

SCHEDULE 4: O & M WORKS REQUIREMENTS

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SCHEDULE 4: O & M WORKS REQUIREMENT

PART 4: DESIGN AND CONSTRUCTION CRITERIA

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1. Site Information

1.1. Land Accommodation Works

- 1.1.1. The Company shall be responsible for agreeing any necessary accommodation works which may be required to facilitate any works and for providing same. Prior to the commencement of any such Works the Company shall provide Consultation Certificates in accordance with the Certification Procedure in respect of this requirement.

2. Specific Requirements

2.1. Fencing and Environmental Barriers

2.1.1. Temporary Fencing

- (i) Temporary fencing shall be provided and erected by the Company to provide a temporary boundary fence to the O&M Works Site where work has commenced until such time as it is replaced by the permanent fencing.

2.2. Drainage and Service Ducts

2.2.1. The Company's Responsibilities

- (i) The Company shall, prior to the commencement of the Operations, give written notification to the Scottish Environment Protection Agency (SEPA) of the intended date for the commencement of the works.
- (ii) The Company shall consult and comply with the requirements of SEPA with respect to the drainage Design including but not limited to drainage outfalls, culverts, all works on inland waters and pollution control.

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

- (iii) The Company shall not discharge water from the O&M Works Site on either a temporary or permanent basis until it has consulted and complied with the requirements of all interested parties including but not limited to
- a) SEPA – (Contact: John McKechnie, East Kilbride Office, Telephone: 01355 574 200);
 - b) Scottish Natural Heritage (SNH) (Contact: Dave Kelly, Telephone: 01786 450 362);
 - c) Scottish Water (Contact: Alex Kerr, Telephone: 0141 355 5006);
 - d) East Dunbartonshire Council (Contact: Mike Newall, Telephone: 0141 578 8574);
 - e) North Lanarkshire Council (Contact: Tom Peebles, Telephone: 01236 616 406);
 - f) Falkirk Council (Contact: Kevin Collins, Telephone: 01324 504 728);
 - g) South East Management Unit; (Contact: Ian Stewart, Telephone: 0845 413 0222); and
 - h) South West Management Unit; (Contact: Drew Lindsay, Telephone: 0141 781 6900).

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

- (iv) The Company shall consult and comply with the requirements of:
- a) East Dunbartonshire Council (Contact: Mike Newall, Telephone: 0141 578 8574);
 - b) North Lanarkshire Council (Contact: Tom Peebles, Telephone: 01236 616 406);
 - c) Falkirk Council (Contact: Kevin Collins, Telephone: 01324 504 728);
 - d) South East Management Unit; (Contact: Ian Stewart, Telephone: 0845 413 0222);
 - e) South West Management Unit; (Contact: Drew Lindsay, Telephone: 0141 781 6900);
 - f) Transport Scotland (Contact: Scott Lees, Telephone: 0131 244 1895); and
 - g) Scottish Water (Contact: Alex Kerr, Telephone: 0141 355 5006).

as appropriate, with respect to the connection of proposed drainage to the existing drainage network and the existing road drainage network.

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

2.2.2. Drainage: General

- (i) The Design shall take account of the Construction Industry Research and Information Association (CIRIA) Report C697 "The SUDS Manual".
- (ii) The Design shall ensure that on all unkerbed roads surface water drainage and ground water drainage shall be in accordance with Drawing B1 and B15, Type X, to Volume 3 of the MCHW.
- (iii) The Design shall ensure that all kerbed roads have a positive drainage system such as gullies.
- (iv) The Design shall ensure that drainage on footways, footpaths, cycle tracks, combined footways/cycletracks, Accommodation Works Access Tracks, Access Roads/Tracks, Means of Access and otherwise shall remove surface water and sub-surface water to at least 450 millimetres below finished track/path levels.
- (v) The minimum pipe diameter for all drainage systems in the Design shall be 150 millimetres except for cross carriageway drainage where the minimum diameter shall be 300 millimetres.
- (vi) Pipe flow velocities shall not be less than 0.75 metres per second at any point nor greater than 2.5 metres per second at pipe discharge points.
- (vii) All pipes under carriageways less than 1.2 metres below the finished road level (measured from the finished road level to the soffit of the pipe) shall be encased in concrete of minimum thickness 150 millimetres, except for pipes intended to drain the pavement foundation.
- (viii) Subject to the other provisions of this Agreement all surface water drainage in the Design shall be designed in accordance with the Modified Rational Method.
- (ix) Drainage in the Design shall be provided to intercept water, field drains and slope drains and otherwise at the top of cuttings, at the bottom of embankments and in the verges.

- (x) All cut-off ditches shall have stable side slopes and, where required, such ditches shall be treated to prevent erosion. The use of concrete or paving slabs shall not be permitted as a treatment to prevent erosion.
- (xi) Where land drains are encountered in the construction of the O&M Works such drains shall be intercepted and connected to an outfall via a drainage system.

The Company shall consult and comply with the requirements of all landowners and tenants/occupiers in respect of land drain connections. The landowner and tenant/occupier shall be permitted to inspect severed land drains and their connections prior to backfilling.

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

2.2.3. Drainage: Existing

- (i) All existing pipework within 1 metre of carriageway formation level which shall become redundant shall either be excavated and removed from the O&M Works Site or grouted up.
- (ii) All existing pipework over 1 metre below formation level and greater than 375 millimetres in diameter which shall become redundant shall be completely infilled with pulverised fuel ash cement grout or equivalent.
- (iii) The Company shall maintain all existing foul and surface water drainage or suitable temporary drainage until the permanent drainage is installed and functioning satisfactorily. Ground profiles shall at all times be maintained to shed surface water efficiently and directly into the nearest drain and to prevent penetration of water into or below existing pavements.
- (iv) Outfalls of temporary drainage shall comply with the special requirements of the Relevant Authorities as outlined in Part 8 of these O&M Works Requirements.

2.2.4. Drainage: Outfalls

- (i) The Company shall ensure by attenuation or otherwise that discharge of the Design drainage system shall not result in an increase in surface water runoff to a receiving watercourse in flood risk areas. The Company shall ensure that the discharge of the Design drainage system shall not make the present situation, in terms of flooding, any worse for any controlled water. Controlled Waters include coastal waters, inland waters, ponds, rivers or watercourses and ground waters.
- (ii) The design of any outfall which the Company proposes shall be shown to cause minimum disruption to the end user. The Company shall consult and comply with the Relevant Authorities and interested parties in respect of their requirements for such outfalls.

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

2.2.5. Drainage: Culverts

- (i) A culvert shall mean a cross carriageway covered channel or pipeline servicing an open drainage system and such culvert Design shall have a minimum diameter of 900 millimetres.
- (ii) All watercourses whether flowing or dry shall, where levels permit, continue on their existing line and be taken under the new road in

culverts. All culverts shall be designed in accordance with CIRIA Report 168 "Culvert Design Guide" (1991) except that all culverts Design shall be for the 1 in 100 years flood peak discharge flow of the watercourse and best practice.

- (iii) The Design shall ensure that, where an existing culvert shall be replaced or extended, the new culvert shall be no less in dimensions and capacity than the existing culvert.
- (iv) All new culverts shall have a formed concrete headwall at both the inlet and outlet.

All culvert headwalls shall be located a minimum of 2.0 metres beyond the back of the adjacent road verge.

Headwalls in the Design shall be designed as Structures.

- (v) The Design shall ensure that measures shall be taken at watercourses to prevent livestock entering all culverts.
- (vi) The company shall consult and comply with the requirements of:
 - (a) East Dunbartonshire Council (Contact: Mike Newall, Telephone: 0141 578 8574);
 - (b) North Lanarkshire Council (Contact: Tom Peebles, Telephone 01236 616 406); or
 - (c) Falkirk Council (Contact: Kevin Collins, Telephone: 01324 504 728); as appropriate, and
 - (d) SEPA (Contact: John McKechnie, East Kilbride Office, Telephone: 01355 574 200);

with regards to providing trash screens and security screens at culverts.

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

- (vii) The Design shall ensure that the invert and sides of all watercourses at the inlets and outlets of culverts over a minimum length of 5 metres shall be protected from scour and erosion.
- (viii) The Design shall ensure that provision shall be made to facilitate safe access to each culvert inlet and outlet for inspection and maintenance purposes.
- (ix) Culverts shall be designed to convey the 1 in 200 year flood return period without causing significant backing up or afflux immediately upstream.

2.2.6. Pollution

- (i) Drainage systems shall be designed inter alia to reduce the risk of accidental spillages causing pollution of controlled waters and to provide for significant removal of suspended solids and other contaminants.
- (ii) Notwithstanding the other provisions of this Agreement, the Company shall take all reasonable precautions and comply with all statutory requirements, including SEPA requirements, in connection with the water environment, including but not limited to:
 - (a) any interference with the supply to or abstraction from such sources;

- (b) silting;
- (c) erosion of their beds or banks; and
- (d) pollution of the water so as to affect adversely the quality or appearance thereof or cause injury or death to animal, aquatic or plant life in each case by an act or omission by the Company.

2.2.7. Service Ducts

- (i) The Company shall consult and comply with Undertakers and owners of private Apparatus and other relevant parties with regard to the provision of service ducts for the use of, or the future use of, any Undertakers and owners of private Apparatus and other relevant parties, including but not limited to, the following:
 - a) Scottish Water (Contact: Alex Kerr Telephone: 0141 355 5006);
 - b) Scottish Power (Contact: Stuart McGhee, Telephone: 01698 782 361);
 - c) Scotland Gas Networks (Contact: Crawford Dyer, Telephone: 01698 253 107);
 - d) British Telecommunications (Contact: Robert Edwards, Telephone: 0141429 5995);
 - e) Cable and Wireless (Contact: Frank McGrath, Telephone: 0141 342 2967);
 - f) Thus plc (Contact: John McMillan, Telephone: 0141 567 1234);
 - g) Virgin Media (Contact: Brian Leckie, Telephone: 01698 326 631); and
 - h) Traffic Master (Contact: Chris Chamberlain/Richard Green, Telephone: 08705 561 712).

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

- (ii) All service ducts shall have a metal foil strip laid above them to aid their future location and shall be provided with 45 degree bends and extensions at each end to provide entry at a depth of 0.5 metres below finished ground level terminating a minimum of 0.5 metres outwith the edge of the carriageway. Empty ducts shall include draw wires or cords and plugs.
- (iii) The Design shall ensure that ducts which do not terminate in a draw chamber shall have 0.3 x 0.3 metres referenced concrete marker slabs placed directly above the duct ends.
- (iv) Where ducts are required in relation to service diversions passing beneath the carriageway they shall be provided in conjunction with those provided for motorway communication control purposes where appropriate.

2.2.8. Thrust Boring

- (i) Where the Company requires drains or service ducts to be installed by thrust boring, pipe jacking or auger boring, they shall be installed within plus or minus 75 millimetres of the Design line and level.

2.3. Earthworks

- 2.3.1. The Company shall take all necessary measures to obviate any adverse effects on the surrounding area and to prevent flooding and/or pollution.
- 2.3.2. Any ground improvement methods and systems that shall be adopted in the Design and the O&M Works shall be constructed in accordance with the manufacturer's written guidance.
- 2.3.3. Cut-off drainage shall be provided at the limits of all earthworks in accordance with Section 2.2.2.
- 2.3.4. The Company shall take all necessary measures to prevent rocks or other debris from falling on a carriageway.
- 2.3.5. Prior to commencement of any earthworks in the vicinity of any railway the Company shall consult and comply with the requirements of Network Rail (Contact: Ian Cameron. Telephone: 0141 555 4163).

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

2.4. Road Pavements

- 2.4.1. Rigid construction shall not be permitted.
- 2.4.2. Where existing pavement construction is incorporated in the Design, its residual life shall be assessed and the total pavement construction shall provide a Design Life equivalent to that required at Handback as given in Part 3 of these O&M Works Requirements.
- 2.4.3. The Company shall consult and comply with the requirements of the Relevant Authorities and interested parties in respect of carriageway tie-ins and private access roads.

The Company shall provide Consultation Certificates in accordance with the Certification Procedure in respect of this requirement.
- 2.4.4. Side Roads, hard shoulders, hardstrips, maintenance crossing points and lay-bys shall have the same pavement construction as the adjoining carriageway.
- 2.4.5. Pavement Design on bridge decks shall ensure the materials used and depth of pavement layers provided shall be equivalent to the adjacent road pavement.
- 2.4.6. Notwithstanding any other provisions of this Agreement the minimum PSV of chippings or of course aggregate in unchipped surfaces for the Design shall be 60.
- 2.4.7. Porous asphalt surface courses shall not be permitted in the Design unless otherwise agreed with the Relevant Authorities.
- 2.4.8. The pavement Design of Side Roads and the pavement Design of the surface course for all new Motorways shall be in accordance with the DMRB and the Highways Agency Interim Advice Note 73/06.
- 2.4.9. The Design shall ensure that surface course for all new Motorways shall be a Transport Scotland approved polymer modified binder based thin surface course system to Clause 942 of the Specification.

The thin surface course system shall have road/tyre noise levels to level 2, as defined in Clause 942.8 of the Specification and Table NG9/30 of Volume 2 of the MCHW.

2.5. Kerbs, Footways and Paved Areas

- 2.5.1. Wherever existing kerbed roads are affected by the O&M Works, kerbs should be reinstated to the existing specification or as agreed with the Relevant Authorities.
- 2.5.2. Where a footway is adjacent to a carriageway, or within 2 metres of a carriageway the carriageway kerbing shall be half battered. At all other locations where kerbing is required, full battered kerbing shall be used unless otherwise specified. A high containment kerb system shall be used at the central reserve at any location on the O&M Works Site where the road restraint system in the central reserve is omitted.
- 2.5.3. Dropped kerbs shall be provided at all non motorised Users crossings and shall be suitable for pedestrians with prams and disabled using a wheelchair.
The Company shall consult and comply with the requirements of the Relevant Authorities.
- 2.5.4. Footways shall be of flexible construction.
- 2.6. Traffic Signs, Road Markings and Studs
- 2.6.1. The Design, construction and completion of traffic signs, road markings and studs shall be in accordance with:
- (i) The Traffic Signs Regulations and General Directions 2002;
 - (ii) The Traffic Sign Manual (The Stationary Office Ltd, 2006)
 - (iii) The DMRB; and
 - (iv) Local Transport Note 1/94.
- 2.6.2. The Company shall consult and comply with the requirements of:
- (i) Transport Scotland Network Management Division (Contact: Mr Scott Lees, Telephone: 0141 272 7346);
- with regard to all detail for the provision of traffic signs, road markings and studs for Motorways, including junction numbering on Motorways.
- The Company shall provide Consultation Certificates in accordance with the Certification Procedure in respect of this requirement.
- 2.7. Road Lighting and Electrical Works for Traffic Signs
- 2.7.1. Any new lighting shall be designed in accordance with DMRB and the Highways Agency Interim Advice Notes 88/07 and 89/07.
- 2.7.2. Any modifications to lighting on the M80 Motorway, M80 - M73 Link Road and associated slip roads shall be protected by a road restraint system, unless lighting columns have been designed in accordance with TA 89 of the DMRB.
- 2.8. Power Supplies to Road Lighting, Traffic Signs and Traffic Scotland
- 2.8.1. Roads for which the Scottish Minister shall be responsible for shall be wired from separate feeder pillars from those for which each Relevant Authority shall be responsible.
- 2.9. Structures
- 2.9.1. All structural assessments and inspections shall be in accordance with DMRB. Copies of reports of assessments and inspections are to be provided to the Relevant Authorities.

- 2.9.2. All highway Structures shall be designed in accordance with the relevant International, European and National standards.
- 2.9.3. All railway Structures shall be designed in accordance with the relevant International, European and National standards, statutory and Health and Safety Executive/Her Majesty's Railway Inspectorate requirements, and the relevant Group and Line Standards.
- 2.9.4. Finish of structural surfaces to be agreed with the Relevant Authorities.
- 2.9.5. Headroom
- (i) Wherever there are O&M Works on or adjacent to an existing structure the Company shall ensure that the existing headroom is not compromised.
- (ii) Headroom new structures should be designed in accordance with DMRB. Notwithstanding this requirement the headroom at all new structures spanning the Motorway shall be a minimum of 5.7 metres.
- 2.9.6. Where any works are undertaken to existing Structures or where new Structures are to be incorporated into the O&M Works, the minimum concrete cover to reinforcement shall be appropriate to the most onerous exposure class at any particular location within a Structure for an intended working life of at least 100 years. Tolerance Δc between the minimum cover and the nominal cover to allow for fixing precision shall be in accordance with Transport Scotland Interim Amendment Number 23.
- 2.9.7. All new bridge deck waterproofing systems shall be in accordance with IAN 96/07 and CHE Memorandum 199/07, shall have a current BBA Road and Bridge Agrément Certificate and shall be capable of being non-destructively tested.
- The design shall include for independent testing of the waterproofing system in accordance with the Specification.
- The independent testing organisation shall have current third party quality assurance certification.
- The whole width of the bridge deck slab between parapet upstands shall be waterproofed.
- In addition to those surfaces specified in the DMRB and elsewhere, a minimum of 1 metre of the vertical faces at deck ends shall be waterproofed.
- 2.10. Environment and Landscaping
- 2.10.1. Environmental and Landscape Design - General Requirements
- (i) Subject to the other provisions of this Agreement, the Company shall design and construct the O&M Works in accordance with the O&M Works Requirements, the Environmental Assessment Documents and the Specification in Part 5 of these O&M Works Requirements.
- (ii) The Company shall ensure that the O&M Works are designed and constructed to mitigate and/or minimise adverse environmental impacts such that they are clearly and demonstrably not greater than those identified in the Environmental Statement. The Company in carrying out any works shall ensure that experienced landscape architects and other professionals (including ecologists, archaeologists and environmental scientists) are employed and involved throughout the design and construction of the O&M Works to ensure that the design and construction of the O&M Works comply with the requirements of this

Agreement, to undertake any necessary consultations on environmental issues and to provide advice on environmental and landscape design, mitigation and environmental enhancement proposals.

- (iii) All implementation or maintenance of landscape and environmental works shall be undertaken in accordance with Schedule 2 to this Agreement and these O&M Works Requirements.