Discrimination Act Good Practice Guide for Roads 2009, various National Standards and Advise. It is to be noted that some of standards and advise listed below have within them reference to superseded documents. It is the designer's responsibility to verify and ensure that they are designing to the most current standards.
- 6.2.2 In addition works shall be carried out in accordance with TA 84/06 Volume 8, Section 1, Part 2 Code of Practice for Traffic Control and Information Systems for All-Purpose Roads and following relevant publications and legislation shall include, but not be limited to the following:
- Construction (Design and Management) Regulations – 2007
  - The Traffic Signs (Amendment) (No 2) Regulations and General Directions 2011
  - The Zebra, Pelican and Puffin Pedestrian Crossing Regulations and General Directions 1997.
  - Design Manual for Roads and Bridges (DMRB)
  - Department for Transport (DfT) Specifications (TD),
  - Traffic Advisory Leaflets (TAL)
  - Local Transport Notes (LTN)
  - Puffin Good Practice Guide
- 6.2.3 The Company shall liaise with the Overseeing Organisations to establish whether or not local design criteria are relevant to the design process. The Company shall if applicable document local requirements and include them within the design for approval.
- 6.2.4 All designs must have a stage 1, 2, 3 and 4 Road Safety Audit (stages 1 and 2 can be combined for smaller installations). No works may commence until all items raised by the stage 2 safety audit have been addressed or a viable exception approved.
- 6.2.5 The Company shall provide the Scottish Ministers and Overseeing Organisation with traffic signal detailed design drawings, standard details, controller TR2500 forms and MOVA Datasets for all proposed installations.
- 6.2.6 Drawings shall be provided as follows inclusive of Key and Notes:
- (i) General Arrangement – to include but not limited to
    - Scale 1:500

### **Appendix 12/5: Traffic Signs - Traffic Signals**

- Stage Arrangement
  - Road Markings
  - Cable Diagram to include Controller, Auxiliary cabinets, link cables for MOVA linking and RS232 communication cables as applicable and detection.
  - MOVA Loop Dimensions Schedule
  - Passive Pole Rating Schedule
  - Pole Numbers
  - Loop References
  - Chamber References
  - Cabinet References
  - Tactile paving
  - Advanced Cycle Stop Lines, if applicable.
  - Detection
  - Traffic Signal Controller and Auxiliary Cabinets
  - Traffic Signal Poles
  - Retention Sockets
- (ii) Traffic Signal Layout – to include but not limited to
- Scale 1:200
  - Stage Arrangement
  - Road Markings
  - Cable Diagram to include Controller, Auxiliary cabinets, link cables for MOVA linking and RS232 communication cables as applicable and detection
  - Traffic Signal Equipment
  - Passive Pole Rating Schedule.
- (iii) Traffic Signal Ducting, Chambers and Detection Loops - to include but not limited to
- Scale 1:200
  - All Chambers including Reference
  - Carriageway Loop Boxes including Reference
  - Ducting
  - Retention Sockets
  - Road Markings
  - Loops including Reference
  - Controller
- (iv) Road Markings
- Scale 1:500

### **Appendix 12/5: Traffic Signs - Traffic Signals**

- Road Markings
- Permanent Traffic Signs required as part of the Traffic Signal Installation
- Temporary Traffic Signs require as part of the Traffic Signal Installation

6.2.7 In addition to the above, Company must provide details on special road surfacing, such as high friction road surfacing, proposed on approaches to stoplines and within controlled crossing areas.

6.2.8 All of the above drawings and documents shall be issued to the Scottish Ministers and Overseeing Organisation for approval. No works are to commence until FULL traffic signal approval has been obtained.

6.2.9 A safety case, including risk assessment/hazard checklists, must be submitted for each design/site. The safety case must include any departure from standards & specifications or use of non-prescribed traffic signs/ road markings and appropriate approvals must be in place for the same. It should also include any CDM, Environmental and DDA related departures and risks. This should be in addition to the independent Road Safety Audit, DDA audits and Independent Audit Review.

**Appendix 30/1: Landscaping : General**

Action Number	Sub-Clause Reference	Specification Amendment
1	3001.2	<p>The Company shall give the Overseeing Organisation at least 48 hours notice of all items in sub-clause 3001.2 as well as for works in or adjacent to the following specific sites of nature conservation or archaeological interest.</p> <ul style="list-style-type: none"> <li>(i) All water courses and otherwise;</li> <li>(ii) All Scheduled Ancient Monuments and other sites of archaeological interest including site identified during the archaeological watching brief;</li> <li>(iii) Sites of Special Scientific Interest; and</li> <li>(iv) Sites designated for their nature conservation interest.</li> </ul>
2	3001.13	Pesticides records forms as detailed in Appendix 30/1, detailing information as required in sub-clause 3001.12, shall be submitted to the Overseeing Organisation on a monthly basis.
3	3001.14	The bird nesting period for this Agreement shall be from March 31st to July 31 <sup>st</sup> inclusive, unless otherwise agreed in writing with SNH.
4	3001.15	<p>Inspection reports on a form as detailed in this Appendix 30/1 shall be submitted to the Overseeing Organisation for the activities carried out under Clauses 3007, 3009 and 3010 at the following intervals:</p> <ul style="list-style-type: none"> <li>(a) In the case of activities carried out under Clause 3007 and 3010 once per year.</li> <li>(b) In the case of activities carried out under Clause 3009 <ul style="list-style-type: none"> <li>(i) Six times per year in the first year of the Establishment Period;</li> <li>(ii) Four times per year in the second year of the Establishment Period;</li> <li>(iii) Three times per year for the remainder of the Establishment Period.</li> </ul> </li> </ul>



**Appendix 30/1: Landscaping : General**

<b>LANDSCAPE WORKS - INSPECTION REPORT</b>	
Date of visit: ../ ../ .. (minimum one record / day)	
Name of Company/Contractor: no:	Company/Contractor's telephone no:
<b>Operations carried out</b>	<b>Locations of Operations</b>
<b>Names of operatives on site:</b> ..... .....	
..... ..... Company observations on damage by others, additional work required or general condition of the works: ..... .....	
..... ..... Observations of Scottish Ministers on standard of workmanship, additional work required or general condition of the works: ..... .....	
..... ..... This maintenance visit has been satisfactorily completed. SIGNED (for Company) ..... NAME: ..... DATE: ../ ../ .. SIGNED (for Scottish Ministers) ..... NAME:..... DATE: ../ ../ ..	

**Appendix 30/2: Weed Control**

Action Number	Sub-Clause	Specification Amendment
1	3002.1	<p>Weed control for all injurious weed species, including those listed in sub-Clause 3002.1 with the addition of Oil Seed Rape, Rosebay Willowherb and Marestail, shall be carried out throughout the New Works until the end of the Establishment Period at sufficient frequency to restrict their growth and prevent their spread.</p> <p>In locations where effective weed control shall be possible and practicable by other means allowed within this Agreement there shall be a presumption against the use of chemical herbicides.</p>
2	3002.3	<p>Total weed control shall apply to the following locations:</p> <ul style="list-style-type: none"> <li>(i) Bases of road restraint systems;</li> <li>(ii) Around structures, columns, posts and signs;</li> <li>(iii) All paved areas, kerbs, hardstandings, filter drains and gravel areas (including but not limited to gravelled central reservations); and</li> <li>(iv) Otherwise.</li> </ul> <p>The Company shall apply herbicides at sufficient frequency to eliminate weed growth throughout the New Works Period until the end of the Establishment Period.</p>
3	3002.4	<p>Total weed control by non-residual herbicide shall apply to the following locations:</p> <ul style="list-style-type: none"> <li>(i) All areas to be seeded and all planting beds prior to seeding or planting so as to be in a weed free condition;</li> <li>(ii) All stockpiles of topsoil which shall be maintained in a weed free condition;</li> <li>(iii) All planted beds; and</li> <li>(iv) Otherwise.</li> </ul>
4	3002.5	<p>A translocated herbicide approved by the Scottish Environment Protection Agency or their successors for use in or near water shall be used for weed control in all open ditches, lagoons, watercourses and filter drains. Control shall be at sufficient frequency to eliminate weed growth throughout the New Works until the end of the Establishment Period.</p>
5	3002.6	<p>Selective weed control using translocated herbicide shall be applied in all non-hardened verges, central reserves, planted areas and other grassed areas as and when necessary to restrict growth and prevent the spread of broadleaf weed species.</p>

**Appendix 30/2: Weed Control**

<b>LANDSCAPE WORKS - PESTICIDES RECORD</b>		
<b>Date of visit: ../ ../ .. (minimum one record / day)</b>		
<b>Contract Name:</b>		
<b>Name of Company:</b>		<b>Company's telephone no:</b>
Operations carried out	Pesticide used	Locations of Operations
Total weed control		
Weed control in any waterbody		
Selective herbicide to areas of grass		
Herbicide to cultivated plant beds		
Total herbicide around individual plants in grass		
Other (state purpose)		
<b>Names of operatives on site: Qualifications of operatives named:</b>		
<b>Supervisor</b> .....		
<b>Storeman</b> .....		
<b>Application by</b> .....		
<b>Signed (for Company) .....</b>		
<b>Company's observations on damage by others or any incidents:</b>  ..... .....		

**Appendix 30/2: Weed Control**

Action Number.	Sub-Clause	Specification Amendment
6	3002.7	<p>Where weed control shall be by spot application translocated herbicide shall be applied as necessary to control weed species listed in Sub Clause 3002.1, and in any case no less than twice a year during periods of active growth throughout the New Works until the end of the Establishment Period at the following locations:</p> <ul style="list-style-type: none"> <li>(i) For control of injurious weeds in grass and wildflower areas;</li> <li>(ii) All woodland and planted areas;</li> <li>(iii) All hedgerow planting areas; and</li> <li>(iv) Otherwise.</li> </ul> <p>Spot treatment shall typically be via controlled droplet application of a type appropriate to the herbicide, the species being treated and the location.</p>
7	3002.8	<p>Weed control by hand weeding shall be carried out as necessary, and in any case no less than twice a year throughout the New Works until the end of the Establishment Period at the following locations:</p> <ul style="list-style-type: none"> <li>(i) All woodland and other planting areas where spot application may cause damage;</li> <li>(ii) Hedgerow planting where spot application may cause damage;</li> <li>(iii) Wildflower areas and areas densely populated with desirable broadleaf species where spot application may cause damage;</li> <li>(iv) Within plant protectors and tree/shrub shelters;</li> <li>(v) Around planting stations in existing woodland; and</li> <li>(vi) Otherwise.</li> </ul>
8	3002.9	<p>Weed control by cutting shall be carried out as necessary in areas where the extent of growth or type of weed is not effectively controlled by herbicide application or hand weeding.</p>
9	3002.10	<p>The Company shall remove all arisings in accordance with sub-clause 3002.10 from weed control operations that involve hand weeding and cutting.</p>

**Appendix 30/3: Control of Rabbits and Deer**

Action Number	Sub-Clause	Specification Amendment
1	3003.1	The Company shall carry out rabbit, hare and deer control in all planting and seeding areas as necessary to ensure successful establishment for the duration of the New Works until the end of the Establishment Period. The Company shall only cut areas of brambles and herbage that shall interfere with the control of rabbits and deer. The arisings shall be used to form habitat piles in locations where they are no likely to become visual intrusive or interfere with access or maintenance. No clearance of brambles or herbage shall be undertaken during the bird nesting season.
2	3003.8	The Company shall ensure effective rabbit control for the duration of the New Works and until the end of the Establishment Period and shall be responsible for contacting adjacent landowners regarding their obligation to control infestations on their own land.
3	3003.9	The Overseeing Organisation shall request an inspection of the site with a representative of the Company at monthly intervals to ensure effective control has been achieved.
4	3003.12	The Company shall keep planting enclosures free of rabbits, rabbit burrows including exit/entry holes and deer until such time that planting has become fully established and is of sufficient size and maturity so as to be no longer vulnerable to significant damage but not earlier than the end of the Establishment Period.
5	3003.14	The Company shall replace damaged plants annually (towards the end of the planting season); and maintain them for the duration of the New Works. All New Works to be undertaken in accordance with the Specification and New Works Requirements.

**Appendix 30/4: Ground Preparation**

Action Number	Sub-Clause	Specification Amendment
1	3004.1	Within areas of proposed planting or seeding, all existing grass and herbaceous vegetation shall be cut, in accordance with sub-clause 3004.1.
2	3004.2	All areas which shall be planted shall be treated with translocated herbicide between 21 and 25 days prior to planting in accordance with sub-clause 3002.4, with the exception of areas to be planted in existing woodland, rock cuttings, areas to be planted in inverted turfs and within areas of undisturbed ground.
3	3004.5	Subsoil in planting areas, excluding areas which shall planted in inverted turfs within areas of undisturbed ground, shall be ripped to a minimum depth of 450 millimetres prior to spreading of topsoil.  Areas in existing arable or pasture land which shall planted shall be ripped to a minimum depth of 600 millimetre to ensure the breaking up of any subsoil compaction.
4	3004.6	Spacing between the tine furrows shall be in accordance with sub-clause 3004.6.
5	3004.7	The requirements of sub-clauses 3004.8 - 3004.11 shall apply to all subsoil to be seeded or topsoil spread under the Agreement except where otherwise stated in Appendix 30/4.
6	3004.8	All undesirable material brought to the surface including but not limited to stones, roots, tufts of grass and foreign matter larger than the sizes specified below shall be removed off Site unless otherwise agreed with the Overseeing Organisation.  The size of the stones / debris which shall be removed relates to the proposed vegetation cover, the maximum stone / debris size permitted for each, is as follows :  (i) Grass verges and visibility splays: 25 millimetre protruding stone after topsoil has been firmed / rolled;  (ii) All other grassland and wildflower grassland: 75 millimetre;  (iii) Planted areas except amenity / ornamental shrub planting: 100 millimetre; and  (iv) Amenity / ornamental shrub planting: 75 millimetre.  The above stone removal shall apply to the full depth of topsoil required for the proposed vegetation cover.  The overall stone content by percentage volume shall not be greater than that of the adjacent soils.  Stones brought to the surface during final preparation of soils shall be retained on site and used to form habitat piles in locations that are not visually intrusive and shall not interfere with access or the maintenance of the New Works Site. All non-organic foreign matter shall be removed off site.

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

Action Number	Sub-Clause	Specification Amendment
1	3005.1	Grass seed shall be sown as per sub-clause 3005.1. Wildflower seed shall be sown in early spring or autumn at the same time as grass unless otherwise recommended by the supplier.
2	3005.2	All areas to be seeded or turfed shall be cultivated as per sub-clause 3005.2, with the exception of rock faces. A 250 millimetre radius shall be left clear of seeding around each new tree and shrub.
3	3005.3	All areas to be seeded with grass shall have fertiliser and or other soil ameliorants incorporated into the upper 50 millimetre of soil at a rate(s) considered necessary for successful establishment. The rate of application and composition of fertilizer and other ameliorants shall be based upon the topsoil test results.
4	3005.4	<p>Grass seed mixes shall be as follows;</p> <ul style="list-style-type: none"> <li>(i) A general purpose grass seed mix shall be used in road verges, embankments and cuttings not planted or where other grassland is required. The seed mix(es) shall provide a rapidly establishing sward to provide an appearance and habitat which reflects adjacent and surrounding grassland communities. The mix(es) shall reflect the diversity of grassland communities along the route as described in the Environmental Assessment Documents;</li> <li>(ii) Wildflower grassland shall be flora and grassland of very low fertility created to enhance the amenity and nature conservation value of the road corridor. The proposed mix(es) shall match the adjacent and surrounding grassland communities of greatest nature conservation value. Short growing grasslands of low fertility in which the growth of wild flowers shall be encouraged. For wildflower grassland mixes the ratio of grass seed to wildflowers shall be 80%:20% respectively. For flowering rough grassland and wet flowering rough grassland seeding mixes refer to contract drawing M8/C/3000/027 – Planting and Seeding Schedule.</li> <li>(iii) Productive grassland shall be sown where grassland is to be returned to agricultural use for pasture. The Company shall consult with relevant landowners with regard to species mixes and sowing density on land to be returned to pasture;</li> <li>(iv) Areas to be returned to arable use shall be seeded with nitrogen fixing species. The Company shall consult with relevant landowners with regard to species mixes and sowing density on land to be returned to arable use;</li> <li>(v) All new woodland and native scrub planting areas shall be seeded with a low-maintenance grass mix capable of suppressing weed growth in planting areas until a full canopy of trees and shrubs has developed.</li> </ul>

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

Action Number	Sub-Clause	Specification Amendment
		Consideration shall be given to use of grass and wildflower species which are unpalatable to deer where there is a risk that deer will be attracted to areas close to the scheme roads.
5	Inserted Clause	All seed shall be delivered to the Site in bags sealed by the supplier. A label shall be attached to each bag giving details of species and percentage breakdown. The same details shall be enclosed within each bag. Each bag shall be numbered uniquely and relate to the label and documents within the bag. The documents shall be submitted to the Overseeing Organisation prior to sowing.
6	3005.7	<p>Wildflower mixes shall be of UK native origin selected and procured in accordance with Appendix 1 of 'Cost Effective Landscape: Learning from Nature'</p> <p>The Company shall complete and submit to the Overseeing Organisation a wildflower seed Provenance Certificate in accordance with the Certification Procedure.</p> <p>Wildflower seed mixes shall contain only species occurring in the National Vegetation Classification category appropriate to the location.</p> <p>Local provenance seed shall be supplied by either harvesting from the approved sites or from nursery propagation to the approval of Scottish Natural Heritage. If nursery propagated seed shall be used the Company shall allow sufficient time in their programme to ensure that the seed is available when required for sowing.</p> <p>All wildflower seed shall be tested by an independent organisation such as the Scottish Agricultural Science Agency (SASA) to verify purity of seed (percentage of seed / inert material), species composition, and percentage germination. The test certificates shall be made available to the Overseeing Organisation for consent prior to sowing.</p> <p>The wildflower seed mixes shall contain a minimum percentage of:</p> <ul style="list-style-type: none"> <li>i) 95% pure seed, not inert material (% by weight); and</li> <li>ii) a percentage of flora rather than grass seed species which matches the percentage of flora species in the surrounding plant communities of greatest nature conservation value. For flowering rough grassland and wet flowering rough grassland seeding mixes refer to contract drawing M8/C/3000/027 – Planting and Seeding Schedule.</li> </ul> <p>Seeds within the wildflower seed mixes shall have a minimum germination rate of 80%.</p>



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

Action Number	Sub-Clause	Specification Amendment
7	3005.8	<p>Sowing of seed shall be carried out at the rate specified below: The sowing of seed shall be carried out as soon as practicable in order to benefit soils stabilisation.</p> <p>Grass seed shall be sown at a rate of not less than 20g/m<sup>2</sup> for verges and side slopes of cuttings and embankments and 15g/m<sup>2</sup> elsewhere.</p> <p>Wildflower grassland areas shall be sown at a rate of not less than 5g/m<sup>2</sup></p>
8	3005.14	<p>Any turf imported shall comply with sub-clause 3005.14 and shall contain a grass and/or herb mixture which reflects adjacent and surrounding grassland communities.</p>
9	3005.25	<p>Turf shall be secured using either galvanised wire pins or softwood pegs as per sub-clause 3005.25.</p>
10	3005.26	<p>Newly laid turf laid shall be watered as per sub-clause 3005.26.</p>
13	3005.29	<p>A minimum of two establishment cuts shall be undertaken; with further cuts undertaken as necessary to achieve a coverage as stated in sub-clause 3005.11 and one cut subsequent to the required sward coverage being achieved.</p>
14	3005.30	<p>All areas shall be left clear of grass clippings following each mowing by raking or other suitable method except where grass height is less than 200mm at the time of cutting in which case grass cuttings may be left in situ.</p>

**Appendix 30/6: Planting**

Action Number	Sub-Clause	Specification Amendment
1	3006.3	Plant stock and sizes shall be as Tables 30/6.1, 30/6.2, 30/6.3 and 30/6.4. Species, varieties and plant spacings shall be in accordance with the New Works Requirements.

**Table 30/6.1 Specimen Rootballed Trees**

Type	Girth at 1 metre Above Ground Level (centimetres)	Clear Stems from Ground Level (metres )	Minimum Height from Ground Level (metres)	Maximum Height from Ground Level (metres)
Extra heavy standard	14-20	1.8	4.25	6.0
Heavy standard	12-14	1.8	3.5	4.25
Standard	8-10	1.8	2.3	3.0

**Table 30/6.2 Feathered Trees, Transplants and Container Grown**

Type	Minimum Age	Minimum Height Above Ground Level	Minimum Container Size
Specimen Trees		1.75 metres	15L
Specimen Trees		2.5 metres	45L
Feathered Trees	As B.S.	1.5-2.5 metres	-
Transplants whips (broadleaves only)	2+1 years	450 millimetres	-
Transplant in tree shelters (broadleaves only)	1+1 years	400 millimetres	-
Container grown evergreens (Holly, Scots Pine)		300 millimetres	2L
Container grown evergreens (Yew)		400 millimetres	3L
Container grown Climbers		600 millimetres	2L
Container grown Ornamental shrubs		400 millimetres	1L – 3L
Container grown Herbaceous		200 millimetres	1L

## Appendix 30/6: Planting

**Table 30/6.3: Cell Grown Stock**

Type	Approximate Height (cm)	Minimum Cell Volume (ml)	Minimum Root Collar Diameter (millimetres)
Broadleaves	20-40, 40-60	120	-

At least 25% of plants shall be supplied in the larger size range. Plants in 35ml cells shall not be more than 3 years old. All other plants shall not be more than 2 years old.

**Table 30/6.4 Shrubs, Hedge Plants, and Ground Cover Plants**

Type	Minimum Age	Column A Acceptable Height	Column B Minimum Height for Small/Slow Growing Plants not Readily Available to Sizes Shown in Column A
Bare root/Hedge plants	1+2 years	400-600 millimetres	-
Transplants in shrub shelters	1+1years	400-600 millimetres	-
Ground cover plants	3 years	300-450 millimetres	150-200 millimetres

Action Number	Sub-Clause	Specification Amendment
2	3006.6	The Company shall provide written confirmation that United Kingdom native plant species have been sourced from the highest available preference for selecting plant material contained within Appendix 1 of 'Cost Effective Landscape: Learning from Nature' prior to commencement of planting Works. The Company shall submit Provenance Certificates in accordance with the Certification Procedure accompanied by certification from the supplying nurseries in respect of the provenance of plant material in accordance with the Certification Procedure. Where there is a choice of form or size of plant material, the most local provenance shall be selected.
3	3006.12	Topsoil for backfilling of tree pits may be site won where it is of suitable quality for successful establishment of the newly planted trees. Imported topsoil shall be general purpose grade conforming to BS 3882.

**Appendix 30/6: Planting**

Action Number	Sub-Clause	Specification Amendment
4	3006.13	<p>Where plants shall be pit planted compost shall be incorporated into the soil during pit preparation and backfilling. Where plants shall be notch planted compost and fertiliser at a rate based on the results of the soil tests shall be deposited over planting areas for incorporation into the soil during ground cultivation. Slow release fertilizer with a Nitrogen: Potassium: Phosphorus: Magnesium ratio of 14:8:13:2 shall be incorporated into the backfill of tree pits/planting areas as follows:</p> <ul style="list-style-type: none"> <li>(i) Standard trees: 20g</li> <li>(ii) Heavy Standard trees: 40g</li> <li>(iii) Extra Heavy Standard trees 100g; and</li> <li>(iv) Ornamental planting beds into the top 75mm of planting bed soil at a rate of 100g per square metre.</li> </ul>
5	3006.14	Compost pH, conductivity and nutrient composition shall be decided in compliance with the Company's Quality Plan and associated method statements based on the results of topsoil tests.
6	3006.15	Slow release fertiliser shall be incorporated into backfill, into the top 75 millimetres of planting bed soil, in accordance with sub-clause 3006.15 and at a rate based on the results of the soil tests.
7	3006.16	<p>Root dips shall be applied to all bare root plants and anti-desiccant sprays shall be applied to all conifers at the following times:</p> <ul style="list-style-type: none"> <li>i) At the time of lifting from the nursery</li> <li>ii) On arrival at site</li> <li>iii) Immediately prior to planting</li> </ul>
8	3006.17	All bare rooted, rootballed and cell grown stock shall be planted whilst the plants are dormant between the beginning of November and the end of March. All evergreen species shall be planted in either March or November.
9	3006.23	Bare root whips, transplants and cell grown plants may be notch planted into areas of cultivated or existing topsoil of minimum 300 millimetres depth in accordance with methods (i) and (ii) of sub-clause 3006.23 or the inverted turf method in areas of proposed planting in undisturbed ground.
10	3006.24	<p>Pits for whips, transplants and shrubs shall be dug in accordance with sub-clause 3006.24 in locations where topsoil depths are less than 300 millimetres. All container grown plants shall be pit planted. Trenches for hedges shall be dug in locations where there is less than 300 millimetres depth of topsoil.</p> <p>Arisings from planting pits and trenches shall be retained on the New Works Site and deposited within proposed landscape earthworks.</p>
11	3006.28	Hedge trenches excavated in accordance with Table 30/1 shall be backfilled with a mixture of 80% topsoil and 20% compost with slow release fertiliser added as required to make up for any nutrient deficiencies identified in the soil test results.

**Appendix 30/6: Planting**

Action Number	Sub-Clause	Specification Amendment
12	3006.29	All areas with spread or existing topsoil shall be cultivated in accordance with sub-clause 3006.29 prior to planting.  Soil ameliorants and slow release fertiliser shall be incorporated to make up any nutrient deficiencies identified from the soil test results.
13	3006.30	A 600mm wide strip along all hedgelines except those that have been backfilled shall be cultivated in accordance with sub-clause 3006.30.
14	3006.33	The soil shall be watered to field capacity immediately after planting if there is a risk to plants of water stress or wilting.
17	3006.38	Root barriers shall be required where the clearances required for underground services and drainage infrastructure or the integrity of structures would otherwise be adversely affected by plant roots or where required by the Relevant Authorities.
18	3006.41	The minimum length of tree stakes for heavy standard and extra heavy standard trees shall be 2 m and the minimum width 75 millimetres. Tree stake sizes for other tree forms shall be in accordance with sub-Clause 3006.41.
19	3006.42	Where planting on a slope stakes may be driven at an angle mid way between the slope and the vertical tree stem.
20	3006.43	Heavy and extra heavy standard trees shall be double staked with the vertical stakes unless planting on a slope where stakes may be driven at an angle mid way between the slope and the vertical tree stem.
21	3006.45	Semi-mature trees shall be planted as shown on Drawing Number K5 to Volume 3 of the MCHW in compliance with the Company's Quality Plan and associated method statements and consented to by the Overseeing Organisation.
22	3006.49	All extra heavy standard, heavy standard and standard trees shall be watered to field capacity immediately following planting. All other tree and shrub plants shall be watered to field capacity immediately after planting if there is a risk to plants of water stress or wilting.
23	Addition al Clause	All container grown, cell grown and root balled plants shall be watered to field capacity immediately before planting.

**Appendix 30/6: Planting**

Action Number	Sub-Clause	Specification Amendment
24	3006.52	Plant protectors shall be provided for all two year old transplants, cell grown plants, shrubs and conifers.  (i) Tree shelters shall be a minimum of 750 millimetres height and 80-120 millimetres diameter. Shrub shelters shall be a minimum of 750 millimetres height and 100-150 millimetres diameter.  (ii) Where the species shall be Fagus, base ventilation shall be provided.  (iii) Shelters shall be installed with timber stakes and adjustable ties according to the manufacturer's specification.  (iv) Stakes shall be a minimum of 1500 millimetres in length.
25	3006.53	All planting shall be watered to field capacity, as required, prior to the application of mulch.
26	3006.54	Mulch shall be applied in compliance with the Company's Quality Plan and associated method statements except where slopes shall exceed a gradient of 1 in 2 in accordance with sub-Clause 3006.55, (ii).
27	3006.55	Bulbs shall be planted at the following rates per square metre:  Bluebell 150 Crocus 100 Tulip 50 Narcissus (large) 40 Narcissus (medium) 60 Narcissus (small) 100 Other species shall be planted at a suitable rate dependant on species in compliance with the Company's Quality Plan and associated method statements.
28	3006.67	Bulbs shall be planted with the base at the depth in accordance with good horticultural practice and in compliance with the Company's Quality Plan and associated method statements.
29	3006.73	Reeds, rushes, marginal and aquatic plants shall be planted around the margins of wet pond drainage features in accordance with the New Works Requirements the Company's Quality Plan and associated method statements.
30	3006.77	Excavated material from sub-clause 3006.77 operations shall be spread throughout the planting area.
31	3006.87	The Company shall replace all plants found to be defective or vandalised annually for the duration of the New Works until the end of the Establishment Period.
32	3006.91	All replacement extra heavy standard, heavy standard, standard and rootballed evergreen stock shall be watered to field capacity following planting. All other tree and shrub plants shall be watered to field capacity immediately after planting if there is a risk to plants of water stress or wilting.

**Appendix 30/6: Planting**

33	3006.92	The Company shall carry out maintenance of new planting in accordance with clauses 3007 and 3009 for the duration of the New Works until the end of the Establishment Period.
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**Appendix 30/7: Grass, Bulbs and Wildflower Maintenance**

Action Number	Sub-Clause	Specification Amendment
1	3007.1	All grass and wildflower areas within the boundary of the New Works Site shall be maintained in accordance with Clause 3007.
2	3007.5	No cutting shall be carried out within 250 millimetres of unprotected trees and shrubs.
3	3007.17	<p>Low frequency grass cutting shall be undertaken in accordance with sub-Clause 3007.17 in the following areas:</p> <ul style="list-style-type: none"> <li>(i) A 1.2 metre swathe width measured from the back edge of the carriageway or hard strip. The width of cut shall be increased accordingly where the remaining grass between the 1.2 metre area and any adjacent boundary (such as a wall, fence or planting bed) is less than 2 metres;</li> <li>(ii) Grassed areas within visibility splays;</li> <li>(iii) Where there are footpaths remote from the carriageway edge where grass between the road and footpath receives a low frequency cut, the outside edge of the footpath shall be subject to the same regime for a width of 1m.</li> </ul> <p>Additional selective cuts shall be undertaken as necessary to maintain visibility. The areas subject to additional selective cuts shall be extended beyond the minimum area required to maintain visibility in order that they appear naturalistic with smoothly curving edges, avoiding straight lines and abrupt angles.</p>
4	3007.18	All grass areas not cut at medium or low frequency shall be cut at a 'minimal frequency' in accordance with sub-Clauses 3007.18-21.
5	3007.20	Additional selective cuts shall be undertaken if required to maintain visibility of road signs. The areas subject to additional selective cuts shall be extended beyond the minimum area required to maintain visibility in order that they appear naturalistic with smoothly curving edges, avoiding straight lines and abrupt angles.
6	3007.22	All banks and ditches shall be cut in accordance with sub-clause 3007.22. All arisings shall be dispersed over the sward avoiding the blocking of drains and ditches.
7	3007.23	All grass cutting in planting areas shall be cut in accordance with sub-Clause 3007.23. The cutting shall include bramble but exclude naturally regenerated tree and shrub seedlings, the retention of which would be consistent with the overall management objectives for the planting area and in compliance with the Company's Quality Plan and associated method statements.
8	3007.26 - 3007.27	All areas seeded with wildflower shall be cut according to the most appropriate regime detailed in sub-clause 3007.26 and according to sub-clause 3007.27. Regime to be in compliance with the Company's Quality Plan and associated method statements to suit the wildflower mix.



**Appendix 30/7: Grass, Bulbs and Wildflower Maintenance**

9	3007.28	The ground shall be scarified only where necessary for wildflower colonisation in compliance with the Company's Quality Plan and associated method statements.
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**Appendix 30/7: Grass, Bulbs and Wildflower Maintenance**

<b>Action Number</b>	<b>Sub-Clause</b>	<b>Specification Amendment</b>
10	3007.29	<p>Spot herbicide treatment in accordance with sub-Clause 3007.29 shall be carried out at an appropriate frequency in all wildflower areas to eliminate undesirable broadleaf weed species.</p> <p>Areas of self-seeding broadleaf plants considered to be desirable for nature conservation shall be retained. These areas shall be identified by the Company to the Overseeing Organisation.</p>
11	3007.30	<p>Areas of wildflower seeding that cannot be effectively controlled by chemical means without risk to of damage to wildflowers shall be hand weeded to eliminate undesirable broadleaf weed species.</p>
12	Additional Clause	<p>All damaged or failed sward shall be reinstated with seed to match the surrounding area.</p>

**Appendix 30/8: Watering**

<b>Action Number</b>	<b>Sub-Clause</b>	<b>Specification Amendment</b>
1	3008.6	The Company shall water all planting for the Establishment Period at a frequency necessary to ensure establishment and survival.
2	3008.7	Additional watering in accordance with sub-Clause 3008.7 may be required for all planting and seeding in periods of abnormally dry conditions.

**Appendix 30/9: Establishment Maintenance for Planting**

Action Number	Sub-Clause	Specification Amendment
1	3009.1	All planting and planting areas shall be maintained for the Establishment Period in accordance with sub-clauses 3009.2 to 3009.25.
2	3009.4	Tree stakes, tubes, guards and ties that are no longer required shall be offered to the Overseeing Organisation for re-use. Where the Overseeing Organisation declines the offer the Company shall dispose of them to a licensed disposal facility.
3	3009.9	Delete sub-Clause 9 and insert:  Plant circles shall be defined as the area within 250 millimetres radius of an individual tree or shrub, within which weed control operations shall be carried out.
3	3009.10	Translocated herbicide shall be applied at a frequency as necessary to keep plant circles in all woodland and scrub planting areas weed free, whilst protecting trees and shrubs from the herbicide. Hand weeding shall be undertaken to remove weeds from within tree and shrub shelters and guards.
4	3009.11	Where alternative means of weed control prove ineffective residual herbicide shall be applied at a frequency as necessary to keep plant circles in all woodland and scrub planting areas weed free in accordance with sub-Clause 3009.11.
5	3009.12	Mulch shall be maintained in accordance with sub-clause 3009.12 in amenity / ornamental shrub planting areas.
6	3009.18	Mulch shall be maintained in accordance with sub-clause 3009.18 in all cultivated beds.
7	3009.20	All hedge bases shall be maintained weed free for the duration of the Establishment Period in accordance with sub-clause 3009.20.
8	3009.25	All extra heavy standard and heavy standard trees and rootballed conifer trees shall be inspected and maintained annually in accordance with sub clause 3009.25.
10	Additional Clause	During the first 2 years after planting, hedge plants shall be pruned once each year between 1 <sup>st</sup> September and 31 <sup>st</sup> January to encourage formation of a vigorous, compact, uniform hedge. The current year's growth of prominent new shoots shall be reduced in length by one third.

**Appendix 30/10: Maintenance of Established Trees and Shrubs**

Action No.	Sub-Clause	Specification Amendment
1	3010.1	All established trees and shrubs shall be maintained for the duration of the period of the New Works in accordance with sub-clauses 3010.2 - 3010.71.
2	3010.4	Healthy arisings shall be dealt with in accordance with one or more of items (iv) to (ix) of sub-Clause 3010.4 in compliance with the Company's Quality Plan and associated method statements.
4	3010.8	Shrubs grown for coloured stems shall be pruned once every two years in accordance with sub-Clause 3010.8 paragraph (i).  Overgrown shrubs to be coppiced back in accordance with sub-Clause 3010.8 paragraph (vii).
5	3010.12	Hedges shall be cut once a year in accordance between September and January.
6	3010.20	If any hedge laying shall be required it shall be undertaken in an appropriate style in order to reflect the adjacent or local appearance.
7	3010.22	Mixed hedgerows shall be laid in an appropriate style in order to reflect the adjacent or local appearance.
8	3010.31	New hedge plants to infill significant gaps in hedges after they have been laid or cut shall be of size, species, and planting density to match the existing hedgerow.
9	3010.45	Tree size categories shall be in compliance with the Company's Quality Plan and associated method statements.
10	3010.54	Crown lifting shall be in compliance with the Company's Quality Plan and associated method statements.
11	3010.55	Crown thinning shall be in compliance with the Company's Quality Plan and associated method statements.
12	3010.56	Crown reduction or reshaping shall be in compliance with the Company's Quality Plan and associated method statements.
13	3010.57	Straight felling shall be in compliance with the Company's Quality Plan and associated method statements.
14	3010.58	Sectional felling shall be in compliance with the Company's Quality Plan and associated method statements.
15	3010.59	Stumps shall be cut as close to the ground as possible or where the tree is growing in a hedge the stump shall be left level with the top of the hedge.
16	3010.60	Stump treatment shall be in compliance with the Company's Quality Plan and associated method statements.
17	3010.62	Stump removal shall be in compliance with the Company's Quality Plan and associated method statements.
18	3010.63	All arisings shall be disposed of off the New Works Site or placed within woodland areas as log piles and or windrows where this is consistent with the management objectives for the woodland and the Company's Quality Plan and associated method statements.

**Appendix 30/10: Maintenance of Established Trees and Shrubs**

Action Number	Sub-Clause	Specification Amendment
19	3010.65	Thinning and coppicing shall be carried out in areas of establishing and maturing woodland in accordance with sub-Clause 3010.1 and where identified as being required by the Company's regular inspections.
20	3010.68	Undesirable scrub species shall be controlled in accordance with sub-Clause 3010.1 and where identified as being required by the Company's regular inspections.
21	3010.69	Undesirable scrub tree and shrub species that shall be controlled shall typically have a stem diameter of 0-75 millimetres and a height of 0.75-2.5 metres.
22	Additional Clause	Undesirable scrub species shall be cut down to 50mm above ground level and plants allowed to re-grow. The Company shall then apply translocated herbicide during the first year of active growth after cutting at a suitable time to maximize the effectiveness of the herbicide.
23	3010.71	Operations in accordance with sub-clause 3010.71 shall be carried out in compliance with sub-Clause 3010.1 and the Company's Quality Plan and associated method statements.

**Appendix 30/11: Management of Waterbodies**

Action Number	Sub-Clause	Specification Amendment
1	3011.1	The management operations under Clause 3011 shall take place in all waterbodies and open ditches within the New Works Site.
2	3011.3	All inlets and outlets that shall be part of the road drainage system within the New Works Site shall be inspected in accordance with sub-Clause 3011.3.
3	3011.4	The Company shall eliminate weeds as listed in Clause 3002 from within or adjacent to water bodies.
4	3011.6	Injurious weeds on the banks of water courses and within the New Works Site shall be removed by hand in accordance with sub-clause 3002.8.
6	3011.8	Silt shall be removed from waterbodies that are part of the road drainage system as required to maintain their functional requirements in accordance with sub-Clause 3011.8. The Company shall be responsible for consulting with SEPA and any other relevant bodies prior to undertaking any operations affecting a water body.
7	3011.9	All reedbeds and marginal plants shall be inspected twice a year in early February and October in accordance to sub-clause 3011.9.
8	Additional Clause	All marginal aquatic plants shall be maintained by the Company for the duration of the New Works until the end of the Establishment Period with any failed or defective plants replaced annually in accordance with Clause 3006.

**Appendix 30/12: Special Ecological Measures**

Action Number	Sub-Clause	Specification Amendment
1	3012.1	Special ecological measures shall be maintained for the duration of the New Works until the end of the Establishment Period.
2	3012.2	Special ecological measures works shall be carried out in seasons to be agreed with SNH and any other relevant consultees.
3	3012.3	Tunnels, ledges, fencing and underpasses and any other mitigation measures for wildlife shall be designed, located and installed in accordance with the requirements of SNH and any other relevant consultees. If there is any discrepancy between SNH's requirements and Clause 3012, SNH's requirements shall prevail.
		<p>The location and extent of fencing for protected fauna shall be consistent with the requirements of the Environmental Assessment Documents, SNH and any other relevant consultees.</p> <p>All badger and otter fencing shall be completed to the approval of the Company's ecological specialist who shall oversee installation. Fencing shall be completed in advance of opening the road to vehicular traffic.</p> <p>Where there is the requirement for badger or otter fencing along the same line as other fence types (e.g a permanent boundary of stock proof fencing or deer fencing) a single fence which combines the specifications and functions of both types of shall be used.</p>
		<p>Badger fencing shall be in accordance with the following specification:</p> <p>Post and mesh fences in accordance with British Standard BS 1722 part 2: 1989 "Specification for rectangular wire mesh and hexagonal wire netting fences" with a rectangular steel wire mesh having maximum openings of 25mm X 50 mm and wires of not less than 3 mm diameter in accordance with British Standard BS 4102: 1990 "Specification for steel wire and wire products for fences" and galvanised to British Standard BS 729: 1971 (1994). "A specification for hot dip galvanised coatings for iron and steel articles".</p> <p>The mesh shall be securely stapled to the posts and (where present) rails of the highway boundary fences installed along the scheme roads. Where the highway boundary fence is post and wire, stobs shall be spaced no more than 1.8 metres apart. The mesh shall extend a minimum of 1.0 metre above ground level and be buried vertically to between 300 millimetres and 500 millimetres below ground and turned at right angles from the bottom of the buried section towards the direction from which badgers are expected to approach for a further 300 millimetres. The return shall consist of a separate roll of mesh attached with clips to the bottom of the vertical mesh. The vertical mesh shall be secured at ground level by a galvanised wire not less than 5 millimetres in diameter and a galvanised barbed wire shall be securely stapled to the posts of the fence 25 millimetres above the top of the mesh. Fixings for attachment to Structures shall use a resin fixed replaceable bolt system.</p>



**Appendix 30/12: Special Ecological Measures**

Action Number	Sub-Clause	Specification Amendment
		Badger Gates shall be constructed in accordance with the RSPCA publication 'Problems with Badgers?' All badger gates shall incorporate concrete sills to prevent digging or erosion.
		<p>Otter Fencing shall be in accordance with the following specification:</p> <p>Post and mesh fences in accordance with British Standard BS 1722 part 2: 1989 "Specification for rectangular wire mesh and hexagonal wire netting fences" with a rectangular steel wire mesh having maximum openings of 50 millimetres X 100 millimetres and wires of not less than 3 millimetres diameter in accordance with British Standard BS 4102: 1990 "Specification for steel wire and wire products for fences" and galvanised to British Standard BS 729: 1971 (1994). "A specification for hot dip galvanised coatings for iron and steel articles". The mesh shall be securely stapled to the posts and (where present) rails of the highway boundary fences installed along the scheme roads. Where the highway boundary fence is post and wire, stobs shall be spaced no more than 1.8 metres apart. The mesh shall extend a minimum of 1.2 metre above ground level and be buried vertically to a depth of not less than 300 millimetres, or 100 millimetres with a horizontal lap turned at right angles from the bottom of the buried section towards the direction from which otters are expected to approach for a further 300 to 450 millimetres. The return shall consist of a separate roll of mesh attached with clips to the bottom of the vertical mesh. The vertical mesh shall be secured at ground level by a galvanised wire not less than 5 millimetres in diameter and a galvanised barbed wire shall be securely stapled to the posts of the fence 25 millimetres above the top of the mesh. Fixings for attachment to Structures shall use a resin fixed replaceable bolt system.</p>
		<p>Tunnels, ledges and underpasses shall be installed in a manner and at locations recommended by the Company's ecological specialist as follows:</p> <p>Free-draining tunnels with a minimum diameter of 600 millimetres and a gradient not exceeding 1 in 3 shall be provided. The openings of the tunnels under the road shall be within the New Works Site. Within the available land and where practicable, a wooden post and 5 rail fence in accordance with drawing H3 of Volume 3 of the MCHW shall be erected not less than 1.5 metres in front of the tunnel openings and shall be angled to meet the posts of the New Works boundary fence. The overall length of the fence shall be not less than 4.8 metres. Alternative types of tunnel entrance shall be in accordance with the guidance given in the RSPCA publication "Problems with Badgers?".</p> <p>Bridges, structures and culverts designed to carry water shall incorporate a ledge or platform not less than 150 millimetres above the highest flood level, not less than 600 millimetres wide and allowing headroom of not less than 600 mm over the full width of the ledge or platform. Access ramps with a minimum width of 300 millimetres and a maximum gradient of 1 in 2 from the ledge or platform to the adjacent banks of the watercourse and to the normal water level shall be provided at each end.</p>
4	3012.4	Wildlife grilles shall be designed and located in accordance with the requirements of SNH and any other relevant consultees.

**Appendix 30/12: Special Ecological Measures**

<b>Action Number</b>	<b>Sub-Clause</b>	<b>Specification Amendment</b>
5	3012.5	In February and October of each year the Company shall inspect all wildlife fencing, gates, tunnels and underpasses and report their condition to the Overseeing Organisation.
6	3012.6	Reflectors shall be designed and located in accordance with the requirements of SNH and any other relevant consultees.
7	3012.7	Reflectors shall be inspected monthly in accordance with the sub-Clause 3012.7.
8	3012.8	Bat boxes, dormice or bird nesting boxes and roosting perches shall be installed in accordance with the requirements of SNH and any other relevant consultees.
9	3012.9	Bat boxes, dormice or bird nesting boxes and roosting perches shall be inspected and their condition reported to the Overseeing Organisation in accordance with the requirements of SNH and any other relevant consultees.
10	3012.11	Other habitat creation measures shall be inspected annually and their condition reported to the Overseeing Organisation. The Company shall consult and comply with the requirements of SNH and any other relevant consultees in respect of Works likely to impact upon or affect any protected species or area.
11	3012.13	The Company shall obtain licenses or use only licensed operatives for all works in the vicinity of protected species.