



Contractor



Forth Crossing Bridge Constructors

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Project **FORTH REPLACEMENT CROSSING**

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LANDSCAPE MANAGEMENT PLAN

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LANDSCAPE MANAGEMENT PLAN

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1 INTRODUCTION

- 1.1.1 This is the Landscape Management Plan (LMP) for the Forth Replacement Crossing, part of the Environmental Management Plan for the construction of the works required by the Code of Construction Practice for the Project.
- 1.1.2 The objective of FCBC is to carry out construction works in such a way that disturbance to the landscape is contained within the construction site. This is in order to ensure that existing landscape elements in the road corridor such as woodland, grassland, marshland, hedges, trees and shrubs (including the soils they sit on) that are not required to be affected by the construction works are adequately protected.
- 1.1.3 The same approach will be taken to the land made available on a temporary basis – land that is not needed will not be touched and existing landscape elements (woodland etc as above) will be similarly protected.
- 1.1.4 FCBC have appointed an Environmental Manager who will be responsible for implementing the procedures in the plan. He is to be assisted in this by the Landscape Clerk of Works, part of the Designer's Site representative team, who will supervise the implementation of the landscape design and the requirements of this plan.
- 1.1.5 This LMP shows how FCBC will achieve this objective; details the controls to be used to protect the landscape from construction activities; sets out the measures to be implemented to manage and maintain the landscape works provided as part of the project and; describes the measures which will be implemented to mitigate visual impacts from the construction works.
- 1.1.6 This plan includes:
- Reference to plans that show the areas of existing trees and vegetation within the construction site to be retained and protected and an outline of the protection measures to avoid accidental damage by construction vehicles and machinery.
 - A schedule of plant species and planting mixes to be used and measures to be implemented to provide sufficient stock of specified species and provenance, including details of plant suppliers to be used.
 - A programme for undertaking planting works.
 - Measures to be implemented to protect new planting.
 - Procedures for the inspection, maintenance and management of planting (including reference to plant handling).
 - Reference to relevant procedures set out in the management plans for other construction activities insofar as they are relevant for the protection of the landscape.
 - Reference to the Pollution Incident Response Plan for emergency procedures to be implemented in the event of a pollution incident.

- 1.1.7 The contractor has consulted with SNH and the relevant local authorities, as appropriate, regarding preparation of the LMP.

2 KEY ISSUES

- 2.1.1 Key issues identified regarding landscape are:

- the Firth of Forth and the estates around South Queensferry are considered to be of high sensitivity to changes in landscape; and
- visual impacts, particularly on residents in close proximity to the construction compounds.
- minimising the effect of the Works on the of areas of mature woodland— particularly on Dundas Estate and St Margaret’s Hope;
- minimising the effects on the areas of wetland— particularly St Margaret’s Marsh; and
- ensuring the successful establishment of landscape mitigation –earthworks, planting and seeding that form part of the Works.

3 EXISTING TREES AND VEGETATION TO BE RETAINED AND PROTECTED

- 3.1.1 The Environmental Statement for the Project includes a commitment (ES table 23.6, item L5) that “Existing trees and vegetation will be retained wherever practicable and incorporated with new planting proposals” and the Construction Code of Practice which accompanies the Forth Crossing Act states that the contractor will avoid unnecessary tree and vegetation removal.
- 3.1.2 This commitment has been translated into the contract through the Indicative Landscape Design – compliance with which is a contractual requirement. The Indicative Landscape Design shows areas of vegetation within the land made available to the Contractor which are to be retained.
- 3.1.3 The FCBC design takes these same areas and, in some small areas, amends them in detail to reflect the difference between the Specimen Design – on which the Indicative Landscape Design was based – and the Construction Design. These changes are subject to Employer agreement through the review process.
- 3.1.4 The site clearance drawings FRC-P_SC-004-D-NT-CLE-02000 to 0200017 clearly indicate the extent of existing vegetation to be retained and protected and note that an arboriculturalist was employed to define the precise limits of felling.
- 3.1.5 The arboriculturalist will, in accordance with BS 5837 (Trees in Relation to Construction), define the line of the protective fencing which will be erected around all areas of retained woodland to stop construction vehicles accidentally straying into protected areas. This fencing will be clearly sign posted to warn construction personnel to avoid the area. The fencing will consist of timber posts with double zinc galvanized wire connectors.

- 3.1.6 In order to proceed as efficiently as possible, FCBC intend to clear the full extent of the site at an early stage in the works. This will also reduce the amount of vegetation removal during the bird breeding season (March-August).
- 3.1.7 In certain areas (e.g. the north slopes of St Margaret's Hope and the Admiralty House access track) with extensive mature trees, the precise extent of felling was defined in consultation with an Arboriculturalist upon completion of the construction design.

4 PLANTING DESIGN, PLANTS AND PLANT SUPPLY

- 4.1.1 The Environmental Statement includes a landscape design to mitigate the adverse effects of the new works and to integrate the road into the landscape.
- 4.1.2 This design has been translated into the contract through the Indicative Landscape Design. The design for the construction tender as accepted varied this design in places to accommodate the changes between the road design on which the Indicative Landscape Design was based and the tender stage design.
- 4.1.3 The construction design further develops this process, to accommodate the final engineering design changes. In all cases the planting design is developed in full cognisance of the Environmental Statement to ensure that the revisions comply with the relevant mitigation commitments.
- 4.1.4 The planting design is shown on drawings FRC-P-___EL-001-A-NT-ENV-30601 to 30617 which were certified and issued for construction in May 2012 (note, two advance planting areas were certified and issued in late 2011, these are incorporated in the above drawing series).
- 4.1.5 The plant mixes used in the design are set out in the Indicative Landscape Design and translated through unchanged into the contract planting schedules,.
- 4.1.6 The plant sourcing has been organised by the Employer, who has agreed a contract with Johnson's of Whixley to supply stock of appropriate local provenance. Discussions will be held between FCBC and the Employer to agree the scheduling of plant supply to tie in with the construction programme. FCBC will also discuss with the Employer the revised plant numbers required where the certified design differs from the indicative design.

5 PLANTING PROGRAMME

- 5.1.1 The Contract requires planting to be carried out as early as possible in the construction programme, in order that the new planting has the maximum time to establish.
- 5.1.2 All woodland, shrub and scrub planting to be at an average density of 1 per m². All plants to be in accordance with the requirements of Specification Appendix 30/6 and all planting material and operations to be in accordance with BS 3936:1992 & BS 4428:1989

respectively.

- 5.1.3 Plants to be planted in random single species groups of 5 to 15 of the same species, except dominant plants which are to be planted throughout the mix area. *Quercus* & *Pinus* to be at least 9m from the edge of the road where there is room in the planting bed.
- 5.1.4 The Employer will provide the plants and ensure that each batch of plants is individually labelled prior to delivery. FCBC will mark up a copy of the planting plans to show where the plants from that batch have been planted. FCBC will retain the plant labels and when work is completed they will forward on to the Employer the labels and the marked-up plans.
- 5.1.5 This requirement will be balanced with the construction reality that areas for planting only become fully available when not only the earthworks are complete but all ancillary works in the area are complete.
- 5.1.6 Two large areas of mitigation planting have been included in the design at Castlandhill and at Echline, which are outwith the land required for the permanent works or for site construction. These were planted in the available first planting season in 2012.

6 SPECIES

6.1.1 MW1 Mixed Woodland Planting

- 5.0% *Aesculus hippocastanum*
- 10.0% *Alnus glutinosa*
- 20.0% *Betula pendula*
- 10.0% *Fagus sylvatica*
- 15.0% *Fraxinus excelsior* (substitute species used following ban on movement of ash)
- 5.0% *Ilex aquifolium*
- 5.0% *Pinus sylvestris*
- 25.0% *Quercus robur*
- 5.0% *Salix caprea*

6.1.2 MW2 Mixed Woodland Planting

- 20.0% *Betula pendula*
- 15.0% *Fraxinus excelsior* (substitute species used following ban on movement of ash)
- 2.5% *Ilex aquifolium*
- 5.0% *Larix decidua*
- 15.0% *Pinus sylvestris*
- 2.5% *Prunus avium*
- 2.5% *Prunus spinosa*
- 15.0% *Quercus robur*

- 17.5% *Salix caprea*
- 2.5% *Taxus baccata*
- 2.5% *Viburnum opulus*

6.1.3 MW2A Mixed Woodland Planting

- 2.0% *Betula pendula*
- 18.0% *Betula pendula*
- 1.5% *Fraxinus excelsior* (substitute species used following ban on movement of ash)
- 13.5% *Fraxinus excelsior*
- 2.5% *Ilex aquifolium*
- 5.0% *Larix decidua*
- 15.0% *Pinus sylvestris*
- 2.5% *Prunus avium*
- 2.5% *Prunus spinosa*
- 1.5% *Quercus robur*
- 13.5% *Quercus robur*

- 17.5% *Salix caprea*
- 2.5% *Taxus baccata*
- 2.5% *Viburnum opulus*

6.1.4 MW3 Mixed Woodland Planting

- 20.0% *Betula pendula*
- 25.0% *Fraxinus excelsior* (substitute species used following ban on movement of ash)
- 2.5% *Ilex aquifolium*
- 2.0% *Larix decidua*
- 8.0% *Pinus sylvestris*
- 7.5% *Prunus avium*
- 20.0% *Quercus robur*

- 7.5% *Prunus spinosa*
- 7.5% *Viburnum opulus*

6.1.5 MW4 Mixed Woodland Planting

- 12.5% *Alnus glutinosa*
- 25.0% *Betula pendula*
- 10.0% *Crataegus monogyna*
- 2.0% *Ilex aquifolium*
- 2.5% *Larix decidua*
- 8.0% *Pinus sylvestris*
- 10.0% *Prunus spinosa*
- 25.0% *Quercus robur*
- 5.0% *Viburnum opulus*

6.1.6 MW4a Mixed Woodland Planting

12.5%	<i>Alnus glutinosa</i>
2.5%	<i>Betula pendula</i>
20.5%	<i>Betula pendula</i>
10.0%	<i>Crataegus monogyna</i>
2.0%	<i>Ilex aquifolium</i>
5.0%	<i>Larix decidua</i>
10.0%	<i>Pinus sylvestris</i>
10.0%	<i>Prunus spinosa</i>
2.5%	<i>Quercus robur</i>
20.0%	<i>Quercus robur</i>
5.0%	<i>Viburnum opulus</i>

6.1.7 HW1 Hedgerow Planting with trees

10.0%	<i>Carpinus betulus</i>
14.0%	<i>Corylus avellana</i>
2.0%	<i>Crataegus monogyna</i>
70.0%	<i>Fagus sylvatica</i>
2.0%	<i>Ilex aquifolium</i>
1.0%	<i>Prunus spinosa</i>
1.0%	<i>Rosa canina</i>

6.1.8 Trees in the above, average 10 in any 100m length of hedge

25.0%	<i>Fagus sylvatica</i>
25.0%	<i>Fraxinus excelsior</i> (substitute species used following ban on movement of ash)
50.0%	<i>Quercus petraea</i>

6.1.9 HW2 Hedgerow Planting

10.0%	<i>Carpinus betulus</i>
14.0%	<i>Corylus avellana</i>
2.0%	<i>Crataegus monogyna</i>
70.0%	<i>Fagus sylvatica</i>
2.0%	<i>Ilex aquifolium</i>
1.0%	<i>Prunus spinosa</i>

7 PLANT PROTECTION

7.1.1 The contract requires that all planting is protected from grazing by animals including livestock, and browsing animals such as rabbits, hares and deer.

7.1.2 Protection will be provided by fencing which will consist of a 1.2m high post and two wire lines; post will be spaced at 2m, with a warning sign placed every 30m along the line of

the fence.

- 7.1.3 An assessment will be made across the scheme in the early stages of the landscape design and all planting areas considered at risk from damage by rabbits will be enclosed by permanent fencing in accordance with Sub-Clauses 306.4(i), 306.5(i) and 306.6 of the Specification.
- 7.1.4 FCBC has consulted with the Deer Commission for Scotland (now part of SNH) and deer proof fencing will be installed (or the boundary fence modified to make it deer-resistant) where required to reduce the risk of vehicular collisions.
- 7.1.5 FCBC will carry out rabbit, hare and deer control in all landscape areas and keep planting enclosures free of rabbits and deer until the planting has become fully established and is of sufficient size and maturity so as to be no longer vulnerable to significant damage, ensure successful establishment of the planting and seeding works.

8 PLANT HANDLING, INSPECTION, MAINTENANCE AND MANAGEMENT.

- 8.1.1 Procurement, movement, handling, storage, planting and establishment maintenance phases of the landscape works will comply with the landscape design and management policy contained in Cost Effective Landscape Learning from Nature.
- 8.1.2 Similarly, the procurement, movement, handling, storage, planting and maintenance of plant material will be in accordance with the following standards, as appropriate:
 - BS 3936-1 Nursery stock. Specification for trees and shrubs.
 - BS 3936-4 Nursery stock. Specification for forest trees, poplars and willows
- 8.1.3 The Contractor's chartered landscape architect will inspect the planting works at regular intervals in accordance with the Contract. While works are under way, the Landscape Clerk of Works will inspect:
 - identifying vegetation to be protected or removed;
 - stripping of topsoil;
 - grading earthworks and landscape;
 - removing redundant surfaces;
 - ripping subsoil;
 - spreading of topsoil;
 - cultivating before and / or after seeding and planting;
 - seeding;
 - preparing for planting; and
 - planting.
- 8.1.4 During the Establishment Period, the chartered landscape architect will regularly inspect the site and report to FCBC in accordance with the Specification. This will include making

written recommendations to FCBC regarding deficiencies and opportunities for improving the landscape maintenance and exploiting environmental opportunities that become apparent during the Establishment Period to enhance biodiversity and reduce pesticide application.

- 8.1.5 A copy of the chartered landscape architect's written recommendations will be submitted simultaneously to the Employer in accordance with the Review Procedure.
- 8.1.6 The Contractor's chartered landscape architect will confirm the requirements for plant replacement, establishment of woodland, shrub and hedgerow planting and all seeded grassland and wildflower areas and remedial works associated with the design of the Works. FCBC will carry out the recommendations of the chartered landscape architect.
- 8.1.7 FCBC provided method statements which explicitly describe the role of the Contractor's landscape architects for all stages of the Works.
- 8.1.8 The work stages and activities to be supervised, recorded and monitored by the landscape architect and / or Landscape Clerk of Works, ensuring that they are undertaken in accordance with the Specification, will include the following:
- site clearance adjacent to existing vegetation to be retained;
 - erection of protective fencing for vegetation and wildlife;
 - sourcing, testing, movement, storage, spreading and preparation of site-won and imported topsoil;
 - movement, handling, storage, planting and maintenance of plant material before and after planting; and
 - testing, handling, storage, ground preparation and sowing grass and wildflower seed, including promotion of natural regeneration and maintenance thereafter, including use of herbicides.
- 8.1.9 The Contractor's landscape architect will produce a report within seven days of each inspection, issued to the Employer, identifying progress in the landscape works in comparison against the programme developed in accordance with the Contract.

9 MANAGEMENT OF EXISTING VEGETATION

- 9.1.1 FCBC will submit a report of proposed management measures for the two woodland areas identified for active management in the Indicative Landscape Design to the Employer prior to the execution of any such works.
- 9.1.2 Works which will be agreed with the Employer which may impact the retained tree line:
- felling or pruning of any dead, diseased or unsafe trees, or plants blocking signs and lines of sight;

- thinning of overcrowded trees or shrubs to allow selected specimens to grow, improve habitat value or reduce shading to adjacent houses and gardens;
- coppicing of overgrown trees and shrubs to allow growth of new shoots;
- under planting with new shrubs and trees where there are gaps in woodland areas to increase screening, enhance visual amenity or improve habitat value;
- wildlife habitat creation, for example by depositing felled timber and brash within woodland areas in log piles and windrows, where appropriate; and
- mitigation measures where felling was undertaken to prevent windthrow, prior to commencement of the Works.

10 MAINTENANCE AND PLANT REPLACEMENT

- 10.1.1 FCBC will prepare a landscape establishment and maintenance method statement which will include details of the controls to protect the landscape from construction activities together with measures to be implemented to manage, establish and maintain planting, seeding and other landscape or ecological works during the Works as covered by Appendices 30/2, 30/3 30/7 to 30/12 of the Specification. The method statement will be submitted to the Employer a minimum of 28 days before the commencement of the main landscape works. The works will be carried out in accordance with the method statement.
- 10.1.2 The Contractor will submit a separate brief method statement to the Employer of sufficient detail to facilitate an assessment of the management commitments to the landscape Works and their ecological consequences beyond the Establishment Period.
- 10.1.3 This method statement will be submitted a minimum of 28 days before the commencement of the landscape planting and seeding works.
- 10.1.4 The Contractor will submit a landscape maintenance manual to the Employer for approval, not less than 42 days prior to commencement of the main planting operations (excluding the advance planting areas) detailing the landscape maintenance and management operations that the Contractor intends to carry out during the Establishment Period.

11 OTHER RELEVANT PROCEDURES

- 11.1.1 Other relevant procedures are covered in the Ecological and Agricultural Management Plans.

12 MITIGATION OF POTENTIAL IMPACTS ON THE LANDSCAPE OR LANDSCAPE RESOURCES

- 12.1.1 FCBC will endeavour to put in place planting and other landscape measures as early as is reasonably practicable where there is no conflict with the construction activities or other

requirements of the Project.

- 12.1.2 Access to the construction site will be controlled in accordance with the requirements of Section 4.6 of the CoCP. FCBC will have regard to potential impacts on trees or other mature vegetation when positioning site access and egress points and will seek to avoid unnecessary impact.
- 12.1.3 The procedures developed by FCBC in management plans for other construction activities will take consideration of the objective to protect the landscape and landscape resources. Relevant procedures will be set out in the following subsidiary management plans, as appropriate:
- Area Management Plan.
 - Dust and Air Pollution Management Plan.
 - Geology, Land Contamination and Waste Management Plan.
 - Surface and Ground Water Management Plan.
 - Ecological Management Plan.
 - Agriculture Management Plan.
 - Cultural Heritage Management Plan.
 - Pollution Incident Response Plan.
- 12.1.4 The procedures set out in Section 11.3 of the CoCP relating to the temporary use of agricultural land will apply equally in relation to the use of other categories of land used temporarily during construction.
- 12.1.5 FCBC will provide appropriate mitigation to reduce landscape, visual and other environmental impacts associated with temporary site offices and compounds.
- 12.1.6 The procedures set out in Section 11.3 of the CoCP relating to the handling of agricultural soils will be applied equally in relation to soils to be used in areas to be seeded or planted. The sourcing, testing, stripping, handling, storage and spreading of site-won and imported topsoil will comply with BS 6031 Code of practice for earthworks.
- 12.1.7 FCBC will comply with the requirements of Section 10.4 of the CoCP in relation to measures to prevent the spread of invasive and alien species.
- 12.1.8 FCBC will comply with the requirements of Section 10.5 of the CoCP regarding the protection of trees and Section 10.6 of the CoCP regarding tree planting and replacement.
- 12.1.9 FCBC will consult with SNH, relevant local authorities, the airport operator of Edinburgh Airport, community councils and adjacent landowners, as appropriate, regarding landscaping and planting proposals.

13 REFERENCES

BS 3936-1:1992 Nursery stock. Specification for trees and shrubs, British Standards Institution;

BS 3936-4:1984 Nursery stock. Specification for forest trees, poplars and willows, British Standards Institution;

BS 3998:1989 Recommendations for Tree Works, British Standards Institution;

BS 5837:2005 Trees in Relation to Construction, British Standards Institution;

BS 6031:1981 Code of Practice for Earthworks, British Standards Institution
Wildlife and Countryside Act 1981, as amended