SCHEDULE 4 : O&M WORKS REQUIREMENTS

CONTENTS

PART 1: OVERALL REQUIREMENTS

PART 2: ROUTINE MAINTENANCE

PART 3: HANDBACK

PART 4: DESIGN AND CONSTRUCTION CRITERIA

PART 5: SPECIFICATION

PART 6: CERTIFICATION

PART 7: REPORTS, INFORMATION AND RECORDS

PART 8: THIRD PARTIES

PART 9: LIAISON PROCEDURES

PART 10: NOT USED

PART 11: RESTRICTED SERVICES

PART 5 : SPECIFICATION

CONTENTS **Page Number**

Preamble to the Specification 5

Appendix 0/1	Additional, Substitute and Cancelled Clauses, Tables and Figures Specific to the Agreement	11
Appendix 0/2	Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Agreement	129
Appendix 0/3	List of Numbered Appendices Referred to in the Specification and Included in the Agreement	133
Appendix 0/4	List of Drawings included in the Agreement	143
Appendix 0/5	Special National Alterations of the Scottish Ministers	151
Appendix 1/5	Sampling and Testing	157
Appendix 1/7	O&M Site Extent and Limitations	195
Appendix 1/9	Control of Noise and Vibration	196
Appendix 1/17	Traffic Safety and Management	203
Appendix 1/18	Temporary Diversions for Traffic	219
Appendix 1/19	Routing of Vehicles	221
Appendix 1/20	Recovery Vehicles for Breakdowns	224
Appendix 1/21	Information Boards	235
Appendix 1/24	Quality Management System	236
Appendix 1/72	Communication System for the Company	237
Appendix 1/74	Safety of Operations	238
Appendix 1/78	Material Stocks	239
Appendix 3/1	Fences Gates and Stiles	241
Appendix 4/1	Road Restraint Systems (Vehicle and Pedestrian)	242
Appendix 4/2	Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, EN 1317-2, BS EN 1317-3 (OE) and DD ENV 1317-4:2002	243
Appendix 4/71	Re-Tensioning of Safety Barriers	247
Appendix 5/1	Drainage Requirements	248
Appendix 5/2	Service Duct Requirements	252
Appendix 5/7	Thermoplastics Structural Wall Pipes and Fittings	253
Appendix 6/1	Requirements for Acceptability and Testing etc of Earthworks Materials	255
Appendix 6/2	Requirements for Dealing with Class U1B and Class U2 Unacceptable Material	262
Appendix 6/3	Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)	263
Appendix 6/5	Geotextiles Used to Separate Earthworks Materials	264
Appendix 6/8	Topsoiling	265

Appendix 6/14 Limiting Values for Pollution of Controlled Water 267
Appendix 6/15 Limiting Values for Harm to Human Health and the Environment 268
Appendix 7/1 Flexible Pavement Construction 269
Appendix 7/2 Excavation, Trimming and Reinstatement of Existing Surfaces 272
Appendix 7/3 Surface Dressing – Performance Specification 273
Appendix 7/4 Bond Coats. Tack Coats and other Bituminous Sprays 278
Appendix 7/5 Insitu Recycling: The Remix and Repave Process 280
Appendix 7/6 Breaking Up or Perforation of Existing Pavements 281
Appendix 7/7 Slurry Surfacing Incorporating Microsurfacing 282
Appendix 7/10 Worksheet Pro Forma for Results of Testing for Constituent Materials in Recycled Coarse Aggregate and Recycled Concrete Aggregate 285
Appendix 7/70 Pavement Strengthening Materials 286
Appendix 7/71 Concrete Pavement Repair Systems 287
Appendix 7/72 Temporary Repairs To Carriageway Defects 288
Appendix 12/1 Traffic Signs General 291
Appendix 12/2 Traffic Signs Marker Posts 293
Appendix 12/3 Traffic Signs: Marking and Studs 294
Appendix 12/5 Traffic Signs: Traffic Signals 296
Appendix 13/1 Information to be provided when specifying Lighting Columns and Brackets 297
Appendix 13/2 Typical Lighting Column and Bracket Data 301
Appendix 13/3 Instructions for Completion of Lighting Column and Bracket Data Sheets 303
Appendix 13/70 Maintenance of High Mast and Other Lighting Incorporating Hoists, Winches and Ropes 304
Appendix 14/3 Temporary Lighting 306
Appendix 14/4 Electrical Equipment for Road Lighting 307
Appendix 14/5 Electrical Equipment for Traffic Signs 311
Appendix 14/70 Purchase Delivery Handling and Storage of Materials 313
Appendix 14/71 Labour Requirements 314
Appendix 14/73 Call Out Report 315
Appendix 14/74 Report 316
Appendix 14/75 Competent Persons Authorisation Certificate 317
Appendix 14/76 Liaisons with Electricity Companies 318
Appendix 15/1 Traffic Scotland Equipment 319
Appendix 15/2 Traffic Scotland – Cable Duct Requirements 323
Appendix 15/11 Communication System 324
Appendix 17/1 Schedule for the Specification of Designed Concrete 325

Appendix 17/2 Concrete – Impregnation Schedule 330
Appendix 17/4 Concrete – General 331
Appendix 17/5 Concrete – Buried Concrete 332
Appendix 17/70 Schedule for the Specification of Designed Concrete 333
Appendix 19/1 Requirements for Bridges, Parapets and Other Highway Structures Except Bearings and Lighting Columns 335
Appendix 19/3 Requirements for Lighting Columns and Bracket Arms 336
Appendix 19/4 Requirements for Other Work 337
Appendix 19/70 Paint System 338
Appendix 20/1 Waterproofing for Concrete Structures 345
Appendix 23/70 Replacement Bridge Expansion Joints and Sealing of Joints 346
Appendix 23/71 Asphaltic Plug Joints – Additional Requirements 347
Appendix 24/1 Brickwork, Blockwork and Stonework 348
Appendix 26/1 Ancillary Concrete 350
Appendix 28/1 Supplies and Salt Spreading Rates 351
Appendix 28/2 Company's Vehicles and Plant 352
Appendix 30/1 General 354
Appendix 30/2 Weed Control 357
Appendix 30/3 Control of Rabbits and Deer 359
Appendix 30/4 Ground Preparation 360
Appendix 30/5 Grass Seeding, Wildflower Seeding and Turfing 361
Appendix 30/6 Planting 364
Appendix 30/7 Grass, Bulbs and Wildflower Maintenance 370
Appendix 30/8 Watering 372
Appendix 30/9 Establishment Maintenance for Planting 373
Appendix 30/10 Maintenance of Established Trees and Shrubs 374
Appendix 30/11 Management of Waterbodies 380
Appendix 30/12 Special Ecological Measures 381
Appendix 32/1 Emergency Response 384
Appendix 33/1 Structural Investigations Test Requirements 386
Appendix 50/1 (Specification for Highway Works) Form HA/P1 (Maintenance) Paint System Sheet 393
Appendix 50/3 (Specification for Highway Works) Form HA/P2 Paint Data Sheet 395
Appendix 50/4SE (Specification for Highway Works) Form SEDD/P3 Paint Sample Despatch List 398

Preamble to the Specification

1 Preamble to the Specification

1.1 The Specification for the O&M Works Requirements shall be the 'Specification for Highway Works' published by the Stationery Office Limited as Volume 1 of the Manual of Contract Documents for Highway Works, as modified and extended by the following:

1.1.1 Appendix 0/1: Agreement-specific Additional Substitute and Cancelled Clauses Tables, Tables and Figures;

1.1.2 Appendix 0/2: Agreement-specific minor alterations to existing Clauses, Tables, and figures;

1.1.3 The Numbered Appendices listed in Appendix 0/3; and

1.1.4 Appendix 0/5: Special National Alterations of the Overseeing Department of Scotland.

Appendix 0/4 contains a list of the Drawings.

1.2 The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates, contained in this Preamble to the Specification.

1.3 An Additional Clause as indicated by a suffix 'A' in Appendix 0/5 is an alteration origination from the Overseeing Organisation of Scotland, Wales and Northern Ireland. An additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is an Agreement-specific alteration.

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

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

1.6 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.

1.7 Any reference in these O&M Works Requirements to a Specification Clause number or Appendix shall be deemed to refer to the corresponding Substitute Clause number or Appendix listed in Appendices 0/1, 0/2 or 0/5.

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

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

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

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

1.12 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

Preamble to the Specification

text of the Specification as appropriate.

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

1.14 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.

1.15 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.

1.16 The Specification is used in conjunction with this Agreement and the delegation of the roles and functions of the Overseeing Organisation as stated in paragraph 1.12 above shall be amended as follows:

1.16.1 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 O&M Works Contractor, such agreement, consent, approval shall be obtained from the Scottish Ministers .

1.16.2 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 roles and functions have been ascribed by paragraph 1.12 above shall exercise such decisions in accordance with the O&M Works Requirements stated in the Agreement.

1.17 Subject to the other provisions of this Agreement, any references to any obligations or actions in this Specification shall be deemed to be obligations on the Company unless such obligations or actions shall be identified otherwise or inferred otherwise.

1.18 The annotation “05/01” is used to indicate the relevant publication date of alteration(s) to Clauses or Sub-Clauses. The first double digit refers to the month, and the second to the year. The annotation “05/01” is used to indicate the relevant publication date of alteration(s) to Clauses or Sub-Clauses. The first double digit refers to the month, and the second to the year.

Preamble to the Specification

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

Series/Appendix	Page Number	Publication Date
000	1	March 1998
000	3F	May 2005
000	2	November 2006
100	2	May 2001
100	W1F	May2005
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, to N6F	November 2006
200	1, 3F	May 2001
200	2	May 2004
300	1	May 2001
300	2, 4, 6F	November 2002
300	5	May 2006
300	3	November 2006
400	1 to 12F	November 2006
500	20, 23 to 26	November 2004
500	28F	May 2005
500	1, 7, 11, 13 to 14, 16 to 19, 21	November 2005
500	3,12, 22, N1F	May 2006
500	2, 4 to 6, 8 to 10, 15, 27	November 2006
600	33	November 2003
600	2, 27 to 32, 34 to 67F, N1, N3 to N4F	November 2005
600	1, 3 to 26, S1, S3F, N2	November 2006
700	1	November 2004
700	16 to 17	May 2001
700	23 to 25F	May 2002
700	2 to 15, 18 to 22, N1 to N5F	November 2006

Preamble to the Specification

Series/Appendix	Page Number	Publication Date
800	1, 22 to 25, 27, to 32F	May 2005
800	4 to 6, 8 to 9, 13 to 16, 19 to 21	November 2004
800	7	May 2004
800	2, 17 to 18, 26	November 2005
800	3, 10 to 12	November 2006
900	6 to 20, 23 to 31, 33 to 34, 36 to 37, 39, 41 to 44, 46, 49 to 51, 53, 58 to 72F	November 2004
900	3 to 4, 21 to 22, 32, 45, 47, 52	May 2005
900	48	November 2003
900	5, 35, 38, 40	May 2006
900	1 to 2, 54 to 57	November 2006
1000	3, 5 to 6	November 2005
1000	1 to 2, 4, 7 to 15, 19 to 33F	May 2006
1000	16 to 18	November 2006
1100	1, 3 to 4F	November 2004
1100	2, N1F	November 2006
1200	1, 14 to 16F, N3	May 2004
1200	2 to 3, 6 to 7, W1F, N2	August 2003
1200	4, 8 to 11, 13, N4F	May 2005
1200	5	May 2001
1200	12, N1	November 2006
1300	3 to 4	November 2004
1300	N2F	November 2003
1300	1, 5 to 10, 12F	November 2005
1300	2, 11, N1	May 2006
1400	2, N1F	May 2001
1400	1, 3 to 9F	May 2006

Preamble to the Specification

Series/Appendix	Page Number	Publication Date
1500	2	February 2003
1500	3 to 4, 8 to 11, 13	November 2004
1500	7	May 2001
1500	1, 5 to 6, 12, 14 to 17F	November 2006
1600	1, 4 to 5, 9, 15, 17 to 18, 24 to 26, 29 to 31, 35, 38, 49F	March 1998
1600	2, 6 to 8, 10 to 14, 16, 19, 27 to 28, 32 to 34, 36 to 37, 39 to 42, 44 to 48	November 2003
1600	3, 20 to 23, 43	November 2005
1700	2 to 7, 10 to 15	May 2004
1700	8 to 9	May 2005
1700	1, 16 to 22F	May 2006
1800	1, 4, 6, 8 to 9	May 2004
1800	2 to 3, 5, 7, 10 to 12F	November 2005
1900	17	May 2003
1900	1 to 16, 18 to 30F, S1 to S2F	May 2005
2000	1, 3 to 4F	May 2001
2000	2	November 2004
2100	1, 4F	March 1998
2100	2	November 2003
2100	3	November 2005
2300	1	March 1998
2300	2 to 3F	May 2001
2400	1, 4, 7F	May 2005
2400	2 to 3, 5 to 6	May 2006

Preamble to the Specification

Series/Appendix	Page Number	Publication Date
2500	1	May 2001
2500	2, 8, 11F	November 2003
2500	6 to 7, 9	May 2005
2500	10	November 2004
2500	5	May 2006
2500	3 to 4	November 2006
2600	1	March 1998
2600	2 to 4	November 2003
2600	5	November 2004
2600	6	May 2005
2600	7F	November 2006
3000	1, 4 to 19, 21 to 27F	May 2001
3000	20	November 2004
3000	2 to 3	May 2006
5000	1 to 19F, S1F	May 2005
Appendix A	1, 6 to 20, 22 to 25F	November 2006
Appendix A	2 to 5, 21	May 2007
Appendix B	1	May 2006
Appendix B	2 to 7F	November 2006
Appendix C	1	May 2005
Appendix C	2F	November 2006
# Appendix D	1F	May 2005
Appendix D(NI)	N1F	March 1998
# Appendix E	1F	May 2005
Appendix E(NI)	N1F	May 2005
Appendix F	1 to 57F	November 2006
Appendix G	1F	May 2004
Appendix H	1	May 2004
Appendix H	2, 6 to 8F	November 2005
Appendix H	3 to 5	November 2006

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

LIST OF ADDITIONAL CLAUSES, TABLES AND FIGURES

Clause Number	Title	Written on Page Number
170AR	Licenses Servitudes Wayleaves and Rights of Access	17
171AR	Depots	17
172AR	Location of Work	17
173AR	Cleanliness of Unit and Use of Land	17
174AR	Site Safety	18
175 AR	Material Stocks	18
176AR	Access Lighting and Protective Measures for Operations above Ground Level	18
177AR	Waste Disposal	20
178AR	Other Works on the O&M Works Site	20
270AR	Tree Felling	20
273AR	Sign Posts	22
370AR	Repairs to and Removal of Existing Fencing	22
470AR	Site Operations to Road Restraint Systems	23
471AR	Repairs to Road Restraint Systems	23
473AR	Re-tensioning of Tensioned Corrugated Beam and Tensioned Rectangular Hollow Section Road Restraint Systems as a Cyclic Maintenance Activity	23
474 AR	Re-tensioning of Wire Rope Road Restraint System as a Cyclic Maintenance Activity	24
476AR	Safety Barrier System Stock Requirement	24
477AR	Repairs to and Renewal of Existing Pedestrian Guardrail	24
478AR	Painting of Pedestrian Guardrails and Handrails	24
570AR	Drainage and Service Ducts	25
573AR	Renewal of Filter drains	26
575AR	High Pressure Water Jetting	26
576AR	High Pressure Water Jetting and Suction	26
577AR	Closed Circuit Television Surveys	26
970AR	Repair of Carriageway Category 1 Defects	28
971AR	Stone Mastic Asphalt Surface Course	29
973AR	Overband Sealing	35
974AR	Pavement Reinforcement	35
975AR	Thin Surface Courses	35
1171AR	Relaying of Existing Footways	35

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

Clause Number	Title	Written on Page Number
1172AR	Siding Out	36
1173AR	Artificial Stone Paving or Natural Stone Paving and Precast Concrete Paving Flags and Blocks	36
1174AR	Laying of Artificial Stone Paving or Natural Stone Paving and Precast Concrete Paving Flags	36
1179AR	Timber Edging to Footways	36
1270AR	Routine Maintenance of Traffic Signs, Hazard Posts, Illuminated Bollards, Marker Posts, Telephone Hoods, Refuge Beacons and ECP Cylinders	37
1272AR	Routine Maintenance of Sign Lighting Units	38
1273AR	Routine Maintenance of Traffic Signals	38
1274AR	Non-Routine Maintenance of Traffic Signals	39
1370AR	Routine Maintenance of Road Lighting Units	40
1371AR	Cleaning Method and Materials	41
1372AR	Lamp Disposal	42
1373AR	Removal of Existing Equipment	42
1374AR	Routine Maintenance of High Mast Lighting	42
1470AR	Temporary Overhead Feed to Lighting Unit	43
1471AR	Non-Routine Maintenance	43
1535AR	Variable Message Signs	44
1536 AR	Traffic Monitoring Units	44
1537 AR	SRTDb detectors and SRTDb equipment	45
1538 AR	Driver Information and Lane Control Signalling Equipment	45
1539 AR	Paved Areas, Access Paths, Access Steps and Hardstandings	45
1540 AR	Required Documentation	45
1541 AR	Journey Time Equipment	46
1570AR	Maintenance of Communications Systems	46
1770AR	Concrete Repairs – Gerneral Requirements	47
1771AR	Removal of Concrete in Areas to be Repaired	47
1772AR	Surface Preparation	48
1773AR	Concrete Repairs	49
1774AR	Foamed Concrete Fill to Structures and Backfilling to Drainage Trenches	64
1970AR	Protection of Steelwork Against Corrosion	64
2070AR	Replacement of Bridge Deck Waterproofing	65

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

Clause Number	Title	Written on Page Number
2071AR	Repairs to Existing Waterproofing	66
2370AR	Bridge Expansion Joints	66
2371AR	Replacement of Bridge Deck Expansion Joints and Gap Sealants	67
2372AR	Asphaltic Plug Joints	68
2470AR	Repointing of Brickwork Blockwork and Stonework	68
2471AR	Replacement of Precast Concrete Copings	68
2472AR	Rebedding Existing Precast Concrete or Stone Masonry Copings	69
2473AR	Replacement Tiling	70
2474AR	Rebuilding of Defective Masonry	70
2475AR	Lime Putty	71
2476AR	Hydraulic Lime Mortars	72
2671AR	Graffiti Removal	76
2672AR	Anti-Graffiti Coatings	76
2674AR	Convex Safety Mirrors in Underpasses and Culverts Used by Pedestrians and Cyclists	77
2801AR	Winter Maintenance Operations	77
2802AR	Basic Facility	78
2803AR	Salting and De-icing Operations	79
2804AR	Snow Clearing Operations	79
2805AR	Company's Vehicles and Constructional Plant	80
2806AR	De-Icing Materials	83
2807AR	Maintenance of Company's Vehicles and Other Constructional Plant	85
2808AR	Miscellaneous Winter Maintenance Operations	85
3101AR	Road Cleaning and Clearance	85
3102AR	Litter and Debris Clearance	86
3103AR	Removal of Dead Animals	86
3201AR	Emergency Response Operations	86
3202AR	Temporary Concrete Road Restraint Systems	87
3301AR	Site Investigation Rotary Coring in Carriageways	87
3302AR	Rotary Coring in Structures	88
3303AR	Structural Investigations	89
3304AR	Inspection Patches Within Surfacing on Bridge Structures	89

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

Clause Number	Title	Written on Page Number
3305AR	Trial Holes in Paved Areas	90
3306AR	Falling Weight Deflectometer Tests	90
3307AR	Dynamic Cone Penetrometer Tests	90
6101AR	Cyclic Maintenance of Safety Barriers	91
6102AR	Cyclic Maintenance of Gullies, Piped Grips, Catchpits Soakaways and Oil Separators	91
6103AR	Cyclic Maintenance of Drainage Grips	92
6104AR	Maintenance of Piped Linear Drainage Systems	92
6105AR	Cyclic Maintenance of Filter Material	92
6106AR	Cyclic Maintenance of Drainage Structures	93
6107AR	Cyclic Maintenance of Ancillary Drainage Items	93
6108AR	Litter and Refuse	93
6109AR	Removal of Dead Animals	94
6110AR	Cyclic Maintenance – General	94
6111AR	Cyclic Maintenance of Expansion Joints	95
6112AR	Cyclic Maintenance of Bridge Drainage Systems	95
6113AR	Cyclic Maintenance of Parapets and Pedestrian Protection on Structures	95
6114AR	Cyclic Maintenance of Bearings and Bearing Shelves	95
6115AR	Cyclic Maintenance of Structures Conveying Watercourses	96
6116AR	Cyclic Maintenance of Sign or Signal Gantries High Mast Lighting and Masts	96
6117AR	Cyclic Maintenance of Non-Structural Items	97
6118AR	Cyclic Maintenance of Underpasses and Culverts Used by Non Motorised Users and Retaining Walls	97
6119AR	Removal of Graffiti, Posters and Encrusted Deposits	97

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

LIST OF SUBSTITUTE CLAUSES, TABLES AND FIGURES

Clause Number	Title	Written on Page No. following
103SR	Communication System	99
110SR	Temporary Information Boards	99
113SR	Programme of Operations	99
117SR	Traffic Safety and Management	99
202SR	Existing Trees, Bushes and Hedges	102
949SR	Repairs to Potholes	102
1501SR	Introduction	102
1502SR	General Requirements	103
1503SR	Materials, Equipment and Workmanship	105
1504SR	Site Records	106
1505SR	Provision of Cabinets, Cables and Ancillary Items	106
1506SR	Cables	107
1507SR	Cable Installation	108
1508SR	Installation of Cabinets	110
1509SR	Gantries for Motorway Signals	111
1510SR	Emergency Roadside Telephones	111
1511SR	Marker Tape	112
1512SR	Provision of and Installation of Ancillary Items	112
1513SR	Jointing and Termination of Multi-pair Communications and Feeder Cables	113
1514SR	Cable Connectors	114
1515SR	Jointing and Termination of Fibre Optic Communications Cables	114
1516SR	Termination and Jointing of Power Supply cables for Communications	114
1517SR	Earthing and Bonding	115
1518SR	Cable Testing	116
1519SR	Labelling and Numbering	117
1520SR	Loading	117
1521SR	Removal and Re-siting of Existing Equipment	118
1522SR	Hazard Warning Signals	118
1523SR	Traffic Scotland Loop Detectors	119
1524SR	Trial Pits	119

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

1525SR	Maintaining the Traffic Scotland Communications Network	119
1526SR	The Inspection and Testing of Electrical Installations and Electrical Equipment	120
1527SR	Cable Installations at Transmission Stations	121
1528SR	Modifications of Existing Cabinets	121
1529SR	Temporary Roadside Emergency Telephones	122
1530SR	Cable Ducts	123
1531SR	Installation of Ducts	124
1532SR	Chambers for Motorway Communications Cables	126
1533SR	Proving and Testing of Ducts	128
1534SR	Closed Circuit Television	129

LIST OF CANCELLED CLAUSES, TABLES AND FIGURES

None		

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

Clause Number	Title and Written Text
170AR	**Licenses Servitudes Wayleaves and Rights of Access** In general the Company shall allow for gaining access to boundary fences and adjacent areas from the O&M Works Site. If in the opinion of the Company access from the O&M Works Site shall be impractical then the Company shall notify the Scottish Ministers of any licences servitudes wayleaves or rights of access that shall have to be arranged to enable the work to be undertaken. Under no circumstances shall the Company gain access across private land without the prior written consent by the Scottish Ministers, Relevant Authorities and the landowner and occupier/tenant.
171AR	**Depots** The Company shall establish depots and the like from which to carry out its Operations.
172AR	**Location of Works** Subject to other provisions of the Agreement the Company shall establish a system whereby the location of the O&M Works carried out under the Agreement is identified by the Routine Maintenance Management System.
173AR	**Cleanliness of Unit and Use of Land** 1. The Company shall take all necessary steps to avoid creating a dust nuisance. If in the opinion of the Overseeing Organisation the Company shall not be dealing adequately with the control of dust the Overseeing Organisation may require the Company to carry out such additional measures as the Overseeing Organisation considers shall be necessary at the Company's expense. 2. The Company shall keep all roads, private entrances, verges, paths, footways, drains and ditches that are affected by the Operations or by vehicles of the Company or by any of its sub-contractors or by suppliers of materials or by plant free from mud slurry or other hazardous substance that have been deposited as a consequence of his Operations and in a safe clean and passable state. The Company shall promptly remove all waste or superfluous material or any substance deposited by the Company or its sub-contractor. 3. The Overseeing Organisation shall have the authority to close any crossings and exits if any substance deposited shall not have been promptly removed by the Company. 4. The Company shall take all necessary precautions to prevent danger nuisance or inconvenience to the owners tenants or occupiers of adjacent properties and to the public generally. The Company shall make its own arrangements with the owners, tenants and occupiers concerned for the use of any private land for plant and equipment stores working space borrow pits or spoil dumps it requires. Access to all frontages whether commercial or residential shall be maintained at

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

Clause Number	Title and Written Text
	all times by the Company.
174AR	**Site Safety** The Company shall comply with the requirements described in Appendix 1/74 in connection with the Relevant Authorities with respect to Health and Safety on the O&M Works Site.
175AR	**Material Stocks** The Company shall establish a minimum stock of material as described in Appendix 1/78 which shall be maintained by the Company for the Contract Period.
176AR	**Access Lighting and Protective Measures for Operations above Ground Level** General 1. Whenever Operations above ground level shall be required the Company shall provide access lighting and protective measures as necessary. Access Scaffolding 2. All used by the Company shall comply with the requirements of the following: (i) Common Scaffold – BS EN 12811-1:2003 (Temporary works equipment. Scaffolds. Performance requirements and general design). (ii) Suspended Scaffold – BS5974:1990 (Code of practice for temporarily installed suspended scaffolds and access equipment). (iii) Special Scaffold Structures – BS EN 12811-1:2003 (Temporary works equipment. Scaffolds. Performance requirements and general design). 3. Scaffolding operations shall be undertaken under the immediate supervision of a competent person with adequate experience of this type of work. 4. Subject to the provisions of the Agreement a method statement describing the proposed methods of access and sheeting shall be prepared by the Company in writing at least 7 days before it is programmed to be used. When the scaffold is complete, certification stating the time and date the scaffold is ready for use shall be maintained. 5. Full details of the safe working load shall be attached to the scaffolding giving details of the correct distribution of personnel plant and equipment and materials and the allowable depth of debris. Mechanical/Hydraulic Access Plant 6. The Company shall ensure that all access plant is maintained in good working order serviced in accordance with the manufacturer's recommendations and shall maintain all relevant certificates. 7. Any working platform shall be of sufficient size and capable of being loaded to accommodate at least two operatives with working equipment and shall have the operating controls duplicated on the vehicle chassis. The vehicle chassis controls shall have priority control. 8. The vehicle chassis shall be fitted with stabilising jacks.

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

Clause Number	Title and Written Text
	9. All access plant shall be fitted with a safety interlock system to ensure that: (i) the stabilising jacks do not operate until the handbrake is applied; (ii) the working platform cannot be moved until the stabilising jacks are lowered; (iii) the stabilising jacks cannot be retracted until the working platform is parked; and (iv) the vehicle cannot be driven with the stabilising jacks down. 10. The hoist system including jacks shall lock in the event of any component or combination of components in the system failing. 11. The working platform shall be fitted with at least two anchor points for safety harnesses. 12. The working platform shall have a simple system of communication with the cab of the vehicle. 13. Any access plant and equipment (for example scaffolding hoists hydraulic platforms or boats) provided by the Company for the carrying out of the Operations shall be made available for use by the Scottish Ministers at any time. Lighting 14. During any inspection of the Operations the Company shall provide adequate illumination. Unless specified elsewhere in relation to a particular Series a light intensity of between 200 and 300 lux shall be provided over the area being inspected. Adequate measures shall be taken to ensure the light spill from the Operations area shall not encroach upon adjacent live carriageways 15. Lighting and all other electrical equipment within the working area shall be flameproof equipment supplied at a voltage not exceeding 110 Volts. Protective Measures 16. The Company shall take reasonable measures to prevent any dust debris water spray or any other materials falling into and/or affecting watercourses vehicles persons or any other public or private property adjacent to the Operations. 17. The wearing of suitable (air fed) masks and protective clothing shall be mandatory for all persons working on or adjacent to high pressure water jetting or other hazardous operations. Protective screens shall be erected if necessary adjacent to work locations. 18. All necessary precautions shall be taken to avoid damage to Structures while high pressure water jetting or other potentially damaging activities are taking place. 19. The Company shall make good any damage to the paint system on steelwork arising during the execution of the Operations as a consequence of high pressure water jetting. 20. During application and curing of protective paint systems any protective measures shall be fully sealed to prevent ingress of dust, dirt or other harmful matter. Forced ventilation and extraction shall be employed continuously to

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

Clause Number	Title and Written Text
	maintain the atmosphere in the working area within the limits laid down by the Health and Safety Executive. The impelled air shall be filtered to remove all dirt and other deleterious matter. Control of Ambient Conditions 21. The company shall erect maintain and remove any necessary measures including heating and dehumidification to comply with any requirements in respect of ambient conditions to progress the Operations.
177AR	**Waste Disposal** 1. The Company shall be responsible for disposal of all waste including but not limited to spoil detritus and otherwise arising from any Operations included within the Agreement. Waste shall be transported to appropriately licensed waste disposal or recycling sites. The Company shall be responsible for all charges and taxes incurred in disposal of waste from the O&M Works Site. 2. The Company shall register as a carrier of waste with the waste disposal authority for the area in which its principal maintenance compound is situated in accordance with the requirements of the Control of Pollution (Amendments) Act 1974.
178AR	**Other Works on the O&M Works Site** The Company shall take into account the presence from time to time of other authorised contractors and other bodies executing work which could have or may have an impact on Operations.
270AR	**Tree Felling** 1. Works shall be carried out in accordance with: BS 5837: 2005 "Trees in relation to construction. Recommendations" BS 3998: 1989 "Recommendations for tree work" BS 4428: 1989 "Code of practice for general landscape operations (excluding hard surfaces) " 2. Marking of Trees to be Removed The Company shall set out the O&M Works prior to the commencement of any tree felling operations and shall indicate with paint those trees the removal of which it considers necessary for the O&M Works. No trees, bushes or hedges shall be felled or uprooted without approval from the Scottish Ministers. 3. Fencing Trees, bushes and undergrowth to be preserved shall be fenced off with type CW 120 cleft chestnut pale fencing complying with BS 1722, Part 4:1999 Fences. Specification for cleft chestnut pale fences, placed in accordance with BS 5837:2005 Trees in relation to construction. Recommendations, and shall be maintained in effective condition until the O&M Works have been fully completed. Fences shall be erected before the O&M Works commence. 4. Precautions Before commencing felling operations warning notices and arrangements shall

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

Clause Number	Title and Written Text
	be made by the Company to prevent public gaining access to the danger zone. 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 O&M Works Site. Where felling takes place close to Side Roads the Relevant Authority and the Police shall be notified. 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. If there shall be a likelihood of contact with overhead telephone lines, these lines should be disconnected during the O&M Works by British Telecom. Where work shall be 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. Position and depth of all pipes, cables and underground structures shall be verified. The method of work shall take into account such items. Voids left after the removal of stumps and roots shall be filled with suitable material and compacted in compliance with Clause 612 of the Specification. Damage to trees, tree saplings, shrubs or hedges during felling shall be made good as described in BS 3998: 1989 "Recommendations for tree work", paragraph 7. 5. Grubbing up Stumps and Filling Voids All stumps and tree roots shall be grubbed up provided this does not damage trees which shall be retained. If a stump cannot be removed it shall be cut at least 300mm below ground level, the hole shall be filled with soil, compacted, levelled and seeded. Refer to sub-clause 8 below. 6. Chipping of Wood and Bark Small timber, twigs, bark and roots not infected by honey fungus may be chipped and left on the O&M Works Site to compost at agreed locations and shall be turned over at specified intervals. Surplus timber shall be removed from the O&M Works Site, unless sub-clause 8 below applies. 7. Preliminary Tree Work - BS 3998: 1989 "Recommendations for Tree Work", 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. 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. When a branch shall 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 shall be no collar the angle of the cut shall be the

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

Clause Number	Title and Written Text
	mirror image of the branch bark ridge. (BS 3998: 1989: page 4; paragraph 13 and figure 1). The outline of pruned trees shall be fair and symmetrical. Sealing of the cut surface with a proprietary preparation shall be carried out when there shall be a high risk of fungal or bacterial infection. Table 1 of Appendix C of BS 3998:1989 "Recommendations for Tree Work", 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 shall be for cosmetic reasons only; a thin layer of bitumastic or latex based paint or household emulsion can be applied. 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. In crown lifting lower branches shall be removed to a given height above ground level in a manner described. 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. 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. 8. Existing Woodland The timber from native species which require to be felled within or adjacent to, existing woodland shall be left within the woodland for habitat enhancement, to the approval of Scottish Natural History. Stumps within woodland shall not be ground down or removed.
273AR	**Sign Posts** 1. Removal of existing sign posts shall include removal of all foundations. 2. Prior to the removal of sign posts carrying illuminated signs the Company shall arrange to de-energise the electricity supply to the electrical equipment. 3. Backfilling of hole to ground level and compaction.
370AR	**Repairs to and Removal of Existing Fencing** 1. Repairs to and renewal of existing fences shall comply with the appropriate Clauses in Series 300. 2. If any posts rails or lengths of fencing shall have been removed by the Company to facilitate repairs or renewal of existing fences they shall be reinstated as soon as possible. In the interim the gap in the fencing shall be closed with temporary fencing in accordance with Clause 303 so that no livestock escapes from the adjoining land. 3. Repairs and renewals of existing fences shall match the existing material and dimensions as far as shall be practicable.

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

Clause Number	Title and Written Text
470AR	**Site Operations to Road Restraint Systems** 1. All Operations on road restraint systems shall be undertaken by organisations certified under the Sector Scheme listed in Appendix A of the Specification for Highway Works. 2. The Company shall carry out Operations to road restraint systems of different types on the O&M Works Site. 3. Operations shall include operations under the following generic headings: (i) repair of road restraint systems; (ii) detensioning and retensioning of tensioned corrugated beams rectangular hollow sections and wire; (iii) removal of road restraint systems; and (iv) erection of new road restraint systems.
471AR	**Repairs to Road Restraint Systems** 1. All repairs to road restraint systems shall comply with the requirements of BS 7669:Part 3:1994. Vehicle Restraint Systems. Guide to the Installation, Inspection and Repair of Safety Fences 2. All repairs and installations of road restraint systems shall be carried out in accordance with: (i) in the case of non-proprietary systems the layout drawings contained in Non-Proprietary Safety Barrier Systems as referred to in Interim Advice Note 44/02 (IAN 44/05)of the DMRB. (ii) in the case of proprietary systems the manufacturers' latest drawings and instructions 3. All accident damage repairs shall be carried out using the same type of safety barrier system as shall currently exist at the location. The type of post used shall depend on the results from examination of post foundations and where necessary loading tests being carried out by the Company in accordance with Annex B of BS 7669-3:1994 Vehicle Restraint Systems. Guide to the Installation, Inspection and Repair of Safety Fences. 4. All materials arising from the repair of road restraint systems which shall be surplus to requirements or unacceptable for re-use shall be removed to a licensed waste disposal facility.
473AR	**Re-tensioning of Tensioned Corrugated Beam and Tensioned Rectangular Hollow section Beam Road Restraint System as a Cyclic Maintenance Activity** 1. Tensioned road restraint systems shall be re-tensioned at the frequencies stated in these O&M Works Requirements. 2. Re-tensioning of such road restraint system shall be carried out in accordance with the procedure referred to in the O&M Works Requirements. 3. Road restraint systems shall be re-tensioned in sections.

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

Clause Number	Title and Written Text
	4. The re-tensioning of a sector shall be completed by the end of each working period and in any event before the removal of any traffic management.
474AR	**Re-tensioning of Wire Rope Road Restraint System as a Cyclic Maintenance Activity** 1. Wire rope road restraint systems shall be re-tensioned at the frequencies stated in these O&M Works Requirements 2. The following procedure shall be used: (i) slacken off wire ropes previously tensioned; (ii) re-tension as referred to in these O&M Works Requirements; and (iii) only one rope between anchorages to be de-tensioned at any one time.
476AR	**Safety Barrier System Stock Requirement** The Company shall maintain a stock of road restraint system components such that at no time does it fall below the minimum level referred to in Part 2 to Schedule 4.
477AR	**Repairs to and Renewal of Existing Pedestrian Guardrail** 1. Repairs to and renewal of existing pedestrian guardrail shall comply with the appropriate Clauses of Series 400 and the following: (i) in general work shall comprise the taking down of parts or sections of existing guardrail and the erection in their place of new parts or sections following accident damage or long term deterioration of the guardrail; (ii) where existing posts and concrete footings are removed and new posts and concrete footings are installed in the same location any remaining voids shall be filled with concrete; (iii) concrete shall be mix ST1; (iv) existing bolt nuts and washers shall not be reused; (v) repairs to pedestrian guardrails shall be carried out using panels and posts which match the original installation as closely as possible; and (vi) all component parts shall comply with Clause 411. 2. Damaged sections of guardrail shall be removed and the resultant opening temporarily closed off. The Company shall make permanent repairs using panels to match existing. Permanent repairs shall be carried out in accordance with these O&M Works Requirements and in any case no later than 28 days after the erection of the temporary units.
478AR	**Painting of Pedestrian Guardrails and Handrails** General 1. Painting shall be carried out in accordance with the recommendations of British Standard Code of Practice CP6150. 2. All steel fabricated into units before delivery to the location of the Operations

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

Clause Number	Title and Written Text
	shall be free of mill scale rust and foreign matter when reviewed by normal vision and primed without delay with calcium plumbate primer to BS 3698:1964 Specification for calcium plumbate priming paints Type A. 3. All other surfaces of iron and steel shall be rendered clean dry and free from grease rust or mill scale prior to priming as described in sub Clause 2 of this Clause 478AR. 4. Galvanised surfaces which have been exposed to atmospheric weathering for a period of 26 weeks or more shall be cleaned down and primed with calcium plumbate primer to BS 3698:1964 Specification for calcium plumbate priming paints Type A or B. Galavnised surfaces which have not been weathered for 26 weeks shall first be treated with an etching compound of the following composition by volume: Industrial methylated spirit 60 per cent Toluol 30 per cent Carbon tetrachloride 5 per cent Commercial hydrachloride acid 5 per cent After etching and before priming galavanised surfaces shall be thoroughly rinsed with clean water to remove chemical residues from the treatment and allowed to dry. 5. Aluminium surfaces shall be cleaned and thoroughly degreased with methylated spirit prior to the application of a thin coat of proprietary etch primer applied in accordance with the manufacturer's written instructions. The surfaces shall then be coated with a compatible zinc chromate primer containing not less than 20 per cent by mass of zinc chromate and free from graphite and from oxide or hydroxide of lead. Undercoat and Finishing Coats 6. All primed surfaces shall be painted with one coat of undercoating of the colour of the finishing coat. 7. Two finishing coats shall be applied.
570AR	**Drainage and Service Ducts** **Rodding Eyes** 1. Rodding eyes shall be either a Type 1 single or Type 2 double arrangement. 2. Rodding eyes shall not be used for pipe diameters in excess of 225 millimetres. 3. The connecting pipe shall be laid at an angle of 45° to the horizontal. 4. The connecting pipes shall be surrounded with 150 millimetre concrete mix ST2 for the full depth of the connection and extending 150 millimetres beyond the connection with the main drain. 5. Covers and frames shall comply with the loading category of BS EN124:1994 (Gully tops and manhole tops for vehicular and pedestrian areas). Design requirements, type testing, marking, quality control, as referred to in Appendix

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

Clause Number	Title and Written Text
	5/1 with a clear opening of 150 or 225 millimetres. 6. Covers and frames to be bedded and haunched with mortar to Clause 2404 mix designation (ii) and set flush with the surface. Bedding mortar shall be a maximum of 25 millimetres thick and placed directly on the concrete surround.
573AR	**Renewal of Filter Drains** 1. Filter drains shall be renewed by replacing the filter media or the complete drain. 2. Where the filter media only is to be replaced all or part of the existing material within the trench shall be removed to the specified depth. The trench shall then be back-filled up to ground level with Type B material in accordance with Table 5/5 Clause 505. Any geotextile membrane present shall be replaced with new material equivalent to that removed. 3. Where the complete drain shall be replaced all of the existing filter media pipe and pipe bedding shall be removed down to the base of the original trench. The drain shall then be reconstructed and back-filled up to ground level with Type B material in accordance with Table 5/5 Clause 505. 4. Where required, the top 80 millimetres of material in central reserves shall be replaced with red chippings. The chippings shall be 14 millimetre nominal size igneous stone, natural red in colour.
575AR	**High Pressure Water Jetting** High pressure water jetting shall be carried out using water which complies with sub-Clause 1702.3 by a jetting pump with a variable output up to 220l/minute at a minimum of 14N/mm^2. Minimum water storage capacity shall be 4.5 cubic metre. A minimum length of 180 metres of 25 millimetre diameter jetting hose shall be provided.
576AR	**High Pressure Water Jetting and Suction** In addition to the jetting requirements which shall be as Clause 575AR the suction facility shall be provided by a liquid ring exhauster and shall have an air flow of at least 70 cubic metre per minute and 380 millimetre Hg vacuum through a 200 millimetre boom mounted pipe with a debris tank capacity of at least 5.5 cubic metre.
577AR	**Closed Circuit Television Surveys** 1. Definition For the purposes of this Clause 'drain' shall be deemed to include sewers drains filter drains ducts piped grips combined drainage and kerb systems and linear drainage channel systems. 2. Extent of Survey and Method to be Used (i) The drains shall be inspected by closed circuit television so that all cracks

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

Clause Number	Title and Written Text
	blemishes encrustations open joints silt debris collapsed sections roots vermin and alignment can be observed. (ii) Television cameras shall be drawn by cables and winches self-propelled tractor driven or fixed to rods. (iii) Where the survey of a drain length shall be stopped by a blockage in the drain the drain shall be surveyed from the other direction. 3. Picture Quality (i) The electronic systems television camera and monitor shall be capable of providing a picture of not less than 350 lines definition with 5 shades of grey. (ii) Horizontal and vertical linearity shall be better than 10 per cent positional error over the whole television monitor screen (central circle only). (iii) The adjustment of focus shall give a focus range from near objects to infinity. (iv) The combination of illumination of the object and light sensitivity of the camera shall obtain an effective picture of the structure of the drains. (v) The Company shall provide a suitable test device which shall enable it to demonstrate to the Scottish Ministers that the definition of shades of grey and linearity comply with the above requirements by use of the Marconi Resolution Chart No 1 (central circle only). A test shall be carried out using this equipment as frequently as may be required. 4. Linear Measurement (i) The monitor display shall incorporate an automatically updated record of the metreage of the camera position along the drain accurate to plus or minus 2 per cent. (ii) The Company shall provide a suitable metering device which shall enables the cable length to be accurately measured. (iii) The Company shall demonstrate that the above tolerance shall be being complied with using one or both of the following methods: (a) use of cable calibration device; (b) tape measurement on the surface between chambers. 5. Video Tapes The Company shall provide a video recording on E180 VHS tapes of all drain lengths showing a continuous record of data displayed automatically on the monitor screen containing the following information. (i) automatic update of the camera's metreage position in the drain line (ii) date of survey; (iii) direction of survey;

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

Clause Number	Title and Written Text
	(iv) pipe dimensions; and (v) length/location reference; and shall be recorded on tapes which comply with the recording equipment manufacturer's standard tape specification (VHS compatible). Video recordings shall become the property of the Scottish Ministers. 6. Photographs (i) Photographs shall be taken of defects and samples of average condition. (ii) Where colour in-line photography shall be used photographs shall be taken at intervals not exceeding 5 metres. (iii) Durable half plate photographs shall be provided. They shall be identified in relation to the metreage of the place taken shall show clear definition and accurately reflect what shall be shown on the monitor. (iv) The speed of the camera in the drain shall be limited to 0.10 m/s for drains of diameter less than 200 millimetre, 0.15 m/s for diameters exceeding 200 millimetre but not exceeding 300 millimetre and 0.20 m/s for those exceeding 300 millimetre or such other speed consented to in writing by the Scottish Ministers as shall enable all details to be seen on the video tape recording. 7. Reports (i) All reports shall be presented to the Scottish Ministers in accordance with the format laid down in the NEC/DOE 'Manual of Sewer Condition Classification 4th published in 2004. (ii) Each chamber shall be recorded on a separate sheet except for buried chambers which may be included within a length. (iii) Photographs shall be mounted and shall follow the relevant page of the report. (iv) All dimensions shall be in metric units. (v) The report shall include the depth measured from cover level to invert for every drain in each chamber. (vi) All dimensions shall be in metric units. (vii) The report shall include the depth measured from cover level to invert for every drain in each chamber. (viii) One copy of the report shall be provided within 14 days of completion of each survey or if otherwise required by the Scottish Ministers each section of the survey.
970AR	**Repair of Carriageway Category 1 Defects** 1. Temporary repairs of carriageway Category 1 Defects shall be undertaken in accordance with these O&M Works Requirements.

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

<table>
<tr><th>Clause Number</th><th>Title and Written Text</th></tr>
<tr><td></td><td>2. The Company may undertake a permanent repair in lieu of a temporary repair in the timescales stated in Part 2 of these O&M Works Requirements for a temporary repair of a Category 1 Defect.

3. The permanent repair shall be carried out in accordance with the relevant Clauses of Series 600, 700 and 800 using material complying with Series 900.</td></tr>
<tr><td>971AR</td><td>Stone Mastic Asphalt Surface Course

General

1. Stone mastic asphalt shall comply with the general requirements of BS 4987 Part 1:2005 Coated Macadam (Asphalt Concrete) for Roads and Other Paved Areas: Specification for Constituent Materials and for Mixtures, for coated macadam Series 700 and 900 and the specific requirements of sub-Clauses 2 to 39 of this Clause.

2. Stone mastic asphalt shall be produced in plants that shall be registered to the BS EN ISO 9001 ‘Sector Scheme for the Production of Asphalt Mixes’, described in Appendix A.

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.

4. The Company shall declare target aggregate gradings and binder contents prior to commencement of the Operations.

5. The nominal installation depths shall be classified into three categories as given in the table below:

<table>
<tr><td>Type</td><td>Type A</td><td>Type B</td><td>Type C</td></tr>
<tr><td>Nominal installation depth (millimetre)</td><td><18</td><td>18 to 25</td><td>>25</td></tr>
</table>

Aggregates

6. Coarse aggregate shall be crushed rock or crushed slag complying with Clause 901.

7. 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.

8. 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.

9. 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.</td></tr>
</table>

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

Clause Number	Title and Written Text
	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. Filler 10. Added filler aggregate shall be hydrated lime, crushed limestone or Portland Cement, in accordance with the requirements of BS 594-1:2005, Hot Rolled Asphalt for Roads and Other Paved Areas: Specification for Constituent Materials and Asphalt Mixtures and shall be not less than 2% by mass of total aggregate. Binder 11. 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 Supply of Paving Grade Binders', described in Appendix A. The said binder shall not be harder than penetration reference 50 (paving grade 40/60). 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. Binder Modifiers 12. 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. 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. 13. 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. The Company shall provide the rheological product identification data for pre-blended modified binders in accordance with Clause 928 and cohesion in accordance with Clause 939. Mixture 14. The binder drainage of the loose mixture at the target composition at a temperature of 175°C in accordance with DD 232 : 1996 shall not be more than

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

Clause Number	Title and Written Text
	0.3% by total mass of mixture. 15. The agreed binder content for the mixture shall be the target binder content ± 0.6%. Job Mixture Approval 16. Details of the proposed mixture Design from each asphalt mixing plant shall be submitted to the Overseeing Organisation. 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: (i) bitumen penetration reference; (ii) quantities of binder and aggregate; (iii) aggregate source and grading; (iv) proprietary name and generic type of binder modifier; (v) quantity of any binder modifier, including natural or man-made fibres added at the mixer; and (vi) modified binder and mixture data requirements specified in Appendix 7/1. 17. 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. 18. The mixture shall be approved in writing by the Overseeing Organisation as the job standard mixture provided that: (i) the mixture Design proposed complies with sub-Clauses 1 and 3 of this Clause; (ii) information has been submitted in accordance with sub-Clauses 9 and 10 of this Clause; (iii) information submitted in accordance with sub-Clause 16 of this Clause has been approved in writing by the Overseeing Organisation. 19. 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. 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. If carried out off site, trials may be arranged independently or in conjunction with other works.

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

Clause Number	Title and Written Text
	Mixing 20. 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 4987-1:2005 Coated Macadam (Asphalt Concrete) for Roads and Other Paved Areas: Specification for Constituent Materials and for Mixtures, for the penetration reference of the bitumen. This shall be done in such manner that a homogeneous mixture of aggregate, filler, bitumen and additive results. At the time of mixing, the coarse aggregate shall be in a surface dry condition. Transportation 21. The transportation of stone mastic asphalt shall be in accordance with sub-Clause 901.3. Permanent Works 22. When specified in Appendix 7/1, sampling and testing shall be carried out to establish compliance of material laid in the permanent works. Sampling from the Laid Material 23. 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 598-100:2004 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Methods for Sampling for Analysis, Clause 6.3. 24. Six 200 millimetre diameter cores shall be cut, where practical from the centre of the Lane out of material from each mixing plant: (i) from material laid specially in a job mixture approval trial; (ii) from the first 1 kilometre length of stone mastic asphalt from a mixing plant laid in the permanent works; or (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. 25. 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. The cores shall be transported as soon as possible to the laboratory. If the storage period shall be less than 4 days, the storage temperature shall be within the range 0°C to 25°C. 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. Site storage of cores where unavoidable and conditions of transportation shall be as close as shall be practicable to the laboratory conditions. The storage temperature and times, including whilst cores are on the O&M

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

Clause Number	Title and Written Text
	Works Site shall be recorded. 26. Three pairs of 150 millimetre diameter cores shall be cut at the same chainages as the 200 millimetre diameter core. 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. 27. 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. 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. Core holes shall be backfilled with materials compacted to refusal with a circular headed vibrating hammer in layers not exceeding 75 millimetre thick. Hot base material shall be similar to existing pavement. 28. 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. Tests and Calculations 29. For each uncompacted sample the compositional analysis shall be carried out in accordance with BS 598-102:2003 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Part 102: Analytical Test Methods, corrected by any correction factor approved under sub-Clause 16 of this Clause. 30. Each six consecutive 200 millimetre diameter cores of material from the same mixing plant shall form a set of cores on a running basis. 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. 31. For each 150 millimetre diameter core the bulk density shall be determined in accordance with the procedure in BS 598-104:2005 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Methods of Test for the Determination of Density and Compaction, Clause 4. The bulk density at a chainage shall be the mean from the two cores taken at a chainage. 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

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

Clause Number	Title and Written Text
	Maximum Density. The air void content of each pair of 150 millimetre diameter cores shall be calculated to ± 0.1% as follows: 100% x) Air voids content = $\frac{(1 - \rho)}{\rho \text{ Max}} \times 100\ \%$ where: ρ shall be the bulk density in accordance with BS 598-104:2005 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Methods of Test for the Determination of Density and Compaction (Mg/m3); and ρ Max shall be the maximum density in accordance with BS EN 12697-5:2002 Bituminous Mixtures: Test Methods for Hot Mix Asphalt: Determination of the Maximum Density (Mg/m3). Compliance Requirements 32. When determined in accordance with BS 598-102:2003 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Part 102: Analytical Test Methods, the compositional analysis shall demonstrate compliance with following (i) the binder content on analysis shall not differ from the target binder content declared by the Company by more than ± 0.6%; and (ii) the aggregate grading shall not differ from that declared by the Company. 33. Deformation resistance shall be determined in accordance with the requirements of Clause 952 and the deformation values specified in Appendix 7/1. 34. 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. 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. Reporting Results 35. 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. Surface Preparation 36. Existing surfaces shall be prepared in accordance with the requirements of BS 4987-2:2003 Coated Macadam (Asphalt Concrete) for Roads and Other Paved Areas: Specification for Transport, Laying and Compaction, and Series 700 Clauses. Bond coats and tack coats shall be in accordance with Clause 920 except that where the thickness of the stone mastic asphalt shall be less than 20 millimetre,

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

Clause Number	Title and Written Text
	only polymer modified bond coats shall be used. Laying 37. 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. Weather Conditions 38. The weather conditions specified in Clause 945 shall not apply to stone mastic asphalt laid in accordance with this Clause. 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. Temporary Trafficking 39. The Company shall ensure the pavement material has adequately cooled and hardened before it shall be subjected to temporary traffic. 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.
973AR	**Overband Sealing** 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 2. The minimum skid resistance value of the overband material shall be 60 measured by the skid resistance pendulum method. 3. All material removed from the cracks and joints shall be removed to a licensed waste disposal site. 4. All loose material shall be removed off the Unit to a licensed waste disposal site or recycling centre.
974AR	**Pavement Reinforcement** Pavement reinforcement shall be in accordance with the requirements of these O&M Works Requirements.
975AR	**Thin Surface Courses** Thin surface courses shall have Scottish Executive system approval and are listed in Appendix 7/1, Paragraph B – Materials – Scottish Executive System Approved Materials.
1171AR	**Relaying of Existing Footways** Relaying of existing footways shall be carried out with materials compatible with the adjacent areas.

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

Clause Number	Title and Written Text
1172AR	**Siding Out** General 1. Siding out shall normally be carried out at the edge of footways and paved areas but may be extended to more general areas for the breaking up and removal of excessive or hardened dirt or weeds or any other undesirable material on the footway or paved surface. 2. Footways and paved areas may be sided out either manually or mechanically. However the Company shall ensure that any siding out machine it employs does not cause damage to the existing footway or paved area. 3. Arisings shall be disposed of by removal off the O&M Works Site. Footways and Paved Areas 4. Footways shall be sided out up to and including any existing footway edging or to specified width of line. Where the sided out edges do not generally exceed a height of 75 millimetre above the existing footway surface they may be trimmed with a vertical face. Where they generally exceed a height of 75 millimetre above the existing footway surface they shall be trimmed to an approximately 45 degree battered face.
1173AR	**Artificial Stone Paving or Natural Stone Paving and Precast Concrete Paving Flags and Blocks** 1. Before work in any individual existing artificial stone paving natural stone or precast concrete flag/block paved footway commences the Company shall record the dimensions and number of flags to be replaced and take photographic records. These records shall be maintained and made available to the Scottish Ministers at any time when required by other or both. 2. There shall be no payment for flags/blocks broken or damaged in lifting or relaying. The Company shall carefully lift the flags/blocks and set aside. If these flags/blocks shall not be permanently relaid on the same day as they shall be lifted the Company shall stack them in neat piles to a height not exceeding one metre.
1174AR	**Laying of Artificial Stone Paving Natural Stone Paving and Precast Concrete Paving Flags** Paving of artificial stone, natural stone or precast concrete flags shall be reconstructed to match existing as closely as possible and shall be in accordance with BS 7533 Parts 1, 2, 3, 4, 6, 7, 8, 10, 11 and 12.
1179AR	**Timber Edging to Footways** 1. Timber shall be as described in Clause 304 and sized to match existing although the minimum dimensions to be used shall be not less than 75

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

Clause Number	Title and Written Text
	millimetre x 32 millimetre. 2. Timber shall be pressure impregnated with preservative in accordance with Clause 311. 3. Fixing shall be by means of 50 millimetre x 50 millimetre x 300 millimetre pointed pegs at 1.5 metre centres impregnated as in sub Clause 2.
1270AR	**Routine Maintenance of Traffic Signs, Hazard Posts, Illuminated Bollards Marker Posts Telephone Hoods, Refuge Beacons and ECP Cylinders** 1. Traffic signs, hazard posts, illuminated bollards and marker posts shall be maintained in compliance with TD25 of the DMRB and the following sub-clauses. 2. Traffic signs, hazard posts, illuminated bollards and marker posts shall be maintained in a clean condition. Stiff-bristled brushes or abrasive tools or cleaners shall not be used for cleaning reflectorised sign faces A wet non-abrasive detergent cleaner shall be used which has generally neutral acidity/alkalinity in the range pH 6.8 to pH 7.2. Strong aromatic solvents alcohol steam cleaning or high pressure water jets shall not be used. Approved proprietary sign cleaning products may be used. All brushes mops detergents and chemicals shall not damage the surface of the item being cleaned. 3. As part of the cleaning Operations all hazard posts and marker posts shall be straightened and the ground around the base of the post re-compacted. 4. Sign cleaning shall not be carried out when the ambient temperature shall be 2℃ or less and falling or when the Operations are likely to result in the formation of ice on the footway or carriageway. 5. The Company shall ensure that the method used to clean any illuminated unit sign or bollard shall in no way affect the electrical installation to the unit. 6. Leaning ladders against sign faces shall not be permitted. 7. Records of cleaning work carried out shall be maintained in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.

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

Clause Number	Title and Written Text
1272AR	**Routine Maintenance of Sign Lighting Units** 1. The Company shall carry out routine maintenance of sign lighting units to ensure their proper and efficient function. 2. The routine maintenance operation shall include: (i) A thorough cleaning of all photo electric control units' lantern external and internal surfaces and any other components affecting the optical performance of the lantern. The cleaning methods and materials shall be in accordance with Clause 1371AR. (ii) Degreasing lubrication and operation of all toggles wing nuts hinges door locks and lifting gear. (iii) The bracket lantern and lantern optical equipment to be correctly aligned in respect of the sign face and to minimise glare to traffic. (iv) All grub screws locking devices and the like shall be properly tightened in accordance with the manufacturer's written instructions. (v) A report of any damage corrosion or misalignment of posts. (vi) A report of any electrical component showing signs of overheating fracture condensation or tracking. (vii) The removal of the lamps for lantern cleaning purposes. The lamp to be refitted shall be the existing or new as appropriate. (viii) The replacement of lamps. (ix) All new lamps to be marked with date of installation and this date to be recorded centrally. (x) Spraying of all electrical components with a de-moisturising spray. (xi) Visual checking of sign face fixings. Any defects shall be recorded (xii) Checking of conduits for any corrosion and other defects. Any defects shall be recorded. (xiii) Checking of all electrical connections. Any defects shall be recorded (xiv) Checking of all earthing connections. Any defects shall be recorded. (xv) Clearing of debris from around the sign post bases for 1 metre radius 3. The supply shall be isolated at the cut-out for the removal and fitting of lamps. 4. Any lamp fault shall be disposed off in accordance with Clause 1372AR. 5. Records of maintenance work carried out shall be held in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.
1273AR	**Routine Maintenance of Traffic Signals** 1. The Company shall carry out routine maintenance of traffic signals as necessary

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

Clause Number	Title and Written Text
	to ensure their proper and efficient function. 2. The routine maintenance shall include: (i) Compliance with Section 3.1 of TD24 of the DMRB; (ii) Thorough cleaning of all traffic signal lenses internal and external surfaces and any other components affecting the optical performance of the lenses. The cleaning methods and materials shall be in accordance with Clause 1371AR. Cleaning materials shall not cause harmful effects to the range of materials and surfaces to be cleaned; (iii) All grub screws locking devices and the like shall be properly tightened in accordance with manufacturer's written instructions; (iv) A report of any damage corrosion or misalignment of posts; (v) A report of any electrical component showing signs of overheating fracture condensation or tracking; (vi) The removal of the lamps for lantern cleaning purposes. The lamp to be refitted shall be the existing or new as appropriate; (vii) The replacement of lamps; (viii) Identifying faults on any unit and recording; (ix) Spraying of all electrical components with a de-moisturising spray; (x) Visual checking of fixings. Any defects shall be recorded; (xi) Checking of conduits for any corrosion and other defects. Any defects shall be recorded; (xii) Checking of all electrical connections. Any defects shall be recorded; (xiii) Checking of earthing connections. Any defects shall be recorded; (xiv) Clearing of debris from around the post bases for 1 metre radius. 3. The supply shall be isolated at the cut-off for the removal and fitting of lamps. 4. Any faulty lamp shall be disposed of in accordance with Clause 1372AR. 5. Records of maintenance work carried out shall be in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.
1274AR	**Non Routine Maintenance of Traffic Signals** 1. The Company shall carry out non routine inspections on or in:

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

Clause Number	Title and Written Text
	(i) Traffic Signals; (ii) Posts; (iii) Underground cable systems; (iv) Control systems; (v) Any other related electrical equipment; 2. The Company shall attend to emergency call-outs and provide a report to the Scottish Ministers; 3. The Company shall repair random failures of traffic signals as follows. (i) Category 1 repairs - TD24 of the DMRB within 24 hours of the defect being recorded. (ii) Category 2 repairs - TD24 of the DMRB within 6 weeks of the defect being recorded. 4. The Company shall maintain daily records of works progress and details of labour and constructional plant used.
1370AR	**Routine Maintenance of Road Lighting Units** 1. The routine maintenance of road lighting units shall be carried out in accordance with TD23 of the DMRB. The following tasks shall be undertaken: (i) thorough cleaning of all photo electric control units luminaire external surfaces internal surfaces and any other components affecting the optical performance of the luminaire. The cleaning methods and materials shall be in accordance with Clause 1371AR. The Company shall ensure that the internal surfaces and any other components affecting the optical performance of luminaires with an ingress protection rating of IP65 shall not normally be cleaned. Cleaning materials shall not cause harmful effects to the range of materials and surfaces to be cleaned; (ii) the degreasing lubrication and operation of all toggles wing nuts hinges door locks and any raising and lowering gear; (iii) correct alignment of the bracket luminaire and luminaire optical equipment with respect to the carriageway; (iv) tightening of all grub screws locking devices and the like in accordance with the manufacturer's written instructions; (v) a report of any damage or corrosion; (vi) a report of any electrical component showing signs of overheating fracture condensation ingress of moisture or tracking; (vii) the removal of the lamp(s) during the lantern cleaning process. The

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

Clause Number	Title and Written Text
	lamp(s) to be refitted shall be the existing or new as appropriate; (viii) replacement of lamps either by bulk replacement or individually following burn to extinction. (Bulk replacement required on motorways and dual carriageways with a speed limit in excess of 40mph); (ix) marking all new lamps indelibly with date of installation; (x) identifying faults on any lighting unit which fails to operate or undertaking minor repairs or reporting such failure; (xi) spraying of all isolated electrical components with a demoisturising spray; (xii) checking of all electrical connections any defects shall be recorded; (xiii) checking of all earthing connections any defects shall be recorded; (xiv) removal of all debris from 1 metre radius of column base or foundation; (xv) cleaning of the column flange; (xvi) repair of grouting; (xvii) raising and lowering of columns including provision and operation of all necessary specialist equipment; and (xviii) cleaning of all warning and numbering labels. 2. The electrical supply shall be isolated at the cut-out before lamp removal and fitting and all maintenance Operations. 3. Disposal of lamps shall be isolated at the cut-out before lamp removal and fitting and all maintenance Operations. 4. All labour employed on electrical or associated site Operations shall comply with the requirements of these O&M Works Requirements. 5. The Company shall each day prepare a report that details Operations progress labour employed and Constructional Plant used. The format of the report shall be in accordance with these O&M Works Requirements. These records shall be stored in accordance with the procedures in the Quality Plan and made available to the Scottish Ministers at any time.
1371AR	**Cleaning Method and Materials** 1. The cleaning of all lighting equipment shall be carried out using an antistatic water based alkaline cleaner/degreaser and cloths complying with the following requirements: (i) An approved detergent cleaning solution shall be used and shall be non-toxic and cause no handling dangers to personnel; (ii) the cleaning solution shall cause no harmful effects to the range of materials and surfaces to be cleaned; (iii) the cleaning solution shall be highly effective against greasy surface deposits fast acting and suitable for use in cold water and in hard or soft

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

Clause Number	Title and Written Text
	water areas; (iv) the cleaning solution shall not give rise to smearing and it shall not be necessary to carry out rinsing with clean cold water after cleaning; (v) the cleaning solution shall not cause persistent foaming in use and shall not promote the formation of static charges on the equipment surfaces; (vi) the cleaner/degreaser solution shall be diluted with clean uncontaminated water in accordance with the manufacturer's written instructions and shall be applied by means of soft muslin cloths; 2. The cleaning cloths shall be continually cleaned or changed to ensure that no scouring or abrasive action damages the surfaces of the optical components. The cloths shall not be 'wrung out' or cleaned on the working platform of the lift vehicle and quantities of the cleaning solution in open containers shall not be carried on the working platform on the lift vehicle; 3. The Company shall ensure that during the Operations dropping of quantities of water or solution onto vehicles passing below or adjacent to the cleaning vehicle shall not occur. 4. After the use of the cleaning solution all surfaces treated shall be wiped with a clean dry cloth and left reasonably dry.
1372AR	**Lamp Disposal** 1. All lamps for disposal shall be passed through a lamp disposal machine. 2. The discharge into sewers or watercourses of any contaminated water arising from the disposal of lamps shall not be permitted. The lamp disposal machine used shall incorporate a recirculation facility. 3. The Company shall provide a skip for the neutralised lamp debris and a separate skip for the lamp containers the skips shall be located as near as possible to the lamp disposal machine.
1373AR	**Removal of Existing Equipment** 1. The Company shall carefully excavate around and dismantle any existing equipment to be removed. Following removal or any excavation, the excavation shall be reinstated including any pavement, surfacing or landscaping. 2. If the equipment shall not be immediately re-erected the Company shall then transport it to be stored in one of its depots. It shall remain the property of the Scottish Ministers.
1374AR	**Routine Maintenance of High Mast Lighting** Routine maintenance of high mast lighting units shall include all Operations in accordance with Clause 1370AR and in addition maintenance in accordance with Section 6 of Technical Report No 7 'High Mast Lighting' published by The Institution of Lighting Engineers 1996.

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

Clause Number	Title and Written Text
1470AR	**Temporary Overhead Feed to Lighting Unit** 1. The temporary overhead feed to lighting unit system shall consist of conductor wires supported by a steel catenary wire. The minimum height above ground of the span shall, according to the location, be as follows: (i) 10 metres for motorways; and (ii) 5.8 metres for all other roads and road crossings.
1471AR	**Non Routine Maintenance** 1. The Company shall carry out non routine Operations on or in: (i) luminaries; (ii) columns and brackets; (iii) underground cable systems; (iv) feeder pillars and associated switchgear; (v) control systems; and (vi) any other related electrical and lighting equipment. 2. When undertaking the replacement of luminaries columns and brackets as non-cyclic maintenance Operations the Company shall have regard to the aesthetic requirements of Clause 1302 and shall ensure that any replaced items match the existing in both physical appearance and lighting levels. 3. For the purpose of energy efficiency electronic control gear or low loss control gear shall be used in all replacement luminaries. 4. The Company shall attend to Emergency call-outs and prepare a report in a format as Appendix 14/73 as consented to in writing by the Scottish Ministers. The report shall be stored and made available to the Scottish Ministers at any time. 5. Isolation Energising of Power Supplies and Making Safe Electricity Cables (i) All work shall be carried out in accordance with Electricity Council Engineering Recommendation G39. (ii) Any person isolating or energising power supplies shall be "competent" in accordance with G39. (iii) The Company shall inform the Traffic Scotland Networks Operations Manager prior to isolating or energising power supplies to any equipment its uses or for which it shall be responsible. 6. Private Cable Supplies (i) In the event of an Emergency no authorisation shall be required to isolate any cable but the Scottish Ministers shall be notified as soon as possible. (ii) If a communication system supply shall be isolated the Police and the Traffic Scotland Networks Operations Manager shall be informed initially

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

Clause Number	Title and Written Text
	by telephone followed immediately thereafter be a written confirmation. (iii) The isolation or energising of power cable shall be recorded by the Company who shall ensure only one activity shall be being carried out on any cable at this time. (iv) Whenever routine maintenance Operations are being undertaken only the minimum number of feeder pillars shall be de-energised at any one time. (v) Control circuits shall be returned to normal operation on completion of the Operations. (vi) All cable shall be isolated at the main isolator or switched fuse. (vii) The isolation of individual circuits shall be carried out using the mini circuit breaker or fuses within a distribution board. 7. Electricity Company Supplies (i) Where electricity companies supplies are required to be isolated above the cut out only competent persons in accordance with G39 and qualified to 'Electrician' status (see Appendix 14/71) may remove the fuse. (ii) Where electricity company's supplies are required to be isolated below the cut out the Company shall then liaise with the electricity authority before Operations commence (see Appendix 14/75). 8. Special Tools Duplicate sets of special tools keys and handling devices essential for the correct running operation and maintenance of electrical equipment shall be handed to the Scottish Ministers at the Agreement Expiry Date. 9. Fixings for Attachment to Structures Fixings for attachment to Structures shall use a resin fixed replaceable bolt system.
1535AR	**Variable Message Signs** 1. Where the Company provides and installs VMS foundations and associated infrastructure these shall be in accordance with the standards and requirements detailed in these O&M Works Requirements and NDX1001-01. The power cabinet shall be as detailed in NDX1011-01. 2. Any ducting required to pass through the foundation shall comply with the NDX drawing unless otherwise stated in Appendix 15/1.
1536AR	**Traffic Monitoring Units** 1. Traffic Monitoring Units shall be installed in Highways Agency Type 600 cabinets, or as otherwise described in Appendix 15/1, in accordance with the equipment manual 601/602, MCH1540 and MCH1589. 2. Cabinets housing TMU's shall be located at the same longitudinal location as the loop detectors unless the TMU connected to the loop detector is being grouped together with other equipment. The length of feeder cable connecting the loop tails to the TMU shall not exceed the maximum permitted value as

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

Clause Number	Title and Written Text
	given in O&M Works Requirements. 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 shall have a minimum of 3 metre of cable coiled in the chamber Type C adjacent to the Cabinet housing the TMU to allow for subsequent re-terminations. Each feeder shall be individually identified by means of a label.
1537AR	**SRTDb Detectors and SRTDb Equipment** The SRTDb Detectors and Equipment shall be provided and installed as described in the Agreement, the O&M Works Requirements and in accordance with Appendix 15/1.
1538AR	**Driver Information and Lane Control Signalling Equipment** Lane control signalling equipment shall be provided and installed as described in the Agreement, the O&M Works Requirements and in accordance with Appendix 15/1.
1539AR	**Paved Areas, Access Paths, Access Steps and Hardstandings** 1. Paved areas, access paths, access steps, handrails and hardstandings 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 hardstandings appropriate to each new and existing site. 2. The general requirements for paved areas, access paths, access steps and handrails shall be as typically shown on the NDX Drawings. 3. Hardstandings 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. The hardstanding shall be constructed such as to enable grass to grow through the hard standing support mesh and be typically as shown in the NDX Series drawings listed in 1539.3
1540AR	**Required Documentation** 1. TR1100 shall be considered as a general guide to Traffic Scotland's 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's NDS9001 'Employer's Health and Safety File Requirements and Model Forms'. Any significant changes with respect to this requirement shall be agreed with the Scottish Ministers. 2. All final as-built documentation forming all or part of the Traffic Scotland's deliverable documentation shall be provided within 28 days of the award of substantial completion for the works. However it is also required that draft copies of all such required deliverable documentation relating to the Traffic Scotland infrastructure and equipment shall be made available to the Scottish Ministers prior to the commissioning and integration of the Traffic Scotland

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

Clause Number	Title and Written Text
	installation. 3. During the period of the O&M Works, documentation shall be made available to the Scottish Ministers on request, including that described in the O&M Works Requirements and 1504SR. 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 Scottish Ministers shall release the necessary Traffic Scotland documentation to the Company and the Company shall update the documentation. All such updated documentation shall be presented to the Scottish Ministers for approval. 5. The Company shall use a version of AutoCAD™ computer software and Microsoft Word to provide or modify all Traffic Scotland documentation. The final or modified Traffic Scotland documentation shall be provided within 28 days of substantial completion. All soft versions of Traffic Scotland documentation shall be supplied without any software restriction and shall be capable of being modified by the Scottish Ministers. The standards and procedures for all CAD drawings provided under the requirements of this Agreement shall generally comply with NDS1624 or as detailed in Appendix 15/1. All test results and test certificates shall be produced in a suitable software format or by an industry standard software package. 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. Draft issues shall be identified as 'Not for Construction' and use revision numbers (0,1,2,…) whereas approved 'For Construction' drawings and documents shall use issue letters (A,B,C,….). 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 Scottish Ministers. All details shall ensure compliance with the Contractual requirement relating to the 1991 Act.
1541AR	**Journey Time Equipment** Unless otherwise described in Appendix 15/1, where required to be provided by the Company in accordance with the Agreement such equipment and associated Traffic Scotland infrastructure and equipment shall be installed in accordance with NDX1069-00. The detailed specification for such ANPR based equipment is contained within Traffic Scotland document NDS1069.
1570AR	**Maintenance of Motorway Communications Systems** The maintenance of emergency telephones, hazard warning signals, variable message signs, automatic data collection systems and closed circuit television systems is carried out under a separate contract (MOSES). The responsibilities of the

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

Clause Number	Title and Written Text
	Company shall be as specified in these O&M Works Requirements.
1770AR	**Concrete Repairs – General Requirements** **Storage of Materials** Cement and aggregates shall be stored in accordance with Clause 1706. 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. 2. The materials shall not be removed from the store for use until immediately prior to mixing. **Records** 3. As repair work proceeds the Company shall keep records including but not limited to date stamped photographs of the Operations. Records shall be held in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time. **High Pressure Water Jetting** 4. 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.
1771AR	**Removal of Concrete in Areas to be Repaired** **Requirements for the Removal of Concrete** 1. The Company shall cut out and remove concrete from areas specifically identified following inspection and testing. 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 millimetre beyond the rear face of the reinforcement. Where corroded reinforcement is identified the area of concrete removed shall be extended to expose 100 millimetre of uncorroded reinforcement. 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 millimetre or to within 10 millimetre of the reinforcement whichever shall be the lesser. 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 shall be poured. 5. Cut edges shall be abraded by girt blasting or equivalent methods. 6. Concrete shall be removed by employing safe methods and equipment identified by the Company. The concrete shall be removed by the use of suitable hand or mechanical tools

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

Clause Number	Title and Written Text
	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. 7. Where concrete shall be removed by high pressure water jetting a lightweight electric or pneumatic chipping hammer may be used for final trimming of the area broken out. 8. Overbreak of concrete shall be made good using a concrete repair system selected from Clause 1773AR. 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. 10. The site of the Operations shall be kept free of debris or standing water arising from the high pressure water jetting activities. 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 1772AR.
1772AR	**Surface Preparation** **General Requirements** 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. 2. Water for cleaning – only clean cold water which complies with the requirements of BS EN 1008 shall be used for cleaning and rinsing. **Preparation of Surfaces of Reinforcement** 3. 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. 4. Process (i) Where dry blast cleaning shall be employed these shall use a dry air/abrasive system. (ii) Where wet blast cleaning shall be employed a low pressure air/water/abrasive system shall be used. The equipment shall not allow the air/water pressure to exceed 14 bar and shall incorporate a metering device to allow the

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

Clause Number	Title and Written Text
	abrasive quantity introduced to be adjusted from zero to 14 bar. (iii) Within an hour of cleaning the treated reinforcement shall be pressure washed with water for cleaning as above. **Preparation of Surfaces of Concrete** 5. Standard – Concrete surfaces shall be clean and dry and free of cement laitance contaminants and loose friable material. Surfaces 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 existing concrete. 6. Process (i) High Pressure Water Jetting The surface profile after cutting out shall be irregular with aggregate particles projecting above the surrounding concrete matrix. (ii) Hand or Mechanical Tools All "bruised" concrete surfaces to receive repair materials exposed by percussive methods using hand or mechanical tools shall be prepared by low vibration processes such as grit blasting or high pressure water jetting to remove all fractured aggregate particles and expose a sound substrate. **Trials** 7. 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 photographic record for inspection by the Scottish Ministers.
1773AR	**Concrete Repairs** 1. General (i) 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. 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. (ii) Proprietary repair materials and systems shall have an Agreement Board Roads and Bridges Certificate registered with the Scottish Ministers. (iii) Proprietary repair mortars shall be used for repair areas less than 1m² or repair depths less than 30 millimetre deep. Normal flow concrete or high flow concrete or sprayed concrete shall be used for repair areas greater than 1m² or greater than 30 millimetre m

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

Clause Number	Title and Written Text
	deep or as otherwise proposed by the Company and subject to consent in writing by the Scottish Ministers. 2. Repairs using Normal Flow Concrete (i) Cement shall comply with sub-clause 1702.1 (ii) Repair concrete shall be a designed mix for special structural concrete as defined in Clauses 1701.2 and 1705. (iii) Cement content shall be not less than 400 kg/m³ or more than 550 kg/m³. (iv) Maximum aggregate size shall be 10 millimetres. (v) The free water/cement ratio shall not be greater than 0.4. (vi) The minimum 28 day compressive strength class shall be 40N/mm^2. (vii) Alkali – silica reaction shall be controlled as specified in Clause 1704.5 3. Repairs Using Proprietary Repair Mortar (i) Prebatched polymer modified cementitious mortars incorporating a shrinkage reduction agent shall be used. (ii) Mortars for hand screeding of surfaces to be waterproofed shall be sand/cement mortar containing styrene acrylate or styrene butadine polymer bonding admixture. (iii) The free water/cement ratio shall be not greater than 0.4. (iv) The maximum aggregate grain size in the mortar shall be suitable for the depths of repair required. (v) Water required to mix repair mortars shall comply with the requirements of BS EN 1008. (vi) The cement content shall be not less than 400 kg/m³ or more than 550 kg/m³. (vii) The maximum total chloride content expressed as % of chloride ion by mass of cement of the materials shall not exceed 0.3%. and for repairs to prestressed or heat cured concrete shall not exceed 0.1%. Calcium chloride or admixtures containing chloride salts shall not be used (viii) The minimum 28 day strength of the mortar shall be 40 N/mm². (ix) Alkali-silica reaction shall be controlled as specified in sub-Clause 1704.5 4. Delivery and Storage of Material (i) The Company shall supply with each batch of the material delivered to the Site of the Operations certificates furnished by the supplier stating: (a) the polymer used; (b) evidence that the chloride contents are less than specified in sub-Clause 5(vii) of this specification; (c) the content of sodium oxide equivalent in the mortar;

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

Clause Number	Title and Written Text
	(d) maximum shelf life; and (e) handling arrangements; (ii) 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 (iii) The materials shall not be removed from the store for use until immediately prior to mixing. 5. Placing Repair Mortar (i) 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. (ii) The repair mortar shall be suitable for the purpose intended i.e. for soffits or vertical surfaces as appropriate. (iii) Repair mortar shall not be applied when the temperature of the surface to be repaired falls below 5°C. (iv) The material shall be incorporated within 1 hour of mixing or such lesser period as stated in writing by the manufacturer. (v) 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 5°C by artificial means if necessary. 6. Surface Finish to Repair Mortar (i) Repair mortar shall be float finished to produce a dense smooth uniform surface free from float marks to the specified line and level. 7. Repairs Using Proprietary High-Flow Repair Concrete Materials (i) Materials for proprietary high-flow repair concretes shall comply with the specification requirements in BS 8500-1:2006 Concrete: Complementary British Standard to BS EN 206-1: Method of Specifying and Guidance for the Specifier. (ii) Water shall be clean potable water and shall comply with the requirements of BS EN 1008. (iii) Cement content shall be not less than 400 kg/m^3 or more than 550 kg/m^3. (iv) Alkali-silica reaction shall be controlled as specified in Clause 1704.5. (v) 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.

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

Clause Number	Title and Written Text

(vi) Aggregate shall be well graded with the maximum size not exceeding 8 millimetre except when pumping is to be employed when the maximum size shall not exceed 6mm and shall comply with sub-Clause 1702.2.

(vii) 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.

(viii) 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.

(ix) Microsilica content shall not exceed 5% of the mass of the cement. Microsilica shall comply with Table 17/70.

TABLE 17/70: Microsilica Cement

Item	Limit (by mass)
Silica content ($Si0_2$)	Minimum 85%
Alkali content ($Na0_2$)	Maximum 2%
Carbon	Maximum 2%
Proportion passing 50 micron sieve	Minimum 99%

(x) Water shall comply with the requirements of BS EN 1008.

(xi) The specified minimum 28 day strength of the concrete shall be not less than 40 N/mm². The maximum free water/cement ratio shall not exceed 0.4.

8. Delivery and Storage of Material

(i) Records shall be kept of each batch of material delivered to the site of the Operations 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;

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

Clause Number	Title and Written Text
	(h) cement content; (i) combinations and additions used; and (j) the equivalent sodium oxide content; (ii) Containers shall be damp proof and readily emptied of their contents. (iii) Containers shall be marked with the following information: (a) material identification; (b) batch reference number; (c) formulator's name; (d) net weight; and lifting arrangements and storage specific requirements (e) any warnings or precautions concerning the contents; (iv) The material shall be stored in a dry environment free from extremes of cold and heat. (v) Material shall not be older than 3 months or lesser period specified by the formulator when used in the Operations. (vi) The materials shall not be removed from the store for use in the Operations until immediately prior to mixing. 9. Formwork Site Mixing Placing and Curing (i) Formwork shall be Class F2 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. (ii) 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: (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 Operations within ± 2% of the agreed content. (b) No extra water shall be added after the original mixing. (c) The material shall be incorporated in the Operations 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. (d) The material shall not be mixed or placed in the Operations at ambient temperatures lower than 5℃ or where the surface temperature of the concrete in the repair void is less than 5℃. (e) The concrete when placed shall have a temperature of not less

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

Clause Number	Title and Written Text
	than 5°C and not more than 20°C. (f) The surface temperature of the concrete shall be maintained at not less than 5°C until the concrete reaches a strength of 10 N/mm² as determined by tests on cubes cured under similar conditions to the structural concrete. Heat shall not be applied direct to any concrete. (g) Repair concrete shall not be placed against other concrete which has been in position for more than 30 minutes unless a construction joint shall be formed in accordance with Clause 1710. In addition, the joint surface shall be saturated for a minimum of 2 hours before concrete shall be placed against it. When repair concrete has been in place for 4 hours no further concrete shall be placed against it for a further 20 hours. (h) Vibration shall not be used. The side shutters shall be tapped lightly with a hammer to expel surface air voids. (iii) 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 manufacturers written instructions and not before 14 days as described in Clause 1709. Curing membranes shall not be used. (iv) When the mix proportions have been determined no variations shall be made in the manufacturer supply mix proportions or method of mixing of the material. 10. Approval Tests (i) Before Operations 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. (ii) 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 Operations. The composition shall not be varied throughout the course of the tests and the material shall be obtained from the same batch. (iii) The tests fall into two categories; flowability and compressive strength. (iv) The flowability tests shall demonstrate: (a) flow characteristics in a trough at 5°C and 20°C as specified in

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

Clause Number	Title and Written Text
	Note 1 below; and (b) flow characteristics in a simulated soffit repair at 5℃ and 20℃ as specified in Note 2 below. 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 shall be below 750 millimetre in 30 seconds without signs of segregation or bleeding. Note 2: The flow characteristics of the concrete in a simulated soffit repair shall be tested in accordance with BD27 of the DMRB. 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 100mm 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. 11. Compressive Strength Tests (i) Compressive strength tests shall comply with conformity testing requirements in BS 8500-2:2006 (Concrete: Complementary British Standard to BS EN 206-1: Specification for Constituent Materials and Concrete) Section 10. (ii) Compressive strength tests shall be carried out to determine the compressive strength of the concrete at 5℃ and 20℃. (iii) Test cubes shall be made in 100 millimetre metal moulds to BS EN 12390-1:2000 (Testing Hardened Concrete: Shape, Dimensions and Other Requirements for Specimens and Moulds). 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 in accordance with BS EN 12390-2:2000

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

Clause Number	Title and Written Text
	(Testing Hardened Concrete: Making and Curing Specimens for Strength Tests.) (iv) 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 in lower than the specified value and the difference between the highest and lowest values shall be not more than 20% of the average. Identity testing where required shall be carried out in accordance with Clause 1707. 12. Batch Acceptance Tests Each batch of material delivered to the site of Operations shall be tested as follows: (i) the material shall be taken at random from one or more containers from the same batch; (ii) flow trough tests shall be carried out as specified in Note 1 of sub-Clause 10 above at 20℃; and (iii) compressive strength tests shall be carried out as specified in sub-Clause 11 above at 20℃. 13. Site Tests (i) Site tests shall be carried out to monitor: (a) Flowability; and (b) Compressive strength. (ii) The flowability of a sample of fresh concrete shall be determined in a trough as specified in sub-Clause 10 Note 1. (iii) The gain in strength of the repair concrete shall be monitored by testing cubes cured alongside the repaired areas at ambient temperature. (iv) For each days production of repair concrete six 100mm cubes shall be made in accordance with sub-Clause 11 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 2 cubes shall be retained to be tested at 28 days. 14. **Repairs Using Proprietary Sprayed Concrete** Materials

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

Clause Number	Title and Written Text

(i) The proprietary material shall be pre-weighed and pre-mixed at a location off the site of the Operations.

(ii) Cement shall comply with Clause 1702.

(iii) Alkali-silica reaction shall be controlled as specified in Clause 1704.5.

(iv) 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.

(v) Combinations and additions may comprise pulverised fuel ash ground granulated blast furnace slag microsilica and plasticisers.

(vi) Calcium chloride or admixtures containing chloride salts and expansion agents shall not be used.

(vii) The maximum sulphate content shall comply with sub-Clause 1704.6.

(viii) Material shall be capable of being applied to a thickness of 100 millimetre 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 F2) without detrimental effects.

15. Performance Characteristics

The proprietary material shall have performance characteristics as detailed in Table 17/71 which are to be verified by an independent testing authority.

TABLE 17/71 Performance Characteristics

TEST	PERFORMANCE
Bond Strength to BS EN 1542:1999 Products and Systems for the Protection and Repair of Concrete Structures: Test Methods: Measurement of Bond Strength by Pull-off.	greater than 1.0 N/mm2
Characteristic strength of cores (28 days) to BS EN 12504-1:2000 Testing Concrete in Structures: Cored Specimens: Taking, Examining and Testing in Compression.	40 N/mm2
Tensile splitting strength (28 days) to BS EN 12390-6:2000 Testing Hardened Concrete: Tensile Splitting Strength of Test Specimens.	greater than 2.4 N/mm2
Static modulus of elasticity to BS EN 13412:2006 Products and Systems For the Protection and Repair of Concrete Structures: Test Methods: Determination of Modulus of Elasticity in Compression.	27000 ± 3000 N/mm2

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

Clause Number	Title and Written Text

Shrinkage to BS EN 12617-4:2002 Products and Systems for the Protection and Repair of Concrete Structures: Test Methods: Determination of Shrinkage and Expansion	less than 0.002%
Coefficient of thermal expansion to BS EN 1770:1998 Products and Systems for the Protection and Repair of Concrete Structures: Test Methods: Determination of the Coefficient of Thermal Expansion.	8 to 12 x 10-6/℃
Coefficient of chloride ion diffusion to BS EN 13396:2004 Products and Systems for the Protection and Repair of Concrete Structures: Test Methods: Measurement of Chloride Ion Ingress	To be agreed with the Scottish Ministers

16. Delivery and Storage of Material

(i) Records shall be kept of each batch of material delivered to the Site of the Operations and shall include:

(a) formulator's name and address;

(b) formulator's agent's name and address where applicable;

(c) batch reference number size of batch and number of containers in the delivery;

(d) date of manufacture;

(e) evidence that the chloride contents are less than specified in sub-Clause 14(iv) above;

(f) details of the significant rock components contained in the aggregates;

(g) cement content; and

(h) additives used

(i) The sodium oxide equivalent content.

(ii) Containers shall be damp proof and readily emptied of their contents.

(iii) Containers shall be marked with the following information:

(a) material identification;

(b) batch reference number;

(c) formulator's name;

(d) net weight – lifting arrangements and specific storage requirements; and

(e) any warnings or precautions concerning the contents.

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

Clause Number	Title and Written Text
	(iv) The material shall be stored in a dry environment free from extremes of cold and heat. (v) Material shall not be older than 3 months or lesser period specified by the formulator when incorporated in the Operations. (vi) The materials shall not be removed from the store for use in the Operations until immediately prior to mixing. 17. Trial Mixes Practical tests shall be carried out on the site of the Operations by constructing test panels to confirm the suitability of the mix for the Operations. 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 Operations. 18. Procedure Trials (i) Before work commences on the site of the Operations procedure trials shall be carried out to pre-qualify the nozzlemen proposed for use on the Operations. Nozzlemen who have not been pre-qualified shall not be permitted to apply sprayed concrete on the Operations. (ii) Each nozzleman shall carry out procedure trial panels. The procedure trial panels shall have minimum dimensions of 750 millimetre x 750 millimetre x 100 millimetre deep and shall be made of plywood with 45° sloped edge to permit rebound to escape. (iii) 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 27(ii) of this Clause. (iv) One procedure trial panel shall be carried out by each nozzleman proposed for use on the Operations using each proposed mixture proportion at each proposed orientation i.e. horizontal overhead and the like. (v) The 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. (vi) No sprayed concrete shall be carried out on the Operations until the procedure trial testing requirements have been met. 19. Surface Preparation for Sprayed Concrete (i) Sound surfaces which are to receive sprayed concrete shall be thoroughly cleaned and roughened by grit blasting or high pressure water jetting.

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

Clause Number	Title and Written Text
	All 'bruised' concrete surfaces to receive sprayed concrete exposed by percussive methods using hand or mechanical tolls shall be prepared by low vibration processes such as grit blasting or high pressure jetting to remove all fractured aggregate particles and expose a sound substrate. (ii) Grit blasted areas shall have sprayed concrete applied within 48 hours or shall be reblasted. (iii) 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. 20. Outline Definition (i) 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. (ii) Guide wires shall be installed tight and true to line and in such a manner that they may be easily tightened. 21. Mixing Sprayed Concrete (i) Sprayed concrete shall be mixed in a batch type mixer complying with the requirements of BS1305:1974 Specification for Batch Type Concrete Mixers 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. (ii) The temperature of water and cement when added to the mix shall not exceed 60℃ and 65℃ respectively. (iii) Water used in sprayed concrete shall comply with the requirements of BS EN 1008. 22. Reinforcement 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 2 per m^2. The fabric shall be spaced at not less than 25 millimetre from the finished surface of the concrete. 23. Transport and Placing Sprayed Concrete (i) No concrete shall be sprayed in air temperatures less than 5℃ or onto a surface temperature less than 5℃. Surfaces shall be free from standing water. Surfaces shall be free from standing water

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

Clause Number	Title and Written Text
	(ii) 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. (iii) Sprayed concrete shall be applied under sufficient pressure as to give a dense and homogeneous covering to the surface in one or more layers of a thickness compatible with the mix Design constituent's position of reinforcement and plane of application to ensure the placed concrete does not slump or sag. (iv) Adequate precautions shall be taken to ensure that sprayed concrete rebound shall not be incorporated in the finished work and that any previously deposited hardened rebound which may prevent a proper bond or encasement shall be removed from reinforcement. (v) Adequate protection shall be given to the nozzle and application surface during high winds. (vi) The final coat shall be hand screeded to a Class U3 finish in accordance with sub-Clause 1708.4. 24. Fibre Reinforced Sprayed Concrete (i) The weight of steel and/or composite fibres shall not exceed 5% 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. (ii) Unless otherwise stated elsewhere in the Agreement a final 15 millimetre thick coat of unreinforced sprayed concrete shall be applied over the whole exposed surface to cover exposed fibres. (iii) The gun and nozzle shall be electrically earthed. 25. Construction Joints 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 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. 26. Curing of Sprayed Concrete (i) Freshly sprayed concrete shall be protected from rain or water until the surface shall be sufficiently hard to resist damage. (ii) Immediately after placing and for 14 days thereafter sprayed concrete shall be protected against harmful effects of weather including rain rapid

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

Clause Number	Title and Written Text
	temperature changes and frost and from drying out. Curing membranes shall not be used. (iii) Impregnation in accordance with Clause 1709 may be carried out after 14 days. 27. Production Testing of Sprayed Concrete (i) One production test panel shall be carried out for each nozzle orientation for each day of sprayed concrete production or every 15m³ of sprayed concrete whichever is the lesser. (ii) Sprayed concrete production test panels shall be made with dimensions 450 millimetre x 450 millimetre x 100 millimetre thick with 45° 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 BS EN 12390 or BS 1881. They shall be tested in a UKAS accredited laboratory. Records shall be maintained of all tests and stored at a suitable location. (iii) Routine tests shall be carried out by the Company on the finished sprayed concrete. These shall consist of taking 25 millimetre or 100 millimetre diameter 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. 28. Resin Injection Repairs Preparation of Surfaces Around Cracks (i) The concrete surface at least 50 millimetre 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 50mm beyond the end of the crack or until the crack becomes too narrow to warrant resin injection. (ii) 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 watercourse shall not be contaminated and that run-off shall be collected and disposed of in

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

Clause Number	Title and Written Text
	a safe manner. Moisture in Cracks (iii) 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. (iv) If for whatever reason the crack becomes damp before it shall be resin injected no further work shall be permitted until the temporary crack sealant shall be removed and the crack blown through again with dry hot air. (v) 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. Resin Injection (vi) 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 shall be less than 5℃. (vii) 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 millimetre. (viii) 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 shall be locked off. (ix) The injected crack shall be left undisturbed for a period of at least 24 hours to allow the resin to harden. (x) When the resins are sufficiently cured the cracks and any resin spillages shall be cleaned from the face of the concrete. Proving Tests When the resin has set two 20 millimetre diameter proving cores shall be taken to he 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. 29. Sealing of Cracks in Concrete Bridge Decks 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 28, above. Application of Sealer

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

Clause Number	Title and Written Text
	(i) The sealing resin shall be a low viscosity polyester epoxy or acrylic polymer which shall be compatible with any proposed waterproofing system. (ii) The material shall be applied by pouring through a fine nozzle directly into the crack or into preformed dams. (iii) The injected crack shall be left undisturbed for a period of at least 24 hours to allow the resin to harden. (iv) When the resins are sufficiently cured the cracks and resin spillages shall be cleaned to the face of the concrete.
1774AR	**Foamed Concrete Fill to Structures and Backfilling to Drainage Trenches** 1. Foamed concrete fill to arches or bridge decks shall be density 1400 – 1600 kg/m³. Minimum cement content shall be 350 kg/m³. The maximum free-water/cement ratio shall be 0.4. The minimum cube compressive strength shall be 8 N/mm². 2. Foamed concrete fill to drainage trenches shall comply with sub-Clause 1 above.
1970AR	**Protection of Steelwork Against Corrosion** **General** 1. All paint systems shall be formulations which have been registered by the manufacturer with the Scottish Ministers on or before the date entered by the Company in Part 2 of Form BE/P2. Maintenance painting of steel highway Structures and painting of new steel elements within a maintenance scheme shall comply with Volume 5 Section 2 Part 4 of the MCHW as amended by the following: 2. Amendments to Clause 5002 (i) Delete sub-Clause 6(I) and insert the following 6 (i) Form BE/P2 (Maintenance) Paint System Sheet Form BE/P5 Paint Data Sheet For each order issued for maintenance painting the Company shall prepare a partially complete Form BE/P2 (Maintenance) Paint System Sheet which shall be submitted for information to the Scottish Ministers. The Company shall then complete and return Form BE/P2 which shall be subject to consent in writing by the Scottish Ministers. Simultaneously the Company shall forward a copy of the paint manufacturer's data sheet (Form BE/P5 Paint Data Sheet for each of the paints to the Scottish Ministers. (ii) Delete sub-Clause 7 and insert the following 7 All paints forming any one protective system shall be obtained from the

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

Clause Number	Title and Written Text
	manufacturer named in the Form(s) BE/P2 (Maintenance) Paint System sheet submitted by the Company and consented to in writing by the Scottish Ministers unless there are exceptional reasons and with the written consent of the Scottish Ministers the source(s) of supply shall not be changed during the course of the work. 3. Clause 5009 Surface Preparation and Protective Systems – Particular Requirements (i) Particular requirements for surface preparation and protective systems are as specified in Appendix 19/70 as an alternative to Examples 1 to 7 in Volume 1 Series 5000 of the MCHW. (ii) The high build epoxy polyurethane paint systems included in Appendix 19/70 may also be used in addition to those examples in Volume 1 Series 5000 of the MCHW.
2070AR	**Replacement of Bridge Deck Waterproofing** **Removal of Existing Waterproofing** 1. The existing surfacing shall generally be removed by cold-milling (planing) in accordance with Clause 709. Small areas may be removed using other suitable methods. 2. The existing bridge deck waterproofing or protective layer comprising the last 30 millimetre above the concrete substrate shall be carefully removed to avoid damage to the concrete. In exceptional cases for particularly difficult materials method statements shall be submitted for written consent of the Scottish Ministers before these techniques shall be used. 3. The final removal of the remaining waterproofing or primer to expose the concrete substrate shall be by recoverable abrasive blast cleaning systems. 'Open' blast cleaning shall not be permitted except on vertical surfaces or intricate details. **Inspection and Testing** 4. Prior to application of the new waterproofing the deck concrete shall be examined by the Company to determine the following: (i) if any testing is required (in accordance with the requirements of Series 2300, Volume 1 of the MCHW); (ii) if additional deck preparation is required; and (iii) if structural concrete repairs are required (in accordance with the requirements of Series 1700, Volume 1 of the MCHW). **Additional Preparation of Bridge Deck** 5. Additional work required in the preparation of the bridge deck prior to the application of the new waterproofing shall include but shall not be limited to the following:

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

Clause Number	Title and Written Text
	(i) removal of surface defects such as screed marks and footprints; (ii) removal of formwork/falsework anchors from the original construction which have inadequate cover; (iii) sealing of cracks greater than 0.25 millimetre; (iv) repairs to or forming of fillets and chases to facilitate waterproofing; and (v) additional preparation of the surface of concrete deck to an acceptable standard for the application of the waterproofing membrane. 6. Any work required in addition to the items listed above such as removal of chloride contaminated concrete or delaminated concrete and concrete repairs considered necessary by the Company shall be deemed to be structural concrete repairs and shall be undertaken in accordance with Series 1700. **Replacement of Bridge Deck Waterproofing** 7. The replacement waterproofing system shall be in accordance with Clauses 2001 to 2003 and be installed in accordance with Clause 2005.
2071AR	**Repairs to Existing Waterproofing** 1. Repairs shall be carried out to the existing waterproofing only where the existing system has a current British Board of Accreditation -Roads and Bridges Agrément certificate showing compliance with the requirements of BD47 of the DMRB 'Waterproofing and Surfacing of Concrete Bridge Decks' or for other spray applied waterproofing with the written consent of the Scottish Ministers. Repairs shall be carried out using systems compliant with BD47 of the DMRB and compatible with the system to be repaired. The waterproofing shall be applied in accordance with the method statement included with the Agrément certificate for the particular system. 2. All waterproofing repairs shall be carried out in accordance with Clause 2070AR. 3. Where the existing waterproofing shall be a spray applied system for repair areas of less than $2m^2$ at any one location a hand-applied system equivalent to and compatible with the existing may be used subject to the written consent of the Scottish Ministers. 4. The repair areas within the carriageway width shall have a protective layer incorporated into the waterproofing system in accordance with sub-Clause 2003.2. 5. Details of current forms of waterproofing systems in use on the trunk road network shall be provided in Appendix B of the TRBDB User Manual (Table 46, 47 and 48). Manufacturer's details for deck waterproofing shall be held for individual Structures within the TRBDB where records shall be known.
2370AR	Details of the basic types of bridge expansion joints shall be as provided in Appendix 23/70.

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

Clause Number	Title and Written Text
2371AR	**Replacement of Bridge Deck Expansion Joints and Gap Sealants** 1. Replacement repair and alterations to expansion joints shall be subject to consent in writing by the Scottish Ministers. Such work shall comply with the requirements of Clauses 2301 to 2304 and BD33 and BA26 of the DMRB (Volume 2, Section 3). It may comprise replacement of a complete joint or essential maintenance of a joint where complete or partial replacement is not considered necessary. Joints shall be installed in accordance with the manufacturer's written instructions. 2. Existing joints (including transition strips) shall be carefully broken out or unbolted and removed. The adjacent carriageway hardshoulder hardened verges and central reservations shall be saw cut to provide neat vertical edges. The location of any existing services or ducts shall be determined prior to breaking out or saw cutting and measures shall be taken to protect them. 3. Existing flashings and sealants shall be removed. Where appropriate, existing intact waterbars may be retained. Existing galvanised plates in buried joints shall be set aside for possible re-use. 4. The existing surfacing and additional protective layer adjacent to the expansion joint shall be removed to expose the waterproofing membrane. The waterproofing shall be carefully cut back to expose the concrete surface which shall be prepared to receive the expansion joint system. Continuity of the waterproofing membrane shall be provided by bond or lap between the waterproof membrane and the expansion joint. 5. Existing holding down bolts and fixings shall be protected if required for installation of the proposed replacement joint. If they shall not be required they shall be removed or ground flush with the surface of the deck concrete. 6. The concrete substrate shall be examined by the Company for defects. Where required testing shall be carried out and concrete repairs undertaken in accordance with Series 1700 and this Appendix 0/1. 7. If the joint shall not be completely replaced material and components shall form the same system as the existing joint where possible. 8. Where considered necessary by the Company and subject to approval of the Scottish Ministers vertical drain holes shall be installed adjacent to expansion joints. The drain holes shall comprise a down pipe fixed into holes cored through the superstructure of minimum internal diameter 40 millimetre and a conical entry funnel with cap to allow water to enter the funnel but prevent blocking of the

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

Clause Number	Title and Written Text
	waterway by the surfacing. The cap and funnel shall be covered with a sheet of permeable membrane prior to surfacing. 9. Where gap sealant shall be replaced the existing sealant and deteriorated joint filler shall be raked out to leave clean surfaces. Where possible, new joint filler, replacing that removed, shall be installed prior to re-sealing the gap. Where it shall not be possible to replace joint filler the joint shall still be sealed. 10. All debris arising from Operations shall be removed off the Site.
2372AR	**Asphaltic Plug Joints** Installation 1. All joints shall have a valid Approval/Registration in accordance with Appendix E of this Specification. 2. The joints shall be installed in accordance with the manufacturer's written instructions which shall comply with the terms of the certification. 3. All batches of materials delivered to the Site shall have a certificate of compliance stating: (i) The binder compound and its properties including Penetration Value Softening Point (Ring and Ball) and Flow Resistance; (ii) The specific type and density of aggregate/stone used in the asphaltic plug matrix; (iii) The quantities and weights of binder and aggregate used at each joint location.
2470AR	**Repointing of Brickwork Blockwork and Stonework** 1. Masonry joints in brickwork and blockwork to be repointed shall be ground out to a depth of 25 millimetre to give adequate key. For natural stone masonry and historic structures power tools shall not be used. All unsound mortar at a greater depth than this shall be removed until sound mortar shall be encountered. Apparatus used for grinding out shall be fitted with a depth gauge to allow control of rake out depth. 2. All detritus shall be removed by low pressure water jetting. Repointing shall be carried out by trowel or purpose made repointing keys or by using injection techniques. 3. Cement mortar designation shall be selected based on Clause 2404 and 2417 and Table 24/5. Lime mortar designation shall be selected based on Clause 2476AR Table 24/7, Table 24/8 and Table 24/9.

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

Clause Number	Title and Written Text
	Water for mortars shall be clean and free from impurities. 4. The specification of mortars used in the repair of masonry construction shall be prepared with reference to the existing mortar in the remaining construction and appropriate adjustment shall be made to take account of existing Site conditions and availability of materials. For historic brick Structures and all stone masonry Structures, the mortar specification shall be prepared by the Company in conjunction with specialist advice based on mortar analysis and evaluation carried out on the mortar samples from the existing construction. Lime mortar is extensively used in the construction of masonry road Structures. Mortars used for repairs and repointing shall match the appearance and characteristics of existing materials as closely as possible. The choice of lime mortar to be used shall generally be influenced by the nature of stone the nature of any surviving lime based materials and the environmental conditions or exposure of the Site. 5. Samples of mortar pointing at locations shall be provided for reference and comparison for the duration of the work. Mortar for pointing shall be required to match the standards and details of the samples. 6. Adequate protection of repair works and pointing from sun wind rain and frost shall be provided until cured. 7. For historic Structures, power tools shall not be used to remove mortars. Damage to stone work shall be avoided. If any significant voids are present the Company shall where necessary wedge and pin up loose stones. In deep cavities, work shall be carried out in layers of not more than 35 millimetre allowing the material to dry before placing the next layer and allow 24 hours between layers. Deep voids shall be filled to within 35 millimetre or twice the width of the joint back from the finished wall face to allow sufficient depth for pointing.
2471AR	**Replacement of Precast Concrete Copings** 1. Broken precast concrete copings shall be removed together with the old mortar bed and any loose and friable mortar in the joints of the brickwork below the coping. All debris shall be removed off the O&M Works Site. 2. New precast concrete copings shall be laid on a mortar designation (i) (see Clause 2404) bed to a line and level to match existing copings.
2472AR	**Rebedding Existing Precast Concrete or Stone Masonry Copings** Precast concrete or stone masonry copings shall be removed and stored for re-use. The existing mortar bed shall be completely removed together with any loose and

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

Clause Number	Title and Written Text
	friable mortar in brickwork joints below the coping. All debris shall be removed off the O&M Works Site. Copings shall be relaid on a mortar designation (i) (see Clause 2404) or where wall construction contains lime mortar to Clause 2476AR. Rebedding or existing precast concrete or stone masonry copings shall match existing line and level.
2473AR	**Replacement Tiling** 1. All damaged or defective tiles adhesive mortar loose concrete grout and the like shall be broken out and removed off the O&M Works Site. Replacement tiles shall be in accordance with BS5385 Part 1 1995 Wall and Floor Tiling: Code of Practice for the Design and Installation of Internal Ceramic and Natural Stone Wall Tiling and Mosaics in Normal Conditions, Wall and Floor Tiling. 2. Any areas of the underlying concrete surface which have been damaged shall be made good as detailed in Series 1700 of the Specification. Repair materials shall be compatible with the tile adhesive to be used. 3. The edges of retained existing tiles shall be clean and free of any grout. 4. Replacement tiles shall be glazed ceramic of a colour size and pattern to match existing tiles. They shall be installed to a line and level to match existing tiling with the joints grouted to match the existing grout colour and pattern. New tiling shall be cleaned of excess grout when the grout to the joints has hardened.
2474AR	**Rebuilding of Defective Masonry** 1. Bricks concrete blocks and stones designated for reuse in the repairs or reconstruction of existing masonry including bridge road restraint systems shall be taken down and set aside for reuse or removed for storage. Where road restraint systems have been damaged the Company shall include for retrieval of displaced bricks, blocks and stones from their position after displacement. This may include recovery from watercourses and rail tracks. The Company shall include for consultation with the appropriate bodies to obtain agreement on access and method of working for rebuilding. For scheduled ancient monument Structures consultation and appropriate approvals shall be obtained from Historic Scotland. For repairs to listed Structures consultation and appropriate approvals shall be obtained from the local planning department. The Company shall set up lines of communication and processes to enable timescales for rebuilding to be achieved.

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

Clause Number	Title and Written Text
	2. The Company shall include in its procedure for approval by Historic Scotland the following steps to ensure early consent: (i) Inform Historic Scotland - Ancient Monument Division of damage to a scheduled ancient monument Structure and apply for Scheduled Monument Consent for repair works with cost estimates using new stone and sketch drawings of proposed repairs. Record photos of damaged areas shall be submitted at this point. (ii) Carry out assessment of retrieval of stones from river beds and otherwise and notify Historic Scotland of outcome. (iii) Send stone samples to British Geological Survey's for best matching replacement stones. Copy report to Historic Scotland. (iv) Meet Historic Scotland on site with draft proposals for repair. (v) Agree final repair scheme and submit all information to Historic Scotland for final comment. (vi) Historic Scotland issue Scheduled Monument Consent. 3. The Company shall include in its procedures for the liaison and approval by local planning departments any proposals for repairs and any repair works or alterations required due to damage to listed historic Structures other than scheduled ancient monuments which shall be covered by sub-Clause 2 of this Clause. 4. All mortar from the faces of the bricks concrete blocks or stone shall be removed before incorporating into the works. Recovered bricks, blocks and stones from watercourses and other situations where the surfaces have been discoloured or contaminated shall be cleaned and allowed to dry before incorporating into the reconstruction works. 5. Where new replacement parapet stones are required for listed/ancient monument Structures they shall be of matching stone based on British Geological Survey's analysis of stone samples from the structure. 6. New materials to be incorporated into existing brick concrete block or stone masonry construction shall match the remaining construction with regard to appearance and physical characteristics subject to the current O&M Works Site conditions and availability of materials.
2475AR	**Lime Putty** 1. Lime putty shall be traditional non-hydraulic slaked lime putty to comply with BS 890:1972 Specification for Building Limes, with a density of not less than 1.35kg/ltr. 2. Portland or other modern cements shall not be used. Water from mortars shall be clean and free from impurities which would adversely affect the mortar. 3. The Company shall ensure that personnel responsible for the supervision of the production of mortars and the like shall be suitably experienced in the techniques of preparing and using traditional lime mortars. Where ready made mortars are being purchased the Company shall obtain evidence that the

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

Clause Number	Title and Written Text
	supplier shall be suitably experienced in the techniques of production of traditional lime mortars. The Company shall comply with BS8000:2001 Part 3 Workmanship on Building Sites: Code of Practice for Masonry, in terms of standards of workmanship and Site practice.
2476AR	**Hydraulic Lime Mortars** 1. Hydraulic lime for preparation of lime mortars to be used for building, rebuilding, grouting, mechanical pointing and hand pointing shall be Natural Hydraulic Lime NHL5 (eminently hydraulic), or Natural Hydraulic Lime NHL 3.5 (moderately hydraulic) or Natural Hydraulic Lime NHL2 (feebly hydraulic) and shall conform to BS EN 459-1:2001 Building Lime: Definitions, Specifications and Conformity Criteria. Non-hydraulic lime shall conform to BS EN 459-1:2001 Building Lime: Definitions, Specifications and Conformity Criteria. 2. Proportions of hydraulic lime to sand shall be based on Table 24/7 according to the required mortar durability designation defined in BS 5628 'Code of Practice for Use of Masonry' and as specified in Appendix 24/1.

TABLE 24/7 Typical Hydraulic Lime Mortar /Durability Designation

Constituents	Mix Reference/Durability Designation										
	M1 10	M2 9	M3 8	M4 7	M5 6	M6 5	M7 4	M8 3	M9 2	G1 5-6	G2 2-4
NHL5 Eminently Hydraulic	1	1	1							3	2
NHL3.5 Moderately Hydraulic				1	1	1					
NHL2 Feebly Hydraulic							1	1	1		
Lime Putty										1	1
Brick Powder (Reactive)/ Pozzolanic additive		1/2		1/2		1/2	1/2				
Well Graded Sharp Sand	1 1/2	1 1/2	2	1 1/2	2	2 1/2	1 1/2	2	2	10	9
Soft Sand	1/2	1/2	1/2	1/2	1	1	1/2		1/2		
Porous Limestone or Brick aggregate		1/2	1/2	1/2		1/2	1/2	1	1 1/2		
Lime Mortar Mix Proportions by Volume	1:2	1:2 1/2	1:3	1:2 1/2	1:3	1:4	1:2 1/2	1:3	1:4	3:1:20	2:1:9

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

Clause Number	Title and Written Text
	3. Hydraulic lime mortar shall be mixed as described below unless otherwise described in Appendix 24/1. Mortar shall be mixed thoroughly by hand or mechanical until its colour and consistency are uniform. The constituent materials shall be accurately measured. Mortar shall be made in small quantities only as and when required Mortar which has begun to set or has been mixed for a period of more than 2 hours shall be discarded. Hydraulic lime shall be delivered to the O&M Works Site in sealed paper bags stored in dry conditions and used within 24 weekend of manufacture. Brick powder in fine particles (<100 microns) reacts with free lime to form a pozzolan which improves frost resistance. Care is needed as if used at too high a proportion it can increase porosity and reduce flexibility. Introducing porous limestone or brick to the lime mortar mix will assist carbonation and frost resistance. Grading shall be similar to that for sharp sand. Pre-soaking prior to mixing will also help act as a retarder. Hydraulic Lime : Sand Mortar 4. Hydraulic lime mortars may be provided as pre mixed dry lime/sand mixes - either bagged or, for larger projects, silo mixes may be appropriate - or they may be Site mixed from bagged hydraulic lime and sand. 5. Hydraulic lime mortars have good working qualities but develop strength more slowly than cement mortars. They can develop appropriate strength and durability and have a higher flexural strength in proportion to compressive strength than do cement mortars. They shall be eminently suitable for the construction of masonry arch bridges which require a degree of flexibility to function structurally as arches. Hydraulic lime mortars shall always be used for repair of masonry arch bridges that were constructed using hydraulic lime mortars (i.e. all historic masonry arch bridges). 6. All hydraulic lime mortars shall be mixed in accordance with the supplier's written instructions. 7. Hydraulic lime mortar should be specified in accordance with the durability classification required. (refer to Table 24/8). TABLE 24/8 Durability Class Requirements for Straight Hydraulic Lime Mortars Mortar durability designation (with approximate compressive strengths) for general use building mortar and general use mechanical or hand pointing mortar

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

Clause Number	Title and Written Text

Masonry Type	Parapet and copings masonry facing roadsides subject to spray and de-icing salts	Other parapets, abutments and spandrel walls above flood levels	Soffit to arch barrel above flood level
Dense impermeable masonry. Squared or random. Brick, Basalt, Granite etc. (No Suction)	9-10 2.2 N.mm^2	7-8 1.8 N / mm^2	5-6 1.5 N/mm^2
Medium permeability masonry. Squared or random. Brick, Blockwork, Reconstructed stone, Sandstone, Limestone and mixed quality field stone masonry. (Moderate Suction)	7-8 1.8 N / mm^2	5-6 1.5 N/mm^2	3-4 1.34 N/mm^2
High permeability masonry. Squared or random Brick, Blockwork, Reconstructed stone, Sandstone, Limestone and mixed quality field stone masonry. (High Suction)	5-6 1.5 N/mm^2	3-4 1.34 N/mm^2	2-4 1.34 N/mm^2
When work is planned to continue beyond the autumn raise the durability class by at least 1 where the background masonry permits. Where the background masonry does not permit, plan to commence in the early spring and be complete before the end of summer.			

8. Lime mortars suitable for use below flood level, depending on time required, are mortar designation 9-10, which shall be suitable for immersion within 24 hours or mortar designation 7-8 if a coffer dam shall be provided to allow 72 hours for d) setting.

9. Site mixed hydraulic lime mortars are sufficiently workable for laying and building stone masonry units but shall be generally not initially workable for laying bricks in a modern context without being banked up for several hours and reworked.

   Site mixed hydraulic lime mortars shall be generally not suitable for pumping without the use of air entraining additives.

   Where required for site mixed mortars, an air entrainer can be used to increase workability and minimise water requirement.

   Air entrainers shall be used in accordance with the manufacturer's written

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

Clause Number	Title and Written Text

instructions.

Pre-mixed dry bagged or silo mixes generally have a higher entrained air content than Site mixed mortars and shall be suitable for building, pumping and pointing without the need for additional air entrainers.

The use of air entraining additives provides mortars of the same durability class which shall generally have superior performance characteristics in respect of earlier resistance to freeze/thaw action, faster rate of carbonation, better vapour permeability, and lower capillarity, due to their higher air content and reduced water demand.

Gauged Hydraulic Lime : Sand Mortars

(i.e. mortars containing hydraulic lime, non-hydraulic lime putty or hydrate and sand)

10. Gauged hydraulic lime mortars shall generally only be specified where this shall be necessary to match existing mortars in repointing work.

There shall normally be no requirement for significant structural strength in re-pointing work.

Gauged Hydraulic lime mortar should be specified in accordance with the durability classification required. (refer to Table 24/9).

TABLE 24/9 Durability Class Requirements for Gauged Hydraulic Lime Mortars

Mortar durability designation (with approximate compressive strengths) for general use building mortar and general use mechanical or hand pointing mortar			
Masonry Type	Parapet and copings masonry facing roadsides subject to spray and de-icing salts	Other parapets, abutments and spandrel walls above flood levels	Soffit to arch barrel above flood level
Dense impermeable masonry. Squared or random. Brick, Basalt, Granite etc. (No Suction)	N/A	N/A	5-6 1.5 N/mm^2
Medium permeability masonry. Squared or random. Brick, Blockwork, Reconstructed stone, Sandstone, Limestone and mixed quality field stone masonry. (Moderate Suction)	N/A 1.8 N / mm^2	5-6 1.5 N/mm^2	2-4
High permeability masonry. Squared or random Brick, Blockwork, Reconstructed stone, Sandstone, Limestone and mixed	5-6 1.5 N/mm^2	3-4 1.34 N/mm^2	1.34

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

Clause Number	Title and Written Text
	quality field stone masonry. (High Suction) | | | N/mm^2
	When work is planned to continue beyond the autumn raise the durability class by at least 1 where the background masonry permits. Where the background masonry does not permit, plan to commence in the early spring and be complete before the end of summer.
	11. Gauged hydraulic lime mortars exhibit slower rates of carbonation and higher capillarity than straight hydraulic lime mortars and shall not be used in close proximity to wet areas or in areas subject to road spray. 12. Gauged hydraulic lime mortars do not require the addition of air entrainers as 2. Good workability is ensured by the inclusion of lime putty.
2671AR	**Graffiti Removal** 1. Graffiti posters and encrusted deposits shall be removed by hand high pressure water jetting chemical washing light grit blasting or over-painting of painted surfaces provided the substrate is not damaged. 2. Encrusted deposits may be removed by a light grit blast in accordance with Clause 1772AR provided the substrate is not damaged. 3. The Company shall ensure that all electrical equipment and any other fixtures and fittings are fully protected during graffiti removal. 4. Over-painting shall be in a colour and material to match the existing where necessary and shall be subject to consent in writing by the Scottish Ministers.
2672AR	**Anti-Graffiti Coatings** 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. 2. The coating system shall be applied strictly in accordance with the manufacturers written instructions. 3. The application of the coating system shall not change the appearance of the substrate. 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. 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. 6. Where an existing anti-graffiti coating system is of the type that requires grit-

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

Clause Number	Title and Written Text
	blasting water jetting or the use of chemical cleaning agents likely to affect the substrate then these methods shall only be used as and when specifically subject to consent in writing by the Scottish Ministers.
2674AR	**Convex Safety Mirrors in Underpasses and Culverts Used by Pedestrians and Cyclists** 1. Convex safety mirrors in underpasses and culverts used by pedestrians and cyclists shall be polycarbonate external type. They shall be fixed in accordance with the manufacturer's written instructions. 2. Cleaning of polycarbonate safety mirrors shall be carried out using a non hazardous de-greaser/cleaning agent. Repetitive use of the de-greaser/cleaning agent shall not have a detrimental effect on the safety mirrors.
2801AR	**Winter Maintenance Operation** **General** 1. Subject to the other provisions of the Agreement the Company shall provide all resources including but not limited to depots materials labour and Constructional Plant required to fulfil its obligations under the Agreement. Such resources shall include the provision of all labour Constructional Plant and the like to ensure all necessary measures are taken to keep all roads open to road Users and free from ice and snow at all times. 2. For the avoidance of doubt the resources identified in Tables 1 to 4 inclusive of Appendix 28/2 shall be deemed to be the minimum provision and shall not be construed as being all resources required by the Company to fulfil its obligations for winter maintenance Operations. All necessary measures shall include the provision of labour and hiring leasing and the like of Constructional Plant. 3. Salt shall be stored in accordance with current planning and environmental regulations at the locations and in the quantities as stated in Appendix 28/1 Table 1. All salt storage locations shall be designated as loading points. 4. The Company shall provide adequate and sufficient salt loading facilities at each salt storage location to load vehicles. 5. With 24 hours of completing each precautionary salting operation or other snow or ice removal or other Operations a report shall be completed by the Company held electronically in accordance with the procedures in the Quality Management System and Quality Plan and be available for inspection by the Scottish Ministers at any time. The report shall state the times of commencement and completion of each route the rate of spread and the quantity and size of salt used on each route. 6. A log of hours for each operative spent on "call out" or "standby" shall be kept in accordance with the procedures in the Quality Plan.
2802AR	**Basic Facility** 1. Drivers of all winter maintenance vehicles shall hold appropriate skill

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

Clause Number	Title and Written Text
	qualifications and experience. 2. The Company shall ensure that at least one month prior to the commencement of the operational winter maintenance period sufficient drivers and operatives shall be available to provide the winter service Operations. 3. The Company shall ensure that throughout the entire operational winter maintenance period there shall be available at least 3 trained drivers for each operational vehicle and other items of Construction Plant. Additionally every driver based at a vehicle loading point shall have a basic knowledge of every salting route emanating from that point and be capable of undertaking that route if necessary. 4. A two-way radio or hands free mobile phone shall be fitted in each vehicle used for winter service Operations. 5. The Company shall be responsible for all arrangements necessary to ensure the availability of operatives to meet the response time detailed in sub-Clause 3 of this Clause. Prior to 1 October each year the Company shall prepare rosters detailing the availability of supervisors salting vehicle drivers and loading machine drivers for the operational winter service period. This roster shall also include names addresses and telephone numbers of the personnel listed. 6. The Company shall satisfy itself that arrangements for handling and loading salt at the vehicle loading points shall be adequate to achieve the specified response times. 7. When on continuous night shift the Company's personnel shall be stationed at the appropriate vehicle loading point to provide immediate response. When on continuous day shift the Company's personnel shall be either: (i) stationed at all or some of the vehicle loading points to provide an immediate response; or (ii) engaged elsewhere on the O&M Works Site but be capable of providing a one hour response. 8. Prior to 1 October each year the Company shall carry out a 'dry' run of each route and fit and remove the plough to every vehicle so equipped. Records including details of time taken to traverse the route fit the plough and any problems encountered shall be held in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.
2803AR	**Salting and De-icing Operations** 1. Salting and de-icing Operations shall commence at the time and be carried out at the spread rates instructed by the winter service duty officer. 2. Salt spreading shall be carried out in such a manner as to avoid damage to other vehicles and pedestrians or other users of the road network. Spreading width shall be adjusted to suit the carriageway width. 3. No vehicle shall be driven above the legal speed limit at any time and at a speed greater than 40mph whilst salting on de-restricted dual carriageways and motorways. Unless otherwise consented to in writing by the Scottish Ministers

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

Clause Number	Title and Written Text
	precautionary salting shall be carried out from the left hand lane of 2 lane dual carriageways from the centre lane of 3 lane dual carriageways and from the left hand centre lane of 4 lane dual carriageways. Spread patterns shall be adjusted to suit the travel lane and carriageway width. 4. On single carriageway roads salt shall be spread across the full width of the road in a single pass with the spreading vehicle travelling at a speed no greater than 30mph. 5. Operations on Project Roads requiring temporary traffic management involving contra-flow running may occasion an amendment to a route. Salt spreading shall be carried out from the offside lane of the contra-flow and the spread pattern adjusted to ensure that salt shall be spread behind and to the nearside and shall not be thrown into the path of oncoming traffic. Particular care shall be taken to ensure that all open lanes at contra-flow crossovers shall be adequately treated. 6. In the event of a breakdown of one of more of the Company's spreading vehicles details shall be recorded. The Company shall make immediate arrangements for a reserve vehicle to be made available in order to comply with the requirements of the Agreement. 7. The Company shall clear ice from footways footbridges and cycle facilities in accordance with the requirements of Section 3 to Part 2 of these O&M Works Requirements.
2804AR	**Snow Clearing Operations** **Ploughing** 1. The Company shall ensure sufficient resources are mobilised to prevent snow or ice from remaining on the trunk roads and Motorways. The Company shall put in place specific arrangements to ensure that these resources shall be mobilised to keep the trunk roads free of snow and ice subject to Appendix 0/1 Series 2800 of this Specification and Section 3 of Part 2 of these O&M Works Requirements. 2. All vehicles engaged in snow clearing Operations shall be manned taking cognisance of the Company's obligations under health and safety legislation. 3. Subject to the other provisions of the Agreement spreading of salt during ploughing shall be at the rate of spread instructed by the winter maintenance manager. During prolonged periods of snow ploughing shall be continuous from the onset of snow to prevent a build-up of snow and compaction by traffic. Ploughing shall continue until the roads shall be clear of ice and snow. 4. The plough blade shall be set as close to the road surface as shall be consistent with removal of the maximum amount of snow whilst avoiding damage to the road surface other equipment in the road surface and plough blade. **Single Carriageway Roads** 5. When clearing single carriageway roads particularly those having more than two lanes snow clearance Operations shall avoid the build up of snow in the centre of the road.

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

Clause Number	Title and Written Text
	Dual Carriageway Roads 6. The clearance procedure shall be dependent on the number of lanes on each carriageway. In the event only the right hand lane shall be ploughed towards the central reservation. When conditions and resources permit the winter maintenance manager may instruct echelon ploughing (2 or more vehicles moving in the same direction one behind each other on different lanes). 7. When ploughing to the nearside other vehicles (unless stationary or on the hardshoulder) shall never be overtaken snow shall never be thrown over bridge parapets onto the road beneath and when ploughing to the central reservation the speed shall be such as not to throw snow into the path of traffic on the opposing carriageway. **Machine Snow Clearance other than by Salting Vehicles** 8. In the event of significant snow falls where snow ploughing being carried out by the salting vehicles shall not be sufficient the Company's Winter Maintenance Manager shall deploy additional equipment for snow clearance to ensure delays caused by the weather conditions shall be kept to a minimum. **Hand Snow Clearance** 9. When machine snow clearance shall not be suitable (including clearance around carriageway obstructions) hand snow clearance and salting shall be carried out. 10. Snow clearance shall take place on the footways footbridges and cycle facilities specified in accordance with the requirements of Section 3 to Part 2 of these O&M Works Requirements and de-icing material spread to restore the original surface free from ice and snow.
2805AR	**Company's Vehicles and Constructional Plant** 1. The Company shall ensure that the winter Constructional Plant listed in Appendix 28/2 and Annex C to Part 2 of these O&M Works Requirements shall be available as necessary for the winter service. 2. The Company's winter Constructional Plan shall as a minimum meet the specification set out in this Clause 2805AR. 3. The Company shall state where required in Annex C to Part 2 of these O&M Works Requirements details of the winter Constructional Plant to be used in connection with the winter service. Such details shall be incorporated into this Agreement. 4. When used on the trunk road and Motorway for operator training and maintenance runs, the spinner disc at the rear of the Company's winter Constructional Plant shall be covered in such a way that damage by sharp edges in the event of an accident shall be reduced to a minimum. 5. Front line and reserve winter Constructional Plant shall be fitted with onboard electronic data loggers which shall provide an accurate record of: (i) driver time;

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

Clause Number	Title and Written Text
	(ii) distance travelled; (iii) times when de-icing materials shall have been spread; (iv) rate of spread; and (v) width of spread; In the event of an on-board electronic data logger malfunction the Company shall within 12 hours prepare a similar written record. 6. The Company shall provide apparatus to measure and record the quantity of de-icing material spread on each occasion on each precautionary treatment route. Such apparatus can be fitted to winter Constructional Plant or can be located at depots. Such apparatus shall be additional to the data loggers. 7. The Company shall provide and operate a global positioning system (GPS) for all carriageway de-icing vehicles that shall record an accurate real time location for all front line and reserve winter Constructional Plant. The GPS system shall be capable of downloading to personal computer to allow the displaying of real time information. 8. As a minimum requirement, in September and January of each Contract Year the Company shall calibrate all de-icing material spreading equipment. In September and January the calibration for de-icing material spreading equipment shall comply with the requirements of BS1622:1989 Specification for Spreaders for Winter Maintenance. September testing shall comply with the requirements of tests 'A' and 'B' and January testing the requirements of test 'B' of BS1622:1989 Specification for Spreaders for Winter Maintenance. All calibrations shall be independently carried out and certificated. Re-calibration and testing shall be carried out after repairs to the spreading equipment and at other times when necessary to ensure the accuracy of de-icing material spreading. Calibration certificates shall be held in accordance with the requirements of the Winter Service Plan and the Company's Quality Management System and Quality Plan shall be available for inspection by the Scottish Ministers at any time. 9. The Company shall provide winter Constructional Plant and other Constructional Plant in accordance with the specifications referred to in paragraph 9 to 13 of this Clause 2805AR. General 10. The winter Construction Plant which shall be used for spreading rock salt on the Project Roads shall consist of a truck chassis/cab upon which shall be mounted a salt spreading machine of sufficient capacity to enable the Company to fulfil its obligations for winter service Operations. Where alternative de-icing materials shall be specified the Company shall provide Winter Constructional Plant to spread these in accordance with the manufacturer's written recommendations. Winter Constructional Plant Specification for Plant used for Spreading Rock Salt 11. The chassis/cab shall:

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

Clause Number	Title and Written Text
	(i) be of robust construction and shall comply fully with the requirements of the Motor Vehicle Construction and Use Regulations; (ii) have a suitable wheelbase to accommodate the appropriate salt spreader body without excessive overhang behind the rear spring suspension brackets; and (iii) be fitted with a diesel engine which develops sufficient horsepower to cater for snow clearing and winter service. Operations 12. The salt spreading equipment shall: (i) be of proven design and comply fully with the requirements of BS.1622:1989 Specification for Spreaders for Winter Maintenance; (ii) be capable of spreading dry salt to BS 3247:1991 Specification for Salt for Spreading on Highways for Winter Maintenance; (iii) be capable of symmetrical and asymmetrical spreading in accordance with the Class A1 requirements of BS 1622:1989 Specification for Spreaders for Winter Maintenance; (iv) be fitted with a hopper that itself shall be fitted with removable salt screens; (v) be fitted with a spreading mechanism at the rear of the machine designed to minimise damage to passing vehicles when the machine shall be operating. The level of the spreader shall be not greater than 350 millimetre above the road surface. The spreader shall be capable of even distribution of salt over the full width of spread at rates between 10g/sq. m and 40g/sq. m and the trajectory of the salt leaving the spreader shall at no time be higher than 150 millimetre above the point of distribution; (vi) be fitted with a salt discharge indicator connected to the salt spreading machine so as to inform the operator that spreading has ceased; (vii) be fitted with an electronic data logger in accordance with Clause 2805AR.5; and (viii) be fitted with an on board global positioning system. 13. The Company shall provide a range of snowploughs which shall be capable of clearing all snow conditions in the O&M Works Site. 14. Snow blowers utilised shall: (i) be capable of blowing up to 600 tonnes of snow per hour; (ii) have a width of cutter head to be at least 1.8 metres; and (iii) be capable of operating in up to 4 metres depth of snow. 15. All winter Constructional Plant used for de-icing and snow and ice clearance Operations shall:

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

Clause Number	Title and Written Text
	(i) be painted golden yellow to BS 4800:1989 Schedule of Paint Colours for Building Purposes; (ii) have 2 additional headlamps shall be fitted to permit forward visibility when the snow plough shall be fitted; (iii) have 3 rotating amber beacons shall be fitted to the vehicle 2 on the roof of the cab and 1 beacon at the rear of the salt hopper; (iv) be fitted with a sign board reading "SPREADING" fitted to the back of the salt hopper. The lettering shall be 160 millimetre 'x' height in black capitals from the 'transport heavy alphabet' described in the Traffic Signs Regulations and General Directions on a yellow Class 1 reflective background in accordance with BS 381C:1996 Specification for colours for identification, coding and special purposes lemon yellow No 355; and (v) The vehicle shall be fitted with a passenger seat.
2806AR	**De-Icing Materials** 1. The Company shall procure and provide the salt and other deicing materials necessary to comply with the winter service requirements. 2. Stock level requirements for de-icing materials shall be indicated in Appendix 28/1 and Annex C to Part 2 of these O&M Works Requirements. 3. Salt for de-icing shall be 6.3 millimetre grading particle size complying with BS 3247:1991 Specification for Salt for Spreading on Highways for Winter Maintenance and treated with an anti-caking agent. 4. At loading points salt storage shall ensure that the moisture content of the stored salt shall not exceed 4%. Where the moisture content of salt used for de-icing shall exceed 4% spread rates shall be increased by 100% for spread rates up to and including 20 grams/ square metre. 5. Within 10 days of delivery salt shall be tested by the Company at loading points in accordance with BS 812 Testing aggregates, and results recorded to ascertain: (i) moisture content (1 test per 500 tonnes); (ii) particle size distribution (1 test per 500 tonnes); (iii) chloride content (1 test per 1500 tonnes); and (iv) soluble sulphate compounds (1 test per 1500 tonnes). 6. New deliveries of salt shall be tested by the Company in accordance with paragraph 3 of this Clause 2806AR but existing salt stocks shall be tested by the Company for salt moisture content at monthly intervals throughout each winter period and the results shall be recorded. 7. An electronic data base shall be provided by the Company for the storage of materials test data and shall be available for access at any time by the Scottish Ministers. Pre-wetted Salt

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

Clause Number	Title and Written Text
	8. Pre-wetted salt for de-icing material shall be 6.3 millimetre grading particle size complying with BS 3247:1991 Specification for Salt for Spreading on Highways for Winter Maintenance. 9. If salt brine shall be used for pre-wetting salt the percentage of salt brine added to salt for spreading Operations shall not exceed 30% of the total spread material (70% dry salt/30% brine solution) and the saturated salt in the brine solution before combination shall not exceed 23%. 10. Agricultural by-products or other additives used in de-icing materials shall be used in accordance with the supplier's instructions and shall require the prior written consent of the Scottish Ministers. 11. Prior to the use of ethylene glycol the Company shall provide the Scottish Ministers with documentation to demonstrate that the de-icing material complies with all aspects of the Specification and specified use of this material including but not limited to details of the storage and use of materials to comply with the anti-pollution requirements of the Environmental Protection Act. 12. Ethylene glycol used for de-icing Operations shall comply with the Ministry of Defence Specification 68-118 (De-icing/Anti-Icing Fluid for Run Ways) unless otherwise consented to in writing by the Scottish Ministers. Abrasive Aggregates 13. A single sized abrasive aggregate of particle size of 6 millimetre, or 5 millimetre sharp sand having low fines content may be added to the salt in a 50% salt and 50% grit or sand. Materials Storage 14. The Company shall satisfy itself that in accordance with sub-Clause 4 arrangements for storage handling and loading de-icing materials at the loading points shall be adequate to achieve the specified response times. 15. Materials shall be stored in such a manner as to ensure compliance with sub-Clause 4 and in accordance with current planning and environmental regulations and in accordance with the supplier's written instructions in the case of additives and ethylene glycol. 16. As salt de-icing material shall be removed from storage areas a positive slope shall be maintained to avoid danger to operatives and winter Constructional Plant from the collapse of cliff walls of de-icing material stockpiles. 17. The Company shall be responsible for the safeguarding and management of all de-icing material stockpiles. 18. The Company shall ensure that de-icing material stockpiles do not become contaminated with foreign matter likely to: (i) cause damage to winter Constructional Plant; and (ii) affect other trunk road and Motorway Users.
2807AR	**Maintenance of Company's Vehicles and other Constructional Plant** 1. The Company shall be responsible for ensuring that its vehicles and other

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

Clause Number	Title and Written Text
	Constructional Plant shall be mechanically maintained to a standard in order to comply with the other provisions of the Agreement. 2. The Company shall arrange for sufficient qualified motor fitters to be on standby at all times during the operational winter maintenance period. In the event of mechanical breakdown or other mechanical failure with the Company's vehicles and other Constructional Plant the Company shall arrange for the necessary repairs to be carried out without delays so that the response and treatment times can be met.
	3.
3101AR	**Road Cleaning and Clearance** **Sweeping** 1. Subject to the other provisions of the Agreement the Company shall provide all the necessary labour Constructional Plant materials and equipment required to maintain to the standards of cleanliness set out in the Environmental Protection Act 1990 Code of Practice on Litter and Refuse (Category 6 Zone) the carriageways, channels, hardshoulders, central reserves, footways, cycle facilities and footbridges on the O&M Works Site. 2. Sweeping of channels shall be to such a standard that on completion of the work there shall be an unimpeded passage for storm water into the drainage system. Channels shall be swept at least once annually in the spring. Vehicles engaged in sweeping shall only travel in the same direction of flow as the adjacent road traffic. 3. Sweeping shall also take place when required to remove material which constitutes an immediate or imminent hazard (Category 1 Defect) to road Users. 4. Sweeping shall also be required on all paved areas and all roads within the O&M Works Site to ensure that detritus and vegetation do not obscure any carriageway markings or otherwise cause a road safety hazard (such as loose material in hatched areas). 5. The Company shall identify all mechanical sweeping equipment to be provided for use in the O&M Works Site in its Quality Plan. Records of cleansing work carried out shall be maintained within its Quality System and be available for inspection by the Scottish Ministers at any time.
3102AR	**Litter and Debris Clearance** 1. Subject to the other provisions of the Agreement the Company shall maintain all road verges and central reservations to meet the standards for motorways and strategic routes set out in the Environmental Protection Act 1990 Code of Practice on Litter and Refuse (Category 6 Zone). 2. The term "verges" includes all grassed and planted areas between the road boundary fences which are not surfaced with bituminous materials or classified as central reservations. 3. Central reservations shall be both grassed and paved areas and no distinctions shall be made between either type.

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

Clause Number	Title and Written Text
	4. The Company shall carry out safety inspections and safety patrols on the Roads to the standards identified in Part 2 of these O&M Works Requirements. The inspectors and patrollers shall collect from the carriageway, hardshoulder, central reserve and verges all objects of any material size or form weighting less than 25kg which might be a hazard of distraction to road Users. 5. Records of litter and debris clearance shall be held in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.
3103AR	**Removal of Dead Animals** The carcass of a dead animal found on the O&M Works Site that needs to be removed for safety or environmental reasons shall be collected and disposed of in accordance with the requirements of the Local Authority Environmental Health Officer.
3201AR	**Emergency Response Operations** **General** Notwithstanding the provisions of Section 17 of Part 1 of these O&M Works Requirements this clause specifies the requirements for emergency response Operations. **Emergency Operations** 1. The Company shall provide emergency standby/response Operations as described in Appendix 32/1. 2. At all times the Company shall have available competent and trained operatives and suitably equipped vehicles and to be on the site of the emergency within the time period stated in Appendix 32/1. 3. Eight weeks prior to the commencement of the Agreement and at least two weeks prior to 1 April and 1 October in each Annual Period thereafter the Company shall prepare rosters detailing the availability of supervisors and emergency crews for each 6 month period of each Contract Year commencing 1 April. The roster shall include names and addresses and telephone and message pager numbers of the personnel listed. The roster shall be updated at such times when the personnel identified on the roster cease to be available or changes are proposed to the personnel by the Company. 4. The Company's arrangements for training and supervision shall ensure that all operatives are familiar with the types of incident that can be expected including any special procedures necessary during the hours of darkness. 5. Section 17 of Part 1 of these O&M Works Requirements specifies the customer contact system to be provided by the Company to which emergency calls shall be transmitted. It also describes the role of the emergency liaison officer. 6. 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 in connection with the Agreement. They shall however be able to attend at the site of any emergency on any part of the O&M Works Site within the response time stated in Appendix 32/1. The Company's stock of material as specified in Appendix 1/78 shall include all materials necessary to respond

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

Clause Number	Title and Written Text
	without delay to an emergency on the O&M Works Site. 7. For the avoidance of doubt the resources identified in Table 1 of Appendix 32/1 shall be deemed to be the minimum provision and shall not be construed as being all resources required by the Company to fulfil its obligations for emergency response Operations.
3202AR	**Temporary Concrete Road Restraint Systems** **General** When necessary, to ensure the safety of the Users of the O&M Works Site and Company operatives, the installation of temporary vertical concrete road restraint systems shall be carried out in accordance with Series 400. The Company shall have immediate access to at least 90 metres of temporary vertical concrete road restrain system and shall ensure that the necessary Constructional Plant and personnel shall be available to commence erection of the road restraint system as soon as practicable but within 24 hours. Records of such use shall be held within the Company's Quality System and be available for inspection by the Scottish Ministers at any time.
3301AR	**Site Investigation** **Rotary Coring in Carriageways** 1. Rotary coring in carriageways shall be carried out in accordance with this Clause. Cores shall be 100 millimetre or 150 millimetre nominal diameter and taken in the positions and to the depths proposed by the Company and consented to in writing by the Scottish Ministers. 2. Cores shall be cut in accordance with BS 598-100:2004 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas: Methods for Sampling for Analysis Using a Coring Machine, which complies with BS 4019 Rotary Core Drilling Equipment. Cores shall generally be required to test the bituminous and concrete carriageways layers only but the Company shall allow for the coring entering lean mix road base and cement bound or granular sub-base. 3. The walls and base of all holes from which core samples have been cut shall be thoroughly dried and painted with hot bituminous binder immediately prior to reinstatement. The holes shall be filled to within 50 millimetre to 75 millimetre inclusive from the road surface with wet lean concrete and topped off with well compacted bituminous repair material which on completion shall be at the same level as the adjacent surface. 4. The cores shall be handled carefully to prevent damage wrapped in polythene to prevent moisture loss. They shall be indelibly marked to indicate the location and date of coring. 5. Cores shall be packaged to avoid damage, clearly labelled and delivered to the Company's store.

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

Clause Number	Title and Written Text
	At the Company's store, cores shall be handled carefully and stored on purpose built racks or shelves. Cores shall be stored for periods determined by the Company to enable the necessary recording testing and data to be obtained or inspected by the Scottish Ministers. The Company shall establish if the Scottish Ministers wish to inspect the cores prior to disposal. 6. Core sampling operations testing, referencing, information obtained from data analysis and interpretation shall be recorded by the Company and a copy of data and reports supplied to the Scottish Ministers. 7. The Company shall submit evidence in writing to the Scottish Ministers for written consent that the persons including any subcontractor proposed to carry out coring testing and reporting Operations have the expertise and resources to carry out any such work. All coring testing and reporting Operations shall be carried out by a specialist testing firm or laboratory holding accreditation granted in respect of such coring and testing by the United Kingdom Accreditation Service (UKAS) or by the European Co-operation for Accreditation of Laboratories (EAL).
3302AR	**Rotary Coring in Structures** 1. Rotary coring in Structures shall be carried out in accordance with this Clause. Cores shall be 50 millimetre, 75 millimetre or 100 millimetre nominal diameter and taken in the positions and to the depths proposed by the Company and consented to in writing by the Scottish Ministers. 2. The cores shall be cut in accordance with BS 598-100:2004 Sampling and Examination of Bituminous Mixtures for Roads and Other Paved Areas using a coring machine which complies with BS 4019 Rotary Core Drilling Equipment. 3. Cores shall generally be cut through structural concrete with measures taken to avoid encountering reinforcement. 4. The holes from which core samples have been cut shall be reinstated using repair mortar in accordance with Clause 1773AR. 5. The cores shall be handled carefully to prevent damage wrapped in polythene to prevent moisture loss. They shall be indelibly marked to indicate the location and date of coring. 6. Cores shall be packaged to avoid damage, clearly labelled and delivered to the Company's store. At the Company's store cores shall be handled carefully and stored on purpose built racks or shelves. Cores shall be stored for periods determined by the Company to enable the necessary recording testing and data to be obtained or inspection by the Scottish Ministers. The Company shall establish if the Scottish Ministers wish to inspect the cores

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

Clause Number	Title and Written Text
	prior to disposal. 7. Core sampling operations testing referencing information obtained from data analysis and interpretation shall be recorded by the Company and copies of data and reports supplied to the Scottish Ministers. 8. The Company shall submit evidence in writing to the Scottish Ministers for written consent that the persons including sub-contractors proposed to carry out coring testing and reporting Operations have the expertise and resources to carry out the work. All coring testing and reporting Operations shall be carried out by a specialist testing firm or laboratory holding accreditation granted in respect of such coring and testing by the United Kingdom Accreditation Service (UKAS) or by the European Co-operation for Accreditation of Laboratories (EAL).
3303AR	**Structural Investigations** 1. Structural investigation and testing Operations shall be carried out in accordance with this Clause. 2. Separate reports upon the findings testing and the like together photographic evidence shall be supplied for each Structure as detailed in Appendix 33/1. The number of copies for each report shall be described in Appendix 33/1. 3. The Company shall submit evidence to the Scottish Ministers that the persons including sub-contractors proposed to carry out investigation testing and reporting Operations have the expertise and resources to carry out the work. All sampling and testing Operations shall be carried out by a specialist testing firm or laboratory holding accreditation Service (UKAS) or by the European Co-operation for Accreditation of Laboratories (EAL).
3304AR	**Inspection Patches Within Surfacing on Bridge Structures** 1. The general requirements for excavation and reinstatement of inspection patches within surfacing on bridges shall be as described in the appropriate Clauses of Series 700 900 and 1100 except that existing material may be removed by the use of air driven percussion tools. 2. Details of patch size and location within footways and carriageways shall be agreed in advance by the Scottish Ministers. Such inspection patches shall be excavated through any flexible surfacing asphaltic sand carpet and waterproofing system which may be present. 3. Following excavation all residual deposits of surfacing and waterproofing shall be disposed of off the O&M Works Site and the deck cleaned. 4. Excavation patches shall remain open for testing and inspection and shall only be reinstated after having received the written consent of the Scottish Ministers.
3305AR	**Trial Holes in Paved Areas** 1. The Company shall excavate trial holes by hand or machine to permit inspection or sampling of unbound or bitumen bound materials.

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

Clause Number	Title and Written Text
	The size and location of the trail holes shall be determined by the Company in accordance with the other provisions of this Agreement. 2. Trial holes shall be excavated and reinstated in accordance with Clause 706 except that trial holes shall remain open for testing and inspection and shall only be reinstated after having received the written consent of the Scottish Ministers.
3306AR	**Falling Weight Deflectometer Tests** 1. The Operating Company shall undertake falling weight deflectometer tests to assess the structural condition of bituminous and cementitious road pavements. The location, length to be tested and number of tests to be carried out shall be determined by the Company in accordance with the other provisions of this Contract. 2. The testing and reporting shall be carried out in accordance with the guidance given in HD 29 of the DMRB.
3307AR	**Dynamic Cone Penetrometer Tests** 1. The Company shall undertake dynamic cone penetrometer tests to assess the structural condition of bituminous and cementitious road pavements. 2. The testing shall be carried out in accordance with the manufacturers written instructions. 3. The calculations and reporting shall be carried out in accordance with the guidance given in Transport and Road Research Laboratory Overseas Road Note 8 – "A Users Manual for a Program to Analyse Dynamic Cone Penetrometer Data".
6101AR	**Cyclic Maintenance of Safety Barriers** Re-tensioning of Safety Barriers Beam safety barriers shall be re-tensioned in accordance with the requirements of Clause 473AR within the periods specified in Part 2 of Schedule 4. Wire rope safety fencing shall be re-tensioned in accordance with sub-Clause 474.2AR within the periods specified in Part 2 of Schedule 4.
6102AR	**Cyclic Maintenance of Gullies, Piped Grips, Catchpits Soakaways and Oil Separators** 1. Cleaning of gullies, catchpits, soakaways and oil separators shall be carried out in accordance with Clauses 520, 521 and the following 2. Gullies, catchpits, soakaways and oil separators shall be emptied not less than once in each Contract Year and when necessary to ensure that water does not stand on the carriageway adjacent to or flow past the gully and silt traps and that oil separators are effective. All collected sediment debris and polluted water shall be disposed of to a licensed special waste management facility in accordance with the requirements of Scottish Environment Protection Agency. Where Scottish Environment Protection Agency agree, polluted water may be

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

Clause Number	Title and Written Text
	disposed of in an alternative manner (for example to sewer, infiltration) provided the necessary discharge consents arrangements with sewerage undertakers and permits have been obtained. Polluted water shall not be used to dislodge compacted materials in the gully pot if there is any risk of that water being discharged into the drainage system. As part of the cleaning Operations the outlet pipe shall be jetted with clean water to ensure that it is flowing freely. Any restrictions in flow shall be noted. Oil separators shall be cleansed to avoid pollution. Polluted water shall not be used to jet or surcharge gullies. Polluted water or sludge shall not be discharged into watercourses or onto land other than suitably licensed waste management facilities. 3. Before putting a gully grating cover back on a spot of paint shall be sprayed onto the underside. The colour of the paint shall differ for each cycle of cleaning. 4. Notwithstanding the provisions of sub-Clause 1 of this Clause 6102AR at least once a year all gullies and chambers in the O&M Works Site shall be emptied and cleaned. Details of the Operations including the road and number of gullies and chambers emptied and any defects found in respect to blockages or damages to the drainage system or components together with the location of those defects shall be recorded. 5. Any damage and defects to gullies chambers or components shall be repaired immediately if considered a danger to the public. 6. Only clean water shall be used for flushing and filling gully pots and the Company shall pay all charges for such water. Drawing water from fire hydrants shall not be carried out without written approval from the Relevant Authority. 7. Cleaning and emptying of oil separators shall be carried out annually.
6103AR	**Cyclic Maintenance of Drainage Grips** Drainage grips shall be cut and maintained across verges such that free flow of water shall not be impeded and water does not stand on the carriageway adjacent to the grip. Care shall be taken not to disturb the soil beneath or alongside the excavation.
6104AR	**Maintenance of Linear Drainage Systems** 1. Cleaning of linear drainage systems shall include piped drains combined drainage and kerb systems linear drainage channel systems kerb or channel offlet pipes and piped grips and shall when required be carried out in accordance with Clauses 520, 521 and the following: 2. Additionally cleaning may be carried out by drawing through a mandrel with a

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

Clause Number	Title and Written Text
	diameter 20 millimetre less than the nominal diameter of the pipe or nominal minimum area of the "waterway area" of the block. 3. Where necessary a root cutter attachment shall be used with the high pressure water jetter. 4. Any damage to drainage systems or components shall be repaired immediately if they shall be considered to be a danger to the public. 5. Piped grips shall be cleaned as necessary such that all silt and loose obstructions shall be removed from the pipe such that the free flow of water shall not be impeded and that the water shall not stand on the carriageway adjacent to the pipe grip. Any suction system used shall comply with Clause 576AR. 6. Each end of the piped grip shall be maintained free from vegetation or other obstructions including any material expelled from the pipe. Where the invert of the outlet is below the invert of the ditch the invert of the ditch shall be excavated until the invert of the pipe is exposed.
6105AR	**Cyclic Maintenance of Filter Material** 1. The location of any obstruction that cannot be removed shall be recorded together with the location of the obstruction. 2. The filter media of filter drains shall be loosened by harrow and all weed growth removed in accordance with Clause 3002. 3. The filter material shall be loosened to a depth of 200 millimetre over the full width of the drain so as to minimise retention of water within this depth. 4. Any build up of detritus between the edge of the carriageway and the filter drain shall be removed at the same time.
6106AR	**Cyclic Maintenance of Drainage Structures** 1. The Company shall ensure that each end of the drainage structure including any ancillary drainage items shall be free of vegetation and other obstructions including any material disturbed during cleaning. 2. Where the invert of any drainage structure at intake and outfall points shall be below the invert of an adjacent watercourse, the watercourse invert shall be excavated to the invert level of the drainage structure to facilitate flow from the drainage structure. 3. The Company shall maintain a daily record sheet during cleaning operations giving drainage structure locations and any defects found and report any situation immediately to the Scottish Ministers if considered a safety hazard. 4. All collected sediment debris and polluted water shall be disposed of to a licensed special waste management facility in accordance with the requirements of Scottish Environment Protection Agency. Where Scottish Environment Protection Agency agree, polluted water may be disposed of in an alternative manner (for example to sewer or infiltration) provided the necessary discharge consents arrangements with sewerage

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

Clause Number	Title and Written Text
	Undertakers and permits have been obtained. Polluted water shall not be used to dislodge compacted materials.
6107AR	**Cyclic Maintenance of Ancillary Drainage Items** 1. Ancillary drainage items shall be cleared of all vegetation and debris and shall be cleaned to remove all silt loose obstructions and other detritus. 2. In the case of sluices, tidal flaps, penstocks, valves, pumps and other specialist equipment the Company shall check that all mechanisms shall be functioning as required and shall lubricate any moving parts in accordance with any manufacturers written instructions. 3. The Company shall maintain a daily record sheet during cleaning operations giving locations of control systems and mechanisms together with any defects noted and shall report any situation immediately to the Scottish Ministers if considered a safety hazard. 4. The Company shall dispose of all debris and arisings from the Operations to a licensed disposal facility and shall take all necessary precautions to prevent contamination of adjacent watercourses or ponds.
6108AR	**Litter and Refuse** 1. Subject to the other provisions of this Agreement the Company shall ensure that all roads and other land within the Site shall be maintained to the standards of a Category 6 Zone as set out in the Environmental Protection Act 1990 Code of Practice on Litter and Refuse. 2. Road cleaning and clearance of channels shall be to such a standard that on completion of the Operation there shall be an unimpeded passage for storm water into the drainage system. Seasonal variations of such accumulations shall be taken into consideration when formulating cleaning regimes. Vehicles engaged in sweeping shall only travel in the same direction of flow as the adjacent road traffic. Any growth of grass or other vegetation which shall be likely to obstruct the flow of water in the channel shall be controlled in accordance with Clause 3002. 3. The term “grassed areas” as referred to in the Code of Practice shall include all areas that shall be either grassed planted granular or the like between the road boundary fences which shall not be hard surfaced or classified as central reservations. 4. Central reservations shall be both grassed and hard surfaced areas and no distinctions shall be made between either type. 5. Any necessary litter picking shall be undertaken prior to grass cutting Operations.
6109AR	**Removal of Dead Animals** The carcass of a dead animal found on the Site that needs to be removed for safety or environmental reasons shall be collected and disposed of in accordance with the

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

Clause Number	Title and Written Text
	requirements of the Local Authority Environmental Health Officer.
6110AR	**Cyclic Maintenance - General** 1. Vegetation on or adjacent to the Structure shall be removed using hand tools or appropriate mechanical means which preserve the integrity and do not damage the Structure. Any injurious weed such as Japanese Knotweed and Giant Hogweed shall be removed in accordance with Clause 3002 and reported to the Scottish Ministers. 2. Removal of debris from any part of the Structure shall be undertaken using hand tools or appropriate mechanical means which preserve the integrity and do not damage the Structure and any protective systems. Disposal shall be to a licensed disposal facility. The removal of debris from carriageway verges shall not be included unless it constitutes an immediate hazard to traffic. Areas of Structures affected by bird droppings shall be cleaned using stiff bristle brushes, hoses, clean water and suitable detergents. Disposal shall be to a licensed disposal facility. 3. Checking and tightening of bolts in particular holding down bolts to expansion joints parapets high mast lighting sign/signal gantries shall employ calibrated hand or mechanical wrenches to achieve where available the torque specified by the manufacturer/designer for the specific element. Local damage to protective systems shall be made good. 4. Missing bolts shall be replaced and tightened in accordance with the manufacturer's written specifications where available using calibrated torque wrenches. Local damage to protective systems shall be made good. 5. Where required by standard or the manufacturer suitably approved or registered personnel shall be used to undertake these tasks.
6111AR	**Cyclic Maintenance of Expansion Joints** 1. Debris and vegetation shall be cleaned out from the expansion joint using hand tools or appropriate mechanical means that shall avoid damage to the joint. 2. Bolts securing the expansion joint cover plates or nosing joints shall be checked and tightened in accordance with Clause 6110AR. 3. Neoprene or elastomeric material shall be checked for splitting or detachment from the supporting frame by a visual inspection and the use of appropriate hand tools. 4. Cover plates and nosing joints shall be checked by visual inspection and the use of appropriate hand tools and if required tightened in accordance with sub-Clause 2 of this Clause. 5. Debris and sediment from associated drainage below the joint shall be cleared

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

Clause Number	Title and Written Text
	using hand tools or appropriate mechanical means that shall avoid damage.
6112AR	**Cyclic Maintenance of Bridge Drainage Systems** 1. Cleaning of bridge drainage systems shall be carried out in accordance with Clauses 520, 6102AR and 6104AR. 2. Drainage holes in structural components obstructions outlet pipes outlet manholes weep pipes silt and debris deposits shall be cleaned using appropriate hand tools drainage rods and mechanical means including jetting so as to avoid damaging the Structure. 3. Flap valves shall be checked for operation by hand or using appropriate lifting devices. Hinges and fixings shall be greased using a corrosion inhibiting lubricant that will not flow below 70°C. 4. Vegetation and weeds blocking pipes shall be removed using hand tools or appropriate mechanical means which preserve the integrity and do not damage the Structure.
6113AR	**Cyclic Maintenance of Parapets and Pedestrian Protection on Structures** 1. Hollow section drain holes shall be cleaned using appropriate hand or mechanical tools, avoiding damage to any paint and galvanising. 2. Checking and tightening of bolts shall employ calibrated hand or mechanical wrenches to achieve the torque specified where available by the manufacturer/designer for the specific element. Local damage to protective systems shall be made good. 3. Missing bolts shall be replaced and tightened in accordance with the manufacturer's specification to the appropriate torque using a calibrated tool. Local damage to protective systems shall be made good. 4. Where required by standard or in writing by the manufacturer suitably approved or registered personnel shall be used to undertake these tasks.
6114AR	**Cyclic Maintenance of Bearings and Bearing Shelves** 1. Removal of debris including bird droppings shall be as Clause 6110AR. 2. In accordance with the manufacturers written instructions clean and, where appropriate, grease accessible mating bearing surfaces and components to ensure satisfactory performance. Existing bearing grease shall be inspected (removing and replacing existing grease boxes if present) and if the grease is brittle or contaminated shall be removed by suitable degreasing solvents and scraping with plastic scrapers. New grease shall then be applied to a thickness of 3 millimetre. The new grease shall be corrosion inhibiting and shall not flow at temperatures below 70°C. 3. Local damage to protective systems shall be made good.

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

Clause Number	Title and Written Text
	4. Checking freedom of movement of bearings. Bearings shall be carefully observed and signs of misalignment, binding, distortion or excessive freedom shall be reported to the Scottish Ministers.
6115AR	**Cyclic Maintenance of Structures Conveying Watercourses** 1. All fittings shall be maintained, including clearing of debris and encrustations, greasing and lubrication where appropriate. This shall be in accordance with manufacturer's written instructions or information in the maintenance manual or as- built records where available. 2. Vegetation debris and silt shall be removed using hand or mechanical tools as appropriate to ensure free flow of water and to preserve the integrity performance and to avoid damage to the Structure. 3. All collected sediment debris and polluted water shall be disposed of in accordance with Clause 6106AR.
6116AR	**Cyclic Maintenance of Sign or Signal Gantries High Mast Lighting and Masts** 1. Holding down assemblies and fixings including to cladding shall be checked and tightened employing calibrated hand or mechanical wrenches to achieve the torque specified by the manufacturer/designer where available for the specific element. Local damage to protective systems shall be made good. 2. Missing bolts in the holding down assemblies and fixings shall be replaced and tightened in accordance with the manufacturer's written specifications where this shall be available to the appropriate torque using a calibrated tool. Local damage to protective systems shall be made good. 3. Holding down assemblies shall be cleaned and re-greased and where available in accordance with the manufacturer's written specifications. 4. Cladding shall be cleaned with appropriate hand or power tools using detergents that will not discolour/degrade cladding finishes. 5. Seals to box type gantries shall be visually inspected for leaks using torches and tools suitable for use in confined spaces. Any box type gantries that shall not be wind and waterproof shall be reported to the Scottish Ministers.
6117AR	**Cyclic Maintenance of Non-Structural Items** 1. Moveable parts shall be cleaned and greased and where available in accordance with the manufacturer's written specifications where available. 2. Holding down assemblies and fixings including to cladding shall be checked and tightened employing calibrated hand or mechanical wrenches to achieve the torque specified in writing by the manufacturer/designer where available for the specific element. Local damage to protective systems shall be made good.

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

Clause Number	Title and Written Text
	3. Missing bolts in the holding down assemblies and fixings shall be replaced and tightened in accordance with the manufacturer's written specifications where this shall be available to the appropriate torque using a calibrated tool. Local damage to protective systems shall be made good. 4. Holding down assemblies shall be cleaned and re-greased and where available in accordance with the manufacturer's written specifications. 5. Vegetation shall be removed in accordance with Clause 6110AR.
6118AR	**Cyclic Maintenance of Underpasses and Culverts Used by Non Motorised Users and Retaining Walls** 1. All surfaces painted finishes and protective systems within culverts and underpasses including ceilings, soffits and handrails shall be cleaned using hand or the appropriate power tools with detergents and cleaning agents that shall not be detrimental to the surfaces painted finishes or protective systems. 2. Cleaning of light fittings shall be by hand using appropriate cleaning agents. 3. Cleaning of polycarbonate mirrors shall be by hand using the appropriate cleaning agents as specified in writing by the manufacturer, where available. 4. Cleaning shall not be carried out when the ambient temperature is 2℃ or less and falling or when the Operations shall be likely to result in the formation of ice. 5. Vegetation shall be removed in accordance with Clause 6110AR. 6. Clearing of weep pipes and drainage systems shall be in accordance with Clause 6112AR.
6119AR	**Removal of Graffiti, Posters and Encrusted Deposits** 1. Graffiti, posters and encrusted deposits shall be removed by suitable methods. Overpainting of painted surfaces may be carried out provided the substrate shall not be damaged during the process. 2. Encrusted deposits may be removed by a light grit blast in accordance with Clause 1772AR provided the substrate shall not be damaged. 3. All electrical equipment and any other fixtures and fittings shall be fully protected during removal operations. 4. Over-painting shall be in a colour and material to match the existing where necessary and shall be subject to consent in writing by the Scottish Ministers.

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

Clause Number	Title and Written Text
103SR	**Communication System** 1. The Company shall provide, operate and maintain a communication system as specified in Appendix 1/70. 2. The communication system shall ensure that communications links between the various parts of the Company within the O&M Works Site can be maintained throughout the Contract Period such that the Company shall be able to comply with its other obligations contained elsewhere in the Agreement. 3. Where the communication system or any part thereof shall be inoperative for any reason whatsoever that does not permit the Company to comply with the other provisions of this Clause 103SR the Company shall take all reasonable measures to effect a repair or a replacement to the said system or a part of the system within 24 hours of such inoperation.
110SR	**Temporary Information Boards** The Company shall clean and maintain the advertising signs set out in Appendix 1/17 and all temporary information boards required by Scottish Office Industry Department Circular 1/1994. It shall also clean and maintain any information boards provided by it for its own use and shall dismantle and remove them on completion of the Operations. Company advertising boards other than those set out in Appendix 1/17 shall not be allowed on or adjacent to the O&M Works Site. It shall however be allowed at the entrance to compounds subject to the restriction specified in these O&M Works Requirements.
113SR	**Programme of Operations** The Company shall establish and maintain a high level of co-operation with the Traffic Scotland Networks Operations Manager, NNCC, Police, adjacent operating companies and Relevant Authorities to ensure that road Users shall be provided with the best possible service and that disruptions to traffic flows are kept to a minimum.
117SR	**Traffic Safety and Management** 1. Traffic management measures shall be determined by the Company and may comprise lane closures, Lane Occupations, mobile and short duration static lane closures and diversions all as detailed in Appendix 1/17 or other such measures as may be necessary for the Operations. The duration and scope of the traffic management measures shall vary according to the nature and extent of the Operations being carried out by other contractors and outside bodies. 2. The Company shall ensure that to minimise disruption to traffic optimum use shall always be made of traffic management provided as part of the Operations. 3. The Company shall provide erect maintain reposition cover and uncover and finally remove traffic signs as required. In so doing such other measures shall be taken by the Company as may be necessitated by the Operations in accordance with any special requirements in Appendix 1/17 recommendations in Chapter 8 of the Traffic Signs Manual or any amendments thereto or other requirements of the Scottish Ministers as detailed in Appendix 1/17.

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

Clause Number	Title and Written Text
	4. Traffic signs shall comply with the appropriate Clauses in Series 1200 of the Specification. The Company shall keep traffic signs clean secure and legible. It shall ensure that all signs required to be lit by external or internal lighting are illuminated during periods when road vehicles are required to display lights. 5. All traffic safety and management measures necessitated by the Operations shall be fully operational before the Company commences any Operations which affect the road network. 6. Any area of the road network which had previously been closed because of the Operations shall not be opened to traffic until it had been swept and cleared of all personnel items of constructional plant material and debris and until any appropriate traffic safety and management measures have been completed and the road is in a suitable condition for public use. 7. When Operations shall be carried out on or adjacent to a road open to vehicles the Company shall ensure vehicles and mobile Constructional Plant under its control operating on or adjacent to such road in the execution of the Operations shall be painted in a conspicuous colour. 8. 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 non-reflectorised yellow (Colour No. 355 to BS 381C:1996 Specification for Colours for Identification, Coding and Special Purpose). 9. All other vehicles under the Company's control 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 marking and signs to clearly define that the vehicle is a roadworks vehicle. 10. Vehicles shall have a sign board reading 'Motorway Maintenance' or 'Road Maintenance' (to Diagram 7404 of Schedule 12 Part V of The Traffic Signs Regulations and General Directions) fixed at the rear. The lettering shall be the largest 'x height' that can be accommodated out of the following heights 37.5 millimetre, 50 millimetre, 62.5 millimetre or 100 millimetre. The lettering shall be black capital letters from the alphabet described in The Traffic Signs Regulations and General Directions: Schedule 13: Part II on a yellow non-reflectorised background in accordance with BS 381C:1996 Specification for Colours for Identification, Coding and Special Purpose, colour number.355. In addition the Company's all purpose vehicles and Constructional Plant shall each be provided with either roof mounted light bars or at least two amber flashing beacons and the Company's light vans and cars shall each be provided with a roof mounted amber flashing distinctive lamp. 11. The lamps shall be switched on: (i) when the vehicle or Constructional Plant is manoeuvring into or out of the O&M Works Site or operating at low speed on a carriageway or hardshoulder open to vehicles; and (ii) when the vehicle or Constructional Plant is standing on a carriageway or hardshoulder open to vehicles.

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

Clause Number	Title and Written Text
	12. Temporary lighting shall be provided in accordance with Clause 1405 where it shall be required in the execution of the Operations. 13. Unless otherwise stated in Appendix 1/17 the Company shall provide and suitably sign points of entry and exit from the Operations for vehicles and Constructional Plant engaged on the Operations. The Company shall ensure that when any vehicle or item of Constructional Plant shall be reversing within the O&M Works Site on or adjacent to a road open to vehicles it does so only under the supervision of a person designated for the purpose of regulating traffic within the O&M Works Site who shall be readily distinguishable from the remainder of the work force. 14. Where Operations are carried out on or adjacent to a road open to vehicles the Company shall ensure that the work force and supervisory staff at all times wear jackets complying with Class A in BS 6629:1985 Specification for Optical Performance of High-visibility Garments and Accessories for Use on the Highway, incorporating the recommendations of Appendix G of BS 6629:1985 Specification for Optical Performance of High-visibility Garments and Accessories for Use on the Highway, except that where protected by a safety zone they may wear jackets complying with either Class A or Class B in BS 6629:1985 Specification for Optical Performance of High-visibility Garments and Accessories for Use on the Highway. 15. All vehicles and Constructional Plant operating within the O&M Works Site between sunset and sunrise and during periods of poor visibility and fog shall have mandatory lights illuminated and shall travel in the same direction of flow as the adjacent traffic. Vehicles travelling within the O&M Works Site against the adjacent traffic flow shall not have headlights on or be similarly illuminated and shall keep as far away as possible from the lanes open to vehicles. 16. The Company shall be restricted to entering and leaving the site of the Operations and erecting and removing traffic management measures during the time periods quoted in Appendix 1/17. 17. If an accident or breakdown occurs on a carriageway or hardshoulder open to vehicles within or in the vicinity of the Operations, the Company and operators of recovery vehicles provided in accordance with Clause 120 shall act as requested by the Police. 18. The Company shall produce for each and every site of the Operations a safety plan which amongst other safety issues shall identify the traffic management measures to be utilised and the surveillance and maintenance standards. 19. Traffic management measures shall be monitored and modified by the Company to ensure traffic delays are minimised. When traffic signals are in use, queue lengths shall be monitored to ensure that the phase settings result in equal queue lengths and are adjusted appropriately to accommodate the varying flows throughout the whole day. 20. The Company shall make good any damage or disturbance to temporary signs or other traffic management measures which shall be reported to it within 30 days.

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

Clause Number	Title and Written Text
202SR	**Existing Trees, Bushes and Hedges** Existing trees, bushes, hedges and shrubs shall be retained and protected wherever possible. When removal shall be unavoidable they shall be cut down in accordance with the requirements of Specification Series 3000.
949SR	**Repairs to Potholes** A permanent repair to a Category 1 Defect including but not limited to road stud sockets shall be carried out in accordance with Appendix 7/72.
1501SR	**Introduction** 1. Motorway Communications for Scottish Road Network forms part of the National Driver Information and Control System (Traffic Scotland) and shall, within this document, be referred to as Traffic Scotland Equipment. All work relating to the provision, installation, testing integration and commissioning of Traffic Scotland Equipment shall comply with this Series. For the purposes of this Series unless otherwise described in Appendix 15/1 the word "provide" means design and provide. 2. This document serves as the outline specification for the installation of Traffic Scotland Equipment which shall typically consist inter alia of the following elements: (i) Ducting and chambers; (ii) Cables and all cable fittings; (iii) Cabinets and all ancillary items; (iv) Hazard Warning Signals (HWS); (v) Emergency Roadside Telephones (ERT); (vi) Traffic Scotland vehicle detectors; (vii) SRTDb vehicle detectors; (viii) Closed Circuit Television Cameras (CCTV cameras); (ix) Variable Message Signs (VMS); (x) Journey Time Equipment; (xi) Lane Control Signalling; (xii) Communications infrastructure; (xiii) Mains power supply and distribution infrastructure; (xiv) Instation Equipment; (xv) Hard landscaping. 3. The representative of the Scottish Ministers shall be the Traffic Scotland Network Operations Manager who shall be responsible for all aspects of the Traffic Scotland Equipment. Contact details for the Traffic Scotland Network Operations Manager is provided in Appendix 15/1

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

Clause Number	Title and Written Text
	4. The existing 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. 5. These specifications are applicable to all work undertaken under the Agreement that includes Traffic Scotland infrastructure or equipment.
1502SR	**General Requirements** 1. The Company shall carry out all such work as required by the Agreement in such a way as to comply with this Specification. 2. When any elements of Traffic Scotland equipment are supplied by the Overseeing Organisation, the Company shall be responsible for the collection and loading of such equipment from the Overseeing Organisation's stores, at the location given in Appendix 15/1. 3. The Company shall be responsible for the safe keeping of all Traffic Scotland equipment whether supplied by the Company or collected from the Overseeing Organisation's store, including its unloading and secure storage. The Company shall provide a dry, heated and vermin free store for Traffic Scotland equipment 4. The Company shall be responsible for providing written notice within three days, of any defects or damage to equipment received or collected from the Overseeing Organisation's store. 5. Any Traffic Scotland equipment damaged or missing after purchase by the Company, or provided by the Overseeing Organisation in good condition shall be replaced and any associated works to make good shall be carried out by the Company at no cost to the Scottish Ministers. The period for which the Company shall be responsible for replacement and making good of Traffic Scotland equipment shall be as detailed within the Agreement. 6. In order to allow time for the integration and commissioning of the Traffic Scotland equipment provided under the Agreement, the Company shall programme the O&M Works or section thereof so that the Traffic Scotland equipment is provided, installed, tested, integrated and commissioned and the test results approved by the Overseeing Organisation at least 8 weeks before the date of opening the O&M Works, or section thereof to the road User, unless otherwise stated in Appendix 15/1. 7. The Company shall provide appropriate installation facilities for the electricity supplier and communication service connection, as detailed within the Agreement and as agreed with the Overseeing Organisation. 8. The Company shall provide all drawings, documentation and certification as required by the Agreement typically as described by TR1100, NDS9001and satisfying the requirements of the CDM Regulations.

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

Clause Number	Title and Written Text
1502SR Continued	9. The Company shall employ only parties qualified and experienced in the provision, installation, testing, integration and commissioning of driver information and control 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, 8 weeks prior to the commencement of any Traffic Scotland equipment work or at any earlier date as required by the Agreement. 10. The Company shall be responsible for the appropriate disposal of all waste equipment and materials in compliance with TR1100 unless otherwise detailed in Appendix 15/1. 11. Unless otherwise stated in Appendix 15/1 the Company shall ensure all sensitive electronic equipment, shall be adequately protected during installation. Appropriate environmental protection under cover must be provided, either by purpose made tents or suitably equipped vehicles. Installation work shall include cable joints, terminations and equipment assemblies. 12. Roadside verges on or into which Traffic Scotland infrastructure or equipment shall be to be installed shall be of an adequate width and topology acceptable to Traffic Scotland. The Traffic Scotland roadside sites shall be of suitable construction and either finished horizontal or be of an appropriate single gradient acceptable to Traffic Scotland. 13. The design and construction of any works adjacent to a Traffic Scotland site shall be such as to adequately route surface water away from the Traffic Scotland equipment, equipment foundations, communications chambers and associated Traffic Scotland ducting network. 14. The design of road restraint systems, civils works directly adjacent to Traffic Scotland ducts, chambers or equipment shall ensure that the Traffic Scotland infrastructure shall be not damaged or the service provided by that infrastructure shall be not adversely affected. 15. There shall be a general overall requirement for all Traffic Scotland roadside equipment to be located, and suitably protected as to incorporate such guidance as shall be contained within TA89 of the DMRB 'Use of Passively Safe Sign Posts to BS EN 12767:2000 Passive Safety of Support Structures for Road Equipment: Requirements and Test Methods". Similarly, for structures mounted over the carriageway all associated protection barriers and fences shall be designed and installed in such a way as to minimise the risk of personal injury if an errant vehicle strikes it.

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

Clause Number	Title and Written Text
1503SR	**Materials, Equipment and Workmanship.** 1. The Company's electrical workmanship, materials and equipment supplied shall comply with BS 7671; Requirements for Electrical Installations, IEE Wiring Regulations, the Electricity at Work Regulations and the regulations of the electricity supplier. Unless otherwise described in Appendix 15/1 Traffic Scotland equipment shall not share any electricity supply with any other equipment. 2. All Traffic Scotland equipment provided by the Company shall comply with TR1100 with respect to environmental compatibility and be sufficiently compact to allow for satisfactory installation and operation in the accommodation provided for it. 3. The Company shall take full account of future maintenance of all Traffic Scotland equipment being provided and installed and provide and install all necessary measures including equipment and infrastructure necessary for future maintenance. 4. 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 'General Specification for Motorway Signs, Signalling and Communications Equipment'. Furthermore minimum workmanship standards shall be as detailed in a standards publications such as 'Workmanship Standards Manual' ISBN 0-632-04003-3. It shall be a requirement of this Series 1500 that the Company's Quality Plan must include reference to a workmanship standards document. 5. 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 Specification.

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

Clause Number	Title and Written Text
1504SR	**Site Records** 1. The Company shall keep a daily record in duplicate in a clear and legible form of all Traffic Scotland work carried out as it proceeds. One copy shall be kept available on site for inspection by the Overseeing Organisation during the Agreement and, at completion of the O&M Works, shall form part of the documentation as detailed in the O&M Works Requirements to be handed to the Overseeing Organisation for record purposes. At a minimum the following information shall be recorded: (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 mandreling and pressure testing; (ii) Chamber locations including type, depth, incoming and outgoing ducts, type of chamber cover, and duct plugs or duct sealing method used; (iii) Cabinet locations and type; (iv) Cabinet and cable identifiers; (v) Route, length and type and cable drum number of each individual length of installed cable; (vi) Position of electricity supplier supply points together with electricity supplier name, type, rating, identifying no., etc; (vii) Position of private wire interfaces together with private wire supplier name, type identifying no., etc; (viii) Position of installed Traffic Scotland equipment, details of hazard warning signals, VMSs, gantries and all system equipment; (ix) Details regarding the removal and re-siting of existing Traffic Scotland equipment; (x) Details of all works undertaken in NNCC and transmission buildings; (xi) Any additional requirements detailed in Appendix 15/1; (xii) The Company shall maintain an up to date record of all equipment and cable provided by the Scottish Ministers.
1505SR	**Provision of Cabinets, Cables and Ancillary Items** Cabinets, cables and ancillary Items shall be provided as detailed in Appendix 15/1.

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

Clause Number	Title and Written Text
1506SR	**Cables** 1. Traffic Scotland cable types shall be as detailed in Appendix 15/1. 2. Other than cables used for internal wiring of cabinets or on the hazard warning signal poles, non-armoured mains power cable shall not be acceptable for use as part of the Traffic Scotland equipment. Unless otherwise described in Appendix 15/1 the Company shall be required to submit reasons for any installations requiring the use of mains power cable with conductors larger than 25 millimetres square to the Overseeing Organisation. If such reasons are justifiable the Overseeing Organisation shall approve the use of conductors larger than 25 millimetres square otherwise the Company shall modify the Design to prevent the need to use conductors larger than 25 millimetres square. 3. Each drum of cable delivered to the O&M Works 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 shall be 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 laying 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). The results shall form part of the site records of the Company's tests and a copy shall be provided to the Overseeing Organisation. The location in the ground of cable lengths by reference to their drum numbers shall be kept with the daily records. 4. All underground cables for use in the Traffic Scotland infrastructure shall be installed in ducts 5. The outer sheath of all Traffic Scotland cables shall be coloured black. 6. The Company shall return part used drums of cable to the 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. 7. 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.

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

Clause Number	Title and Written Text
1507SR	**Cable Installation** 1. Cables shall be laid in accordance with this clause. 2. Cables shall only be laid when the ambient temperature shall be above 0º C on a rising thermometer, and the cable has been stored for at least the previous 24 hours at a temperature greater than 0º C. 3. Sufficient length of cable shall always be allowed for its correct termination. When termination does not proceed immediately following the installation of the cable, the cable ends shall be sealed against the ingress of moisture in accordance with drawing NDX1061-00. 4. The Company shall not install cables until the duct mandrel and pressure test certificates have been registered in the Company's Quality Plan documentation. Furthermore the Company shall satisfy himself that ducts are, in all respects, suitable for cable installation prior to the drawing in of cable. 5. No cable shall be left exposed at the end of any work period. 6. In the event of any damage whilst cables are being installed, the whole of the particular length of cable concerned shall be removed, replaced, reconnected and if necessary re-tested at the Company's expense prior to the handover date. 7. Every cable shall be permanently labelled using cable markers to identify the destination of the cable in accordance with the drawing NDX1061-00 to ensure its unambiguous identification immediately following its installation. 8. The Overseeing Organisation shall be provided with the opportunity to witness the installation of all cables. 9. Cables shall be drawn into cable ducts and chambers that have been installed in compliance with Clauses 1530SR, 1531SR and 1532SR. 10. Unless otherwise described in Appendix 15/1 power supply cables may share the same ducts as the longitudinal communications cables for power supply cable runs less than 50 metres. For power cable runs greater than 50 metres a separate duct shall be installed for the power cable which at no point shall be less than 0.5 metres from the ducts containing communications cabling. 11. Cables shall be installed 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 calibration certificate relating to the winch shall be provided to the Overseeing Organisation prior to use.

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

Clause Number	Title and Written Text
1507SR Continued	12. 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. 13. 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 shall be protected from contact with the frame metal. Cable guides shall be used to support the cable at all intermediate chambers. 14. 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 shall be 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 millimetres from the entry and exit points of the chamber. The type of labelling to be used shall comply with drawing NDX1061-00. 15. Where more than one cable shall be to be installed in a duct, before the second cable shall be pulled the Company shall ensure that the duct shall be 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 shall be 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 30/40 pair and optical fibre cables are to be installed into the same duct, the 30/40 pair cable(s) shall be installed first. 16. Optical fibre cables shall additionally be marked at intervals of 500 millimetres along their length, inside chambers. If the cable sheath shall be not indelibly marked during manufacture the marking shall be added using 25 millimetres wide, yellow PVC adhesive tape or alternative fit for the purpose. 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 shall be greater.

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

Clause Number	Title and Written Text
1507SR Continued	18. Unless otherwise described in Appendix 15/1 all fibre optic and copper communications cables shall be provided with service loops. These loops shall be installed in a Type 'C' chamber located at each copper or fibre termination pillar of sufficient dimensions to ensure the cable shall be 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. 19. Unless otherwise described in Appendix 15/1 no cable support ironwork shall be fitted within the chambers. Cable stowage shall be as described in Appendix 15/1. 20. The Company shall ensure that on completion of the cable installation works a draw cord shall be installed in each duct and both ends secured within the terminating chambers or enclosure. 21. All cables installed on gantries shall be protected from mechanical damage by being installed within a covered cable tray.
1508SR	**Installation of Cabinets** 1. Cabinet types shall be those as required to comply with the Agreement. 2. The Company shall provide and install paved areas around cabinets together with access paths, steps and hard standings in accordance with Clause 1539AR. A minimum 700 millimetres clearance shall be provided between any cabinet and any retaining wall, embankment or cutting. 3. The Company shall install foundations and erect cabinets in accordance with the appropriate MCX or NDX Drawings. If no MCX or NDX drawing exists the Company shall install foundations and erect cabinets in accordance with drawings provided by the Company and agreed with the Overseeing Organisation. 4. Unless otherwise described in Appendix 15/1 cabinets shall be situated in groups located in a consistent sequence as shown typically in NDX1063-05 and the Traffic Scotland equipment manual. 5. Cabinet doors shall be capable of opening and closing without being fouled by paved area or access paths or steps and hinged to provide protection from spray from vehicles. i.e. hinged to the roadside.

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

Clause Number	Title and Written Text
1508SR Continued	6. 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, gravel and water into the duct ends. The internal void within the plinth or base shall then be filled with 6 millimetre 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. To achieve the required resin seal the duct ends and expanded foam seal shall be below the finished level of the resin seal by a minimum of 10 millimetres and a maximum of 30 millimetres. The resin seal shall be poured to provide a waterproof seal to all cables and finished to provide a smooth and level surface. 7. 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. 8. 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 manufacturers instructions and/or in accordance with Series 1900. 9. The Company shall ensure that power shall be available and all cabinet environmental control equipment shall be tested, commissioned and operational before any electronic Traffic Scotland equipment shall be installed in the cabinet.
1509SR	**Gantries for Motorway Signals** Where required to be installed, the Company shall do so in accordance with the Agreement.
1510SR	**Emergency Roadside Telephones** 1. The Company shall install emergency roadside telephones including foundations, posts housings and handsets in accordance with the requirement of the Agreement. Typically this will be in accordance with drawing NDX1049-01 or as otherwise described in Appendix 15/1. Where Type HA 354 ERT telephones are specified these shall be installed as instructed by the Overseeing Organisation. 2. Where emergency roadside telephones are installed on existing motorways or roads to which the public have access, then they 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.

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

Clause Number	Title and Written Text
1511SR	**Marker Tape** 1. All ducts installed underground shall have their position indicated by the use of detectable marker tape. Unless otherwise described in Appendix 15/1 such marker tape, as described below, shall be buried in the trench above the cable/duct as detailed in NDX1063-00. 2. Marker tape shall be manufactured from self coloured thermoplastic material not less than 150 millimetres 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: (i) Stainless steel wire or wires with a minimum total cross sectional area of 0.30 millimetres square laid in a sinusoidal wave form or stainless steel strip with minimum dimensions of 10 millimetre 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. (ii) Aluminium foil with minimum dimensions of 50 millimetre 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. 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 shall be maintained. The joint shall be protected from corrosion and attack from ground chemicals. 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 1 metre apart. The letters of the wording shall be a minimum of 30 mm high with a minimum of 5 millimetre line thickness 5. Marker tape shall be yellow in colour, with wording in black.
1512SR	**Provision of and Installation of Ancillary Items** 1. Unless otherwise described in Appendix 15/1 the Company shall provide and install all ancillary items required to comply with the documents listed within the O&M Works Requirements. 2. Power supply distribution and protection circuits shall be housed in cabinets to be provided by Traffic Scotland. The cabinets are as detailed in drawings NDX1011-01, NDX1002-01 and NDX1011-05. The layout of the supply distribution and protection circuits shall be as detailed in drawings NDX1011-01, and NDX1011-05. The circuits detailed on Drawings NDX1011-01 and NDX1011-05 are shown for example only and the Company shall provide power schematic layout drawings in accordance with drawings NDX1072-01 and NDX2019-01. The Company shall also ensure that this work conforms to the requirements of the BS7671 (Requirements for Electrical Installations; IEE

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

Clause Number	Title and Written Text
	Wiring Regulations). 3. The Company shall provide and install enclosures, termination equipment and all fixings to joint fibre optic cable in fibre optic termination pillars in accordance with NDX1034-02. 4. Cabinets type 600 shall be installed as shown on drawings in NDX1002 series. The Company shall install standard termination frames and wiring or modify the cabinet internals and wiring as shown in NDX1002-01. Where the termination frame arrangement shall be required, the frame shall be wired using 0.5 millimeter 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 1513SR and shall satisfy the requirements of the applicable workmanship standards manual that forms part of the Quality Plan. 5. The Company shall provide, install, test, integrate and commission additional ancillary equipment as required to comply with the Agreement within the NNCC and/or Traffic Scotland transmission buildings.
1513SR	**Jointing and Termination of Multi-pair Communications and Feeder Cables** 1. No permanent 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 shall be replaced. Cable replacement shall take place within 28 days of the damage. The Traffic Scotland special requirements provide further details relating to Traffic Scotland equipment damage and repair. 2. The type of cable joints between detector loops tails and feeder cables shall be as specified in Appendix 15/1 and shall comply with Clause 1523SR. Furthermore the specified loop tail and feeder cable joints shall be installed in loop roadside chambers in accordance with NDX1063-04. 3. To terminate multi-pair cables in cabinets, the outer and inner sheaths 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. 4. Cables shall be glanded and dressed neatly and installed in conformance with the NDX drawings and in accordance with the pair allocation tables as typically detailed in the Traffic Scotland Equipment Manual. 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 sleeve or collar. 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

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

Clause Number	Title and Written Text
	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. 7. Where the Company shall be required to joint or terminate cables onto existing operational cables, the Company shall, through the Overseeing Organisation arrange for the Traffic Scotland maintenance company to attend each site to supervise all work for which the Company shall be responsible. The Company shall prepare a method statement for this operation which shall include the time and duration of operation, fall back scenario, order of stages involved in the operation and means employed to minimise impact on the existing system. 8. Links shall be installed and connected using, as appropriate, the insulated conductors of multi-pair/0.9 millimetre 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.
1514SR	**Cable Connectors** Cable connectors shall be as described in the NDX drawings.
1515SR	**Jointing and Termination of Fibre Optic Communications Cable** 1. Fibre optic communication cables shall be jointed and terminated in Highways Agency Type 609 cabinet in accordance with NDX1034-02 or within existing transmission buildings. Within existing transmission buildings the Company shall use the existing fibre optic cable jointing and termination facilities or provide new 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 accordance with the Agreement. 2. 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 not cause losses greater than that detailed in MCG 1055. 3. Stage 2 tests shall be carried out after consultation with the Overseeing Organisation.
1516SR	**Termination and Jointing of Power Supply Cables for Communications** 1. Power supply cables shall be terminated in accordance with good standard working practice as described in the applicable design drawings, Work Procedures and Method Statements, Appendix 15/1 and the 'Workmanship Standards Manual' ISBN 0-632-04003-3. 2. Where cables greater in size than 25 millimetres square are required, then, unless otherwise described within the Appendix 15/1, approval of the Overseeing Organisation shall be necessary. Underground joints are not

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

Clause Number	Title and Written Text
	permitted on Scottish motorways communications system sites either direct buried or in chambers, ducts or troughs. 3. Where a new power supply shall be being provided to existing equipment, which will result in a disruption to or the loss of existing facilities (signals, CCTV etc), the Company shall obtain written authority from the Overseeing Organisation, who will advise the motorway Police and the Overseeing Organisation's maintenance company of the anticipated duration, so that the effects of the power supply disruption can be assessed. The Company shall provide at least two weeks' notice in writing to the Overseeing Organisation of all planned disruptions detailing the duration and overall impact of the power supply disruption. The Company shall undertake all necessary preparatory work to ensure that the period of disruption shall be minimised. 4. Where power supply cables are to be terminated into existing cabinets which contain operational equipment the Company shall, through the Overseeing Organisation, arrange for the Traffic Scotland maintenance company to attend each site to witness cable termination work undertaken by the Company. The Company shall give at least two weeks' written notice to the Overseeing Organisation.
1517SR	**Earthing and Bonding** 1. The earthing and bonding of the Traffic Scotland installations shall comply with the recommendations contained in BS7671; Requirements for Electrical Installations; IEE Wiring Regulations and BS7430:1998 Code of Practice for Earthing. Where required further details of the earthing and bonding requirements may also be given in Appendix 15/1. 2. The area of gland plates or boxes, which will come into contact with a cable gland shall be cleaned of all paint and corrosion before a cable gland shall be fitted. Once the gland shall be fitted, exposed metalwork of gland plates or enclosures 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 Suppliers Regulations. This bonding cable shall be copper and have insulation coloured green/yellow – also see sub-Clause 5 below. 3. All connections to bolted fixtures shall be made through crimped type lugs and using correctly sized bolts with appropriate washers and/or lock nut. 4. All cabinets grouped in close proximity shall be effectively earth bonded together in accordance with the requirements of BS7671; Requirements for Electrical Enstallations; IEE Wiring Regulations; regulations section 600. 5. In all cabinets used on the Scottish motorway communications system 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 the Electricity Suppliers Regulations. This requirement applies to all SWA communications and power supply cables. 6. At all Motorway sites where a power supply shall be installed it shall be a

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

Clause Number	Title and Written Text
	requirement that an earth rod be installed as follows: (i) If the termination pillar contains the electricity suppliers cut out and shall be within 10 metres of the communications cabinets, then the earth rod will be installed adjacent to the termination pillar in accordance with the requirements of BS7671; Requirements for Electrical Installations; IEE Wiring Regulations and BS7430:1998 Code of Practice for Earthing to act as the electricity supply local protective earth.
	(ii) If the termination pillar containing the electricity suppliers cut-out shall be erected remote to the communications cabinets then a communications earth rod shall be installed adjacent to the Highways Agency Type 600 cabinet as a communications local earth. The earth impedance of the earth rod shall be no greater than 10 ohms 7. All pillar, cabinet and hazard warning signal pole doors shall be earth bonded to the main structure chassis using a flexible 6 millimetres square green/yellow insulated conductor cable reference. The bonding conductor shall be sufficiently long as not to be strained when the column door chain shall be fully extended. Where crimp terminals are used these shall be sound in assembly and protected from strain typically using an insulated clip retaining arrangement as typically detailed on drawing NDX2003-01.
1518SR	**Cable Testing** 1. The Company shall undertake tests on cables as detailed in this document, Appendix 1/5 and NDS9553. 2. Cables supplied by the Company to specification TR2158, TR1173 and WOEM 4421 shall be tested in accordance with MCH1221 at the manufacturers works prior to delivery to ensure compliance with those specifications and the testing shall be witnessed by a specialist consultant appointed by the Company. 3. 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). 4. Power cable testing shall be carried out in accordance with both MCG1022 and BS7671; Requirements for Electrical Installations; IEE Wiring Regulations (including Guide No. 3) and Clause 1526SR. All testing shall be witnessed by a specialist consultant appointed by the Overseeing Organisation. 5. 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 (unterminated) in the respective termination cabinets. No site cable tests shall be carried out 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. 6. Three copies of all cable test results shall be supplied to the Overseeing Organisation on the completion of each test. The cable being tested and the instruments being used to complete the test shall be clearly marked on each cable test result. 7. The Company shall provide all safety equipment, display warning notices, erect

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

Clause Number	Title and Written Text
	barriers and ensure trained personnel are present at all points where dangerous voltages may be present during testing. 8. 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. 9. The Company shall give at least two weeks' notice, in writing, to the Overseeing Organisation of his intention to test any cable. 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. 10. Any cable damage identified shall be rectified by the Company in accordance with the Agreement and re-tested. 11. Loop detector and feeder cables shall be tested in accordance with Clauses 1523 and 1537.
1519SR	**Labelling and Numbering** 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 detailed in the O&M Works Requirements, the NDX series drawings and Appendix 15/1. The Company shall not use any other equipment numbering at anytime. 2. Cabinets, roadside emergency telephones, hazard warning 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 Appendix 15/1. 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 Appendix 15/1. 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. 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; Requirements for Electrical Installations; IEE Wiring Regulations. 5. Where the Company carries out modification work to existing cabinets, new labels shall be fitted where appropriate.
1520SR	**Loading** Unless otherwise described in Appendix 15/1, the Company shall determine the loading to be applied to the copper communication cables. Any loading required shall be installed in the copper termination pillar (CTP). The general layout of CTP shall be detailed on drawing NDX1034-03.

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

Clause Number	Title and Written Text
1521SR	**Removal and Re-siting of Existing Equipment** 1. Prior to existing Traffic Scotland equipment being removed and/or re-sited as determined by the Company, the Company shall provide a method statement for comment and approval by the Traffic Scotland Network Operations Manager. The method statement shall provide details of equipment to be removed and/or resited and the operational impact on the system. Existing equipment shall not be removed or existing cables disconnected/cut until the method statement shall be approved by the Traffic Scotland Network Operations Manager. 2. Existing equipment and as detailed in the method statement prepared under Clause 1521SR.1 shall be carefully removed to the Overseeing Organisation store. 3. Where required, and as detailed in the method statement prepared by the Company under Clause 1521SR.1 removal and resiting of Traffic Scotland equipment shall be supervised by the Traffic Scotland maintenance company. At least one week's written notice shall be given by the Company of his intention to remove and or re-site Traffic Scotland equipment. 4. 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. 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. Plinths and concrete foundations shall be broken out and disposed of in compliance with Clause 201. 6. Ducted cables to be removed shall be as determined by the Company. Cable 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 site storage area for subsequent re-use or removal to the Overseeing Organisation's store. 7. The sites of cabinets, plinths and cable trenches shall be reinstated to the level of the surrounding ground unless otherwise described in Appendix 15/1. All re-used cables shall be tested in accordance with MCG 1055 or MCG 1022.
1522SR	**Hazard Warning Signals** 1. An electrical mini-pillar in accordance with NDX1011-05 shall be provided adjacent to each hazard warning signal on the verge, remote from the TP or TEDP and any other hazard warning signal location where the TP or TEDP are greater than 15 metres away from the hazard warning signal. 2. The hazard warning signal equipment shall be provide and installed in accordance with NDX2003-01.

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

Clause Number	Title and Written Text
1523SR	**Traffic Scotland Loop Detectors** 1. Unless otherwise described in Appendix 15/1 the Traffic Scotland loop detectors shall be installed in accordance with Specification MCH1540. 2. In the verge adjacent to the loop detectors a roadside loop chamber shall be installed in accordance with Clause 1532SR. Within the roadside loop chamber the loop tails shall be jointed to the feeder cable in accordance with NDX1063-04 or as otherwise described in Appendix 15/1. The roadside loop chamber shall be installed prior to the detector loops and at the completion of the loop cutting all loop tails shall located within the roadside loop chamber and each tail shall be labelled. 3. Where loops are to be installed on existing roads the Company to shall obtain approval for and provide the traffic management systems necessary for the safe installation of the loops. Traffic management shall comply with the requirements of the Agreement. 4. Where jointing boxes are used to terminate the feeder cables conductors shall be terminated in terminal blocks complying with Clause 1514SR. 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 cables and cable cores by using correctly fitting labels at both ends.
1524SR	**Trial Pits** Trial pits shall be excavated by the Company to determine the location of Traffic Scotland underground equipment. The use of mechanical digging methods should be limited.
1525SR	**Maintaining Traffic Scotland Network** 1. Traffic Scotland services operate throughout Scotland and consequently any damage to equipment/infrastructure within the O&M Works Site can have severe consequences to the system as a whole. The Company shall maintain the integrity of Traffic Scotland equipment and infrastructure by one or any combination of the following methods: (i) Protection and use of existing network and equipment; (ii) Provision of a temporary network; (iii) Use of the new network. The Company shall comply with the special requirements for Traffic Scotland 2. The method(s) shall be detailed in a method statement prepared by the Company which shall be subject to the approval by the Traffic Scotland Network Operations Manager. 3. The Company shall give at least three weeks' written notice of the proposed

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

Clause Number	Title and Written Text
	change to Traffic Scotland equipment, which shall be identified in the Company's programme. Any such proposal shall be subject to approval by the Overseeing Organisation. The modified Traffic Scotland equipment to support the proposed change shall be installed, tested and commissioned by the Company at least five days prior to the propose change being implemented. The Company shall allow adequate time in his programme for any approval. 4. The Company must allow at all times the Traffic Scotland maintenance company and Traffic Scotland Network Operations Manager, access to all equipment within the O&M Works Site which has been identified as operational. 5. Changes to the configuration and/or the maintenance of the communications network must meet the requirements laid down in the Traffic Scotland Network Operations Manger's requirements.
1526SR	**The Inspection and Testing of Electrical Installations and Electrical Equipment** 1. The Company shall carry out the inspection and testing of electrical installations in accordance with BS 7671; Requirements for Electrical Installations; IEE Wiring Regulations. The Company shall provide paper copies of the inspection and completion certificates to the Overseeing Organisation in accordance with BS 7671; Requirements for Electrical Installations; IEE Wiring Regulations. Such certificates provided to the Overseeing Organisation must also be provided in 'soft copy' form conforming to the required format. The format of the paper and soft copies shall be in accordance with the NICEIC format and compatible with AMTEC 'FASTEST' software. Appropriate records shall be kept of routine checks, RCD tests and other testing and inspection of electrical equipment in a format agreed with the Overseeing Organisation or as otherwise specified by the Agreement. 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; Requirements for Electrical Installations; IEE Wiring Regulations, the Company shall make the installation safe and carry out works to make the installation compliant with BS7671; Requirements for Electrical Installations; IEE Wiring Regulations. 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 Effective Date. The earth loop impedance testing instrument shall be of the digital display type and shall operate from zero to 19.99 Ohms (Accuracy ± 1% ES. ± 1.5% Reading) with 0.01 Ohm resolution. Where alternating current measurements are required, testing instruments shall be of the digital display type and shall be capable of operation from with an accuracy of ± 1 % in the useable ranges. 4. All electrical inspection and testing carried out by the Company shall comply with latest editions of BS7671; Requirements for Electrical Installations; IEE Wiring Regulations, BS7671 Guidance Note No. 3 and be in accordance with the latest edition of "Code of Practice for In-service Inspection and Testing of

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

Clause Number	Title and Written Text
	Electrical Equipment" published by the IEE. 5. Prior to testing the installation in accordance with the requirements of BS7671; Requirements for Electrical Installations; IEE Wiring Regulations. 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. 6. Such electrical equipment not forming part of the fixed wiring of the installation as described in Sub-Clause 1526.5 shall be disconnected while carrying out BS7671; Requirements for Electrical Installations; IEE Wiring Regulations testing on the electrical installation then inspected and tested in accordance with the "Code of Practice for In-service Inspection and Testing of Electrical Equipment". 7. The frequency of inspection and testing of fixed installations shall be in accordance with TABLE 3.2 in BS7671; Requirements for Electrical Installations; IEE Wiring Regulations Guidance Note No. 3 and for electrical equipment shall be in accordance with TABLE 1 of "Code of Practice for In-service Inspection and Testing of Electrical Equipment". The frequency of Routine Checks carried out as required by BS7671:2001 Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition shall be as paragraph 3.5 of BS7671; Requirements for Electrical Installations; IEE Wiring Regulations Guidance Note 3 while RCD testing shall be carried out quarterly as required by BS7671; Requirements for Electrical Installation;. IEE Wiring Regulations (Regulation 514-12-02). 8. 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.
1527SR	**Cable Installation at Transmission Stations** 1. Cables shall be installed into and terminated within transmission station buildings as required by the Agreement. 2. Work shall not be undertaken in transmission station buildings by the Company until the Overseeing Organisation has approved the Company's proposals for the transmission building works. The Company shall provide at least two weeks' notice in writing to obtain authority to undertake the work. 3. The Company must ensure that he does not disrupt any live systems without making prior arrangements to cover for such disruption in compliance with Clause 1525SR.
1528 SR	**Modification of Existing Cabinets** 1. The Company shall carry out modifications to existing cabinets as determined by the Company after seeking approval by the Overseeing Organisation. 2. The Company shall, prior to laying any cable to the 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

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

Clause Number	Title and Written Text
	each cable found. 3. Where necessary the Company shall remove, retain for re-use, and replace the cabinet base pea gravel; remove and relay any hardstanding; excavate to expose cable remake loop, excavate cable routes; re-route cable to gain sufficient lengths for the proposed modification; reinstate cable trenches; break open and re-seal resin filled base; disconnect and reconnect, undo existing gland and re-gland, including the provision of new gland assemblies and cable termination ancillaries where required; withdraw and reinstall cables at cabinet base. All new cables installed and all existing direct buried cables exposed during the modification shall be installed and/or reinstalled in ducting laid according to Clauses 1530SR and 1531SR. Also where remake loops in direct buried cables are exposed extra chambers shall be constructed to accommodate this cable. Such typical Type C chambers shall be accordance with Clause 1532SR and drawing NDX1063-03. 4. Any work required involving operational Traffic Scotland equipment shall be undertaken only with the approval of the Company's method statement for the work by the Traffic Scotland Network Operations Manager. The Company shall give at least two weeks notice in writing to obtain approval by the Overseeing Organisation.
1529SR	**Temporary Roadside Emergency Telephones.** 1. Temporary roadside emergency 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 as Clause 1510SR.2. The direction to the temporary roadside emergency 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. 2. Telephone instruments and posts shall be supplied by the Company in compliance with Clause 1510SR unless otherwise described in Appendix 15/1. 3. Cable for temporary roadside emergency 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. 4. Cable for temporary roadside emergency telephones shall be connected to the nearest copper termination pillar 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. 5. Connections and disconnections from the live communications network shall be carried out by the Traffic Scotland maintenance company. The Company shall give at least one 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.

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

Clause Number	Title and Written Text
	6. The Company shall install, place in position, maintain, cover up, uncover, reposition, re-cable and remove temporary roadside emergency telephones and associated work as necessitated by the progress of any O&M Works. 7. Maintenance of temporary roadside emergency telephones connected onto the network shall only be undertaken by the Traffic Scotland maintenance company. The Company must allow, at all times, access arrangements to any Traffic Scotland maintenance company and the Traffic Scotland Network Operations Manager.
1530SR	**Cable Ducts** 1. The term cable duct used in this series describes the ducts used for Traffic Scotland communication and power cables. 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 3. The ducts installed to this specification are used for all types of Traffic Scotland cables 4. The ducts shall comply with this series and any other requirements described in Appendix 15/2. 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. 5. The ducts shall comply with the general requirements of BS EN 50086-1:1994 Specification for Conduit Systems for Cable Management; General Requirements and in particular requirements of BS EN 50086-2-4:1994 Specification for Conduit Systems for Cable Management; Particular Requirements; Conduit Systems Buried Underground. The ducts shall have a current British Board of Agreement Roads and Bridges Certificate in accordance with Clause 104. 6. The ducts shall be manufactured from thermoplastic material. The 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. 7. The longitudinal, transverse and local ducts shall meet BS EN 50086-2-4:1994 Specification for Conduit Systems for Cable Management; Particular Requirements; Conduit Systems Buried Underground 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. 8. Unless otherwise described on Appendix 15/2 the nominal sizes of the ducts

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

Clause Number	Title and Written Text
	shall be as described in the O&M Works Requirements. The minimum internal diameters shall be 150 millimetre, 99 millimetre and 47 millimetre. 9. The external wall of the ducts shall be self coloured black for all communication installations regardless of whether they contain power or communications cable. 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 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. 11. Each duct shall be fitted with a pigmented, stranded polypropylene 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 shall be terminated. Draw cords shall be secured to the duct plugs where fitted. Draw cords shall not be knotted within ducts; where a joint shall be required it shall be a spliced joint. 12. The duct network shall be sealed to ensure compliance with Clause 1533SR. 13. Ducts containing motorway communications 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 shall be uppermost. The method of marking shall not affect the integrity of the duct. This marking shall be 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. 14. Each duct shall be fitted with a proprietary branded duct insert as shown on NDX1063-00dt. 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 millimetres, this spacing would typically be 1 metre. 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. The Company shall provide the Overseeing Organisation with details of the proposed strapping and spacer arrangement for approval at least two weeks prior to the installation of any ducts.
1531SR	**Installation of Ducts** 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 hardshoulder. 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

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

Clause Number	Title and Written Text
	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. 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 shall be complete. 3. Cable ducts shall comply with the appropriate British Standard and shall be tested in accordance with Clause 1533SR. Ducts with push-fit joints shall have a register and clear markings to ensure that the duct joint shall be fully engaged. 4. Cable duct configurations, bedding, haunching and surround shall be as shown on drawing NDX1063-00. 5. Backfilling shall be undertaken immediately after the required operations preceding it have been completed. 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 millimetre 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 millimetre of the ducts. 7. For ducts shown on drawing NDX1063-00 topsoiling, grass seeding and/or turfing, as described in Clause 618 and 3005, shall be placed in the top 150 millimetre of the cable duct trench unless otherwise specified in Appendix 15/2. 8. For ducts shown on drawing NDX1063-00 marker tape shall be laid within the trench excavation at a depth of 150 millimetres or at the class A/topsoil interface whichever shall be the greater. The marker tape shall comply with Clause 1511SR. 9. Prior to mandreling, the Company shall swab through each duct to clear all debris. 10. Ducts that are laid across or within the filter drains (French drains) shall be surrounded with 150 millimetres of mix ST2 concrete in compliance with Clause 2602. In the event that the route of a duct comes within 500 millimetres 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. 11. Unless otherwise described in the O&M Works Requirements the Traffic Scotland equipment duct network comprises of :

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

Clause Number	Title and Written Text
	(i) quad 100 millimetre inside diameter sealed longitudinal communication ducts installed along both verges terminating at each roadside longitudinal Type A chamber constructed at each equipment site and at transverse duct locations and additional location such that no duct run shall be greater than 250 metre. A nominal spacing of Type A chambers shall be 250 metre centres. Additional Type A chambers shall be provided where changes of level or direction occur. (ii) six way 100 millimetre inside diameter sealed transverse ducts at 500 metre intervals passing through the central reserve Type A chamber and terminating in the Type A roadside longitudinal chambers. The ducts are to be installed continuously through the central reserve chamber and shall not be broken away unless otherwise described in Appendix 15/2; (iii) single 100 millimetre inside diameter local ducts as typically shown in NDX1063-00; (iv) single 50 millimetre inside diameter local ducts as NDX1063-00 to provide for cables connecting to the roadside emergency telephones and hazard warning signals. (v) single 150 millimetre inside diameter local power ducts for power cable connection from termination pillar to traffic equipment distribution pillars.
1532SR	**Chambers for Motorway Communications Cables** 1. Chambers shall be either a Type A, B, C or Loop chamber. Chambers Type A, B and C are rectangular in plan with a standard plan size and are constructed so that their covers are raised 50 millimetre above the level of the adjacent ground. Type A and B are shown in the drawings NDX1063-01 and NDX1063-02. Type C shall be shown on NDX1063-03. The construction of the detector loop roadside chamber shall be shown in NDX1063-04. 2. Chambers shall be used solely for Traffic Scotland equipment. 3. The site records must include details of the location, type, etc as required in Clause 1504.1 (ii)SR 4. Unless otherwise described in Appendix 15/2 the following chamber types shall be installed at the locations as follows: (i) Type A chambers shall be placed at 500 metre intervals along the length of the longitudinal ducts in both verges. At these locations a Type A chamber shall also be constructed in the central reserve and six transverse ducts installed to connect the two verge chambers through the central reserve chamber. (ii) Type A intermediate chambers shall also be installed in both verges along the longitudinal ducts midway between chambers detailed in the previous sub clause so providing duct access at 250 metre intervals. At these intermediate chambers no transverse ducts are required to be installed. (iii) A cable stowage Type C chamber shall be constructed adjacent to all individual or group of communications cable termination cabinets where

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

Clause Number	Title and Written Text
	service loops are required. (iv) additional Type A chambers where Traffic Scotland equipment site shall be not adjacent to the Type A chambers detailed in sub clause a) and b) above (v) additional Type A chambers for cable access shall also be constructed wherever the associated ducts change level or direction; (vi) Type A or Type B chambers shall also be constructed as required to accommodate local ducting containing electricity supply or private wire interface cables; (vii) roadside loop chambers shall be installed in the verge adjacent to each Traffic Scotland vehicle detection sites and each SRTDb vehicle classification detection site. 5. Foundations to chambers shall be of mix ST4 concrete in accordance with Clause 2602. 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 unpointed joints in Clause 2412. The ends of all ducts shall be neatly built into the brickwork and finished flush with mortar designation (i). 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 200:1989, they shall be surrounded by 150 millimetres 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 as required by the manufacturer's instructions. No more than 6 off 100 millimetre 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. 8. Where the depth of invert of chambers exceeds 900 millimetres below the finished surface of the carriageway or the adjacent ground, manhole steps complying with BS 1247: Part 1 or Part 2:1990 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. 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 shall be 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 concrete chambers, the shafts shall be surrounded by a minimum thickness of 150 millimetres of mix ST4 concrete, and the remaining excavation backfilled with general fill material as described in Table 6/1 compacted in compliance with Clause 612.

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

Clause Number	Title and Written Text
	10. Chamber covers and frames shall be as described in Appendix 15/2 and shall comply with BS EN 124:1994 Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control. Special duty covers for use in carriageways and other special situations shall be as agreed with the Overseeing Organisation. 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 hardstanding 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 civil's construction. 12. Four sets of lifting keys as described in Appendix 15/2 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 where the mass of an individual cover exceeds the value in Appendix 15/2. 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. 14. Chambers shall be constructed with a sump as shown NDX Drawings. This sump shall be constructed to drain into a soakaway immediately below the chamber. It shall be a requirement of this specification that the chamber drainage shall be adequate to minimise the accumulation of water in the chamber. Under no circumstances should running water be allowed to drain through the chambers. 15. Chambers shall be clearly identified by the legend "MOTORWAY COMMUNICATIONS"; the lettering shall be 25 millimetres 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.
1533SR	**Proving and Testing of Ducts** 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 1530SR.14 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 plug the duct in accordance with Clause 1530SR.14. 3. To undertake the air test, air shall be pumped into the duct by suitable means

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

Clause Number	Title and Written Text
	until a stable pressure of 100 millimetre head of water shall be indicated in a U-tube connected to the system. The air pressure shall not fall to less than 75 millimetre head of water during a period of five minutes without further pumping, after an initial period to allow for stabilisation. 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. 5. Unless otherwise described in Appendix 15/2 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 1063-00dt sheet 7 of 10 refers.
1534SR	**Closed Circuit Television** 1. Closed circuit television (CCTV) typically consists of cameras, associated masts, pan and tilt units, camera mast cables and video transmission equipment. 2. The Company shall design and install a camera mast foundation in accordance with the standards detailed in the mast manufacturers' instructions, the O&M Works Requirements and the NDX series drawings.

Appendix 0/2 Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Agreement

MINOR ALTERATIONS TO EXISTING CLAUSES

Clause Number	Title and Written Text	Written on Page Number
104	Standards Quality Assurance agreement Certificates and Other Approvals	131
201	Clearing	131
204	Hazardous Materials	131
507	Chambers	131
601	Classification Definitions and Uses of Earthworks Materials	131
610	Fill to Structures	132
611	Fill Above Structural Concrete Foundations	132
1101	Precast Concrete Kerbs Channels Edgings and Quadrants	132
1102	In Situ Asphalt Kerbs	132
1103	Freestanding In Situ Concrete kerbs Channels and Edge Details	132
1104	Footways and Paved Areas (Precast Concrete Flags)	132
1106	Footways and Paved Areas (In Situ Concrete)	132
1201	Regulation Sign Classification and Standards	132
1208	Location and Erection of Permanent Traffic Signs	133
1209	Covering of permanent traffic signs	133
1210	Permanent Bollards	133
1213	Road Studs	133
1310	Amendments and Additions to BS 5649: Part 3: 1982 Lighting columns. Specification for materials and welding requirements	133
1403	Location of lighting Units and Feeder Pillars	133
1422	Cable Joints	133

Appendix 0/2 Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Agreement

Clause Number	Title and Written Text
104	**Standards Quality Assurance Agreement Certificates and Other Approvals** Sub-Clause 4 add at the end: "All Quality Management Schemes listed in Appendix A of the Specification for Highway Works shall be applicable to this Agreement".
201	**Clearing** Sub-Clause 6 after paragraph 2 add new paragraph as follows: "In the case of items such as stone, copes, granite setts, kerbs, concrete paving and the like, stacking and protection shall be achieved by palletising." Sub-Clause 7 delete and replace with: "7. Topsoil excavated for any purpose shall be reserved and protected for re-use. Multiple handling of topsoil shall be kept to a minimum."
204	**Hazardous Materials** In sub-Clause 1 after " …in Site clearance" insert "or any other work on the O&M Works Site including emergency situations".
507	**Chambers** Add the following new sub-Clauses 19-23: 19. The frame shall be haunched with mortar to within 40 millimetres of its top. The remaining 40 millimstres shall be painted with joint bitumen. 20. The remainder of the void around the frame shall be filled with either bitumen macadam or rolled asphalt surfacing material to match the surrounding surface. The surface course shall be laid in a uniform layer of the specified thickness and shall include any surface treatment necessary to match the surrounding surface. Such treatment shall comply with the relevant Clauses in this Specification. 21. Covers and frames shall be broken-out adjusted reinstated and able to be trafficked in the course of one working day. 22. In certain circumstances for example if the Site shall be overlaid the Company may adjust covers and frames to levels above the adjacent surface. The covers and frames shall be surrounded by a temporary ramp in bituminous material to a gradient not steeper than 1:10. The Company shall provide warning signs in accordance with Clause 117. 23. Draw pit chambers for electrical supply cables shall be as referred to in Appendix 5/2."
601	**EARTHWORKS** Classification Definitions and Uses of Earthworks Materials At the end of sub-Clause 2 add the following "(g) any other material designated in the Agreement as unacceptable material Class U1."

Appendix 0/2 Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Agreement

Clause Number	Title and Written Text
610	**Fill to Structures** In sub-Clause 1(iv): delete " unless otherwise required in Appendix 6/6". In sub-Clause 2 line 2 delete " 6P, 7A and 7B". In sub-Clause 2 lines 3 and 4 delete ", in the locations described in Appendix 6/6" In sub-Clause 3 lines 2 and 3 delete: "6P, 7A and 7B " In sub-Clause 6 lines 1 and 2 delete " 6P and 7B"
611	**Fill Above Structural Concrete Foundations** In sub-Clause 1 (i) delete "6P, 7A or 7B" In sub Clause 1 (ii) delete whole sub Clause
1101	**KERBS FOOTWAYS AND PAVED AREAS** **Precast Concrete Kerbs Channels Edgings and Quadrants** Sub-Clause 2 lines 13 and 14 Delete "At expansion joints in bridge decks the kerb joints shall be as described in Appendix 11/1". Sub-Clause 4 – delete and replace with the following "4. The longitudinal surface regularity shall not deviate by more than 3mm in 3 metres when checked with a 3 metre straight edge. Horizontal alignment shall comply with Clause 702."
1102	**In Situ Asphalt Kerbs** Sub-Clause 2 – delete.
1103	**Freestanding In Situ Concrete Kerbs Channels and Edge Details** Sub-Clause 1 line 8 Delete all text after "dragging" and add "The longitudinal surface regularity shall not deviate by more than 5mm in 3 metres when checked with a 3 metre straight edge."
1104	**Footways and Paved Areas (Precast Concrete Flags)** Sub-Clause 2 lines 2 and 3 Delete "with a bond as described in Appendix 11/12".
1106	**Footpaths and Paved Areas (In Situ Concrete)** Add "4. Synthetic fibres shall be added to the concrete at the concrete mixing plant at a rate of 0.9kg per cubic metre of concrete as and when specified by the Scottish Ministers
1201	**Regulations Sign Classifications and Standards** Sub-Clause 4 (i) – delete "or specially authorised by the Secretary of State". Sub-Clause 4 (ii) – delete.

Appendix 0/2 Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Agreement

Clause Number	Title and Written Text
	Sub-Clause 4 (iii) – delete "designated by the Company".
1208	**Location and Erection of Permanent Traffic Signs** Sub-Clauses 1 and 6 – delete
1209	**Covering of Permanent Traffic Signs** Sub-Clause 7 add "Any damage caused as a result of the temporary covering of permanent traffic signs shall be rectified at the Company's expense."
1210	**Permanent Bollards** Sub-Clause 2 after "Internally illuminated bollards" insert "base illuminated bollards".
1213	**Road Studs** Add new sub-Clause "9 New or replacement thermoplastic road studs shall be installed as CHART node points as and when directed by the Scottish Ministers. Details of material to be used and installation methods are specified in Appendix 12/3."
1310	**ROAD LIGHTING COLUMNS AND BRACKETS** **Amendments and Additions to BS 5649 Part 3 1982** Amendments and Additions to BS EN 40-5: 2002 Lighting columns. Requirements for steel lighting columns and BS EN 40-6 : 2002 Lighting columns. Requirements for aluminium lighting columns for Lighting Columns and Brackets, CCTV Masts and Cantilever Masts In paragraph 1310.1 For Lighting Columns and Brackets Page 8 Clause 7.1 sub-Clause 7.1.5 Destructive Testing, delete all text after paragraph 1. In paragraph 1310.2 For CCTV Masts and Cantilever Masts Page 8 delete all text.
1403	**Location of Lighting Units and Feeder Pillars** Sub-Clause 1 – delete completely and insert "1. The exact location of new lighting units and feeder pillars shall be consented to in writing by the Scottish Ministers before commencement of any ground work. The Company shall be responsible for recording the agreed location."
1422	**Cable Joints** Sub-Clause 3 – delete completely and insert "3. Cable joints shall not be provided for cables situated in a duct or trough."

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

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

List 'A' shall be a complete list of the numbered Appendices referred to in the Specification for Highway Works with those not adopted marked 'Not Used'.

List 'B' shall be a complete list of CONTRACT SPECIFIC Numbered Appendices devised for the Agreement.

The responsibility for compiling/completing the numbered Appendices shall be indicated by the following symbols:

E The Scottish Ministers compile

E/C The Scottish Ministers partially compile and the Company completes and returns to the Scottish Ministers,

C The Company compiles, completes and returns to the Scottish Ministers.

(P) This indicates the Appendix shall be a national Performa and the format shall not be altered.

The Company shall compile/complete the numbered Appendices in accordance with the Notes for Guidance on the Specification for the Highway Works (Volume 2 of the MCHW), and provide as a minimum the information described in the sample appendices.

Compiled/ Completed by	Appendix Number	Title
Introduction		
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 the Scottish Ministers
Preliminaries		
Not Used	1/1	Temporary Accommodation and Equipment for the Scottish Ministers
Not Used	1/2	Vehicles for the Scottish Ministers
Not Used	1/3	Communication System for the Scottish Ministers
Not Used	1/4	Working and Fabrication Drawings
E/C	1/5	Testing to be Carried out by the Company
Not Used	1/6	Supply and Delivery of Samples to the Scottish Ministers
E	1/7	O&M Site Extent and Limitations on Use
Not Used	1/8	Operatives for the Scottish Ministers
E	1/9	Control of Noise and Vibration
C	1/10	Structures to be Designed by the Company

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

Compiled/ Completed by	Appendix Number	Title
C	1/11	Structural Elements and Other Features to be Designed by the Company
C	1/12	Setting Out and Existing Ground Levels
C	1/13	Programme of New Works
Not Used	1/14	Payment Applications
C	1/15	Accommodation Works
C	1/16	Privately and Publicly Owned Services and Supplies
E	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
C	1/22	Progress Photographs
C	1/23	Risks to Health and Safety from Materials or Substances
E/C	1/24	Quality Management System
C	1/25	Temporary Closed Circuit Television (CCTV) System for the Monitoring of Traffic
C	1/26	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR)
C	1/27	Temporary Automatic Speed Camera System for the Enforcement of Mandatory Speed Limits at Road Works (TASCAR) – Particular Requirements
Site Clearance		
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
C	2/4	Explosives and Blasting
C	2/5	Hazardous Materials
Fencing and Environmental Barriers		
E/C	3/1	Fencing, Gates and Stiles
Road Restraint Systems (Vehicle and Pedestrian)		
E/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 1317-1:1998 Road restraint systems. Terminology and general criteria for test methods, BS EN 1317-3:2000 Road restraint systems. Performance classes,

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

Compiled/ Completed by	Appendix Number	Title
		impact test acceptance criteria and test methods for crash cushions and DD ENV 1317-4: 2002
Drainage and Service Ducts		
E/C	5/1	Drainage Requirements
E/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
E/C	5/7	Thermoplastics Structural Wall Pipes and Fittings
Earthworks		
E/C	6/1	Requirements for Acceptability and Testing etc. of Earthworks Materials
E/C	6/2	Requirements for Dealing with Class U1B and Class U2 Unacceptable Material
E/C	6/3	Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)
C	6/4	Requirements for Class 3 Material
E/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
E/C	6/8	Topsoiling
C	6/9	Earthworks Environmental Bunds, Landscape Areas, Strengthened Embankments
C	6/10	Ground Anchorages, Crib Walling and Gabions
C	6/11	Swallow Holes and Other Naturally Occurring Cavities and Disused Mine Workings
C	6/12	Instrumentation and Monitoring
C	6/13	Ground Improvement
E/C	6/14	Limiting Values for Pollution of Controlled Waters
E/C	6/15	Limiting Values for Harm to Human Health and the Environment
Road Pavements – General		
E/C	7/1	Flexible Pavement Construction

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

Compiled/ Completed by	Appendix Number	Title
E/C	7/2	Excavation, Trimming and Reinstatement of Existing Surfaces
E/C	7/3	Surface Dressing – Performance Specification (Sheets 1, 2 and 3)
E/C	7/4	Bond Coats, Tack Coats and Other Bituminous Sprays (Sheets 1, 2 and Binder Data Sheet
E/C	7/5	In Situ Recycling: The Remix and Repave Processes
E/C	7/6	Breaking Up or Perforation of Existing Pavement
E/C	7/7	Slurry Surfacing Incorporating Microsurfacing (Sheets 1, 2 and 3)
	7/8	Not Used
C	7/9	Cold Milling (Planing) of Bituminous Bound Flexible Pavement
E/C	7/10	Worksheet Pro Forma for Results of Testing for Constituent Materials in Recycled Coarse Aggregate and Recycled Concrete Aggregate
C	7/11	Overband 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	Saw-Cut, Crack and Seat Existing Jointed Reinforced Concrete Pavements
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
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 (Sheets 1, 2 and Binder Data Sheet
C	7/22	Repair to Potholes
Road Pavements – Concrete and Cement Bound Materials		
C	10/1	Plant and Equipment for the Construction of Exposed Aggregate Concrete Surface
Kerbs, Footways and Paved Areas		

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

Compiled/ Completed by	Appendix Number	Title
C	11/1	Kerbs, Footways and Paved Areas
C	11/2	Access Steps
Traffic Signs		
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
Road Lighting Columns and Brackets. CCTV Masts and Cantilever Masts		
E/C	13/1	Information to be Provided When Specifying Lighting Columns and Brackets
E/C	13/2	(Specification for Highway Works) Typical Lighting Column and Bracket Data Sheets 1 and 2
E/C	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	13/6	Instructions for Completion of CCTV Mast Sheets
C	13/7	Information to be Provided When Specifying Cantilever Masts
C	13/8	(Specification for Highway Works) Typical Cantilever Masts Data Sheets 1 and 2
C	13/9	Instructions for Completion of Cantilever Masts Data Sheets
Electrical Work For Road Lighting And Traffic Signs		
C	14/1	Site Records
C	14/2	Location of Lighting Units & Feeder Pillars
E/C	14/3	Temporary Lighting
E/C	14/4	Electrical Equipment for Road Lighting
E/C	14/5	Electrical Equipment for Traffic Signs
Motorway Communications		
E/C	15/1	Traffic Scotland Equipment
E/C	15/2	Traffic Scotland - Cable Duct Requirements
Piling and Embedded Retaining Walls		
C	16/1	General Requirements for Piling and Embedded Retaining

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

Compiled/ Completed by	Appendix Number	Title
		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
Structural Concrete		
E/C	17/1	Schedule for the Specification of Designed Concrete
E/C	17/2	Concrete - Impregnation Schedule
C	17/3	Concrete - Surface Finishes
E/C	17/4	Concrete - General
E/C	17/5	Buried Concrete
C	17/6	Grouting and Duct Systems for Post-Tensioned Tendons
Structural Steelwork		
C	18/1	Requirements for Structural Steelwork
Protection of Steelwork Against Corrosion		
E/C	19/1	Requirements for Bridge, Parapets and Other Highway Structures Except Bearings and Lighting Columns
E/C	19/3	Requirements for Lighting Columns and Bracket Arms
E/C	19/4	Requirements for Other Work
Waterproofing for Concrete Structures		

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

Compiled/ Completed by	Appendix Number	Title
E/C	20/1	Waterproofing for Concrete Structures
Bridge Bearings		
C	21/1	Bridge Bearing Schedule
Bridge Expansion Joints and Sealing of Gaps		
C	23/1	Bridge Deck Expansion Joints Schedule
C	23/2	Sealing of Gaps Schedule (Other than in Bridge Deck Expansion Joints)
Brickwork, Blockwork and Stonework		
E/C	24/1	Brickwork, Blockwork and Stonework
Special Structures		
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
Miscellaneous		
C	26/1	Ancillary Concrete
C	26/2	Bedding Mortar
C	26/3	Cored Thermoplastic Node Markers
Landscape and Ecology		
E/C	30/1	Landscaping: General
E/C	30/2	Weed Control
E/C	30/3	Control of Rabbits and Deer
E/C	30/4	Ground Preparation
E/C	30/5	Grass Seeding, Wildflower Seeding and Turfing
E/C	30/6	Planting
E/C	30/7	Grass, Bulbs and Wildflower Maintenance
E/C	30/8	Watering
E/C	30/9	Establishment Maintenance for Planting
E/C	30/10	Maintenance of Established Trees and Shrubs
E/C	30/11	Management of Waterbodies
E/C	30/12	Special Ecological Measures
Maintenance Painting of Steelwork		

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

Compiled/ Completed by	Appendix Number	Title
E/C	50/1	(Specification for Highway Works) Form (HA/P1 (Maintenance) Paint System Sheet
C	50/2	Requirements for Other Work
E/C	50/3	(Specification for Highway Works) Form HA/P2 Paint Data Sheet
E/C	50/4SE	(Specification for Highway Works) Form HA/P3 Paint Sample Despatch List: Sheets 1 and 2
C	50/5	General Requirements

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

Amendment to the Specification for Highway Works

List 'B': List of AGREEMENT Numbered Appendices Devised for this Agreement		
Compiled / Completed By	**Appendix Number**	**Title**
Preliminaries		
E/C	1/72	Communication System for the Company
E/C	1/74	Safety of Operations
E/C	1/78	Material Stocks
Road Restraints Systems (Vehicle and Pedestrian)		
E/C	4/71	Re-Tensioning of Safety Barriers
Road Pavements – General		
E/C	7/71	Concrete Pavements Repair Systems
E/C	7/72	Temporary Repairs to Carriageway Defects
Road Lighting Columns and Brackets, CCTV Masts and Cantilever Masts		
E/C	13/70	Maintenance of High Mast and Other Lighting Incorporating Hoists Winches and Ropes
Electrical Work for Road Lighting and Traffic Signs		
E/C	14/70	Purchase Delivery Handling and Storage of Materials
E/C	14/71	Labour Requirements
E/C	14/73	Call Out Report
E/C	14/74	Report
E/C	14/75	Competent Person's Authorisation Certificate
E/C	14/76	Liaison with Electricity Companies
Motorway Communications		
E/C	15/11	Communication System
Structural Concrete		
E/C	17/70	Schedule for the Specification of Designed Concrete
Protection of Steelwork Against Corrosion		
E/C	19/70	Paint System
Bridge Expansion Joints and Sealing of Gaps		
E/C	23/70	Replacement Bridge Expansion Joints And Sealing Of Joints
E/C	23/71	Asphaltic Plug Joints – Additional Requirements
Winter Maintenance Operations		
E/C	28/1	Supplies and Salt Spreading Rates
E/C	28/2	Company's Vehicles and Plant

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

Emergency Response Operations		
E/C	32/1	Emergency Response
Site Investigation		
E/C	33/1	Structural Investigations Test Requirements

Appendix 0/4 List of Drawings Included in the Agreement

2 Agreement Specific Drawings Supplied to the company

The drawings referred to in this Appendix are bound separately.

Title	Drawing No
Land Made Available by the Scottish Ministers for the O&M Works Sheet 1 of 16	B0524200/CD/LMAO&M/01 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 2 of 16	B0524200/CD/LMAO&M/02 Rev. 4
Land Made Available by the Scottish Ministers for the O&M Works Sheet 3 of 16	B0524200/CD/LMAO&M/03 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 4 of 16	B0524200/CD/LMAO&M/04 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 5 of 16	B0524200/CD/LMAO&M/05 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 6 of 16	B0524200/CD/LMAO&M/06 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 7 of 16	B0524200/CD/LMAO&M/07 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 8 of 16	B0524200/CD/LMAO&M/08 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 9 of 16	B0524200/CD/LMAO&M/09 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 10 of 16	B0524200/CD/LMAO&M/10 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 11 of 16	B0524200/CD/LMAO&M/11 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 12 of 16	B0524200/CD/LMAO&M/12 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 13 of 16	B0524200/CD/LMAO&M/13 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 14 of 16	B0524200/CD/LMAO&M/14 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 15 of 16	B0524200/CD/LMAO&M/15 Rev. 3
Land Made Available by the Scottish Ministers for the O&M Works Sheet 16 of 16	B0524200/CD/LMAO&M/16 Rev. 3

Appendix 0/4 List of Drawings Included in the Agreement

3 Standard Drawings

Drawing Number	Sheet Number	Rev.	Title
NDX1001-01ga	1	C	Typical Overall Type 1 Cantilever MK3 VMS Site Infrastructure
NDX1001-01ga	2	C	Typical Site Layout For Type 1 Cantilever MK3 Variable Message Sign
NDX1001-01sp	3	0	For Future Use
NDX1001-01sp	4	0	For Future Use
NDX1001-01dt	5	C	Installation Drawing For Typical Safety Fence & Earth Bonding at Type 1 Cantilever MK3 VMS Sites
NDX1001-02ga	1	B	Typical Overall Cantilever MS3 400/320mm VMS Site Infrastructure
NDX1001-02ga	2	2	Typical Cantilever MS3 400/320mm Variable Message Signs
NDX1001-03ga	1	2	Typical Overall Cantilever MS4 400/320mm VMS Site Infrastructure
NDX1001-03ga	2	1	Typical Cantilever MS4 400/320mm Variable Message Signs
NDX1001-04ga	1	2	Typical Overall Cantilever Continuous Matrix 400/320mm VMS Site Infrastructure
NDX1001-04ga	2	1	Typical Cantilever Continuous Matrix 400/320mm Variable Message Signs
NDX1002-00ga	1	B	HA Type 600 Cabinet Installation - Plinths
NDX1002-00dt	2	B	HA Type 600 Cabinet Foundations
NDX1002-00dt	3	A	Earth Stud Typical Assembly
NDX1002-00dt	4	A	HA Type 600 Cabinet Door Security Strap
NDX1002-00dt	5	B	HA Type 600 Cabinet Thermostat & Heater Type 1020
NDX1002-00dt	6	C	HA Type 600 Cabinet Labels
NDX1002-00no	7	B	HA Type 600 Cabinet Labels
NDX1002-00ga	8	B	HA Type 600 Cabinet Installation
NDX1002-00no	9	B	HA Type 600 Cabinet Installation Notes
NDX1002-01dt	6	A	HA 600 Cabinet Communications Cable Clamping & Earthing Detail

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX1007-01cl	1	A	Detector Loop Layout (Monitoring)
NDX1007-01cl	2	B	Detector Loop Layout (Monitoring)
NDX1007-01cl	3	A	Detector Loop Layout (Monitoring)
NDX1010-00ly	1	A	Typical Camera Site - Cabinet Layout
NDX1010-00ly	2	A	Typical Camera Site - Duct Layout
NDX1010-00wd	3	A	Typical Camera Site - Earthing Arrangement
NDX1010-00cl	4	A	Typical 10 & 15 Metre CCTV Mast, Cabinet Base & Paved Area
NDX1011-01ga	1	C	Typical Type L, TP & TEDP Cabinets Installation Detail
NDX1011-01wd	2	D	Termination Pillar Type L (Lucy) Electricity Suppliers Connection - TP
NDX1011-01wd	3	C	Traffic Electrical Distribution Pillar Type - TEDP
NDX1011-01wd	4	A	Traffic Electrical Distribution Pillar Type– TEDP 16mmsq to 35mm sq CSA Cables
NDX1011-01cd	5	C	Typical Type L, TP & TEDP Cabinets Circuit Detail
NDX1011-01no	6	D	Item List & Notes For Type L, TP & TEDP Cabinets
NDX1011-01dt	7	C	Labels For TP, TEDP & Other Electrical Supply Equipment Cabinets
NDX1011-05ga	1	A	Electrical Mini-Pillar Type J Overall General Assembly
NDX1011-05no	2	A	Electrical Mini-Pillar Type J Wiring Detail, Item List & Notes
NDX1025-02ga	1	3	Typical signal unit 550mm MS4 MSU Modules (for use on gantries)
NDX1025-03ga	1	3	Typical MS4 MSU Modules (AMI)
NDX1029-02ga	1	3	Typical Signal Unit Detail as Post Mounted MS4 550mm MAC Signals
NDX1029-02dt	2	2	Typical Signal Unit Detail as Post Mounted MS4 550mm MAC Signals – Signal Head Assembly
NDX1029-02dt	3	2	Typical Signal Unit Detail as Post Mounted MS4 550mm MAC Signals – Brackets & Clamps

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX1029-02dt	4	2	Typical Signal Unit Post Mounted MS4 550mm MAC Foundations
NDX1029-02dt	5	1	Post mounted motorway access control unit – label detail
NDX1031-00dt	1	A	Gantry Signal Indicator Alignment Details
NDX1031-00dt	2	A	Gantry Sign Setting Out & Optical Alignment (MK3 & Message Signs)
NDX1031-00dt	3	A	Gantry Sign Setting Out & Optical Alignment (MK3 & Message Signs)
NDX1033-02ga	1	3	Typical Hybrid FTMS, Plate and LED Post Mounted VMS (Journey Time)
NDX1033-03ga	1	2	Typical Plate and LED Post Mounted VMS (Car Park)
NDX1033-04ga	1	3	Typical Plate and LED Post Mounted VMS (Park & Ride)
NDX1033-05ga	1	1	Typical Plate and LED Post Mounted VMS (Gateway Sign)
NDX1034-00ga	1	A	General Assembly Of HA 609 Cabinet
NDX1034-00dt	2	A	HA Type 609 Cabinet Door Security Strap
NDX1034-00dt	3	B	HA Type 609 Cabinet Foundations
NDX1034-00no	4	1	HA Type 609 Cabinet Installation Notes
NDX1034-00dt	5	1	Cabinet HA Type 609 Labels
NDX1034-00no	6	1	Cabinet HA Type 609 Label Notes
NDX1034-02ga	1	B	OF Cable Cassette Termination Arrangement In HA Type 609 Cabinet
NDX1034-02dt	3	A	OF Cable Cassette Termination Through Arrangement In HA Type 609 Cabinet
NDX1034-02dt	4	A	OF Cable Cassette Termination Through Arrangement In HA Type 609 Cabinet - L
NDX1034-02dt	5	A	OF Cable Cassette Termination Through Arrangement In HA Type 609 Cabinet - Notes
NDX1034-02no	6	1	OF Cable Cassette Termination Arrangement In HA Type 609 Cabinet - Notes

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX1034-03ga	1	B	Copper Termination Pillar Type TB13 Cabinet Installation Detail
NDX1034-03wd	3	B	Copper Termination Pillar Type TB13 At HA 600 Sites (No BT Connection)
NDX1034-03wd	4	B	Copper Termination Pillar Type TB13 At Intermediate Sites
NDX1034-03sa	5	B	Copper Termination Pillar Type TB13 Cabinet Support Frame
NDX1034-03dt	6	A	Termination of Copper Communication Cable Circuits
NDX1034-03no	7	B	Copper Termination Pillar Type TB13 Cabinet Items List & Notes
NDX1034-03dt	8	A	Copper Termination Pillar Type TB13 Cabinet Label Detail
NDX1047-01ga	1	B	Typical Overall Type 1 VERGE Mounted VMS Site Infrastructure
NDX1047-01ga	2	A	Typical Site For Type 1 VERGE Mounted Variable Message Signs/MK3 Signal
NDX1047-02ga	1	2	Typical Overall VERGE Mounted MS3 400/320mm VMS Site Infrastructure
NDX1047-02ga	2	3	Typical VERGE Mounted MS3 400/320mm Variable Message Sign
NDX1047-03ga	1	2	Typical Overall VERGE Mounted MS3 240mm VMS Site Infrastructure
NDX1047-03ga	2	2	Typical VERGE Mounted MS3 240mm Variable Message Sign
NDX1047-04ga	1	2	Typical Overall Offset Verge Mounted MS4 VMS Site Infrastructure
NDX1047-04ga	2	2	Typical Offset Verge Mounted MS4 Variable Message Sign
NDX1047-05ga	1	2	Typical Overall Verge Mounted Continuous Matrix 400/320mm VMS Site Infrastructure
NDX1047-05ga	2	2	Typical Verge Mounted Continuous Matrix 400/320mm Variable Message Sign

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX1047-06ga	1	2	Typical Overall Verge Mounted Continuous Matrix 240mm VMS Site Infrastructure
NDX1047-06ga	2	1	Typical Verge Mounted Continuous Matrix 240mm Variable Message Sign
NDX1049-01dt	1	A	Emergency Telephone Type A Housing Installation Detail
NDX1049-01dt	2	A	Emergency Telephone Type A Lightning Protection Installation Detail
NDX1049-01ly	3	A	Setting Position Of Emergency Telephone Type A
NDX1049-01dt	4	A	Labels For Emergency Telephone Housing
NDX1049-01dt	5	A	Emergency Telephone Instructions For Use Label
NDX1055-02ga	1	2	Typical Overall Gantry Mounted Continuous Matrix 1x21 400/320mm VMS Site Infrastructure
NDX1055-03ga	1	2	Typical Overall Gantry Mounted Continuous Matrix 2x21 400/320mm VMS Site Infrastructure
NDX1060-01ga	1	1	Electrical Mini-Pillar Type J Modifications For Use At Mobile VMS Site
NDX1061-00dt	1	A	20/30 to 2 Pair Cable Gland Conversion Kit Assembly Detail
NDX1061-00dt	2	A	Method of Sealing Unused Cable Ends
NDX1061-00dt	3	A	Cable Identification Labels
NDX1061-00dt	5	A	Cable Termination & Continuity Kit Installation – Multi-Pair Cable
NDX1061-00dt	6	A	Cable Termination & Continuity Kit Installation – Multi-Pair & OF Cable
NDX1063-00dt	1	C	Ducts
NDX1063-00dt	2	A	Installation of Deep Traverse Ducts
NDX1063-00dt	3	B	Duct Installation - Longitudinal
NDX1063-00dt	4	BZ	Duct Installation - Local ducts
NDX1063-00dt	5	A	Duct Installation -Transverse ducts
NDX1063-00dt	6	A	Duct Installation - Spacers & Strapping

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX1063-00dt	7	B	Duct Installation - Mechanical Duct Plugs
NDX1063-00dt	8	B	Longitudinal Duct Cable Allocation
NDX1063-00cl	9	B	Plan View Of Typical Ducted System Layout- Both Verges
NDX1063-00cl	10	D	Plan View Of Typical Ducted System Layout- Single Verge
NDX1063-01ga	1	B	Type A Chamber Construction Detail
NDX1063-02ga	1	B	Type B Chamber Construction Detail
NDX1063-03ga	1	B	Type C Chamber Construction Detail
NDX1063-04ga	1	C	Type D Chamber Construction Detail Detector Loop Sites
NDX1063-04wd	2	B	Loop Wiring In Roadside Chamber At Detector Loop Sites (PTC Joint)
NDX1063-05cl	1	C	Typical Ducting Emergency Telephone/HWS Site
NDX1063-05cl	2	C	Typical Ducting At Intermediate Site (TB13)
NDX1070-01ga	1	A	Typical Site Access Steps
NDX1070-02ga	1	A	Typical Site Access Safety Handrail Detail
NDX1072-00cl	1	2	Typical Layouts Of Communications Cabinets & Hardstanding
NDX1072-00cl	2	D	Typical NADICS site Maintenance Hardstanding.
NDX2003-01ga	1	D	Hazard Warning Signal Post Overall General Assembly
NDX2003-01sa	2	C	Hazard Warning Signal Post Back Board Assembly
NDX2003-01sa	3	B	Hazard Warning Signal Post Lantern Batten Assembly
NDX2003-01sa	4	B	Hazard Warning Signal Support Post Assembly
NDX2003-01wd	5	C	Hazard Warning Signal Post Cable Layout & Termination Layout
NDX2003-01no	6	C	Hazard Warning Signal Post Installation Notes

Appendix 0/4 List of Drawings Included in the Agreement

Drawing Number	Sheet Number	Rev.	Title
NDX2019-00sp	1	0	For Future Use
NDX2019-00ty	2	C	Typical Emergency Telephone/HWS Ducted Cable Site – Local Side
NDX2019-01no	1	C	Layout Key For Ducted Cable Electrical Schematics
NDX2019-01es	2	C	Electrical Schematic For Ducted Cable Emergency Telephone Sites
NDX2019-01es	3	C	Electrical Schematic For Ducted Cable HWS Sites
NDX2019-01es	4	C	Electrical Schematic For Ducted Cable Detector Loop Sites

The following drawings are made available for inspection as outlined below

Drawing Number	Title	Aspect required if not whole Drawing
None	Traffic Scotland Manuals	Available for Inspection at the National Network Control Centre, 32 Elmbank Street, Glasgow G2 4PF, by arrangement with Tom McLean, Telephone 0141 287 9304

List of Drawings Brought into the Agreement by Reference

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

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		

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

Clause Number	Title
632SE	Determination of Moisture Condition Value (MCV) of Earthworks Material.
850SE	Crushed Gravel Sub-base Material Type 1
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
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
632SE	**Determination of Moisture Condition Value (MCV) of Earthworks Material.** 1. Where the Moisture Condition Value (MCV) shall be required in Appendix 6/1, the MCV determination shall be carried out in accordance with TRL Report 273 (Transport Research Laboratory), Appendix A, Section 1 to 3. 2. Where the natural moisture content MCV shall be required in Appendix 6/1, the MCV determination shall be carried out in accordance with TRL Report 273, Appendix A, Section 1 to 3. 3. Where the MCV of saturated materials shall be required in Appendix 6/1, the MCV determination shall be carried out in accordance with TRL Report 273, Appendix A, Section 1, 2 and 4. 4. When required in Appendix 6/1, the determination of the MCV/moisture content relation shall be carried out in accordance with TRL Report 273, Appendix A, Sections 1, 2 and 5. 5. An alternative procedure shall be given in Appendix A, Sections 1, 2 and 6 of TRL Report 273. The rapid assessment procedure for material acceptability may be used when permitted in Appendix 6/1. 6. The Company shall provide, for each moisture condition apparatus (MCA) to be used, a test certificate to show that the MCA shall be functioning correctly. The tests for correct function should be carried out as described in Appendix D of TRL Report 273 and the results recorded on form MCA3 (TRL Report 273, Appendix B), . All equipment used shall be traceable to national standards. 7. The Company shall provide, for each operator of the MCA, a certificate which shows the operator has completed an appropriate course of training approved by the Scottish Ministers (Materials and Specification Branch of Transport Scotland). The Scottish Ministers should be contacted for details of those organisations able to provide such training.
850SE	**Crushed Gravel Sub-base Material Type 1** **Material Properties** 1. For the purpose of this Clause gravel shall be defined as aggregate derived from a natural, unconsolidated, coarse-grained sedimentary deposit consisting of water-worn rock fragments. 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.

Appendix 0/5 Special National Alterations of the Scottish Ministers

Clause Number	Title

TABLE 8/50SE: Sub-base Type 1 Range of Grading

BS sieve size	Percentage by mass passing
75mm	100
37.5mm	85-100
10mm	40-70
5mm	25-50
600 micron	8-22
75 micron	0-10

3. The particle size shall be determined by the washing and sieving method of BS 812: Part 103.

4. The material passing the 425 micron BS sieve shall be non-plastic as defined in BS 1377-2:1990 Methods of test for soils for civil engineering purposes. Classification tests and tested in compliance therewith.

5. The degree of crushing of individual particles in the mixed material shall meet the following requirements:

   (i) not less than 90% by mass of the particles passing BS 50mm and retained on BS 6.3mm sieve shall exhibit at least 3 freshly broken faces; and

   (ii) not less than 80% by mass of the particles in each BS 63-1:1987 Road aggregates. Specification for single-sized aggregate for general purposes specified size fraction within the size range stated at (i) above shall exhibit at least three freshly broken faces.

6. The material shall satisfy the minimum CBR requirement of Appendix 7/1 when tested in accordance with Clause 7 of BS 1377-4:1990 Methods of Test for Soils for Civil Engineering Purposes; Compaction-Related Tests. 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% and the optimum moisture content determined in compliance with BS 5835-1:1980 Recommendations for Testing of Aggregates; Compactibility Test for Graded Aggregates. The specimens shall be tested in a soaked condition.

7. The material shall have a ten per cent fines value of 50 kN or more when tested in compliance with BS 812-111:1990 Testing Aggregates; Methods for Determination of Ten Per Cent Fines Value (TFV), 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.

8. The aggregate will be considered suitable if:

   (i) aggregate from the source, when tested in accordance with BS 812-121:1989 Testing Aggregates; Method for Determination of Soundness, has a soundness value greater than 65; or

Appendix 0/5 Special National Alterations of the Scottish Ministers

Clause Number	Title
	(ii) evidence can be provided to the Scottish Ministers of satisfactory use of aggregate from the source as Type 1 sub-base material. 9. The water absorption of the coarse aggregate from the source determined in accordance with BS 812 : Part 2:1975 Testing aggregates. Methods for determination of physical properties shall also be declared. **Transportation and Compaction** The material shall be transported, laid and compacted to the requirements of Clause 801 at a moisture content within the range 1% above to 2% below the optimum moisture content determined in compliance with BS 5835-1:1980 Recommendations for Testing of Aggregates; Compactibility Test for Graded Aggregates, and without drying out or segregation. **Trafficking Trial** When required by Appendix 7/1, the Company 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. **Performance of Crushed gravel Sub-base** A brief performance report on the behaviour of the crushed gravel sub-base shall be required.
1911SE	**Paint and Similar Protective Coatings** The term paint shall be deemed to refer also to similar protective coatings including specialist coatings such as grease paints. 10. Where a registered paint shall be specified, the Company 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 (New Works) Paint System Sheet. 11. 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, eg whether primer, undercoat or finish), colour, item no, paint manufacturer's reference number, batch number and date of manufacture. Where date of manufacture shall be coded, the Company shall provide the code key. 12. 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 shall be able to apply the paints satisfactorily to all parts of the structure in these conditions. 13. 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 Company in Form HA/P1 (New Works) Paint System Sheet. 14. The requirements of sub-clauses #1911.3, 7, 8, 9, 10 and their respective tables shall apply in Scotland.

Appendix 0/5 Special National Alterations of the Scottish Ministers

Clause Number	Title
1912SE	**Testing of Paints** 1. Unless otherwise described in the Agreementt, the Company 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 Company shall supply 500 ml 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 Company to the testing authority, approved by the Scottish Ministers. 2. Depending upon the importance of the proposed painting application, the Scottish Ministers may elect to have 'A' samples sent for limited testing by a local paint testing firm or other agency approved by the Scottish Ministers. Appropriate forms for use in connection with limited testing shall be derived from the standard paint forms and shall be agreed with the Scottish Ministers. 3. The Company shall supply paint in sufficient time to allow for sampling and testing of 'A' samples before the start of application. The Company shall be responsible for handling, provision of clean tins for samples, packing as necessary, and prompt despatch and transit of all samples for testing. 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. 5. The requirements of sub-clauses #1912.10, 11 and 12 shall apply in Scotland. 6. Except for procedure trials painting shall not start until the first of the 'A' samples are confirmed as satisfactory.
1920SE	Addition Requirements for the Protection of Steel in Bridge Bearings **Applicable Clauses** Unless otherwise described in the Contract, the work described in this Clause shall be carried out in compliance with Appendix 19/1 and with Clauses 1901 to 1919 inclusive. **Supply of Coatings** 7. Information, including the name of the paint manufacturer, required for completing Form HA/P1 (New Works) Paint System Sheet, for the bearings, shall be obtained by the Company from the bearing manufacturer. 8. 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 system shall be obtained from the manufacturer of that system.

Appendix 0/5 Special National Alterations of the Scottish Ministers

List of Alterations Clauses, Tables and Figures Minor

Clause Number	Title
1702.2	Add at the end of clause: The minimum testing frequency shall be in accordance with table 3 of BS812: Part 120: 1989. Testing aggregates. Method for testing and classifying drying shrinkage of aggregates in concrete
Appendix A	note 2 on page 8 of Appendix A should be deleted and replaced with the following: The implementation date of this scheme shall be 1 January 2000.

Appendix 1/5 Sampling and Testing

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

   The Company shall incorporate in the schedule of tests required under the Agreement as a minimum the tests detailed in the following table together with all additional tests required by the Agreement.
8. All samples and cores taken for testing in accordance with series 900 of the Specification shall be photographed against a suitable base scale to the approval of the Scottish Ministers.

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

Appendix 1/5 Sampling and Testing

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)		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	Anchorages and attachment systems for use in drilled holes.		Ultimate tensile load (Manufacturer's tests).		Required	To provide well attested and documented evidence.
404	Anchorages in drilled holes		On-site tensile load test	As required in Appendix 4/1	Required	
	Post foundations					
406	Vehicle Parapets.				Required (BS6779-1 1998 (Amd No 14290, 21 March 2003)	Quality Management Scheme applies
409	Vehicle parapet posts				Required	Certification in accordance with Clause 409 shall be required
410	Anchorages in drilled holes		On site tensile load test	As required in Appendix 4/1	Required	

Appendix 1/5 Sampling and Testing

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

Appendix 1/5 Sampling and Testing

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 Sampling and Testing

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		

Appendix 1/5 Sampling and Testing

Clause	Works, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 500 continued						
513 cont		Precast hollow concrete blocks	(Manufacturer's tests)		Required	
514	Fin Drains		(Manufacturer's tests)		Required	BBA certification (or equivalent) applies
515	Narrow filter drains					
		Geotextile, pipes and fittings	(Manufacturer's tests)		Required	BBA certification (or equivalent) applies
		Granular fill	Plastic index (N)	1 per source		
			Resistance to fragmentation (N)			
			Water-soluble 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	Certification that the systems comply with Clause 516 shall be 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 shall be required
518	Thermoplastics structured wall pipes and fittings		(Manufacturer's tests)		Required	BBA certification (or equivalent) applies

Appendix 1/5 Sampling and Testing

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^3 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^3 up to max of 5 per day		
			SMC of chalk (N)	Twice a week		
			Bulk density (pfa) (N)	2 per 1000 m^3 up to max of 5 per day		
	3.	General chalk fill	mc(N)	2 per 1000 m^3 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/MCV (N)	1 per 400 tonnes		

Appendix 1/5 Sampling and Testing

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		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/MC V 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 Sampling and Testing

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 Sampling and Testing

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	
615 641 643	Lime stabilisation to form capping	Rate of spread of lime	1 per 500 square metres of lime spread	Required	
		Available lime content	Each source of lime weekly during stabilisation operation		
622 638 639	Earthworks for reinforced soil and anchored earth structures	Redox potential	5 locations within the affected area	Required	
	Drainage layers	Grading Chemical analysis	1 per 400 tonnes		
	Reinforcing elements	Coeff. of friction	Each type of element with each type of fill		
	Anchor elements	Adhesion			
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)	
642	Earthworks materials for corrugated steel buried structures	Constrained soil modulus (M*)	3 on each side of each structure	Required	

Appendix 1/5 Sampling and Testing

Clause	Works, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 700					
710	Constituent materials in recycled aggregate	Quality control	Checks are to be carried out by the Company in accordance with the procedure set down in 'Quality Control – Production of Recycled Aggregates' and with those in this Clause	Required	The quality control procedure should be in accordance with the 'Quality Control – Production of Recycled Aggregates' published by Waste and Resources Action Programme shall be available from WRAP website, http://www.wrap.org.uk The results of all quality control checks shall be delivered promptly to the Scottish Ministers on request
711	Overbanding and inlaid crack sealing systems			Required	BBA certification (or equivalent) applies
Series 800					
801 803 804 805 806	General requirements for Unbound Mixtures adjacent to cement bound materials, concrete pavements, structures or products	Water-soluble sulfate (WS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes	Required	
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes		
	Unbound mixtures beneath surface of a road or paved central reserve	Frost heave (N)	1 per source		
		Grading and fines content	1 per week		
		Plastic index (N)			
		Resistance to fragmentation (N)	6 monthly		
		Resistance to wear micro-Deval test			
		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 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
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		[BS EN 1097-3]
		Soundness (N)	Once every 4 months		
		Dicalcium silicate disintegration (N)	1 per 500 tonnes		
		Iron disintegration (N)			
	Steel slag	Bulk density (N)	1 per 500 tonnes		
		Volume stability (N)	1 per 500 tonnes		
	Coarse aggregate for surface courses	Resistance to polishing (PSV) (N)	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 Sampling and Testing

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, 937, 938, 942, 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 Macadams	In situ air void content (N)	As required	Required	
		Refusal air void content (N) (PRD Test)			
		Binder volume (N)			
		Grading (N)			
		Binder content (N)			
911	Rolled asphalt surface course (design mix)	Stability value(N)	1 per source	Required	National quality management sector scheme applies
		Flow value (N)			
		Density (N)			
915	Coated chippings	Grading (N)	1 per stockpile	Required	
		Binder content (N)	1 per stockpile		
		Flakiness index (N)	1 per source		
		Resistance to polishing PSV (N)	1 per source		
		Resistance to surface abrasion (AAV) (N)	1 per source		
		Hot sand test (N)	1 per source		Not required for coated chippings for surface dressing to Clause 919
		Rate of spread (N	As required		
921	Surface macrotexture	BS EN 13036-1 Volumetric Patch Technique (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 Sampling and Testing

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			Required	National quality management sector scheme applies
		Binder drainage test	In accordance with BS DD 232 1996		
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	Rolled asphalt surface course (performance-related design mix)			Required	National quality management sector scheme applies
		Grading (N)	As required		
		Binder content (N)			
		Density (N)			
		Wheel-tracking rate (N)			
		Wheel-tracking rut depth (N)			
		Air voids content			

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
944	Performance-specified base				National quality management sector scheme applies
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 25ºC and 5ºC (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 spray per month	Required	Not more than 6 weeks prior to start of work and one per month
		Rate of spread	1 per week		
		Penetration at 25ºC and 5ºC (N)	Every manufactured batch		Manufacturer's QA test results may be submitted

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
919 922	Surface Dressing				National quality management sector scheme applies
	Binder				Modified binders should have a BBA HAPAS Roads and Bridges Certificate. In the event that no such Certificates have been issued, then in the interim, only modified binders undergoing BBA assessment should be considered for approval by the Scottish Ministers.
		Product identification	1 per product per source	Required	Tests are expected to be repeated every two years
		Vialit cohesion (N)	1 per product per source	Required	Tests are expected to be repeated every two years
		Accuracy of spread	1 for each binder and spray per week	Required	Not more than 6 weeks prior to start of work and one per week
		Rate of spread	Every 1000 linear metres initially	Required	Frequency to be reduced to daily after 3 satisfactory results, but not less than 1 test per site
		Penetration at 25ºC and 5ºC (N)	Every batch		For cut back binders as supplied, manufacturer's QA viscosity test results may be submitted
	Chippings	Resistance to (PSV) polishing (N)	Source approval	Required	Less than 6 months prior to work
		Resistance to abrasion (AAV) (N)	Source approval	Required	Less than 6 months prior to work
		Grading (N)	1 per 200 tonnes	Required	
		Binder content (N)	1 per 200 tonnes	Required	Coated chippings only
		Flakiness index (N)	1 per 200 tonnes	Required	
	Chipping (cont'd)	Accuracy of spread (N)	1 for each chipping spreader for every change of chipping size or source	Required	Initial test not more than 6 weeks prior to start of work
		Rate of spread	Every 500 linear metres initially		Frequency to be reduced to daily after 3 satisfactory results, but not less than 1 test per site
	System	TAIT or BBA/HAPAS		Required	
	Rollers	Spray bars working	Before work starts and daily during works		

Appendix 1/5 Sampling and Testing

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 1030	Cement			Required	Quality management and product certification schemes apply
1044	Portland cement CEM I				Tests and test certificates are required
	Portland blastfurnace cement				
	Blastfurnace cement CEM III/A				
	Portland PFA cement CEM II/B-V				
	Pozzolanic cement CEM IV/A			Required (BS6610)	
	Portland cement with microsilica			Required	BBA Roads and Bridges Certificate required for microsilica
	Pulverised - fuel ash				Tests and test certificates are required. Product certification schemes apply to pfa and slag.
	Ground granulated blast furnace slag				
	Admixtures				
	Mixing water	Sulphate content (N)	Monthly		
	Aggregates	Resistance to freezing and thawing - magnesium sulphate soundness (N)	1 per source	Required	
		Water absorption (N)	As required		

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
1001 1030 1044 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	
	Sand (i.e. Fine aggregate)	Acid-soluble material (N)	Monthly		Not required for CBM aggregate
	Blastfurnace slag	Bulk density (N)	Every 6 months		
		Dicalcium silicate disintegration (N)	Every 6 months		
		Iron disintegration (N)	Every 6 months		
		Total sulphur (TS) and acid-soluble sulphate (AS) content (N)	Every 6 months		
	Pulverised-fuel ash			Required (BS3892: Part 2)	

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 continued					
1002 1003 1004	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		
1044		Strength (N)	As required in Table 10/10	Required	
1005	Consistence (Workability)	Degree of Compact-ability (Compaction Index) (N)	As required in Table 10/10	Required	
		Vebe (N)			
		Slump[(N)			
1011 1012	Dowel bars Tie bars			Required (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 BS42454)	

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 continued					
1016 1017 cont.		Resilience	1 per 1000 m or 1 per day		
	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		
1026 1044	Surface macrotexture	BS EN 13036 - 1 Volumetric Patch Technique (N)	1 per day (set of 10)	Required	
1027	Aluminised curing compound	Efficiency index	1 per source	Required	
1030	Wet lean concrete	Density	As required in Table 10/9	Required	
		Cube strength (N)			
1043	Foamed Concrete	Cube strength (N)	2 cubes per $12m^3$	Required	
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 Sampling and Testing

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^2 of each product (BS EN 1339)	Required	
	Bedding	Granular material				
		Mortar				
1107	Concrete block paving		Compressive strength	Minimum of 8 per 1000 m^2 of each product (BS EN 1338)	Required	
1108	Clay pavers		Bending strength	Minimum of 8 per 1000 m^2 of each product (BS EN 1344)	Required	
			Skid resistance	Minimum of 8 per 1000 m^2 of each product (BS EN 1344)		
Series 1200						
1202	Permanent traffic signs				Required	Quality management scheme applies. Certification that the traffic sign shall be capable of passing the tests in BS 873: Part 1 shall be 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 shall be 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 Sampling and Testing

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 shall be 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 shall be required
		Test specified in Clause 1214	As required		
	Other traffic delineators			Required	Certification that the delineators have been tested and comply with Clause 1214 shall be 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 shall be required.
1217	Traffic signals				Quality management scheme applies. Statutory type approval of equipment applies.
	Cables				Product certification scheme applies
	Controllers *[Other equipment]*	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) shall be required

Appendix 1/5 Sampling and Testing

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 shall be required
	Epoxy resin			Required	Certification that the epoxy resin complies with specification MCH 1540 shall be required
	Feeder cable			Required	Certification that completed cables comply with specification TR 2031 shall be required.
	Joints	Pull test (4 kgf)	Each crimp		
	Installation	Series resistance	Each loop	Required	Certification in accordance with specification MCH 1540 shall be required
		Insulation resistance			
		Inductance			
Series 1300					
1305	Anchorages for use in drilled holes	Tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence
1306	Anchorages 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 Sampling and Testing

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1300 continued						
1313 cont.			Water absorption			
			Impact strength			
1314	Brackets for laminated GFRP lighting columns				Required	
		Polyurethane foam	Bulk density	1 per batch		
			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) shall be required.
	Networks		Test specified in Clause 1424	Each network	Required	Certification that the installation complies with BS 7671 (the IEE Wiring Regulations) shall be required
Series 1500						
1506	Copper communications cable				Required	Certification that each completed cable complies with specification TR2150 or TR 2158, as appropriate, shall be required
	Optical fibre communications cable				Required	Certification that each completed cable complies with specification TR2151 or TR 2159, as appropriate, shall be required
	Coaxial communications cable					Certification that each completed cable complies with specification TR2152 or TR 2160, as appropriate, shall be required
	Energy cable				Required	Certification that each completed cable complies with specification TR2153 or TR 2161,as appropriate, shall be required

Appendix 1/5 Sampling and Testing

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 shall be 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	Motorwarn 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) shall be required
1530	Cable ducts		Tests specified in BS EN 50086-1, 2 and 4	Each supplier	Required	Current British Board of Agrément Certificate shall be 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 shall be required
		Air test	Tests specified in Clause 1533	Each duct	Required	Certificate that each length of duct between chambers satisfies the air test shall be required
Series 1600						
1601	Soil samples In situ soil tests			Required		
1602 to 1606 1610 to 1615	Concrete Grout Reinforcement Prestressing Steelwork Welding Protection against corrosion			Required		
1606	Coatings for protection against corrosion	Adhesion	As required in Appendix 16/6			

Appendix 1/5 Sampling and Testing

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1600 continued					
1607	Reduction of friction on piles				
1608 1616	Integrity testing 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 ggbs)		
	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 Product certification scheme applies
		Shell content (N)	Monthly		
		Flakiness index (N)	Monthly		
		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 Sampling and Testing

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^3 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^3 or 4 batches whichever represents the lesser volume		
			Mass concrete - two cubes from 50 m^3 or 50 batches whichever represents the lesser volume		
			Additional cubes for special purposes	Required	
		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 Sampling and Testing

Series 1700 (continued)					
Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1709	Silane			Required for each delivery	Certification that the silane complies with Clause 1709 shall be 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 shall be 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 Sampling and Testing

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 shall be 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 Sampling and Testing

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				Product certification scheme applies
	Steel wire			Required (BS5896)	
	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 mm 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 Sampling and Testing

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1800 continued						
1801 1803 cont'd	Stainless steel 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 Sampling and Testing

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1800 continued						
1801 1803 cont'd	Welding (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 Sampling and Testing

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1900 continued						
1911	Paints					
		Samples 'A' and 'B'	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 Agrement 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 Sampling and Testing

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 Sampling and Testing

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 Sampling and Testing

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				Quality management scheme applies
	Timber				
	Concrete				
	Steel				
	Brickwork				
	Other materials				
	Barriers	Sound absorption	As required in Appendix 25/4		
		Sound insulation			
	Post foundations	Loading test on site	As required in Appendix 25/4		
2505, 2506	Drainage structures/buried rigid pipes for drainage structures. Pipes for drains and culverts having diameters or clear span exceeding 900 mm				
	Vitrified clay				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 Sampling and Testing

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 shall be 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 shall be 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 Sampling and Testing

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					
		Samples 'A' and 'B'	Specific gravity			Samples will be selected in accordance with Clause 5007SE
			Colour match			
			Composition			
			Application Characteristics			

Appendix 1/7 O&M Site Extent and Limitations

1 O&M Works Site Extent

1.1 The O&M Works Site is defined in the Agreement and comprises, subject to the definition in Clause 1.1 of the Agreement:

1.1.1 The land as detailed in the 'Land Made Available by the Scottish Ministers for the O&M Works' drawings listed in Appendix 0/4; and

1.1.2 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 O&M 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 O&M Works Site

2.1 The O&M Works Site shall be used solely for the construction and completion of the O&M 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 O&M Works.

2.3 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.

2.4 Road access to the O&M Works Site shall be gained solely via public roads and as detailed by Appendix 1/19.

2.5 The Company may gain entry to the O&M 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.

2.6 The Company shall erect appropriate signs to show accesses and restricted routes.

2.7 The Company shall comply with the restrictions imposed by Network Rail for all O&M Works to be carried out within or adjacent to Network Rail property.

2.8 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.

2.9 The Company's attention is drawn to the special requirements for third parties detailed in Part 5 of these O&M Works Requirements.

Appendix 1/9 Control of Noise and Vibration

1 Noise Control Applicable to O&M Works Site

1.1 The Company shall liaise with:

1.1.1 The Housing and Protective Services, East Dunbartonshire Council (Contact: Nigel Kerr, Telephone: 0141 761 4891),

1.1.2 Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435

1.1.3 Falkirk Council (Kevin Collins, Telephone 01324 504 728),

as appropriate, prior to commencement of work on the O&M Works Site.

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

1.1.4 The Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891),

1.1.5 Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435

1.1.6 Falkirk Council (Kevin Collins, Telephone 01324 504 728),

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 O&M 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 any adjacent properties, the Company shall carry out an assessment of the predicted noise levels associated with construction on the O&M 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.

Appendix 1/9 Control of Noise and Vibration

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 O&M 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 O&M 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 Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982) 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 the Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982) as appropriate.

The Company shall apply, in writing, for consent to work outside normal working hours to Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982) 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 the Housing and Protective Services, East Dunbartonshire Council, Protective Services Division, North Lanarkshire Council and/or Development Services, Falkirk Council, as appropriate in their application that:

1.6.1 it is not reasonably practicable to carry out the work during standard working hours;

1.6.2 the Company has considered all mitigation measures and has implemented appropriate measures;

1.6.3 all interested parties have been consulted; and

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

The Company shall also arrange for leaflets to be delivered to residents within 200

Appendix 1/9 Control of Noise and Vibration

metres of the proposed O&M 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 Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as appropriate.

1.7 Where O&M Works are required, a suitable assessment shall be undertaken that shall require the input of an appropriately qualified acoustician to determine whether a pre-construction ambient noise assessment shall be required, as outlined below. If required, the pre-construction ambient noise assessment shall be undertaken by the Company, using an appropriately qualified acoustician who shall be a member of the Institute of Acoustics for agreement with Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as appropriate within 100 metres of where the O&M Works shall be undertaken, before the commencement of the O&M Works

The noise assessment shall demonstrate the typical ambient noise levels at representative properties adjacent to the O&M Works Site.

Measurement locations chosen for the 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, the Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as necessary

1.8 The ambient noise levels, as detailed in paragraph 1.7, shall be used to calculate maximum permissible O&M Works noise levels.

Any measured O&M Works noise level shall not exceed any appropriate level, given in Table 9/1 below when compared to the ambient noise level. The permissible O&M Works noise level shall not be exceeded at any property in the surrounding area of the O&M 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 Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), 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

Appendix 1/9 Control of Noise and Vibration

2/92, The Noise Installation (Scotland) regulations 1975.

TABLE 9/1: PERMISSIBLE O&M WORKS NOISE

Typical Ambient Noise as appropriate	Permissible O&M Works Noise Levels							
	Weekday working Monday to Friday excluding Public Holidays							
	Day (07.00-19.00) *$L_{Aeq,12hr}$	L_{Amax} (Fast)	Evening (19.00-22.00) *$L_{Aeq,3hr}$	L_{Amax} (Fast)	Night Hours (22.00-07.00)	Saturday (08.00-13.00) *$L_{Aeq, 5hr}$	L_{Amax} (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 ambient noise level shall be the total L_{Aeq} as determined from the ambient noise assessment from all the noise sources at the measurement location over the specified period.

(ii) Maximum sound level shall 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 shall be available, to Types 0, 1 or 2.

(iii) The measurement location shall be representative such that the measurements are representative of the noise which shall be 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 the Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as appropriate, prior to commencement of O&M 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 the Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone:

Appendix 1/9 Control of Noise and Vibration

0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as appropriate, prior to commencement of the relevant activities.

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 O&M Works shall be 5mm/second measured at the property closest to the operations being carried out and applies to all operations.

Where the construction of the O&M Works is intermittent, the maximum permitted peak particle velocity generated shall be no greater than 10 mm/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 7385-2:1993 Evaluation and Measurement for Vibration in Buildings; Guide to Damage Levels From Groundborne Vibration

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

2.3.1 Equal to or less than a zero to peak displacement of 0.6mm/s at frequencies less than 4Hz;

2.3.2 Less than 15mm/s at 4Hz, rising to less than 20mm/s at 15Hz; and

2.3.3 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 the Housing and Protective Services, East Dunbartonshire Council (Nigel Kerr, Telephone: 0141 761 4891), Protective Services Division, North Lanarkshire Council (Jeff Toner, Telephone 01236 812 435) and Development Services, Falkirk Council (Stuart Henderson, Telephone: 01324 504 982), as appropriate.

2.5 Vibration Monitoring Equipment

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

2.5.1 Minimum sampling rate 1000 samples/second/channel;

2.5.2 Capable of recording Peak Particle Velocity (Directly), Peak Acceleration (Calculated), Peak;

2.5.3 Displacement (Calculated), Frequency at the Peak Velocity (Calculated);

2.5.4 Dual Mode instrument having (a) Self Triggering Mode and (b) Continuous Monitoring Mode;

2.5.5 Transducer - 3 orthogonally mounted transducers on one mounting unit;

2.5.6 Frequency Range - 4.5 to 200 Hertz;

2.5.7 Minimum Resolution - 0.05mm/second, velocity;

2.5.8 Range - 0 to 100mm/second, velocity;

Appendix 1/9 Control of Noise and Vibration

2.5.9 Record of Events - hard copy printout and storage on solid state memory or disc for subsequent printout; and

2.5.10 Power - 240 volt mains for continuous unattended operation plus internal battery with minimum of 24 hours capacity.).

Appendix 1/16 Privately and Publicly Owned Services and Supplies

1 General

1.1 Notwithstanding any information provided in this Appendix1/16, the Company shall consult and comply with the requirements of all Undertakers and other owners of Apparatus as necessary to determine the effect of the O&M Works on Apparatus, and to arrange any alterations of any Apparatus which, in the opinion of the Undertakers or other owners of Apparatus, may be necessary for or resulting from the Design, construction and completion of the O&M Works.

1.2 The Company shall make arrangements with the Undertakers and others concerned for the coordination of the Operations of the O&M Works with all the Undertaker's works and works for other owners of Apparatus and otherwise required to be carried out concurrently with the Design, construction and completion of the O&M Works.

1.3 The Company shall make arrangements with Undertakers and others for the phasing of all necessary Apparatus works affected by or forming part of the O&M Works.

1.4 The Company shall consult and comply with all Undertakers and others in connection with diversion routes, road closures, interruptions to supplies and otherwise while Apparatus works are being carried out.

1.5 The Company shall comply with any periods of notice being given by the Undertakers.

1.6 Any such compliance by the Company shall not relieve the Company of any of his other obligations under this Agreement.

1.7 The Company shall satisfy itself as to the exact location of all services prior to carrying out work in any part of the O&M Works Site.

1.8 The Company shall make arrangements with third parties for the phasing of all necessary disconnections and diversions of private services affected by the O&M Works.

1.9 The Company shall satisfy itself that the Operations of the Works take account of all existing Apparatus.

1.10 Apparatus to individual properties are not generally listed.

1.11 The Company shall make arrangements with Undertakers and relevant owners of Private Apparatus and others concerned for the phasing of all necessary Undertakers works and owners of private Apparatus works affected by the O&M Works.

1.12 The Company shall bear the cost of all works associated with Apparatus or any other works which may be required for the Operations of the O&M Works.

1.13 It shall be the Company's responsibility to co-ordinate all Undertakers works and owners of private Apparatus works or future provision works to meet the requirements of Undertakers or relevant owners of private Apparatus.

1.14 The Company shall be responsible for all traffic management associated with the O&M Works in connection with all Undertakers works and owners of private Apparatus works required to be carried out in accordance with this Agreement.

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 O&M Works Requirements that his traffic management proposals shall have been developed such that they shall 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 otherwise.

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

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 and any relevant Transport Scotland publications 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 O&M Works. The programme shall identify the Temporary Traffic Management Scheme associated with each 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 Scottish Ministers in writing and require the following notice:

1.4.1 amending or making temporary traffic Orders - 8 weeks;

1.4.2 authorisation of temporary traffic signals - 3 weeks;

1.4.3 authorisation of non prescribed signs – 1 week.

For advance notice of requirements for diversions, occupations and works occupations refer to Appendix 1/18.

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

1.5 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 O&M Works Requirements and the Certification Procedure.

1.6 Prior to any Operation starting on the O&M Works Site, the Company shall supply to the Scottish Ministers details of traffic management proposals including, but not limited to, the following:

1.6.1 phasing of each Operation;

1.6.2 drawings showing traffic management layouts including, but not limited to, the following:

(i) position of traffic signs, signals and cones; width of lanes;

(ii) working areas;

(iii) safety zones;

Appendix 1/17 Traffic Safety and Management

(iv) details of temporary barriers for the protection of personnel;

(v) entry and exit points for site traffic;

(vi) provisions for emergency vehicles;

(vii) provisions for vehicle recovery;

(viii) provisions for wide loads; and

(ix) crossovers;

1.6.3 timing of each Operation;

1.6.4 Sufficient information to demonstrate the objectives stated in paragraph 1.1 of this Appendix 1/17 can be achieved.

1.6.5 Names and telephone numbers of a minimum of 3 personnel who can be contacted by the Police and/or Scottish Ministers, 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 O&M Works Site shall be closed.

1.7 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 Scottish Ministers:

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.

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.

1.8 Temporary crossovers shall be designed for a Design speed (85 percentile speed) of 70kph, or a minimum of 60kph where it can be demonstrated to the Scottish Ministers that it shall be necessary in the interests of safety.

1.9 Where required by the Police, the Company shall supply, erect, maintain and remove on completion of the O&M 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.

1.10 The Company shall maintain access across the O&M Works Site to the requirements and standards in Table 1/18 of Specification Appendix 1/18.

The Company shall carry out inspections of any Temporary Traffic Management Schemes associated with the O&M Works Site, and shall respond to and make good any defects in such Temporary Traffic Management Schemes including maintenance renewal and cleaning in accordance with the detailed frequencies and maximum response times identified below whether identified in the inspections or reported to the Company by the Police.

Frequency of inspections and maximum response times are detailed below:

Appendix 1/17 Traffic Safety and Management

Location	New M80 Motorway and New M80-M73 Link Road		All other roads	
	Frequency of inspection per 24 hour period	Maximum Response Time	Frequency of inspection per 24 hour period	Maximum Response Time
Advance Signing	4	60 minutes	2	60 minutes
Taper	12	15 minutes	6	15 minutes
Lane Closure	6	30 minutes	3	30 minutes
End Signing	4	60 minutes	2	60 minutes

1.11 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.

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 Relevant Authority personnel with regard to the layout of the Temporary Traffic Management Scheme for which they are responsible.

1.12 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.

A copy of this record shall be forwarded to the Scottish Ministers on the following day.

1.13 In the event of a traffic accident occurring in or adjacent to the O&M Works Site, the Company shall immediately contact the Police, Fire and Ambulance emergency services as appropriate and the Scottish Ministers informing them of the following:

1.13.1 Location of the accident; and

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

The Company shall attend such accidents in accordance with the requirements for recovery vehicles set out in Specification Appendix 1/20.

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 shall be required to reinstate the traffic control to its original layout. In any event complete reinstatement shall be made within 24 hours of the accident.

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

Appendix 1/17 Traffic Safety and Management

control layout.

1.14 When a contraflow shall be 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.

1.15 The needs and safety of non motorised users shall be considered at all times.

The Company shall comply with the advice of paragraph D3.10.4-6 and O3.13 of Chapter 8 of the Traffic Signs Manual.

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.

No at-grade crossings of Motorways shall be permitted.

All diversions of pedestrian routes which normally shall be lit shall be provided with a standard of lighting at least equal to that of the original route.

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

1.17 Provision for the passage of abnormal loads through the O&M Works shall be as follows:

1.17.1 The Company shall assist the Police in moving abnormal loads through the O&M Works by modifying the signing/coning as necessary; and

1.17.2 Signs/cones so moved shall be replaced immediately the abnormal loads have passed through the O&M Works.

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 O&M Works.

1.18 Meetings between the Scottish Ministers, the Company, Police and East Dunbartonshire Council, North Lanarkshire Council and Falkirk Council, as appropriate, shall be arranged by the Company monthly throughout the duration of the Operations, at initiation or changes of traffic management layouts and at any other time deemed necessary by any of these parties.

1.19 The Company shall ensure that its traffic management proposals shall take account of events and public holidays which shall be likely to affect traffic flows.

1.20 The Company shall accommodate roadworks schemes adjacent to the O&M Works and shall consult and comply with the Relevant Authority in this respect.

2 Monitoring of Roadworks

2.1 The Company shall nominate two members of staff to liaise with Traffic Scotland at all times.

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.

2.3 In accordance with Appendix 1/24 the Company shall within its method statements for

Appendix 1/17 Traffic Safety and Management

traffic management include procedures to inform the motoring public of delays and queues on the approaches to and within the O&M Works Site.

2.4 The following organisations shall be informed at the frequencies indicated in the reporting frequencies section of paragraph 2.6 below:

2.4.1 National Network Control Centre;

2.4.2 AA Roadwatch;

2.4.3 Radio Scotland;

2.4.4 Local Radio Networks;

2.4.5 Traffic Link; and

2.4.6 any other organisations identified by the Scottish Ministers.

2.5 Traffic queues shall be monitored at all times during periods when Temporary Traffic Management Systems shall be in operation.

2.6 Traffic queues shall be measured by means of time delay.

Queue lengths measured as being less than eight minutes shall be defined as representing *"no substantial delay".*

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

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

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

For the purposes of this Agreement, a queue shall be defined as being where the speed of vehicles shall be less than 20 miles per hour.

Reporting Frequencies

Traffic information outlets shall be informed if:

2.6.1 a queue reaches eight minutes delay;

2.6.2 a queue changes by five minute band;

2.6.3 substantial delay ends i.e. delay less than eight minutes; and

2.6.4 the Company shall report to NNCC every 30 minutes irrespective of traffic conditions.

2.7 The Company shall not open any area to traffic unless the following requirements are met:

2.7.1 appropriate road markings have been laid or removed;

2.7.2 the carriageway has been fully swept and cleared of all items of Constructional Plant, personnel, materials and debris;

2.7.3 adjacent road restraint systems, where required, have been erected and tensioned;

2.7.4 the Company shall not have to impose future traffic restrictions on the section

of carriageway to undertake O&M Works which could have reasonably been completed under the preceding traffic control period; and

2.7.5 all temporary or permanent signing and lighting shall be in place.

3 Traffic Safety and Control Officer

3.1 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 Contract Period and shall liaise with the Relevant Authorities as required. The traffic safety and control officer shall take instructions in the case of emergency direct from the Scottish Ministers and the Police where they have assumed control. Radio contact should be maintained at all times with the traffic safety and control officer.

3.2 The responsibilities of the traffic safety and control officer shall include the following:

3.2.1 All traffic management measures associated with the O&M Works;

3.2.2 Ensuring that all equipment shall be in place and in full working order at all times;

3.2.3 Enforcement of all relevant Health and Safety directives, relating to operations and live traffic;

3.2.4 Enforcement of site access requirements;

3.2.5 Liaison with the Scottish Ministers and the Relevant Authorities and continued monitoring of the traffic management measures adopted; and

3.2.6 Arranging for watchmen and other staff so that the O&M Works Site shall be 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.

3.3 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.

4 Lane Closures

4.1 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 Motorways during the O&M Works, as a minimum requirement.

4.2 In exceptional circumstances, the Company shall apply to the Scottish Ministers for written approval to reduce the lane provisions described in paragraph 4.1 above to a minimum of one lane for all permitted classes of vehicle in each direction on the mainline carriageway of the Motorways between the hours 2000 and 0600 Monday to Friday and all day Saturday and Sunday, during the O&M Works.

4.3 The Company shall demonstrate to the Scottish Ministers that such applications are necessary in terms of either buildability or health and safety.

4.4 Applications shall be made a minimum of 4 weeks in advance of any planned reduction to the provision of paragraph 4.1 above during the O&M Works.

4.5 Reduction to the provision of paragraph 4.1 above shall not be permitted during the following periods, except in the case of emergencies:

4.5.1 Christmas and New Year holidays (24 December to 2 January inclusive);

Appendix 1/17 Traffic Safety and Management

4.5.2 Good Friday to Easter Monday inclusive;

4.5.3 between Friday and Monday inclusive on any local Bank holiday or public holiday weekend during May or September;

4.5.4 the weekends at the start and end of the Glasgow Fair holiday; and

4.5.5 as directed by the Police.

4.6 On side roads or new means of access, no lanes may be occupied until such time as consultation and agreement has been reached with the Relevant Authorities or land owners or occupiers and a temporary replacement route or temporary diversion shall be in operation.

5 Safety of Personnel

5.1 Notwithstanding any other requirements of this Agreement, safety zones at all Temporary Traffic Management Schemes on the O&M 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 temporary vertical concrete or varioguard safety barrier in lieu of other means of demarcation allowed under the other requirements of this Agreement. In such an event, the safety zone shall be a minimum of 500 millimetres wide.

5.2 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.

5.3 The Scottish Minister 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.

5.4 All drivers including those delivering plant and materials shall be given clear instructions regarding the traffic arrangements applicable at that particular time.

5.5 All personnel working on or adjacent to trafficked roads shall be issued with printed copies of appropriate safety instructions and receive training as necessary.

6 Requirements for Vehicles used on the O&M Works Site

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

6.1.1 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 381C:1996 Specification for Colours for Identification, Coding and Special Purpose, or similar).

6.1.2 Similarly all vehicles engaged in O&M 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.

6.1.3 All other vehicles undertaking O&M 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 shall be exposed to approaching vehicles, conspicuous markings and signs to define clearly that the vehicle shall be a roadworks vehicle.

6.1.4 Vehicles shall have a sign board reading "Highway Maintenance" (to Diagram

Appendix 1/17 Traffic Safety and Management

740A of Schedule 12 Part V of the Traffic Signs Regulations and General Directions) fixed at the rear.

6.1.5 The lettering shall be 150 millimetre "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 millimetre.

6.1.6 The lettering shall be black capital letters from the alphabet described in the Traffic Signs Regulations and General Directions, Schedule 13 Part II on a yellow non-reflectorised background in accordance with BS 381C:1996 Specification for Colours for Identification, Coding and Special Purpose, Colour No 355.

6.1.7 Heavy goods vehicles shall be fitted with an audible reversing warning device.

6.1.8 All vehicles entering the O&M Works Site for any purpose shall comply fully with the requirements of Specification Appendix 1/19.

6.1.9 Only essential vehicles shall be allowed to enter an O&M Works site. Any vehicles deemed by the Scottish Ministers to be non-essential (especially private cars), or any vehicle not complying with the requirements of paragraph 6.2 to 6.5 below will not be permitted to remain on the O&M Works site.

6.2 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.

6.3 All warning lamps shall be switched on when the vehicle or plant shall be manoeuvring into or out of the location of the O&M Works, operating at low speed on the carriageway or hardshoulder open to vehicles or standing on a carriageway or hard shoulder open to vehicles.

6.4 Hazard warning lights are not an acceptable alternative to roof mounted flashing lamps, but may be used in addition.

6.5 All vehicles and plant shall be free from oil and fuel leaks and if refuelled on the O&M Works site care shall be taken to prevent spillage.

6.6 Side tipper vehicles shall be used where such shall limit turning manoeuvres alongside trafficked Lanes.

6.7 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.

6.8 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 O&M Works Site adjacent to live traffic.

7 Temporary Traffic Signs

7.1 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.

7.2 All traffic signs required by the Traffic Signs Regulations and General Directions shall be reflective shall be made reflective by the application of Class 1 retroreflective material.

7.3 All temporary traffic signs shall comply with the Traffic Signs Regulations and General Directions.

Appendix 1/17 Traffic Safety and Management

7.4 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:

7.4.1 Advanced signing two miles prior to roadworks as drawing Number (P) 7004 sheet 1 of 3 detailing modification to sign WBM 338.1 of Chapter 8 of the Traffic Signs Manual.

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

7.4.3 Signing erected one mile in advance of roadworks as drawing number (P) 7005 detailing modification to sign WBM 338 of Chapter 8 of the Traffic Signs Manual.

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

7.4.5 At the commencement of the roadworks, the additional line shall read, for example "until July 09"

7.4.6 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".

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

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

7.4.9 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.

7.4.10 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.

7.4.11 Where within all of the drawings listed above reference shall be made to “The Scottish Office”, it shall be deleted and replaced with “Transport Scotland”.

7.4.12 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 O&M Works to explain why part of the road has been coned off but no O&M Works shall be, or appears to be taking place.

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

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

7.4.15 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.

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

7.4.17 The legends required to the works are:

(i) WORK SUSPENDED

(ii) UNSUITABLE WEATHER

(iii) ROAD REPAIRS

Appendix 1/17 Traffic Safety and Management

(iv) MATERIALS HARDENING

(v) LANE CLOSED FOR SAFETY

(vi) CONCRETE SETTING

(vii) LANE CLOSED TO PROTECT WORKFORCE

(viii) FURTHER WORKS AHEAD

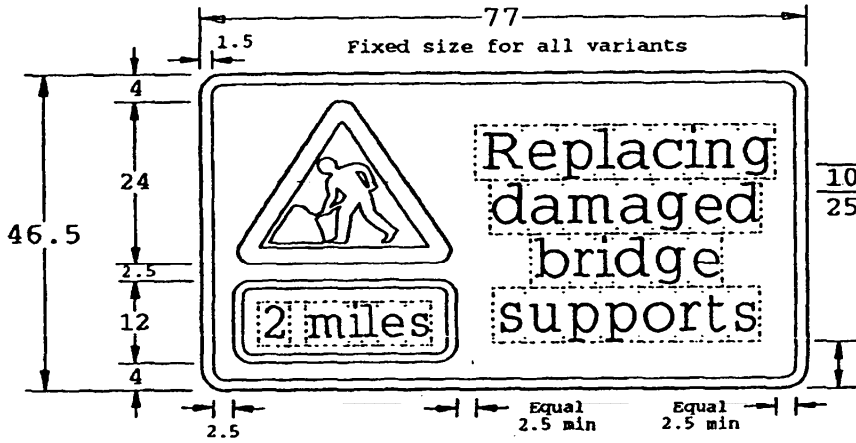
(ix) LANE REMAINS CLOSED FOR SAFETY PURPOSES

7.4.18 The minimum period of inactivity which would warrant the display of a sign shall be 15 minutes.

Appendix 1/17 Traffic Safety and Management

Drwg.No. (P)7004 Sheet 1 of 3

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 sign.
3. Colours:- BS.873:Part 6 (Black & White- Table 5 / Other colours- Clause 4.3.3)
   Legend & Border---- Black
   Background--------- Yellow
   P7001 triangle { Border------ Red / Symbol------ Black / Background-- White
   Supplate { Border & Legend- Black / Background------ White
4. Illumination: The sign may be internally or externally lit, but if not so lit throughout ALL the hours of darkness it shall be reflectorised.
5. x-heights are in millimetres, other dimensions in stroke widths at large x-height. (4sw equals the x-height)
6. The signs shall comply with the current edition of BS.873.



Other variants

TOP LINE- Repairs to, or Renewing
CENTRE LINE- worn out, or weak
BOTTOM- road, bridge deck (2 lines), concrete, or surface

(0.8 of large x-ht) 2 miles 80 min / 200 max x-ht

supplate designed to x-ht used in it, distance may be varied.

DETAILS OF ROADWORKS TRIANGLE ON DRWG NO (P)7001

P7004-1

Before using this drawing confirm that it has not been superseded.

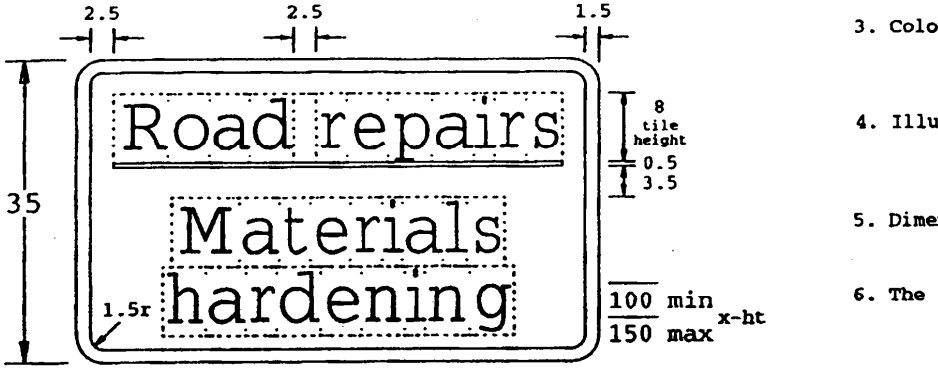
modified WBM(R)338.1

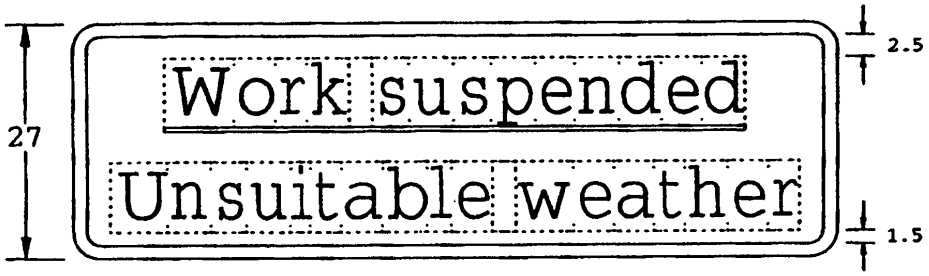
FIRST ISSUED:	18.6.92
REVISIONS:	
THIS ISSUE:	18.6.92
Drawn: S.P.	Approved:
Title:	Roadworks DESCRIPTION AND DISTANCE TO WORKS
DEPARTMENT OF TRANSPORT	
Drwg.No.	(P)7004 Sheet 1 of 3

Appendix 1/17 Traffic Safety and Management

Drwg.No. (P)7004 sheet 2 of 3

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, Other colours- Clause 4.3.3)
   Legend, Borders and Underline--- 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.





FIRST ISSUED: 18.6.92
REVISIONS:

THIS ISSUE: 18.6.92
Drawn: R.M. Approved:

Title: Roadworks
DESCRIPTION OF WORKS

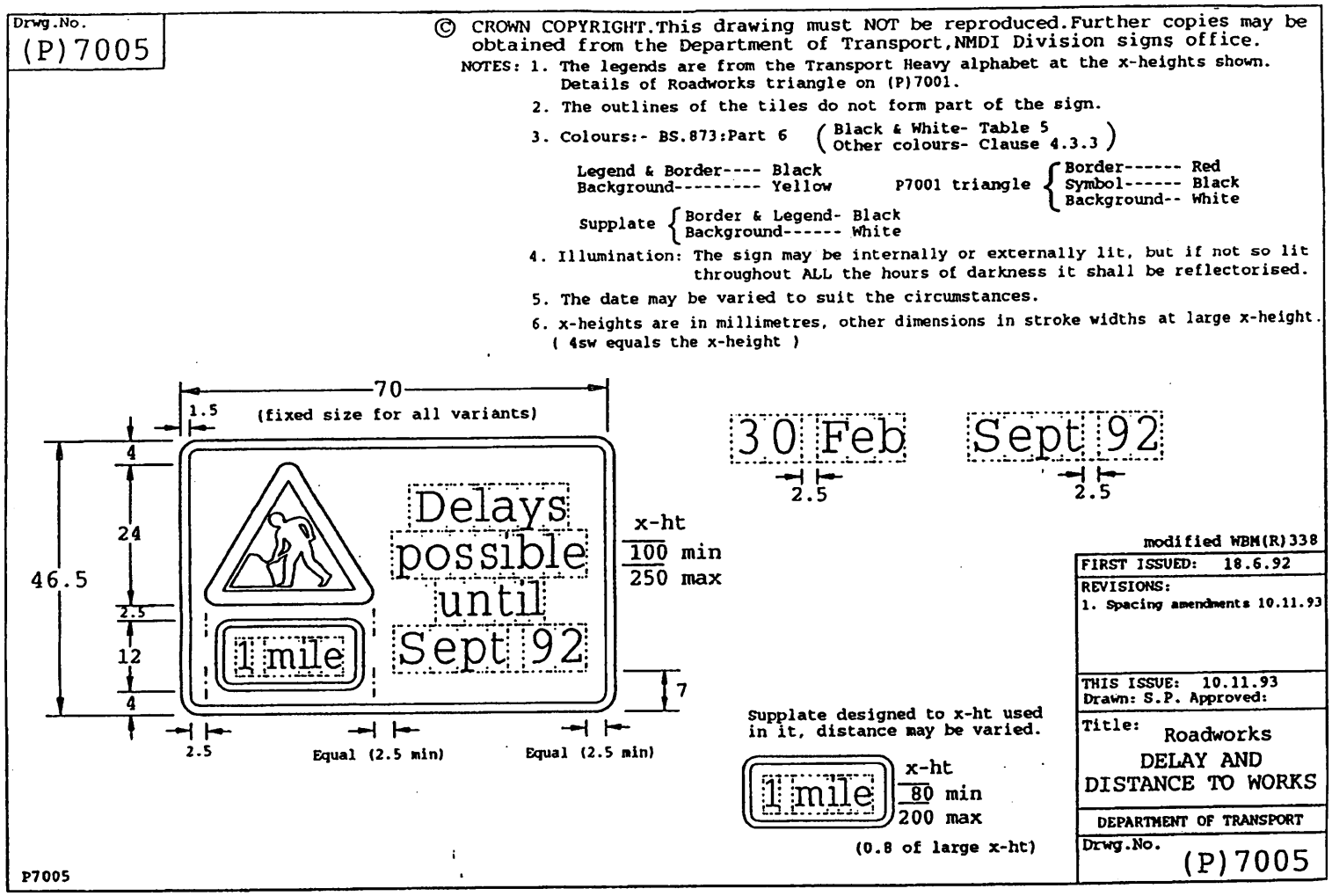
DEPARTMENT OF TRANSPORT

Drwg.No. (P)7004 sheet 2 of 3

P7004-2

Before using this drawing, confirm that it has not been superseded.

Appendix 1/17 Traffic Safety and Management



Appendix 1/17 Traffic Safety and Management

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.

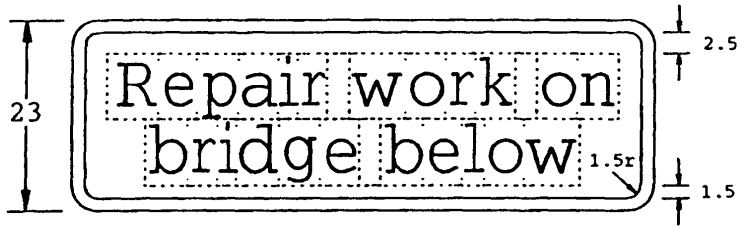
REVISIONS
DATE: February 1994
SCALE: 1/20
"WORK STARTS HERE, DELAYS POSSIBLE"
The Scottish Office Roads Directorate
Drawing No. **W(S) 148**

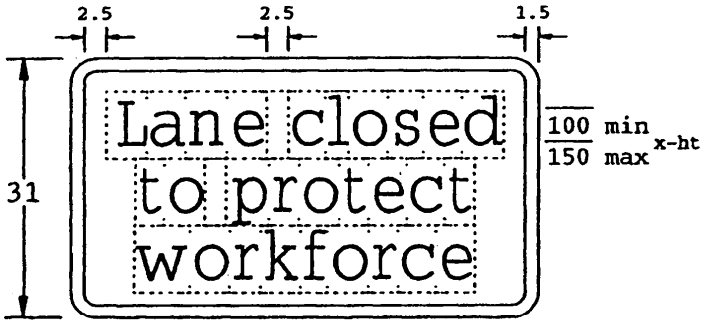
GF150

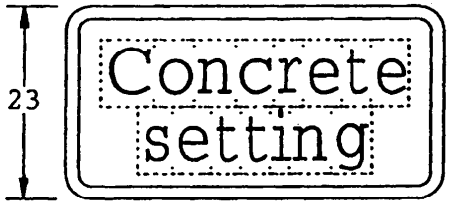
Appendix 1/17 Traffic Safety and Management

Drwg.No. (P)7004 sheet 3 of 3

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, Other colours- Clause 4.3.3)
   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.







FIRST ISSUED: 18.6.92
REVISIONS:

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

P7004-3

Before using this drawing, confirm that it has not been superseded.

Appendix 1/17 Traffic Safety and Management

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. **W(S) 149**

GF1504

Appendix 1/18 Temporary Diversions for Traffic

1 DESIGN OF TEMPORARY DIVERSIONS FOR TRAFFIC

1.1 Safe access across the O&M Works shall be maintained or diversions provided in accordance with the minimum standards shown in Table 1/18 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 O&M Works Site shall be phased such that no road or private access shall be closed to traffic until such time as a permanent replacement route or temporary diversion shall be in operation.

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 O&M Works interfere with existing public or private roads or other ways over which there shall be 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 Scottish Ministers their detailed proposals as below for the temporary diversion of traffic (including non motorised user routes) at least 6 weeks prior to the implementation date:

1.6.1 Phasing of the diversion works including all concurrent diversions;

1.6.2 Drawings showing traffic management layout including as follows:

(i) position of traffic signs, signals and cones;

(ii) width of lanes;

(iii) working areas;

(iv) safety zones;

(v) details of temporary barriers for the protection of personnel;

(vi) entry and exit points for O&M Site traffic;

(vii) provisions for emergency vehicles;

(viii) provisions for vehicle recovery;

(ix) provisions for wide loads;

(x) crossovers;

1.6.3 Making or amending traffic orders.

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

1.6.4 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 O&M Works.

1.6.5 Temporary diversions of the Trunk Roads and Motorways shall be designed in accordance with the DMRB to a Design speed of 70kph.

Any temporary diversions of Slip Roads and Side Roads shall be designed to a Design speed of 50kph.

Appendix 1/18 Temporary Diversions for Traffic

1.6.6 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.

1.6.7 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 shall be 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 shall be 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 O&M 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 shall be not in operation.

Table 1/18: Requirements of the Scottish Ministers During Construction of O&M Works and Diversions Necessitated by the O&M Works.

Description	Requirements	Remarks
New M80 Motorway, M73-M80 Link Road – Main Carriageway	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 shall be maintained as a minimum in each direction if approval shall be granted in accordance with Paragraph 4.2 of Appendix 1/17.	Refer to Appendix 1/17
Motorway 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 Falkirk Council, as appropriate.	

Appendix 1/19 Routing of Vehicles

1 General

1.1 The Company shall submit his proposals for O&M Works Site access points including access to offices etc. at least four weeks in advance of the proposed start date for construction of the proposed O&M Works Site access points.

1.2 Access to the O&M Works Site for the Company's vehicles of over 3 tonnes unloaded weight shall be taken at the following points only:

1.2.1 Existing M80 Motorway West;

1.2.2 Existing M80 Motorway East; and

1.2.3 Existing M73 Motorway.

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 Scottish Ministers, East Dunbartonshire Council, North Lanarkshire Council and Falkirk Council, as appropriate.

The Company shall provide, maintain and keep available at all times equipment as may be necessary to keep such ways clean.

The Company shall apprise itself of the standards of such routes with regard to height, weight or other restrictions by which its Operations may be limited or affected.

Any strengthening work required shall be carried out by the Company to the approval of the Scottish Ministers, East Dunbartonshire Council, North Lanarkshire Council and Falkirk Council, as appropriate.

All other possible access points to the O&M Works from existing roads shall be signed with the 'NO ACCESS TO CONSTRUCTION TRAFFIC' sign (layout to be approved by the Scottish Ministers).

1.3 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.

All accesses shall comprise a minimum paved width of 6.5 metres for a distance of 20 metres from the public road.

All accesses shall incorporate a suitable wheel wash on the exit side.

All roads and accesses within the O&M Works Site, including existing public and private roads, footpaths, bridleways, farm field and house accesses used by any vehicles engaged on the O&M Works Site 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.

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.

All egresses shall incorporate a suitable wheel wash on the exit side.

1.4 Bulk Haulage of material excavated within the O&M Works Site shall be carried out on haul roads within the O&M Works Site wherever possible.

The use of public roads for this operation shall only be permitted subject to consultation with the Scottish Ministers or East Dunbartonshire Council, North Lanarkshire Council and Falkirk 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 Scottish Ministers.

Appendix 1/19 Routing of Vehicles

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

1.5 If the proposed method of construction involves the use of any part of the permanent O&M works by construction traffic, the Company shall take any necessary measures to protect such permanent works.

1.6 The Company shall submit to the Scottish Ministers details of proposed borrow pits and tipping areas, which are off O&M Works Site and the intended routing of vehicles to and from such sites.

The Company should also inform the Scottish Ministers of the type of such vehicles to be used for transport, which should be compatible with the standard of the above routes.

1.7 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.

1.8 At-grade right turns or U-turns to and from or on the Project Roads shall be prohibited at all times.

Right turn manoeuvres shall only be permitted at grade separated interchanges.

Persistent infringement of the foregoing restrictions shall be deemed a Company Event of Default in terms of this Agreement.

1.9 If the Company wishes to make use of existing laybys as access points to the O&M Works Site, approval shall be obtained from the Relevant Authorities and, where required, an alternative layby provided for the duration of the O&M Works, to accommodate bus services, breakdown situations and police traffic monitoring operations.

1.10 Any work which necessitates machinery and plant crossing public roads shall only be permitted with the prior written approval of the Relevant Authority.

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.

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 shall be necessary to protect and maintain the surface of the public road crossed by Constructional Plant.

3 Temporary Structures 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:

Appendix 1/19 Routing of Vehicles

3.1.1 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.

3.1.2 The Company shall provide copies of the Design and Design Check Certificates in accordance with the Certification Procedure.

3.1.3 For temporary Structures spanning the New Roads, the headroom shall be not less than 5.7 metres.

Appendix 1/20 Recovery Vehicles for Breakdowns

1 Recovery Vehicles to be Provided

1.1 Heavy Recovery Vehicles

1.1.1 Consideration shall be given to the provision of 1 number heavy recovery vehicle on the O&M Works Site wherever works involve one or more of the following:

(i) reduction in the number of lanes available;

(ii) narrow lane widths;

(iii) sections of motorway without hard shoulders;

(iv) hard shoulder running;

(v) known congestion sites; and

(vi) decommissioning of emergency telephones over a significant length of carriageway.

Consideration shall include the preparation of a risk assessment. Where a heavy recovery vehicle is not considererd necessary a copy of the risk assessment shall be provided to the Scottish Ministers before works commences.

Heavy recovery vehicles shall not be required for Type C Works.

1.1.2 The heavy recovery vehicle shall comply with the following:

(i) be a 3 axled vehicle capable of suspend towing a loaded 44 tonne vehicle up a slope of 4 per cent and shall comply with all appropriate current legislation including Motor Vehicle 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 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 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 millimetres 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

Appendix 1/20 Recovery Vehicles for Breakdowns

Quantity	Item
1	1-10 person first aid kit to include disposable surgical gloves
2	10 metres 12 tonne nylon straps
2	30 metres by 13 millimetre polypropylene rope
1	44 tonne straight tow pole
1	44 tonne cranked tow pole
10	Highway cones 750 millimetre 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
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 70mm 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

1.1.3 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

Appendix 1/20 Recovery Vehicles for Breakdowns

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).

(i) 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.

(ii) 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.

(iii) 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 Consideration shall be given to the provision of 1 number light recovery vehicle on the O&M Works Site wherever works involve one or more of the following:

(i) reduction in the number of lanes available;

(ii) narrow lane widths;

(iii) sections of motorway without hard shoulders;

(iv) hard shoulder running;

(v) known congestion sites; and

(vi) decommissioning of emergency telephones over a significant length of carriageway.

Consideration shall include the preparation of a risk assessment. Where a light recovery vehicle is not considererd necessary a copy of the risk assessment shall be provided to the Scottish Ministers before works commences.

Light recovery vehicles shall not be required for Type C Works.

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 Motor Vehicle 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

Appendix 1/20 Recovery Vehicles for Breakdowns

recovery operatives).

(v) Be conspicuous, for example, by marking with suitable tape (not less than 125 milllimetres 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 millimetre polypropylene rope
1	6 tonne straight tow pole
10	Highway cones 750 millimetre 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 50mm, 2 inch or jaw type fittings
1	Broom and shovel
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 70mm 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

1.2.3 The light recovery vehicle shall also carry as a minimum requirement:

Quantity	Item

Appendix 1/20 Recovery Vehicles for Breakdowns

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).

(i) 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

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. Evidence of this roadworthiness shall be 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.

If the duration of the works exceeds 6 months, 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.

2.2 Lifting equipment

All lifting equipment shall be fully certified by an independent competent person to comply with all current legislation.

2.3 Reports

A copy of each inspection report shall be:

2.3.1 provided for the Scottish Ministers.

2.3.2 kept in the recovery vehicle.

2.4 Record form

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 O&M Works.

3.2 The recovery vehicles shall be located within easy access to the Temporary Traffic Management Scheme.

Appendix 1/20 Recovery Vehicles for Breakdowns

4 Communication System

4.1 In addition to the requirements of Appendix 1/3, the Company shall:

4.1.1 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

4.1.2 provide an emergency telephone and line at the recovery base station(s) and the police shall be by direct land line.

4.2 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 O&M Works.

5 Location(s) for Vehicle Removal

5.1 At all times when Motorways have traffic management due to the O&M 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 O&M 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, traffic shall be directed onto an emergency route.

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 O&M Works Site.

8 Requirements for Recovery Personnel

8.1 Suitability: It shall be 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 Moor 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 O&M 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:

8.3.1 Safety helmet CE marked to BS EN 397:1995 Specification for Industrial Safety Helmets

8.3.2 Reflective safety garment complying with sub-Clause 117.18 of the Specification;

8.3.3 Boots with steel reinforcement toecaps and/or safety footwear in accordance with BS EN 345;

8.3.4 Suitable gloves with the appropriate CE mark;

8.3.5 Protective goggles in accordance with BS 2092:1967 Specification for Industrial Eye-Protectors.

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:

8.4.1 An identity card which incorporates the name of the recovery contractor (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.

8.4.2 A reflective safety garment (referred to in 8.3.2 above) which prominently displays the Company's name.

8.4.3 Working hours: Recovery vehicles shall be provided 24 hours a day during the O&M Works. Recovery operatives shall be on duty for a maximum of 12 hours 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'

RECOVERY VEHICLE DAILY CHECK SHEET Week Commencing:……							
Driver's Name:				Vehicle Type/Registration Number:		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:			
COMPLETED SHEET TO BE RETURNED TO SCOTTISH MINISTERS EACH WEEK							

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: M80 Stepps to Haggs DBFO Contract

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.

1. The roadworks operations commence at the 'Roadworks Ahead – 3 miles' sign and end at the 'Roadwork End' sign.

2. The recovery service provided along the extent of the roadworks operation is free.

3. Vehicles will be recovered clear of the roadworks operations to a safe location on the local network unless otherwise directed by the police.

4. 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:

Local Garage……

AA……...

RAC……

Greenflag……...

Assistance will also be given by telephoning ……..

If a motorway emergency telephone is used, the police will assist.

Appendix 1/20 Recovery Vehicles for Breakdowns

SHEET 4: INFORMATION TO BE PROVIDED BY THE COMPANY

VEHICLE RECOVERY LOGSHEET (1 of 2) M80 Stepps to Haggs DBFO Contract						Recovery Vehicle: ……					Week Ending: ……..					(i) Sheet Number: ……				
Date	Time			Where?	Dir.	Lanes Closed					Police etc Present*	Incident		Recovery	Vehicle Type#	Q'ing	Weather	Road Surface		Remarks
	Call Out	Arrival at Scene	Road Clear	Marker Post Number.		HS	1	2	3	4		Acc	B/d	Tow?** Y/N		Y/N		Dry	Wet	

*P-Police **Y-Tow/Lift #C-Car
F-Fire Service R-Restart M/C-Motorcycle
A-Ambulance F-False Call V-Van
HGV-Heavy Goods Vehicle

Appendix 1/20 Recovery Vehicles for Breakdowns

SHEET 4 (Continued)

VEHICLE RECOVERY LOGSHEET (2 of 2) **M80 Stepps to Haggs DBFO Contract**			b) Recovery Vehicle: ……	**Week Ending:…../……/……**		c) Sheet Number:……
Date and Time	**Type of Vehicle**	**Registration Number.**	**Name and Address of Driver or Firm**	**Location of Breakdown**	**Nature of Breakdown**	**Recovery Operator's Name**

Appendix 1/21 Information Boards

1 General

1.1 Details of Network Customer Contact Signs shall be as provided in Appendix H of Part 1 of Schedule 4.

1.2 The locations of Network Customer Contact Signs shall be as required in Part 1 of Schedule 4.

1.3 The Company may erect for its own purpose sign boards at the entrance to each of the compounds which it uses in connection with the maintenance of the O&M Works Site.

1.4 The size of these boards shall be no greater than the boards required for Network Customer Contact Signs and shall be subject to the written approval of the appropriate planning authority.

Appendix 1/24 Quality Management System

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), including, but not limited to, silane, bridge deck waterproofing systems, and paints.

The Company shall institute and operate a quality management system complying with Schedule 5.

Appendix 1/72 Communication System for the Company

1 Communication System

1.1 The communication system referred to in Clause 103SR shall ensure communications between the following parts of the Company, including, but not limited to:

1.1.1 the central office sub offices depots and otherwise;

1.1.2 the emergency vehicles;

1.1.3 the traffic officer's vehicle the traffic safety and control officer's vehicle and all vehicles involved with establishment and maintenance of traffic management;

1.1.4 the winter maintenance manager's vehicle the duty officer's vehicles and all vehicles involved with winter maintenance management Operations and winter maintenance Operations;

1.1.5 the supervisory personnel's' and inspection personnel's' vehicles; and

1.1.6 the other key personnel involved in the Operations including all persons nominated from time to time to be on call 24 hours on every day for emergency call out.

Appendix 1/74 Safety of Operations

1 General

1.1 Notwithstanding compliance with any legislation in connection with the O&M Works Site safety including, but not limited to, the CDM Regulations and also the other provisions of this Agreement the Company shall comply with its own published safety policy current at the time the Operations are carried out.

1.2 The Company shall, while carrying out Operations within the O&M Works Site, comply with traffic management requirements specified elsewhere in this Agreement.

1.3 The Company shall while carrying out the Operations comply specifically with the requirements of:

1.3.1 Control of Substances Hazardous to Health Regulations 1988

1.3.2 Electricity at Work Regulations 1989

1.3.3 BS 7671: Requirements for Electrical Installations; IEE Wiring Regulations.

1.4 The Company shall prior to complying with paragraphs 1.1 to 1.3 of this Appendix 1/74 carry out a formal risk assessment as required by Management of Health and Safety at Work Statutory Instrument No 2951 conforming to the approved code of practice.

Records of risk assessment shall be maintained in accordance with the procedures in the Quality Plan and be available for inspection by the Scottish Ministers at any time.

1.5 The Scottish Ministers may suspend the Operations or part thereof in the event of non-compliance by the Company with health and safety matters specified in the Agreement.

The Company shall not resume Operations until the Scottish Ministers shall be satisfied that non-compliance has been rectified.

In respect of any such period of suspension the Company shall not add any cost to the Operations price and no extra time shall be allowed for completion.

2 The Wearing of Safety Helmets

2.1 All O&M Works Sites under the jurisdiction of the Company shall be managed in strict accordance with the Construction (Head Protection) Regulations 1989 and supporting Health and Safety Executive guidance.

2.2 The Company shall display at appropriate locations signs described in the Health and Safety Executive Guidance on Regulations (Regulation 5).

3 High Visibility Clothing

3.1 The Company shall ensure that the clothing required to be worn shall be maintained to a standard that accords with its intended use.

Appendix 1/78 Material Stocks

Typical items of materials to be held in stock shall be listed and quantified in Table 1 of this Appendix 1/78. The Company shall hold in accordance with its Quality Plan procedures the quantified list of material stocks to be held and the storage location(s) of such materials. In preparing the list the Company shall comply with any requirement specified elsewhere in the Agreement.

Table 1

Type of Material		Location of Depot	Number available
General	Sandbags (rot proof)		
	Sand		
	Liquid for removing oil from carriageways		
	Oil absorbent granules (20 kg bags)		
	5 kg bags bituminous instant repair material		
	25 kg bags bituminous instant repair material		
	25 kg bags Bitucrete or equivalent		
	50 kg bags of cement		
Fencing	Spares to all types of road restraint systems used within the O&M Works Site.		
	Boundary Fence Rails BS 1722-7:2006 Fences; Specification for Wooden Post and Rail Fences		
	Boundary Fence Posts BS 1722-7:2006 Fences; Specification for Wooden Post and Rail Fences		
	10 metre rolls of cleft chestnut pale fencing		
	25 metre rolls of sheep netting		
	25 metre rolls of galvanised barbed wire		
	25 metre rolls of galvanised 2.5 millimetre diameter plain wire		
	50 millimetre x 2.765 millimetre diameter galvanised nails		
	100 millimetre x 4.5 millimetre diameter galvanised nails		
Signs	Type 1 marker Posts		
	Type 2 Marker Posts		
	Type 8b Marker Posts		
	Marker post numerals (20 of each 0 to 9)		
	Marker post telephone symbols		
	“Road Closed” signs		
	“Diverted Traffic” signs (variable arrows)		
Drainage	Gully Grating GA2-456		
	Pre cast gully pots		

Appendix 1/78 Material Stocks

Type of Material	Location of Depot	Number available
Medium duty manhole cover MB2-60 Heavy duty manhole cover MA60		

Note: Stocks of electrical equipment shall be detailed in Appendix 14/70

Appendix 3/1 Fences Gates and Stiles

1 General

1.1 Fencing for the protection of planted areas shall be hexagonal wire netting fencing complying with Section 8 of BS 1722-2 or equivalent and in accordance with HCD Drawing Number H39 Fencing Type 1.

1.2 Where shown on the drawings, wire mesh shall be attached to permanent or existing fencing in accordance with HCD Drawing Numbers H46 and H47 to protect the hedge from rabbits and hares.

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

Schedule of Road Restraint Systems (Vehicle and Pedestrian)
[To be determined by the Company]

Location and Start Chainage* (m)	**Finish Chainage (m)**	**Position on Cross Section +**	Type of Road Restraint System** (Safety barriers, vehicle parapets, transitions, terminals, crash cushions, pedestrian parapets, pedestrian guardrails)	**Set-back (m)**	Containment Performance Class** (Safety barriers, vehicle parapets, transitions) Performance Level (Crash Cushions)	Available Working Width** (m) (Safety barriers, vehicle parapets, transitions)	Working Width Class** (Safety barriers, vehicle parapets, transitions)	Velocity Class (Crash Cushions)	**Lateral Displacement Zone Class (Terminals, Crash Cushions)**	**Redirective (R) or Non-redirective (NR) (Crash Cushions)**	**Other Requirements / Comments ** ++ +++**

Notes:

* e.g. Road name, verge, central reserve, slip road etc.
\+ e.g. LH verge; central reserve, RH hand verge etc.
** Enter temporary safety barrier where required.
++ Height requirements etc.
+++ Anti-glare Screens

Appendix 4/2 Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, EN 1317-2, BS EN 1317-3 (OE) 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 drawings supplied.		
7	Confirmation from test house	That the test conforms to the relevant requirements of BS EN 1317-1 (and including and additional test data required under BS EN 1317-2, BS EN 1317-3 and DD ENV 1317-4:2002).		
Additional information, which will be required on acceptance of initial type test prior to installation.				
8	System specification	Manufacturer's specification.		
9	Installation details	Manufacturer's drawings.		
10	Installation procedures	Manufacturer's installation instructions		
11	Maintenance Manual	Manufacturer's inspection, repair, and maintenance instructions.		
12	Certificate of compliance	With the Quality Management Scheme 1 for Manufacture of Fencing Components. 2		
13	Certificate of compliance	With the Sector Scheme 2B for the Supply and Installation of Fences Vehicle Restraint Systems. 2		
14	Certificate of compliance	With the Quality Management Schemes 5 for the Fabrication and Installation of Bridge Parapets and Cradle Anchorages. 3 (i) Sector Scheme 5A for The Manufacture of Parapets for Road Restraint Systems; and (ii) Sector Scheme 5B for The Installation of Parapets		
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		
Notes:				
1. All documents, which are not in English, will have to be translated. If they are in a language other than French or German the promoter will be required to supply a full translation.				
2. Items 12 and 13 are required for safety barrier systems and transitions.				
3. Items 14 and 15 are required for vehicle parapets.				
Signature:		Name:		
Date:				

Appendix 4/2 Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, EN 1317-2, BS EN 1317-3 (OE) and DD ENV 1317-4:2002

					Sheet 2 of 4	
SUBMISSION FOR COMPLIANCE WITH BS EN 1317-1, BS EN 1317-2, 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:						
			Specified	Actual	Satisfactory (Yes or No)	Compliance
BS EN 1317-1, Table 1	Vehicle Details	**Impact Condition(s)** Total vehicle mass (kg) Speed (kmh) Angle (degrees)	 …… (± …) …… (0, +7%) …… (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …… (± 10%) …… (± 10%) ± …….			
		Model				N/A
BS EN 1317-2, Clause 4.2	Vehicle Restraint System (VRS) Behaviour	1) The VRS shall contain and redirect the vehicle without breakage of principal longitudinal elements of the system. 2) No major part of the VRS shall become totally detached or present an undue hazard to other traffic, pedestrians or personnel in a work zone. 3) Elements of the VRS shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into the passenger compartment that can cause serious injuries are not permitted. 4) Ground anchorages and fixings shall perform according to the design of the VRS.				
BS EN 1317-2, Clause 4.3	Vehicle Behaviour	1) The centre of gravity (CG) of the vehicle shall not cross the centreline of the deformed system. 2) The vehicle shall remain upright during and after impact, although moderate rolling, pitching and yawing are acceptable. 3) 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 (2.2m) plus vehicle width +16% of the length of the vehicle within a distance B (10m) from the final intersection (break) of wheel track with the initial traffic face of the VRS.				
BS EN 1317-2, Clause5.3 .2	Installation	1) The length of the VRS shall be sufficient to demonstrate the full performance characteristics of the system. 2) 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	SPECIFIED THIV Limit 33 km/h PHD Limit 20 g ASI Limit 1.4	ACTUAL THIV….. km/h PHD….. g ASI…. .			
BS EN 1317-2, Clause 5.7, Figure 3	Photographic coverage	1) Photographic coverage shall be sufficient to clearly describe behaviour and vehicle motion during and after impact. 2) High speed cameras shall be operated at a minimum of 200 frames per second and stills. 3) As recommended in Clause 5.7 and Figure 3.				
	Drawings	Drawings included			N/A = Not Applicable	
FULLY COMPLIES WITH STANDARD: BS EN 1317-1, BS EN 1317-2, DD ENV 1317-4:2002						
Signature:		Name:				
Date:						

Appendix 4/2 Information Required to Demonstrate Compliance of Road Restraint Systems to BS EN 1317-1, EN 1317-2, BS EN 1317-3 (OE) 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 Condition(s)** Total vehicle mass (kg) Speed (kmh) Angle (degrees)	 …… (± …) …… (0, +7%) …… (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …… (± 10%) …… (± 10%) ± …….			
		Model				N/A
BS EN 1317-3,Clause 6.2	Crash Cushion Behaviour	1) Elements of the crash cushion shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into, the passenger compartment that could cause serious injuries are not permitted. 2) No major element of the crash cushion, having a solid mass greater than or equal to 2.0kg, 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.				
BS EN 1317-3,Clause 5.4. and Table 4	Impact Severity Levels	SPECIFIED Level A: Level B: Levels A & B: PHD <20g	ACTUAL			
BS EN 1317-3,Clause 7.7 Figure 4	Photographic coverage	1) High speed cameras and/or high speed video cameras shall be operated at minimum of 200 frames per second. 2) Stills 3) 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 Road Restraint Systems to BS EN 1317-1, EN 1317-2, BS EN 1317-3 (OE) 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 & 7.5	Vehicle Details	**Impact Condition(s)** Total vehicle mass (kg) Speed (kmh) Angle (degrees)	 …… (± …) …… (0, +7%) …… (-1, +1.5)			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m)	 …… (± 10%) …… (± 10%) ± …….			
		Model				N/A
DD ENV 1317-4:2002, Clauses 5.4 &5.5.2	Terminal Behaviour	1) Elements of the terminal shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into, the passenger compartment that could cause serious injuries are not permitted. 2) No major part of the terminal shall become totally detached and come to rest outside the permanent lateral displacement zones defined in Clause 5.4. 3) Anchorages and fixings shall perform to the terminal design specifications and other specified requirements as listed in the test report.				
N 1317-4,:2002 Clause 5.5.3 (OE)	Vehicle Behaviour	1) The vehicle shall not overturn, although rolling, yawing and moderate pitching may be accepted. For the performance class P1 rolling onto a side may be accepted. 2) The exit box values for the specified test are as defined in Figures 5.6 and 7 (as appropriate).				
DD ENV 1317-4:2002, Clause 7.3.2 (OE)	Installation	1) The terminal shall conform to the structural design details and with the system installation details as given in the design specification of the manufacturer.				
BS EN 1317-4:2002, Clause 5.5.4 & Table 5 (OE)	Impact Severity Levels	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) THIV < 33km/h (Tests 4 & 5) ASI < 1.4 Levels A & B: PHD <20g	ACTUAL			
DD ENV 1317-4:2002, Clause 7.7. & Figure 7	Photographic coverage	1) Photographic coverage shall be sufficient to describe clearly terminal and vehicle motion during and after impact. 2) High speed cameras and/or high speed video cameras at a minimum of 200 frames per second. 3) Stills				
	Drawings	Drawings included				
					N/A = Not Applicable	
FULLY COMPLIES WITH STANDARD: BS EN 1317-1 and DD ENV 1317-4:2002						
Signature:			Name:			
Date:						

Appendix 4/71 Re-Tensioning of Safety Barriers

Safety Barriers shall be re-tensioned in accordance with the following procedure:

1 Tensioned Corrugated Beam Safety Barrier

1.1 Tensioned corrugated beam safety fence shall be re-tensioned in accordance with BS 7669 : Part 3, Section 2.1 or equivalent.

1.2 Tensioning between any two limits shall not proceed until each limit shall be anchored sufficiently securely to resist the load effects due to tensioning.

1.3 Tensioning shall be undertaken only when the ambient temperature shall be between 25°C and -5°C.

1.4 Adjuster assemblies shall be located not more than 70.5 metres apart and each installation shall incorporate at least one adjuster assembly.

1.5 On completion of tensioning, the centre of each screw securing beams to posts shall be not closer than 25 millimetres ±2 mm to the end of the slotted hole in the beam.

2 Wire Rope Safety Barrier

2.1 Wire rope safety fence shall be re-tensioned in accordance with BS 7669 : Part 3, Section 2.5 or equivalent.

2.2 Tensioning between any two limits shall not proceed until each limit shall be anchored sufficiently securely to resist the load effects due to tensioning.

2.3 Tensioning shall be undertaken only when the ambient temperature shall be between 30°C and - 10°C.

2.4 Before tensioning the ropes the ambient temperature shall be agreed by the Scottish Ministers.

2.5 The tension shall be measured using a tension indicating device approved in writing by the Scottish Ministers.

2.6 Before putting the safety fence into service the tension in each rope shall be checked and it shall be retensioned if necessary.

3 Tensioned Rectangular Hollow Section

3.1 Assembly and tensioning shall be carried out in accordance with BS 7669 : Part 3, Section 2.4 or equivalent.

3.2 Tensioning between any two limits shall not proceed until each limit shall be anchored sufficiently securely to resist the load effects due to tensioning and that the safety fence has been completely assembled and connected to the anchorages.

3.3 Tensioning shall be undertaken only when the ambient temperature is between 10°C and 20°C.

3.4 Tensioner assemblies shall be located not more than 70.5 m apart and each installation shall incorporate at least one tensioner assembly.

Appendix 5/1 Drainage Requirements

1 General

1.1 The Design for new drainage systems shall be in accordance with other provisions of this Agreement.

1.2 The permitted alternative pipe/trench options for carrier drains shall be as given in Table 5/1 below:

Table 5/1 - Permitted Alternative Pipe Bedding Combinations

Pipe Diameter (millimetres)	Pipe Group No.	Vitrified Clay					Precast Concrete			Ductile Iron	GRP	Thermoplastic (Structural Wall)
		L	95	120	160	200	Class L	Class M	Class H			
100	1				ASBFN	ASBFN				S	S	ST
100	2				ASBFN	ASBFN				S	S	ST
100	3				ASBFN	ASBFN				S	S	ST
100	4				ASBFN	ASBFN				S	S	ST
100	5				ASBFN	ASBFN				S	S	ST
100	6				ASBFN	ASBFN				S	S	ST
100	17				Z	Z				Z	Z	Z
150	1				ASBFN	ASBFN	ASBFN	ASBFN		S	S	ST
150	2				ASBFN	ASBFN	ASBFN	ASBFN		S	S	ST
150	3				ASBFN	ASBFN	ASBFN	ASBFN		S	S	ST
150	4				ASBFN	ASBFN	ASBFN	ASBFN		S	S	ST
150	5				ASBFN	ASBFN	ASBF	ASBFN		S	S	ST
150	6				ASBFN	ASBFN	ASBF	ASBFN		S	S	ST
150	17				Z	Z	Z	Z		Z	Z	Z
225	1				ASBFN	ASBFN	ASBF	ASBFN		S	S	ST
225	2				ASBFN	ASBFN	ASBF	ASBFN		S	S	ST
225	3				ASBFN	ASBFN	ASBF	ASBF		S	S	ST
225	4				ASBFN	ASBFN	ASBF	ASBF		S	S	ST
225	5				ASBFN	ASBFN	ASB	ASBF		S	S	ST
225	6				ASBF	ASBFN	ASB	ASBF		S	S	ST
225	17				Z	Z	Z	Z		Z	Z	Z
300	1				ASBFN	ASBFN	ASBF	ASBF		S	S	ST
300	2				ASBFN	ASBFN	ASB	ASBF		S	S	ST

Appendix 5/1 Drainage Requirements

300	3				ASBFN	ASBFN	ASB	ASBF		S	S	ST
300	4				ASBFN	ASBFN	ASB	ASB		S	S	ST
300	5				ASBFN	ASBFN	ASB	ASB		S	S	ST
300	6				ASBFN	ASBFN	AS	ASB		S	S	ST
300	17				Z	Z	Z	Z		Z	Z	Z
375	1				ASBFN	ASBFN	ASB	ASBF	ASBFN			
375	2				ASBFN	ASBFN	ASB	ASBF	ASBF			
375	3				ASBFN	ASBFN	AS	ASBF	ASBF			
375	4				ASBFN	ASBFN	AS	ASBF	ASBF			
375	5				ASBFN	ASBFN	A	ASB	ASBF			
375	6				ASBFN	ASBFN	A	ASB	ASBF			
375	17				Z	Z	Z	Z	Z			
450	1			ASBF	ASBFN		AS	ASBF	ASBFN			
450	2			ASBF	ASBFN		AS	ASBF	ASBF			
450	3			ASBF	ASBFN		A	ASBF	ASBF			
450	4			ASBF	ASBFN			ASB	ASBF			
450	5			ASBF	ASBFN			ASB	ASBF			
450	6			ASBF	ASBFN			ASB	ASB			
450	17			Z	Z		Z	Z	Z			
600	1	ASB	ASBF					ASBF	ASBFN	S	S	ST
600	2	ASB	ASBF					ASBF	ASBF	S	S	ST
600	3	AS	ASBF					ASBF	ASBF	S	S	ST
600	4	AS	ASBF					ASBF	ASBF	S	S	ST
600	5	A	ASB					ASB	ASBF	S	S	ST
600	6	A	ASB					ASB	ASB	S	S	ST
600	17	Z	Z					Z	Z	Z	Z	Z
750	1						ASB	ASBF	ASBFN			
750	2						ASB	ASBF	ASBF			
750	3						AS	ASB	ASBF			
750	4						AS	ASB	ASBF			
750	5						A	ASB	ASBF			
750	6						A	ASB	ASB			

Appendix 5/1 Drainage Requirements

750	17						Z	Z	Z			
900	1						ASB	ASBF	ASBFN	S	S	ST
900	2						ASB	ASBF	ASBFN	S	S	ST
900	3						AS	ASBF	ASBF	S	S	ST
900	4						AS	ASB	ASBF	S	S	ST
900	5						A	ASB	ASBF	S	S	ST
900	6						A	ASB	ASBF	S	S	S
900	17						Z	Z	Z	Z	Z	Z

1.3 Bed types shall be in accordance with Drawings F1 and F2 of the Highway Construction Details

1.4 Replacement pipes in an existing system shall match the existing where practicable.

Appendix 5/1 Drainage Requirements

2 Covers to Chambers and Gullies

2.1 Covers to chambers and gullies shall comply with the loading category of BS EN124 as follows:

2.1.1 Chambers:

(i) Ductile heavy duty double triangular three point suspension non rock cover Class D400. Opening to be square;

(ii) Ductile medium duty double triangular three point suspension non rock cover Class;

(iii) B225;

(iv) Triple two piece gully type gratings Class D400 with waterway area 3330cm².

2.1.2 Gullies:

(i) Single piece hinged gully grating Class C250 with waterway area 1240cm²;

(ii) Double triangular two piece non rock gully grating Class D400 with waterway area 1870cm².

2.1.3 Rodding Eyes:

(i) Ductile non-rocking cover Class D400, B225 or C250 as appropriate to the location;

(ii) The required loading category shall be determined by the Company in accordance with other provisions of this Agreement.

3 Adjustment of level to covers and frames

3.1 Manhole and chamber covers shall be set or reset to the final levels prior to the laying of the uppermost wearing course or if no surfacing site Operations shall be required to be undertaken to the level of the surrounding ground surface.

Gully frames shall be set 6 millimetres below the level of the adjacent surface.

3.2 Covers and frames together with any shims, tiles, brick or other authorised material used to adjust the level shall be bedded using polyester epoxy or ultra-rapid hardening cementitious mortar applied in accordance with the manufacturer's written instructions.

3.3 The requirement for watertight joints shall be determined by the Company in accordance with other provisions of this Agreement.

3.4 Use of rigid joints shall be determined by the Company in accordance with the other provisions of this Agreement.

3.5 Use of saddles on existing pipes shall be permitted except where otherwise determined by the Company in accordance with other provisions of this Agreement.

3.6 Requirements for connections to existing drains shall be determined by the Company in accordance with the other provisions of this Agreement.

3.7 Chambers shall be constructed in accordance with HCD Drawings F3, F4, F5 and F11.

3.8 Gullies shall be trapped or un-trapped as determined by the Company in accordance with the other provisions of this Agreement.

3.9 All existing drainage systems within the O&M Works Site shall be cleaned in accordance with Specification Clauses 520, 521 and 6102.

Appendix 5/2 Service Duct Requirements

1 General

1.1 The permitted alternative design groups for service ducts shown on Drawing I2 to Volume 3 of the MCHW shall be:

Design Group 1	2 number 100 millimetre diameter UPVC
Design Group 2	2 number 100 millimetre diameter split UPVC
Design Group 3	2 number 50 millimetre split UPVC

1.2 Depth to top of ducts shall be 600 millimetres in all cases.

1.3 All existing drainage systems within the O&M Works Site shall be cleaned in accordance with Specification Clauses 520, 521 and 6102.

2 Chambers

2.1 Chambers shall be constructed with 225 millimetres thick walls of engineering bricks set in Class 1 mortar laid on a base slab 150 millimetres thick of mix ST4 concrete.

2.2 The inspection cover and frame shall be medium duty bedded on Class 1 mortar.

2.3 Type A chambers shall have internal dimensions of 1200 millimetres x 675 millimetres and be 1000 millimetres deep.

2.4 Type B chambers shall have internal dimensions of 450 millimetres x 450 millimetres and be 1000 millimetres deep.

2.5 Cable ducts shall be built in to the end walls of the chambers.

2.6 Draw ropes for service ducts shall be secured by tying/fixing the draw rope to the stoppers. Two metres of slack rope shall be provided at both ends of every duct

Appendix 5/7 Thermoplastics Structural Wall Pipes and Fittings

1 Information to be provided by the Company

1.1 The Company shall provide the following information in accordance with Specification Clause 518.2 for the range of pipes and fittings (to be verified by the certification body – see sub-Clause 518.15)

1.2 Technical drawings showing dimensions and tolerances including sealing rings and weight per metre together with properties as specified in Specification Clauses 518.3 and 518.5.

1.3 Material specification, as shall be required in Specification Clause 518.2

Table 1: Unplasticised polyvinyl-chloride (PVC-U)

Property	Test method reference	Specification
Tensile Properties	BS EN ISO 6259, BS EN ISO 527-1	
Vicat	BS EN 727	
Longitudinal reversion	BS EN 743	
K-value	BS EN 922	
PVC content	EN 1905	
Density	BS EN ISO 1183-3, ISO 4451	
Heat Reversion	ISO 1209 or equivalent 1	
Effects of heating (injection moulded fittings only)	BS EN 763	

Table 2: Polyethylene (PE)

Property	Test method reference	Specification
Tensile Properties	BS EN ISO 6259, BS EN ISO 527-1	
Oxygen induction time	BS EN 728	
Melt Flow Rate	BS EN ISO 1133	
Density	BS EN ISO 1183-3, ISO 4451 or equivalent	
Melt Flow Rate	ISO 4440 or equivalent	
Heat Reversion	ISO 12091 or equivalent	
Effects of heating (injection moulded fittings only)	BS EN 763	

Appendix 5/7 Thermoplastics Structural Wall Pipes and Fittings

Table 3: Polypropylene (PP)

Property	Test method reference	Specification
Tensile Properties	BS EN ISO 6259, BS EN ISO 527-1	
Oxygen induction time	BS EN 728	
Melt Flow Rate	BS EN ISO 1133	
Density	BS EN ISO 1183-3, ISO 4451 or equivalent	
Heat Reversion	ISO 12091 or equivalent	
Effects of heating (injection moulded fittings only)	BS EN 763	

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

1 General

1.1 The acceptability of earthworks materials shall be determined by compliance with the Specification, including Table 6/1, as amended by this Appendix.

1.2 The Company shall be responsible for the assessment and selection of materials in earthworks and shall be responsible for the classification of materials on site, or off site, as appropriate. Fill materials shall be assessed at the place of excavation or deposition, as required by the Company.

1.3 Class 3 material shall not be used.

1.4 Material for disposal shall be removed to a licensed disposal facility.

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

Table 6/1 Acceptable Earthworks Materials: Classification Requirements (see footnotes)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability (in Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Testing in Accordance with:	Acceptable Limits Within					
									Lower	Upper				
General Granular Fill	1	A	-	Well graded granular material	General Fill	Any material or combination of materials other than chalk and material designated as Class 3 in this Contract. (Properties i, ii, and iv in the next column, shall not apply to chalk) Recycled aggregate	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	1	A	-
							(ii) Uniformity coefficient	See Note 5 (OE)	10	-				
							(iii) mc	BS 1377: Part 2	omc-2%	omc+2%				
							(iv) SMC	Clause 634 (OE)		20%				
							(v) Optimum mc	BS 1377: Part 4 2.5kg rammer (OE)						
	1	B	-	Uniformly graded granular material	General Fill	Any material or combination of materials other than chalk. Recycled aggregate	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	1	B	-
							(ii) uniformity coefficient	See Note 5	-	10				
							(iii) mc	BS 1377: Part 2 (OE)	omc-2%	omc+1%				
							(v) Optimum mc	BS 1377:Part 4 2.5kg rammer (OE)						
	1	C	-	Coarse granular material	General Fill	Any material or combination of materials other than material designated as Class 3 in this Contract. (Properties (i) and (ii) in the next column, shall not apply to chalk. Recycled Aggregate	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	1	C	-
							(ii) uniformity coefficient	See Note 5	5	-				
							(iii) 10% fines	Clause 634	50kN	-				

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

General Cohesive Fill	2	A	-	Wet cohesive material	General Fill	Any material or combination of materials other than material designated as Class 3 in this Contract. (Properties i), ii), iii) lower limit and iv) in the next column, shall not apply to chalk	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 1 except: - i) for materials with liquid limit greater than 50, determined by BS 1377: Part 2, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. ii) for chalk all types of vibratory rollers of Categories over 1800kg shall not be used.	2	A	-
							(ii) plastic limit (PL)	BS 1377: Part 2 (OE)	10	-				
							(iii) mc	BS 1377: Part 2 (OE)	omc-2%	omc+2%				
							(iv) MCV	Clause 632	8	14				
	2	B	-	Dry cohesive material	General Fill	Any material or combination of materials other than chalk	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	B	-
							(ii) plastic limit (PL)	BS 1377: Part 2 (OE)	-	-				
							(iii) mc	BS 1377: Part 2 (OE)	-	PL - 4%				
							(iv) MCV	Clause 632	8	14				
	2	C	-	Stony cohesive material	General Fill	Any material or combination of materials other than chalk	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	C	-
							(ii) plastic limit (PL)	BS 1377: Part 2 (OE)	-	-				
							(iii) MCV	Clause 632	8	14				
	2	D	-	Silty cohesive material	General Fill	Any material or combination of materials other than chalk	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	2	D	-
							(ii) MCV	Clause 632	8	14				
	2	E	-	Reclaimed pulverised fuel	General Fill	Reclaimed material from lagoon or stockpile	(i) mc	BS 1377: Part 2 (OE)	To enablce compaction to Clause 612		End product 95% of maximum dry density	2	E	-

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

Landscape Fill	4	-	-	Various	Fill to landscape areas	See Appendix 6/1	(i) grading	BS 1377: Part 2 (OE)			See Clause 620	4	-	-
							(ii) MCV	Clause 632	8	14				
Topsoil	5	A	-	Topsoil, or turf, existing on Site	Topsoiling	Topsoil or turf designated as Class 5A in this Contract	(i) grading	Clause 618	-	Clause 618	-	5	A	-
	5	B	-	Imported topsoil	Topsoiling	General purpose grade complying with BS 3882 (OE)	-	-	-	-	-	5	B	-
Selected Granular Fill	6	A	-	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil or any combination thereof. (Properties (i) and (ii) in next column, shall not apply to chalk. Recycled aggregate.	(i) grading	BS 1377: Part 2 (On-site) (OE)	Tab 6/2	Tab 6/2	No compaction	6	A	-
								BS EN 933-2 (Off-site)	Tab 6/5	Tab 6/5				
							(ii) uniformity	See Note 5	10	-				
							(iii) plasticity index	BS 1377: Part 2 (OE)	Non-plastic					
	6	B	-	Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Properties (ii) and (iii) in next column, shall not apply to chalk. Recycled aggregate.	(i) grading	BS 1377: Part 2 (On-site) (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	6	B	-
								BS EN 933-2 (Off-site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2 (OE)	Non-plastic					
							(iii) Los Angeles Coefficient	Clause 635	-	50kN				

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

Selected Granular Fill	6	C	-	Selected uniformly graded granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Properties (iii) and (iv) in next column, shall not apply to chalk. Recycled aggregate.	(i) grading	BS 1377: Part 2 (On-site) (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	C	-
								BS EN 933-2 (Off-site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	-	10				
							(iii) plasticity index	BS 1377: Part 2 (OE)	Non-plastic					
							(iv) Los Angeles Coefficient	Clause 635	-	50kN				
							(v) mc	BS 1377: Part 2 (OE)	omc -2%	omc+1%				
	6	F	2	Selected granular material (coarse grading	Capping	Any material, or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Property (i) in next column shall not apply to chalk.) Recycled aggregate.	(i) grading	BS 1377: Part 2 (OE)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6	6	F	2
							(ii) optimum mc	BS 1377: Part 4 (vibrating hammer method) (OE)	-	-				
							(iii) mc	BS 1377: Part 2 (OE)	omc -2%	optimum mc				
							(iv) Los Angeles Coefficient	Clause 635	-	50				
	6	G	-	Selected granular material	Gabion filling	Natural gravel, crushed rock, crushed concrete or any combination thereof. None of these constituents shall include any argillaceous rock.	(i) grading	BS 1377: Part 2 (On-site) (OE)	Tab 6/2	Tab 6/2	None	6	G	-
								BS EN 933-2 (Off-site)	Tab 6/5	Tab 6/5				
							(iv) Los Angeles Coefficient	Clause 635	-	50				

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

Selected Granular Fill	6	N	-	Selected well graded granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, well burnt colliery spoil, or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt.	(i) grading	BS 1377: Part 2 (On-site) (OE)	Tab 6/2	Tab 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	N	-
								BS EN 933-2 (Off-site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	10	-				
							(iii) Los Angeles Coefficient	Clause 635	-	40				
							(iv) undrained shear parameters (c and φ)	Clause 633	To be determined by the Company	-				
							(v) effective angle of internal friction (φ) and effective cohesion (c')	Clause 636	To be determined by the Company	-				
							(vi) permeability	Clause 640	To be determined by the Company	-				
							(vii) mc	BS 1377: Part 2 (OE)	To be determined by the Company	To be determined by the Company				
							(viii) MCV	Clause 632	To be determined by the Company	To be determined by the Company				

Notes

1 App = Appendix
2 Tab = Table
3 Where in the Acceptable Limits column reference is made to Appendix 6/1, only those properties have limits ascribed to them in Appendix 6/1 shall apply.
4 Where Appendix 6/1 give limits for other properties not listed in this Table such limits shall also apply.
5 Where BS 1377: or equivalent. Part 2 is specified for mc, this shall mean BS 1377: Part 2 or equivalent or BS EN 1097-5 as appropriate.
6 Uniformity coefficient is defined as the ratio of the particle diameters:
D60 to D10 on the particle-size distribution curve, where:
D60 = particle diameter at which 60% of the soil by weight is finer
D10 = particle diameter at which 10% of the soil by weight is finer
7 The limiting values for Class U1B material are given in Appendix 6/14 and Appendix 6/15

Appendix 6/1 Requirements for Acceptability and Testing etc of Earthworks Materials

8 The above table contains details of materials, which are considered to be those most commonly encountered on the O&M Works Site. However, it this does not preclude the use of other materials, whose use shall be determined by the Company in accordance with other provisions of the Agreement.

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

1 General

1.1 The Company shall dispose of Class U1B and Class U2 unacceptable material in accordance with statutory provisions and the requirements of the Scottish Environment Protection Agency.

1.2 For Operations where Class U1B or Class U2 unacceptable material shall be encountered the Company shall submit its proposals for dealing with the material.

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

1 General

1.1 The use of a nuclear moisture/density gauge shall be permitted for measuring field dry densities of fill to Structures and fill above structural foundations where an end product compaction requirement shall be specified in Table 6/1.

1.2 Embankments shall be constructed in general with side slopes not steeper than 1 in 2.

Appendix 6/5 Geotextiles Used to Separate Earthworks Materials

1 General

1.1 Geotextile Type 1 shall be a general purpose woven or non-woven geotextile of nominal weight 100 g/m².

For scheme specific purposes the Company shall be required to prepare a further detailed Appendix 6/5 to reflect the particular needs of the Operations to be carried out.

Appendix 6/8 Topsoiling

Action Number	Sub-Clause Reference	Specification Amendment
1	602.9	Topsoil and subsoil to be stripped to their full depth for areas stated in 602.9
2	602.10	No stockpiles of topsoil, or any other material shall be stored within the root zone of mature trees or in areas where existing trees / habitats may be damaged or where surface run off to water courses would be detrimental to water quality
3	618.2	There shall be no imported topsoil without the prior written approval of the Scottish Ministers, for which supporting evidence that the supply of existing topsoil, 5A, has been responsibly used and exhausted.
4	618.4(I)	Topsoil depths shall be: 1. 50 - 100 millimetres in areas of grass on verges, embankments and cuttings where no planting shall be required and the land shall be not to be returned to agriculture 2. 150 - 250 millimetres in areas of grass where the land shall be to be returned to agriculture for primarily grazing purposes, MLURI land capability classes 5/2 to 4/2 (refer to ES) 3. 300 – 400 millimetres in areas of grass where the land shall be to be returned to agriculture for primarily grazing and arable, MLURI land classes 4/1 to 3/2 4. 300 – 400 millimetres of topsoil in areas to be planted with native shrub, scrub or woodland mixes, using material won from the site, to minimise noxious weed growth during the establishment period and promote a rich herb layer throughout the remainder of the Contract Period. 5. 300 – 400 millimetres of topsoil with a nutrient deficient capping layer of 50 millimetres in areas to be planted with mixed woodland where the ground shall be level (+/- 10 degrees) using material won from the site, to minimise noxious weed growth during the establishment period and promote a rich herb layer throughout the remainder of the Contract Period. 6. 35 – 50 millimetres of topsoil shall be spread in areas to be wildflower seeded. 7. No topsoil shall be spread in areas of planting into inverted turves. 8. The above does not apply to the topsoil in rock niches.
5	618.4(ii) + (iv)	1. The removal of stones and undesirable material relates to areas to be planted or seeded. The maximum stone and debris size shall be as follows: (i) Grass verges and sightlines: 50 millimetres protruding stone after topsoil has been firmed / rolled (ii) All other grassland and wildflower grassland: 75 millimetres (iii) Moorland grassland: 125 millimetres (iv) Planted areas (all planting except amenity / ornamental shrub planting) : 100 millimetres (v) Amenity / ornamental shrub planting: 75 millimetres.

Appendix 6/8 Topsoiling

Action Number	Sub-Clause Reference	Specification Amendment
		2. The stone removal for (iv) and (v) applies to the full depth of topsoil. 3. No stones are to protrude greater than 50 millimetres for any of the above vegetation cover types. 4. The overall stone content by % volume relates to the characteristics of the insitu soils: within any area of respread topsoil there should not be a greater stone content by % volume than the adjacent existing soils. 5. The above supersedes all clauses within the specification and BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces) relating to the stone sizes.

1 Notes

1.1 The thickness of topsoil to be deposited shall be as determined by the Company in accordance with the other provisions of this Agreement.

1.2 The use of a tracked vehicle shall not be permitted to spread topsoil.

1.3 The use of topsoil class 5B shall be determined by the Company in accordance with the other provisions of this Agreement.

Appendix 6/14 Limiting Values for Pollution of Controlled Water

1 General

1.1 The Company shall determine the limiting values in a material for pollution of controlled waters.

These values may be expressed as total concentrations in the material or preferably as concentrations or cumulative leached amounts in standard leaching tests carried out on the materials.

1.2 The Company shall through consultation with the Scottish Environment Protection Agency establish generic guideline values for given soil conditions or shall undertake risk assessments in order to derive such values.

Any values established in this manner shall be approved by Scottish Environment Protection Agency.

1.3 The Company shall include for all testing requirements in relation to this Appendix in its Quality Management System as part of its Inspection and Test Plan or the like in accordance with the requirements of Appendix 1/5.

Appendix 6/15 Limiting Values for Harm to Human Health and the Environment

1 General

1.1 The Company shall determine the limits on the amount of contaminants in a material which if exceeded shall lead to a significant possibility of significant harm to human health or the environment.

1.2 The Company shall through consultation with the Scottish Environment Protection Agency establish generic guideline values for given soil conditions or shall undertake risk assessments in order to derive such values. Any values established in this manner shall be approved by Scottish Environment Protection Agency.

1.3 The Company shall include for all testing requirements in relation to this Appendix in its Quality Management System as Part of its Inspection and Test Plan or the like in accordance with the requirements of Appendix 1/5.

Appendix 7/1 Flexible Pavement Construction

1 Permitted Pavement Options – Schedule 1

2 General Requirements – Schedule 2

2.1 Grid for checking surface level of pavement courses (Clause 702.4)

Longitudinal dimension = 10 metres

Transverse dimension = 2 metres

2.2 Surface regularity Category of road: (Clause 702.7) - A.

2.3 Surface Texture required: Sand Patch (Clause 921).

2.4 The requirement for a surface macrotexture shall be determined by the Company in accordance with the other provisions of this Agreement.

3 Permitted Construction Materials – Schedule 3

Pavement Layer	Material Reference
Surface Treatment	AST1
Surface Course*	SC7 to SC7c Inclusive

4 General Requirements for Construction Materials – Schedule 4

4.1 The minimum PSV and Maximum AAV requirements for the permitted surface course materials listed in schedule 5 of this Appendix shall be Scheme specific and shall be determined in accordance with Tables 3.1 and 3.2 of HD 36/06 or equivalent of the DMRB or equivalent respectively.

The required values for each Scheme shall be determined by the Company in accordance with the other provisions of this Contract.

4.2 Individual layer thicknesses shall be Scheme specific and the required values for each Scheme shall be determined by the Company in accordance with other the provisions of this Contract.

Appendix 7/1 Flexible Pavement Construction

5 Requirements For Construction Materials – Schedule 5

Material Reference	Clause	Description	Requirement
AST1	924	High Friction Surfaces	Type Classification – to be determined by the Company in accordance with the other provisions of this Contract Minimum Declared PSV – 70
SC7	942	Thin Surface Course Systems. Note: The use of this material shall be subject to written consent by the Director on a Scheme specific basis with the exception of small areas of repair to existing surface courses where Clause 942 material has been used(1).	The following parameters shall be determined by the Company in accordance with the other provisions of this Contract: (i) Traffic Count (ii) Site definition and stress level (iii) Minimum wheel-tracking level required on BBA HAPAS Roads or equivalent and Bridges Certificate (iv) Road/tyre noise level relative to HRA required on BBA HAPAS Roads and Bridges Certificate or equivalent (v) The average macrotexture depth of each Lane kilometre if not 1.5mm and the average minimum value if not in accordance with sub-Clause 942.13 (vi) Surface macrotexture – Performance equirements if not in accordance with sub-Clause 942.16 The guarantee period shall be two years unless otherwise stated on the Order. The guarantee period shall be two years unless otherwise stated on the Order.
SC7a		Design Type1 - Fibre based SMA type surface course	Note: Where repairs require to be carried out to a surface of area less than 100m2 which shall be comprised of a thin surface course system the material used shall be of the Design Type previously used.
SC7b		Design Type2 Polymer Modified SMA type surface course	
SC7c		Design Type3 Polymer Modified SMA type veneer coat surface course	

Appendix 7/1 Flexible Pavement Construction

6 Thin Surface Course Systems: Information to Be Provided By The Company - Schedule 6:

6.1 The Company shall provide the following information:

6.1.1 A copy of the British Board of Agrément HAPAS Roads and Bridges Certificate or Certificates or equivalent for the thin surface course system or systems that shall be proposed for use in the Scheme, together with a copy of the Installation Method Statement associated with each Certificate

6.1.2 For any Certificate that covers several variants of one thin surface course system, proposed variant or variants of the system to be used in the Scheme [variants of a system occur from any option that results in different values being reported on the Certificate for one or more properties, and could involve changes in nominal maximum aggregate size, aggregate type, aggregate grading, binder type, binder content, fibres or other additives, type and rate of spread of bond coat]

6.1.3 If required or if the thin surface course system shall not be produced under a Sector Scheme, the proposed component materials to be used in the thin surface course system and their proportions for each proposed system

6.1.4 Proposed source or sources of coarse aggregate together with statement of properties including polished stone value, ten per cent fines value, aggregate abrasion value and flakiness index

6.1.5 If regulating material shall be used, evidence of its deformation resistance either independently or in combination with the thin surface course system

7 Binder Data Requirements – Schedule 7

8 Mixture Data Requirements - Schedule 8

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

1 General

1.1 Where excavation shall be required to be carried out in an existing pavement the limits of the excavation shall be formed by saw cutting and the excavation completed in such a manner as to minimise disturbance of the adjacent pavement.

1.2 The cross sectional diagram of a typical trench reinstatement shall be shown in HCD Drawing K4 to Vulume 3 of the MCHW.

Appendix 7/3 Surface Dressing – Performance Specification

1 Sheet 1

1.1 The Design for surface dressing shall be carried out by the Company in accordance with TRL Road Note 39 (5th Edition) (Revised) together with the requirements of this Appendix.

The Code of Practice for Surface Dressing (RSDA 2000a) shall be referred to within TRL Road Note 39 and shall be complied with for this work.

Where there shall be conflict between the requirement of Clause 919 of the Specification and Road Note 39 Road Note 39 shall take precedence.

1.2 Patching and crack repair of the existing carriageway shall be carried out at least 21 days in advance of the surface dressing.

Patching with a high stone content material shall have a similar hardness to existing adjacent surfacing and shall not have horizontal sealing strip applied.

1.3 Seasons and weather conditions – in accordance with TRL Road Note 39 (6.3.2 and Table 6.3.2).

1.4 Permitted options shall be restricted to 'racked-in' surface dressing systems and double surface dressing systems.

1.5 Binder shall be modified premium grade.

Both cut-back bitumen and bitumen emulsion shall be permitted.

1.6 Binder cohesivity shall be a minimum of 1.2 J/cm2 over the widest possible temperature range.

1.7 Binder rate of spread – in accordance with TRL Road Note 39 adjusted where appropriate for local conditions and experience.

1.8 Chippings shall be 14 millimetre and 6 millimetre size complying with BS EN 13043.

Chippings rate of spread – in accordance with TRL Road Note 39 (8.3).

1.9 Chippings shall comply with Figure 6.3.1 in TRL Road Note 39 for PSV and AAV respectively.

1.10 Maximum pavement temperature – in accordance with TRL Road Note 39 (Table 6.3.2).

1.11 Notwithstanding any other provision of this Agreement the finished surface dressing site Operations shall be guaranteed by the Company for 2 years in respect of surface texture and loss of chippings.

1.12 The Company shall arrange an independent measurement of surface texture using the high speed texture meter or the high speed road monitor and shall submit these details to the Scottish Ministers.

Measurement of sensor measured texture depth shall be made in the nearside and offside wheel tracks of all Lanes.

The texture depth shall be measured after 11 months and before 13 months following initial trafficking and finally after 22 months and before the end of the guarantee period of 2 years.

The minimum average sensor measured texture depth at any point up to 2 years shall be 1.05 millimetre for every 100 metre Lane length.

In addition the percentage decrease in sensor measured texture depth between 12 and 2 years shall not exceed 40 per cent.

In the case of non-compliance detailed examination of the printout and the areas in question on the O&M Works Site shall be undertaken.

Appendix 7/3 Surface Dressing – Performance Specification

Minimum lengths of 100 metres and full lane width shall be considered for remedial action written consent by the Director.

Chip loss shall be visually monitored and upon detailed examination shall not exceed the following values at any time within the 2 years from opening to traffic:

(i) Fretting 4 per cent

(ii) All defects except fretting 2 per cent

(iii) Localised chip loss 10 per cent

1.13 The Company shall be responsible for determining the extent of failures and for proposing remedial measures and shall be responsible for any costs incurred as consequence.

The opportunity shall be afforded to the Scottish Ministers to participate in such evaluation in order that he is in a position to grant written consent to the appropriate actions.

1.14 The speed of traffic allowed onto new surface dressing shall be limited to 15mph by a suitable temporary traffic management scheme including the use of slow moving control vehicles.

In pursuit of a requirement of nil chipping damage to Users' vehicles the Design for the surface dressing shall be such that by the end of each work shift the surface dressing shall be stable and all excess chippings removed by suitable suction sweeper with no requirement for further sweeping.

1.15 In addition to the Design proposal and binder data sheet the Company shall keep compile and maintain the records required by Road Note 39 Clause 8.4 together with the following:

1.15.1 type of surface dressing;

1.15.2 site sample peak binder cohesivity and the temperature range over which the specified minimum applies;

1.15.3 weather condition including humidity measurement;

1.15.4 road surface temperature; and

1.15.5 sensor measured texture depth measurements (12 and 24 months)

2 Sheet 2

2.1 The Company shall provide the following information:

2.1.1 A copy of BS EN ISO 9001 certificate showing at least the name of the Company, the name of the certification body and the reference number and date of the certificate.

A copy of the relevant part of the company quality assurance document showing the appropriate scope and limitations of the certification.

The Scottish Ministers will wish to inspect all or any of the company's quality assurance documentation as part of the vendor assessment system and may wish to satisfy themself on the nature of the quality assurance systems of the company's material suppliers.

2.1.2 Proposed binders together with their data sheets, product identification data and cohesivity data as specified.

2.1.3 Proposed source or sources of chippings together with statement of properties including target grading, target flakiness, minimum declared PSV and AAV.

2.1.4 A method statement for each site or group of similar sites showing how it shall be

Appendix 7/3 Surface Dressing – Performance Specification

proposed to carry out the Operations in conformance with the Specification.

2.1.5 Proposals for traffic control and aftercare for each site and reaction times for carrying out remedial measures and sweeping.

2.1.6 Contingency plans in the event of any breakdown of plant or failure of the dressing and provision for dusting.

2.1.7 A type approval installation trial certificate within the Sector Scheme for the production of surface dressing or in the event of no certificates being issued a statement of any previous applications on roads similar in site type and road hardness to each site containing the same data as listed in Sheet 3 of this Appendix

2.1.8 A statement of relevant experience and expertise, naming managers supervisors and teams responsible for and allocated to this work.

2.1.9 Design proposal for surface dressing for each location.

2.1.10 Estimated Design life of the surface dressing for each location.

2.1.11 For the performance specification the results of any other tests or other data the Company considers would assist the Scottish Ministers in assessing the technical merit of the Design.

2.1.12 An 'As Built Manual' as specified in sub-Clause 922.18.

Appendix 7/3 Surface Dressing – Performance Specification

Binder Data Sheet	**Surface Dressing - Performance Specification**		
Manufacturer of Binder:	Product name:		
Binder Type:	Batch no:		
Binder Grade (highlight as required)	Conventional	Intermediate	
	Premium	Super-premium	
Binder Source:	**Supplied Binder**	**Aged Binder**	**Recovered Binder**
Test	As supplied to site	Recovered in accordance with Clause 923	Age Binder in accordance with Clause 923
Penetration at 25ºC 0,1 mm (100g and 5 secs)			
Penetration at 5ºC 0,1 mm (200g and 60 secs)			
Manufacturer's QA viscosity test for supplied cutback binder within temperature range 100ºC to 160ºC or alternatively penetration at 5ºC 0,1 mm (100g and 5 secs)	†		
Vialit pendulum cohesion see Clause 939 maximum peak value J/cm²	†#	#	#
Product identification test sub-Clause 922.6. Complex shear (stiffness) modulus (G*) and phase angle (δ) data. See Clause 928			#
Minimum viscosity STV 4 mm cup at 40ºC or Redwood II at 85ºC; (required to prevent binder flow on road - normal camber)	‡		
Other properties the Company considers useful			
Weather limits - information from binder manufacturer: road or air temperatures; humidity; wind chill adjustment; tolerance of surface dampness; etc.	Temperature max: Temperature min: Other:		

- Where indicated with # this Company shall attach a graphical output to this schedule.
- † Cutback binders only.
- ‡ Emulsions only.
- Shaded cells do not require data.

Appendix 7/3 Surface Dressing – Performance Specification

3 Sheet 3: Tait Certificate Information to Be Provided By The Company

3.1 The Company shall provide the TAIT Certificate containing at least the following information for each area:

3.1.1 Company name and address:

3.1.2 Quality Assurance reference number and certifying body:

3.1.3 TAIT reference number:

3.1.4 Date of TAIT:

3.1.5 Self-certified within the Sector Scheme for the production of surface dressing or certified by British Board of Agrément

3.1.6 Proprietary name:

3.1.7 Description of material:

3.1.8 Design procedure or method:

3.1.9 Material thickness (if applicable):

3.1.10 Macrotexture depth at 1 year (as measured and as a percentage of the initial value):

3.1.11 Colour retention (if applicable):

3.1.12 Other optional claims as declared by the installer (eg profile improvement, reduced tyre-road noise emission or RSI, ability to accommodate a variable substrate, skid resistance if greater than PSV and macrotexture would indicate, etc.)

3.1.13 Expected life (Estimated Design Life)

3.1.14 Field of application for the particular material:

3.1.15 Traffic - maximum commercial vehicles per Lane per day:

3.1.16 Traffic - total traffic per Lane per day:

3.1.17 Traffic - speed limit:

3.1.18 Degree of site difficulty, see HD 36 or equivalent (DMRB 7.5.1 or equivalent) for categories:

3.1.19 Constraints on application for the particular material:

3.1.20 Time of year:

3.1.21 Temperature:

3.1.22 Variability of existing surface hardness or type:

3.1.23 Other as declared by the installer:

3.1.24 Name and signature of company representative responsible for the TAIT:

Appendix 7/4 Bond Coats. Tack Coats and other Bituminous Sprays

1 Sheet 1

1.1 Location

1.1.1 Unless otherwise the written consent by the Scottish Ministers the Company shall apply a bond coat or a tack coat to existing surfaces which have been planed prior to laying a surfacing course.

1.1.2 Unless otherwise the written consent by the Scottish Ministers the Company shall apply a tack coat to newly laid material which has remained uncovered by the successive covering layer for more than 3 consecutive days or which has been trafficked.

1.1.3 The Company shall determine the following requirements in accordance with the other provisions of this Agreement for bond coats or tack coats for each application:

(i) Site specific limitations

(ii) Type of binder

(iii) Binder grade

(iv) Rate of spread

(v) Any permitted additives to binder

(vi) Binding material.

All street furniture, ironwork and drop-kerbs shall be masked in accordance with Specification sub-Clause 920.6

Appendix 7/4 Bond Coats. Tack Coats and other Bituminous Sprays

Binder Data Sheet	**Bond Coats, Tack Coats and Other Bituminous Sprays**	
Manufacturer of Binder:	Product name:	
Binder Type:	Batch no:	
Binder Grade (highlight as required)	Conventional	Intermediate
	Premium	Super-premium
	Non-tack	Other
Binder Source →	**Recovered Binder**	**Recovered Binder after Ageing Test**
Test ↓	Recovered in accordance with Clause 923	Aged in accordance with Clause 923
Penetration at 25ºC 0,1 mm (100g and 5 secs)		
Penetration at 5ºC 0,1 mm (200g and 60 secs)		
Vialit pendulum cohesion see Clause 939 maximum peak value J/cm²	The Company shall attach a Report and graphical output to this schedule as specified in Clause 939.	The Company shall attach a Report and graphical output to this schedule as specified in Clause 939.
Product identification test. **The provision of data for identification and ageing is optional for unmodified bituminous emulsions to BS 434 and for bitumen to BS EN 12591 and cutback bitumen to BS 3690.** Complex shear (stiffness) modulus (G*) and phase angle (δ) data. See Clause 928	The Company shall attach a Report and graphical output to this schedule as specified in Clause 928.	The Company shall attach a Report and graphical output to this schedule as specified in Clause 928.
Other properties the Company considers useful: Minimum Binder Content Binder temperature range for spray application Emulsion Properties and Viscosity Break time Breaking Agent type Weather limits - information from binder manufacturer: road or air temperatures; humidity; wind chill adjustment; tolerance of surface dampness; etc. Temperature max: Temperature min: Other:		

Appendix 7/5 Insitu Recycling: The Remix and Repave Process

1 General

1.1 The Company shall determine the following requirements in accordance with the other provisions of this Agreement for each individual Operation:

1.1.1 The location of the insitu recycling and repave process.

1.1.2 The requirements for milling.

1.1.3 Requirements for thickness and materials.

1.1.4 Proportions of new and existing materials.

1.1.5 Levels.

Appendix 7/6 Breaking Up or Perforation of Existing Pavements

1 General

1.1 Where perforation of existing pavements shall be required the Company shall perforate the full depth of the existing carriageway construction with holes of 100 millimetres mininum diameter on a 500 millimetre x 500 millimetre grid.

1.2 No perforation shall be made closer than 750 millimetres to a chamber, cover, box or grating in the carriageway surface or edge of surfacing material.

Appendix 7/7 Slurry Surfacing Incorporating Microsurfacing

1 Sheet 1

1.1 Information to be provided by the Company in accordance with the other provisions of this Agreement:

1.1.1 Location;

1.1.2 Traffic count;

1.1.3 Traffic speed, 85 percentile and site speed limit;

1.1.4 Category of site;

1.1.5 Description of existing surface;

1.1.6 Thickness of slurry surfacing;

1.1.7 Minimum declared PSV of coarse aggregate;

1.1.8 Maximum AAV of coarse aggregate;

1.1.9 Preparation and masking requirements;

1.1.10 Definition of colour required;

1.1.11 Surface finish required for footways (if not by transverse brushing);

1.1.12 Minimum macrotexture depth at end of guarantee period;

1.1.13 Maximum texture depth after 4 weeks trafficking;

1.1.14 Maximum percentage decrease in macrotexture initially measured and at end of the guarantee period;

1.1.15 Class of area defects (% area affected) acceptable;

1.1.16 Class of linear defects (metre per 100metres) acceptable;

1.1.17 Class of transverse regularity;

1.1.18 Class of longitudinal regularity;

1.1.19 Special restrictions.

Appendix 7/7 Slurry Surfacing Incorporating Microsurfacing

2 Sheet 2

2.1 Information to be provided by the Company:

2.1.1 A copy of BS EN ISO 9001 certificate showing at least the name of the Company, the name of the certification body and the reference number and date of the certificate.

A copy of the relevant part of the company quality assurance document showing the appropriate scope (slurry surfacing and Sector Scheme) and limitations of the certification.

2.1.2 Design proposal for slurry surfacing for each location and target binder content with tolerances.

2.1.3 Estimated Design life of the slurry surfacing for each location.

2.1.4 A copy of the type approval installation trial certificate within the Sector Scheme for slurry surfacing for the proposed system together with its supporting data.

In the event of no certificates being issued a statement of any previous applications on roads similar in area type to this Agreement. Sites containing the same data as listed in NG Sample Appendix Sheet 3.

2.1.5 A method statement for each site or group of similar sites showing how it shall be proposed to carry out the works in conformance with the specification.

2.1.6 Proposed source or sources of coarse aggregate together with statements of properties including target grading, declared PSV and AAV.

2.1.7 Proposed source or sources of fine aggregate including target grading and other constituents together with statements of properties.

2.1.8 Proposed binder together with data sheets and cohesivity data. A copy of all the data shall be provided to the Scottish Ministers.

2.1.9 Proposals for traffic control and aftercare for each site and reaction times for: carrying out remedial measures; sweeping; and site visits with the Scottish Ministers.

2.1.10 Contingency plans in the event of any breakdown of plant or failure of the slurry surfacing.

2.1.11 An 'As Built Manual' as specified in Specification sub-Clause 918.30.

2.1.12 If available the following information shall be provided to the Scottish Ministers:

(i) Test method for binder content.

(ii) Test for thickness of slurry surfacing.

(iii) Trafficability time, including method of test.

(iv) Wheel tracking test results at 45ºC or 60ºC or other suitable measure of the ability of the proposed system to resist deformation and flow.

(v) Water sensitivity test results from the test used by BBA/HAPAS or equivalent thin surfacing Guidelines Document or from wet wheel tracking (whichever is available).

(vi) Permeability test carried out on the system, if it is claimed that the process seals the existing surface together with the method of test.

(vii) Accelerated ageing test results in accordance with the appropriate BBA/HAPAS or equivalent test.

(viii) Bond test results using the BBA/HAPAS or equivalent test on either a

Appendix 7/7 Slurry Surfacing Incorporating Microsurfacing

bituminous or a concrete substrate as appropriate to the site or bond coat binder BBA/HAPAS or equivalent certificate.

(ix) Shaking abrasion test results.

(x) Slurry surfacing mix cohesion.

(xi) The results of any other tests or other data

Binder Data Sheet	**Slurry Surfacing Incorporating Microsurfacing**		
Manufacturer of Binder:	Product name:		
Binder Type:	Batch no:		
Binder Source:			
Test	Binder as supplied to site	Recovered binder in accordance with Clause 923	Aged binder in accordance with Clause 923
Penetration at 25ºC 0,1 mm (100g and 5 secs)			
Penetration at 5ºC 0,1 mm (200g and 60 secs)			
Vialit pendulum cohesion see Clause 939 maximum peak value J/cm²		#	#
Product identification test sub-Clause 918.7. Complex shear (stiffness) modulus (G*) and phase angle (δ) data. See Clause 928		#	#
Other properties the Company considers useful			
Weather limits - information from binder manufacturer: road or air temperatures; humidity; wind chill adjustment; etc.	Temperature max: Temperature min: Other:		

Where indicated with # this Company shall attach a graphical output to this schedule.

Shaded cells do not require data.

Appendix 7/10 Worksheet Pro Forma for Results of Testing for Constituent Materials in Recycled Coarse Aggregate and Recycled Concrete Aggregate

Results Of Testing For Constituent Materials in Recycled Coarse Aggregate and Recycled Concrete Aggregate

Sample reference	
Date	
Tested by	

Mass of test portion, M_{total}, Duplicate 1	
Mass of test portion, M_{total}, Duplicate 2	

Category 1	Mass $M_{subscript}$		Percentage $P_{subscript}$		
	Duplicate 2	Duplicate 1	Duplicate 2	Duplicate	Mean
Asphalt (Class A)					
Masonry (Class B)					
Concrete and concrete products (Class C)					
Glass (Class G)					
Lightweight particles (Class L)					
Unbound aggregate (Class U)					
Other particles (Class X)					
Sum*					

*Sum shall be the total of $M_A + M_B + M_C + M_G + M_L + M_U + M_X$. If sum shall not be within 1% of M_{total}, repeat the test.

Appendix 7/70 Pavement Strengthening Materials

1 Pavement strengthening materials

1.1 Pavement strengthening materials shall be Glasgrid 8501 or equivalent.

1.2 The material shall be laid in accordance with the manufacturers instructions.

Appendix 7/71 Concrete Pavement Repair Systems

1 General

1.1 The following proprietary repair materials may be used on the O&M Works Site for the repair of concrete pavements.

1.1.1 The materials shall be used in accordance with the manufacturers written instructions.

1.1.2 The Company shall seek written consent from the Scottish Ministers for any alternative equivalent materials proposed.

1.1.3 Fibrescreed manufactured by Prismo.

1.1.4 Toproc – for thin bonded and full depth repairs from Danlaid Contracting Pty Ltd.

1.1.5 Jointmaster (JMCrete) manufactured by Rhino Asphalt Solutions Limited.

Appendix 7/72 Temporary Repairs To Carriageway Defects

1 General

1.1 Cut back and trim surface.

1.2 Loose material shall be removed before filling the hole.

1.3 Standing water shall be removed before filling the hole.

1.4 The filling material shall be compacted to refusal with suitable compaction plant.

1.5 The surface of the compacted material shall be level with that of the adjacent road.

1.6 Temporary filling of depressions shall be in accordance with Specification Clause 950

2 Temporary Repair Materials

2.1 The Company shall list in the following Table 1 alternative temporary repair materials suitable for use on the O&M Works Site.

2.2 When undertaking the Operations the Company shall select the most appropriate temporary repair material from the completed table.

Appendix 7/72 Temporary Repairs To Carriageway Defects

Table 1

Reference Number	Temporary Repair material

Appendix 7/72 Temporary Repairs To Carriageway Defects

Table 2

Column 1	Column 2	Column 3						
Location on the O&M Works Site, where temporary repair materials shall be used.	**Climatic conditions/seasonal /time conditions where temporary repair materials shall be used.**	**Type of repair**						
		Holes less than 0.5m^2 in area.	**Holes exceeding 0.5m2 but not exceeding 1.0m^2 in area.**	**Holes greater then 1.0m^2 in area.**	**Road stud sockets**	**Depressions not exceeding 0.5m^2 in area.**	**Depressions exceeding 0.5m^2 but not exceeding 1.0m^2 in area.**	**Depressions exceeding 1.0m^2 in area.**

Notes for completion of Table 2

1. In column 1 the Company shall state in which location the particular temporary repair material is suitable for use which can be generic for example. all Motorways or specific for example. routes XXX.
2. In column 2 the Company shall state under what conditions the temporary repair material is suitable for use e.g. summer winter temperatures greater than x degrees wet conditions etc.
3. In column 3 the Company shall insert the reference number of the temporary repair material**.**

Appendix 12/1 Traffic Signs General

1 General

1.1 Sign schedules which detail the individual requirements for sign assemblies shall be prepared by the Company in accordance with the other provisions of this Agreement. These shall include:

1.1.1 Sign face details, dimensions and location;

1.1.2 Mounting height;

1.1.3 Post details; and

1.1.4 Foundation details

2 Sign faces

2.1 Sign faces shall generally be constructed using Class 1 retroreflective material to BS 873-6.

The requirement for the use of microprismatic retroreflective material and non reflective material shall be determined by the Company in accordance with the other provisions of this Agreement.

2.2 Where determined by the Company in accordance with the other provisions of this Agreement, sign faces shall be protected with dew resistant sheeting as manufactured by 3M Scotchlite or equivalent.

3 Foundations

3.1 Foundations for permanent traffic signs shall be in accordance with Clause 1203.

4 Sign Posts

4.1 Base Plates

4.1.1 Each post shall have a galvanised base plate.

4.1.2 This shall be fixed to the post in order to prevent any rotation of the post.

4.1.3 It shall be of square section with the side dimensions being at least twice the diameter of the post.

4.2 Base Housings

4.2.1 The minimum diameter of base housings on tubular posts shall be 168 millimetres.

4.2.2 Rectangular posts requiring an electrical supply shall be fitted with an integral flush fitting door above ground level.

4.2.3 Detachable root boxes are not to be used.

4.2.4 The internal base housing shall contain

4.2.5 A baseboard manufactured from marine plywood or hardwood with a minimum thickness of 15 millimetres and minimum dimensions of 100 millimetres x 380 millimetres.

4.2.6 It shall be mounted securely to the back of the compartment on which the electrical equipment shall be mounted.

4.2.7 The minimum distance from the face of the baseboard to the inside of the front of the housing shall be at least 100 millimetres.

4.2.8 A brass or stainless steel earthing screw or stud 8 millimetre diameter

Appendix 12/1 Traffic Signs General

complete with two brass washers and a brass nut and locknut shall be provided on the housing in a suitable and easily accessible position.

4.2.9 A door aperture measuring not less than 110 x 400 millimetres.

4.2.10 The lower edge of the door shall be positioned so that when the post shall be installed it shall not be less than 300 millimetres above ground level.

4.2.11 The door opening is to face away from oncoming traffic.

4.3 End Caps

4.3.1 All posts shall be supplied complete with plastic end cap. End caps shall be shaped to shed water to the outside of the post and shall be the same colour as the post.

4.4 Protective Finish

4.4.1 The protective finish to steel posts and brackets shall be as follows

(i) Hot dip galvanised to BS EN ISO 1461 at the fabrication factory.

(ii) The post shall be covered in bitumen in accordance with BS EN 40-5 both outside and inside the post up to 150 millimetres above proposed ground level.

5 Permanent Bollards

5.1 Internally illuminated bollards shall be base illuminated.

6 Sign Fix Clips

6.1 Sign fix clips shall be made of stainless steel.

7 Ducting

7.1 Ducting installed through the foundations of posts into which electrical equipment shall be installed shall be 50 millimetre diameter uPVC street lighting duct with a wall thickness of 5 millimetres.

8 Identification Numbers

8.1 Identification numbers shall be as follows:

8.1.1 Each sign shall be identified by a unique system of letters and numbers for maintenance and inspection purposes.

8.1.2 Letters and numbers shall be provided on both sides of sign located in the central reservation on all other signs the numbers shall face oncoming traffic.

8.1.3 Letters and numbers shall be black on a yellow background with characters 75 millimetres high at a minimum height of 1.5 metres and a maximum height of 2.5 metres above ground level.

8.1.4 Letters and numbers shall be screen printed onto reflective self adhesive vinyl mounted on 3 millimetres thick Foamex.

The number shall be fixed to the sign by an appropriate adhesive.

Appendix 12/2 Traffic Signs Marker Posts

1 Hazard Marker Posts

1.1 Hazard marker posts shall be capable of being overrun by vehicles in order that they shall 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 retroreflective sheet material to comply with Diagram 561 of Traffic Signs Regulations and General Directions 2002.

The retroreflective 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 in order that the top of the post shall be 750 millimetres -1000 millimetres above ground level.

2 Verge Marker Posts

2.1 Verge marker posts shall be the Glasdon Vergemaster or equivalent and shall be defined as follows:

2.1.1 Type VM1 - stake type fixing which shall include a timber pressure impregnated stake and automatic stake locking mechanism

2.1.2 Type VM2A – Extended Base Fixing backfilled with excavated material

2.1.3 Type VM2B - Extended Base Fixing backfilled with concrete type ST2

2.2 Verge marker posts shall be constructed of material resistant to damage and vandalism and maintenance free.

The posts shall have two integrally moulded shatterproof reflectors angled to give maximum visibility to traffic travelling from either direction on bends and a high visibility band integrally moulded into its body minimum 155 millimetres wide to minimum class 1 retroreflectivity.

2.3 The verge marker post shall be installed in accordance with the manufacturer's instructions.

3 Motorway Marker Posts

3.1 Motorway maker posts shall be as specified in the MCHW Volume 3 Highway Construction Details Drawing E Series.

4 Edge of carriageway Markers

4.1 Edge of carriageway markers Type ECB1 shall be the Glasdon Scottish Admiral Bollard or equivalent

4.2 The bollard shall be installed in accordance with the manufactures written instructions.

4.3 A 150 millimetres retroreflective red and white band shall be attached to the bollard.

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 determined by the Company in accordance with the other provisions of this Agreement.

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 8 millimetres and not greater than 10 millimetres in depth and shall be at 500 millimetres spacing except on slip roads where the spacing shall be reduced to 250 millimetres.

1.3 The requirement for drainage gaps in raised rib markings shall be determined by the Company in accordance with the other provisions of this Agreement.

1.4 All road markings shall provide a skid resistance level of 55.

1.5 Temporary road markings shall be laid in accordance with BS EN 1790

1.6 Where existing road markings shall be required to be covered over the cover application shall comply with BS 7962: 2000 Black Materials for Masking Existing Road Markings; Specification.

2 Road Studs

2.1 General Requirements

2.1.1 Any road stud which has become displaced from its socket or shall be loose or broken shall be removed from the carriageway 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 300 millimetres 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 these O&M Works Requirements.

2.2 Road studs to be used shall be as follows:

2.2.1 Red White and Green Studs

(i) All red white and green studs shall comply with Clause 1213.3.

(ii) Red and green reflectors shall be uni-directional.

(iii) White reflectors shall be bi-directional.

Where installation of road studs shall be required at new locations Method No 1 as detailed in Paving Instruction 1984 Edition (Red) shall be used. This shall be Installation Method No 1.

2.2.2 Amber Studs

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).

2.2.3 Temporary Road Marking studs

Temporary road marking studs shall be either

(i) Hot melt adhesive type.

Appendix 12/3 Traffic Signs: Road Markings and Studs

(ii) Self adhesive type.

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.

2.2.4 Existing metal CHART node studs

These shall be removed to ensure minimum damage to carriageway. Reinstatement shall be carried out using filled bitumen or bituminous instant repair material.

2.2.5 Cored thermoplastic road markers to be installed as CHART node points

Installation of cored thermoplastic road markers to be installed as CHART node points shall use the following method (Method No 5)

(i) a 100 millimetres diameter x 20 millimetres 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.

(iii) 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.

(iv) The material shall consist of plastic resin with white filler and reflective glass particles to BS 3262-3:1989 Hot-Applied Thermoplastic Road Marking Materials.

Appendix 12/5 Traffic Signs: Traffic Signals

1 Temporary Traffic Signals

1.1 Portable traffic signals used to control alternate one-way working shall comply with Department of Transport Specifications MCE 0111C and MCE 0114B for microwave detecting equipment and for haul route crossings specification MCE 0137 shall be located and operated in accordance with TD21/99 and Advice Note TA47/99 of the DMRB and Chapter 8 (2006) Part 1: Design and Part 2: Operations of the Traffic Signs Manual.

1.2 The Company shall obtain the prior written consent of the Scottish Ministers for multiphase temporary traffic signals.

1.3 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.

1.4 The position of signals shall be accurate to within 2 metres.

1.5 The Company shall consult and comply with the requirements of the emergency services (Fire, Ambulance and Police).

1.6 Passenger transport operators shall also be informed if the Operations affect any of their routes.

2 Controlled and Uncontrolled Crossings

2.1 Replacement of surfaces of controlled and uncontrolled crossings shall match that already existing unless otherwise determined by the Company in accordance with the other provisions of this Agreement.

Appendix 13/1 Information to be provided when specifying Lighting Columns and Brackets

1 Lighting Columns

1.1 The cable entry slot shall be positioned directly below the door opening and have minimum dimensions of 50 millimetres x 150 millimetres and the lower edge of the slot shall be 500 millimetres below ground level.

1.2 The cable entry slot shall be free from sharp edges and burrs.

1.3 Each column shall be earthed with an 8 millimetres (minimum) diameter earthing terminal with two plain washers and nuts all of which shall be manufactured from brass. The earthing stud shall be so positioned in order to be readily accessible through the door opening.

1.4 Lighting columns and bracket arm lengths shall be selected to be the same or similar to existing equipment.

1.5 8 metres 10 metres and 12 metres fold down lighting columns shall be hydraulically raised and lowered.

1.6 Column brackets shall be at an angle to match existing equipment.

1.7 The lighting column silhouettes shall be the same as or similar to existing equipment.

2 Column Doors

2.1 Columns shall be provided with weatherproof doors each with a tamperproof locking device.

2.2 Door openings bracket arms and columns shall be free from irregularities or burrs.

2.3 Columns mounted on bridges or viaducts behind parapets shall have the bottom of the door opening above the top of the parapet plinth.

2.4 Stainless steel fixings or chains shall be used to fix and lock those doors required to be captive.

The chain shall be long enough to allow the door to be rested on the ground whilst maintenance is carried out.

2.5 Except for doors which shall be required to be captive all doors shall be interchangeable between similar types of columns without adjustment.

3 Identification Numbers

3.1 Identification numbers shall be as detailed below:

3.1.1 Each column shall be identified by a unique system of letters and numbers for maintenance and inspection purposes.

3.1.2 Letters and numbers shall be provided on both sides of columns located in the central reservation on all other columns the numbers shall face oncoming traffic.

3.1.3 Letters and numbers shall be black on a yellow background with characters 75 millimetres high at a minimum height of 1.5 metres and a maximum height of 2.5 metres above ground level.

3.1.4 Letters and numbers shall be screen printed onto reflective self adhesive vinyl mounted on 3 millimetres thick Foamex.

The number shall be fixed to the column by an appropriate adhesive.

3.1.5 The close proximity of any overhead electricity supplies shall be indicated by

Appendix 13/1 Information to be provided when specifying Lighting Columns and Brackets

danger plates fitted to the columns.

4 Column Flanges

4.1 Where the column flange shall not be in accordance with BS 5649-2 the Company shall supply details of the flange sizes and fixing centres to the column manufacturer.

5 Wall Brackets and Service Boxes

5.1 Wall brackets and service boxes shall match existing wherever possible.

6 Miscellaneous

6.1 The holes for the planted root columns shall be excavated to a diameter not more than twice the diameter of the column root.

The column that shall be erected with bracket affixed shall be placed centrally in the hole.

6.2 The bracket arms shall be fixed in accordance with the manufacturer's written instructions to prevent rotation in service.

6.3 Flange plate columns shall be carefully lowered on to the foundation bases prepared for them and shall be set vertical using metal shims where necessary. The nuts shall be made tight to secure the columns to the foundations and the nuts and exposed bolts shall be coated with protective paste and tape.

6.4 Columns other than high mast columns manufactured in sections shall be assembled at the manufacturer's works.

The assembly of two sections of tube by butt welding shall not be permitted.

There shall be no sharp edges or burrs within the columns or brackets.

6.5 Road lighting columns and brackets shall be constructed assembled located and erected in compliance with this Series and the 1400 Series of the Specification.

7 Installations

7.1 The following information shall be provided.

7.1.1 Completed data sheets – refer to Appendix 13/2.

7.1.2 Completed Appendix A of Part 4 of BD2 of the DMRB.

7.1.3 Column Quality Assurance Certification.

7.2 The number of door keys supplied shall be 1 No for every 10 columns supplied.

7.3 Columns shall be installed with the door openings as detailed below:

Appendix 13/1 Information to be provided when specifying Lighting Columns and Brackets

Column Position	Door Position
As determined by the Company in accordance with the other provisions of this Agreement.	For single bracket arm columns the door shall be on the opposite side to oncoming traffic except for columns on parapet walls which shall face the road.
	For twin bracket arm columns the door position shall be determined by the Company in accordance with the other provisions of this Agreement.

7.4 All brackets shall have an angle uplift to match existing equipment.

7.5 The location factors shall be the relevant exposure class as shown in BS EN 40.

7.6 The columns shall be planted root or flange plate.

Appendix 13/1 Information to be provided when specifying Lighting Columns and Brackets

Sheet 1

Name of manufacturer	Column Reference No	
	Revision No	
	Date	

NAME OF CONTRACT

PART A General

Column nominal height			(m)
Column material			
Material design strength			(N/mm²)
No of door openings			
Door opening size – Height			(mm)
Width			(mm)
Cross-section of base compartment	Height (mm)	Width (mm)	Depth (mm)

Door Opening		
	Any	
Manufacturer's drawing ref no		

Corrosion protection (steel columns only) – basic system type sub-Clauses (1911.9 and 1911.10)	
Reference Wind Velocity V_0 as defined in BS EN 40-3-1:2000	m/s

Additional sacrificial steel thickness above that needed in the Design from the bottom of the column to at least 250mm above the anticipated ground level	(mm)

PART B Foundation Data

Planted base	Planting depth	(metres)

Standard Soil Type Factor G		
630	390	230

Diameter of concrete surround (if any)

	Bolt hole centres	Bolt hole diameter	Design load/bolt
Flange base	(mm)	(mm)	(N)

Relevant forces and moments at ground level	
Line of action of max moment relating to door opening	

NOTE For flange plates with slotted holes a diagram shall be included with the data sheet

Appendix 13/2 Typical Lighting Column and Bracket Data

Sheet 2

LUMINAIRE MAXIMUM CHARACTERISTICS

PART C

Acceptable Luminaires

Post Top Column

		Terrain Categories as defined in BS EN 40-3-1:2000				
		I	II	III	IV	
Luminaire Connection	Luminaire Max Wt (kg)	Maximum windage area (m²) for terrain categories as defined in BS EN 40-3-1:2000				
Diameter / Length						

Single Arm Bracket Column

Luminaire lever arm (mm)	
Due to weight of luminaire	Due to Windage on luminaire

Bracket Projection (m)	Ref No	Drawing No	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	Maximum Windage Area (m²) for terrain categories as defined in BS EN 40-3-1:2000		
			Grade	Design Strength (N\mm²)		Diameter (mm)	Length (mm)				

Double Arm Bracket Column

Luminaire lever arm (mm)	
Due to weight of luminaire	Due to Windage on luminaire

Bracket Projection (m)	Ref No	Drawing No	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	Maximum Windage Area (m²) for terrain categories as defined in BS EN 40-3-1:2000		
			Grade	Design Strength (N\mm²)		Diameter (mm)	Length (mm)				

Appendix 13/2 Typical Lighting Column and Bracket Data

PART D CERTIFICATION

It is certified that the information given in this data sheet has been obtained in accordance with BD 26 of the DMRB and the specification.

Signed on behalf of the Company _____ Date

Name (in Block Capitals)

Appendix 13/3 Instructions for Completion of Lighting Column and Bracket Data Sheets

1 General

1.1 When information shall not be required a dash shall be inserted in the appropriate boxes.

1.2 Where a Data Sheet shall be amended it shall be given a new revision number with a date.

1.3 The revision number shall be consecutive letters of the alphabet commencing with 'A'.

1.4 The date of the revision shall agree with the date of the Company's signature.

1.5 The column may be aluminium fibre glass or galvanised steel to match existing equipment.

1.6 The material Design strength shall be the minimum specified in the Design.

Where more than one material is used values for all materials shall be given.

1.7 All relevant entries shall be made on the Data Sheet before the document shall be certified by the Company

1.8 The column nominal height shall be selected from Clauses 2 or 3 of BS 5649-2 as appropriate.

The height shall also be dependent upon local factors for example overhead power lines.

1.9 The number of door openings shall agree with the manufacturer's drawing.

1.10 The cross-section of the base compartment shall be indicated by a dimensioned diagram/sketch.

1.11 The acceptable positions of bracket arms relative to the door position shall be indicated on the diagram.

Where all positions shall be acceptable the box noted 'ANY' shall be ticked.

1.12 Where concrete shall be necessary around the planted base in accordance with Clauses 1305.3 and 1305.4 the minimum diameter shall be entered.

1.13 For flange bases all forces and moments necessary for the Design of the foundations shall be obtained in writing from the manufacturer.

1.14 The corrosion protection system used on the column when new shall be recorded.

Where additional steel is provided for sacrificial purposes the amount shall also be recorded.

1.15 The signs and attachments surface area, eccentricity from the centre line of the column to the centre of area of the sign and height above ground level to the centre of area of the sign shall be stated.

1.16 The luminaire lever arms weight and maximum windage area quoted shall be based on the most adverse loading on the bracket when it shall be attached to any of the columns quoted in the compatible column sections.

Note The luminaire lever arms shall be the horizontal distances from the centre of gravity of the luminaire and if applicable, the centroid of the windage surface area to the end of the bracket joint.

Appendix 13/70 Maintenance of High Mast and Other Lighting Incorporating Hoists, Winches and Ropes

1 MAINTENANCE SCHEDULE A

Six Monthly Intervals

1.1 A.1 Winch

1.1.1 Remove any dirt or foreign matter that may have accumulated on top of winch or on wire ropes and thoroughly clean.

1.1.2 Check oil bath level (check each time winch shall be used).

(i) Examine condition of oil and change it if excessively thick or dirty. (Compare it with fresh oil). Before draining run lantern down and up to heat oil.

(ii) The oil bath level in single double drum winches shall be correct when it shall be at the oil level hole.

(iii) The screw plug shall be removed to determine this and then replaced.

(iv) Oil shall be as recommended in writing by the manufacturer.

1.1.3 All other bearing surfaces of winches have (self-lubricating) Oilite bushes or thrust washers.

(i) Additional lubrication may be added through the winch drum if required when the lantern shall be in the lowered position.

1.1.4 Check security of bolts at end of first year of operation.

1.1.5 Operate power drive through full length of travel of the lantern carriage and ensure that no undue wear shall be evident in the winch mechanism.

(i) The gear cover shall be removed to view the gear teeth.

1.1.6 Cover entire winch with the cover provided removing it only when about to operate winch.

1.2 A.2 Wire Rope

1.2.1 The very limited running use of the ropes coupled with high corrosion resistance shall ensure a long rope life.

(i) Check rope lay on winch and section of rope visible at mast door opening for frays kinks or corrosion.

(ii) Check anchorage point of winch rope at compensating pulley (if fitted).

(iii) Check winch rope throughout length for frays kinks or corrosion.

(iv) Check rope anchorage points on winch drum and lantern carriage.

(v) From the base of the mast observe ropes from lantern carriage in lowered position to mast head for any obvious defects.

1.3 A.3 Compensating Pulley (when fitted)

1.3.1 Check for damage wear or corrosion.

1.3.2 Lubricate if necessary.

N.B During the operation of hoisting lanterns the ropes within the mast have a tendency to twist a little resulting in the compensator turning about 1/2 to 2 turns this untwists on the reverse journey and no harm results.

1.4 A.4 Luminaire Carriage

Appendix 13/70 Maintenance of High Mast and Other Lighting Incorporating Hoists, Winches and Ropes

1.4.1 Check guide rollers (where fitted) lubricate and adjust if necessary.

1.4.2 Check interconnecting cables and junction boxes for damage.

1.4.3 Check electricity supply cable anchorage and check physical damage to cable.

1.4.4 Check and tighten if necessary all nuts and bolts.

1.4.5 Clean outer surface of photo-electric cell (where fitted).

1.5 A.5 Luminaires

1.5.1 Clean all luminaire bowls and reflectors.

1.5.2 Remove lamps from holders and check contact for arcing.

1.5.3 Check all electrical connections and tighten where necessary.

NB Avoid use of abrasive materials in cleaning.

1.6 A.6 General

1.6.1 With luminaires returned to mast head check that all lamps light.

1.6.2 Check that details of rope and cable rigging (now visible in mast base) and lantern carriage docking shall be all correct.

1.6.3 Check foundation bolts tighten nuts where necessary.

2 MAINTENANCE SCHEDULE B

Two Yearly Intervals

Maintain as Schedule A with the following additions.

2.1 B.1

2.1.1 Test load the wire ropes with the maintenance cradle before maintenance cradle to carry personnel.

2.1.2 Lower lantern carriage uncouple and attach maintenance cradle. Load maintenance cradle with a test load equal to safe working load shown on the safe working load plate on the side of the cradle. Using power drive hoist to head of mast and return to ground level. (This operation may also be used to install the independent safety rope if appropriate.) Remove test load.

2.2 B.2

2.2.1 Ascend in cradle check for damaged galvanising paint deterioration and rust over length of mast make good as necessary.

2.2.2 Check head pulleys split pins and the like for wear and corrosion and tighten all nuts and bolts. Pulleys have Oilite bushes which shall not be expected to require attention.

2.3 B.3

2.3.1 Wire ropes shall be withdrawn for inspection.

Appendix 14/3 Temporary Lighting

1 General

1.1 Temporary lighting may be required where Operations shall be being undertaken.

1.2 All temporary lighting shall provide no less illuminance than existing lighting over the area of the carriageway.

Mounting heights for this lighting shall be the same as the existing lighting

1.3 The installation of temporary lighting shall comply with the relevant Acts and Regulations (for example Electricity at Work Act and BS 7671).

It shall not form a hazard to motorists.

1.4 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 Scottish Ministers.

The temporary lighting shall remain operative until the new permanent lighting is brought into use.

1.5 Temporary lighting arrangements shall have written consent by the Scottish Ministers before the commencement of any affected work.

Appendix 14/4 Electrical Equipment for Road Lighting

1 General

1.1 The Company shall maintain records showing technical data on materials used.

1.2 Records shall be held within the Company's Quality Management System and be available for inspection by the Scottish Ministers at any time.

1.3 All fixings screws and bolts shall be made of stainless steel.

1.4 Fixings shall not be subject to any reaction from the material used for the column construction.

2 Luminaires and Lamps

2.1 All electrical wiring which shall be subject to heat shall be protected by heat insulating sleeving.

2.2 Luminaires shall be full cut-off, medium threshold increment and low threshold increment as appropriate.

2.3 The luminaires shall be compatible with the columns and brackets

2.4 Luminaires shall be fitted with either electronic control gear or low loss control gear.

3 Ancillary Equipment

3.1 Photo Electric Control Units (Clause 1409)

3.1.1 Shall have a switch on illuminance of 70 Lux.

3.1.2 Shall have a switch on/off ratio of 1 to 0.5.

3.1.3 Shall be electronic type.

3.1.4 Mounting sockets shall be NEMA type of road lighting units only.

3.1.5 Multiple wiring assemblies shall be controlled by separate Photo Electric Control Units individually wired

3.1.6 Photo Electric Control Units switch settings shall be sensitive within the temperature range of -20ºC to +50ºC.

3.1.7 Any photocell used to control contactors shall be able to switch a continuous rectified circuit of less than 20 Watts.

3.2 Cut-Outs and Termination Units

3.2.1 All street lighting cut-outs shall be of the combined single phase and neutral type or 3 phase and neutral type incorporating an earth terminal and shall be for concentric or PVC armoured cables of up to 25mm2 cross sectional area with capacity for looping in and out.

3.2.2 Fused links shall comply with EN 60269 category of duty 240 AC 16 rating Class Q1.

3.2.3 Gland plates shall be an integral part of the cut-out and be capable of terminating a maximum of 3 cables of up to 25mm2.

3.2.4 The fuse ratings shall be in accordance with the following:

Appendix 14/4 Electrical Equipment for Road Lighting

Lamp Type	Fuse Rating (Single Lamp)	Fuse Rating (Double Lamp)
Low Pressure Sodium		
18 to 180 Watts	6	10
High Pressure Sodium		
70 to 150 Watts	6	10
151 to 250 Watts	10	20
251 to 400 Watts	16	25

3.3 Capacitors/Ignitors

3.3.1 All exposed metal casings shall be direct earthed.

3.3.2 Reliance on the earthing of security clips shall not be acceptable.

3.3.3 All earths shall be commoned.

3.4 Wiring Requirements

3.4.1 The wiring requirements for lighting columns shall be in accordance with British Standards and manufacturers' written recommendations.

3.5 Base Compartment Fixing Arrangements

3.5.1 The base compartment fixing arrangements shall be as detailed in accordance with British Standards and manufacturers' recommendations.

3.6 Equipment Details

3.6.1 The Company shall insert below details of the equipment which it proposes to use in the Operations and shall submit the information to the Scottish Ministers as part of the Quality Management System including the Quality Plan.

Clause	Item	Manufacturer	Catalogue or Type Number
1409	Photo-electric control units Shorting Plug		
1410	Time Switches		
1411	Ballasts		
1412	Ignitors		
1413	Starters		
1414	Capacitors		
1415	Cut Outs		
1416	Fuse Holders		
	Fuse (Links)		
	MCBs		
1419	Wiring		

Appendix 14/4 Electrical Equipment for Road Lighting

4 Feeder Pillars

4.1 Feeder pillars shall be suitable for the purpose required and they shall conform as closely as possible to others on the O&M Works Site.

4.1.1 The Company shall insert below details of the feeder pillars which it proposes to use in the Operations and shall submit the information as part of the Quality Management System including the Quality Plan to the Scottish Ministers.

Feeder Pillar Type	Manufacturer	Catalogue Number	IP Rating
Type 1 Type 2 Type 3 Type 4 Type 5			

4.1.2 Protective coatings for feeder pillars shall be as referred to in Appendix 19/4.

5 Cables and Cable Joints

5.1 Earthing

5.1.1 A separate earth stud shall be installed as an integral part of the pillar structure with all earths within the pillar terminated on it.

5.1.2 This stud shall then be connected to the local earth at the pillar.

5.1.3 Crimping tools shall be of the correct size for the termination.

5.1.4 Earthing conductors when not crimped shall be terminated between 2 brass washers.

The terminal block shall be connected to the electricity company earth terminal and the main earthing conductor shall be in accordance with the following Table:

Cross sectional areas of phase conductor	Minimum cross sectional area of corresponding protective conductor
Not exceeding 6mm²	6mm² (see Note 1)
10mm²	10mm²
16mm²	16mm²
25mm²	16mm²
35mm²	25mm²

Appendix 14/4 Electrical Equipment for Road Lighting

5.1.5 Note 1

(i) The protective conductor may have to be increased to 10mm^2 to meet variations in the requirements of local electricity companies.

(ii) All bare earth conductors shall be sleeved with green and yellow PVC sheathing.

(iii) All earth connections shall be made between 2 brass washers.

(iv) At the end of every circuit an earth electrode shall be installed.

5.1.6 Sealing of Cables

(i) Cables shall be permanently sealed.

(ii) Cables that are to be temporarily sealed shall be made safe using PVC insulating tape and amalgam tape to ensure complete insulation from electric shock.

(iii) The Company shall display warning notices and area protection.

5.1.7 Equipotential Bonding

(i) Equipotential bonding using earth pit and earth electrode shall be carried out.

5.1.8 Cables

(i) All cables shall be British Approvals Service for Cables approved.

(ii) The Company shall insert below details of the equipment which it proposes to use and shall submit the information as part of the Quality Plan to the Scottish Ministers.

Cable Details	**Manufacturer**	**Catalogue Number** **Reference Number**

5.1.9 Cable Joints

(i) The Company shall insert below details of the equipment which it proposes to use and shall submit the information as part of the Quality Management System including the Quality Plan to the Scottish Ministers.

Type of Cable Joints	Manufacturer	Catalogue Number Reference Number or Name of Cable Joint

Appendix 14/5 Electrical Equipment for Traffic Signs

1 Sign Lighting Luminaire Types

1.1 External Sign Lighting Unit Affixed

1.1.1 Type EA1 2 x 8 Watt side by side Tubular Fluorescent Starterless Lamp – Silicone Coat

1.1.2 Type EA2 2 x 8 Watt end to end Tubular Fluorescent Starterless Lamp – Silicone Coat

1.1.3 Type EA3 2 x 20 Watt side by side Tubular Fluorescent Starterless Lamp – Silicone Coat

1.1.4 Type EA4 2 x 40 Watt side by side Tubular Fluorescent Starterless Lamp – Silicone Coat

1.1.5 Type EA5 2 x 50 Watt High Pressure Mercury Lamp with Phosphor Coating

1.1.6 Type EA6 2 x 80 Watt High Pressure Mercury Lamp with Phosphor Coating

1.1.7 Type EA7 2 x 125 Watt High Pressure Mercury Lamp with Phosphor Coating

1.1.8 Type EA8 2 x 250 Watt High Pressure Mercury Lamp with Phosphor Coating

1.2 External Sign Lighting with Free Standing Unit Complete with Adjustable Mounting Bracket

1.2.1 Type EFS1 2 x 50 Watt High Pressure Mercury Lamp with Phosphor Coating

1.2.2 Type EFS2 2 x 80 Watt High Pressure Mercury Lamp with Phosphor Coating

1.2.3 Type EFS3 2 x 125 Watt High Pressure Mercury Lamp with Phosphor Coating

1.2.4 Type EFS4 2 x 250 Watt High Pressure Mercury Lamp with Phosphor Coating

1.3 Upward Sign Lighting Unit

1.3.1 Type EG1 2 x 50 Watt High Pressure Mercury Lamp with Phosphor Coating

1.3.2 Type EG2 2 x 80 Watt High Pressure Mercury Lamp with Phosphor Coating

1.3.3 Type EG3 2 x 125 Watt High Pressure Mercury Lamp with Phosphor Coating

2 Control

2.1 All sign units and lit signs except internally illuminated bollards shall be controlled by photocell fixed to the unit.

3 Base Compartment Fixing Arrangement

3.1 The base compartment fixing arrangements shall be in accordance with British Standards and manufacturers' written recommendations.

4 Fuses

4.1 The fuse ratings shall be as detailed below:

Lamp Type	Fuse Rating (Single Lamp)	Fuse Rating (Double Lamp)
Sign Lighting		
Up to 80 Watts	4	4
Over 80 Watts	10	10

Appendix 14/5 Electrical Equipment for Traffic Signs

Bollards		2
Sign/Bollard Feeder fuses in lighting column		
Load up to 80 Watts	6	
Load over 80 Watts	16	

4.2 Ancillary equipment feeder pillars cables and cable joints shall be as referred to in Appendix 14/4.

Appendix 14/70 Purchase Delivery Handling and Storage of Materials

1 General

1.1 The Company shall maintain stock levels sufficient to ensure compliance for the replacement of equipment during maintenance to comply with Specification Clause 1471AR.

The Company shall include in its stock adequate numbers of columns with paint system as Appendix 19/3.

1.2 When the Company replaces any faulty component the new component shall be either the same as that being replaced or an equivalent.

1.3 The Company shall ensure all columns and luminaires replaced shall be of a similar and equivalent type to those of existing equipment and are of similar visual appearance.

1.4 The Company shall store for 31 days all faulty columns and luminaries removed to allow inspection by the Scottish Ministers.

Records of faulty equipment shall be held within the Company's Quality Management System and be available for inspection by the Scottish Ministers at any time.

TABLE 1 – STOCK LEVELS OF MATERIALS

Detail of Stock Material Item	Storage Location	Quantity

Appendix 14/71 Labour Requirements

1 General

1.1 The Company shall appoint a supervisor specifically for electrical Operations.

The Company supervisor or his nominated deputy shall be on the O&M Works Site at all times when electrical Operations are proceeding and shall be readily available to deal with all related matters.

1.2 The Company shall complete the form for competent persons detailed in Appendix 14/75.

The criteria for competent persons are given in Electricity Council Engineering Recommendations G39 and shall be for the Supervisor Approved Electricians and Electricians.

Forms shall also be completed for any personnel engaged on column erection or routine and non routine maintenance Operations in connection with electrical equipment.

Appendix 14/73 Call Out Report

DATE ……. WEATHER CONDITIONS ……

TIME CALLED OUT ……..... CALLED OUT BY ……..

ROAD…….. LOCATION ……

DESCRIPTION OF WORK

To include

(i) equipment damaged
(ii) nature of emergency
(iii) registration of any vehicle involved
(iv) colour and type of vehicle involved
(v) name and number of Police Officer at scene
(vi) photographs glued to reverse side of report
(vii) details of any liaison with electricity company
(viii) Police station reference.

MATERIALS USED

(i) To include stores issue number.

TIME ON SITE

TIME OF LEAVING SITE

ADDITIONAL TEAM TYPES AND DURATION

DESCRIPTION OF PLANT USED AND DURATION

NAME OF APPROVED ELECTRICIAN

SIGNATURE OF APPROVED ELECTRICIAN

NAME OF SUPERVISOR

SIGNATURE OF SUPERVISOR

Appendix 14/74 Report

TODAY'S DATE ……..

WEATHER CONDITIONS ……...

LOCATION …… TIME OF ARRIVAL ON SITE ……..

DESCRIPTION OF WORK

To include accurate details of all Operations undertaken in order of the Operations carried out:

(i) results of tests or protective measures taken by the operatives

(ii) any difficulties and further action required

(iii) details of Clause 1402 times of isolation and energising of power supplies

(iv) details of any liaison with electricity companies.

MATERIALS USED

TIME OF LEAVING SITE

TYPE OF CLOSURE USED

DURATION OF CLOSURE

OUTSTANDING WORK

DESCRIPTION OF TEAM TYPES USED AND DURATION

SIGNATURE OF SUPERVISOR……

Appendix 14/75 Competent Persons Authorisation Certificate

CERTIFICATE NUMBER ……

AREA COVERED BY THIS CERTIFICATE THE O&M WORKS SITE

CATEGORY OF AUTHORISATION ……..

Category 1

To supervise the erection of lighting columns and fittings in the vicinity of electricity company overhead lines.

Category 2

To carry out all electrical duties including the following:

1. The testing of installations.
2. The wiring of installations to the outgoing side of the electricity company's cut-out.
3. The maintenance of installations.
4. The initial insertion removal or replacement of the electricity company's cut-out fuses subject to the company's discretion. (Public lighting fuses only.)

Category 3

To work in the vicinity of the electricity company's overhead lines and to withdraw and replace the electricity company's cut-out fuse carriers for:

1. Lamp replacement and cleaning purposes
2. Painting of structures.

NAME OF COMPETENT PERSON (BLOCK LETTERS) ……

CATEGORY OF AUTHORISATION ……..

……

NAME AND ADDRESS OF COMPANY ……..

……

APPROVED BY (Signature) …… POSITION …… DATE ……

RECEIVED (Signature) …… DATE ……

THIS CERTIFICATE IS VALID UNTIL (DATE) ……

A copy of this Certificate shall be held by the competent person named above.

Appendix 14/76 Liaisons with Electricity Companies

1 Emergency Call Out

1.1 The Company shall if necessary seek assistance from the electricity supply company if required for making safe the electrical installation.

1.2 The Company shall liaise with the electricity supply company regarding the making safe disconnection and reconnection of power supplies.

2 Services

2.1 The Company shall liaise with the electricity supply company in programming of Operations for disconnection and reconnection of new and existing power supplies.

2.2 The Company shall be responsible for completing all relevant documentation for the provision and disconnection of supplies.

3 Electricity Council Engineering Recommendations

3.1 The Company shall comply with the requirements of Electricity Council Engineering Recommendations G39 at all times.

Appendix 15/1 Traffic Scotland Equipment

3 MCHW Series 1500 Traffic Scotland Equipment

Action Number.	Sub-Clause Reference	Specification Amendment
1	1501	**Introduction** No additional requirements
3		Traffic Scotland Network Operations Manager, National Network Control Centre, 32 Elmbank St. GLASGOW G2 4NU Tel: 0141 287 9295
2	1502	**General Requirements** Scottish Ministers' store is located at AMEY Infrastructure Services Depot, Cumbernauld Business Park, Wardpark Road, Wardpark South, Cumbernauld. G67 3JZ
6		Commissioning, testing, integration and certification shall be carried out as described in the Scottish Ministers Requirements.
10		No additional requirements
11		No additional requirements
1	1503	**Materials, Equipment and Workmanship** No additional requirements
5		All Agreement specific drawings are listed in Appendix 0/4.
1.(xi)	1504	**Site Records** No additional requirements

Appendix 15/1 Traffic Scotland Equipment

Action Number.	Sub-Clause Reference	Specification Amendment
1	1505	**Provision of Cabinets, Cables and Ancillary Items** Provision of Cabinets, Cables and Ancillary Equipment shall be in accordance with the Scottish Ministers Requirements.
1	1506	**Cables** Cables for use in the Communications System shall be selected from the following: i) Armoured Copper Communications Cable to HA Specification TR2158B, CW1128 or to CW1198 ii) Armoured 24 fibre single mode Fibre Optic cable shall comply with Specification WOEM 4421 as issued by the Welsh Office (iv) Armoured feeder cable for inductive loop detectors to Specification TR 2031; (v) Inductive loop detector cable to Specification TR 2029. (iv) Armoured power cable shall be 3-core XLPE/SWA/PVC to comply with BS4567. (v) Other cables typically for use with ANPR and similar equipment shall only be used with the specific approval of the Scottish Ministers. To allow for this to be given, sample lengths shall be provided together with physical and electrical specifications. Typically only armoured cables shall be considered for inclusion.
2		Approval by the Scottish Ministers is required for the use of cable sizes greater than 25mm square.
10	1507	**Cable Installation** No additional requirements.
18		No additional requirements.
19	1507	**Cable Installation** Where spare cable stowage within a 'C' chamber is not possible, due to restrictions in verge width, spare cable shall be stowed vertically within an 'A' chamber of sufficient depth to correctly accommodate the bending radius of the cable stowed. Proprietary cable support brackets shall be installed and be located such as to minimise pressure points.
4	1508	**Installation of Cabinets** No additional requirements.
1	1510	**Emergency Roadside Telephones** No additional requirements

Appendix 15/1 Traffic Scotland Equipment

Action Number.	Sub-Clause Reference	Specification Amendment
1	1511	**Marker Tape** No additional requirements
1	1512	**Provision and Installation of ancillary Items** The provision, installation and setting to work of ancillary items shall be in accordance with the Scottish Ministers Requirements.
2	1513	**Jointing and Termination of Multi-pair Communications Cables** Re-useable joints shall be used for the connection between the feeder cable and the detector loop tails in accordance with NDX1063-04.
1	1516	**Termination and Jointing of Power Supply Cables for Communications** No additional requirements.
2		Power supply cable greater than 25mm square shall be terminated in accordance with the NDX1011-01 sheet 4.
1	1517	**Earthing and Bonding** No additional requirements
1	1519	**Labelling and Numbering** No additional requirements
2		No additional requirements
1	1520	**Loading** The Scottish Ministers shall approve any loading.
7	1521	**Removal and Resiting of Equipment** No additional requirements.
1	1523	**Loop Detectors** No additional requirements
2		No additional requirements
5	1528	**Modifications to Existing Cabinets** Reference to be made to Clause 1508.9

Appendix 15/1 Traffic Scotland Equipment

Action Number.	Sub-Clause Reference	Specification Amendment
2	1529	**Temporary Emergency Telephones** Emergency Telephones will be supplied by the Transport Scotland.
2	1535	**Variable Message Signs** No additional requirements
1	1536	**Traffic Monitoring Units** Traffic Monitoring Units will be supplied by Transport Scotland.
1	1537	**SRTDb Detectors and SRTDb Equipment** SRTDb Equipment will be supplied by Transport Scotland. The SRTDb detector loops and chambers shall be provided by the Company.
1	1538	**Driver Information and Lane Control Signalling Equipment** This equipment will be supplied by Transport Scotland.
5	1540	**Documentation** No additional requirements
1	1541	**Journey Time Equipment** The journey time equipment shall be provided in accordance with the Scottish Ministers Requirement.
1	1542	**ANPR Camera Equipment** The ANPR camera equipment shall be in accordance with the Scottish Ministers Requirements.
1	1543	**Communications Equipment** The communications equipment shall be in accordance with the Scottish Ministers Requirements.
1	1544	**Specific Equipment commissioning, testing and integration** The specific equipment commissioning, testing and integration shall be in accordance with the Scottish Ministers Requirements.
1	1545	**Power Supplies for Traffic Scotland Equipment** The power supplies for Traffic Scotland equipment shall be in accordance with the Scottish Ministers Requirements.
1	1546	**Spares Provision** The spares provision for Traffic Scotland equipment shall be in accordance with the Scottish Ministers Requirements.

Appendix 15/2 Employer's – Cable Duct Requirements

Action Number.	Sub-Clause Reference	Specification Amendment
4	1530	**Cable Ducts** The duct and chambers shall conform to the Scottish Ministers Requirements Para. 7. and this Series 1500.
8		No additional requirements
7	1531	**Installation of Ducts** No additional requirements.
11(ii)		No additional requirements
4	1532	**Chambers for Motorway Communications Cables** No additional requirements
10		Prior to provision, the Company will agree with the Scottish Ministers the design for all chamber covers and frames. Without the specific agreement of the Scottish Ministers' communications chambers shall not be constructed within the carriageway.
12		Four sets of lifting keys for each type of chamber cover installed shall be provided by the Company. The requirement for cover lifters should be determined by the Company in accordance with the Manual Handling Directive and approved by the Scottish Ministers. The chamber cover lifter shall be safe and fit for purpose. Regard shall be paid to the provision of the concrete apron around the chamber which shall be installed typically as required by NDX1063-03.
5	1533	**Proving and Testing Ducts** No additional requirements.

Appendix 15/11 Communication System

The Company's responsibilities are set out in the table below.

Operation	Emergency Telephones and Hazard Warning Signals	Automatic Data Collection Systems
Cleaning	Yes	Yes
Function check	Yes	No
Emergency make safe	Yes	Yes

Note: In addition to the above duties the Company may be called upon from time to time to carry out minor civil work in connection with the above.

Appendix 17/1 Schedule for the Specification of Designed Concrete

Sheet 1 - Structural concrete above ground

Requirement	Schedule		
Designed Concrete Reference	STR1	STR2	
Intended Working Life of Structure	120	120	
Nominal Cover to Reinforcement	#	#	
Applicable Exposure Classes (Excluding DCclass)	#	#	
DC-class (where appropriate)	N/A	NA	
Compressive Strength Class of Concrete	C32/40	C40/50	
Minimum Cement Content (kg.m3)	360	380	
Maximum Free Water/Cement Ratio	0.4	0.4	
Required Group or Type and Class of Cement or Combination (where a DC-class has not been specified)	Group 5 CIIB-V CIIIA	Group 4 CIIA-V CIIB-S	
Maximum Aggregate Size, mm	20	20	
Chloride Content Class	Cl0,30b	Cl0,10a Cl0,30b	
For Lightweight Concrete, the Density Class or Target Density			
For Heavyweight Concrete, the Target Density	#	#	
Consistence Class			
Special Type or Class of Cement or Combination			
Required Source/Special Type of Aggregate	Freeze/thaw resisting aggregates	Freeze/thaw resisting aggregates	
Maximum Cement Content (kg/m3) [See NG 1704.7]	380	400	
Required Admixture	#	#	

Appendix 17/1 Schedule for the Specification of Designed Concrete

APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE **Sheet 1 - Structural concrete above ground**			
Requirement	Schedule		
Air Entrainment Required [YES/NO]	3.5% min	No	
Minimum or Maximum Temperature of Fresh Concrete ℃	5/30	5/30	
Sampling and Testing Identity testing Type of test Testing rate	##	##	
Other Requirements UKAS or equivalent third party product conformity certification [YES/NO]	Yes	Yes	

3.2 Notes

3.2.1 #The Company shall determine this detail when selecting from the above table and inform the Overseeing Organisation.

3.2.2 ##Cross-reference shall be made to Appendix 1/5 and 1/6 as appropriate

3.2.3 a Prestressed or heat cured concrete

3.2.4 b Concrete with reinforcement or embedded metal

3.2.5 Note Designed concrete reference STR 1 shall be used for all reinforced concrete above foundation level

3.2.6 Designed concrete reference STR 2 may be used for reinforced concrete above ground level only with the prior approval of the Overseeing Organisation.

3.2.7 Designed concrete reference STR 2 may be used for prestressed or heat cured concrete.

3.2.8 However, the Company may develop a designed concrete in accordance with BS 8500-1 and 2 and this Specification and submit to the Scottish Ministers for written consent.

Appendix 17/1 Schedule for the Specification of Designed Concrete

APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE (CONTINUED)

Sheet 2 - Structural concrete in foundations

Requirement	Schedule				
Concrete Reference	FOU 1	FOU 2	FOU 3	FOU 4	FOU 5
Intended Working Life of Structure	120	120	120	120	120
Structural Performance Level	High	High	High	High	High
Nominal Cover to Reinforcement	#	#	#	#	#
DC-class (where appropriate)	DC-1	DC-2 DC-2z DC-3b DC-3-z	DC-3*b DC-3 **b DC-4b DC4z	DC-3a DC-4a DC4*b DC-4**b DC4-ma	DC-4mb DC-4m*b DC-4m**b
Compressive Strength Class of Concrete	C32/40	C32/40	C32/40	C32/40	C32/40
Minimum Cement or Combination Content (kg/m3)	360	360	380	400	400
Maximum Free Water/Cement Ratio	0.4	0.4	0.4	0.4	0.4
Required Group or Type and Class of Cement or Combination	Groups 1 & 2 CIIA-V CIIB-V+SR C1VBV+SR CIIB-S CIIIA CIIIB+SR	Group 2 CIIB-V+SR C1VB-V+SR CIIIB+SR	Group 2 CIIB-V+SR C1VBV+SR CIIIB+SR	Group 2 CIIBV+SR C1VBV+SR CIIIB+SRa	Group 3 SRPC

Appendix 17/1 Schedule for the Specification of Designed Concrete

APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE (CONTINUED) Sheet 2 - Structural concrete in foundations					
Requirement	Schedule				
Maximum Aggregate Size	20mm	20mm	20mm	20mm	20mm
Chloride Content Class	Cl 0,30	Cl 0,30	Cl 0,30	Cl 0,30	Cl 0,20
For Lightweight Concrete, the Density Class or Target Density					
For Heavyweight Concrete, the Target Density					
Consistence Class	#	#	#	#	#
Special Type or Class of Cement or Combination	#	#	#	#	#
Required Source/Special Type of Aggregate	#	#	#	#	#
Maximum Cement Content (kg/m3) [See NG 1704.7]	380	380	400	420	420
Required Admixture					
Air Entrainment Required [YES/NO]	No	No	No	No	No
Minimum or Maximum Temperature of Fresh Concrete	5/30	5/30	5/30	5/30	5/30

Appendix 17/1 Schedule for the Specification of Designed Concrete

APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE (CONTINUED)
Sheet 2 - Structural concrete in foundations

Requirement	Schedule				
Sampling and Testing Identity testing Type of test Testing rate	##	##	##	##	##
Other Requirements UKAS or equivalent third party product conformity certification [YES/NO]	Yes	Yes	Yes	Yes	Yes

\# The Operating Company shall determine this detail when selecting from the above table and inform the Overseeing Organisation.

Cross-reference shall be made to Appendix 1/5 and 1/6 as appropriate.

a Aggregate carbonate range A, DC-3, DC-4 and DC-4m to use only Combination CIIIB+SR

b Aggregate carbonate range B,C only

Note: Designed concretes included in this Appendix are for use at the discretion of the Company. However, the Company may develop a designed concrete in accordance with BS 8500-1 and 2 and this Specification and submit to the Scottish Ministers for written consent.

Appendix 17/2 Concrete – Impregnation Schedule

1 Impregnation Treatment

Structure Reference	Drawing Reference	Area Definition Impregnation Treatment (Note 1)
To be completed by the Company	To be completed by the Company 'M' beams	Piers, columns, crossheads and abutments
		Bearing shelves, ballast walls and deck ends
		Structures in marine environments and columns and soffits over brackish water
		Concrete parapets and parapet plinths
		Deck beams and soffits
		Wing walls
		Retaining walls
		"M" beams

1.1 Notes

1.1.1 This list shall be a guide for selection by the Company but shall not be construed as exhaustive.

1.1.2 Other area definitions shall be inserted by the Company.

1.1.3 Where an alternative to silane treatment shall be available the Company shall submit proposals to the Scottish Ministers for written consent.

Appendix 17/4 Concrete – General

1 General

1.1 All high yield steel reinforcement shall be deformed type 2, as defined in BS5400-4 (Clause 5.8.6.1).

1.2 All tying wire shall be stainless steel.

1.3 Welding of reinforcement shall only be permitted subject to written approval by the Overseeing Organisation.

Appendix 17/5 Concrete – Buried Concrete

The following information shall be completed by the Company for each Structure, or group of Structures, and applies only for buried concrete or partially buried concrete, i.e. with one or more faces in contact with natural or disturbed ground or imported backfill.

Structure Name or Location	
(A separate appendix should be provided for each Structure or location with varying conditions or Design constraints – identical conditions and constraints may be grouped together in one appendix)	To be completed by the Company
Aggressive Chemical Environment for Concrete Class for Site (derived from Table A.2 of BS 8500-1)	
Structural Performance Level (High, normal or low) (derived from Table 3 of BS 8500-1)	
Design Chemical Class (derived from the Aggressive Chemical Environment for Concrete class determined by assessment of ground conditions together with the Structural Performance Level and the concrete section thickness and adjusted as necessary by reference to the footnotes to Table A.4 of BS 8500-1 and NG 1704.11(i) for increase in concrete quality when used as an Additional Protective Measure; specification of 'starred' or 'double' starred' DC classes)	
Other Requirements and Design Constraints (eg Limitations on drainage or Additional Protective Measures required)	

Appendix 17/70 Schedule for the Specification of Designed Concrete

Requirement	Schedule		
Reference	RC30(B) Below Ground	RC30(A) Above Ground	
Intended Working Life of Structure	120	120	
Nominal Cover to Reinforcement	#	#	
Applicable Exposure Classes		#	
DC-class	DC-1$		
Compressive Strength Class of Concrete	C25/30	C25/30	
Minimum Cement Content (kg.m3)	280	280	
Maximum Free Water/Cement Ratio	0.6	0.6	
Required Group or Type and Class of Cement or Combination (where a DC-class has not been specified)	#	Group 4, 5, 6	
Maximum Aggregate Size, mm	20	20	
Chloride Content Class	Cl 0,30	Cl 0,30	
For Lightweight Concrete, the Density Class or Target Density			
For Heavyweight Concrete, the Target Density			
Consistence Class	#	#	
Special Type or Class of Cement or Combination			
Required Source/Special Type of Aggregate			
Maximum Cement Content (kg/m3) [See NG 1704.7]	300	300	
Required Admixture			
Air Entrainment Required [YES/NO]	NO	NO	
Minimum or Maximum Temperature of Fresh Concrete ℃	5/30	5/30	

Appendix 17/70 Schedule for the Specification of Designed Concrete

APPENDIX 17/70: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE			
Requirement	Schedule		
Sampling and Testing	##	##	
Other Requirements	#	#	
# The Company shall determine this detail when selecting from the above table and inform the Overseeing Organisation.			
## Cross-reference shall be made to Appendix 1/5 and 1/6 as appropriate.			
Notes 1 Structural performance level shall be 'High'. 2 $ see tables A2, A4 and A5 of BS 8500-1 and BRE Special Digest 1. 3 RC30 above ground shall comply with Table A6 of BS 8500-1			

Appendix 19/1 Requirements for Bridges, Parapets and Other Highway Structures Except Bearings and Lighting Columns

Paint system that shall be used for bridges parapets and other Structures except bearings and lighting columns shall be as specified in Appendix 19/70.

Appendix 19/3 Requirements for Lighting Columns and Bracket Arms

Paint system that shall be used for lighting columns and bracket arms shall be as specified in Appendix 19/70.

Appendix 19/4 Requirements for Other Work

Paint system that shall be used for other work shall be as specified in Appendix 19/70.

Appendix 19/70 Paint System

1 High Build Epoxy/Polyurethane System

1.1 Notes for Guidance Volume 5 Section 2 of the Manual of Contract Documents for Highway Works.

1.2 Examples of typical maintenance paint systems.

1.3 Example 11 – High Build Epoxy/Polyurethane system as an alternative to Examples 1 to 7 inclusive.

	Condition of Surfaces of Existing System after Surface Preparation				
Category	**1**	**2**	**3**	**4**	**5**
Coat Item No. Registered Description Colour	**Blast cleaned to clean steel** **mdft**	**Blast cleaned or abraded to sound metal coating** **mdft**	**Prepared by power or hand tool cleaning or abrading** **mdft**	**Blast cleaned or abraded to sound zinc chromate primer** **mdft**	**Other sound abraded coating** **mdft**
First Coat Item 115 High Build Aluminium Epoxy Primer aluminium grey OR First Coat Item 111 Zinc Phosphate High Build Epoxy Primer red oxide grey or buff	125 (B or AS) 125(AS)	125 (B or AS)	125 (B)	-	-
Second Coat Item 116 High Build Epoxy Undercoat light grey 00A05 to BS 4800:1989 Schedule of paint colours for building purposes	125	125	125	125	125
Third Coat Item 168 Polyurethane (2 Pack) Finish to appropriate BS4800:1989 Schedule of paint colours for building purposes, shade	50	50	50	50	50
Minimum total dry film thickness to be obtained	350µm	350µm	350µm	200µm	200µm

Appendix 19/70 Paint System

	Condition of Surfaces of Existing System after Surface Preparation				
Category	**1**	**2**	**3**	**4**	**5**
Stripe Coats	Item 115 to 111. One stripe coat at 75 microns mdft to areas prepared to clean steel or sound metal coating. Item 116. One stripe coat to areas prepared to sound paint before second coat.				
Patch Coats	Nil				
Notes	First Coat Primer Item 111 may not be compatible with sound existing coatings therefore if overlapping shall be required compatibility must be checked before proceeding (See also Note 3). The selection of primer shall be made depending on whether overlapping of existing coatings shall be required and on the type of extent of surface preparation performed. For large definable areas of surfaces prepared by blast cleaning to 100% clean steel or sound metal coating Item 111 may be applied by airless spray. For smaller patch areas prepared by blast cleaning or abrading (where primer shall overlap to a greater extent onto adjacent sound coated surfaces) Item 111 shall be applied preferably by brush with airless spray application restricted to large areas. If MIO Finish natural or medium grey shall be required third coat may be replaced by Item No 112 MIO HB Quick Drying Epoxy Undercoat/Finish applied at 100µm mdft. Compatibility of alternative system shall be checked in the case of existing Chlorinated Rubber or Acrylated Rubber systems. When necessary an extra coat of Item 168 may be applied to ensure complete opacity of the finish colour. Item 169 Polyurethane (2-pack) finish may be used in lieu of Item 168 to provide a semi-gloss finish.				
Health and Safety	Polyurethane (2-pack) paints contain isocyanate and can be injurious to health if not correctly used. An assessment of the risks and controls for their safe use shall be carried out before use.				

Appendix 19/70 Paint System

2 (SPECIFICATION FOR HIGHWAY WORKS) FORM HA/P1 (NEW WORKS) PAINT SYSTEM SHEET

1. CONTRACT TITLE: STRUCTURE NO: GRID REF:				
2. DATE OF ISSUE OF DOCUMENTS TO TENDERERS				
3. ENVIRONMENT AND ACCESSIBILITY:				
4. REQUIRED DURABILITY OF SYSTEM: MAJOR MAINTENANCE after YEARS MINOR MAINTENANCE from YEARS NO MAINTENANCE up to YEARS (Ref: NG 1911 Appendices 19/1 and 19/2 14(iii))			5. COLOUR OF FINISH:	
6. PAINT SYSTEM TO BE APPLIED OVER: AREA REF: …. AREA DESCRIPTION: PROTECTIVE SYSTEM TYPE: (i.e. I, II etc):……..				
7. DETAILS	1st Coat	2nd Coat	3rd Coat	4th Coat
Registered Description Item No. and Colour Date Registered BBA HAPAS Roads and Bridges Certificate or equivalent Reference Brand Name and Manufacturer's Ref. No. Manufacturer's Data Sheet No. Where Applied Minimum dry film thickness (mdft) Maximum local dft (See Cl. 1914.7) Estimated total volume of paint likely to be used. (litres) 'A' type testing required? (YES/NO) (See Cl 1912.3) 'B' type testing required? (YES/NO) (See Cl 1912.10)				
8. STRIPE COAT DESCRIPTION (Including Item No. and colour) Workshop: Site:			9. PAINT MANUFACTURER'S OFFICIAL STAMP:	
10. Mdft (µm) NOTE. The minimum total dry film thickness of			11. APPROVED BY:	

Appendix 19/70 Paint System

the paint system, neglecting primers and sealers under 30 microns, shall be 15% greater (to the nearest 25 microns) than the sum of the mdfts of the individual paint coats.	DATE

2.1 Note: Company shall complete the paint system sheet HA/P1 for protection of steelwork against corrosion for new works.

2.2 A separate form shall be provided for each Structure, including CCTV masts, cantilever masts, street lighting columns and bracket arms as appropriate.

Appendix 19/70 Paint System

3 (SPECIFICATION FOR HIGHWAY WORKS) FORM HA/P2 PAINT DATA SHEET

BBA HAPAS Road and Bridges Certificate or equivalent Reference and Date:

Manufacturer: Item No :

Registered Description: Brand Name and Reference No :

Consistency and Method of Application: Weight per 5 Litres (kg) :

Specific gravity: Colour :

For two-pack paints:

Base: Activator: Mixed Components:

Volume Solids %:

For two pack paints volume solids % for mixed paint:

VOC content g/l (mixed):

Manufacturer's Minimum Dry Film Thickness Range

Recommended lower mdft:

Recommended upper mdft:

Full Application Instructions:

Flash Point:

		5℃	10℃	20℃	30℃
Drying Times (hours)	Surface Dry				
	Hard Dry				
Overcoating Times (hours)	Minimum				
	Maximum				
Pot Life (hours)					

Cleaning Solvent : Effect on Drying Times of :

Temperatures below 20℃ :

Manufacturer's Application Restrictions,

e.g. for Temperatures or Humidity :

Manufacturer's General Recommendations :

Note: The Company shall complete the paint system sheet HA/P2 for protection of steelwork against corrosion for new works.

Appendix 19/70 Paint System

4 (SPECIFICATION FOR HIGHWAY WORKS) FORM SEDD/P3 PAINT SAMPLE DESPATCH LIST: SHEET 1

Contract Title:

Structure Name : Structure No:

Client Name:

Supervising Firm: Fax No:

Supervising Firm's Representative Name: Tel No:

Address:

Painting Inspection Firm:

Samples Despatched From: (Note 1) Date Despatched:

Inspector's Name: Tel No:

Inspector's Signature:

SAMPLES: (Numbered A1, A2 etc. or B1, B2 etc.) (Note 2)					
Sample No.	Item No.	Manufacturer's Reference No.	Batch No	Colour BS 4800 reference (Note 3)	Sp.G. (note 4 & 5)

Paint Manufacturer:

5 Form Sedd/P3 Paint Sample Despatch List: Sheet 2

5.1 Procedures

5.1.1 To be followed closely before despatch to an approved local paint testing firm

(i) Check the specific gravity of each batch of paint;

(ii) Check the matching of finish colours to BS 4800;

(iii) Select the required sample, i.e.

Appendix 19/70 Paint System

(a) 'A' sample – unopened tin

(b) 'B' sample – 500ml sample from painter's kettle or from nozzle of airless spray gun in the case of single component coatings or if the check is to be done in situ otherwise for two pack coatings, separate samples of the base and the activator must be dispatched to the testing laboratory.

(iv) List contract details in Section 1 of Form SEDD/P3;

(v) List details of each set of samples in Section 1 of Form SEDD/P3 including the specific gravity of each sample;

5.1.2 Send Form HA/P1 Paint System Sheet with Form SEDD/P3 and paint samples to an approved local paint testing firm and shall:

(i) Ensure samples shall be labelled correctly, clips lids of tins down securely and sends the samples promptly; and

(ii) Ensure that samples shall be labelled with the structure name, sample number, and additionally in the case of 'B' samples, item number, manufacturer's reference number, batch number and colour.

6 Form Sedd/P3 Paint Sample Despatch List: Sheet 2

6.1 Notes:

6.1.1 State whether from workshop or site (give name and address).

6.1.2 Batch samples comprising unopened tins to be marked A1, A2, etc. Control samples in 0.5 litre tins to be marked B1, B2, etc. Samples No. to run consecutively, i.e. A1 and B1 onwards.

6.1.3 Colour reference to BS 4800 to be given, as stated on Form HA/P1 (Maintenance) Paint System Sheet, e.g. 18 B 25.

6.1.4 For 'A' samples specific gravity (Sp.G.) to be measured by Inspector from separate tins of the same batch. For 'B' samples Sp.G. to be measured by Inspector when taking samples. Samples will be rejected unless Sp.G. is filled in above by Inspector.

6.1.5 If Sp.G. differs appreciably from data sheet do not dispatch 'A' or 'B' samples.

6.1.6 The Company shall complete the paint system sheet SEDD/P3 for protection of steelwork against corrosion for new works.

Appendix 20/1 Waterproofing for Concrete Structures

1 Repair and Replacement of Bridge Deck Waterproofing

1.1 Repair and replacement of bridge deck waterproofing shall be in accordance with Specification Clause 2008.

1.2 Where details of existing waterproofing systems to bridge decks shall be unknown the Company shall carry out investigations to determine the system employed.

1.3 The integrity of the waterproofing membrane and bond to substrate shall be included in the investigation.

1.4 Some existing bridge decks may not have received waterproofing.

1.5 In such cases the deck shall be prepared to a U4 finish and receive waterproofing in accordance with Series 2000.

1.6 Deck surfaces that deviate from a U4 finish shall require further preparation and or additional material.

1.7 Typical waterproofing systems that may be found on the O&M Works Site shall include but not be limited to:

1.7.1 Mastic asphalt system;

1.7.2 Proprietary membrane and sheet system; and

1.7.3 Proprietary sprayed waterproofing system.

1.8 Non destructive integrity tests compatible with the waterproofing system shall be carried out.

1.9 Additional Preparation of Bridge Decks.

1.10 Where the concrete deck deviates from a U4 finish further preparation shall be carried out to bring the surface finish up to a suitable standard for the application of waterproofing.

1.11 The application of an additional thin screed coating on the existing concrete deck shall generally not be considered appropriate other than for localised repairs.

1.12 Waterproofing with bituminous paint to buried faces of concrete structures

Material	Method of Application	Rate of Application	Number of coats
Bituminous paint	Brush or spray applied	0.55 litres / m2 (first coat) 0.45 litres/m2 (second coat)	2

Appendix 23/70 Replacement of Bridge Expansion Joints and Sealing of Joints

1 Bridge Expansion Joints

1.1 The following are likely types of bridge expansion joints which will be used on the O&M Works Site.

Type	Description
1	Buried joint under continuous surfacing
2	Asphaltic plug joint
3	Nosing joint with poured sealant
4	Nosing with preformed compression seal
5	Reinforced Elastometic
6	Elastomeric in metal runners
7	Maurer D80

1.2 This list shall not be deemed to be exhaustive and reference shall be made to BA26 and BD33 of the DMRB for all possible types that may be used.

1.3 A description of deck joint types and deck joint manufacturers details shall be provided by the Company in Appendix B of the TRBDB for individual Structures.

Appendix 23/71 Asphaltic Plug Joints – Additional Requirements

1 All batches of materials delivered to the O&M Works Site shall have a certificate of compliance stating:

1.1 The binder compound and its properties including penetration value softenting point (ring and ball) and flow resistance

1.2 The specific type and density of aggregate/stone used in the asphaltic plug matrix

1.3 The quantities and weights of binder and aggregate used at each joint location.

Appendix 24/1 Brickwork, Blockwork and Stonework

1 Selection of Mortar Type

1.1 The Company shall select lime or cement mortars on the basis of the points listed below and in conjunction with Clause 2470AR.

1.2 For repointing of natural stone masonry, lime mortars should generally be used, and particularly for weaker/more porous masonry. Cement mortars will normally only be permitted in natural stone structures where stonework consists of hard, non-porous masonry and subject to harsh environmental exposure conditions or below open water level.

1.3 The mortar mix will vary for each scheme depending on the exposure of the work, the stone in question and the time of year that the work is carried out. Specialist advice shall be sought for the appropriate mortar mix, from organisations such as the Scottish Lime Centre.

2 Cement Mortars

2.1 The mortar designation shall be selected by the Company from Table 24/5 of the Specification (as amended by the Contract Specific Minor Alterations).

2.2 Sulphate resisting Portland cement shall be used in all mortar designations where located below non tidal open water.

2.3 The Company shall determine other locations where it shall be appropriate for Sulphate Resisting Portland cement to be employed.

3 Lime Mortars

3.1 Lime mortar shall be mixed using gauging boxes.

3.2 The durability designation shall comply with Clause 2476AR and shall be selected by the Company from Table 24/7 24/8 and 24/9 of this Specification.

3.3 The Company shall ensure that personnel responsible for the supervision of the production of mortars and otherwise shall be suitably experienced in the techniques of preparing and using traditional lime mortars.

3.4 Where ready made mortars are purchased the Company shall obtain evidence that the supplier shall be suitably experienced in the techniques of production of traditional lime mortars.

4 Selection of masonry

4.1 Natural building stone in repair work shall be of the same quality colour and type as adjacent sound stone and bedded jointed dressed and tooled to match.

4.2 Before such Operations the Company shall compare and match samples of natural building stone with the existing sound stone.

4.3 Reconstructed stone shall be of the same quality colour and type as adjacent sound existing reconstructed stone.

4.4 Before such Operations the Company shall compare and match samples of reconstructed stone with the existing sound reconstructed stone.

5 Repointing

5.1 Pointing to repair work shall be finished to match the existing pointing of adjacent

sound areas of pointing to brickwork, blockwork, reconstructed stonework and stonework.

In new work, finished pointing shall generally be

5.1.1 Bucket handle in brickwork, block-work and reconstructed stone

5.1.2 Flush with the exposed face in natural stonework and stonework in arch rings and faces and

5.1.3 Finished 5 millimetres from the exposed face of squared or un-squared coursed or uncoursed random rubble stonework

The proposed specification and details of brickwork, stonework, blockwork and reconstructed stonework and other relevant details for new build shall be submitted for the written consent of the Scottish Ministers.

5.2 The variation in depth, front to back of stones for natural stone face-work to cast concrete shall not exceed 25 millimetres.

5.3 The variation in depth, front to back of adjacent stones for natural stonework in composite walls shall not exceed 50 millimetres.

5.4 In coursed work the courses shall generally be horizontal.

5.5 For all works, bricks, stone blocks, reconstructed stone and mortar materials shall be stored on pallets and kept dry.

5.6 Bonding for brickwork and blockwork in repairs shall match existing and for new works shall be submitted for the written consent of the Scottish Ministers.

5.7 The Company shall comply with BS8000-3:2001 Workmanship on Building Sites; Code of Practice for Masonry in Terms of Standards of Workmanship and Site Practice.

5.8 The type of permitted fill between the crown of the arch and the underside of the pavement as described in Clause 2417.25 shall be selected by the Company based on the fill thickness and site specific criteria

5.9 Unreinforced masonry arch bridges shall be waterproofed with a permitted sheet system conforming to Clauses 2003 and 2005 of the Specification.

Appendix 26/1 Ancillary Concrete

1 General

1.1 The Company shall prepare an Appendix 26/1 stating special requirements for ancillary concrete (for example, sulphate-resisting cement concrete). These requirements shall be in accordance with the other provisions of this Agreement

1.2 Prescribed concrete references and uses shall also be listed in Appendix 26/1.

Appendix 28/1 Supplies and Salt Spreading Rates

1 TABLE 1 Salt Stockpiles in Company's Maintenance Compounds

1.1 Details that shall be provided by the Company

Location	Stock level at 1st October	Minimum stock level prior to 1st March

2 TABLE 2 Salt Spreading Rates

2.1 Details that shall be provided by the Company

Weather Conditions Road Surface	Air Temperature	Salt Spreading Rate (grams/square metre)

Appendix 28/2 Company's Vehicles and Plant

1 Table 1: Operational Spreading Vehicles

Location	Vehicle Type	Snowplough	Capacity	Number

2 Table 2: Reserve Spreading Vehicles

Location	Vehicle Type	Snowplough	Capacity	Number

3 Table 3: Tractor Loading Shovels

Location	Type and Capacity	Number

Appendix 28/2 Company's Vehicles and Plant

4 Table 4 Other Mechanical Snow Clearance Plant

Location	Type and Capacity	Number

Appendix 30/1 - General

Action Number	Sub-Clause	Specification Amendment
1	3001.2	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. (i) All water courses and otherwise; (ii) All Scheduled Ancient Monuments and other sites of archaeological interest including site identified during the archaeological watching brief; (iii) Sites of Special Scientific Interest; and (iv) Sites designated for their nature conservation interest.
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 31st inclusive, unless otherwise agreed in writing with SNH.
4	3001.15	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: (a) In the case of activities carried out under Clause 3007 and 3010 once per year. (b) In the case of activities carried out under Clause 3009 (i) Six times per year in the first relevant 52 weeks of the Establishment Period; (ii) Four times per year in the second relevant 52 weeks of the Establishment Period; (iii) Three times per year for the remainder of the Establishment Period.

Appendix 30/1 - General

LANDSCAPE WORKS - INSPECTION REPORT	
Date of visit: ../ ../ .. (minimum one record / day) **Name of Company/Contractor:** **Company/Contractor's telephone no:**	
Operations carried out	**Locations of Operations**

Names of operatives on site: .....
.....
.... …….

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 30/1 - General

LANDSCAPE WORKS - PESTICIDES RECORD

Date of visit: ../ ../ .. (minimum one record / day)

Contract Name:

Name of Company: **Company's telephone no:**

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)		

Names of operatives on site: Qualifications of operatives named:

Supervisor.....

Storeman.....

Application by.....

Signed (for Company) .....

Company's observations on damage by others or any incidents: ....

Appendix 30/2 Weed Control

Action Number	Sub-Clause	Specification Amendment
1	3002.1	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 O&M Works at sufficient frequency to restrict their growth and prevent their spread until the end of the Services Period. The Company's weed control programme shall ensure that there shall be a significant reduction in the occurrences and extent of these species each successive year for the duration of the Services Period wherever they occur. 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.
2	3002.3	Total weed control shall apply to the following locations: (i) Bases of road restraint systems; (ii) Around structures, columns, posts and signs; (iii) All paved areas, kerbs, hardstandings, filter drains and gravel areas (including but not limited to gravelled central reservations); and (iv) Otherwise. The Company shall apply herbicides at sufficient frequency to eliminate weed growth until the end of the Services Period.
3	3002.4	Total weed control by non-residual herbicide shall apply to the following locations: (i) All areas to be seeded and all planting beds prior to seeding or planting so as to be in a weed free condition; (ii) All stockpiles of topsoil which shall be maintained in a weed free condition; (iii) All planted beds; and (iv) Otherwise.
4	3002.5	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 until the end of the Services Period
5	3002.6	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.

Appendix 30/2 Weed Control

Action Number	Sub-Clause	Specification Amendment
6	3002.7	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 until the end of the Services Period at the following locations: (i) For control of injurious weeds in grass and wildflower areas; (ii) All woodland and planted areas; (iii) All hedgerow planting areas; and (iv) Otherwise. Spot treatment shall typically be via controlled droplet application of a type appropriate to the herbicide, the species being treated and the location.
7	3002.8	Weed control by hand weeding shall be carried out as necessary, and in any case no less than twice a year until the end of the Services Period at the following locations: (i) All woodland and other planting areas where spot application may cause damage; (ii) Hedgerow planting where spot application may cause damage; (iii) Wildflower areas and areas densely populated with desirable broadleaf species where spot application may cause damage; (iv) Within plant protectors and tree/shrub shelters; (v) Around planting stations in existing woodland; and (vi) Otherwise.
8	3002.9	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.
9	3002.10	The Company shall remove all arisings in accordance with sub-clause 3002.10 from weed control operations that involve hand weeding and cutting.

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 until the end of the Services 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 not likely to become visually 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 until the end of the Services 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 inspections of the site with a representative of the Company to agree whether 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 failed plants annually and maintain them until the end of the Services Period to ensure a full and covered canopy. All Works shall be undertaken in accordance with the Specification and O&M 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 be planted in inverted turfs within areas of undisturbed ground, shall be ripped to a minimum depth of 450 millimetre 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 the O&M Works 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 (all planting 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 O&M 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	Grass seed mixes shall be as follows; (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; (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. No single species of wildflower shall be less than 10% by number of the wildflower component with the exception of Oxeye Daisy (Leucanthemum vulgare) which, if specified, shall be limited to not more than 3% of the wildflower component. (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; (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; (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. 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.

Appendix 30/5 Grass Seeding, Wildflower Seeding and Turfing

Action Number	Sub-Clause	Specification Amendment
5	Inserted Clause	All seed shall be delivered to the O&M Works 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	Wildflower mixes shall be of UK native origin selected and procured in accordance with Appendix 1 of *'Cost Effective Landscape: Learning from Nature'* The Company shall complete and submit to the Overseeing Organisation a wildflower seed Provenance Certificate on a form as detailed in the Certification procedure. Wildflower seed mixes shall contain only species occurring in the National Vegetation Classification category appropriate to the location. 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. 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. The wildflower seed mixes shall contain a minimum percentage of: i) 95% pure seed, not inert material (% by weight); and 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. Seeds within the wildflower seed mixes shall have a minimum germination rate of 80%.
6	3005.8	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. Grass seed shall be sown at a rate of not less than 20g/m2 for verges and side slopes of cuttings and embankments and 15g/m2 elsewhere. Wildflower grassland areas shall be sown at a rate of not less than 5g/m2
7	3005.14	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.
8	3005.25	Turf shall be secured using either galvanised wire pins or softwood pegs as per sub-clause 3005.25.
9	3005.26	Newly laid turf laid shall be watered as per sub-clause 3005.26.

Appendix 30/5 Grass Seeding, Wildflower Seeding and Turfing

Action Number	Sub-Clause	Specification Amendment
13	3005.29	A minimum of two establishment cuts shall be undertaken; with further cuts undertaken as necessary to achieve coverage as stated in sub-clause 3005.11 and one cut subsequent to the required sward coverage being achieved.
14	3005.30	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.

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 O&M Works Requirements.

Table 30/6.1 Extra Heavy Standard and Heavy Standard Rootballed Trees

Type	Girth at 1m 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
Large rootballed specimens	-	-	1.5	1.75

Table 30/6.2 Feathered Trees, Transplants and Container Grown Stock

Type	Minimum Age	Minimum Height Above Ground Level	Minimum Container Size
Transplants whips (broadleaves only)	2+1 years	450 millimetre	-
Transplant in tree shelters (broadleaves only)	1+1 years	450 millimetre	-
Container grown evergreens	2+1 years	300 millimetre	2 litres
Feathered Trees	as B.S.	1.5-2.5	-

Appendix 30/6 Planting

Table 30/6.3 Cell Grown Stock

Type	Approximate Height (cm)	Minimum Cell Volume (ml)	Minimum Root Collar Diameter (mm)
Conifers	20-40	150	5
	20-40	350	8
Broadleaves	40-60	150	6
	40-75	350	8
Holly	20-40	150	7
Shrubs	20-40	150	5
At least 25% of plants shall be supplied in the larger size range. Plants in 350ml 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, Conifers, Hedge Plants, Climbers and Ground Cover Plants

Type	Minimum Age	Column A Acceptable Height (millimetre)	Column B Minimum Height for Small/Slow Growing Plants not Readily Available to Sizes Shown in Column A	Maximum Volume (litres)
Bare root/Hedge plants	2+1 years	400-600	-	-
Tansplants in shrub shelters	1+1years	400-600	-	-
Container grown shrubs and conifers	2+1 years	450-600	300-450 millimetre	2
Container grown climbers	3 years	600-900	400-600 millimetre	2
Ground cover plants	3 years	300-450	150-200 millimetre	2
Rooted Cuttings	2 years	400-600		

Appendix 30/6 Planting

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 completed on the pro forma included within the Schedule 4 Part 6 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.
4	3006.13	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: (i) Standard trees: 20g (ii) Heavy Standard trees: 40g (iii) Extra Heavy Standard trees 100g; and (iv) Ornamental planting beds into the top 75mm of planting bed soil at a rate of 100g per square metre.
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 used in accordance with sub-clause 3006.15 at a rate based on the results of the topsoil tests.
7	3006.16	Root dips shall be applied to all bare root plants and anti-desiccant sprays shall be applied to all evergreens at the following times: (i) At the time of lifting from the nursery (ii) On arrival at site (iii) Immediately prior to planting
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.

Appendix 30/6 Planting

Action Number	Sub-Clause	Specification Amendment
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 mm 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	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 mm. All container grown plants shall be pit planted. Trenches for hedges shall be dug in locations where there is less than 300 mm depth of topsoil. Arisings from planting pits and trenches shall be retained on the O&M Works Site and deposited within proposed landscape earthworks.
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.
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, in compliance with the Company's Quality Plan and associated method statements.
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.
15	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.
16	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 millimetre. Tree stake sizes for other tree forms shall be in accordance with sub-Clause 3006.41.
17	3006.42	Where planting on a slope stakes may be driven at an angle mid way between the slope and the vertical tree stem.
29	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.
20	3006.45	Semi-mature trees shall be planted as shown on HCD Drawing Number K5, Volume 3 of the MCHW in compliance with the Company's Quality Plan and associated method statements and consented to by the Overseeing Organisation.

Appendix 30/6 Planting

Action Number	Sub-Clause	Specification Amendment
21	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.
22	Additional Clause	All container grown, cell grown and root balled plants shall be watered to field capacity immediately before planting.
23	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 millimetre height and 80-120 millimetre diameter. Shrub shelters shall be a minimum of 750 millimetre height and 100-150 millimetre 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 millimetre in length.
24	3006.53	All planting shall be watered to field capacity, as required, prior to the application of mulch.
25	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, grade (ii).
26	3006.55	Where timber mulch shall be used it shall be grade (ii) in sub-Clause 3006.55.
27	3006.66	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.

Appendix 30/6 Planting

Action Number	Sub-Clause	Specification Amendment
29	3006.73	Reeds, rushes, marginal and aquatic plants shall be planted around the margins of wet pond drainage features, along watercourse margins and in areas impeded drainage in accordance with the O&M 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 until the end of the Services Period to ensure a full and covered canopy.
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.
33	3006.92	The Company shall carry out maintenance of new planting in accordance with clauses 3007 and 3009 until the end of the Services Period.

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 O&M Works Site shall be maintained in accordance with Clause 3007.
2	3007.5	No cutting shall be carried out within 250 millimetre of unprotected trees and shrubs.
3	3007.13	Medium frequency grass cutting shall be undertaken in accordance with sub-Clause 3007.13 in all areas identified as amenity grass areas in the vicinity of Auchenkilns Junction
4	3007.17	With the exception of any areas maintained in accordance with sub-Clause 3007.13 low frequency grass cutting shall be undertaken in accordance with sub–Clause 3007.17 in the following areas: (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; (ii) Grassed areas within visibility splays; (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. 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.
5	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 except in areas under management as habitat for Great Created Newts to the north of Haggs Junction where other cutting frequencies may be required.
6	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.
7	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.

Appendix 30/7 Grass, Bulbs and Wildflower Maintenance

Action Number	Sub-Clause	Specification Amendment
8	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.
9	3007.26 - 3007.27	All areas seeded with wildflowers 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.
10	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.
11	3007.29	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. 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.
12	3007.30	Areas of wildflower seeding that cannot be effectively controlled by chemical means without risk of damage to wildflowers shall be hand weeded to eliminate undesirable broadleaf weed species.
13	Additional Clause	All damaged or failed sward shall be reinstated with seed to match the surrounding area.

Appendix 30/8 Watering

Action Number	Sub-Clause	Specification Amendment
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 to the end of the Services Period 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 millimetre radius of an individual tree or shrub, within which weed control operations shall be carried out.
4	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.
5	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.
6	3009.12	Mulch shall be maintained in accordance with sub-clause 3009.12 in amenity / ornamental shrub planting areas.
7	3009.18	Mulch shall be maintained in accordance with sub-clause 3009.18 in all cultivated beds.
8	3009.20	All hedge bases shall be maintained weed free for the duration of the Establishment Period in accordance with sub-clause 3009.20.
9	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 1st September and 31st 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 Number	Sub-Clause	Specification Amendment
1	3010.1	All established trees and shrubs within the O&M Works Site not maintained under Clause 3009 shall be maintained until the end of the Services Period in accordance with sub-clauses 3010.2 - 3010.71 and Table 30/10.1.

Table 30/10.1 – Maintenance Requirements for Established Trees and Shrubs (5 years or longer since planting or issue of Permit to Use, whichever is the later.)

Item/ element	Description/ definition	Maintenance Requirements	Frequency of Operation
Hedgerow	Distinct linear planting (usually marking boundary lines which are intended to be shaped and formally maintained	Trimming/ cutting/ pruning/ removal or arisings between September and January	Once per year
		Weeding	Hedges under 5 years old to be kept weed free
		Gapping-up	Once per year if required to fill gaps in planting
Shrubs	(i) Ornamental shrubs planted as a visual element of the road corridor usually associated with settlements and junctions High maintenance shrub treatment shall be undertaken in areas of high frequency grass cutting; medium maintenance shrub treatment shall be undertaken in areas of medium frequency grass cutting; and low maintenance shrub treatment shall be undertaken in areas of low or minimal frequency	(i) High maintenance	
		Weeding	Monthly during the growing season
		Pruning/ cutting back and removal and disposal of arisings	Once per year
		Checking/topping-up mulch	Once per year if required
		Gapping-up	Once per year if required to fill gaps in planting
		(ii) Medium maintenance	

Appendix 30/10 Maintenance of Established Trees and Shrubs

Item/ element	Description/ definition	Maintenance Requirements	Frequency of Operation
	grass cutting	Weeding	Three times during the growing season
		Pruning/cutting back and removal and disposal of arisings	Once per year
		Checking/topping-up mulch	Once per year if required
		Gapping-up	Once per year if required to fill gaps in planting
		(iii) Low maintenance	
		Weeding	Twice during the growing season
		Pruning/cutting back and removal and disposal of arisings	Once every two years
		Gapping-up	Once per year if required to fill gaps in planting
	(ii) Woodland Shrubs – generally native shrub species informally planted or developing along the road corridor up to a height of approximately 3.5 metres. Including Native Scrub and shrub species planted under the New Works, shrubs planted under the O&M Works and other shrubs.	Pruning/cutting back	Once every 5 years
Woodland	(i) Establishing Woodland	Weeding	Once per year

Appendix 30/10 Maintenance of Established Trees and Shrubs

Item/ element	Description/ definition	Maintenance Requirements	Frequency of Operation
	– between 5 and 10 years after planting, a developing area of tree species with or without shrubs and with potential of developing into a mature woodland area. Including Deciduous Woodland and Mixed Woodland planting planted under the New Works and woodland planted under the O&M Works and other woodland.	Pruning/cutting back and removal and disposal of arisings	Once every 3 years
		Thinning/Coppicing	Once every 5 years
		Clearing/felling	As required to remove unsafe or diseased trees
	(ii) Maturing Woodland – over 10 years old, an established area of dense tree cover with or without woodland shrubs. Including Deciduous Woodland and Mixed Woodland planting planted under the New Works, woodland planted under the O&M Works and other woodland.	Pruning/cutting back and removal and disposal of arisings	Once every 5 years
		Thinning/Coppicing	Once every 5 years
		Clearing/felling	As required to remove unsafe or diseased trees
Undesirable Scrub	Areas of un-desired self seeded vegetation, predominantly (but not exclusively) gorse, broom and bramble under 2.5 metres high	Cutting Back	Once every 5 years and as required for safety reasons
		Clearing	Once every 5 years and as required for safety reasons
		Removal/disposal of arisings	After cutting back and clearance as required for safety reasons
Individual Trees	Lone Trees, or where there is no interlocking canopy with the nearest	Pruning/cutting back/ removal and disposal of arisings	Once every 5 years and as required for safety reasons

Appendix 30/10 Maintenance of Established Trees and Shrubs

Item/ element	Description/ definition	Maintenance Requirements	Frequency of Operation
	neighbours and sporadic trees where there is a loose arrangement of established trees with occasional interlocking canopies. Including Hedgerows Trees, trees planted within Native Scrub under the New Works and other trees not included within Woodland areas.	Clearing/felling	As required to remove unsafe or diseased trees

Appendix 30/10 Maintenance of Established Trees and Shrubs

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.
3	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).
4	3010.12	Hedges shall be cut once a year in accordance with Table 30/10.1 between September and January.
5	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.
6	3010.22	Mixed hedgerows shall be laid in an appropriate style in order to reflect the adjacent or local appearance.
7	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.
8	3010.45	Tree size categories shall be in compliance with the Company's Quality Plan and associated method statements.
9	3010.54	Crown lifting shall be in compliance with the Company's Quality Plan and associated method statements.
10	3010.55	Crown thinning shall be in compliance with the Company's Quality Plan and associated method statements.
11	3010.56	Crown reduction or reshaping shall be in compliance with the Company's Quality Plan and associated method statements.
12	3010.57	Straight felling shall be in compliance with the Company's Quality Plan and associated method statements.
13	3010.58	Sectional felling shall be in compliance with the Company's Quality Plan and associated method statements.
14	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.
15	3010.60	Stump treatment shall be in compliance with the Company's Quality Plan and associated method statements.
16	3010.62	Stump removal shall be in compliance with the Company's Quality Plan and associated method statements.
17	3010.63	All arisings shall be disposed of off the O&M 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.
18	3010.65	Thinning and coppicing shall be carried out in areas of establishing and maturing woodland in accordance with Table 30/10.1 and where identified as being required by the Company's regular inspections.

Appendix 30/10 Maintenance of Established Trees and Shrubs

19	3010.68	Undesirable scrub species shall be controlled in accordance with Table 30/10.1 and where identified as being required by the Company's regular inspections.
20	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.
	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 to time to maximize the effectiveness of the herbicide.
21	3010.71	Operations in accordance with sub-clause 3010.71 shall be carried out in compliance with Table 30/10.1 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 O & M Works Site.
2	3011.3	All inlets and outlets that shall be part of the road drainage system within the O&M 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 O&M 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 Services 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 until the end of the Services 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. 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. 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. 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. Badger fencing shall be in accordance with the following specification: 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". 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 m above ground level and be buried vertically to between 300mm and 500mm 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 300mm. 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 mm in diameter and a galvanised barbed wire shall be securely stapled to the posts of the fence 25mm above the top of the mesh. Fixings for attachment to Structures shall use a resin fixed replaceable bolt system. 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.

Appendix 30/12 Special Ecological Measures

Otter Fencing shall be in accordance with the following specification:

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 50mm X 100 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”. 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 m above ground level and be buried vertically to a depth of not less than 300mm, or 100mm 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 450mm. 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 mm in diameter and a galvanised barbed wire shall be securely stapled to the posts of the fence 25 mm above the top of the mesh. Fixings for attachment to Structures shall use a resin fixed replaceable bolt system.

Tunnels, ledges and underpasses shall be installed in a manner and at locations recommended by the Company’s ecological specialist as follows:

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 O & M 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 O & M 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?".

Bridges, structures and culverts designed to carry water shall incorporate a ledge or platform not less than 150 mm above the highest flood level, not less than 600 mm 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 mm 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.

4	3012.4	Wildlife grilles shall be designed and located in accordance with the requirements of SNH and any other relevant consultees.
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

Appendix 30/12 Special Ecological Measures

		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.

Appendix 32/1 Emergency Response

1 Emergency Response Time

1.1 The response time for attendance at an emergency shall be defined as the time taken from receipt of notification of the emergency by the Company to commencement of appropriate action at the location of the emergency.

1.2 Response times shall always be as short as practicable but in any event shall not exceed the maximum times stated below.

Maximum Response Time	
06:00 to 20.00	20.00 to 06.00
1 hour	1½ hours

2 Emergency Response Team and Constructional Plant

2.1 The following Constructional Plant with operators shall be available for call out 24 hours a day on every day and shall be able to reach the location of the emergency no later than the maximum response time following receipt of notification of the emergency by the Company.

2.2 Pickup trucks 1.5 tonne capacity with towing bracket (equipped with chain saws signs cones lamps and the like cutting equipment temporary patching material ancillary tools and equipment for electrical repairs and isolating supply.)

2.3 The following Constructional Plant with operators shall be available for call out 24 hours a day on every day and shall be able to reach the location of the emergency no later than 4 hours after receipt of notification of the emergency by the Company.

Platform wagons with hoist capable of servicing 18 metres mounting height columns with 2.3 metres bracket projection.

2.3.1 Lorry mounted cranes (safe working load 1.5 tonne).

2.3.2 Suction sweepers with full width brush and channel attachment.

2.3.3 Gully emptiers equipped to work either side of vehicle. Vehicles shall also have a high pressure water jetting facility capable of generating 23.8N/mm² at 75 litres/min.

2.3.4 16 tonne gross vehicle weight lorries with towing bracket. This vehicle shall be complete with snowplough fittings and hydraulics.

2.3.5 Front loading shovels complete with 180° slew back hoe with 4 in 1 bucket and forklift attachment.

2.3.6 Brickwork/masonry saws fitted with metal cutting blade.

2.3.7 Items 2.3.1 to 2.3.5 inclusive shall be fitted with a communication system in accordance with the other provisions of these O&M Works Requirements.

3 Emergency Equipment

3.1 The Company shall have available the following types of equipment specifically to deal with emergencies. The equipment provided shall be stored in the nominated depots for emergency use only:

3.1.1 warning and diversion signs cones lamps tape;

3.1.2 temporary pedestrian fencing traffic barrier;

Appendix 32/1 Emergency Response

3.1.3 chain saws disc cutter/masonry saws; and

3.1.4 drain rods.

3.2 The following equipment shall be available from other sources to react to emergencies temporary concrete safety barrier no later than 24 hours:

3.2.1 portable floodlights and generator no later than 4 hours.

3.3 The Company shall complete the following Table 1 identifying its proposals for the Constructional Plant and equipment that shall be supplied to deal with emergencies. This information shall be included in the Quality System and Quality Plan and the Emergency Response Plan.

Table 1

Emergency Plant and Equipment Proposals

Type of Plant and Equipment	Location of Depot	Number that shall be available

Appendix 33/1 Structural Investigations Test Requirements

1 Test Requirements

1.1 Types of Tests:

1.1.1 Site Surveys/Tests:

(i) half cell potential survey;

(ii) cover survey;

(iii) delamination/soundness survey;

(iv) exposing reinforcement;

(v) depth of carbonation;

(vi) resistivity measurement;

(vii) Initial surface absorption;

(viii) ultrasonic pulse velocity survey; and

(ix) borescope or endoscope survey;

1.1.2 Chemical Tests:

(i) acid soluble chloride content;

(ii) water soluble chloride content;

(iii) cement content/sulfate content/mix proportion;

(iv) water/cement ratio;

(v) alkali content; and

(vi) Alkali silica reaction samples;

1.1.3 Physical Tests:

(i) visual examination of cores;

(ii) density and compressive strength;

(iii) permeability;

(iv) aggregate grading;

(v) petrographic examination;

(vi) micro cracking assessment; and

(vii) electron microscope examination.

1.2 Details of Site Tests

1.2.1 Potential Measurements

(i) Half cell measurements shall be taken to areas proposed by the Company and consented to in writing by the Scottish Ministers at 500 millimetres x 500 millimetres grid centres.

(ii) The equipment shall be saturated copper sulphate (or suitable equivalent) half cell placed on the concrete surface and connected via a high-impedance voltmeter to the reinforcement.

(iii) The tests shall be carried out in accordance with American Society for Testing Materials C876-80. Two readings shall be taken at each node of the grid and the mean value used.

Appendix 33/1 Structural Investigations Test Requirements

(a) Where the readings differ by more than 20 mV a third reading shall be taken and the mean of the two closest readings used.

Ambient conditions and concrete surface temperature shall be recorded together with details of the type of half cell an its most recent calibration check.

(b) Excavation to expose reinforcement for electrical connections shall be made good in accordance with the requirements of Series 1700.

(c) Where appropriate permanent connections shall be made to the reinforcement to facilitate future monitoring of changes in potential.

(d) The results shall be presented as a grid of values marked on projected plans or elevations of the areas measured at a scale of 1:50.

Potential contours shall also be plotted with colour coding at a scale of 1:50 with a contour interval of 50 mV.

Colour block diagrams shall not be an acceptable alternative to colour contours.

1.2.2 Cover Survey

(i) Cover surveys shall be carried out using an instrument complying with the requirements of and in the manner described in BS 1881-204:1988 Testing concrete. Recommendations on the use of electromagnetic covermeters.

(ii) The lowest cover detected in each grid rectangle shall be recorded.

1.2.3 Delamination/Soundness Survey

(i) Delamination / soundness surveys shall be carried out in the following manner

(a) A visual survey shall be carried out and concrete defects such as spalling, cracking crazing honeycombing surface deterioration and staining together with patching or remedial Operations shall be recorded.

(b) Parts of the concrete which shall be suspected of being delaminated shall be tested by sounding with a light hammer.

The affected area shall be recorded and the results presented with the final report.

Photographic records of typical defects shall be taken for the report.

1.2.4 Exposing Bars

(i) Reinforcing bars shall be exposed in areas to be proposed by the Company and consented to in writing by the Scottish Ministers when the results of the potential tests shall be made available.

(ii) The cut-out shall not be greater than 100 millimetres diameter.

(iii) The cover to the bars and the condition of the reinforcement shall be recorded.

(iv) A photograph shall be taken of each bar and caliper measurements

taken to establish the residual cross sectional area.

(v) The removal of concrete shall be carried out carefully such that no damage shall be caused to the reinforcement and overbreak shall be minimised.

1.2.5 Carbonation Tests

(i) Tests for depth of carbonation using a phenolphthalein indicator as detailed in Building Research Establishment Information paper IP/6/81 shall be carried out on core samples drill holes and where concrete shall be broken out either to examine the bars or connect the potential measuring apparatus to the reinforcement.

1.2.6 Resistivity Survey

(i) Resistivity measurements shall be taken at locations and orientations usually where the half cell potential test has indicated that corrosion of reinforcing steel is most likely.

(ii) The test procedure shall be similar to that used for measuring soil resistivity using four electrodes temporarily attached to the concrete across which measurements of voltage and current are taken.

(iii) Details of the proposed testing equipment and method shall be proposed by the Company and consented to in writing by the Scottish Ministers prior to commencing the tests.

1.2.7 Initial Surface Absorption

(i) To be carried out in accordance with BS 1881-5:1970 Testing concrete. Methods of testing hardened concrete for other than strength.

1.2.8 Ultrasonic Pulse Velocity Survey

(i) Ultrasonic pulse velocity surveys shall be carried out using equipment and procedures complying with BS 1881-203:1986 Testing Concrete; Recommendations for Measurement of Velocity of Ultrasonic Pulses in Concrete.

(ii) The purpose of this testing is the detection of defects and estimation of he depth of surface cracks using semi-direct or indirect transmission at grid centres not exceeding 150 millimetres.

(iii) The testing shall be carried out by well-qualified personnel with previous experience in the interpretation of the survey results.

(iv) A water-soluble non-staining couplant shall be used and subsequently removed by power washing.

1.2.9 Borescope Survey

(i) A borescope and suitably experienced operative shall be made available on the O&M Works Site to carry out borescope investigation in holes.

(ii) The borescope shall be of a type and with sufficient length to be suitable for the purpose intended.

(iii) The borescope shall also be fitted with a measuring graticule and a camera attachment. Photographs shall be taken of typical defects.

1.2.10 Endoscope Survey

(i) An endoscope and suitably experienced operative shall be made

available to carry out an endoscope survey.

(ii) The endoscope shall be of a type and with sufficient length of fibrescope to be suitable for the purpose intended.

(iii) The endoscope shall be fitted with a camera attachment and photographs shall be taken of typical defects.

1.3 Chemical Tests

1.3.1 Chloride content acid and water soluble tests shall be carried out in the following manner:

(i) Dust samples shall be reinforced from concrete members using a 20 to 25 millimetres diameter drill bit and the dust collected by a method described in TRRL Company Report 32 or other suitable method.

(ii) Dust samples from the chloride drillings shall be taken at different depths into the concrete and shall be collected and stored in different containers for each depth range clearly labelled with the location depth range date and name of operator.

The depth ranges shall be 0 to 30 millimetres, 30 to 60 millimetres, 60 to 90 millimetres and 90 to 120 millimetres.

Sufficient dust shall be collected at each depth range to enable both acid soluble and water soluble analysis to be carried out.

(iii) Chloride content shall be determined in accordance with BS 1881-124:1988 Testing Concrete; Methods for Analysis of Hardened Concrete.

Samples from each depth range from each set of drillings shall be analysed for the 'total' chloride content using the acid extraction method.

One sample from the 90 to 120 millimetres depth range for each set of drillings shall be analysed for the 'free' chloride content using the water extraction method.

Where the sample from the 90 to 120 millimetres depth range shall be insufficient or unsuitable the 'free' chloride analysis may be carried out on a sample obtained from one of the other depth ranges from the same set.

(iv) Results shall be given in terms of chloride ion by % cement content.

The average cement and sulfate content shall be measured from the analysis of 10% of the drilling samples.

The location of the drillings shall be determined when the potential measurement plots are available.

The exact position should be determined to avoid reinforcing steel by locating the steel with a cover meter.

1.3.2 Cement content sulfate content mix proportions water/cement ratio and alkali content shall be determined in accordance with BS 1881-124:1988 Testing Concrete; Methods for Analysis of Hardened Concrete, on Samples Obtained from Cores.

1.3.3 Alkali Silica Reaction Samples

(i) Cores shall be drilled at locations proposed by the Company and

consented to in writing by the Scottish Ministers.

The cores shall be 75 millimetres diameter drilled to a depth of 400 millimetres.

Intact cores at least 300 millimetres long are required.

(ii) Samples taken from the cores shall be tested for susceptibility of the coarse and fine aggregates to alkali silica reaction.

(iii) The equivalent sodium oxide content shall also be determined for each core. Petrographic examination shall also be carried out as described in the Appendix and

(iv) If alkali silica reaction shall be suspected the Company may propose for the written consent of the Scottish Ministers that the cores be subject to accelerated expansion tests in accordance with Appendix H of the report on 'The Diagnosis of Alkali Silica Reaction' published by the British Cement Association in 1988 reprinted 1992 (The Palmer Report) measurements to be continued up to 1 year with interim reports at 3 monthly intervals.

1.4 Physical Test

1.4.1 Examination of Cores Density and Compressive Strength

(i) Examination of cores density tests and compressive strength tests shall be carried out in accordance with BS 1881-120:1983 Testing concrete. Method for determination of the compressive strength of concrete cores.

Visual examinations are to be carried out on all core samples before preparing the samples for testing.

Density and compressive strength tests are to be carried out on 100 millimetres diameter cores.

(ii) Permeability shall be determined by means of the capillary absorption test in accordance with BS 1881-5:1970 Testing Concrete; Methods of Testing Hardened Concrete for Other Than Strength, on Samples From Cores.

(iii) Aggregate Grading shall be determined in accordance with BS 1881-124:1988 Testing Concrete; Methods for Analysis of Hardened Concrete, on Samples Obtained From Cores.

(iv) Petrographic Examination shall be carried out in the following manner:

(a) Petrographic examination shall be carried out in accordance with ASTM C856-77 on sections obtained from 75 millimetres diameter cores.

(b) The sections shall be obtained from the cores taken for expansion tests for alkali-silica reaction.

(c) Constituent materials shall be identified and a description of the specimen given together with a photograph typically at a magnification of 50X Constituent materials shall be identified and a description of the specimen given together with a photograph typically at a magnification of 50X.

(v) Microcracking Assessment shall be carried out in the following manner:

(a) Selected core samples shall be cleaned of any extraneous debris

and air dried in the laboratory.

(b) They shall then be sprayed with a fluorescent penetrant solution (a dispersion of fluorescent particles in an organic liquid).

(c) When the excess solution has drained from the surface the core samples shall be viewed under ultra-violet light.

(vi) Electron Microscope Examination shall be carried out in the following manner:

(a) Where examination of a sample for microcracking alkali silica reaction susceptibility petrographic analysis or any other purpose indicates that some form of deleterious reaction may be present in the concrete the Scottish Ministers may instruct examination by electron microscope.

(b) Where the Scottish Ministers requires examination the following procedure shall be adopted.

(c) Appropriate pieces of the sample which may take the form of thin sections finely ground sections off cuts or freshly broken surfaces shall be explored with the electron microscope to confirm the presence of the constituents or products of deleterious reactions and to identify them wherever possible.

(d) A written report shall be submitted with electron micrographs (typically at a magnification of 3500 to 5000X) and results of analysis of the matrix with the microprobe.

2 Report Requirements

2.1 Interim Reports shall comply with the following

2.1.1 An interim report shall be to be submitted for each part of a structure to be investigated within one week of completion of site testing showing the results of all surveys and tests carried out on the O&M Works Site.

2.1.2 Copies of field measurements with suitable explanatory notes shall be adequate.

(i) Chloride content analysis shall be presented within fourteen days of sampling.

(ii) Three copies of each interim report are required.

2.2 Final Reports shall comply with the following:

2.2.1 Irrespective of size which shall dictate the number of volumes the Final Report shall be submitted in two sections.

2.2.2 Section 1 of the final report shall be to be submitted within three weeks of completion of O&M Works Site work and shall contain the following information where applicable.

(i) A description of the testing programme and tests carried out a presentation of the results in the form outlined below and a summary of the results.

(ii) The results shall be presented as follows plotted to a scale of 1:50 unless otherwise instructed

Appendix 33/1 Structural Investigations Test Requirements

(A)	half cell potential/ cover	(1)	tabular
		(2)	colour coded contour plans/ elevations to indicate chloride content distribution of results with a contour interval of 50mV
(B)	delamination/ soundness	(1)	plan/elevation marked with suspect areas
		(2)	colour print of major defects
(C)	petrographic	(1)	colour prints of each section
		(2)	detailed description of section with particular reference or otherwise to alkali silica reaction
(C)	ultrasonic pulse	(1)	typical graphs/computer output to demonstrate velocity and interpretation of results
		(2)	plans/elevations/cross sections to show defects detected
(D)	electron microscope	(1)	electron micrographs
		(2)	detailed description of section together with results of microprobe analysis
(E)	borescope	(1)	developed elevations of internal surface of holes examined
		(2)	enlarged colour prints of typical defects
(F)	endoscope	(1)	plans/elevations/cross sections to show location of fibroscope and direction of view for photographs
		(2)	enlarged colour prints of typical defects and other photographs

(iii) All results shall be presented in tabular form and histograms shall be produced where appropriate.

(a) Section 2 of the final report shall contain a written discussion and interpretation of the results of the survey and testing with recommendations for remedial work.

(b) A draft copy of the final report shall be submitted for approval before production of the final report.

2.3 Addendum Reports shall comply with the following:

2.3.1 The results of the alkali silica reaction expansion test shall be reported on a 3 monthly basis.

2.3.2 An Addendum Report shall be produced to cover all the expansion test results.

Appendix 50/1 (Specification for Highway Works) Form HA/P1 (Maintenance)

Paint System Sheet

<table>
<tr><td colspan="9">1. CONTRACT TITLE:
STRUCTURE NO:
GRID REF:</td></tr>
<tr><td colspan="9">2. DATE OF ISSUE OF DOCUMENTS TO TENDERERS:</td></tr>
<tr><td colspan="9">3. ENVIRONMENT AND ACCESSIBILITY:</td></tr>
<tr><td colspan="9">4. EXISTING PROTECTIVE SYSTEM(S):
Metal coatings:
Paint coatings:
Average total thickness (microns):</td></tr>
<tr><td colspan="5">5. REQUIRED DURABILITY OF SYSTEM:
NO MAINTENANCE ……YEARS
MINOR MAINTENANCE ……YEARS
MAJOR MAINTENANCE……..YEARS
(Ref: NG.5008 Appendices 50/1 and 50/2 note (iii))</td><td colspan="4">6. COLOUR OF FINISH:</td></tr>
<tr><td colspan="3">7. BILLED AREA</td><td colspan="4"></td><td colspan="2" rowspan="4">8. PROTECTIVE SYSTEM TYPE:
(i.e. I (M), II (M), III (M), etc):</td></tr>
<tr><td colspan="3">REF: AREA DESCRIPTION:</td><td colspan="4">SURFACE PREPARATION METHOD</td></tr>
<tr><td colspan="3"></td><td colspan="4"></td></tr>
<tr><td colspan="3"></td><td colspan="4"></td></tr>
<tr><td>9. PAINT COAT SUMMARY</td><td colspan="8">CONDITION OF SURFACES OF EXISTING SYSTEM AFTER SURFACE PREPARATION</td></tr>
<tr><td></td><td colspan="2">Condition:

Area Ref.</td><td colspan="2">Condition:

Area Ref.</td><td colspan="2">Condition:

Area Ref</td><td colspan="2">Condition:

Area Ref</td></tr>
<tr><td>COAT & ITEM NO.</td><td>mdft</td><td>B or AS</td><td>mdft</td><td>B or AS</td><td>mdft</td><td>B or AS</td><td>mdft</td><td>B or AS</td></tr>
<tr><td>1st Coat: Item ....</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2nd Coat: Item ....</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3rd Coat: Item ....</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4th Coat: Item ....</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>MINIMUM TOTAL DFT TO BE OBTAINED</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Appendix 50/1 (Specification for Highway Works) Form HA/P1 (Maintenance)

Paint System Sheet

10. DETAILS				
	1st Coat	2nd Coat	3rd Coat	4th Coat
Registered Description Item No. and Colour BBA HAPAS Roads and Bridges Certificate or equivalent Reference Date Registered Brand Name and Manufacturer's ref. No. Manufacturer's Data Sheet No. Minimum dry film thickness (mdft) (µm) Maxaximum local dft (See sub–Clause 5012.6) (µm) Estimated total volume of paint likely to be used. (litres) 'A' type testing required? (YES/NO) (See sub–Clause 5009.3) 'B' type testing required? (YES/NO) (See sub–Clause 5009.11)				
11. STRIPE COAT(S) DESCRIPTION (Including Item No. and colour)				
12. PATCH COAT(S) DESCRIPTION (Including Item No. and colour)				
13. ADDITIONAL INFORMATION (By Paint Manufacturer)				
14. PAINT MANUFACTURER'S OFFICIAL STAMP:				
15. Mdft (µm) NOTE. The minimum total dry film thickness (mdft) of the paint system, neglecting primers and sealers under 30 microns, shall be 15% greater (to the nearest 25 microns) than the sum of the mdfts of the individual paint coats			16. APPROVED BY: DATE	

Appendix 50/3 (Specification for Highway Works) Form HA/P2

Paint Data Sheet

BBA HAPAS Road & Bridges Certificate or equivalent Reference and Date:

Manufacturer:

Item No.:

Registered Description:

Brand Name and Reference No.:

Consistency and Method of Application:

Weight per 5 Litres (kg):

Specific gravity: Colour:

For two-pack paints:

Base: Activator: Mixed components:

Volume Solids %:

For two-pack paints volume solids % for mixed paint:

VOC content g/l (mixed):

Manufacturer's Minimum Dry Film Thickness Range

Recommended lower mdft:

Recommended upper mdft:

Full Application Instructions:

Mix ratio:

Flash Point:

Temperature		5℃	10℃	20℃	30℃
Drying Times (hours)	Surface Dry				
	Hard Dry				
Overcoating Times (hours)	Minimum				
	Maximum				
Pot Life (hours)					

Cleaning Solvent/thinner:

State effects on Drying Times of

Temperatures below 20℃:

Appendix 50/3 (Specification for Highway Works) Form HA/P2

Paint Data Sheet

Manufacturer's Application Restrictions, e.g. for Temperatures or Humidity:

Manufacturer's General Recommendations:

Note:

The Company shall complete the paint system sheet HA/P2 for maintenance painting of steelwork.

Appendix 50/3 (Specification for Highway Works) Form HA/P2

Paint Data Sheet

Contract Title:

Structure Name: Structure No:

Client Name: (Scottish Ministers or other company)

Supervising Firm:

Supervising Firm's Representative Name: Tel No:

Address: Fax No:

Painting Inspection Firm:

Samples Despatched From: (Note 1) Date Despatched:

Inspector's Name: Tel No:

Inspector's Signature:

SAMPLES: (Numbered A1, A2 etc. or B1, B2 etc.) (Note 2)					
Sample No.	Item No.	Manufacturer's Reference No.	Batch No	Colour BS 4800 reference (Note 3)	Sp.G. (Notes 4 & 5)

Paint Manufacturer:

Appendix 50/4SE (Specification for Highway Works) Form SEDD/P3

Paint Sample Despatch List

1 PROCEDURES

1.1 To be followed closely before despatch of paints to an approved local paint testing firm:

1.1.1 Check the specific gravity of each batch of paint;

1.1.2 Check the matching of finish colours to BS 4800;

1.1.3 Select the required sample, i.e.

(i) 'A' sample – unopened tin

(ii) 'B' sample – 500ml sample from painter's kettle or from nozzle of airless spray gun in the case of single component coatings or if the check is to be done in situ otherwise for two-pack coatings separate samples of the base and the activator must be dispatched to the testing laboratory;

1.1.4 List Contract details and details of each set of samples, including the specific gravity of each sample in Sheet 1 SEDD/P3;

1.1.5 Send Form HA/P1 Paint System Sheet with Form SEDD/P3 and paint samples to an approved local paint testing firm and shall:

(i) ensure samples shall be labelled correctly, clips lids of tins down securely and sends the samples promptly; and

(ii) ensure that samples shall be labelled with the structure name, sample number, and additionally in the case of 'B' samples, item number, manufacturer's reference number, batch number and colour.

1.2 Note

1.2.1 State whether from workshop or site (give name and address)

1.2.2 Batch samples comprising unopened tins to be marked A1, A2, etc. Control samples in 0.5 litre tins to be marked B1, B2, etc. Samples No. to run consecutively, i.e. A1 and B1 onwards.

1.2.3 Colour reference to BS 4800 to be given, as stated on Form HA/P1 (Maintenance) Paint System Sheet, e.g. 18 B 25.

1.2.4 For 'A' samples specific gravity (Sp.G.) to be measured by Inspector from separate tins of the same batch. For 'B' samples Sp.G. to be measured by Inspector when taking samples. Samples will be rejected unless Sp.G. is filled in above by Inspector.

1.2.5 If Sp.G. differs appreciably from data sheet do not dispatch 'A' or 'B' samples.

1.2.6 The Company shall complete the paint system sheet SEDD/P3 for maintenance painting of steelwork.