MetroWest

Portishead Branch Line (MetroWest Phase 1)

Planning Inspectorate Reference: TR040011

Applicant: North Somerset District Council

9.47 ExA.FI.D7.V2 – Agreement with Forestry Commission – executed by Forestry Commission

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WOMBLE BOND DICKINSON

2021

Agreement relating to rights at Leigh Woods, Abbots Leigh Road, Abbots Leigh, BS8 3QB

The Secretary of State for Environment Food and Rural Affairs (1) and North Somerset District Council (2)

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DATE

PARTIES

(1) **The Secretary of State for Environment Food and Rural Affairs** care of The Forestry Commission, 620 Bristol Business Park, Bristol, BS16 1ES (the **"Landowner"**); and

(2) **North Somerset District Council** of Town Hall, Walliscote Grove Road, Weston-super-Mare BS23 1UJ (the **"Licensee"**)

RECITALS

1. The Landowner owns the Property.

2. The Licensee is in the process of promoting the Order and if granted will be responsible for the delivery of the Project.

3. As part of the grant of the Order the Licensee is required to comply with or procure compliance with the Habitat Compensation Obligation and the Tree Planting Obligation.

4. As part of the delivery of the Project the Licensee will require access to the Property for the purpose of undertaking geotechnical works and to gain access to the Neighbouring Land.

5. The Landowner has agreed to grant the Licensee an option to require the Landowner to enter into the Access Licence and the Works Licence with the Licensee in accordance with the terms of this Agreement and also to undertake the Habitat Compensation Obligation and Tree Planting Obligation on the Property in accordance with the terms of this Agreement.

AGREED TERMS

1. DEFINITIONS AND INTERPRETATION

1.1 The definitions and rules of interpretation in Clause 1 apply:

Access Licence	means the access licence in the form set out at Schedule 1
Access Licence Notice	means written notice by the Licensee to the Landowner to exercise the Access Licence Option.
Access Licence Option	means the option granted at Clause 2.1.2 to the Licensee to call for the grant of the Access Licence pursuant to Clause 7;
Access Licence Rights	means the rights granted to the Licensee in the Access Licence;
AGVMP	means the Avon Gorge Vegetation Management Plan in the form certified and annexed to the Order which shall be the form annexed to this Agreement at Appendix 2;
Certificate of Competence	means certificates of safe working practice issued by either the Forestry Industry Safety Accord (FISA) or any relevant regulatory body or any industry body in relation to such working practice or such equivalent or replacement bodies as the parties (acting reasonably) may agree;
Compensation Provisions	means the provisions at Schedule 3;

Competent Authority	any statutory undertaker or any statutory public local or other authority or regulatory body or any court of law or government department or any of them or any of their duly authorised officers;
Deed of Covenant	a deed of covenant with the Licensee containing covenants in the same terms as the obligations of the Landowner in this Agreement with such minor modifications as the Licensee may agree;
Disposal	a disposition within the meaning of section 27(2) of the Land Registration Act 2002 of the whole or any part or parts of the Property.
Fee	[redacted]
Habitat Compensation Area	such parts of the land shown edged and tinted blue on Plan 1 which form part of the Property
Habitat Compensation Commencement Date	means the date stated in the Habitat Compensation Obligation Notice (which date shall be not less than 10 Working Days after the date of the Habitat Compensation Obligation Notice);
Habitat Compensation Obligation Notice	means written notice by the Licensee to the Landowner to exercise the Habitat Compensation Option;
Habitat Compensation Obligation Option	means the option granted at Clause 2.1.5 to the Licensee to call for the compliance by the Landowner with the Habitat Compensation Obligation;
Habitat Compensation Obligation Period	means the period of ten years from and including the Habitat Compensation Commencement Date;
Habitat Compensation Obligations	means the obligations, works and management functions required pursuant to the Woodland Management Plan;
Independent Expert	means a Fellow of the Royal Institution of Chartered Surveyors or the Incorporated Society of Valuers and Auctioneers or a Chartered Accountant or a Solicitor (as dictated by the details of the dispute) having at least 5 years' experience relevant to rail and/or infrastructure projects and/or forestry management (depending of the nature of the dispute)
Interest Rate	means three per cent per annum above the base lending rate from time to time of the Bank of England
Landowner's Solicitors	means Michelmores LLP, Broad Quay House, Broad Quay, Bristol BS1 4DJ (reference 137605/57/BZL)
Licence Rights	means the Access Licence Rights and the Works Licence Rights;
Licensee's Solicitors	means Womble Bond Dickinson LLP, 3 Temple Quay, Temple Back East, Bristol, BS1 6DZ (reference 381278.70)

Necessary Consent	means all planning permissions and all other consents, licences, permissions, certificates, authorisations and approvals whether of a public or private nature which shall be properly required by any Competent Authority or third party;
Neighbouring Land	those parts of the land in title ST276238 shown coloured green on Plan 4
NRIL	Network Rail Infrastructure Limited (Company No: 2904587) whose registered office is at 1 Eversholt Street, London NW1 2DN or any successor in function to Network Rail Infrastructure Limited
NRIL's Property	means the land comprising the Parson Street Junction to Portishead railway line of Network Rail (together with all land, embankments, overbridges, underbridges, paths, roadways, verges, structures and works from time to time comprising the railway undertaking of Network Rail) including but not limited to land in the ownership of the Licensee relating to the Project
Option Period	means the period and starting on the date of this Agreement expiring at 5pm on March 2031
Order	the development consent order to be granted by the Secretary of State for Transport under s. 114 Planning Act 2008 pursuant to an application lodged on 15 November 2019 in relation to the Project
Permission	means all consents (including the Order or any other development consent order or similar granted by the Secretary of State for Transport) necessary for the construction or operation of the Project (and/or any modification, replacement or variation of such consent or consents) required under any one or more of the following statutes: 1. Planning Act 2008; 2. Town and Country Planning Act 1990; or 3. any other permissions granted by the appropriate authority (including a local authority), including for the avoidance of doubt any deemed consents in connection with consent under the Planning Act 2008, and for the avoidance of doubt, references to a specific statute in this definition include any statutory extension or modification, amendment, re-enactment or replacement of that statute and any regulations or orders made under that statute)
Plan 1	means the plan attached to this Agreement and marked Plan 1
Plan 2	means the plan attached to this Agreement and marked Plan 2
Plan 3	means the plan attached to this Agreement and marked Plan 3
Plan 4	means the plan attached to this Agreement and marked Plan 4
Planning Acts	means the Town and Country Planning Act 1990 the Planning (Listed Buildings and Conservation Areas) Act 1990 the Planning (Hazardous Substances) Act 1990 the Planning (Consequential Provisions) Act 1990 and the Planning Act

	2008, including all amendments to the same in force from time to time and any other applicable Town and Country Planning legislation
Planning Agreement	means: 1. any agreement bond or guarantee required by a competent authority; or 2. any undertaking bond or guarantee offered to a competent authority in connection with the grant of Permission (whether under Sections 106 or 299 Town and Country Planning Act 1990 Section 33 Local Government (Miscellaneous Provisions) Act 1982 Section 38 or Section 278 Highways Act 1980 Section 18 Public Health Act 1936 Section 104 Water Industry Act 1991 Section 39 of the Wildlife and Countryside Act 1981 Section 111 Local Government Act 1972 or otherwise)
Project	means the construction maintenance and operation of the Parson Street Junction to Portishead railway line together with associated activities including survey, investigation, clearance of vegetation, construction, cleansing, testing, repair, maintenance, renewal and addition of equipment and infrastructure and all other works required for the reinstatement, repair, maintenance and widening of NRILs railway situated on NRIL's Property
Property	means the land in the ownership of the Landowner at Leigh Woods, Abbotts Leigh Road, Abbots Leigh, BS8 3QB, as shown edged purple on Plan 1, comprising the land registered under title number AV227327 at the Land Registry together with any such right title and interest as the Landowner has in the land shown shaded brown on Plan 1 so far as this falls outside of the land shown edged purple on Plan 1
Site	means the part of the Property over which the Licensee requires the Works Licence shown coloured green on Plan 1
Tree Planting Area	means the land shown coloured yellow on Plan 1
Tree Planting Commencement Date	means the date stated in the Tree Planting Obligation Notice (which date shall be not less than 10 Working Days after the date of the Tree Planting Obligation Notice);
Tree Planting Obligation	means the obligations, works and management functions required pursuant to the Tree Planting Plan;
Tree Planting Obligation Notice	means written notice by the Licensee to the Landowner to exercise the Tree Planting Option;
Tree Planting Option	means the option granted at Clause 2.1.4 to the Licensee to call for the compliance by the Landowner with the Tree Planting Obligation;
Tree Planting Period	means the period ten (10) years from and including the Tree Planting Commencement Date;
Tree Planting Plan	means Annex H to the AGVMP

Value Added Tax	means value added tax as defined in the Value Added Tax Act 1994 any tax of a similar nature substituted for or levied in addition to such value added tax
Woodland Management Plan	means Annex M to the AGVMP
Working Day	means any day (other than a Saturday or Sunday) on which clearing banks in the City of London are open to the public for the transaction of business
Works	means rock picking, vegetation clearance and (where required following a geotechnical inspection of the Site by the Licensee) the installation of rock bolts at the Site which shall be required to ensure the Site is sufficiently safe to enable the Project and the ongoing use of the NRIL railway as a passenger train line.
Works Licence	means the works licence in the form set out at Schedule 2.
Works Licence Notice	means written notice by the Licensee to the Landowner to exercise the Works Licence Option;
Works Licence Option	means the option granted at Clause 2.1.3 to the Licensee to call for the Works Licence pursuant to Clause 8;
Works Licence Rights	means the rights granted to the Licensee in the Works Licence.

1.2 Interpretation

In this Agreement unless the context otherwise requires:-

1.2.1 every covenant by a party comprising more than one person shall be deemed to be made by such party jointly and severally;

1.2.2 where the context so requires words importing the singular shall include the plural and vice versa;

1.2.3 any covenant by a party not to do any act or thing shall include an obligation not knowingly to permit or suffer such act or thing to be done by their respective servants agents employees licensees workmen and contractors;

1.2.4 any reference to Licensee shall include the Licensee and NRIL and either of their agents employees professional advisers contractors and any other person who shall have been approved in writing in advance by the Landowner;

1.2.5 any reference to person includes a natural person, corporate or unincorporated body (whether or not having separate legal personality).

1.2.6 any reference to a statute (whether specifically named or not) shall include any amendment or re-enactment of it for the time being in force and all instruments orders notices regulations directions bye-laws permissions and plans for the time being made issued or given under it or deriving validity from it;

1.2.7 all agreements and obligations by any party contained in this Agreement (whether or not expressed to be covenants) shall be deemed to be and shall be construed as covenants by such party;

1.2.8 the words "including" and "include" shall be deemed to be followed by the words "without limitation";

1.2.9 the titles or headings appearing in this Agreement are for reference only and shall not affect its construction;

1.2.10 any reference to a Clause, Schedule or Annexure shall mean a Clause, Schedule or Annexure in this Agreement;

1.2.11 if in order to comply with any obligation in this Agreement the Landowner or the Licensee shall require the consent of a third party such obligation shall be deemed to be subject to the obtaining of such consent.

1.2.12 any reference to writing or written excludes fax and email (save for the service of notices pursuant to Clause 19)

1.2.13 any reference to the Landowner or the Licensee shall include their respective successors in title.

2. OPTIONS FOR RIGHTS AND OBLIGATIONS

2.1 In consideration of the covenants contained in this Agreement on the part of the Licensee and payment of the Fee (receipt of which is acknowledged by the Landowner) the Landowner hereby grants to the Licensee:

2.1.1 for the Option Period the rights granted at Clause 6;

2.1.2 for the Option Period the Access Licence Option;

2.1.3 for the Option Period the Works Licence Option;

2.1.4 the right to call upon the Tree Planting Option in accordance with the provisions at Clause 10; and

2.1.5 the right to call upon the Habitat Compensation Obligation Option in accordance with the provisions at Clause 9 .

3. TITLE MATTERS

3.1 The Landowner's title to the Property has been deduced to the Licensee's Conveyancer before the date of this Agreement;

3.2 The Licensee is deemed to have full knowledge of the Landowner's title to the Property and is not entitled to raise any objection, enquiry, requisition or claim in relation to it, save for in respect of any matter arising or registered after the date of this Agreement or which are revealed by the Licensee's pre-completion searches;

3.3 The Landowner agrees with the Licensee that insofar as any right or obligation granted to the Licensee pursuant to this Agreement in respect of the Property are affected the Landowner shall not:

3.3.1 make any Disposal at any time during the term of this Agreement without first procuring that the person to whom the Disposal is being made has executed a Deed of Covenant; or

3.3.2 create or vary nor permit or suffer to be created or varied any third party rights or encumbrances over the Property (including without limitation the grant or variation of licences, easements or wayleaves) without the prior written consent of the Licensee, such consent not to be unreasonably withheld or delayed and to be provided within 20 Working Days of each request (any failure to respond within 20 Working Days is to be treated as deemed approval)

provided that the Landowner shall be free to let the whole or any part of parts of the Property where the rights or obligations granted to the Licensee pursuant to this Agreement are not adversely affected; and

provided further that with the Licensee's approval (such approval not to be unreasonably withheld or delayed) the Landowner may let the whole or any part of parts of the Site where the rights or obligations granted to the Licensee pursuant to this Agreement are affected under the terms of a licence on terms that:

3.3.3 provide that the term of occupation expires after a period of twelve (12) months or if later contains a Landowner's break clause on no more than two (2) months' notice; and

3.3.4 provide for use of such parts of the Property for forestry purposes and activities (which shall include leisure activities) ancillary thereto only.

3.4 The Landowner covenants that until the later of either the expiry of the Option Period or the termination or expiry of the Works Licence it shall not make any claim against the Licensee in relation to any interference with any mines and minerals located under the Site arising from the carrying out of the Project and agrees to waive all rights (if any) in such mines and minerals for nil consideration.

3.5 The Licensee may following the date hereof register a unilateral notice, against the Landowner's title to the Property in relation to this Agreement and the Landowner shall provide such assistance to the Licensee as the Licensee reasonably requires (the Licensee paying the Landowner's proper and reasonable costs in doing so) to enable it do so.

3.6 The Landowner consents to the entry of the following restriction against the Landowner's title to the Property at HM Land Registry and will provide the Licensee with all necessary assistance (the Licensee paying the Landowner's proper and reasonable costs in doing so) and/or documentation to permit entry of the restriction:

"No disposition of the registered estate by the proprietor of the registered estate or by the proprietor of any registered charge not being a charge registered before the entry of this restriction is to be registered without a certificate signed by North Somerset District Council or by its conveyancer that the provisions of Clause 3.3 of the Option Agreement dated 2021 and entered into between (1) The Secretary of State for Department of Environment Food and Rural Affairs and (2) North Somerset District Council have been complied with or do not apply to the disposition."

3.7 Following an assignment of this Agreement as permitted by Clause 16, the Licensee shall make an application to HM Land Registry to withdraw the restriction and unilateral notice entered by the Licensee against the title to the Property in respect of this Agreement and the assignee of this Agreement shall be entitled to register a new restriction in the same form as that detailed in Clause 3.6.

3.8 Within 15 days of the earlier of the expiry or termination of this Agreement the Licensee shall make an application to HM Land Registry to withdraw any subsisting restriction or unilateral notice entered against the Property in respect of this Agreement.

4. MATTERS TO WHICH THE RIGHTS ARE SUBJECT

4.1 The Licence Rights are granted subject to:

4.1.1 all matters in the nature of easements and quasi or purported easements rights and privileges (if any) affecting the Property;

4.1.2 all local land charges (whether registered before or after the date of this Agreement) and all matters capable of registration as local land charges;

4.1.3 all notices served and orders demands proposals or requirements made by any local or other public authority (whether before or after the date of this Agreement);

4.1.4 all actual or proposed charges notices orders restrictions agreements conditions or other matters arising under the Planning Acts;

PROVIDED THAT the Landowner shall use reasonable endeavours prior to entering into this Agreement to assist by way of providing full and proper replies to written enquiries to the Licensee in order that the Licensee can determine the nature and extent of such matters.

5. LANDOWNER'S USE OF THE SITE

5.1 The Landowner covenants that during the term of this Agreement it shall not be entitled to work win or interfere with any mines and/or minerals located beneath the Site provided doing so shall not contravene or interfere with delivery of and compliance with the AGVMP.

5.2 The Landowner agrees with the Licensee that until termination of this Agreement pursuant to Clause 12 the Landowner shall be entitled to:

5.2.1 erect construct or place any new building or structure or carry out any excavation or plant any new trees (save as provided for pursuant to the terms of this Agreement) or lay any new surface on the Site; or

5.2.2 materially raise or lower or suffer to be raised or lowered the existing level of the surface of the Site;

in either case provided doing so shall not contravene or interfere with delivery and compliance with the AGVMP or unless it has first obtained the consent in writing of the Licensee such consent not to be unreasonably withheld or delayed provided that the Licensee is satisfied (acting reasonably) that there will be no material adverse effect on its ability to exercise the rights granted by this Agreement.

6. ENTRY DURING THE OPTION PERIOD

6.1 Subject to Clause 6.2 to Clause 6.8 inclusive during the Option Period the Landowner grants the Licensee the right upon giving to the Landowner not less than 10 Working Days' written notice:

6.1.1 to pass and repass with or without vehicles at all reasonable times along such routes as shall be notified to the Licensee by the Landowner over the Property in order to access the Site;

6.1.2 to enter the Site at all reasonable times with any necessary plant, equipment, materials and vehicles for the purposes of:

(a) carrying out site soil and environmental surveys, environmental mitigation measures, geotechnical ecological archaeological and site investigations in respect of and in preparation for the Works only; and

(b) making trial holes in such positions on the Site as the Licensee is required to in order to investigate the nature of the surface layer and subsoil and remove necessary soil samples where rock bolting is required.

PROVIDED THAT the Licensee shall be required to erect security fencing around any works undertaken pursuant to Clause 6.1.2 and following completion remove all security fencing at its own cost making good all damage caused.

6.2 Before exercising the rights granted in Clause 6.1 the Licensee shall in each instance:

6.2.1 submit for prior approval by the Landowner a:

(a) method statement (which shall incorporate any access requirements);

(b) risk assessment; and

(c) all relevant and necessary Certificates of Competence.

6.2.2 obtain all Necessary Consents in respect of any access or works undertaken.

6.3 In exercising the rights granted in Clause 6.1 the Licensee shall in each instance:

6.3.1 comply with all security and health and safety regulations in respect of the Property which shall be notified to the Licensee;

6.3.2 comply with all reasonable request and requirements of the Landowner which shall be notified to the Licensee (which shall include but not be limited to any requests pursuant to best practice guidance and Forestry England byelaws); and

6.3.3 use reasonable endeavours to ensure that as little disturbance and no damage is caused to the Property and to any flora and fauna on the Property;

6.3.4 make good any damage to the Property or any fixture on the Property caused by the Licensee, its employees or its contractors at its own cost;

6.3.5 leave the Property in a clean and tidy condition and in no worse condition than it was prior to such entry and free of the Licensee's equipment and property; and

6.3.6 during any works erect security fencing around such parts of the Site over which the works are being undertaken and following completion of those works to remove the security fencing from the Site.

6.4 Where access to the Property cannot reasonably be accommodated by the Landowner because:

6.4.1 such access would interfere with the Landowner's:

(a) necessary maintenance; or

(b) forestry operations; or

(c) compliance with its statutory obligations, or

6.4.2 there is an immediate health and safety risk,

then subject to giving the Licensee not less than 5 Working Days written notice (except in the case of an emergency) the Landowner shall be entitled to delay access to the Property by the Licensee until such time as the Landowner can reasonably accommodate access to the Property by the Licensee PROVIDED THAT such delay shall be not more than four weeks or (in the case of delay pursuant to Clause 6.4.2 only) until such time as there is no longer an immediate health and safety risk, whichever is the later.

6.5 The Landowner shall at all times act in good faith in order to accommodate access to the Property by the Licensee and shall use reasonable endeavours to minimise the duration of any such delay.

6.6 Subject to the Compensation Provisions the Licensee shall indemnify the Landowner against all proper damage, losses, liability, proceedings, costs, claims, demands and expenses incurred or arising in connection with the exercise of the rights set out in this Clause 6 by the Licensee

6.7 During such entry as permitted by Clause 6.1 above the Licensee may place and leave on the Site (but only during the period of such entry) any apparatus or equipment for use in connection

with the purposes set out in Clause 6.1 above at its own risk and the Landowner shall not at any point accept responsibility for the security of any apparatus or equipment left on the Site.

6.8 The Licensee acknowledges that the Landowner has given the Licensee, and others authorised by the Landowner, permission and the opportunity to inspect, survey and carry out investigations as to the condition of the Site and that by exercising the Works Option, the Licensee will be acknowledging that it has formed its own view about the condition and suitability of the Site for the Licensee's purposes.

7. EXERCISE OF THE ACCESS LICENCE OPTION

7.1 At any time during the Option Period the Licensee shall be entitled (but not bound) to serve an Access Licence Notice on the Landowner.

7.2 Following service of a valid Access Licence Notice this Agreement shall constitute an agreement by the Landowner to grant to the Licensee the Access Licence and the Landowner and the Licensee shall enter into the Access Licence within 10 Working Days or earlier by agreement between the parties.

8. EXERCISE OF THE WORKS LICENCE OPTION

8.1 At any time during the Option Period the Licensee shall be entitled (but not bound) to serve a Works Licence Notice on the Landowner.

8.2 Following service of a valid Works Licence Notice this Agreement shall constitute an agreement by the Landowner to grant to the Licensee the Access Licence and the Landowner and the Licensee shall enter into the Works Licence within 10 Working Days or earlier by agreement between the parties.

9. HABITAT COMPENSATION OBLIGATION

9.1 At any time during the Option Period the Licensee shall be entitled (but not bound) to serve a Habitat Compensation Obligation Notice on the Landowner.

9.2 Following service of a valid Habitat Compensation Obligation Notice the Habitat Compensation Period shall commence on the Habitat Compensation Commencement Date.

9.3 Subject to Clause 9.4 the Landowner covenants with the Licensee that for the duration of the Habitat Compensation Period the Landowner shall use reasonable endeavours to observe and perform the Habitat Compensation Obligations.

9.4 The Licensee shall pay to the Landowner within 20 Working Days of receipt of a valid VAT invoice the proper and reasonable costs incurred by the Landowner in undertaking the Habitat Compensation Obligations, such costs to include but not to be limited to staff time, materials, operational charges, sub-contractor costs, professional fees, loss of revenue and profit from tree felling and any product arising or generated directly from any such tree fell and any costs incurred before the Habitat Compensation Commencement Date directly relating to the delivery of the Habitat Compensation Obligations.

9.5 The Landowner shall invoice the Licensee quarterly in arrears.

9.6 In the event the Landowner does not wish or is unable to undertake the Habitat Compensation Obligations the Landowner shall be entitled upon not less than twelve (12) months written notice to the Licensee to withdraw from such obligations provided that on request by the Licensee the Landowner shall allow the Licensee to step in and undertake the Habitat Compensation Obligations in accordance with Clause 9.9.

9.7 In the event the Landowner fails to observe and perform all or any part of the Habitat Compensation Obligations the Licensee may serve a written notice on the Landowner setting out details of any such failure.

9.8 Following receipt of any notice served pursuant to Clause 9.7 the Landowner shall either:

9.8.1 rectify the obligations set out within the notice to the standard required in the Woodland Management Plan as soon as is reasonably practicable; or

9.8.2 subject to Clause 9.9 allow the Licensee to step in and undertake the Habitat Compensation Obligations.

9.9 Where either:

9.9.1 the Landowner allows the Licensee to step in and undertake the Habitat Compensation Obligations pursuant to Clause 9.8.2;

9.9.2 the Landowner serves notice pursuant to Clause 9.7; and

9.9.3 for any reason the obligations in the Woodland Management Plan have not been complied with

the Landowner shall as soon as reasonably practicable and in any event in good time to enable the Licensee to perform the Habitat Compensation Obligations grant a licence to the Licensee which shall grant all such rights that are reasonably required by the Licensee in order to access the Habitat Compensation Area and undertake the Habitat Compensation Obligations **PROVIDED ALWAYS THAT:**

(a) such rights shall be limited to and only exercised strictly in accordance with the provisions of this Clause 9.9;

(b) subject to Clause 9.12 and reasonable amendment to reflect the Habitat Compensation Obligations the form of licence will on the same terms as the Access Licence and the Works Licence.

9.10 In exercising the rights granted in Clause 9.9 the Licensee shall in each instance:

9.10.1 undertake the Habitat Compensation Obligations strictly in accordance with the obligations and requirements in the AGVMP;

9.10.2 submit for prior approval by the Landowner (such approval not to be unreasonably withheld) a:

(a) method statement (which shall incorporate any access requirements);

(b) risk assessment; and

(c) all relevant and necessary Certificates of Competence.

PROVDED THAT the Landowner shall not be entitled to withhold approval where any document referred to in this Clause 9.10.2 complies with the requirements of the AGVMP.

9.10.3 comply with all security and health and safety regulations in respect of the Property which shall be notified to the Licensee;

9.10.4 comply with all reasonable requests and requirements of the Landowner which shall be notified to the Licensee (which shall include but not be limited to any requests pursuant to best practice guidance and Forestry England byelaws); and

9.10.5 obtain all Necessary Consents in respect of any access or works undertaken.

9.10.6 use reasonable endeavours to ensure that as little disturbance and no damage is caused to the Property and to any flora and fauna on the Property;

9.10.7 make good any damage to the Property or any fixture on the Property caused by the Licensee, its employees or its contractors at its own cost; and

9.10.8 leave the Property in a clean and tidy condition and in no worse condition than it was prior to such entry (which shall be evidenced by a Photographic Schedule of Condition prepared by the Licensee to the reasonable satisfaction of the Landowner) and free of the Licensee's equipment and property.

9.11 In the event the Licensee undertakes all of any part of the Habitat Compensation Obligations the Licensee shall, subject to the Compensation Provisions, indemnify the Landowner against all damage, losses, liability, proceedings, costs, claims, demands and expenses incurred or arising in connection with the exercise of the rights granted pursuant to Clause 9.9.

9.12 Any licence granted pursuant to Clause 9.9 shall include (in place of the existing provision within the forms of Access Licence and Works Licence) a provision which states that:

Where access to the Habitat Compensation Area cannot reasonably be accommodated by the Landowner because:

9.12.1 such access would interfere with the Landowner's:

(a) necessary maintenance; or

(b) forestry operations; or

(c) compliance with its statutory obligations, or

9.12.2 there is an immediate health and safety risk,

then subject to giving the Licensee not less than 5 Working Days written notice (except in the case of an emergency) the Landowner shall be entitled to delay access to the Property by the Licensee until such time as the Landowner can reasonably accommodate access to the Property by the Licensee PROVIDED THAT such delay shall be not more than four weeks or (in the case of delay pursuant to Clause 9.12.2 only) until such time as there is no longer an immediate health and safety risk whichever is the later.

9.13 The Landowner shall at all times act in good faith in order to accommodate access to the Property by the Licensee and shall use reasonable endeavours to minimise the duration of any such delay.

10. TREE PLANTING OPTION

10.1 At any time during the Option Period the Licensee shall be entitled (but not bound) to serve a Tree Planting Obligation Notice on the Landowner;

10.2 Following service of a valid Tree Planting Obligation Notice the Tree Planting Period shall commence on the Tree Planting Commencement Date;

10.3 Subject to Clause 10.4 the Landowner covenants with the Licensee that for the duration of the Tree Planting Period the Landowner shall use reasonable endeavours to observe and perform the Tree Planting Obligations.

10.4 The Licensee shall pay to the Landowner within 20 Working Days of receipt of a valid VAT invoice the proper and reasonable costs incurred by the Landowner in undertaking the Tree Planting Obligations, such costs to include but not be limited to staff time, materials, operational charges, sub-contractor costs, professional fees, loss of revenue and profit from tree felling and any product arising or generated directly from such tree fell and any costs incurred before the Tree Planting Commencement Date directly relating to the delivery of the Tree Planting Obligations;

10.5 The Landowner shall invoice the Licensee quarterly in arrears.

10.6 In the event the Landowner does not wish or is unable to undertake the Tree Planting Obligations the Landowner shall be entitled upon not less than twelve (12) months written notice to the Licensee to withdraw from such obligations provided that a request by the Licensee the Landowner shall allow the Licensee to step in and undertake the Tree Planting Obligations in accordance with Clause 10.9.

10.7 In the event the Landowner fails to observe and perform all or any part of the Tree Planting Obligations the Licensee may serve a written notice on the Landowner setting out details of any such failure.

10.8 Following receipt of any notice served pursuant to Clause 10.7 the Landowner shall either:

10.8.1 rectify the obligations set out within the notice to the standard required in the Woodland Management Plan as soon as is reasonably practicable; or

10.8.2 subject to Clause 10.9 allow the Licensee to step in and undertake the Tree Planting Obligations.

10.9 Where either:

10.9.1 the Landowner allows the Licensee to step in and undertake the Tree Planting Obligations pursuant to clause 10.8.2;

10.9.2 the Landowner serves notice pursuant to clause 10.7; and

10.9.3 for any reason the obligations in the Woodland Management Plan have not been complied with

the Landowner shall as soon as reasonably practicable and in any event in good time to enable the Licensee to perform the Tree Planting Obligations grant a licence to the Licensee which shall grant all such rights that are reasonably required by the Licensee in order to access the Tree Planting Area and undertake the Tree Planting Obligations **PROVIDED ALWAYS THAT:**

(a) such rights shall be limited to and only exercised strictly in accordance with the provisions of this Clause 10.9; and

(b) subject to Clause 10.13 and reasonable amendment to reflect the Tree Planting Obligations the form of licence will on the same terms as the Access Licence and the Works Licence.

10.10 In exercising the rights granted in Clause 10.9 the Licensee shall in each instance:

10.10.1 undertake the Tree Planting Obligations strictly in accordance with the obligations and requirements in the AGVMP;

10.10.2 submit for prior approval by the Landowner (such approval not to be unreasonably withheld) a:

(a) method statement (which shall incorporate any access requirements);

(b) risk assessment; and

(c) all relevant and necessary Certificates of Competence.

PROVDED THAT the Landowner shall not be entitled to withhold approval where any document referred to in this Clause 10.10.2 complies with the requirements of the AGVMP.

10.10.3 comply with all security and health and safety regulations in respect of the Property which shall be notified to the Licensee;

10.10.4 comply with all reasonable requests and requirements of the Landowner which shall be notified to the Licensee (which shall include but not be limited to any requests pursuant to best practice guidance and Forestry England byelaws); and

10.10.5 obtain all Necessary Consents in respect of any access or works undertaken.

10.10.6 use all reasonable endeavours to ensure that as little disturbance and no damage is caused to the Property and to any flora and fauna on the Property;

10.10.7 make good any damage to the Property or any fixture on the Property caused by the Licensee, its employees or its contractors at its own cost; and

10.10.8 leave the Property in a clean and tidy condition and in no worse condition than it was prior to such entry (which shall be evidenced by a Photographic Schedule of Condition prepared by the Licensee to the reasonable satisfaction of the Landowner) and free of the Licensee's equipment and property.

10.11 In the event the Licensee undertakes all of any part of the Tree Planting Obligations the Licensee shall subject to the Compensation Provisions indemnify the Landowner against all damage, losses, liability, proceedings, costs, claims, demands and expenses incurred or arising in connection with the exercise of the rights granted pursuant to Clause 10.9.

10.12 Providing the Landowner has complied with the planting specification contained within the Tree Planting Plan the Landowner will not be liable in the event that all or any tree, shrub or plant fails to establish or grow after it has been planted.

10.13 Any licence granted pursuant to Clause 10.9 shall include (in place of the existing provision within the forms of Access Licence and Works Licence) a provision which states that:

Where access to the Tree Planting Area cannot reasonably be accommodated by the Landowner because:

10.13.1 such access would interfere with the Landowner's:

(a) necessary maintenance; or

(b) forestry operations; or

(c) compliance with its statutory obligations, or

10.13.2 there is an immediate health and safety risk,

then subject to giving the Licensee not less than 5 Working Days written notice (except in the case of an emergency) the Landowner shall be entitled to delay access to the Property by the Licensee until such time as the Landowner can reasonably accommodate access to the Property by the Licensee PROVIDED THAT such delay shall be not more than four weeks or (in the case of delay pursuant to clause 10.13.2 only) until such time as there is no longer an immediate health and safety risk whichever is the later.

10.14 The Landowner shall at all times act in good faith in order to accommodate access to the Property by the Licensee and shall use reasonable endeavours to minimise the duration of any such delay.

11. NON-EXERCISE OF OPTION

11.1 If the Access Option, the Works Option, the Habitat Compensation Obligation Option and the Tree Planting Option have not been exercised in accordance with the terms of this Agreement or

if the Landowner terminates this Agreement under Clause 12 then within 10 Working Days after the expiry of the Option Period or termination of this Agreement (whichever is earlier), the Licensee will remove all entries relating to this Agreement registered against the Landowner's title to the Property.

12. TERMINATION

12.1 For the avoidance of doubt the Licensee may at any time terminate this Agreement immediately by serving notice in writing on the Landowner Provided That such termination shall be without prejudice to the rights either party may have in respect of any outstanding liability (which shall include any outstanding payment) or any antecedent breach of the terms of this Agreement.

12.2 Without affecting any other right or remedy available to it, the Landowner may terminate this Agreement with immediate effect by giving notice to the Licensee if any of the following events occur:

12.2.1 the Licensee is in substantial material breach of any of its obligations in this Agreement and has failed to rectify the breach within four weeks of receiving written notice to rectify from the Landowner specifying;

12.2.2 the Licensee has confirmed to the Landowner in writing that the Project is either completed, decommissioned, suspended, terminated or is no longer proceeding for any reason whatsoever.

13. PERMISSIONS

13.1 Provided such Permission relates solely to the Works, the Landowner shall not object to any application for a Permission made by or on behalf of the Licensee in relation to the Site or any adjoining or neighbouring property or the Project itself and shall take reasonable steps to assist the Licensee (at the Licensee's expense) to obtain all permissions and consents

13.2 Subject to the Compensation Provisions the Licensee will keep the Landowner indemnified against all damage, losses, liability, proceedings, costs, claims, demands and expenses incurred or arising under each Permission that the Landowner enters into under this Agreement including any irrecoverable VAT thereon.

14. PLANNING AGREEMENTS

14.1 The Licensee shall obtain the Landowner's approval (such approval not to be unreasonably withheld or delayed) in connection with any Planning Agreement or Planning Agreements which may be requisite or conducive to obtaining permission or consent relating to the Project.

14.2 Subject to Clause 14.1, upon the reasonable request of the Licensee and at the Licensee's cost the Landowner will enter into any Planning Agreement required in respect of the Works and which relates to all or any part of the Property or the Neighbouring Land providing that the Licensee shall observe and perform all of the obligations on the part of the Landowner contained in the Planning Agreement.

14.3 The Licensee will ensure that any Planning Agreement contains stipulations which confirm that:

14.3.1 Any obligation imposed by the Planning Agreement will be conditional upon the commencement of the Project;

14.3.2 The Landowner will be released from all liability under any Planning Agreement or Planning Agreements if the Landowner disposes of its interest in the whole of the land subject to the Planning Agreement;

14.3.3 The Planning Agreement will cease to bind the Property once the Project has been decommissioned and made safe and all necessary reinstatement has taken place.

14.4 The Licensee will keep the Landowner indemnified against all damage, losses, liability, proceedings, costs, claims, demands and expenses incurred or arising under each Planning Agreement that the Landowner enters into under this Agreement including any irrecoverable VAT thereon.

15. PAYMENTS

15.1 All payments made by the Licensee under the terms of this Agreement or pursuant to the terms of the Access Licence or the Works Licence shall be made by direct credit transfer to an account nominated in advance by the Landowner for that purpose.

15.2 In the event that any payment is not made by the Licensee within thirty days of the due date (which in the case of any compensation shall be in accordance with the Compensation Provisions) then the Landowner shall be entitled to interest on the outstanding balance (excluding any payments made by the Licensee to the Landowner on account) at the Interest Rate from the due date until the date payment is received by the Landowner.

15.3 Save for where indicated to the contrary all claims for compensation made by the Landowner shall be subject to the Compensation Provisions.

15.4 The sums payable pursuant to this Agreement shall be subject to an inflationary increase in each third year of the term of this Agreement (effective from the 1 January in each third calendar year) which shall be calculated in accordance with the Retail Price Index or any official index replacing it.

16. ASSIGNMENT

16.1 The Licensee may assign the whole of its rights under this Agreement to:

16.1.1 any successor to the business undertaking of the Licensee or owner of the Project without the prior consent of the Landowner but subject to providing the Landowner with not less than ten (10) Working Days' notice;

16.1.2 Network Rail Infrastructure Limited (or any successor in function to Network Rail Infrastructure Limited) without the prior consent of the Landowner but subject to providing the Landowner with not less than 10 Working Days' notice; or

16.1.3 any third party not referred to in Clause 16.1.1 and Clause 16.1.2 with the prior written consent of the Landowner such consent not to be unreasonably withheld or delayed.

16.2 The Landowner shall within twenty (20) Working Days of receipt of an application in writing from the Licensee for consent to assign the rights under this Agreement to a third party in accordance with Clause 16.1.3 provide the Licensee with a written decision (**"the Decision Notice"**) stating:

16.2.1 whether or not the Landowner consents to the proposed assignment; and

16.2.2 in the case of a refusal the reasons why the Landowner refuses to give consent to the assignment

PROVIDED ALWAYS that time is of the essence for the purposes of this Clause 16.2 and in the event that the Landowner fails to serve the Decision Notice on the Licensee within the time specified it shall be deemed that the Landowner consents to the proposed assignment.

16.3 Within ten (10) Working Days of any assignment of this Agreement the Licensee shall give to the Landowner written notice thereof such notice stating the name and address of the assignee.

17. VALUE ADDED TAX

17.1 Any payment to be made under the terms of this Agreement shall be deemed to be exclusive of Value Added Tax (if applicable) and the recipient of the payment shall where appropriate supply a valid Value Added Tax invoice addressed to the party making the payment.

17.2 If VAT is chargeable on any supply made by the Landowner under or pursuant to this Agreement, the Licensee will pay the Landowner an amount equal to that VAT as additional consideration on the date that the supply is made.

17.3 If the Landowner has already elected or chooses prior to termination of this Agreement to elect to waive exemption from Value Added Tax in relation to its interest in the Property then the Landowner shall not following the date hereof or following such election (as the case may be) do anything which would disapply or render ineffective for any reason or revoke that election.

18. LEGAL AND SURVEYOR'S COSTS

The Licensee will pay the Landowner's legal and surveyors' reasonable and proper costs and disbursements including any irrecoverable VAT incurred in connection with the Project the Habitat Conservation Activity and the Tree Planting Obligation which shall include the preparation and negotiation of this Agreement and the preparation, negotiation and completion of the Access Licence and Works Licence.

19. NOTICES

19.1 Any notice given under this Agreement must be in writing and signed by or on behalf of the party giving it.

19.2 Any notice or document to be given or delivered under this Agreement must be:

19.2.1 sent by email; and

19.2.2 delivered by hand; or (in place of Clause 19.2.2 only)

19.2.3 sent by pre-paid first class post or other next Working Day delivery service.

19.3 Any notice or document to be given or delivered under this Agreement must be sent to the relevant party as follows:

19.3.1 to the Landowner at:

[redacted]

19.3.2 to the Licensee at:

[redacted]

[redacted]

or as otherwise specified by the relevant party by notice in writing to the other party.

19.4 Any notice or document given or delivered in accordance with clause 19 will be deemed to have been received:

19.4.1 if delivered by hand, on signature of a delivery receipt provided that if delivery occurs before 9.00 am on a Working Day, the notice will be deemed to have been received at 9.00 am on that day, and if delivery occurs after 5.00 pm on a Working Day, or on a day which is not a Working Day, the notice will be deemed to have been received at 9.00 am on the next Working Day; or

19.4.2 if sent by pre-paid first class post or other next Working Day delivery service, at 9.00 am on the Working Day after posting;

19.4.3 if sent by email, at the time of transmission, or, if this time falls outside of the hours of 9.00am to 4.00pm Monday to Friday or on a day which is a public holiday in the place of receipt, at 9.00am on the next business day.

19.5 This clause 19 does not apply to the service of any proceedings or other documents in any legal action or, where applicable, any arbitration or other method of dispute resolution.

20. CONFIDENTIALITY

The terms of this Agreement shall be confidential to the parties and no party shall make or permit or suffer the making of any announcement or publication of such terms (either in whole or in part) nor any comment or statement relating thereto without the prior consent of the other or unless such disclosure is required due to any duty imposed by law on that party (including Freedom of Information legalisation) or disclosure is required by the Licensee in connection with or in order to obtain a Permission

21. ENTIRE AGREEMENT

21.1 This Agreement and the documents annexed to it constitute the entire agreement and understanding of the parties and supersedes any previous agreement or understanding between them relating to the subject matter of this Agreement.

21.2 The Licensee acknowledges and agrees that in entering into this Agreement, it does not rely on and will have no remedy in respect of any statement, representation, warranty, collateral agreement or other assurance (whether made negligently or innocently) of any person (whether party to this Agreement or not) other than as expressly set out in this Agreement or the documents annexed to it.

21.3 Nothing in this clause 21 will, however, operate to limit or exclude any liability for fraud.

22. JURISDICTION

This Agreement and any matter arising from it shall be governed by and construed in accordance with the laws of England in all respects

23. INVALIDITY OF CERTAIN PROVISIONS

If any term of this Agreement or the application of it to any person or circumstances shall to any extent be invalid or unenforceable such term shall be separable and the remainder of this Agreement or the application of such term to persons or circumstances other than those as to which it is held invalid or unenforceable shall not be affected thereby and each term provision of this Agreement shall be valid and enforced to the fullest extent permitted by law

24. DISPUTES

24.1 If any dispute arises in connection with this Agreement, the parties will consult in good faith in an attempt to come to an agreement in relation to the disputed matter. If the matter cannot be resolved within twenty (20) Working Days, either party may refer the matter to an Independent Expert

24.2 Where an Independent Expert is appointed pursuant to Clause 24.1, such expert shall be an independent third party either:

24.2.1 agreed between the parties; or

24.2.2 where no agreement can be reached within ten (10) Working Days of the date that either party indicated that they intend to refer to the matter to an Independent Expert either party shall be entitled to apply to the President for the time being of the Royal Institution of Chartered Surveyors asking them to nominate a person as the Independent Expert. When selecting an Independent Expert the President of the Royal Institution of Chartered Surveyors shall be advised by the applicant of the issues at dispute and shall be required to nominate an Independent Expert with the necessary expertise in the subject matter that is in dispute

24.3 The Independent Expert shall be requested to make a decision on the dispute within thirty (30) Working Days of his appointment and shall act as expert and not as arbitrator

24.4 If the Independent Expert dies or becomes unwilling or incapable of acting or does not deliver the decision within the thirty (30) Working Day period referred to in Clause 24.3, then either party may discharge the Independent Expert and apply to appoint a replacement for him and this clause shall apply in relation the new Independent Expert as if he were the first Independent Expert appointed

24.5 The parties shall be entitled to make submissions to the Independent Expert and shall provide (or procure that others provide) the Independent Expert with such assistance, information and documents as the Independent Expert requires for the purpose of reaching a decision. To the extent not provided for by this Agreement, the Independent Expert may, in his discretion, determine such other procedures to assist with the conduct of his determination as he considers appropriate including (to the extent he considers necessary) instructing professional advisors to assist him

24.6 Each party shall bear their own costs in relation to the Independent Expert whose fees and costs shall be borne by them equally or in such other proportions as the Independent Expert may direct

24.7 Nothing in this Agreement shall prevent either party from seeking an injunction in the courts of England and Wales where their commercial interests would be prejudiced by complying with the above process

25. CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999

It is not intended that the Contracts (Rights of Third Parties) Act 1999 shall operate to confer any rights upon any person who is not a party to this Agreement

26. EXECUTORY AGREEMENT

This Agreement is an executory agreement only and is not to operate or be deemed to operate as a demise of the Property or any part thereof

27. COUNTERPARTS

This Agreement may be executed in any number of counterparts, each of which shall constitute a duplicate original, but all the counterparts shall together constitute the one agreement.

IN WITNESS whereof the parties have executed this deed on the above date

SCHEDULE 1

Access Licence

AGREED TERMS

DEFINITIONS AND INTERPRETATION

1. The definitions and rules of interpretation in this Paragraph 1 apply to this Licence:

1.1

Access Licence Fee	the fees payable pursuant to paragraph 3.1.1 of this Schedule 1
Access Licence Period	means two (2) years which shall begin on and including the date of the Licence, subject to extension pursuant to paragraph 2.1.7.
Access Licence Period Extension Notice	means written notice by the Licensee to the Landowner to extend the Access Licence Period on the terms set out in paragraph 2.1.7.
Access Plan	the plan annexed to this Agreement at Appendix 1 and marked Plan 1
Access Rights	means the rights listed in paragraph 2.1
Access Route	means that part of the Property shown coloured brown on the Access Plan or such other route as shall be designated by the Landowner from time to time and the Landowner shall use reasonable endeavours to ensure that such alternative routes are not materially less convenient or commodious to the Licensee having due regard and consideration for the nature and location of the works for which access is required.
Agreement	means the agreement dated 2021 made between (1) The Secretary of State for Department of Environment Food and Rural Affairs and (2) North Somerset District Council a copy of which is annexed to this Licence.
Certificate of Competence	shall have the meaning given to it in the Agreement.
Compensation Provisions	means the provisions at Schedule 3 of the Agreement as if the same were restated here in full mutatis mutandis;
Landowner	shall have the meaning given to it in the Agreement.
Licence End Date	shall mean the date of expiry of the Access Licence Period.
Licensee	shall have the meaning given to it in the Agreement.
Necessary Consent	shall have the meaning given to it in the Agreement.
Neighbouring Land	shall have the meaning given to it in the Agreement.
Period of Access	shall mean a period of consecutive days during which the Licensee will exercise the Access Rights.

Public Car Park	the public car park shown coloured brown and hatched black on the Access Plan or such other area within the Property as may be designated by the Landowner from time to time and the Landowner shall use reasonable endeavours to ensure that such alternative location is not materially less convenient or commodious to the Licensee having due regard and consideration for the nature and location of the works for which access is required.
Property	shall have the meaning given to it in the Agreement
Peak Periods	means weekends, bank holidays and each day during the school holidays (as notified by Bristol City Council in each calendar year)
Secondary Site Compound	means that part of the Property shown edged red on Plan 2 or such other area within the Property as the parties may agree.
Staff Car Park	the staff car park shown edged red on Plan 3 or such other area within the Property as may be designated by the Landowner from time to time and the Landowner shall use reasonable endeavours to ensure that such alternative location is not materially less convenient or commodious to the Licensee having due regard and consideration for the nature and location of the works for which access is required.
Works	shall have the meaning given to it in the Agreement.

1.2 Clause headings shall not affect the interpretation of this Licence.

1.3 Unless the context otherwise requires, words in the singular shall include the plural and in the plural shall include the singular.

1.4 Unless otherwise specified, a reference to a statute or statutory provision is a reference to it as amended, extended or re-enacted from time to time.

1.5 A reference to a statute or statutory provision shall include all subordinate legislation made from time to time under that statute or statutory provision.

1.6 A reference to writing or written does not include fax or e-mail (save for the service of notices pursuant to Paragraph 7)

1.7 A reference to this Licence or to any other agreement or document referred to in this Licence is a reference to this Licence or such other agreement or document as varied or novated (in each case, other than in breach of the provisions of this Licence) from time to time.

1.8 Unless the context otherwise requires, references to paragraphs are to the paragraphs of this Licence.

1.9 Any words following the terms including, include, in particular, for example or any similar expression shall be construed as illustrative and shall not limit the sense of the words, description, definition, phrase or term preceding those terms.

1.10 Any obligation on a party not to do something includes an obligation not to allow that thing to be done.

1.11 Any definition not defined within this Licence shall otherwise have the meaning given to it in the Agreement.

2. LICENCE

2.1 In consideration of the obligations on the Licensee and in consideration of the payment of the Access Licence Fee the Landowner grants to the Licensee during the Access Licence Period (upon not less than 10 Working Day's written notice to the Landowner for each Period of Access):

2.1.1 A right in common with the Landowner with or without vehicles equipment and machinery over the Access Route for the purpose of accessing the Site and the Neighbouring Land.

2.1.2 A right to use on a temporary basis such parts of the Public Car Park (which shall comprise no fewer than seven conventional car parking spaces) as the Landowner shall designate from time to time agree for the parking of motor vehicles and as a temporary site compound for the temporary storage of equipment, trailers, materials and welfare facilities subject to the following conditions;

(a) the Licensee shall use reasonable endeavours to keep the Landowner appraised of the proposed site usage and give the Landowner as much prior notice as reasonably practicable (such notice not to be less than 10 Working Days) of instances of actual use of the Public Car Park and/or access to the Site via the Access Route;

(b) prior to using any part of the Public Car Park as a temporary storage area the Licensee shall erect a secure fence around such parts of the Public Car Park that are to be used as a temporary storage area;

(c) the Licensee shall not use the Public Car Park during Peak Periods unless such use is authorised in advance by the Landowner; and

(d) the Landowner shall be entitled upon giving a reasonable period of not less than 10 Working Days' notice (except in the case of an emergency) to instruct the Licensee to relocate any use of the Public Car Park as a temporary storage area to an alternative location within the Property and the Landowner shall use reasonable endeavours to ensure that such alternative location is no less convenient or commodious to the Licensee having due regard and consideration for the nature and location of the works for which access is required.

2.1.3 A right to use at any time within the Access Licence Period the Secondary Site Compound for the parking of motor vehicles and as a temporary site compound (subject to the erection of security fencing by the Licensee) for the temporary storage of equipment, trailers, materials and welfare facilities subject to the following conditions.

2.1.4 A right to use up to four parking spaces within the Staff Car Park during the Access Licence Period for the parking of motor vehicles subject to the following conditions:

(a) the Licensee shall give the Landowner not less than 10 Working Days' notice (in each instance) of such periods when access may be required; and

(b) the Licensee shall not use the Staff Car Park during Peak Periods unless such use is authorised in advance by the Landowner.

2.1.5 Subject to the terms of this Licence and prior written approval from the Landowner (such approval to be at the Landowner's absolute discretion) a right to remove any fences, walls, trees, plants, other vegetation or structures on the Property which may interfere with the exercise of the Access Rights.

2.1.6 Subject to prior written approval from the Landowner (such approval to be at the Landowner's absolute discretion), the right to undertake such other alterations to the Property as the Licensee may reasonably require to facilitate the Access Rights.

2.1.7 At any time during the Access Licence Period the Licensee may serve on the Landowner an Access Licence Period Extension Notice to extend the Access Licence Period by up to twelve (12) months (such right to be exercisable on one occasion only).

2.1.8 Following the expiry of the Access Licence Period the Licensee shall be required for a further period of 12 months enter the Site subject to the terms of this Licence for the purposes of:

(a) undertaking a geotechnical re-inspecting of the Site in order to establish whether any additional Works are required; and

(b) undertaking an inspection of all of the Works undertaken by the Licensee during the Works Licence Period in order to ensure there are no defects within those works

in each case making good any damage caused.

2.2 The Licensee acknowledges that:

2.2.1 the Licensee shall occupy such parts of the Property referred to in paragraph 2.1 as a licensee and that no relationship of landlord and tenant is created between the Landowner and the Licensee by this Licence;

2.2.2 the Landowner retains control, possession and management of the Property and the Licensee has no right to exclude the Landowner from all or any part of the Property;

2.2.3 this Licence is personal to the Licensee;

2.2.4 where the Access Rights cannot reasonably be accommodated by the Landowner because:

(a) exercising the Access Rights would interfere with the Landowner's:

(i) necessary maintenance; or

(ii) forestry operations; or

(iii) compliance with its statutory obligations, or

(b) there is an immediate health and safety risk,

then subject to giving the Licensee not less than 5 Working Days written notice (except in the case of an emergency) the Landowner shall be entitled to delay the Licensee from exercising the Access Rights until such time as the Landowner can reasonably accommodate the Licensee exercising the Access Rights.

2.2.5 the Landowner shall at all times act in good faith in order to accommodate the Licensee exercising the Access Rights and shall use reasonable endeavours to minimise the duration of any such delay.

2.2.6 the Licensee shall at all times act in good faith and shall use reasonable endeavours to ensure that:

(a) the number of separate Periods of Access are kept to a minimum throughout the Access Licence Period; and

(b) the duration of each Period of Access is kept to a minimum in each instance.

3. LICENSEE'S UNDERTAKING

The Licensee agrees and undertakes:

3.1 Payments

3.1.1 Subject to paragraph 3.1.4 to pay to the Landowner the following sums upon demand:

(a) a fee of [redacted]

(b) a fee of [redacted];

3.1.2 The fees shall be invoiced quarterly in arrears by the Landowner based on usage statistics provided to the Landowner by the Licensee not less than 20 Working Days after the end of each month which shall confirm the number of days on which the Licensee has exercised the Access Rights during the preceding month;

3.1.3 The Licensee will pay the fees within 30 Working Days of receipt of the Landowners invoice.

3.1.4 The sums payable pursuant to this paragraph 3 shall be subject to an inflationary increase in each third year of this licence (effective from the 1 January in each third calendar year) which shall be calculated in accordance with the Retail Price Index or any official index replacing it.

3.2 Planning

Prior to exercising any of the Access Rights it will obtain all such Necessary Consents permissions licences or approvals.

3.3 Exercise of Access Rights

In exercising the Access Rights the Licensee shall (and shall procure that its contractors and agents shall):

3.3.1 observe the reasonable site notices rules and regulations of the Landowner at all times;

3.3.2 comply with all security and health and safety regulations at the Property which are advised by the Landowner in writing from time to time;

3.3.3 submit for prior approval by the Landowner (such approval not to be unreasonably withheld) a:

(a) method statement (which shall incorporate any access requirements);

(b) risk assessment; and

(c) all relevant and necessary Certificates of Competence.

PROVDED THAT the Landowner shall not be entitled to withhold approval where any document referred to in this paragraph 3.3.3 complies with the requirements of the AGVMP.

3.3.4 use reasonable endeavours not to obstruct any access roads or tracks on the Property.

3.3.5 cause as little disturbance and inconvenience as reasonably possible to the Landowner and the owners and occupiers of the Property and any Neighbouring Land;

3.3.6 not to do anything that will or might constitute a breach of any Necessary Consents affecting the Property or which will or might vitiate in whole or in part any insurance effected by the Landowner in respect of the Property from time to time;

3.3.7 not to make any alteration or addition whatsoever to the Property, save for any works approved by the Landowner in advance;

3.3.8 not to cause or permit to be caused any damage to the Property or any neighbouring property of the Landowner and to make good as soon as reasonably practicable to the reasonable satisfaction of the Landowner any damage to the Property or any fixture on the Property or neighbouring property of the Landowner caused by the Licensee;

3.3.9 subject to the Compensation Provisions to indemnify the Licensor and keep the Licensor indemnified against all proper losses, claims, demands, actions, proceedings, damages, costs, expenses or other liability in any way arising from:

(a) this Licence;

(b) any breach of the Licensee's undertakings contained in paragraph 3; and/or

(c) the exercise of any rights given in paragraph 2

3.3.10 maintain insurance or procure that their contractors maintain insurance of not less than £10,000,000 with a reputable insurer against all public liability and other third party liability in connection with any injury, death, loss or damage to any persons or property arising out of or in connection with the exercise of any rights granted by or breach of this Licence and to provide details of such insurance and evidence that it is in force to the Landowner upon request, Provided that the Landowner shall not request such information more than once in any 12 month period.

3.4 Reinstatement

3.4.1 At the end of the Access Licence Period or as soon as reasonably practicable thereafter:

(a) to make good any remaining damage to the Property or any fixture on the Property caused by the Licensee;

(b) to leave the Property in a clean and tidy condition and in no worse condition than it is immediately prior to the exercise of the rights as evidenced by the photographic schedule of condition and free of the Licensee's equipment and property.

Provided always that the Licensee shall not be required to put the Property into any better condition and where the parties shall agree (acting reasonably) the Licensee may compensate the Landowner in lieu of carrying out all or any of its obligations under this paragraph 3.4 in which case the obligations in respect of which the Landowner has been compensated shall be extinguished immediately upon receipt of the compensation by the Landowner.

3.5 Statutory Requirements and Insurance

Not to do anything that will or might constitute a breach of any statutory requirement affecting the Property or that will or might wholly or partly vitiate any insurance effected in respect of the Property by the Landowner.

3.6 **Use of the Property**

Not to use the Property other than for the exercise of the Access Rights, or any other rights properly exercisable pursuant to the terms of this Licence.

4. SCHEDULE OF CONDITION

4.1 Before exercising any right granted to it by this Licence the Licensee shall prepare and submit to the Landowner for prior approval a photographic schedule of condition (the **'Schedule of Condition'**) of the Access Route and of all other areas to be used by the Licensee pursuant to the terms of this Licence.

4.2 The Landowner shall within 10 Working Days of receipt of the same provide comments on the Schedule of Condition.

4.3 If the Landowner confirms its approval of the Schedule of Condition or fails to provide comments within 10 Working Days the Schedule of Condition shall be deemed to be the final Schedule of Condition for the purposes of this Licence.

4.4 If the Landlord shall submit any comments pursuant to paragraph 4.2 the parties shall (both acting reasonably) seek to incorporate these into the Schedule of Condition Provided That any dispute shall be resolved in accordance with Clause 24 of the Agreement.

5. LANDOWNER'S UNDERTAKING

5.1 Access

The Landowner agrees and undertakes that during such periods of access as the Licensee may notify under the Access Rights it shall:

5.1.1 use reasonable endeavours to prevent nor permit others to enter onto those parts of the Property which are being used by the Licensee as a site compound or the Site; and

5.1.2 not to park vehicles on or otherwise obstruct the Access Route.

6. TERMINATION

6.1 This Licence shall end on the earliest of:

6.1.1 the Licence End Date; and

6.1.2 the expiry of any notice given by the Landowner to the Licensee at any time on breach of any of the Licensee's obligations contained in paragraph 3 (provided that the Licensee shall have been first notified in writing of such breach and given a reasonable opportunity of not less than two months to remedy any breach notified to it by the Landowner); and

6.1.3 the expiry of not less than three months' written notice to the Landowner by the Licensee that this Licence shall no longer be required and following any reinstatement works to the Landowner's reasonable satisfaction.

6.2 Termination of this Licence shall not affect the rights of either party in connection with any breach of any obligation under this Licence which existed at or before the date of termination.

7. NOTICES

Any notice or other communication given under this Licence shall be in writing and shall be delivered in accordance with the terms set out in the Agreement.

8. COSTS

On completion of this Licence, the Licensee shall pay to the Landowner on a full indemnity basis all proper and reasonable costs, fees, charges and expenses and disbursements of the Landowner and their professional advisors incurred in relation to the negotiation and completion of this Licence, plus an amount equivalent to VAT on them except to the extent that the Landowner is able to recover that VAT.

9. NO WARRANTIES FOR USE OR CONDITION

9.1 The Landowner gives no warranty that the Property possesses the Necessary Consents for the permitted use.

9.2 The Landowner gives no warranty that the Property is physically fit for the purposes specified in paragraph 2.

9.3 The Licensee acknowledges that it does not rely on, and shall have no remedies in respect of, any representation or warranty (whether made innocently or negligently) that may have been made by or on behalf of the Landowner before the date of this Licence as to any of the matters mentioned in paragraph 9.1 or paragraph 9.2.

9.4 Nothing in this paragraph shall limit or exclude any liability for fraud.

10. LIMITATION OF LANDOWNER'S LIABILITY

10.1 Subject to paragraph 10.2, the Landowner is not liable for:

10.1.1 the death of, or injury to the Licensee, its employees, customers or invitees to the Property; or

10.1.2 damage to any property of the Licensee or that of the Licensee's employees, customers or other invitees to the Property; or

10.1.3 any losses, claims, demands, actions, proceedings, damages, costs or expenses or other liability incurred by Licensee or the Licensee's employees, customers or other invitees to the Property in the exercise or purported exercise of the rights granted by paragraph 2.

10.2 Nothing in paragraph 10.1 shall limit or exclude the Landowner's liability for:

10.2.1 death or personal injury or damage to property caused by negligence on the part of the Licensor or its employees or agents; or

10.2.2 any matter in respect of which it would be unlawful for the Licensor to exclude or restrict liability.

11. INDEMNITY

Subject to the Compensation Provisions the Licensee shall indemnify the Landowner against all liabilities, costs, expenses, damages and losses suffered or incurred by the Landowner arising out of or in connection with any breach of the terms of this Licence.

12. THIRD PARTY RIGHTS

A person who is not a party to this Licence shall not have any rights under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Licence.

13. GOVERNING LAW

This Licence and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the law of England and Wales.

14. JURISDICTION

Each party irrevocably agrees that the courts of England and Wales shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this Licence or its subject matter or formation (including non-contractual disputes or claims).

SCHEDULE 2

Works Licence

AGREED TERMS

DEFINITIONS AND INTERPRETATION

1. The definitions and rules of interpretation in this Paragraph 1 apply to this Schedule:

1.1

Agreement	means the agreement dated 2021 made between (1) The Secretary of State for Department of Environment Food and Rural Affairs and (2) North Somerset District Council a copy of which is annexed to this Licence.
Certificate of Competence	shall have the meaning given to it in the Agreement.
Compensation Provisions	means the provisions at Schedule 3 of the Agreement as if the same were restated here in full mutatis mutandis;
Landowner	shall have the meaning given to it in the Agreement.
Licence End Date	shall mean the date of expiry of the Works Licence Period.
Licensee	shall have the meaning given to it in the Agreement.
Necessary Consent	shall have the meaning given to it in the Agreement.
Neighbouring Land	shall have the meaning given to it in the Agreement.
Peak Periods	means weekends, bank holidays and each day during the school holidays (as notified by Bristol City Council in each calendar year)
Period of Access	shall mean a period of consecutive days during which the Licensee will exercise the Works Rights.
Project	shall have the meaning given to it in the Agreement.
Property	shall have the meaning given to it in the Agreement.
Site	shall have the meaning given to it in the Agreement.
Works	shall have the meaning given to it in the Agreement.
Works Area	means the Site and/or such other land as the parties (acting reasonably) may agree.
Works Licence Period	means two (2) years which shall begin on and including the date of the Licence, subject to extension pursuant to paragraph 2.1.4.
Works Licence Period Extension Notice	means written notice by the Licensee to the Landowner to extend the Access Licence Period on the terms set out at paragraph 2.1.4.
Works Rights	means the right listed in paragraph 2.1 of this Schedule 2

1.2 Clause headings shall not affect the interpretation of this Licence.

1.3 Unless the context otherwise requires, words in the singular shall include the plural and in the plural shall include the singular.

1.4 Unless otherwise specified, a reference to a statute or statutory provision is a reference to it as amended, extended or re-enacted from time to time.

1.5 A reference to a statute or statutory provision shall include all subordinate legislation made from time to time under that statute or statutory provision.

1.6 A reference to writing or written does not include fax or e-mail.

1.7 A reference to this Licence or to any other agreement or document referred to in this Licence is a reference to this Licence or such other agreement or document as varied or novated (in each case, other than in breach of the provisions of this Licence) from time to time.

1.8 Unless the context otherwise requires, references to paragraphs are to the paragraphs of this Licence.

1.9 Any words following the terms including, include, in particular, for example or any similar expression shall be construed as illustrative and shall not limit the sense of the words, description, definition, phrase or term preceding those terms.

1.10 Any obligation on a party not to do something includes an obligation not to allow that thing to be done.

1.11 Any definition not defined within this Licence shall otherwise have the meaning given to it in the Agreement.

2. LICENCE

2.1 In consideration of the obligations on the Licensee in this Licence, the Landowner grants to the Licensee during the Works Licence Period (upon not less than 10 Working Day's written notice to the Landowner for each Period of Access):

2.1.1 The right to enter the Works Area to undertake the Works.

2.1.2 The right to exclude any occupiers, visitors and/or third parties from such parts of the Works Area as are reasonably required for the exercise of the Works Rights at any time during the Works Licence Period whilst the Works Rights are being exercised.

2.1.3 Subject to prior approval from the Landowner (such approval to be at the Landowner's absolute discretion), the right to remove any fences, walls, trees, plants, other vegetation or structures on or adjacent to the Works Area which may interfere with the Works Rights or the works connected with the Project.

2.1.4 At any time during the Works Licence Period the Licensee may serve on the Landowner a Works Licence Period Extension Notice to extend the Works Licence Period by up to twelve (12) months (such right to be exercisable on one occasion only).

2.1.5 Following the expiry of the Works Licence Period the Licensee shall if required for a further period of 12 months enter the Site subject to the terms of this Licence for the purposes of:

(a) undertaking any additional Works that are deemed to be required following a geotecnical re-inspection of the Site; and

(b) undertaking any additional Works in order to rectify any defects identified within the Works undertaken during the Works Licence Period

in each case making good any damage caused.

2.2 The Licensee acknowledges that:

2.2.1 the Licensee shall occupy such parts of the Property referred to in paragraph 2.1 as a licensee and that no relationship of landlord and tenant is created between the Landowner and the Licensee by this Licence;

2.2.2 the Landowner retains control, possession and management of the Property and the Licensee has no right to exclude the Landowner from all or any part of the Property;

2.2.3 this Licence is personal to the Licensee;

2.2.4 throughout the Works Licence Period the Landowner shall be entitled (but not obliged) at its discretion to appoint of supervising surveyor who shall be duly authorised to enter upon the Site in order to monitor the progress of the Works;

2.2.5 the Licensee shall not undertake any Works during Peak Periods unless such use is authorised in advance by the Landowner;

2.2.6 where the Works Rights cannot reasonably be accommodated by the Landowner because:

(a) exercising the Works Rights would interfere with the Landowner's:

(i) necessary maintenance; or

(ii) forestry operations; or

(iii) compliance with its statutory obligations, or

(b) there is an immediate health and safety risk,

then subject to giving the Licensee not less than 5 Working Days written notice (except in the case of an emergency) the Landowner shall be entitled to delay the Licensee from exercising the Works Rights until such time as the Landowner can reasonably accommodate the Licensee exercising the Works Rights.

2.2.7 the Landowner shall at all times act in good faith in order to accommodate the Licensee exercising the Works Rights and shall use reasonable endeavours to minimise the duration of any such delay.

2.2.8 the Licensee shall at all times act in good faith and shall use reasonable endeavours to ensure that:

(a) the number of separate Periods of Access are kept to a minimum throughout the Works Licence Period; and

(b) the duration of each Period of Access is kept to a minimum in each instance.

3. LICENSEE'S UNDERTAKING

The Licensee agrees and undertakes:

3.1 Planning

Prior to exercising any of the Works Rights it will obtain all such Necessary Consents permissions licences or approvals.

3.2 Exercise of Works Rights

In exercising the Work Rights the Licensee shall (and shall procure that its contractors and agents shall):

3.2.1 observe the reasonable site notices rules and regulations of the Landowner at all times;

3.2.2 comply with all security and health and safety regulations at the Property which are advised by the Landowner in writing from time to time;

3.2.3 submit for prior approval by the Landowner (such approval not to be unreasonably withheld) a:

(a) method statement (which shall incorporate any access requirements);

(b) risk assessment; and

(c) all relevant and necessary Certificates of Competence.

PROVDED THAT the Landowner shall not be entitled to withhold approval where any document referred to in this paragraph 3.2.3 complies with the requirements of the AGVMP.

3.2.4 carry out any complete the Works:

(a) using good quality, new materials which are fit for the purpose for which they will be used;

(b) in a good and workmanlike manner and in accordance with good building and other relevant practices, codes and guidance; and

(c) in accordance with the method statement and risk assessment provided pursuant to paragraph 3.2.3.

3.2.5 cause as little disturbance and inconvenience as reasonably possible to the Landowner and the owners and occupiers of the Property and any Neighbouring Land;

3.2.6 not to do anything that will or might constitute a breach of any Necessary Consents affecting the Property or which will or might vitiate in whole or in part any insurance effected by the Landowner in respect of the Property from time to time;

3.2.7 not to make any alteration or addition whatsoever to the Property, save for the Works and any other works approved by the Landowner pursuant to this Licence in advance;

3.2.8 not to cause or permit to be caused any damage to the Property or any neighbouring property and to make good as soon as reasonably practicable to the reasonable satisfaction of the Landowner any damage to the Property or any fixture on the Property caused by the Licensee;

3.2.9 Subject to the Compensation Provisions to indemnify the Licensor and keep the Licensor indemnified against all losses, claims, demands, actions, proceedings, damages, costs, expenses or other liability in any way arising from:

(a) this Licence;

(b) any breach of the Licensee's undertakings contained in paragraph 3; and/or

(c) the exercise of any rights given in paragraph 2

3.2.10 maintain insurance or procure that their contractors maintain insurance of not less than £10,000,000 with a reputable insurer against all public liability and other third party liability in connection with any injury, death, loss or damage to any persons or property arising out of or in connection with the exercise of any rights granted by or breach of this Licence and to provide details of such insurance and evidence that it is in force to the Landowner upon request Provided That the Landowner shall not request such information more than once in any 12 month period.

3.3 Reinstatement

3.3.1 At the end of the Works Licence Period or as soon as reasonably practicable thereafter:

(a) to make good any remaining damage to the Works Area or any fixture on the Works Area caused by the Licensee

(b) to leave the Works Area in a clean and tidy condition and in no worse condition than it is immediately prior to the exercise of the Works Rights and free of the Licensee's equipment and property

Provided always that the Licensee shall not be required to put the Property into any better condition and where the parties shall agree (acting reasonably) the Licensee may compensate the Landowner in lieu of carrying out all or any of its obligations under this paragraph 3.3.1 in which case the obligations in respect of which the Landowner has been compensated shall be extinguished immediately upon receipt of the compensation by the Landowner.

3.4 Statutory Requirements and Insurance

Not to do anything that will or might constitute a breach of any statutory requirement affecting the Property or that will or might wholly or partly vitiate any insurance effected in respect of the Property by the Landowner.

3.5 Use of the Property

Not to use the Property other than for the exercise of the Works Rights or any other rights properly exercisable pursuant to the terms of this Licence.

3.6 Completion of the Works

The Licensee must notify the Landowner in writing once the Works have been completed.

4. SCHEDULE OF CONDITION

Before exercising any right granted to it by this Licence the Licensee shall prepare and submit to the Landowner for prior approval a photographic schedule of condition (the **'Schedule of Condition'**) of the Site and of all other areas to be used by the Licensee pursuant to the terms of this Licence.

4.1 The Landowner shall within 10 Working Days of receipt of the same provide comments on the Schedule of Condition.

4.2 If the Landowner confirms its approval of the Schedule of Condition or fails to provide comments within 10 Working Days the Schedule of Condition shall be deemed to be the final Schedule of Condition for the purposes of this Licence.

4.3 If the Landlord shall submit any comments pursuant to paragraph 4.2 the parties shall (both acting reasonably) seek to incorporate these into the Schedule of Condition Provided That any dispute shall be resolved in accordance with Clause 24 of the Agreement.

5. LANDOWNER'S UNDERTAKING

5.1 Access

The Landowner agrees and undertakes that during such periods of access as the Licensee may notify under the Works Rights

5.1.1 use reasonable endeavours to prevent nor permit others to enter the Site during use by the Licensee; and

5.1.2 not to park vehicles on or otherwise obstruct

such part or parts of the Works Area as are being occupied from time to time by the Licensee for the purposes of undertaking the Works.

6. TERMINATION

6.1 This Licence shall end on the earliest of:

6.1.1 the Licence End Date; and

6.1.2 the expiry of any notice given by the Landowner to the Licensee at any time on breach of any of the Licensee's obligations contained in paragraph 3 (provided that the Licensee shall have been first notified in writing of such breach and given a reasonable opportunity of not less than two months to remedy any breach notified to it by the Landowner); and

6.1.3 the expiry of not less than three months' written notice to the Landowner by the Licensee that this Licence shall no longer be required and following completion of the Works and any reinstatement works to the Landowner's reasonable satisfaction.

6.2 Termination of this Licence shall not affect the rights of either party in connection with any breach of any obligation under this Licence which existed at or before the date of termination.

7. NOTICES

Any notice or other communication given under this Licence shall be in writing and shall be delivered in accordance with the terms set out in the Agreement.

8. COSTS

On completion of this Licence, the Licensee shall pay to the Landowner on a full indemnity basis all reasonable and proper costs, fees, charges and expenses and disbursements of the Landowner and their professional advisors incurred in relation to the negotiation and completion of this Licence, plus an amount equivalent to VAT on them except to the extent that the Landowner is able to recover that VAT.

9. NO WARRANTIES FOR USE OR CONDITION

9.1 The Landowner gives no warranty that the Property possesses the Necessary Consents for the permitted use.

9.2 The Landowner gives no warranty that the Property is physically fit for the purposes specified in paragraph 2.

9.3 The Licensee acknowledges that it does not rely on, and shall have no remedies in respect of, any representation or warranty (whether made innocently or negligently) that may have been made by or on behalf of the Landowner before the date of this Licence as to any of the matters mentioned in paragraph 9.1 or paragraph 9.2.

9.4 Nothing in this clause shall limit or exclude any liability for fraud.

10. LIMITATION OF LANDOWNER'S LIABILITY

10.1 Subject to paragraph 10.2, the Landowner is not liable for:

10.1.1 the death of, or injury to the Licensee, its employees, customers or invitees to the Property; or

10.1.2 damage to any property of the Licensee or that of the Licensee's employees, customers or other invitees to the Property; or

10.1.3 any losses, claims, demands, actions, proceedings, damages, costs or expenses or other liability incurred by Licensee or the Licensee's employees, customers or other invitees to the Property in the exercise or purported exercise of the rights granted by paragraph 2.

10.2 Nothing in paragraph 10.1 shall limit or exclude the Landowner's liability for:

10.2.1 death or personal injury or damage to property caused by negligence on the part of the Licensor or its employees or agents; or

10.2.2 any matter in respect of which it would be unlawful for the Licensor to exclude or restrict liability.

11. INDEMNITY

11.1 Subject to the Compensation Provisions the Licensee shall indemnify the Landowner against all liabilities, costs, expenses, damages and losses suffered or incurred by the Landowner arising out of or in connection with any breach of the terms of this Licence.

12. THIRD PARTY RIGHTS

A person who is not a party to this Licence shall not have any rights under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Licence.

13. GOVERNING LAW

This Licence and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the law of England and Wales.

14. JURISDICTION

Each party irrevocably agrees that the courts of England and Wales shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this Licence or its subject matter or formation (including non-contractual disputes or claims).

SCHEDULE 3

Compensation Provisions

In respect of each claim or demand for compensation given under this Agreement (each a **"Claim"**) the provisions set out below shall apply.

1. Mitigation

   The person making any such Claim (a **"Claimant"**) shall take all steps reasonably necessary in order to mitigate any losses liabilities or expenses being the subject of such Claim

2. Conduct of Claims

   The Claimant shall not settle or compromise any Claim or knowingly make any admission of liability to the person making the claim or demand made by a third party without having consulted and obtained the consent of the party not being the Claimant (the **"Defaulting Party"**) but for the avoidance of doubt the Claimant's insurers shall be entitled to settle or compromise any claim without any such consultation or consent and the Defaulting Party shall be responsible for any and all additional costs and other suits suffered or incurred by the Claimant which the Claimant would not have suffered or incurred but for the Defaulting Party's refusal to consent to any settlement compromise or admission of liability the Claimant wishes to make

3. No Liability

   The Defaulting Party shall have no liability in circumstances where any action claim cost or expense arises out of the acts omissions neglect negligence or wilful default of the Claimant or their employees servants tenants licensees or other occupiers

4. Economic and Consequential Losses

   The Landowner and the Licensee or their officers employees contractors sub-contractors or agents shall be liable to the other party (on the basis of breach of contract warranty or tort including negligence and strict or absolute liability or breach of statutory duty or otherwise) for any matter arising out of or in connection with this Agreement or its termination in respect of any liabilities, costs, expenses, damages and losses (including but not limited to any direct loss, loss of revenue and profit deriving from tree felling and any product arising or generated directly from any such tree fell and all interest, penalties and legal costs and all other proper professional costs and expenses) calculated on a full indemnity basis (but excluding any indirect, economic or consequential losses) by such other party. Each party undertakes not to sue the other party its officers employees agents contractors or sub-contractors in respect of such economic or consequential loss. For the purpose of this Agreement economic and consequential loss shall mean any indirect economic or consequential loss (including loss of business opportunities deriving from loss of contract loss of goodwill loss of use or liability under other agreements) resulting from the performance or non-performance of any obligation hereunder any act or omission of negligence breach of contract or otherwise by any party and whether or not such party knew or ought to have known that such indirect or consequential loss would be likely to be suffered as a result of the same

5. Licensee's Liabilities

5.1 The liability of the Licensee under the provisions of this Agreement as to the making good of or paying compensation for loss damage or injury due to the exercise of the rights granted by this Agreement shall extend to and include claims and liabilities and loss damage or injury caused by reason of:-

   5.1.1 the negligence trespass or wilful act or default of any person or persons directly employed authorised or instructed by or on behalf of or under the direct control of the Licensee;

5.1.2 the actions negligence trespass or wilful act or default of the Licensee's contractors and their sub-contractors and of all persons employed in connection with the exercise of the rights within this Agreement and the Licence Rights except for actions carried out expressly or impliedly at the request of the Landowner.

6. Landowner's Liabilities

6.1 The liability of the Landowner under the provisions of this Agreement against claims and liabilities in respect of the Landowner's breach of any of its obligations contained in this Agreement shall extend to and include respectively claims and liabilities and loss damage or injury caused by reason of:

6.1.1 the negligence trespass or wilful act or default of any person or persons directly employed by or under the direct control of the Landowner (which shall not exclude all members of the public)

6.1.2 the actions of the Landowner's contractors and their sub-contractors and all persons employed in connection with the use of the Property and of all tenants or occupiers of the Property (which shall not exclude all members of the public) except for actions carried out expressly or impliedly at the request of the Licensee.

7. Compensation

7.1 Where the precise amount of any item of compensation payable has not been agreed or determined the Licensee shall be entitled at any time without prejudice to the final settlement or determination of the matter to make such payment on account as shall represent the amount of compensation which the Licensee considers to be the proper amount attributable to that item or as may be otherwise agreed between the parties

7.2 Any compensation payable to the Landowner in respect of any damage to land and crops or structures thereon or drains thereunder and any injury to stock thereon shall be deemed to be payable within two calendar months after lodgement of the claim therefor and the Licensee shall pay interest on the amount of the compensation as finally agreed or determined such interest (if any) to be payable in respect of the period (but only if greater than two months) from the date of agreement or determination of such claim until payment of the compensation at three per cent above the base rate for the time being of the Bank of England or such other comparable rate of interest as the Landowner and the Licensee (both acting reasonably) shall agree or failing agreement as shall be determined on the application of either party by the President for the time being of the Royal Institution of Chartered Surveyors

PROVIDED THAT:

7.2.1 no interest shall be due in respect of payments of compensation made within the said period of two (2) calendar months of the lodgement of the claim therefor; and

7.2.2 in calculating interest no interest shall accrue in respect of any payments on account made in accordance Paragraph 7.2 of this Schedule 3 after the date on which any relevant payment on account was made

7.3 Any unavoidable loss or repayment of any grants will be taken into account in the assessment of the compensation payable under the provisions of this Agreement

7.4 If any livestock is killed or injured by the exercise of the rights granted by this Agreement the Licensee shall pay compensation to the owner of such livestock immediately after the amount of such compensation has been agreed or determined

7.5 The Landowner and the Licensee agree that wherever full and final settlement of compensation (or any respect of compensation) is negotiated between the parties such settlement shall be recorded in a form reasonably required by the Licensee and shall specify what matters (if any) shall be excluded from such full and final settlement

7.6 Any dispute concerning any matter to be determined under this Schedule shall be resolved in accordance with Clause 24

7.7 Subject to any award of costs made by an expert appointed in accordance with Clause 24 the Licensee shall pay the Landowner's reasonable valuation costs in connection with the negotiation of any matter to be dealt with under this Schedule PROVIDED THAT no payment will be made where valuation is not reasonably necessary having regard to the Licensee's obligations procedures and practices under this Agreement

APPENDIX 1

Plans

MetroWest - Phase 1

Key:

- Limits of Land to be Acquired or used
- Land to be used Temporarily
- HMLR Titles

Colourings on plans showing nature of acquisition is indicative only and nature of interest to be taken may change.

Plots contained within ST276238:

13/07 - Area: 19246.67 sqm / 4.756 acres

Plots contained within ST276228:

13/31 - Area: 11.57 sqm / 0.003 acres
13/32 - Area: 84.15 sqm / 0.021 acres
13/55 - Area: 16738.18 sqm / 4.136 acres
14/05 - Area: 1121.27 sqm / 0.277 acres

Plan 4(c)

Title:
MetroWest - Phase 1
The National Trust
Ownership
Sheet 3 of 3

Scale: 1:2500 @ A3

20m 0m 20m 40m 60m 80m 100m

Dwg Ref:
Tit_National_Trust_R3.dwg

Plan Ref:
Tits_National_Trust_R3

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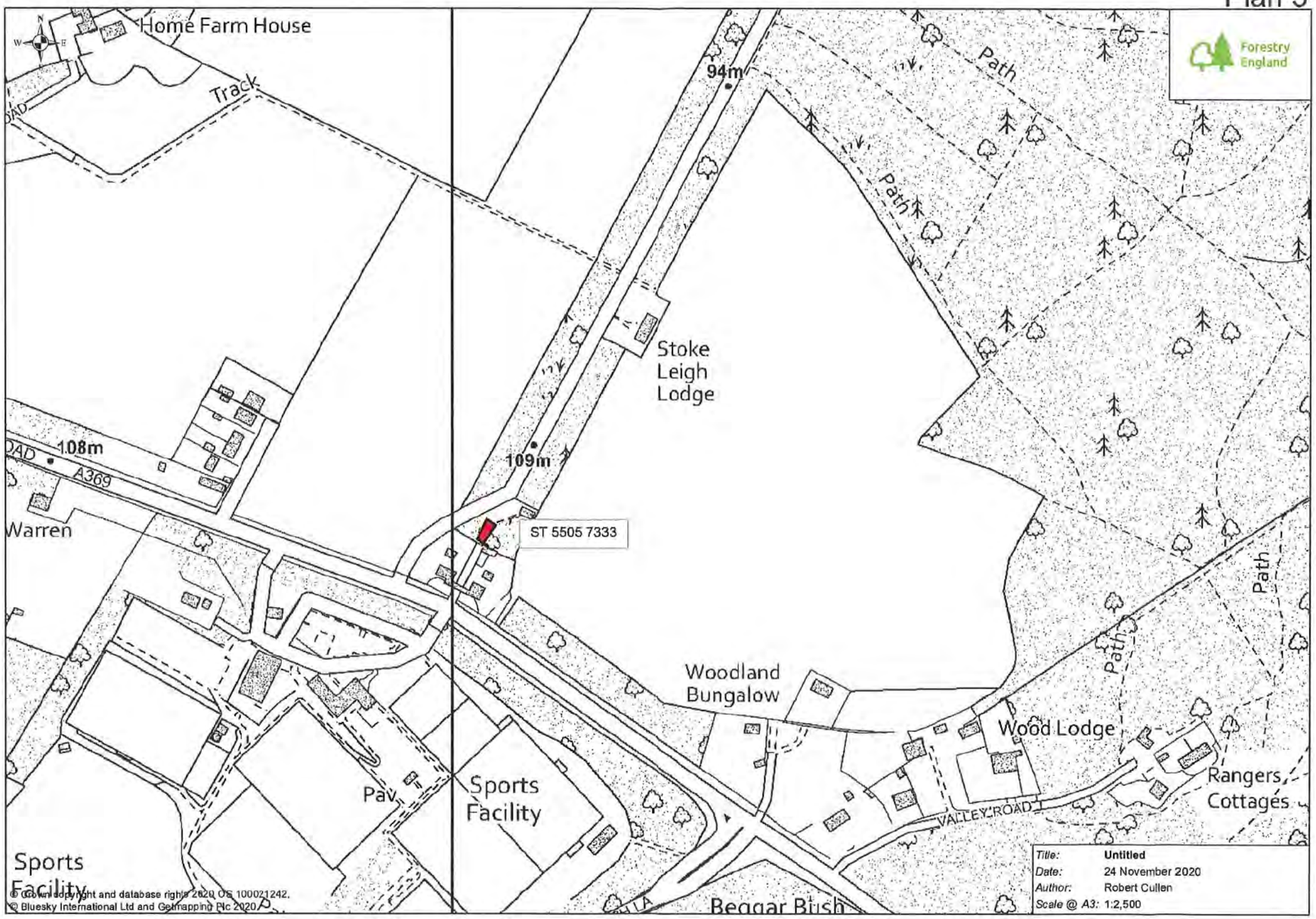
Date:	Drawn by:
25.11.2020	G.J
Rev: 3	Checked: C.P

N

ardent
infrastructure and regeneration

Plan 3



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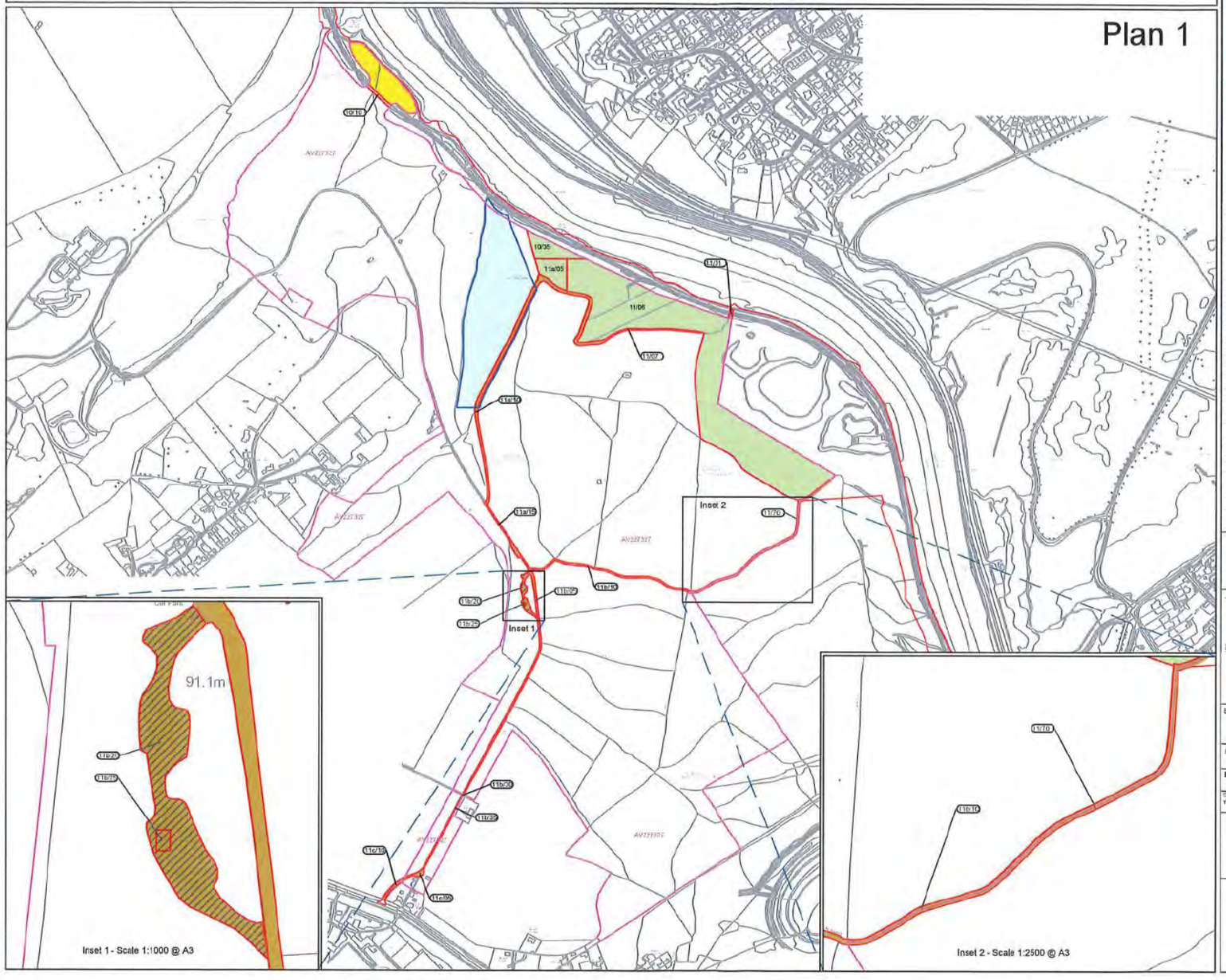
The Draft Portishead Branch Line (MetroWest Phase 1) Order

Plan 1



Key:

- Limits of Land to be Acquired or used
- Land to be Acquired
- Land to be used Temporarily
- Access Routes, Site Compound and Parking Areas
- Public Car Park
- Red Oak Plantation Land
- Compensation Land
- HMLR Titles

Colourings on plans showing nature of acquisition is indicative only and nature of interest to be taken may change.

Plots contained within AV227327 (Land above tunnel):

10/10 - Area: 370.87 sqm / 0.092 acres
10/35 - Area: 3487.78 sqm / 0.862 acres
11/06 - Area: 65917.72 sqm / 16.289 acres
11/07 - Area: 2164.02 sqm / 0.535 acres
11a/05 - Area: 3234.19 sqm / 0.799 acres
11a/10 - Area: 3867.13 sqm / 0.956 acres
11b/35 - Area: 424.01 sqm / 0.105 acres
11c/05 - Area: 390.74 sqm / 0.097 acres
11/70 - Area: 520.00 sqm / 0.128 acres
11a/15 - Area: 652.83 sqm / 0.161 acres
11b/05 - Area: 2168.97 sqm / 0.536 acres
11b/10 - Area: 1815.63 sqm / 0.449 acres
11b/20 - Area: 1021.21 sqm / 0.252 acres
11b/25 - Area: 24.00 sqm / 0.006 acres

Occupier:

11b/30 - Area: 8.65 sqm / 0.002 acres
11c/10 - Area: 364.73 sqm / 0.090 acres

Occupier in respect of underbridge:

11/31 - Area: 142.72 sqm / 0.035 acres

travelwest

Title:

The Draft Portishead Branch Line (MetroWest Phase 1) Order Department for Environmental Food & Rural Affairs c/o The Forestry Commission Ownership Sheet 1 of 1

Scale: 1:7500 @ A3

50m 0m 50m 100m 150m 200m 250m

Dwg Ref: The_Forestry_Commission_R2a.dwg

Plan Ref: The_Forestry_Commission_R2a

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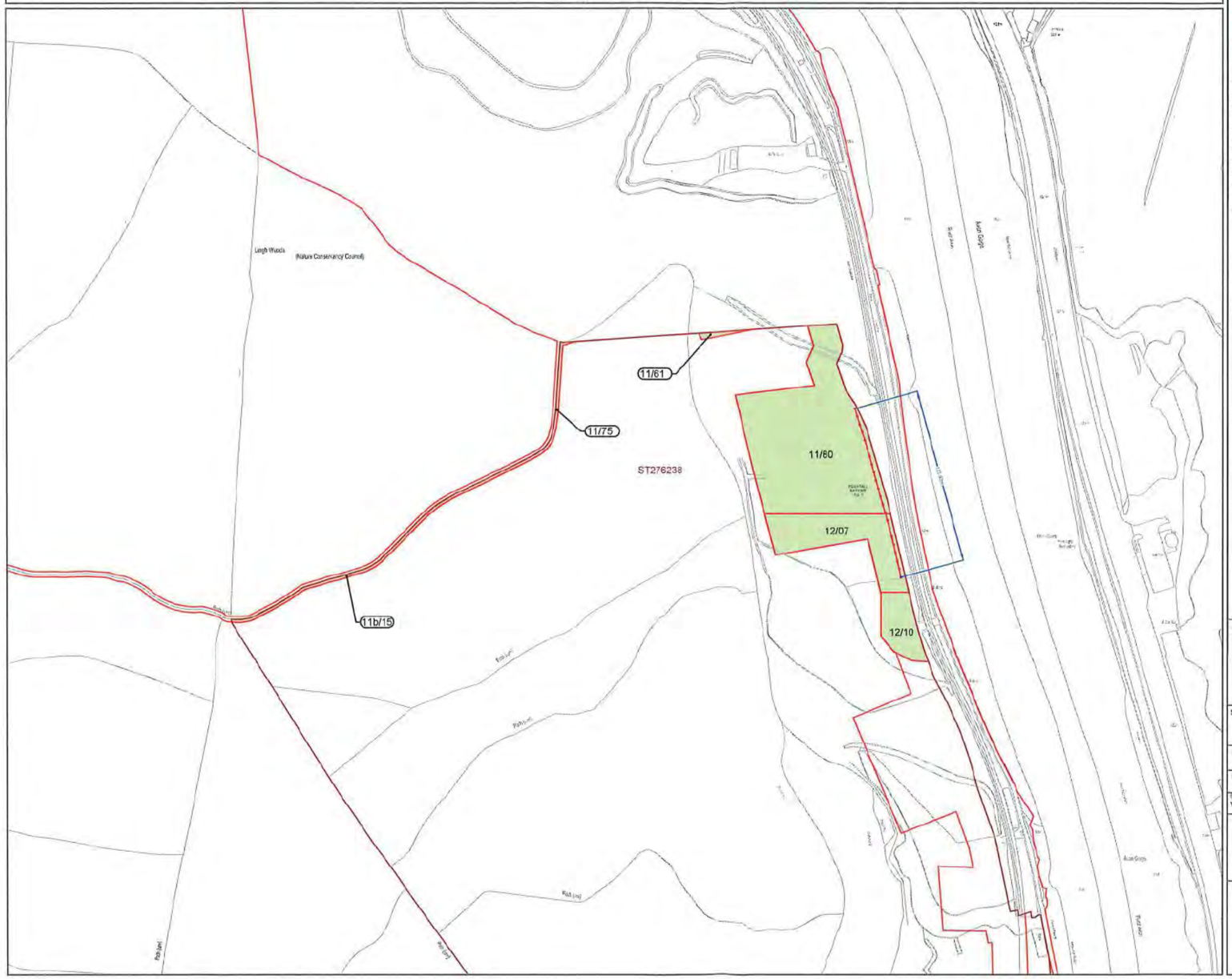
	Date: 08.03.2021	Drawn by: G.J
N	Rev: 2a	Checked: C.P

ardent infrastructure and regeneration

MetroWest - Phase 1



Key:

- Limits of Land to be Acquired or used
- Land to be used Temporarily
- HMLR Titles

Colourings on plans showing nature of acquisition is indicative only and nature of interest to be taken may change.

Plots contained within ST276238:

11/61 - Area: 91.25 sqm / 0.023 acres
11/75 - Area: 362.11 sqm / 0.089 acres
11/80 - Area: 8875.90 sqm / 2.193 acres
11b/15 - Area: 331.05 sqm / 0.082 acres
12/07 - Area: 2820.72 sqm / 0.697 acres
12/10 - Area: 1164.35 sqm / 0.288 acres

Plan 4(a)

Title
MetroWest - Phase 1
The National Trust
Ownership
Sheet 1 of 3

Scale: 1:2500 @ A3

Dwg Ref: The_National_Trust_R3.dwg

Plan Ref: The_National_Trust_R3

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	Date: 25.11.2020	Drawn by: G.J
N	Rev: 3	Checked: C.P

ardent
infrastructure and regeneration

Plan 2

Forestry England

Title: **Untitled**
Date: 27 October 2020
Author: Laurence Platt
Scale @ A3: 1:2,500

Forest Roads

Forest Roads

Land Registrations (Eng.)

Land Registrations (Eng.)

MetroWest - Phase 1

Key:

- Limits of Land to be Acquired or used
- Land to be used Temporarily
- HMLR Titles
- A — B Footpath

Colourings on plans showing nature of acquisition is indicative only and nature of interest to be taken may change.

Plots contained within ST276238:

12/21 - Area: 20.49 sqm / 0.005 acres
12/30 - Area: 17352.38 sqm / 4.288 acres

Plots contained within ST276238 (Land above Tunnel):

12/20 - Area: 557.42 sqm / 0.138 acres

Plan 4(b)

Title:
MetroWest - Phase 1
The National Trust
Ownership
Sheet 2 of 3

Scale: 1:2500 @ A3

20m 0m 20m 40m 60m 80m 100m

Dwg Ref:
The_National_Trust_R1.dwg

Plan Ref:
The_National_Trust_R1

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Date:	Drawn by:
25.11.2020	G.J
Rev: 3	Checked: C.P

N

ardent
infrastructure and regeneration

APPENDIX 2

The AGVMP

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
8.12, Avon Gorge Vegetation Management Plan
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(q)
Planning Act 2008

Author: CH2M
Revision: Version 3
Date: March 2021

NetworkRail | West of England Local Enterprise Partnership | West of England Combined Authority | HM Government | Bath & North East Somerset Council | North Somerset Council | South Gloucestershire Council | travelwest

This document was submitted in duplicate as part of the Developer's Application: one document formed Appendix 9.11 of the Environmental Statement; the other is this stand alone document. It was intended that the document contained within the Environmental Statement would not be updated. However, as both the Environmental Statement and this Avon Gorge Vegetation Management Plan will be certified documents they have both been updated and are identical, though bearing different document reference numbers.

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Document history

Project	Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme
Planning Inspectorate Scheme Reference	TR040011
Part and Application Document Reference	8, 8.12
Document title	Avon Gorge Vegetation Management Plan
Regulation Number	Regulation 5(2)(q)
Applicant	North Somerset District Council
Lead Author	CW at CH2M

Version	Date	Status of Version
01	15/11/19	Application Issue
02	07/10/20	Update following ongoing consultation with Natural England and the Forestry Commission
03	12/03/21	Updated to reflect recent changes in legislation and policy, and changes agreed during examination

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Acronyms, Abbreviations and Glossary

AGVMP	Avon Gorge Vegetation Management Plan
Arisings	Material obtained from cutting vegetation, such as logs and brash from trees and grass cuttings
Brash	Material obtained from trees from limb reduction or crown lifting
BSBI	Botanical Society of Britain and Ireland
DCO	Development Consent Order
EcCoW	Ecological clerk of works
ES	Environmental Statement
FC	Forestry Commission including Forestry England
GRIP	Governance for Railway Investment Projects
Ha	Hectare
INNS	Invasive non-native species
NERC Act 2006	Natural Environment and Rural Communities Act
NR	Network Rail
NSDC	North Somerset District Council
NSIP	Nationally significant infrastructure project
NVC	National Vegetation Classification
Positive management	Vegetation management which focuses on vegetation clearance to benefit rare plants, particularly removal of invasive non-native species.
SAC	Special Area of Conservation
Secondary (recent) woodland	Woods which developed on previously open ground from the start of the 17th century are termed secondary or recent woodland
SCI	Sites of Community Importance
SMS	Site Management Statement
SSSI	Site of Special Scientific Interest
VMP	Vegetation Management Plan
WCA	Wildlife and Countryside Act

Summary

0.1.1 MetroWest is a programme of major rail improvements for the West of England region, which is being delivered by the West of England councils, led by North Somerset District Council ("NSDC") and the West of England Combined Authority ("WECA"), who are working with Network Rail ("NR") and Great Western Railway ("GWR") to develop the scheme. MetroWest is being delivered in two phases, Phase 1 includes re-opening a section of disused line between Pill and Portishead and upgrading the freight line between Bristol and Portishead to allow for passenger train services. In order to re-open the railway from Portishead to Pill, NSDC requires a Development Consent Order ("DCO") under the Planning Act 2008. The proposed scheme is the Portishead Branch Line (MetroWestPhase 1) Development Consent Order Scheme ("the DCO Scheme").

0.1.2 The original railway between Bristol and Portishead was built in the 1860s, but regular passenger services ceased in 1964 and all services stopped in 1981. Following construction of the Royal Portbury Dock, the branch line was re-opened in 2001 for freight.

0.1.3 Part of the existing operational railway runs through the Avon Gorge Site of Special Scientific Interest ("SSSI") and the Avon Gorge Woodlands Special Area of Conservation ("SAC"). The site is subject to an existing NR Site Management Statement ("SMS") and Vegetation Management Plan ("VMP") (Appendix 9.15, DCO Document Reference 6.25) which has been approved by Natural England.

0.1.4 The main habitats adjacent to the rail corridor are the extensive woodlands (much of it *Tilio-Acerion* woodland for which the site is designated), some scrub, grasslands (including *Festuco-Brometalia* for which the site is designated), rocky outcrops and cliffs. There are also the railway cuttings, embankments, walls and a small amount of saltmarsh along the River Avon. The site also supports many rare plants, including endemic whitebeams found nowhere else in the world.

0.1.5 Rail upgrade and improvement works and their resulting operational activities, if not carefully managed, could impact the sensitive features of the Avon Gorge SAC and SSSI. As such, this document highlights how habitats and features within the Avon Gorge SAC and SSSI on NR land will be managed and monitored prior to, during and post construction of the DCO Scheme, so that the status of these important ecological and geological designations may be maintained, protected and enhanced. During construction, geotechnical works are also required on rock faces owned by third parties e.g. National Trust and construction works will be managed in these areas.

0.1.6 Mitigation measures are set out to minimise the impact during construction. These include site briefings and supervised vegetation clearance, fencing and signage of locations of rare plants.

0.1.7 Management plans have been drawn up to compensate for the loss of habitat during construction of the DCO Scheme. The loss of habitat has been minimised as much as possible within the *Festuco-Brometalia*

grassland and *Tilio-Acerion* woodland but some unavoidable vegetation clearance is required for construction of the DCO Scheme. To compensate for this, positive management is proposed in woodland areas to eliminate non-native species, particularly in areas which would benefit rare whitebeam trees. In addition, clearance of scrub and non-native species is proposed in small areas of *Festuco-Brometalia* grassland within NR land. The areas identified for such management are twice the size of the areas lost. Two alternative proposals for compensation for the loss of SAC qualifying woodland habitat are presented in the AGVMP but unless the Secretary of State specifies otherwise in determining the DCO application, all compensatory positive woodland management will be undertaken on land adjacent to the SAC that is owned by the Secretary of State for Environment, Food and Rural Affairs and managed by the Forestry Commission ("FC") in accordance with the detailed woodland management plan and monitoring at Annex M.

0.1.8 Two alternative packages to compensate for the loss of up to 27 individual rare whitebeam trees are presented in the AGVMP. Package 1 proposes four planting locations on NR land. Package 2 proposes two planting locations on NR land and one planting location on land owned by the Secretary of State for Environment, Food and Rural Affairs and managed by FC. Both packages are described in Annex H. Unless the Secretary of State specifies otherwise in determining the DCO application, Whitebeam Planting Package 2 will be delivered instead of Package 1. An agreement has been reached between NSDC and the FC to secure delivery of the compensation measures on FC land. NSDC will retain responsibility under the DCO for measures on FC land for the duration of the AGVMP.

0.1.9 The positive management detailed in this plan will be implemented during the construction phase (estimated to be 20 months duration). The rare whitebeam trees will be planted at the end of the construction phase on NR land and during construction on FC land. After this, the planted rare whitebeam trees will be managed and monitored annually for ten years as specified in Annex H. Areas where positive management has been completed on NR land will be monitored in year 1, 3 and 5 after the construction phase. Areas where positive management has been completed on FC land will be monitored in accordance with the Woodland Management Plan at Annex M. Activities completed will be reported to Natural England annually during the monitoring period of this plan.

0.1.10 The plan will result in improved management of *Tilio-Acerion* woodland, the restoration of *Festuco-Brometalia* grassland and the management of rare plants, including endemic whitebeams, on NR land and FC land. This is considered to be of positive benefit for the SAC/SSSI, which has declined over the years due, in part, to lack of appropriate management to remove invasive non-native species. This Vegetation Management Plan complements the Site Improvement Plan (Natural England, 2015) for the SAC.

0.1.11 During the development of this plan, the MetroWest Phase 1 project was the catalyst for discussions between NR and the FC for proposals to work together to implement the FC plan to undertake tree felling close to the

freight line and in addition, the DCO Scheme has provided rare whitebeam seed to FC for propagation.

SECTION 1

Introduction

1.1 Objectives of this report

1.1.1 The Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme ("the DCO Scheme") proposes to reopen the railway line between Bristol and Portishead to passenger trains. The railway line runs through the Avon Gorge Site of Special Scientific Interest ("SSSI") and the Avon Gorge Woodlands Special Area of Conservation ("SAC").

1.1.2 Rail upgrade and improvement works and their resulting operational activities, if not carefully managed, could impact the sensitive features of the Avon Gorge SAC and SSSI. This document presents the Avon Gorge Vegetation Management Plan ("the Plan") which sets out how habitats and notable flora species within the Avon Gorge will be managed and monitored as part of the DCO Scheme, so that the status of these important ecological and geological designations may be maintained, protected and (where possible) enhanced.

1.1.3 The aims of the Plan are described below.

- To set out the mitigation, compensation and management measures to be undertaken during and following the construction of the DCO Scheme through the Avon Gorge Woodlands SAC/SSSI, including the mechanisms by which the measures will be implemented.
- To inform the HRA on the likely significant effect of the DCO Scheme on the integrity of the SAC after consideration of the measures proposed by management to improve the site.
- To be the document with which agreements providing for the carrying out of any part of the DCO Scheme within the Avon Gorge SAC/SSSI and/or the measures set out in the Plan shall require compliance when specifying the mitigation, compensation and management measures to be undertaken.
- To provide that where this Plan identifies alternative compensation measures for the loss of individual rare whitebeam trees and the loss of qualifying SAC woodland habitat, the measures to be delivered shall be Whitebeam Planting Package 2 in Annex H and the Woodland Management Plan at Annex M unless the Secretary of State specifies otherwise in determining the DCO application.
- To complement the existing Network Rail ("NR") Site Management Statement ("SMS"; 2018-2023) and Vegetation Management Plan ("VMP") (Appendix 9.15, DCO Document Reference 6.25) for the operating railway line.

1.2 Background to the DCO Scheme

1.2.1 The Portishead Branch Line was built in the 1860s. Passenger services continued between Portishead and Bristol until 1964, and freight services continued to 1981. The Royal Portbury Dock opened in 1978 and in 2001 the currently operational part of the former Portishead Branch Line was re-

opened to service the port for freight only. The owner of the Royal Portbury Dock, Bristol Port Company, has commercial rights to run up to 20 freight trains per day in each direction along the operational railway line. The current volume of freight trains operating is substantially less than this.

1.2.2 The Portishead Branch Line will provide an hourly (or hourly service plus) passenger service between Portishead and Bristol Temple Meads between 0600 and 2400 Monday to Saturday and between 0900 and 1900 on Sundays. The hourly service for the Portishead Branch Line entails; passenger trains operational hourly all day between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This provides up to 18 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays. The alternative hourly service plus for the Portishead Branch Line entails; passenger trains operating every 45 minutes during the am and pm peak and hourly off peak, between Portishead and Bristol Temple Meads, calling at Pill, Parson Street, and Bedminster. This 'hourly service plus' option provides up to 20 passenger trains in each direction per day (Monday to Saturday), with approximately 10 passenger trains in each direction on Sundays.

1.2.3 The DCO Scheme comprises the nationally significant infrastructure project ("NSIP") and its associated development. The reconstruction of the disused section of the railway line between Portishead and Pill falls within the definition of a nationally significant infrastructure project for the purposes of Section 25 of the Planning Act 2008, being the construction of a railway over 2 km in length. Other works required for the DCO Scheme, such as the new stations, works to the highway at Portishead and the alterations to the railway between Pill and Ashton Junction are Associated Development as defined by Section 114 of the Planning Act 2008. In addition, certain works on the national rail network will be carried out under NR's permitted development rights to facilitate the DCO Scheme.

1.2.4 A detailed description of the DCO Scheme is presented in the Environmental Statement ("ES") Chapter 4 Description of the Proposed Works (DCO Document Reference 6.7) and a summary of permanent works within the Avon Gorge SAC is provided in Table 1. Further details are presented in the Construction Strategy DCO Document Reference 5.4. The locations of works which can be presented at a mappable scale are shown on the General Arrangement Plan DCO Document Reference 2.4.

1.2.5 All the works within the Avon Gorge Woodlands SAC fall with the NSDC boundary.

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Track Works	
Minor modifications to the vertical and horizontal alignment of the existing railway line to achieve the required line speed and passenger comfort. The horizontal displacement is typically in the order of 2 to 3 centimetres and does not	Various locations along the railway line.

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
materially alter the footprint of the track and ballast.	
Replacement of the track and ballast including site preparation, de-vegetation, (3 m from the running rail), soil/ballast removal, ballast track lifts, re-railing, replacement of occasional sleepers.	The whole length of the operational railway through the Avon Gorge Woodlands SAC.
Geotechnical Works Subject to further assessment at GRIP 5	
Geotechnical stabilisation works on cliff faces on NR and third party land. The main activities are: - Partial de-vegetation of the cliff faces - Loose rock picking off cliff faces, - Rock bolting, - Three sections of new catch fences, each 2 m high and between about 60 and 160 m long to the foot of the cliff secured by anchors.	See the General Arrangement Plan Sheets 9 to 13 DCO Document Reference 2.4 for the location of cliff faces and works required. Temporary access is required from the top of some of the cliff faces.
Geotechnical works on slopes within Network Rail land Subject to further assessment in GRIP 5	
Rock Face ID01 Confirmed actions: Removal of loose blocks and three trees causing root jacking. Potential actions: None envisaged. Ecological constraints: in the SAC.	122mi 7.5ch to 122mi 9.5ch
Rock Face ID02 Clifton Bridge No. 1 Tunnel South Portal Confirmed actions: None envisaged. Potential works: None envisaged. Ecological constraints: in the SAC.	122mi 20ch to 122mi 23ch
Rock Face ID03 Clifton Bridge No. 1 Tunnel North Portal Confirmed actions: Removal of loose blocks, apply an estimated five rock bolts especially above the tunnel portal, and removal of c No. 5 trees causing root jacking. Potential Actions: Apply an estimated ten rock bolts. Ecological constraints: In the SAC. 13 rare whitebeams present.	122mi 25ch to 122mi 31.5ch
Rock Face ID04 Confirmed actions: Removal of loose blocks and removal of c No. 10 trees causing root jacking.	122mi 37.5ch to 122mi 38.5ch

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Potential actions: Apply an estimated ten rock bolts if loose rocks/blocks cannot be removed safely. Ecological constraints: In the SAC. Six rare whitebeams present.	
Rock Face ID05 Clifton Bridge No. 2 Tunnel South Portal Confirmed actions: Removal of loose blocks. Potential actions: Apply an estimated ten rock bolts. Ecological constraints: In the SAC. Three rare whitebeams present.	122mi 50.5ch to 122mi 52.2ch
Rock Face ID06 Clifton Bridge No. 2 Tunnel North Portal Confirmed actions: Removal of loose blocks. Potential actions: Apply an estimated ten rock bolts. Ecological constraints: In the SAC. One whitebeam present and assume 20m^2 of rock-cress will need to be removed.	122mi 62.5ch to 122mi 63.5ch
Rock Face ID07 Confirmed actions: Removal of loose blocks. Potential actions: Apply an estimated ten rock bolts and rock fence potentially required 2 m high and 30 m long combined with the existing fence line position. Ecological constraints: In the SAC. 15 whitebeams present.	122mi 66ch to 122mi 68ch
Rock Face ID08 Confirmed actions: Removal of loose blocks. Potential actions: Apply an estimated ten rock bolts. Ecological constraints: In the SAC.	123mi 02ch to 123mi 04ch
Rock Face ID09 Confirmed actions: Removal of loose blocks and removal of c No. 5 trees causing root jacking. Potential actions: Apply an estimated ten rock bolts. Ecological constraints: In the SAC. Approximately 188 whitebeams present.	123mi 12.5ch to 123mi 16ch
Rock Face ID10 Confirmed actions: None envisaged. Potential actions: None envisaged. Ecological constraints: In the SAC.	123mi 18.5ch to 123mi 22ch
Rock Face ID11 Confirmed actions: Removal of loose blocks. Potential: Apply an estimated ten rock bolts.	123mi 43.5ch to 132mi 47ch

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Ecological constraints: In the SAC. Two common whitebeams present.	
Rock Face ID12 Sandstone Tunnel South Portal Confirmed actions: None envisaged. Potential actions: Apply an estimated two rock bolts . Ecological constraints: In the SAC.	123mi 75ch to 123mi 77.5ch
Rock Face ID13 Sandstone Tunnel North Portal Confirmed actions: None envisaged. Potential actions: Apply an estimated two rock bolts. Ecological constraints: In the SAC.	124mi 01ch to 124mi 2.5ch
Rock Face ID14 Confirmed actions: None envisaged. Potential actions: Apply an estimated five rock bolts and light scaling. Ecological constraints: In the SAC.	124mi 11.5ch to 124mi 26.5ch
Geotechnical works on slopes on third party land Subject to further assessment in GRIP 5	
Rock Face Area 1 Confirmed actions: Removal of loose blocks which are an immediate risk to the railway. Potential actions: Apply an estimated five rock bolts. Ecological constraints: In the SAC.	122mi 15.5ch to 122 17ch
Rock Face Area 1a Confirmed actions: Removal of loose blocks which are an immediate risk to the railway. Potential actions: None envisaged. Ecological constraints: In the SAC.	122mi 20.5ch to 122mi 22.7ch
Rock Face Area 2 Confirmed actions: Catch fence along top of cutting from tunnel portal (122 mi 25.7ch to edge of old quarry (122 mi 29.5ch). Rock debris (blocks) to be removed from slope to allow safe working below. Potential actions: None envisaged. Ecological constraints: In the SAC. No rare whitebeams on cliff top but present on lower slopes on NR land.	122mi 25.7ch to 122mi 31.8ch
Rock Face Area 3	122mi 36.8ch to 122mi 40.0ch

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Confirmed actions: None envisaged. Potential actions: None envisaged. Ecological constraints: In the SAC.	
Rock Face Area 4 Risk: Low 2 Confirmed actions: Notify landowner and recommend block above large planar failure is monitored for signs of future movement as potential risk to public tow path below. No works proposed. Potential actions: None envisaged. Ecological constraints: In the SAC.	122mi 5.01ch to 122mi 52.7ch
Rock Face Area 5 Confirmed actions: Apply an estimated five rock bolts to support wedge feature identified. Potential actions: None envisaged. Ecological constraints: In the SAC. No rare whitebeams present where works are required but are present on land below. Two rare plant species but no impact expected. detailed plans to protect rare species before works.	122mi 63.2ch
Rock Face Area 6 Confirmed actions: Targeted scaling on c 40% of cliff face to remove worst blocks. Install catch fence between 122mi 67.9ch to 122mi 70.5ch. Removal of vegetation along 5m wide strip to install catch fence. Potential actions: None envisaged. Ecological constraints: In the SAC. Rare whitebeams present. Two rare plant species but no impact expected.	122mi 68.2ch to 122mi 70.5ch
Rock Face Area 7 Confirmed actions: Install catch fence along cess between 122mi 76.4ch and 123mi 3.6ch. Removal of 3 m vegetation up slope and 1m down slope to install the fence. Scaling of escarpment and removal of blocks on slope to allow safe working below. Potential actions: None envisaged. Ecological constraints: In the SAC. Rare whitebeams present. Pad trunk of *S. bristoliensis*	122mi 77.3ch to 123mi 4.1ch

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
on slope prior to and during works to prevent damage from falling rocks hitting trunk.	
Rock Face Area 8 Confirmed actions: None envisaged. Potential actions: None envisaged. Ecological constraints: In the SAC. One rare whitebeam.	123mi 3.2ch to 123mi 10ch
Rock Face Area 9 Confirmed actions: Vegetation removal and light scaling of rock escarpment to allow detailed inspection and remove loose blocks which are an immediate risk to the railway. Potential actions: None envisaged Ecological constraints: In the SAC. No whitebeam on third party rock face. One whitebeam and two rare plant species on low cliff at south end. No impact expected.	123mi 15.7ch to 123mi 16.8ch
Rock Face Area 10 Confirmed actions: None envisaged. Potential actions: None envisaged. Ecological constraints: In the SAC. Presence of rare species not investigated.	123mi 35.0ch to 123mi 40.0ch
Rock Face Area 11 Confirmed actions: Removal of loose blocks which are an immediate risk to the railway. Ecological constraints: In the SAC. No rare whitebeams.	123mi 44.3ch to 123mi 50.0ch
Structures	
Minor works to repair railway bridges. • Miles Dock Bridge (S15), • Quarry Bridge No. 6 (S18). • Quarry Bridge No. 5 (S19). • Quarry Bridge No. 4 (S20). • Quarry Bridge No. 3 (S21). • Underbridge (S25). • Valley Bridge (S26). Minor strengthening works e.g. spandrel wall tie bars and pattress plates required. Removal of vegetation around the structures and erection of scaffolding to complete the works using small scale drills and hand tools.	124mi 08ch 123mi 64ch 123mi 34ch 123mi 23ch 123mi 11ch 122mi 40ch 122mi 34ch See the General Arrangement Plan DCO Document Reference 2.4.

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Localised earthworks associated with the bridge repairs.	
Quarry Bridge No. 2 (S22). Construct a new earth ramp from the railway to a temporary construction compound within the SAC. Partial dismantling and reconstruction of the bridge and abutments.	122mi 74ch See the General Arrangement Plan DCO Document Reference 2.4.
Avon Gorge Tunnels • Some clearance of vegetation and loose debris around the tunnel portals. • Localised repairs and strengthening may be required to the tunnel linings. • Cabling clipping works. • Installation of cable trough. • Track renewal works in Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel and Sandstone Tunnel.	Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel, and Sandstone Tunnel.
Minor local repairs to retaining walls and earthworks to address localised failure due to bulging or rotation at two locations.	See the General Arrangement Plan DCO Document Reference 2.4. 122mi 79ch 122mi 67ch
Communications, signalling and cabling	
Installation of new GSM-R communications antenna and masts to provide coverage in the Avon Gorge.	Two repeater antennae mounted on a pole at the south end of Clifton Bridge No. 2 Tunnel and about 500 m from the Clifton Suspension Bridge, with one antenna mounted at 8 m facing up the railway towards Clifton Bridge No. 1 Tunnel and the other mounted at 5 m pointing north into Clifton Bridge No. 2 Tunnel. Two repeater back to back antennae attached at 5 m to Sandstone Tunnel East (south) portal.
Installation of new signals with cabinets and associated telephones inside the SAC, to enable freight and passenger services to operate along the single track. Minor earthwork platforms may be required on which to seat the cabinets.	Locations to be confirmed at detailed design.

Table 1: Summary of Works within the Avon Gorge Woodlands SAC

Description of Development	Approximate Location
Troughing and cabling along the railway line associated with the new signalling and communications masts. Cables are laid in covered metal troughs usually flush with the ground surface.	The edge of the track along the entire length of the SAC. The usual location is near the edge of the track within the ballast, although this varies sometimes due to local conditions. Ideally it is 2 to 3 m away from the running rail.
Fencing and Access	
Replacement of the existing fencing along both sides of the railway corridor with Paladin style fencing typically 1.8 m high.	Along both sides of the railway along the entire length of the SAC, except where there are substantial natural boundaries, such as cliff faces, retaining walls or dense vegetation, or where the fencing has been de-scoped in the vicinity of Clifton Bridge.
New permanent stepped access points from the railway line up the embankment to facilitate maintenance: • Miles Dock (124 m 07 ch), • Valley Bridge (122 m 30 ch), • NR access gate to NR land (122 m 79 ch), • Quarry Bridge No. 5 (123 m 33 ch).	See the General Arrangement Plan Sheets 10, 11, 12 and 13 DCO Document Reference 2.4.

1.2.6 Some of the works identified above were undertaken in the early 2000s as part of the works to re-open the railway line for freight traffic, or subsequently as part of the maintenance works along the operational freight line. These activities include:

- Relaying the ballast, sleepers and rails
- Repairs to structures and tunnels
- Vegetation clearance and rock picking on the cliff faces

1.3 Avon Gorge SAC/SSSI Site description

1.3.1 The Avon Gorge (grid reference ST560743) is a 1.5-mile (2.5-kilometre) long gorge on the River Avon in Bristol, England. The gorge runs south to north through a limestone ridge 1.5 miles (2.4 km) west of Bristol city centre and about 3 miles (5 km) from the mouth of the river at Avonmouth. The gorge forms the boundary between the unitary authorities of North Somerset and Bristol City, with the boundary running along the south (west) bank. On the east side of the gorge is the Bristol suburb of Clifton and The Downs, a large public open space. On the west side of the gorge is Leigh Woods, the name of both a village and the woodland in which it is situated.

1.3.2 There are three Iron Age hill forts overlooking the gorge, as well as the Clifton Observatory. The Clifton Suspension Bridge, an icon of Bristol, crosses the gorge connecting Clifton and Leigh Woods.

1.3.3 Owing to its geology and ecology, an area of 155.4 hectares (384.0 acres) of the gorge and surrounding woodland was designated as a biological and geological SSSI in 1988 under the Wildlife and Countryside Act 1981 (as amended). In 2005 the site was designated as a Special Area of Conservation in accordance with the European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).

1.3.4 The steep cliffs of the gorge support some rare fauna and flora, including species unique to the gorge. There are approximately 30 Nationally Rare and Nationally Scarce vascular plant species, at least seven of which are rare whitebeams including Avon whitebeam *Sorbus avonensis*, Bristol whitebeam *S. bristoliensis,* Leigh Woods whitebeam *S. leighensis,* Houston's whitebeam *S. x houstoniae,* White's whitebeam *S. whiteana* and Wilmott's whitebeam *S. wilmottiana* all of which are endemic to the Gorge. The rare whitebeams are adapted to living on the thin soils of the gorge and most are found growing in the open rocky areas. Smaller rare plants are present, mainly associated with the limestone grassland communities, growing on the open rocky outcrops and grassy slopes. They include round-headed leek or 'Bristol onion' *Allium spaeocephalon* and Bristol rock-cress *Arabis scabra*, which are unique to the site. Spiked speedwell *Veronica spicata* is also present. Bristol rock-cress, round-headed leek and spiked speedwell are Schedule 8 plants protected under the Wildlife and Countryside Act 1981 (as amended).

1.3.5 Nationally scarce plants in the gorge which are present within NR land include fingered sedge *Carex digitata* and spring cinquefoil *Potentilla tabernaemontani.*

1.3.6 In summary, the Avon Gorge is important for the ancient woodland, including some very old small-leaved lime *Tilia cordata* trees and the associated species-rich transitions to scrub and herb-rich calcareous grasslands. The open limestone grassland and cliff ledges support a high number of uncommon species, including rare whitebeams *Sorbus* spp., and other important plants, such as Bristol rock-cress and spiked speedwell. Small groves of yew *Taxus baccata* also occur on some of the rockier situations.

1.3.7 The Avon Gorge supports horseshoe bats, peregrine falcons, ravens and rare invertebrates including silky wave moth *Idaea dilutaria* which only occurs in one or two places in Wales, and occasionally in England as well as chalk-hill blue *Lysandra coridon*. Small blue butterfly *Cupido minimus* may also be present because the habitat is suitable and it is present on the Bristol side of the Avon Gorge.

1.3.8 The Avon Gorge is also a nationally important geological site (which is reflected as part of the SSSI designation) and been studied since the early 19th century. The rock formations show the complete local succession of Carboniferous limestone. The succession spans the entire Tournaisian and Visean Stages, and also includes the Devonian Portishead Beds below. Extensive historic quarrying in the gorge have left their mark on the topography and have been largely recolonised by vegetation.

1.3.9 The gorge has a microclimate around 1 degree warmer than the surrounding land. The steep south-west facing sides receive the afternoon sunlight, but are partially sheltered from the prevailing winds. When winds come from the Bristol Channel to the north west they may be funnelled into the gorge, creating harsh and wet conditions.

1.4 Legislative Context

Legislation

1.4.1 Specific habitats and plant species receive legal protection in the UK under various pieces of legislation, including:

- The Wildlife and Countryside Act 1981 (as amended);
- The Natural Environment and Rural Communities Act 2006 (as amended);
- The Conservation of Habitats and Species Regulations 2017 (as amended); and
- The Protection of Badgers Act 1992 (as amended).

1.4.2 The **Wildlife and Countryside Act 1981** (as amended) ("WCA") consolidated and amended domestic legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats ("Bern Convention") and Council Directive 79/409/EEC on the Conservation of Wild Birds ("Birds Directive") in Great Britain. Part 1 protects animal and plant species while Part 2 protects habitats and geological features.

1.4.3 SSSIs are designated under the WCA. In England, Natural England has a duty to notify as a SSSI any land which in its opinion is of special interest by reason of any of its flora, fauna, geological or physiographical features. The designation is primarily to identify those areas worthy of preservation. A SSSI is given certain protection against damaging operations, which are listed in the citation for the site and any such operations must be authorised by the designating body. Local authorities and other public bodies now also have a statutory duty to further the conservation and enhancement of SSSIs both in carrying out their operations, and in exercising their decision-making functions, which includes planning decisions. The Countryside and Rights of Way Act 2000 strengthened the law giving greater power to the designating body to enter into management agreements, to refuse consent for damaging operations, and to take action where damage is being caused through neglect or inappropriate management.

1.4.4 The **Natural Environment and Rural Communities** Act 2006 ("NERC Act 2006") extended the biodiversity duty set out in the Countryside and Rights of Way ("CRoW") Act 2000 to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity. The Duty is set out in Section 40 of the Act which states that: *"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"*. This Act includes lists of Habitats and Species of Principal Importance for England and there is an obligation to implement measures to further the conservation interest of such species and to restore or enhance their populations or habitats. Section 41 of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for

the conservation of biodiversity in England. These are all the habitats and species in England that were identified as requiring action in the UK Biodiversity Action Plan ("UK BAP") and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

1.4.5 The **Conservation of Habitats and Species Regulations** 2017 (as amended) ("the Habitats Regulations") originally implemented provisions of the Habitats Directive, including those requiring the selection and proposal to the European Commission of SACs and the process to be followed where any plan or project was likely to have a significant effect on a SAC. On 31 December 2020 the Habitat Regulations were amended to provide for the retention of EU-derived law on habitats and species and to make such amendments as were necessary to reflect the withdrawal of the United Kingdom from the regulatory frameworks of the European Union. Sites that are European sites for the purposes of the Habitats Regulations, which include SACs, now form part of the national sites network ("NSN") rather than the EU Natura 2000 network. The process of Habitats Regulations Assessment is substantially unchanged although the amendments provide for the transfer of functions from the European Commission to appropriate authorities in England and Wales. In particular, in place of the European Commission, the Secretary of State for Environment, Food and Rural Affairs will now provide the opinion required by reg. 64(2)(b) in cases where a competent authority proposes to allow a plan or project in the case of a European site hosting a priority habitat or species but it is not possible to exclude the possibility of an adverse effect on the integrity of a European site on the basis of imperative reasons of overriding public interest other than reasons relating to human health, public safety or beneficial consequences of primary importance to the environment.

1.4.6 The **Protection of Badgers Act 1992** (as amended) makes it is an offence to kill, injure, take, possess or cruelly ill-treat a badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority. Sett interference includes disturbing badgers while they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.

Avon Gorge Woodlands SAC

1.4.7 The Avon Gorge Woodlands SAC designation is reproduced in Annex A. The Conservation Objectives can be found at: http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sac/conservationobjectives.aspx

1.4.8 The conservation objectives are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the two qualifying features:
  - H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco-Brometalia*; Dry grasslands and scrublands on chalk or limestone.
  - H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes.

- The structure and function (including typical species) of qualifying natural habitats.
- The supporting processes on which qualifying natural habitats rely.

1.4.9 A Site Improvement Plan has been written for the Avon Gorge Woodlands SAC (Natural England, 2015) which details the threats and pressures on the designated site and actions required to address the issues. This document identifies the follow priority issues in respect of the qualifying features of the site:

- invasive species (woodland and grassland);
- under grazing (grassland);
- public access (woodland and grassland);
- disease (woodland);
- changes in species distributions (woodland and grassland); and
- air pollution (woodland and grassland).

Avon Gorge SSSI

1.4.10 The Avon Gorge SSSI designation is reproduced in Annex B. In summary, the key features are the geological interest of the natural cliffs and quarry exposures of Carboniferous limestone, and the screes, scrub, pockets of grassland and woodlands which support an exceptional number of nationally rare and scarce plant species including many endemic whitebeam species.

1.4.11 All the SSSI management units within NR ownership (SSSI units 2, 6, 7, and 10) are currently in unfavourable recovering condition[1]. These SSSI management units include land owned by other landowners outside the boundaries of NR land. Natural England has advised that if the condition of the land within NR ownership was classified alone it is likely that it would be in unfavourable declining condition.

Schedule 8 Plants

1.4.12 Plant species listed on Schedule 8 of the WCA receive protection under Section 13. Three of these species, round-headed leek, Bristol rock-cress and spiked speedwell are known to occur in the Avon Gorge. Section 13 of the WCA makes it an offence to:

- intentionally pick, uproot or destroy (Section 13 1a);
- sell, offer for sale, possess or transport for the purpose of sale (live or dead, part or derivative) (Section 13 2a);
- advertise (any of these) for buying or selling (Section 13 2b).

1.4.13 The WCA allows for actions that would otherwise be unlawful regarding these three species listed to be undertaken if an appropriate licence has been issued. Licences can be issued for the purposes of science or conservation. A licence may be required for construction works if it affects Bristol rock-cress and this is discussed further in Section 5.8.

[1] https://designatedsites.naturalengland.org.uk/SiteUnitList.aspx?SiteCode=S1003073&SiteName=avon&countyCode=&responsiblePerson (accessed 29/05/2018).

Schedule 9 Plants

1.4.14 Section 14 (2) of the WCA prohibits planting or otherwise causing to grow in the wild any plant which is included in Part II of Schedule 9. Species listed on Schedule 9 include Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and various cotoneaster species *Cotoneaster* spp. which are found in the Avon Gorge.

1.4.15 Where relevant, this Plan takes account of the legislative protection afforded to specific habitats and species.

Landownership and existing site management

1.4.16 Leigh Woods, on the west side of the Avon Gorge, is owned by the National Trust, the Forestry Commission ("FC"), NR and the Wills Estate.

1.4.17 NR owns and is responsible for the management and maintenance of the operational railway line. NR has prepared a SMS and VMP to address maintenance and operational issues for the section of the railway which passes through the Avon Gorge Woodlands SAC / Avon Gorge SSSI.

1.4.18 It is understood that the National Trust is not planning to manage the slopes of the Avon Gorge intensively, but will be creating woodland pasture for management elsewhere in the SAC. Their main aim for Quarry No. 2 and other parts of their site such as Blockhouse Slope is to manage the site by grazing with sheep.

1.4.19 The FC manages 33 ha (just over 20%) of Leigh Woods that is owned by the Secretary of State for Environment, Food and Rural Affairs. FC has a Management Plan for the Avon Gorge SSSI (Forestry Commission 2016) which aims to help Natural England meet the conservation objective for the SSSI with a long term aim of achieving favourable condition on all units.

SECTION 2

Considerations for the Plan

2.1 Key Issues

2.1.1 This Avon Gorge Vegetation Management Plan takes into account the following key issues:

- Balancing safe rail operations and nature conservation
- The operating railway, known as the Portbury Freight line
- Rope access on steep slopes
- Vegetation succession and secondary (recent) woodland
- Eutrophication of soils under scrub and woodland
- Non-native plants
- Deer and rabbit browsing and woodland regeneration
- Disposal of arisings
- Demarcation of sensitive species
- Impacts on Geological designations

2.1.2 These issues are discussed in the following paragraphs.

Safe rail operations and nature conservation

2.1.3 NR, Natural England, NSDC, Bristol City Council and FC have a duty to conserve and enhance the special features of SSSIs when undertaking their statutory functions (Section 28G WCA).

2.1.4 NR's primary objective is to maintain the rail infrastructure to permit the safe and efficient passage of trains. The paramount concern is for railway safety: there is a need to prevent accidents such as those arising from falling trees or unstable slopes affecting the railway line. Prevention of these accidents must be balanced against affecting the nature conservation interest of the site.

2.1.5 Historically, the line and adjacent woodland has been heavily managed, however, the use of the railway line for freight alone (since it opened in 2001) has meant that minimal woodland and rock face management has been undertaken in the last two decades. As a result, although a 3 m trackside clearance and height clearance has been maintained in places along the route, some additional vegetation clearance and replacement fencing is required to allow the safe passage of the much lighter passenger trains and to allow working space for construction of the DCO Scheme. The SAC was designated in April 2005, by which time the impact of lack of management (such as caused by invasive non-native species ("INNS")) had already affected the SAC.

2.1.6 The more recent minimal management regime along NR land within the Avon Gorge Woodlands SAC/SSSI has resulted in the development of a tall etiolated secondary (recent) woodland and overgrown coppice stools as well as the expansion of invasive species.

2.1.7 On the Leigh Woods side of the track, behind these more etiolated trees, are the mature semi natural ancient woodland with forestry plantations on FC land. These woodlands contain some areas of veteran coppiced lime that have not been cut for many years, some of these coppice stools have failed. The lime coppice stools are currently within the woodland edge which in turn is protected by the trackside tall etiolated secondary (recent) woodland. The danger with any major track clearance is that these trees would be exposed to the elements and more failures would occur.

2.1.8 Some mature coppiced lime, oak and sweet chestnut *Castanea sativa* are growing along the top edge of some of the trackside embankments. These trees appear sound, but may have weaker unions and decay at the base of the stems. Longer-term, these coppiced trees will require some form of management. The minimum would be to reduce the height of the main stems, or removal of the front stems. More ideal would be to re-coppice the trees and maintain them on a regular basis as coppiced trees (although this may not be suitable management for veteran trees such as lime, but these could be coppiced and the base retained as veteran features). Again, if major clearance dictates that the trees are coppiced, consideration must be given to the stability of the woodland edge trees behind the coppice trees. Whether a coppice cycle is suitable in the longer term would be part of the operational management of the woodland, which will be considered by NR as part of their SMS and VMP. NR has confirmed that there is the possibility that coppicing may be employed, but there is no certainty or planning around this and NR would not wish to make any firm commitment in this regard at the present time.

2.1.9 The majority of trackside trees are semi-mature tall etiolated ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus*, with cherry, oak, elm and lime in lesser numbers. Because of the shallow soils over rock the stability of these trees again cannot be guaranteed. Track clearances can be achieved by crown lifting/reduction or coppicing of these trees, but for longer term safety and the ongoing management programme NR may require the removal of some of these trees, which will be considered by NR as part of their SMS and VMP.

2.1.10 Removal of a high number of trees may have implications for slope and/or tree stability and could have an impact on other ground flora. If large numbers of trees are to be removed, liaison with site engineers, ecologists and third party woodland managers such as the FC and the National Trust will be necessary to manage this issue.

2.1.11 Above tunnel portals and along the top edge of rock faces there are again more mature coppiced trees that were once cut back and have now regrown. The integrity of these coppice stools cannot always be guaranteed and longer term they will require further inspection and possible removal due to their size and/or decay in stem unions making them unsound or their integrity may be improved by undertaking a regular cutting cycle.

2.1.12 Dead, dying and diseased trees may have to be removed routinely to prevent accidents, which could affect many of the woodland edges along the railway. The widespread incidence of ash die-back disease in the Avon Gorge since 2016 could result in death of mature ash trees along the railway in the next few years. However, the general assumption is not to clear ash affected by ash die-back disease unless they are a risk to the railway and where practical, natural regeneration of ash should be encouraged.

2.1.13 Due to dense vegetation or steep slopes and rock faces, surveys of inaccessible trees may need to be carried out prior to the commencement of construction works. Liaison with project engineers regarding slope and rock face stability would help establish if these inaccessible trees could be a risk to the DCO Scheme or ongoing management of the railway line.

Portbury Freight line

2.1.14 The site is an existing operational rail corridor and NR is obliged to maintain this status accordingly. As such NR will be undertaking woodland management works in accordance with their SMS. These works should complement the works required for the DCO Scheme.

2.1.15 During inspections to facilitate the development of this Plan a number of trees representing a potential health and safety risk to the rail corridor were identified in 2017 (Annex J). NR has been notified of these trees.

Rope access on steep slopes

2.1.16 Many of the cliffs and steep slopes above the railway require rope access to work safely, giving practical limitations as to what can be achieved, especially whilst the railway line is operational.

2.1.17 The Bristol Port Company is allowed, pursuant to planning permission, to run up to 20 freight trains a day in each direction, although in recent years the number of train passes has been much lower. Notwithstanding, it is usually necessary to request a line block while undertaking works along the Avon Gorge that requires access within 2 m of the railway line or may pose a safety risk to the trains.

Vegetation succession and secondary (recent) woodland

2.1.18 Woods which developed on previously open ground from the start of the 17th century are termed secondary or recent woodland[2].

2.1.19 There is a long-term issue in the Avon Gorge of grassland and open scrub undergoing natural succession through dense scrub to secondary (recent) woodland, as many old photographs testify. The Portishead Branch Line was closed to passengers in 1964, and to all traffic in 1981. Historic photographs show that many habitats were much more open than today, especially the quarries, railway sides and the River Avon Tow Path. Photographs of the Avon Gorge near Clifton Bridge No. 2 Tunnel taken in 1937 show the land between the railway and the River Avon Tow Path as predominantly clear of trees[3]. Following closure of the railway and cessation of quarrying activities and lack of vegetation maintenance, the open, rocky cuttings through the Avon Gorge would have provided ideal colonisation sites for many trees and shrubs, including Whitebeams, and much is now tall secondary (recent) woodland.

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[2] www.woodlands.co.uk/owning-a-wood/managing-your-woodland-for-wildlife/03-chapter-1---identifying-woodland-types.pdf, (accessed 20.05.19).

[3] www.gettyimages.co.uk/photos/avon-gorge-1937?phrase=avon%20gorge%201937&sort=mostpopular#license www.gettyimages.co.uk (accessed 20.02.2020).

2.1.20 Active management is required to maintain the grassland and open scrub which are important for rare grassland plants. Many of the Whitebeams are mid-succession species in scrub, but rarely survive to the tall closed woodland stage. Clearance and management beneficial for the survival of the Whitebeams and other species will occur if the DCO Scheme proceeds.

Eutrophication of soils under scrub and woodland

2.1.21 As scrub and secondary (recent) woodland develop over grasslands, there tends to be an accumulation of nutrients as the leaf litter increases and becomes incorporated into the soil. This means that once dense scrub and secondary (recent) woodland develop, removal of the upper soil horizons may be required to return the soil to a low nutrient status required to support *Festuco-Brometalia* grasslands (one of the habitat types for the SAC citation) and reduce the impact of competitive native and non-native species.

Non-native plants

2.1.22 A major problem in the Avon Gorge is the spread of non-native plants, some of which are listed on Schedule 9 of the WCA 1981 (as amended). These non-native plants require coordinated control throughout the designated site. For example, evergreen non-native species such as holm oak *Quercus ilex* (this is probably the major threat in the gorge), cherry laurel *Prunus laurocerasus* and locally rhododendron *Rhododendron ponticum* are a particular problem for native vegetation, giving dense shade all year round and stopping the ground flora from growing. Invasive non-native deciduous trees such as Norway maple *Acer platanoides* and sweet chestnut also compete with native trees. Smaller woody shrubs such as butterfly bush *Buddleja davidii* and the many species of cotoneaster (e.g. *Cotoneaster simonsii, C. microphyllus*) spread rapidly into open ground, rock faces and grasslands. In some places, herbaceous invasive plants such as Himalayan balsam *Impatiens glandulifera* are also present.

2.1.23 This is a SAC-wide problem not confined to NR land. Control of non-native species needs to be undertaken in a coordinated fashion with the adjacent land owners (namely National Trust, Trustees of the Wills Estate, and the FC) to ensure widespread control and minimise re-colonisation. Some control programmes have already been undertaken, especially by the National Trust.

2.1.24 The following non-native plants are listed in order of priority for control along the railway corridor:

- Holm oak
- Cotoneaster species
- Rhododendron
- Cherry laurel
- Laurustinus *Viburnum tinus*
- Norway maple
- Butterfly bush
- Red valerian *Centranthus ruber*
- Himalayan balsam
- Japanese rose *Rosa rugosa*
- Snowberry *Symphoricarpos albus* and hybrids

- Red oak *Quercus rubra*
- Turkey oak *Quercus cerris*
- Sweet chestnut *Castanea sativa*

Deer and rabbit browsing and woodland regeneration

2.1.25 There is relatively little natural woodland regeneration apparent on the North Somerset (west) side of the gorge, except near areas with high visitor pressure, probably due to the deer population which browse the young saplings. Many small holly and yew shrubs show signs of browsing, and there is a noticeable browse line at about 1.3 m above ground level. Any coppicing or new plantings (e.g. of whitebeams or lime) will need to be protected from deer and rabbit damage.

Disposal of arisings

2.1.26 There will be a substantial amount of arisings from vegetation control along the railway line which will require disposal. Historically, arisings have been left *in situ* beside the cess or left on open grasslands and rocks for later collection but some have not been cleared, resulting in the degradation of grassland vegetation and open rocky habitats, eutrophication of soils and subsequent development of scrub. Disposal of arisings is detailed in Section 5.4 and Annex L.

Demarcation of sensitive species

2.1.27 A number of techniques including spray paint, coloured tape and plastic collars have been used to demarcate sensitive Whitebeam plants in the Avon Gorge, as shown in the photographs below. The number of methods employed have the potential to cause confusion to those undertaking works, alert the public to sensitive species and also distract from the natural setting of the woodland. As such the mechanism of demarcation needs to be consolidated, as discussed in Section 5.3.

Impact on geological designations

2.1.28 ES Chapter 10 Geology, Hydrogeology, Ground Conditions and Contaminated Land (DCO Document Reference 6.13) includes assessment of the potential for impacts from the construction of the DCO Scheme on the underlying geology. Any potential for impacts on geological conservation sites present within the footprint of the DCO Scheme are also considered. The assessment concludes that within the Avon Gorge, the cliff stabilisation assessment and mitigation measures required are relatively small scale and are not predicted to affect the SSSI designation.

Plastic yellow collars installed to facilitate the identification of sensitive species during works along the freight line. A number of these collars are now constricting the plant which they demarcate and should be removed to prevent growth restriction and death of the tree.

More recently blue and orange tape has been used to demarcate sensitive Whitebeam species. This method is temporary and vulnerable to removal from third parties. It also obtrusive to the natural setting of the gorge.

Trees on retaining walls marked with blue spray paint. There is evidence of trees having been removed along the wall by persons unknown and this could be attributed to the demarcation method employed.

2.2 Key habitat features to be considered in the Plan

Woodland

2.2.1 Both ancient semi-natural woodland and secondary (recent) woodland are included in the qualifying *Tilio-Acerion* woodlands (European Commission 2007) for which the SAC is designated (mainly national vegetation classification ("NVC ") types W8 and W9).

Ancient semi-natural woodland

2.2.2 The woodland is dominated by small-leaved lime with beech *Fagus sylvatica*, ash and wych elm *Ulmus glabra*, with yew associated with the more natural slopes, rocky outcrops and cliffs. Much of this is diverse Ancient Woodland with uncommon species in the ground flora such as lily-of-the-valley *Convallaria majalis*. This woodland occurs on the natural rocks and slopes, for example around the Clifton Bridge No. 1 Tunnel portal, and small widths are included in the NR Land bordering the railway.

Secondary (recent) woodland

2.2.3 Secondary (recent) woodland (taller than 5 m) is the main woodland type along the railway cuttings, in quarries, between the railway and the River Avon Tow Path, and between the tow path and the river, with lime, oak, ash, sycamore, wych elm, hazel, hawthorn, traveller's joy, bramble and invasive non-natives such as holm oak and Norway maple. Much of this woodland is not diverse, but the more open areas are a key habitat for some of the rare whitebeams, at least whilst the woodland is young.

2.2.4 Some parts of the woodland between the tow path and river are in NR ownership, such as between Quarry Bridge No. 6 and Sandstone Tunnel. These woodlands are relatively diverse, including, limes, wych elms and rare whitebeams.

Scrub

2.2.5 Scrub (less than 5 m tall) variably composed of hawthorn, bramble, dogwood, birch, privet and ivy, traveller's joy is widespread in the quarries, railway cuttings and open rock faces, and varies in composition from place to place. Some areas have butterfly bush, young holm oak and other non-native plants. Scrub is widespread on NR land.

2.2.6 The scrub (mainly NVC types W21d and W24) is not a qualifying feature of the SAC but it is included in SAC citation "*species-transitions to scrub and grasslands are associated with the woodland*". The discontinuous scrub layer within the woodlands is part of the Avon Gorge SSSI citation. However, scrub is often encroaching on more valuable grassland habitats and in these situations the grassland should be treated as higher priority.

Grasslands

2.2.7 The *Festuco-Brometalia* grassland (European Commission 2007) is a qualifying feature for which the SAC is designated (mainly NVC types CG1 and CG3).

2.2.8 There are few large areas of grassland left on the west side of the gorge, and these are mainly associated with the quarries and over Clifton Bridge No. 2 Tunnel, these typically have upright brome *Bromopsis erecta* with species such as Gloucester hawkweed *Hieracium glevense* and fly orchid.

2.2.9 Only a few small areas survive on NR land and these grade into the rocky habitats (see below) and others are being invaded by scrub but have potential for restoration. There are also small areas of grassland scattered along the River Avon Tow Path (some of which is owned by NR) which are also mostly being colonised by scrub species such as dogwood as well as ivy, though occasional patches remain with rare plants such as spring cinquefoil.

Rock outcrops

2.2.10 The rock outcrops are a major feature within the Avon Gorge, many with significant nature conservation value for both geology and biodiversity.

2.2.11 There are a few natural cliffs present, but most cliffs are in man-made cuttings or quarries. These may be covered with ivy and are an important location for rare whitebeams. They are a feature for which the SSSI is designated and their visibility (i.e. being free of scrub/trees) is a key factor to their geological condition.

2.2.12 The low, partially-vegetated rocky outcrops, which grade into *Festuco-Brometalia* grassland (NVC type CG1) and thus are qualifying features of the SAC, provide habitat for rare plants such as Bristol rock-cress and spiked speedwell.

Railway cuttings, embankments and trackside vegetation

2.2.13 There are extensive cuttings along the railway, often vegetated with secondary (recent) woody vegetation, which may include rare Whitebeams.

2.2.14 The railway has species such bramble and ivy lining the sides of the ballast and cess. The edges of the ballast provide a significant habitat for the narrow-leaved bittercress *Cardamine impatiens*, pale St John's-wort *Hypericum montanum* and small teasel *Dipsacus pilosus*.

2.2.15 The railway retaining walls support some species of interest, including many round-leaved whitebeam *Sorbus eminens* saplings.

Saltmarsh

2.2.16 The saltmarshes along the River Avon are subject to large changes in water levels with the tides, and typically have sea couch *Elytrigia atherica*, saltmarsh grass *Spartina anglica* and sea aster *Aster tripolium*. The saltmarshes are a feature for which the SSSI is designated. There are only small areas of saltmarsh within the NR ownership.

SECTION 3

Impacts of the DCO Scheme

3.1 Key impacts

3.1.1 Unmitigated site clearance and construction works have the potential to cause the following:

- Habitat loss;
- Loss of rare plant species;
- Wind throw to stands of Ancient Woodland trees, particularly areas of mature coppice, as they will be more exposed following the removal of front stands of trees (including land outside of NR ownership);
- Invasive species and pathogen transfer, as machinery and materials move across the site; and
- Disturbance and incursions to these areas from site personnel, machinery and storage of materials and equipment.

3.2 Construction works and vegetation clearance

3.2.1 Construction works are required for the DCO Scheme. The works identified from the outline design (NR Governance for Railway Investment Projects "GRIP" 3) within the Avon Gorge are identified on the General Arrangement Plans DCO Document Reference 2.4 and are listed below:

- New, replaced or removed fencing,
- Access steps,
- A signal and an equipment cabinet (Signal BL1899),
- Minor repair works to seven bridges,
- Reconstruction of Quarry Bridge No. 2 (an indicative description of strengthening works is provided in Annex C). To enable the construction works, a temporary construction compound is required within the adjacent quarry (Quarry 2) owned by the National Trust. A temporary ramp from the railway embankment to the construction compound will be built and removed on completion of the works.
- Interventions on rock faces on NR land such as stone picking and rock bolting,
- Interventions on third party rock faces belonging to the National Trust, FC and the Wills Estate including stone picking, rock bolting and catch fences,
- Installation of telecommunications masts,
- Works to repair small areas on two retaining walls.
- Minor earthworks retaining structures.

3.2.2 New or replaced fencing is required for the DCO Scheme for health and safety reasons and to prevent trespass, which is a particular problem north and south of Clifton Bridge No. 1 Tunnel. Vegetation will need to be removed to install fencing, however, there are benefits from more secure fencing by managing public access and disturbance to the SAC, which is highlighted as a pressure/threat in the Site Improvement Plan.

3.2.3 NR has confirmed that the following scale of vegetation clearance is required for construction activities:

- 1 m either side of fences to be removed/replaced or new fences proposed and access steps.
- 1 m either side of wing walls and 5 m from bridges where work is proposed (seven bridges reference numbers S15, S18, S19, S20, S21, S25 and S26 – See Figure 1 for the location of structures).
- Quarry Bridge No. 2 (reference number S22, Figure 1) to be reconstructed) – 5 m around the structure on both sides of the structure and along the railway embankment.
- Quarry Bridge No. 2 site compound. A temporary ramp from the freight line to Quarry 2 with an associated site compound area is proposed for the construction works to Quarry Bridge No. 2 and the scale of vegetation clearance is shown in Table 2. The draft methodology for the bridge replacement and location of the site compound is presented in Annex C.
- A vegetation clearance of 1 m will be required around each GSM-R telecommunications antenna and masts. An equipment box will be required at each tunnel portal and at the GSM-R masts, which wil require vegetation clearance for the box and 1 m around it. Removal of rare Whitebeams will be avoided.
- Local rebuild of Retaining Wall at 122mi 67ch and 122mi 79ch. Vegetation clearance on 2 m of wall to rebuild and 2 m either side of wall plus 2 m either side to tie-in (10 m in total at each retaining wall).
- No vegetation clearance is required for the minor earthworks retaining structures.

3.2.4 In addition to this, vegetation removal is required for geotechnical works on NR owned rock faces and third party rock faces to avoid rock falls affecting the railway by interventions such as installation of rock bolts or rock catch fences. The detailed design for the interventions has not been completed at the current time and the exact locations of the interventions have not been determined. To undertake an assessment of vegetation losses and impacts, realistic worse-case scenarios have been undertaken as discussed in Section 3.3.

3.2.5 NR proposes five 'micro' construction compounds within the Avon Gorge and has confirmed that these will be placed in areas where no vegetation clearance is required e.g. near bridges or if vegetation clearance is necessary, the locations will be where only low value vegetation such as bramble is present.

Figure 1: Location of bridges in the Avon Gorge

Structures within the Avon Gorge SAC/SSSI are S15, S18, S19, S20, S21, S22, S25 and S26

3.3 Calculation of area of SAC habitat to be affected

3.3.1 The areas of vegetation to be removed for construction activities have been calculated for fencing, access steps, structures, the signal and signal locator box, telecommunications masts and equipment boxes and retaining walls.

3.3.2 A preliminary design has been produced for a site compound area for construction works to Quarry Bridge No. 2 and an associated ramp to allow access from the freight line to the site compound area (Annex C). The compound area is within the former quarry site and is owned by the National Trust (Quarry 2). Removal of grassland, scrub and ancient woodland has been calculated from the preliminary design, which assumed a worst-case with respect to habitat loss.

3.3.3 A realistic worse-case scenario has been developed to determine the potential impact of geotechnical works on NR rock faces. The methodology for this is explained in Annex D. Eleven of the 14 rock faces potentially require installation of rock bolts and one requires a rock catch fence that, to reduce potential impacts, could be combined with the proposed fence line position at the bottom of the rock face and therefore no additional vegetation removal has been predicted for installation of this fence (Rock face ID07, Annex D). The locations of the rock faces are shown in Annex F, Figure 2.

3.3.4 A realistic worse-case scenario has also been developed to determine the potential impact of geotechnical works on third party rock faces that are owned by the National Trust, the FC and the Wills Estate. The methodology for this is explained in Annex E. Two of the eleven rock faces require

installation of rock bolts and three require a rock catch fence. The locations of the rock faces are shown in Annex F, Figure 3.

3.3.5 No rare/notable plants will be removed or affected from removing loose blocks, rock scaling or individual trees causing root-jacking during geotechnical works. If there is potential for rare plants to be damaged by material falling onto them from above, they will be protected and this will be developed during the detailed design. Tree species causing root jacking on rock faces have not been confirmed at this stage but will be confirmed at the detailed design stage.

3.3.6 Table 2 shows the total area of vegetation to be removed for each of the construction related activities. The areas have been divided into losses of semi-natural ancient woodland, secondary (recent) woodland and SAC grassland. All are assumed to be SAC-qualifying features.

Table 2: Areas of vegetation clearance within the Avon Gorge SAC/SSSI by habitat type

Construction Activity	Semi-natural ancient woodland (m^2)	Secondary (recent) woodland (m^2)	SAC grassland (m^2)
Fences removed/replaced or proposed and new access steps	2494	2225	76
Works to bridges numbers S15, S18, S19, S20, S21, S25 and S26	162	606	
Works to Quarry Bridge No. 2 (S22)	50	43	
Signal BL1899	1		
Equipment cabinet for Signal BL1899		6	
Telecommunications masts and associated equipment boxes	25		15
Quarry Bridge No. 2 site compound (within National Trust owned former quarry) and ramp on rail embankment	106		381
Geotechnical works on NR owned rock faces. Predicted areas.	296		80
Geotechnical works on third party owned rock faces. Predicted areas.	868	390	20

Table 2: Areas of vegetation clearance within the Avon Gorge SAC/SSSI by habitat type

Construction Activity	Semi-natural ancient woodland (m^2)	Secondary (recent) woodland (m^2)	SAC grassland (m^2)
Local rebuild of Retaining Walls at 122mi 67ch and 122mi 79ch.		10	10
Total	**4,002**	**3,280**	**582**

3.3.7 The total approximate area of land under management of NR running through the protected areas of the SSSI and SAC designations is 11.5 ha. The vegetation clearance in Table 2 is 7,864 m^2 in total (0.79 ha), which equates to approximately 6.9% of NR land and 0.52% of the total area within the SAC (which is 151 ha).

3.4 Impacts on rare plants

Impacts on rare Whitebeams

3.4.1 The Avon Gorge has a diverse population of whitebeams, with 21 taxa recorded and on-going speciation (Rich & Houston 2004; Houston et al. 2008, Rich et al. 2009; Rich et al. 2010). Surveys by L. Houston in 2015-2016 show that 11 *Sorbus* species are present on NR land, some of which are very rare.

3.4.2 As part of the project a detailed survey was undertaken to plot the exact positions of the rare Whitebeams on NR land. The survey team worked with national Whitebeam experts Tim Rich and Libby Houston to identify and survey the rare Whitebeams.

3.4.3 The impacts on rare Whitebeam species within the SAC are predicted to be as shown in Table 3. The reason for tree removal is given in the table. A contingency of an additional 1 tree for each species has been included in case of slight changes in scheme detailed design and construction tolerances. The number and species to be removed on NR and third-party rock face has been predicted and can be considered as a realistic worse-case scenario, as discussed in Annexes D and E. The locations of the rare Whitebeam trees are shown on Annex F, Figure 1 where known.

3.4.4 Some of the rare whitebeam trees are dangerously overhanging tunnel portals and stumps will need to be treated with herbicide due to safety reasons. Trees which are damaging rock faces would also be removed and stumps treated with herbicide. NR would accept coppicing at other locations in certain circumstances, especially the smaller, slow growing whitebeams in non-safety critical locations. For the purposes of this report, whether the tree is removed (and stump treated) or coppiced, it is considered an impact to the whitebeam population.

Table 3: Removal/coppice of rare Whitebeam trees for DCO Scheme

Species and number	Reference number (Annex F, Figure 1)	Location	Removal or coppice	Description of tree (Houston 2017)	Reason for removal
1 Avon whitebeam	AV04	Clifton Bridge No. 1 Tunnel portal	Remove and stumps treated with herbicide	Coppiced, height 4m, girth 7cm, 4 stems	Dangerously overhanging
1 Avon whitebeam	AV03	Clifton Bridge Tunnel No. 1 portal	Remove and stumps treated with herbicide	Coppiced, height 4.5m, 3 stems	Dangerously overhanging
1 Avon whitebeam	AV05	Clifton Bridge No. 1 Tunnel portal	Remove and stumps treated with herbicide	Coppiced, height 6m, girth 20cm, 2 stems	Dangerously overhanging
1 Avon whitebeam	AV07	Clifton Bridge No. 1 Tunnel portal	Coppice	Coppiced, height 2.5m, multi-stem	Overhanging rock face
1 Avon whitebeam	AV022	Clifton Bridge No. 1 Tunnel portal	Coppice	Maiden, height 11m, girth 38cm	Overhanging rock face
1 Avon whitebeam	Predicted	NR rock face ID03	Remove	Unknown	Predicted for installation of rock bolts
1 Avon whitebeam	Predicted	NR rock face ID04	Remove	Unknown	Predicted for installation of rock bolts
4 Avon whitebeams	Predicted	Third party rock face 2	Remove	Unknown	Predicted for installation of rock catch fence
1 Avon whitebeam	Predicted		Remove	Unknown	Contingency

Table 3: Removal/coppice of rare Whitebeam trees for DCO Scheme

Species and number	Reference number (Annex F, Figure 1)	Location	Removal or coppice	Description of tree (Houston 2017)	Reason for removal
1 Round-leaved whitebeam	EMI10	Clifton Bridge No. 2 Tunnel eastern portal	Remove and stumps treated with herbicide	Coppiced, height 3m, 2 stem	Dangerously overhanging
1 Round-leaved whitebeam	EMI182	Bridge No. 6	Remove	Coppiced, height 2m, girth 3.5cm, 2 stem from 15cm stump. Long known tree	To enable bridge works
1 Round-leaved whitebeam	EMI08	Near Valley Bridge	Coppice	Coppiced, height 0.32m, 4 stems	For installation of new fencing
1 Round-leaved whitebeam	Predicted	NR rock face ID05	Remove	Unknown	Predicted for installation of rock bolts
1 Round-leaved whitebeam	Predicted		Remove	Unknown	Contingency
1 Bristol whitebeam	BRI08	Clifton Bridge No. 2 Tunnel portal	Coppice	Maiden, height 4m, girth 27cm, long known stunted mature tree	Overhanging rock face
1 Bristol whitebeam	Predicted		Remove	Unknown	Contingency
5 Leigh Woods whitebeam	Predicted	NR rock face ID09	Remove	Unknown	Predicted for installation of rock bolts
1 Leigh Woods whitebeam	Predicted		Remove	Unknown	Contingency
1 Willmot's whitebeam	Predicted	NR rock face ID07	Remove	Unknown	Predicted for installation of rock bolts

Table 3: Removal/coppice of rare Whitebeam trees for DCO Scheme

Species and number	Reference number (Annex F, Figure 1)	Location	Removal or coppice	Description of tree (Houston 2017)	Reason for removal
1 Grey-leaved whitebeam	Predicted		Remove	Unknown	Contingency

3.4.5 Table 3 shows twelve Avon Whitebeam that are predicted to be affected by the DCO Scheme, of which ten require removal and two will be coppiced. Five Round-leaved whitebeam are predicted to be affected, of which four would be removed and one coppiced. Two Bristol whitebeam are predicted to be affected, with one removed and one coppiced. Six Leigh Woods whitebeam, one Wilmott's whitebeam and one Grey-leaved whitebeam will be removed. The total number of rare whitebeam trees impacted is 27.

3.4.6 Where rare whitebeams are coppiced, NR has confirmed that forward plans for managing these trees will be on an ongoing basis and determined on a case by case basis, rather than delivered in line with an overarching, long-term strategy. The SMS will be updated in the future and better tagging/marking of trees agreed (and / or added to NR's maintenance work database (known as "ELIPSE") as a work item to be delivered in the future (known as an "MST").

3.4.7 More trees (a total of 50) were estimated as directly affected for the two trains per hour proposals in the Preliminary Environmental Information Report which was published for the statutory consultation (CH2M, 2017). However, the DCO Scheme is based on the hourly plus service and the assessment have been refined resulting in a lower level of impact.

Impacts on other rare plants

3.4.8 Bristol rock-cress, a WCA Schedule 8 plant, is present on NR rock face ID06. As a reasonable worst case scenario, it is estimated that an area of 20 m^2 where Bristol rock-cress is present will be removed for the potential installation of ten rock bolts. A licence will be required for removal of this WCA Schedule 8 plant.

3.4.9 Ballast replacement may result in the loss of seeds of the rare plants narrow-leaved bittercress which are very locally abundant along the sides of and in the railway tracks and Pale St John's-wort which is present along the edge of the cess north and south of Quarry 3 Bridge (11 plants in 2016/2017).

SECTION 4

Management Proposals

4.1 Vegetation Management Plan

4.1.1 The management proposals have been developed as part of the environmental impact assessment process to mitigate and compensate for the impacts of the DCO Scheme. Specific compensation for the anticipated loss of rare whitebeam trees is provided separately from the woodland compensation measures and is described in Section 5.7 and detailed in Annex H.

4.1.2 Compensation for the loss of qualifying woodland and grassland habitat within the SAC will be undertaken by positive management in other areas of land identified in consultation with Natural England. Although two alternative proposals are presented in this Plan for woodland management, an agreement between NSDC and the FC concluded before the end of the Examination provides for the delivery of all 1.45 ha of the proposed woodland compensation measures on FC land. As set out in the Statement of Common Ground, the provision of woodland compensation measures on FC land is preferred by both Natural England and NSDC. Unless the Secretary of State determines otherwise, the woodland compensation measures specified on FC land adjacent to the SAC but outside the Order limits will be delivered instead of the woodland management measures initially proposed on NR land within the SAC and Order limits that is described in paragraphs 4.1.3 – 4.1.5 below.

4.1.3 At the time of submission of the DCO application the woodland compensation measures proposed in this Plan were all located within NR land as detailed in Annex G with the locations shown in Annex F Figure 1 as Groups G1 to G26. The positive management focuses on vegetation clearance to benefit rare whitebeam trees by reducing competition and shade from other plants by removal of vegetation surrounding whitebeam trees, particularly invasive non-native species. Priority has been given to management where rare whitebeams will be removed or coppiced for construction of the DCO Scheme at Clifton Bridge No. 1 Tunnel, Clifton Bridge No. 2 Tunnel, Valley Bridge, Quarry Bridge No. 6 and NR rock faces.

4.1.4 Management proposals are detailed in Annex G at locations (G1 to G26) identified in Annex F, Figure 1. Each area confirmed for positive management will be surveyed in detail to develop appropriate management actions. The main tasks are as follows:

- Survey current vegetation composition at each site, including NVC description, % scrub cover, identification and frequency of invasive species, locations of whitebeams, presence of any rare or notable grassland species.
- Develop the objectives for management at each site e.g. removal of all invasive species (and identification of species); reduction of scrub to a specified % cover; retention of rare species, including whitebeams.
- Develop a logistics and programme of management, e.g. how the site will be accessed and what machinery will be used.

- Develop protection needed during construction and management works.
- For longer term management of these areas, NR land within the Avon Gorge SAC/SSSI will be managed under NR's SMS and VMP. After completion of the actions set out in the current SMS (2018- 2023) and the activities of the MetroWest DCO Scheme, NR will reassess its activities to develop a new SMS, to be agreed with Natural England.

4.1.5 Positive management is proposed in a total area that is approximately double the size of the area lost. A 3:1 ratio of positive management compared to habitat lost is used for ancient woodland habitat, given its relatively higher ecological value, as compared to secondary (recent) woodland habitat. In these woodland habitats, positive management would focus on the removal of invasive species, coppicing and removal of bramble and scrub, thus reducing competition for native species and opening up habitat to benefit woodland ground flora and rare whitebeams.

4.1.6 For grassland, positive management is to be provided on a 2:1 basis with management focussing on removal on non-native invasive species and scrub removal. Removal of scrub, specifically from grassland habitats will prevent a deterioration in quality and potential loss of SAC qualifying grassland.

4.1.7 The proposed positive management is in accordance with the Site Improvement Plan for the SAC (Natural England, 2015). Invasive plant species have been identified as a threat to SAC qualifying habitats (woodland and grassland) and management of these is required (as part of an Avon-Gorge wide plan). Changes in species distributions (woodland and grassland habitats) are also identified in the Site Improvement Plan as a threat, largely via scrub and invasive species.

4.1.8 The total area of vegetation losses compared to the area proposed for management for SAC grassland and woodland is shown in Table 4.

Table 4: Areas of vegetation clearance within semi-natural ancient woodland, secondary (recent) woodland and SAC grassland (m2) compared to areas where positive management is proposed

	Semi-natural ancient woodland	Secondary (recent) woodland	SAC grassland	Total
Total area lost	4,002	3,280	582	7,864
Positive management proposed	12,582	1,914	1,470	15,966

4.1.9 During the preparation of the DCO application NE suggested that consideration be given by NSDC to a proposal to undertake positive management on FC land outside of the Avon Gorge Woodlands SAC, as an alternative to some or all of the areas identified on NR land (Annex G at locations G1 to G26). Through discussions between the relevant stakeholders an adaptive approach to compensation was developed under which the required extent of woodland compensation could be achieved by undertaking some measures on NR land and some measures on FC land.

As surveys and negotiations progressed following the submission of the DCO application it became clear that all woodland compensation could be provide on FC land and that this was Natural England's preferred option. Prior to the conclusion of the Examination of the DCO Scheme NSDC reached agreement with the FC under which all 1.45 ha of the proposed woodland compensation can be provided on FC land. The detailed woodland management plan for the FC land is included in Annex M. The compensation proposals will still be based on 1.6 ha of positive management in total, with the 0.15 ha of grassland compensation still to be provided on NR land as described at paragraph 4.1.6 above. The DCO Scheme will deliver the agreed level of compensation for the SAC by improving an equivalent area of land on FC property rather than undertaking woodland compensation on NR land. The quantity of compensation agreed with NE takes into account the timescale for delivery and was calculated when the intention was for all whitebeam planting and woodland habitat compensation to have taken place on NR land. Any planting or positive management on NR land would be undertaken after the construction phase.

4.1.10 The area proposed for positive woodland management on FC land is identified in Annex F, Figure 4. The existing habitat is woodland with planted native and non-native trees and old coppice stools of small leaved lime (many with 1 stem left to grow).

4.1.11 The area is 3.14 ha in total but only 1.45 ha of this area will be managed. The areas to be managed have been subject to ecological survey (Annex M). A ten year woodland management plan is included in Annex M. The management that is considered appropriate for this area of habitat is as follows:.

- Positive management by selective felling of planted Cherry, Beech and conifer trees (Lawson cypress, hemlock, Corsican pine and Douglas fir).
- Re-coppice small leaved lime in some areas within coppice panels 30 m x 30 m in size or coppicing a strip at the bottom of the slope. Trees subject to coppicing will be carefully selected as advised by an arboriculturalist. Some of the most lapsed coppice trees might not respond to coppicing, particularly if it is only a single stem on a significantly decayed coppice stool.
- Within coppice panels, deer fencing to be installed for 2 years or until coppice has taken with 2 m high fencing with steel mesh and chestnut stakes.

4.2 Timescale of plan

4.2.1 The positive management detailed in the plan will be implemented during the construction phase (about 20 months duration). Compensation for the loss of whitebeam trees is described in Section 5.7 and takes the form of the planting of an agreed number of rare whitebeam trees at the end of the construction phase on NR land and during construction on FC land. After this, the planted rare whitebeam trees will be managed and monitored annually for ten years after the initial planting (year 1). Areas where positive management is completed on NR land will be monitored in year 1, 3 and 5 following the construction phase. Measures proposed on NR land complement NR's SMS and VMP. Positive management undertaken on FC

land, instead of NR land, will be monitored as set out in Section 9 of the Annex M Woodland Management Plan.

4.2.2 If Bristol rock-cress is affected by the DCO Scheme, the receptor areas will be checked and monitored for 9 years after initial planting.

4.2.3 In the longer term, NR land within the Avon Gorge SAC/SSSI will be managed under NR's SMS and VMP. After completion of the actions set out in the current SMS (2018- 2023) and the activities of the MetroWest DCO Scheme, NR will reassess its activities to develop a new SMS. FC land will continue to be managed under FC's own management plan.

4.3 Responsibilities for implementing the plan

4.3.1 The procurement route to implement the Avon Gorge Vegetation Management Plan on NR land has not been determined at this stage, but it is likely to be implemented by a combination of the Main Contractor for the construction works and a specialist contractor for undertaking vegetation clearance for positive management and planting/maintenance of rare Whitebeam trees. NR will manage the Main Contractor and NSDC will have an overseeing role to ensure that the plan is implemented.

4.3.2 NSDC will be responsible for maintenance of the area of replanted whitebeams on NR land under licence agreed with NR for the ten year duration after initial (year 1) planting.

4.3.3 NR will be responsible for those activities required on its operational railway land during the operational phase of the railway once this plan is complete and NSDC will no longer be involved. This plan will be complete once the management and monitoring actions have been undertaken for up to ten years as detailed in Section 4.2.

4.3.4 Under the terms of the agreement reached between the FC and NSDC, the planting/maintenance of whitebeams and the positive woodland management measures will be undertaken by FC with licences granted to NSDC to ensure that the AGVMP measures are delivered throughout the duration of the Plan and provision for step-in rights for NSDC in the event that FC either does not undertake measures in accordance with this Plan or notifies NSDC that it no longer wishes to undertake the measures.

4.4 Reporting

4.4.1 A report summarising the activities undertaken in pursuance of this Plan will be produced for submission to Natural England in December of each year that the Plan is active.

SECTION 5

Site Clearance and Planting

5.1 Introduction

5.1.1 The 'Site' is defined as the area required for construction works, including access routes and construction compounds, including material storage areas. Management of the site will consider species and habitats of importance close to working area where there is a risk of incursion or damage by construction works.

5.1.2 Site clearance will be required initially to establish an adequate works footprint and operational corridor for the proposed construction works. Site clearance and tree works will be undertaken by an appropriately qualified Contractor in accordance with the measures detailed in subsequent sections of this Plan. The vegetation clearance works will be overseen by a representative of the Council and NR.

5.2 Site briefings

5.2.1 All site construction personnel will receive a general site briefing on the sensitivity of the Avon Gorge Woodlands SAC/SSSI and the need for the implementation of sensitive working practices in these areas from an Ecological Clerk of Works ("EcCoW"). Those working in the Avon Gorge will receive a site-specific briefing, which will outline applicable legal protection and working practices for the actions they will be undertaking. A signed record of attendance at site briefings will be maintained for the duration of the construction of the DCO Scheme.

5.3 Demarcation of sensitive species

5.3.1 To minimise damage to important and notable ecological features during construction of the DCO Scheme a consistent method of demarcation will be developed for the site. The method of demarcation will need to be appropriate for both construction and operational phase and will need to be developed by an appropriately qualified ecological specialist.

5.3.2 Although the precise method of demarcation is yet to be determined, methods such as Passive Integrated Transponder tags will be considered for sensitive tree species, namely rare whitebeam. This method allows individual trees to be permanently marked, so that that their long-term status may be monitored, it also allows for individual prescriptive measures to be defined for each tree. It is also unobtrusive, does not restrict or impede growth and is resistant to inclement weather conditions. It is likely that more conventional methods of demarcation namely tape, barrier and paint may also be needed during the construction phase to provide a visual guide to the contractor, but these measures should be removed upon completion of the works.

5.3.3 Demarcation of coppiced rare whitebeam tree stumps will be particularly important to ensure that they are left to regrow within a coppice cycle if appropriate for long term management.

5.3.4 Sites for other rare and protected plant species will be fenced with barrier tape and warning signs to avoid accidental damage until work on them is required, which will be done under supervision of a suitably experienced ecologist.

5.3.5 The supervising ecologist will need specialist botanical skills in rare plant identification. The timing for the demarcation and fencing of the site will be critical for grassland species and rare woodland ground flora because it will be dependent on the plants being present and being able to identify them. They may have to be identified well in advance of the works and this should be factored into the construction programme.

5.4 Arisings

5.4.1 Managing the vegetation will produce arisings. A well-managed and healthy woodland habitat should contain a variety of plant species of age, size and decay. Dead wood/plants provide nutrients and CO_2 to soils to plants, bacteria, animals and invertebrates. Managed correctly, arisings can replicate dead wood/plants and replicate nature balance of growth. However, arisings can cause enriched soil and promote weed and scrub growth, therefore, each feature should be looked at separately as below. The removal of arisings along the Avon Gorge is expected to be major task due to restrictions of access. For this reason, a reasonable approach to their removal is proposed, as detailed below and in Annex L.

Semi-natural Dry Grassland

5.4.2 No timber or arisings are to be left on grassland areas. Small quantities of cut grass can remain on site to decay but not on areas of species rich grassland or rare species. Large amounts of grass and scrub should be raked and removed from site or piled into an edge of scrubland (of no significant value). Raking should be carried out carefully and under ecological supervision where rare species are present to avoid damaging the plants.

Woodland

5.4.3 A pragmatic approach to arisings should be sought, as detailed below. Annex L identifies specific locations where arisings can be stored temporarily and locations for the provision of dead wood.

- Felled trees – The majority of the felled trees will need to be removed from site. The SAC objective (Natural England, 2019) allows for 3 to 5 fallen trees with a diameter of >300 mm per hectare to be left on site. The timber must not obstruct light for SAC qualifying habitats or rare species or smother other species or pose a risk to their stability. Timber cannot be chipped and left on site, it must be left as is or cut to facilitate decay, which provides habitats for invertebrates. Brash from felled trees should be removed from site. Areas have been identified in Annex L where a small number of cut trees can be left in small piles to decompose.
- Brash – From trees, created through limb reduction or lifting should be removed from site. Where trees have been coppiced, a small percentage of brash (not from invasive non-native species) should

remain on site and can be piled over each coppice stool to act as a physical barrier to help deter deer from eating shoots of new growth, although it cannot be assumed that a small amount of brash will provide the necessary deterrent, particularly if the deer population is high or muntjac deer are present in the woodlands. The FC has confirmed, however, that they have found that piling brash around coppiced trees is a good deterrent to deer browsing (FC, pers comm).

- Any timber left on site must be safely stored so that it cannot slip and pose a risk to the railway, staff or members of the public or protected species.
- If arisings cannot be removed immediately, they must be stored in a position of safety along the track or in an area of clearance (preferably areas of secondary (recent) woodland) which does not impact on any protected species. Arisings must be removed as soon as possible and this shall be monitored by the EcCoW.

5.5 Biosecurity measures

5.5.1 Biosecurity measures are the measures taken to avoid the spread of invasive non-native species, diseases and parasites.

5.5.2 The Contractor will ensure that any work does not result in the spread of damaging organisms. The choice of clothing/PPE, plant, equipment, soil management and waste disposal and methods of working must take this into consideration and avoid the risk of spread.

5.5.3 The Contractor will ensure that all clothing/PPE, plant and equipment comply with the Check, Clean, Dry approach specifically following the guidance for Biosecurity in the Field[4]. The non-native species secretariat website[5] has a variety of resources including identification sheets. The Contractor shall also refer to the Arboricultural Association 'Biosecurity in Arboriculture and Urban Forestry Position Statement'. The Check, Clean Dry approach is detailed below.

- Check - Check plant, equipment and clothing for living organisms. Pay particular attention to areas that are damp or hard to inspect.
- Clean - Clean and wash all plant, equipment, footwear and clothes thoroughly, preferably with hot water. All tools shall be surface sterilised with methylated spirits after use on trees which are known or suspected to be diseased.
- Dry - Dry all plant, equipment and clothing - some species can live for many days in moist conditions. Make sure they are not transferred elsewhere.

[4] http://www.nonnativespecies.org/index.cfm?pageid=174 (accessed 17/06/19).

[5] http://www.nonnativespecies.org/home/index.cfm (accessed 17/06/19)

5.6 Vegetation clearance

5.6.1 All vegetation clearance will be supervised by a suitably qualified ecologist with training in identifying rare whitebeams and competent in identifying other rare plants.

Arboriculture

5.6.2 Tree work for construction clearance and in areas subject to positive management as specified in the Management Catalogue (Annexes F, Figure 1 and Annex G) or alternative positive management areas on FC land (Annex F, Figure 4 and Annex M woodland management plan) will be undertaken in accordance with the following.

- Ideally tree surgery, felling, thinning and coppicing operations shall only be undertaken outside the bird nesting season or trees checked by an ecologist for nesting birds 24 hours before tree works.
- All mature trees shall be checked for bat roosts, before arboricultural works are carried out. Trees identified with bat roosting potential as part of the preparation of this Plan are detailed in Annex J.

Tree Surgery

5.6.3 All proposed tree works should be carried out by a suitably qualified and insured contractor preferably registered with the Arboricultural Association. Tree work should be carried out in accordance with *BS 3998:2010 – Tree Work - Recommendations*. Under no circumstances shall any tree pruning be undertaken by construction personnel.

5.6.4 All operations must be carried out to avoid damaging neighbouring retained trees. Trees to be retained must not be used for anchorage or winching purposes.

Tree Felling

5.6.5 Prior to felling, any adjacent retained trees (rare whitebeams trees will be marked) will be protected from cut material falling on them.

5.6.6 The stumps of invasive non-native species only will be treated with plugs of herbicide within 24 hours of felling. It is particularly important that all stumps of holm oak are treated (even small ones). Herbicide treatment would be specified in the Contract and agreed with Natural England.

Coppicing

5.6.7 Rare whitebeams will be subject to their own protocol where removal is necessary (Section 6.2).

Scrub Control in Grass

5.6.8 Scrub control shall be carried out on the important grassland areas listed in Annex G and as prescribed in Annex G. It should be undertaken outside of the bird nesting season or scrub checked by an ecologist for nesting birds 24 hours before the works.

5.6.9 Scrub species shall be cut down to 50 mm above ground level where prescribed in Annex G and arisings removed off site. The plants will be

allowed to re-grow unless they are INNS which will be treated with herbicide using a non-residual herbicide applied in strict accordance with the manufacturer's recommendations to avoid transfer to non-target species.

5.6.10 Herbicide treatment will be specified in the Contract and agreed with Natural England and consent from the Environment Agency will be obtained if herbicide application is in proximity to a watercourse.

Animals

5.6.11 The site supports a number of important and notable protected species, including birds, bats, dormice and invertebrates. The seasonal restrictions, legal protection and habitat characteristics of these species will be taken into consideration during the implementation of the Avon Gorge Vegetation Management Plan by implementation of the Construction Environmental Management Plan and advice from the EcCoW.

5.7 Replacement rare whitebeam planting

5.7.1 Table 5 summarises the total number of rare whitebeam trees that are predicted to be removed for the DCO Scheme. A programme of seed collection and propagation has been in place since 2016 to provide sufficient saplings to compensate those lost. Collecting seed across a number of years and using different locations and methods for propagation aims to minimise the risks of failing to achieve sufficient germination and establishment of sufficient saplings of the rare species, some of which are inherently difficult to propagate. The programme of seed collection is summarised in Table 5a. The fruit collections have been undertaken by rare whitebeam experts Tim Rich and Libby Houston. Hardwood cuttings from Avon whitebeam trees were also taken in 2019 but success of propagation from these cuttings is doubtful (Annex I). In 2020, fruits were collected from common whitebeam *Sorbus aria* as well as Avon whitebeam, Bristol whitebeam and round-leaved whitebeam because common whitebeam is included in the planting proposals on FC land (for Package 2 as described below) as a pollination resource for the rare species. Collections with good fruits were made for all four species, though the numbers of Avon whitebeams fruits were relatively low as only one accessible tree was in fruit in 2020.

5.7.2 At the end of 2020, 72 rare whitebeam trees have been grown to sapling stage from the 2016 seed collection. Of these, five are Avon whitebeam, 30 are Leigh Woods whitebeam, 30 are round-leaved whitebeam and 7 are Bristol whitebeam (Table 5a). Two Wilmott's whitebeam and one grey-leaved whitebeam have grown from the 2018 seed collection, making a total of 75 trees available for planting. However, one of the Wilmott's whitebeam saplings is very weak and has not grown as expected (Annex I). Saplings that establish from the 2019 and 2020 seed collection have not been included in the current planting proposals but will be considered for future planting and for replacement of any trees that fail to establish. Table 5a indicates that there are a further 108 saplings available from the 2019 seed collection, of which two are Avon whitebeam. There are no data yet from the 2020 seed collection as these are expected to germinate in spring 2021. In addition, there are 15 saplings (10 round-leaved whitebeam and five Leigh

Woods whitebeam) from those provided by Tim Rich to Paignton Zoo (Annex I).

5.7.3 A total of 54 trees will be planted initially to compensate for the loss of rare whitebeam trees on a basis of two planted for each one affected. Not all species can be replanted on a two for one basis, however, due to some species such as Avon whitebeam being more difficult to propagate. Propagation of new stock to replace any trees that may be lost during the monitoring period after initial planting will continue during the 10 year maintenance and monitoring period. The relative proportions of each whitebeam species in the planting proposals will be reviewed at the time of initial planting. If there are not enough of the relevant whitebeam species either at initial planting or at any time during the monitoring period for replacement to meet the desired ratio of two trees planted as compensation for each tree lost, agreement with Natural England will be sought for an alternative option that could include any of the following:

- the substitution of those species at the specified Planting Site with a different whitebeam species;
- the substitution of those species at a different Planting Site with a different whitebeam species;
- deferring the planting of that species at the relevant Planting Site until sufficient saplings from the relevant species had been grown.

Table 5: Number of rare whitebeam removed for the DCO Scheme, number of tree saplings available for planting and total number to be initially planted

Whitebeam species	Total number to be removed (or coppiced)	Total number of saplings available for planting (2016 and 2018 seed)	Total number to be initially planted
Avon Whitebeam	12	5	5
Leigh Woods whitebeam	6	30	13
Round leaved whitebeam	5	30	26
Bristol whitebeam	2	7	7
Wilmott's whitebeam	1	2	2
Grey-leaved whitebeam	1	1	1
Total	27	75	54

Table 5a: Summary of seed collection and propagation results for rare whitebeams. Plants resulting from 2016 and 2018 seed collections are included in current planting proposals.

Date of seed/fruit collection	Species collected	Locations for propagation	Number of saplings / seedlings
20/10/2016	Avon Whitebeam	Paignton Zoo (details provided in Annex H and Annex I)	5
	Bristol whitebeam		7
	Round leaved whitebeam		30
	Leigh Woods whitebeam		30
24/9/2018	Avon Whitebeam	Paignton Zoo (details provided in Annex H and Annex I)	0
	Bristol whitebeam		0
	Grey-leaved whitebeam		1
	Wilmott's whitebeam		2
23/10/2019	Avon Whitebeam	Paignton Zoo, University of Bristol Botanic Garden, Forestry Commission (Cheviot Trees). See Table 3, Annex H.	2 (Bristol)
	Bristol whitebeam		8 (FC)
	Round leaved whitebeam		2 (Bristol) 2 (FC)
	Leigh Woods whitebeam		28 (Paignton Zoo) 13 (Bristol) 2 (FC)
	Grey-leaved whitebeam		12 (Bristol) 25 (FC)
	Wilmott's whitebeam		11 (Bristol) 3 (FC)
6/10/2020	Avon Whitebeam	University of Bristol Botanic Garden, Ness Botanic Gardens	Germination expected spring 2021
	Bristol whitebeam		
	Round leaved whitebeam		
	Common whitebeam		

Whitebeam Planting Areas

5.7.4 At the time of submission of the DCO application NSDC proposed compensation measures on four parcels of land owned by NR for the anticipated loss of up to 27 individual rare whitebeam trees. These proposals for whitebeam planting were described in the version of Annex H of the AGVMP that was submitted as part of the DCO application (Appendix 9.11 Ver. 01, DCO Document Reference 8.12). At that time initial discussions had taken place between NSDC, FC and NE to see if compensation whitebeam planting could take place on FC land as an alternative to two of the four NR sites that had been proposed. Subsequent to the submission of the DCO application, further surveys were undertaken and discussions progressed. The conclusion reached was that the concerns expressed by NE in respect of two of the proposed replacement whitebeam planting sites on NR land could be overcome by undertaking that part of the replacement whitebeam planting on an identified area of FC land within the SAC but outside Order limits.

5.7.5 The AGVMP presents the mitigation and compensation measures that have been developed in close consultation with NE, NR and FC through meetings, a site visit with NE on 20 February 2020 and subsequent assessments and evaluations. As a result, the planting proposals have been presented as two alternative packages; the first package comprises the original planting sites detailed in Annex H of the DCO submission (Appendix 9.11 Ver. 01, DCO Document Reference 8.12) with minor modifications. The second package comprises two NR sites and adds the new planting site on FC land. Proposed planting as part of Package 1 or Package 2 are shown in Table 5b. As Package 2 has been proposed in response to NE concerns over some aspects of Package 1 and agreement between NSDC and FC to secure the delivery of the relevant planting on the identified FC land has been secured prior to the closure of the Examination, Package 2 is the preferred option and will be delivered unless the Secretary of State specifies otherwise in determining the DCO application.

5.7.6 Planting locations have been selected where:

- Whitebeams will not affect safety on the railway in the future (e.g. on the embankments below the railway),
- Competing vegetation can be managed safely in the short term until the trees are established,
- Whitebeams can be monitored safely,
- There is no other significant nature conservation interest which may be affected,
- Whitebeams will get enough light and will not be shaded out by other trees (at least in the short to medium term),
- If non-native invasive species are present, they can be removed, creating places where whitebeams can be planted,
- Soil conditions are suitable. These soils are usually calcareous soils over limestone or limestone rubble on embankments for all species, or some sandstone-derived more acidic soils are suitable for Bristol whitebeam, common whitebeam and round-leaved whitebeam,

- Close to common whitebeam populations so pseudogamous pollination can be facilitated,
- Close to the existing whitebeams populations so they can contribute to metapopulation.

5.7.7 Site 1a is on the east-facing embankments between the freight line and River Avon Tow Path at Nightingale Valley, south of Valley Bridge. The planting site covers 350 m^2 north of the bridge (35 m long and 10 m wide). This site is a railway embankment with made ground. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary (recent) woodland which has developed on the railway embankment.

5.7.8 If Package 1 is undertaken, three Avon Whitebeams, two Leigh Woods whitebeams and three Bristol whitebeam saplings will be planted at Site 1a Nightingale Valley (SE side of Valley Bridge). This site requires most of the trees and shrubs to be removed, except for the three trees listed in Table 7 in Annex H. Control of ivy will be required in the longer term. If Package 2 is undertaken, there will be no planting at this site.

5.7.9 Site 1b is also on the east-facing embankment between the freight line and River Avon Tow Path at Nightingale Valley, north of Valley Bridge. The planting site covers 550 m^2 north of the bridge (55 m long and 10 m wide). The is a railway embankment with made ground. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary (recent) woodland which has developed on the railway embankment. Some trees show evidence of coppicing in the past (railway vegetation management) and some younger trees at the south end are maidens.

5.7.10 Under Package 1, four Bristol whitebeams and 11 Leigh Woods whitebeam saplings will be planted at Nightingale Valley Site 1b (NE side of Valley Bridge). Under Package 2, the proposals are for three Avon whitebeams and 12 Leigh Woods whitebeams. This site requires most of the trees and shrubs to be removed, except for the three trees listed in Table 9 in Annex H, control of ivy will be required in the longer term.

5.7.11 Site 2 is on the embankment between the operational freight line and the River Avon Tow Path north of Miles Dock Bridge. The planting site is 1,650 m^2 in total (110 m long and 15 m wide). This site is a railway embankment with made ground. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary (recent) woodland which has developed on the railway embankment.

5.7.12 If Package 1 is undertaken, it is proposed to plant 26 of the round-leaved whitebeam saplings at the site to the north of Miles Dock Bridge (Site 2). This site requires most of the trees and shrubs to be removed except for the 13 trees listed in Table 11 Annex H. Control of ivy will be required in the longer term. If Package 2 is undertaken, there will be no planting at this site.

5.7.13 Site 3 is on land above Clifton Bridge No. 2 Tunnel, southern end. This is probably natural ground on the edge of the plateau, though modified by a path with a low 30 cm high mound of earth along its east side. This is a small site of 30 m^2 in total (c. 10 m long and 3 m wide). The site is open and

unfenced. The vegetation is open woodland edge and mixed scrub over a ground flora of false wood-brome *Brachypodium sylvaticum* and is NVC type is W21d *Crataegus monogyna – Hedera helix* scrub, *Viburnum lanata* subcommunity.

5.7.14 The Clifton Bridge No. 2 Tunnel site is suitable for planting five whitebeams; two Avon whitebeam, two Wilmott's whitebeam and one grey-leaved whitebeam saplings. An area of scrub c. 10 m long and 3 m wide on the west side of the relict path will be cleared to create an area for planting whitebeams. This scrub will be cut and the stumps treated with herbicide (herbicide to be approved by NE). Any non-native woody species in the immediate area outside the planting site such as Stern's cotoneaster *Cotoneaster sternianus* will be removed and the stumps treated. Arisings will be placed within the adjacent scrub in a habitat pile. All trees listed in Table 13 of Annex H will be retained. Planting is proposed at Site 3 for Package 1 and Package 2.

5.7.15 Site 4 is an area of red oak plantation over sandstones, bounded by the railway and Sandstone Tunnel on the south side and the River Avon Tow Path with a wall on the north side. This is a large site 930 m^2 in total and is in FC ownership. This is probably a natural ground form on the east side of Paradise Bottom valley. The site is largely occupied by a red oak plantation which has been planted on the slopes with easy access. The northern edge appears to be older woodland with pedunculate oak *Quercus robur* and small-leaved lime *Tilia cordata*. The plantation type does not equate to an NVC community. Seven Bristol whitebeam and 27 round-leaved whitebeam saplings are planned within the red oak plantation. It is also proposed to plant 25 common whitebeams to provide a pollination resource for the rare species. The planting sites are specifically located where the trees will be in open conditions adjacent to the railway with minimal shade from adjacent woodland. This site requires most of the trees and shrubs to be removed except for the 15 trees listed in Table 16 Annex H. Approximately 10% of this site will be required for planting. Planting is proposed at Site 4 for Package 2 only.

Table 5b: Number of trees planted at each site for each package

Package 1	**Number affected by the DCO Scheme**	**Planting Site 1a**	**Planting Site 1b**	**Planting Site 2**	**Planting Site 3**	**Planting Site 4**	**Total planting**
Avon whitebeam *S. avonensis*	12	3			2		5
Bristol whitebeam *S. bristoliensis*	2	3	4				7
Round-leaved whitebeam *S. eminens*	5			26			26
Grey-leaved whitebeam *S. porrigentiformis*	1				1		1
Leigh Woods whitebeam *S. leighensis*	6	2	11				13
Wilmott's whitebeam *S. wilmottiana*	1				2		2
Total	**27**	**8**	**15**	**26**	**5**	**0**	**54**
Package 2	**Number affected by the DCO Scheme**	**Planting Site 1a**	**Planting Site 1b**	**Planting Site 2**	**Planting Site 3**	**Planting Site 4**	Total planting
Avon whitebeam *S. avonensis*	12		3		2		5
Bristol whitebeam *S. bristoliensis*	2					7	7
Round-leaved whitebeam *S. eminens*	5					27	27
Grey-leaved whitebeam *S. porrigentiformis*	1				1		1
Leigh Woods whitebeam *S. leighensis*	6		12				12
Wilmott's whitebeam *S. wilmottiana*	1				2		2
Total	**27**	**0**	**15**	**0**	**5**	**34**	**54**

5.7.16 All planting sites have had a detailed survey to provide more specifics regarding the amount of management of existing vegetation required to allow successful establishment and growth to maturity of the planted rare whitebeam. The details of this survey are provided in Annex H and cover the following.

- Details on existing vegetation, including % cover of each species and age, height and stem diameter of whitebeam, small leaved lime and other ancient woodland indicator species.
- Current habitat types e.g. semi-natural ancient woodland (particularly *Tilio-Acerion* woodland), secondary (recent) woodland, grassland (including type) and scrub and soil profiles.
- Management required for successful planting and long-term maturity of rare whitebeam (including consideration of shading out by overtopping). The sites will not be clear felled and existing whitebeam, small leaved lime and other ancient woodland indicator species will be retained.
- Planting density, distances apart of planted rare whitebeam and % of total area required for planting.

5.7.17 Details of the surface substrate of all planting sites have been described (Annex H).

5.7.18 A specialist contractor will be employed to plant, manage and maintain the whitebeam trees. A contract will be written to specify e.g. plant protectors, handling plants, frost protection, timing of planting, planting depth, type of stakes and watering. It will also cover the maintenance of the plants for ten years after initial planting (year 1), including inspection intervals, plant circles and depth of mulch. Some of the requirements are detailed below.

Preparation of planting site

5.7.19 To ensure the greatest chance of success for the whitebeam saplings, the sites will need to be prepared to minimise encroachment and competition. This will include managing existing secondary (recent) mixed deciduous woodland (except for trees specified to be retained) and ground flora such as false brome *Brachypodium sylvaticum*, ash saplings, ivy saplings, and bramble.

5.7.20 One plant of Pale St John's-wort *Hypericum montanum*, which is International Union for Conservation of Nature ("IUCN") category 'Near Threatened', is present at Clifton Bridge No. 2 Tunnel planting site and this will be avoided and protected with fencing prior to preparation of the site.

5.7.21 To prevent the removed trees from competing with rare whitebeam planting, stump treatments with the appropriate herbicide will need to be undertaken to ensure there is no excessive competitive regrowth of tree species that would then compete with the establishing whitebeam.

Whitebeam Planting

5.7.22 The appointed landscape contractor will carry out tree planting and maintenance as specified in the contract to comply with NR requirements and specific requirements of rare whitebeam trees.

5.7.23 All planting works shall be carried out in accordance with BS 8545:2014; *Trees: from nursery to independence in the landscape – Recommendations, BS 4043 Recommendations for planting root balled trees, BS 4428 Code of practice for general landscape operations (excluding hard surfaces)* and *BS 5837 Trees in relation to design, demolition and construction* at the locations specified in Annex H.

5.7.24 Each tree shall be watered in on the same day as planting and at intervals afterwards as specified in Section 7 if necessary. The water shall be delivered by means of a low-pressure hose to avoid any washing out of the soil, into a depression made in the planting medium around the base of the stem to ensure that the water goes to the root system. The planting medium shall then be returned to its previous level.

5.7.25 On completion of planting operations, all disturbed accesses to, and ground around the planted areas shall be completely reinstated to their former condition as at the commencement of planting.

5.7.26 All whitebeams supplied shall be sourced from Paignton Zoological Gardens from the seeds collected from the Avon Gorge in 2016 and 2018 and will consist of tree saplings grown on from that seed. The younger seedlings and small saplings from the 2019 seed collection (Annex H) are not included within the planting proposals, but will be considered for future planting and for replacement of any trees that fail to establish, along with any saplings establishing from 2020 and subsequent seed collections.

5.7.27 Plants will be planted in an area where their canopy/branches will not grow within 3 m of the operational rail corridor.

5.7.28 Appropriate measures such as fencing and tree guards shall be used to protect planted trees from pest species, such as rabbits and deer and this will be specified in the contract.

5.7.29 Evidence of successful whitebeam planting projects in Leigh Woods (Avon Gorge), Penmoelallt, Powys, North Devon and Arran are provided in Annex H to provide some confidence that the proposed compensation planting will be successful.

Maintenance of planting sites

5.7.30 The sites chosen offer a good probability of success, however, it is important that the ongoing ten-year maintenance programme after initial planting (year 1) is followed to ensure good establishment for these sensitive species. For planting sites on NR land and FC land further details are provided in Section 7 and Annex H.

5.7.31 Tree planting areas shall be visited at intervals over ten years after initial planting (year 1) to ensure that the new planting is safeguarded, as specified in Section 7 and Annex H.

5.7.32 Any whitebeams that die or are damaged by rabbits or deer due to the failure to maintain the fences, shelters or guards, desiccation or disease shall be replaced from the stock available at Paignton Zoological Gardens or other locations described in this Plan. Some of the trees currently grown will be retained at Paignton Zoological Gardens and/or other locations to replace the trees potentially lost during the ten-year monitoring period after planting. Propagation of new stock will continue during the 10 year

maintenance and monitoring period. Replacement plants may not be the same species due to availability of stock but further collection of seeds from five species and cuttings for Avon Whitebeam in the Avon Gorge was undertaken in October 2019 and 2020.

5.7.33 The replacement whitebeams shall be maintained in accordance with the stipulated maintenance measures.

5.7.34 Surplus propagated whitebeams from more widespread species will be offered to the Avon Gorge SSSI landowners, including the FC, for planting.

5.8 Management for other rare plants

5.8.1 As a reasonable worse case, an area of 20 m^2 of Bristol rock-cress has been predicted to be removed for installation of rock bolts at NR rock face ID06 (north of Clifton Bridge No. 2 Tunnel). Consent for the removal of the plant, which is protected under Schedule 8 of the WCA (as amended), will be sought from Natural England prior to works commencing.

5.8.2 A conservation strategy for Bristol rock-cress has been developed (Annex K). The rock face will be surveyed during the detailed design stage of the DCO Scheme to determine the exact location of the individual plants. The location of the rock bolts and working area will avoid individual plants where possible.

5.8.3 Following detailed design of the works, an assessment will be completed on the number of plants that will be affected by the proposed rock safety works (both directly and indirectly). Any Bristol rock-cress plants which cannot be avoided by the works will be marked carefully for transplant. Bristol rock-cress plants and seed will be removed from the rock face at an appropriate time of year, prior to works commencing, and cultivated at an appropriate botanic garden (such as Bristol University Botanic Garden). On completion of the construction works both plants and seed will be replanted as close to the donor site as possible where suitable habitat requirements exist, within NR rock face ID06. Any Bristol rock-cress plants affected will be replaced on a 2 to 1 basis, with management and monitoring of the transplanted plants undertaken.

5.8.4 Further replanting will be undertaken at NR land within Quarry 1 to further compensate for impacts.

5.8.5 The Bristol rock-cress receptor areas will be checked and monitored twice a year by NSDC in Years 1 and 2 after planting, then annually in Years 3, 4 and 5 and Years 7 and 9. The aim will be to ensure survival of the rock cress and replace dead plants if necessary in years 1-5, and to learn about growth of the rock-cress which can be used to inform potential future mitigation plantings in the long term.

5.8.6 Light vegetation clearance will be required on NR rock face ID06 (an area of 555 m^2 in total) to complete the full geotechnical inspection. This will be done under an ecological watching brief by a specialist botanist and will avoid any rare/notable plants including Bristol rock-cress; as Bristol rock-cress forms rosettes on the ground, it will not need to be removed to facilitate the full geotechnical inspection.

5.8.7 Positive management is proposed on NR rock face ID06 (G14, Annex F and G) in a 420 m^2 area of SAC grassland. This will entail clearance of

vegetation (excluding rare vegetation) including holm oak and cotoneaster. The light vegetation clearance and positive management will provide more open rock face which will benefit Bristol rock-cress in the short term by reducing competition and shading.

5.8.8 Fingered sedge and spring cinquefoil are also present on NR rock face ID06. Rock bolts will avoid these plants if possible but will prioritise avoiding Bristol rock-cress.

5.8.9 Pale St John's Wort, present along the edge of the cess north and south of Quarry Bridge No. 3, will be translocated from the cess to safe areas suitable for this species identified by a plant specialist prior to ballast replacement. Narrow-leaved bittercress, a biennial which responds to disturbance of its seed bank, is locally abundant in the cess and is likely to benefit from the disturbance so plants will not be moved. The operational management of these species present along the edge of the cess is discussed in Section 6.1.3.

5.9 Management for Quarry Bridge No. 2 site compound

5.9.1 NR's current methodology and design for the ramp and site compound area is included in Annex C and assumes a worst-case with respect to ecological impacts. Management of the impacts include avoiding and protecting rare whitebeam trees by fencing, temporary fencing around the construction compound, temporary relocation of boulders and wood piles and construction materials to be placed on geotextile membranes to aid removal after construction works have been completed. The ramp will be constructed from imported clean limestone aggregate placed on geotextile membranes.

5.9.2 Access to the compound will be required along the River Avon Tow Path by vehicles 3 to 4 times a day.

5.9.3 A survey of habitats and flora at the site compound and surrounding area has been undertaken (Appendix 9.10, Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI, DCO Document Reference 6.25). Prior to construction works commencing, a full ecological survey of the area to be affected by the works will be completed, focusing on identifying any rare or protected species.

5.9.4 After completion of the construction works, the areas of grassland and scrub affected by the site compound within National Trust ownership will be monitored for two years to ensure that it is not affected by ruderal weeds on the disturbed ground after the construction works have been completed. If ruderal weeds affect the disturbed ground, this would be managed by topping and/or spot spraying the ruderal vegetation. The area will not be re-seeded unless there is a high concentration of weeds and the ground is not recovering. If this is the case, then short, native, local provenance limestone species such as Emorsgate seed will be sown to restore the site.

SECTION 6

Management proposals during operation

6.1 Routine vegetation control

6.1.1 Vegetation management during operation is detailed in NR's SMS and VMP (Appendix 9.15, DCO Document Reference 6.25). The work plan for the four years of the VMP is currently being developed by NR and a draft is currently being discussed with Natural England.

6.1.2 The SMS states that "*The cess (3 metres from line) shall be maintained clear of all woody vegetation. The area vertically above this shall also be maintained clear of all vegetation*" and "*Manage trees and vegetation beyond 3 m of the line when and where required for the safe operation of the railway, taking account of the SAC and SSSI features and ensuring that they are not negatively affected by these actions. Efforts must first be made to find alternative methods of tree management (beyond felling) where a protected species is highlighted as a risk (Dead, Dying or Dangerous). For all of the above, if the tree is a rare species or qualifying species of the SSSI or SAC, consent from Natural England is required, except in emergency situations*".

6.1.3 For herbicide application the SMS states "*Pesticide application within agreed weedspray restrictions. If application is by spraying within the SSSI boundary then it is only permitted as spot spraying with a knapsack sprayer fitted with a suitable nozzle to minimize any spray drift or by the use of a weedwiper when height differential is sufficient and ground conditions allow*". NR confirmed that herbicide spraying will be carried out within 3 m of the rail, in line with the current SMS.

6.1.4 In the longer term, NR land within the Avon Gorge SAC/SSSI will be managed under NR's SMS and VMP. After completion of the actions set out in the current SMS (2018 - 2023) and the activities of the DCO Scheme, NR will reassess its activities to develop a new SMS and agree this with Natural England. The SMS should assess changes in operational impacts such as greater risk of spread of invasive species and pathogens due to increased frequency of rail movements as a result of the passenger service. FC land will continue to be managed under FC's own long-term management plan for the northern part of Leigh Woods (including the land covered by the AGVMP).

6.1.5 NR and FC should consider the guidance below when managing the site where rare plants are present.

6.2 Guidance for managing rare whitebeams

6.2.1 Most of the rare endemic Whitebeams have a similar ecology in that they generally are relatively short-lived species which require well-lit situations to grow and reproduce. They only reproduce by seed, hence the need for them to flower and fruit, and they do not flower when shaded. Fruit production is also dependent on the presence of other

Whitebeams nearby to provide pollen essential for development of the endosperms in the seed (but does not contribute to the genetic make-up). As they reproduce by apomixis (effectively clonally) and are genetically uniform, there is no genetic structure to the populations.

Rare whitebeams on railway cuttings

6.2.2 Whitebeams are light-demanding species and grow towards the light. On the side of the cuttings, where shaded both from above by tall woodland and from the side by secondary woodland developed between the track and the River Avon Tow Path, the whitebeams tend to grow out sideways towards the light in the centre of the track and thus into the path of the trains. The heavy shade also means they rarely flower and fruit.

6.2.3 For the very rare Avon whitebeam, a significant proportion of the total population occurs on the sides of the railway cuttings. To enable them to be retained and to fruit and contribute to the population, the only option is to enable them to grow upwards. This can be achieved by removing shading trees above them on the slopes immediately above the cuttings, removing the secondary woodland between the track and the tow path (this can be allowed to develop into bramble scrub and kept short every five years), and removing any further shading species between the tow path and the river. This should allow them to grow upwards in the light out of the way of trains. However, there is some concern that a genetic trait of Avon whitebeam is to grow sideways to some extent so the management to encourage them to grow upwards should be started gradually and reviewed depending on their growth habit.

6.2.4 Alternatively, the Avon whitebeam trees could be coppiced rather than removed if their growth habit becomes a safety risk to trains.

Whitebeams in woodland edges

6.2.5 Where whitebeams occur in woodland and lean out towards the light over the railway and thus require clearing for rail safety but surrounding vegetation is not being removed, they are best controlled by crown reduction or crown lifting rather than cutting at the base as this will probably kill them (they do not regenerate in shaded woodland from the base of cut trunks as they require light). Pruning back the crown to an acceptable distance for rail safety should allow them to re-sprout from the top of trunk and get leaves into the light quickly.

6.2.6 Where all surrounding woodland vegetation is also being removed, they may be subject to wind-throw. In this case they can be coppiced leaving coppice trunks 30-50 cm high. The regenerating coppice stools will need protecting from deer browsing, and clearance of competing woody vegetation may be required in subsequent years to ensure they can continue to grow.

Whitebeams in scrub

6.2.7 Whitebeams are classic scrub species and can be left when surrounding scrub is cleared. If they need to be cut back for rail safety, they can be coppiced to 30-50 cm high. The regenerating coppice stools will need

protecting from deer browsing, and clearance of competing woody vegetation may be required in subsequent years to ensure they can continue to grow.

Whitebeams in retaining walls

6.2.8 Where whitebeams are rooted on the sides of the retaining walls usually in shade (as for example around 123 mi 62 ch) they rarely flower. Where the trees are of sufficient size that they are affecting the masonry and stability of the walls, they can be removed (it is not worthwhile attempting to transplant them given a low likelihood of success) and replaced elsewhere from stock grown from seed. Small saplings which are not doing any damage may simply be left to grow.

Whitebeams on rock faces

6.2.9 Where whitebeams are rooted on the sides of cliffs, they can be coppiced back if necessary.

6.3 General guidance for management of rare plants

6.3.1 Dwarf sedge *Carex humilis* is a perennial species of calcareous grassland which reproduces by seed and whose patches slowly spread outwards. It occurs as a single clump in scrubby woodland above the Clifton Bridge No. 2 Tunnel portal at 122 mi 52 ch presumably a relic from former open grasslands before the railway was constructed; it is heavily shaded by holm oak trees and threatened by further scrub invasion. The holm oaks will be removed, and stumps treated with herbicide in consultation with the main engineering contractor ensuring the clump is protected (See Annex G, location G4), and adjacent scrub cleared.

6.3.2 Spring cinquefoil is a perennial species which grows in open limestone grasslands and open rocky habitats. It flowers and sets seed in the spring and early summer and spreads by creeping shoots. The most appropriate management is by annual strimming of its grasslands to 5 cm in winter and removal of cuttings to enable seed set and minimise competing vegetation.

6.3.3 Spiked speedwell (a WCA Schedule 8 plant) is a perennial species which grows in open rocky habitats in the Avon Gorge (Rich 1997; Wilson *et al.* 2000). It flowers and sets seed in the late summer and forms loose clumps. The most appropriate management of its rocky habitats is by hand weeding of woody species (with removal of arisings) in October-November to enable seed set and minimise competing vegetation.

6.3.4 Bristol rock-cress (a WCA Schedule 8 plant) is a short-lived perennial which grows on rocks and open grasslands where it roots in crevices or on bare soil and grows either in the open or in light shade. As this species is evergreen and flowers in spring and fruits in early summer (Pring 1961), any management work such as removal of shading/invading scrub is best carried out in autumn and winter.

6.3.5 Southern polypody *Polypodium cambricum* (a species of fern) tends to form evergreen, large persistent patches on open rocks but also tolerates shade. Its sites can be cleared of scrub every five years at any time of year. Where it invades the habitat of other rare plants it can be removed, as it is frequent through the Avon Gorge.

6.3.6 Hutchinsia *Hornungia petraea*, dwarf mouse-ear *Cerastium pumilum* and little-robin *Geranium purpureum* are annual species of open calcareous soils, screes and open grasslands which typically germinate in the autumn, over-winter as rosettes and flower from early spring onwards, setting seed and dying down by mid-June. Management should consist of ensuring open soil and screes are present in the autumn, which can be achieved by strimming to ground level (after checking seedlings are not already present) and if necessary, disturbing the top soil layers with a small fork or hand trowel.

6.3.7 Narrow-leaved bittercress is a biennial species of woodland edges which germinates in the spring one year and flowers the next year. It currently grows on the ballast in the railway track and along the side of the cess where the irregular disturbance to the track edges already creates suitable patch dynamics for it to flourish; no specific further management is needed. It will benefit from removal of arisings from control of bramble and scrub adjacent to the railway. It may also benefit from disturbance associated with the track upgrading and trenching works.

6.3.8 Fingered sedge *Carex digitata* and angular solomon's-seal *Polygonatum odoratum* are long-lived perennial species which flourish best in semi-shade or in the open on limestone rocks and shallow soils with little or no competing vegetation. Neither species is currently in situations where it needs specific management; but needs to be considered to prevent accidental damage whilst accessing other areas or clearing other vegetation.

6.3.9 Ivy broomrape *Orobanche hederae* is also primarily a woodland and scrub edge species growing parasitically on Ivy. Ivy is common and widespread in the Avon Gorge with many scattered populations of the broomrape and no specific plans are needed.

6.3.10 Pale St John's wort is a perennial of calcareous scrub and woodland edges, and currently grows beside the cess along the railway. It should not be cut or mown but competing vegetation and arisings should be removed.

6.3.11 Field garlic *Allium oleraceum* is a perennial of grasslands and scrub edges. It is green during the winter and its habitats can be mown every other summer to remove competing vegetation with arisings removed.

6.3.12 Compact brome *Anisantha madritensis* is an annual grass which occurs on rocky outcrops and on the railway ballast. It is likely to benefit from work carried out for other rare species such as spiked speedwell and narrow-leaved bittercress and no specific plans are needed.

SECTION 7

Monitoring

7.1.1 Where positive management is undertaken on NR land (Annex G, areas G1 to G26), each site will be monitored subsequently in year 1, 3 and 5 after management. This will entail survey of vegetation composition, including % scrub cover, identification and frequency of invasive species, locations of whitebeams and presence of any rare or notable grassland species. This will allow comparison with survey findings before and after management was undertaken to assess the effectiveness of the management measures. NSDC will be responsible for monitoring the sites in year 1, 3 and 5 after management.

7.1.2 Where positive management is undertaken on FC land (Annex F, Figure 4), as an alternative to NR land, monitoring will be as set out in Section 9 of the Annex M Woodland Management Plan. As undertaker, NSDC will be responsible for ensuring that the AGVMP measures are undertaken and has step-in rights under its agreement with FC in the event that FC notifies NSDC that it does not wish to undertaken the positive management measures or the measures are not being undertaken by FC in accordance with the AGVMP.

7.1.3 Monitoring and management of the planting sites for rare whitebeam saplings is detailed in Annex H and summarised in Table 6 below. For planting on NR land this will be undertaken for 10 years after the initial planting by a specialist contractor under this plan, managed by NSDC. A contract will be written to specify management and maintenance, including inspection intervals, watering, removal of weed growth, checking tree guard positioning and tree survival. Where planting is on FC land, FC will undertake monitoring and management with NSDC retaining responsibility under the DCO for ensuring that the AGVMP measures are undertaken and the ability to step-in if necessary. Any whitebeams that die within the ten-year maintenance programme will be replaced with plants obtained from stock grown on from seed or cuttings by Paignton Zoological Gardens (or other botanical gardens contracted to propagate the seed collected in 2019 and subsequent years). An annual report will be produced in December each year detailing the measurements and survival of each tree and an indication of fruiting performance (if mature enough).

7.1.4 If Bristol rock-cress is affected by the DCO Scheme, the receptor areas will be checked and monitored for 9 years after initial planting, managed by NSDC.

7.1.5 After the NSDC monitoring period, NR will be responsible for those activities required on its operational railway land during the operational phase of the railway once this plan is complete and NSDC will no longer be involved. NR land within the Avon Gorge SAC/SSSI will be managed under NR's SMS and VMP. After completion of the actions set out in the current SMS (2018-2023) and the activities of the MetroWest DCO Scheme, NR will reassess its activities to develop a new SMS. FC land will be managed in accordance with FC's own long-term management plan for Leigh Woods.

Table 6: Summary of the planting and monitoring programme for rare whitebeam saplings

Date	Task
Year 1	The initial planting will be undertaken in early March. A report with planting plan and tree numbers will be produced. Between April and September, they will be checked monthly to undertake watering if necessary and other care requirements such as removal of weed growth, check tree guard positioning and tree survival, as stipulated in the contract.
Year 2	Saplings will be checked in March and September to undertake care requirements such as removal of ivy. If they are suffering from establishment issues such as desiccation this will be considered and frequency of management/monitoring increased to monthly if required between April and September inclusive. In March, any replacement planting will be carried out using stock reserved at Paignton Zoological Gardens (or other botanical gardens used to propagate the seed collected) and management/monitoring of new plants will be as detailed in Year 1.
Year 3 – 10	In years 3 to 10 after initial planting, the saplings will be checked in March and September to undertake care requirements. In March, any replacement planting will be carried out using stock reserved at Paignton Zoological Gardens (or other botanical gardens used to propagate the seed collected) and management/monitoring of new plants will be as detailed in Year 1.

SECTION 8

Discussion

8.1.1 The key features of the vegetation management plan are:

- To facilitate the construction and operational clearance for the DCO Scheme.
- Secure protection and enhancement of the important woodlands for which the Avon Gorge is designated. Namely, minimising the loss of habitat as much as possible within the Avon Gorge Woodlands SAC and undertaking management either as detailed in Annex G on NR land or (the preferred alternative) as detailed in Annex M on FC land. In either case the aim will be to enhance areas where rare whitebeams are or could be present, by eliminating non-native species. The areas identified for such management are twice the size of the areas removed or affected by the DCO Scheme.
- No vegetation management was carried out for several decades following the cessation of services in 1981. Since the start of freight services in 2001, vegetation management has been limited to keeping the railway free from encroaching vegetation. The DCO Scheme provides an opportunity for positive management across the NR estate, while without the DCO Scheme vegetation management will be based on the current SMS and focus on vegetation management within close proximity of the railway line.
- Clearance and restoration of the small areas of *Festuco-Brometalia* grassland (for which the SAC is designated) which are currently invaded by scrub and non-native species.
- Minimise the impact from construction works on the rare whitebeams as much as possible at this stage e.g. by avoiding rare whitebeam trees from telecommunication mast installation and siting of the construction compound for Quarry Bridge No. 2.

8.1.2 Planting 54 rare Whitebeam saplings grown from seed taken from the Avon Gorge in 2016 and 2018 is proposed at planting sites within NR ownership (Package 1) or a combination of NR sites and FC-owned planting sites for Package 2. The numbers, age, size and species of whitebeam saplings available will be reviewed prior to each planting. If there are not enough of the relevant whitebeam species either at initial planting or for replacement to meet the desired ratio of two trees planted as compensation for each tree lost, agreement with Natural England will be sought for an alternative option. Given the unpredictable nature of seed viability that varies from year to year, it is not possible to guarantee germination and growing on of specific numbers of each species. To maximise the stock available for planting, propagation of new stock will continue during the 10 year maintenance and monitoring period. Current contracts with University of Liverpool Ness Botanic Gardens, Bristol Botanical Garden and Paignton Zoo are for propagation to continue until 2023. New contracts will be agreed after this for the 10 year maintenance and monitoring period after initial planting.

8.1.3 NR may be able to reduce the amount of new and replacement fencing within the Avon Gorge or undertake the fencing differently in key areas of sensitivity, subject to detailed design. This would reduce the amount of vegetation to be removed for fence installation.

8.1.4 Further mitigation measures to avoid impacts on SAC grassland, ancient woodland, rare whitebeam trees, Bristol rock-cress and other rare or notable plant species on rock faces will be considered during the detailed design stage. Detailed surveys of the rock faces will be undertaken during the detailed design of the geotechnical works and impacts on important habitats and species will be avoided, where possible. Impacts on rare whitebeam trees and Bristol rock-cress, in particular, have been assessed by a realistic worst-case scenario described in Annexes D and E. Impacts could be reduced by the following:

- Avoid low numbers of rare whitebeam on NR rock face ID05 by careful siting of rock bolts.
- Avoid impacts on Bristol rock-cress on NR rock face ID06 from rock bolt installation by avoiding individual plants or installing a rock catch fence at the bottom of the rock face instead.
- Avoid impacts on high numbers of rare whitebeam on NR rock face ID09 from rock bolt installation by avoiding individual trees or installing a rock catch fence at the bottom of the rock face instead.
- Avoid siting the rock catch fence on Third party rock face area 2 within the area where Avon whitebeams are present.
- Combining the boundary fence and rock catch fence at Third party rock face Area 7.

8.1.5 The AGVMP now proposes as the preferred option compensation for loss of woodland by positive management on FC managed land outside of the Avon Gorge SAC/SSSI within the area identified in Annex F, Figure 4. Unless the Secretary of State specifies otherwise in determining the DCO application, the detailed woodland management plan set out in Annex M will be delivered instead of providing compensation on some of the 23 sites identified on NR land (Annex G at locations G1 to G26). The compensation proposals will still be based on 1.6 ha of positive management in total.

8.1.6 During the development of this plan, the DCO Scheme was the catalyst for discussions between NR and the FC for proposals to work together to implement the FC plan to undertake tree felling close to the freight line. The tree felling work requires a rail possession which NR may supply as part of their SMS. More seed was collected from the rare whitebeam trees in the Avon Gorge in October 2019 and the DCO Scheme provided rare whitebeam seed to FC to propagate.

8.1.7 Overall the Plan will result in improved management of *Tilio-Acerion* woodland, restoration of some areas of *Festuco-Brometalia* grassland and management of endemic whitebeams.

SECTION 9

References

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Annex A
Avon Gorge Woodlands SAC designation

(HTTP://PUBLICATIONS.NATURALENGLAND.ORG.UK/PUBLICATION/6740736611450880)

Avon Gorge Woodlands

Site details

Country	England
Unitary Authority	Gloucestershire, Wiltshire and Bristol/Bath area
Centroid*	ST560741
Latitude	51.46388889
Longitude	-2.633611111
SAC EU code	UK0012734
Status	Designated Special Area of Conservation (SAC)
Area (ha)	151.07

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

General site character

Heath, Scrub, Maquis and Garrigue, Phygrana (4%)
Dry grassland, Steppes (4%)
Humid grassland, Mesophile grassland (2%)
Broad-leaved deciduous woodland (70%)
Coniferous woodland (5%)
Mixed woodland (5%)
Inland rocks, Screes, Sands, Permanent Snow and ice (10%)

Natura 2000 standard data form for this site as submitted to Europe (PDF, < 100kb).

Interactive map from MAGIC (Multi-Agency Geographic Information for the Countryside).

Location of Avon Gorge Woodlands SAC/SCI/cSAC

Note:

When undertaking an appropriate assessment of impacts at a site, all features of European importance (both primary and non-primary) need to be considered.

Annex I habitats that are a primary reason for selection of this site

9180 Tilio-Acerion forests of slopes, screes and ravines * Priority feature

Avon Gorge is representative of ***Tilio-Acerion* forests** in south-west England on the limestone cliffs and screes of a large river gorge. It is important because of the high concentration of small-leaved lime *Tilia cordata*, compared with other sites in the region, the presence of rare whitebeams *Sorbus* spp., including two unique to the Avon Gorge (*S. bristoliensis* and *S. wilmottiana*), and other uncommon plants, such as green hellebore *Helleborus viridis*. Other characteristic species include soft shield-fern *Polystichum setiferum* and hart's-tongue *Phyllitis scolopendrium*. Species-rich transitions to scrub and grasslands are associated with the woodland. Small groves of yew *Taxus baccata* also occur on some of the stonier situations.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

Annex II species that are a primary reason for selection of this site

Not applicable

Annex II species present as a qualifying feature, but not a primary reason for site selection

Not applicable.

Annex B
Avon Gorge SSSI designation

COUNTY: AVON SITE NAME: AVON GORGE

DISTRICT: WOODSPRING, BRISTOL CITY

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended) Part is National Nature Reserve declared under Section 23 of the National Parks and Access to the Countryside Act 1949.

Local Planning Authority: Avon County Council, Woodspring District Council, Bristol City Council

National Grid Reference: ST 560743, 564740 Area: 155.4 (ha) 384.0 (ac)

Ordnance Survey Sheet 1:50,000: 172: 1 10,000: ST 57 NW, ST 57, NE,

ST 57 SW, ST 57 SE

Date Notified (Under 1949 Act): 1952 Date of Last Revision: 1974

Date Notified (Under 1981 Act): 1988 Date of Last Revision: –

Other Information:

Site listed in "A Nature Conservation Review" Ed D.A. Ratcliffe (Cambridge University Press 1977) and in the Geological Conservation Review. The National Nature Reserve is owned by the National Trust. Boundary has been amended by extension and deletion.

Description and Reasons for Notification:

Avon Gorge lies on the edge of Bristol and rises about 100 metres from the tidal River Avon to Observatory Hill on the eastern side and Stokeleigh Camp to the west. The site includes part of Leigh Woods.

The Gorge has natural cliffs and quarry exposures of Carboniferous limestone, which are of great geological interest and, together with the screes, scrub, pockets of grassland and adjacent woodland, support an exceptional number of nationally rare and scarce plant species.

Nationally rare plants found on the gorge are Round-headed Leek *Allium sphaerocephalon*, Bristol Rock-cress *Arabis stricta*, which is unique to the site, Compact Brome *Bromus madritensis*, Nit-grass *Gastridium ventricosum*, Little Robin *Geranium purpureum ssp purpureum*, Western Spiked Speedwell *Veronica spicata ssp hybrida* and Honewort *Trinia glauca*. Nationally scarce plants in the gorge are Fingered Sedge *Carex digitata*, Dwarf Sedge *Carex humilis*, Dwarf Mouse-ear *Cerastium pumilum*, Hutchinsia *Hornungia petraea*, Spring Cinquefoil *Potentilla tabernaemontani*, Autumn Squill *Scilla autumnalis* and Rock Stonecrop *Sedum fosterianum ssp elegans*. Other plants of restricted distribution in Britain are Little-robin *Geranium purpureum* and Lesser Meadow-rue *Thalictrum minus*. Rock outcrops and small areas of limestone grassland in Leigh Woods support some of these rare and scarce plants. Angular Solomon's-seal *Polygonatum odoratum*, which is nationally scarce, occurs in the woodland.

Leigh Woods cover the gorge's western side, the plateau above and the steep valleys down to the River Avon and overlie the limestone except for a narrow band of Devonian sandstones to the north. The woods are mainly semi-natural, broadleaved woodland, but the site also includes areas of mixed and broadleaved plantation and

parts are ancient woodland. The canopy has Pedunculate and Sessile Oak *Quercus robor* and *Q. petraea*, with Ash *Fraxinus excelsior*, Wych Elm *Ulmus glabra* much of which has died of Dutch Elm Disease, Small-leaved Lime *Tilia cordata*, Birch *Betula sp* and whitebeams *Sorbus spp*. Beech *Fagus sylvatica*, Hornbeam *Carpinus betulus*, Sycamore *Acer pseudoplatanus*, Spanish Chestnut *Castanea sativa*, Wild Cherry *Prunus avium* and occasional hybrid limes *Tilia spp* have all been planted, sometimes in single species stands. The shrub layer is discontinuous, with frequent Hazel *Corylus avellana* and occasional Field Maple *Acer campestre*, Privet *Ligustrum vulgare*, Hawthorn *Crataegus monogyna*, Spindle *Euonymus europaeus*, Dogwood *Cornus sanguinea* and Yew *Taxus baccata*. The main ground layer species are Ivy *Hedera helix*, Male Fern *Dryopteris filixmas*, Bluebell *Hyacinthoides non-scripta*, Ramsons *Allium ursinum*, Dog's Mercury *Mercurialis perennis* and Bramble *Rubus fruticosus*. The ground flora is very diverse and plants of particular note include Columbine *Aquilegia vulgaris*, Lily-of-the-Valley *Convallaria majalis*, Ivy Broomrape *Orobanche hederae*, Toothwort *Lathraea squamaria*, Wild Madder *Rubia peregrina*, Green Hellebore *Helleborus viridis*, Softshield Fern *Polystichum setiferum*, Southern Polypody *Polypodium cambricum* and Beech Fern *Thelypteris phegopteris*.

The northern slope of Paradise Bottom has fine Small-leaved Lime high forest and young Ash stands, with ground layers dominated by Ramsons.

The woods and gorge have an exceptional diversity of whitebeams *Sorbus spp* including two which are unique to Avon Gorge, *Sorbus bristoliensis* and *S. wilmottiana*. *S. anglica* and *S. eminens*, national rarities, and the nationally scarce *S. porrigentiformis* also occur.

Of the other species, Wild Service-tree *S. torminalis* and the introduced Swedish Whitebeam *S. intermedia* are of note.

Other habitats include small areas of herb-rich calcareous grassland, patches of Bracken *Pteridium aquilinum* and the strandline saltmarsh along the River Avon.

Geological interest

This site shows the complete local succession of the Carboniferous Limestone. The classic work of Vaughan and Reynolds on the marine fossils of the limestones, and the adoption of the sections as the standard for the 'Avonian' (=Dinantian), makes this one of Britain's historic geological sites, important for both the study and development of stratigraphy. The section spans (with gaps) the entire Tournaisian and Visean series (Courceyan-Brigantian stages), and also includes the Old Red Sandstone Portishead Beds below. The Avon Gorge affords one of the best opportunities for the study of Carboniferous rocks in Britain, studies which have continued since the early 19th century.

Annex C Quarry Bridge No. 2 draft construction methodology

Quarry Bridge No. 2 Draft Construction Methodology (NR, December 2018)

This is an indicative methodology for the works at Quarry Under Bridge No. 2. This is currently in the initial design stage and there may be further changes due to design progression and ecology constraints that impact on the construction methodology.

The anticipated duration for the specific bridge works is approximately 3-6 months, however the impact to the operational railway will be over 4-5 days. Duration is dependent upon final methodology, ecology constraints, possession access, and delivery and retrieval of materials.

Outline methodology

1. Clear vegetation from approximately 5m from all sides of the bridge to enable construction works. NR understands there is one whitebeam sapling to the north west of the bridge which can be protected. A detailed survey is to be carried out prior to construction. The method of protection used will most likely be a fence.
2. Construction compound area to be enclosed within temporary fencing.
3. The boulders at the entrance of the Quarry will be temporarily relocated during construction outside of indicative compound area to a location agreed with NSDC.
4. The woodpiles, under the supervision of an ecologist, will be relocated outside of indicative compound area to a location agreed with NSDC
5. Compound to be established; indicative layout shown below. Statement on drawing that the area is to be kept to an absolute minimum acknowledges the constraint, but until detailed methodology is available from contractor exact extent of area cannot be confirmed.
6. Construct temporary access ramp. The existing embankment may need to be graded to allow construction of this ramp. The ramp is located so that the track-side edge follows the surface of the embankment in order to minimise disturbance to the embankment and material import. Clean imported limestone aggregate to be used to construct the ramp which will be placed on geotextile membrane or similar to aid removal post construction works. It is anticipated that small excavators will be used for this. The transport of these will most likely be along the rail corridor to reduce potential impacts on the tow path and therefore the SAC, however this will be confirmed ahead of construction.
7. It is necessary to install an access route for construction vehicles going from the ramp to the underside of the bridge. NR understands this goes through a sensitive area however access to the underside of the bridge is required and the footpath/cycle path side is unsuitable. NR will discuss options further to protect grass land with the contractor ahead of construction. Options potentially include use of matting or stone track above geo-textile membrane.
8. Materials such as precast bridge components will be delivered to site before the main construction activities via the railway corridor and down the ramp. Geo-tech membrane or other measures will be used to protect the ground underneath. The materials will be delivered to site as close to the main possession as possible,

however this is dependent upon the track possession access at the time. These will be stored in the area Gorge side of the ramp.

9. During possession, cut out track, excavate halfway down abutments, this could be carried out from the rail. Demolish arch using excavator located in the site compound. Demolished/excavated material is likely to be retained onsite in compound area and removed during follow up railway possessions.
10. Prepare abutment, install precast cill beam and lift in new structure using plant located in the compound.
11. Install precast headwalls and stitch deck together, waterproof.
12. Backfill and lay track, using machines located track level.
13. Construction compound to be demobilised including removal of access route and ramp. Membranes beneath the top level of stone help to ensure no contamination of underlying soils. The boulders will be reinstated at Quarry entrance.
14. Construction/design will take into consideration location of existing known services (sewer) and take appropriate precautions.

Discounted Options:

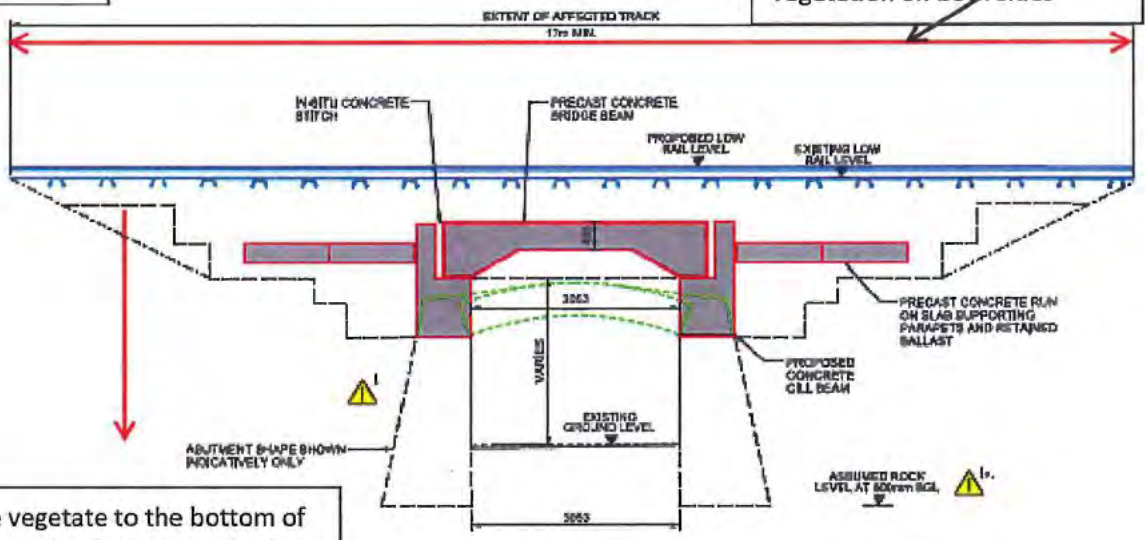
The following construction options have been discounted at this stage.

15. NR endeavours to explore options to install from the track where possible. However, at this stage we cannot confirm if this is possible due to the size of the rail mounted crane that would be required and extent of the temporary works needed to stabilise the embankment during construction. Using a rail mounted methodology would also mean increased de-vegetation works on the embankments to allow the bridge components to be slewed into place.
16. A concrete saddle methodology has been considered however this is not NR's preferred option. This is due to extensive temporary works that would be required to prop the underside of the bridge, this would restrict access. Furthermore, this methodology imposes more risk due to the poor condition of the existing arch barrel.

Overview of Indicative Bridge Construction

Figure 1

Approximately 17m of de vegetation on both sides

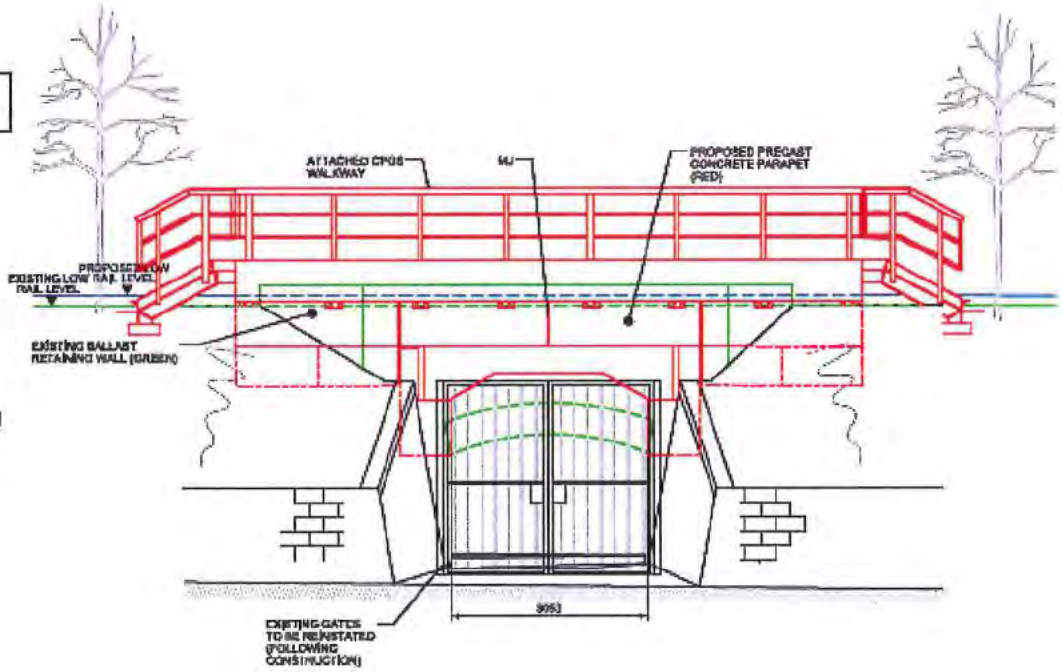


De vegetate to the bottom of the embankment on all sides

SECTION 1

SCALE 1:50

Figure 2



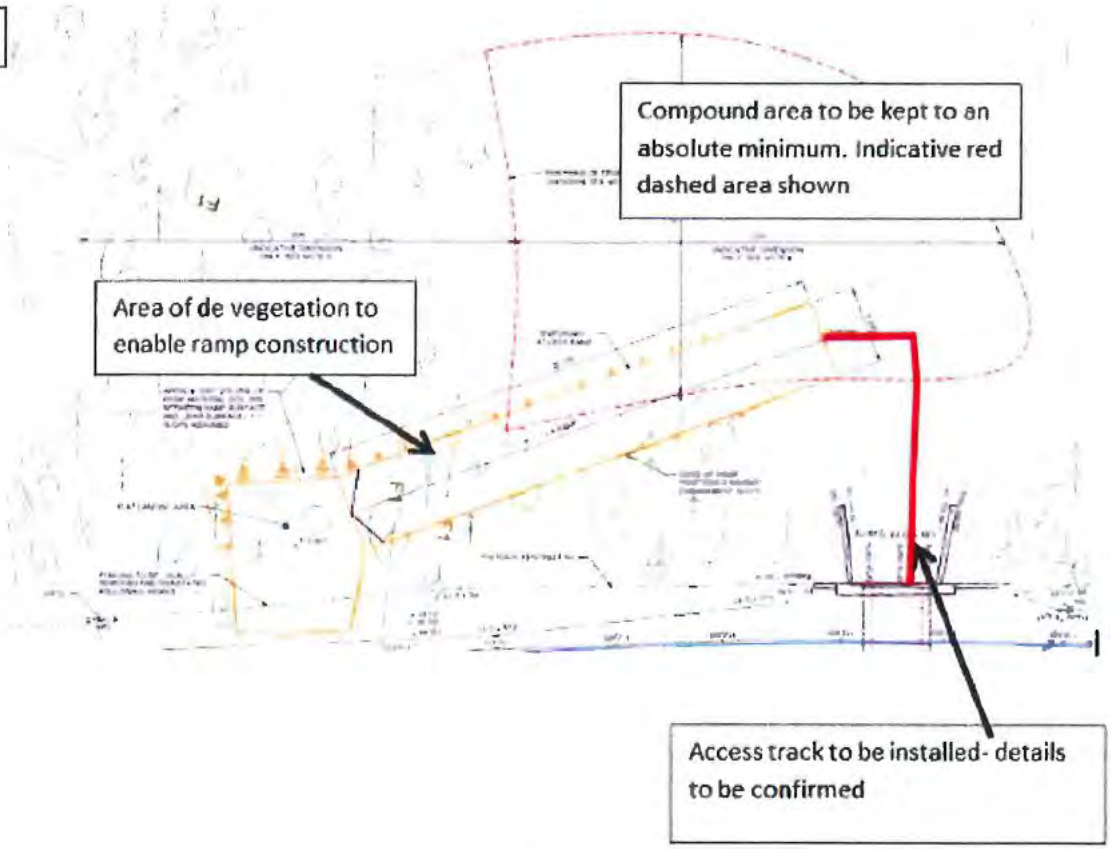
Area of D

ELEVATION A

SCALE 1:50

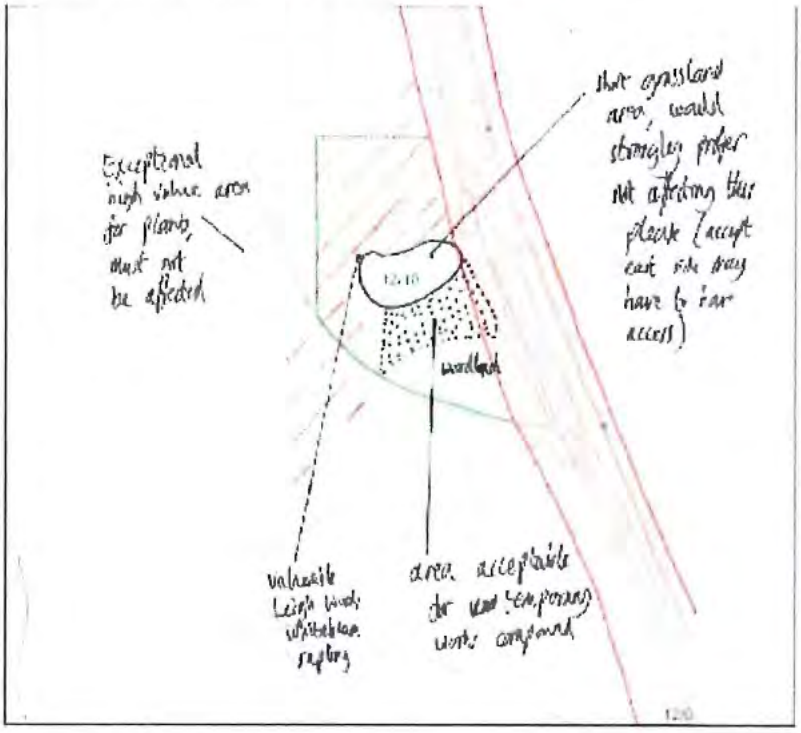
Overview of ramp and compound area

Figure 3



Recommended Location for Works Compound

Figure 4



Annex D Assessment of construction works to Network Rail rock faces

Construction works to Network Rail Rock Faces within Avon Gorge Woodlands SAC

Assessment based on construction works detailed in Arup report (2016)

Assumptions agreed with NR and NSDC and used to determine the predicted impact on the SAC and rare plants:

- No rare or notable plants need to be removed for vegetation clearance for geo-technical inspection.
- Each rock bolt will require 4 m2 of vegetation removal for installation
- No rare/notable plants will be removed or affected from removing loose blocks, rock scaling or individual trees causing root-jacking. If there is potential for plants to be damaged by material falling onto them from above, they will be protected, and this will be developed during the detailed design. Tree species causing root jacking have not been confirmed at this stage but will be confirmed at the detailed design stage.
- The impact on rare whitebeam trees is predicted by calculating the percentage of the rock face area impacted by the construction works. This percentage was then used to calculate the predicted number of whitebeam trees to be removed. This assumes that whitebeams and rock bolts are distributed evenly across the rock face. This is unlikely to be the case, but locations of rock bolts cannot be determined until detailed design.
- No additional vegetation clearance is required for access because all works will be undertaken from the railway track.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face ID01 – Secondary (recent) Woodland habitat				
Clear ivy, do not remove any rare/notable plants. Ecological watching brief.	Remove loose blocks Remove 3 trees causing root jacking	None	Routine type of work, no significant impact	None present
Rock Face ID02 – SAC grassland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Light veg clearance, do not remove any rare/notable plants. Ecological watching brief.	None	None	None	None present
Rock Face ID03 – Ancient woodland habitat				
Light vegetation clearance. Remove unstable trees from portal. Avon whitebeam numbers AVO3, AV04, AV05 (Annex F, Figure 1) on the portal have been already considered and require removal (dangerous trees, Table 3). Ecological watching brief.	Remove loose blocks Remove approx. 5 trees causing root jacking and assume 5 rock bolts in portal.	10 rock bolts, no mesh	Removal of 60 m^2 of ancient woodland. 4 m^2 per rock bolt, assume 15 in total needed.	13 Avon whitebeam present. Total area = 1570 m^2 Impacted area = 60 m^2 3.82% of trees = 0.49 **Assume 1 tree**
Rock Face ID04 - Ancient woodland habitat				
Clear ivy, do not remove any rare/notable plants. Ecological watching brief.	Remove loose blocks Remove approx. 10 trees causing root jacking	10 rock bolts, no mesh	Removal of 40 m^2 of ancient woodland.	6 Avon whitebeam present. Total area = 310 m^2 Impacted area = 40 m^2 13% of trees = 0.78 **Assume 1 tree**
Rock Face ID05 – Ancient woodland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Clear ivy, do not remove any rare/notable plants. Ecological watching brief.	Remove loose blocks	10 rock bolts, no mesh	Removal of 40 m^2 of ancient woodland.	3 round-leaved whitebeam present. Total area = 2120 m^2 Impacted area = 40 m^2 1.89% of trees = 0.1 **Assume 1 tree**
Rock Face ID06 – SAC grassland habitat				
Light vegetation clearance, do not remove any rare/notable plants for inspection. Ecological watching brief.	Remove loose blocks	10 rock bolts, no mesh	Removal of 40 m^2 of SAC grassland. Bristol rock-cress present in approx. half of the rock face.	1 Bristol whitebeam present. Already considered to coppice (Table 3, Bri08). No additional trees. Assume 20 m^2 of area where Bristol rock-cress is present will be removed.
Rock Face ID07 – SAC grassland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Clear vegetation, do not remove any rare/notable plants. Ecological watching brief.	Remove loose blocks	10 rock bolts, no mesh	Removal of 40 m^2 of SAC grassland. Third party land issues – rock fence required 2 m high and 30 m long combined with the existing fence line position. Assume no additional vegetation needs to be removed for installation of rock fence.	13 Wilmotts whitebeam, 2 observatory whitebeam present. Total area = 730 m^2 Impacted area = 40 m^2 5.5% of trees = 0.82 **Assume 1 tree**
Rock Face ID08 – Ancient woodland habitat				
Light vegetation clearance, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks	10 rock bolts, no mesh	Removal of 40 m^2 of ancient woodland.	No whitebeam present
Rock Face ID09 – Ancient woodland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Light vegetation clearance, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks. Remove 5 trees causing root jacking.	10 rock bolts, no mesh	Removal of 40 m^2 of ancient woodland.	Approximately 188 whitebeam trees present (180 not detailed). Rare species mostly Leigh Woods whitebeam. Total area = 1610 m^2 Impacted area = 40 m^2 2.5% of trees = 4.7 **Assume 5 trees**
Rock Face ID10				
Clear vegetation, do not remove any rare/notable plants. Ecological watching brief.	None	None	None	None present
Rock Face ID11 – Ancient woodland habitat				
Clear ivy, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks	10 rock bolts, no mesh	Removal of 40 m^2 of ancient woodland.	2 common whitebeam. No impacts on rare whitebeam.
Rock Face ID12 – Ancient woodland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Clear vegetation, do not remove any rare/notable plants. Ecological watching brief.	None	Assume 2 rock bolts, no mesh. (not in Arup report but pers. comm. Route Asset Manager (Geotechnics, Drainage & Offtrack) – Western, NR)	Removal of 8 m^2 of ancient woodland	None present
Rock Face ID13 – Ancient woodland habitat				
Clear vegetation, do not remove any rare/notable plants. Ecological watching brief.	None	Assume 2 rock bolts, no mesh. (not in Arup report but pers. comm. Route Asset Manager (Geotechnics, Drainage & Offtrack) – Western, NR)	Removal of 8 m^2 of ancient woodland	None present
Rock face ID14 – Ancient woodland habitat				
Clear vegetation, do not remove any rare/notable plants. Ecological watching brief.	None	Assume 5 rock bolts (no mesh) and light scaling (not in Arup report but pers. comm. Route Asset Manager (Geotechnics, Drainage & Offtrack) – Western, NR)	Removal of 20 m^2 of ancient woodland	None present

Summary

- Removal of 296 m^2 of ancient woodland
- Removal of 80 m^2 of SAC grassland
- Removal of 9 rare whitebeam trees – assumed species are 2 Avon whitebeam, 1 round-Leaved whitebeam, 1 Wilmott's whitebeam and 5 Leigh Woods whitebeam.
- Removal of 20 m^2 of Bristol rock-cress, a WCA Schedule 8 species.

References

Arup (2016) MetroWest Phase 1 Vegetation Clearance and Rock De-Scaling Works within the Avon Gorge. Report for NR.

Annex E Assessment of construction works to third party rock faces

Ecological assessment of construction works to Third Party Rock Faces within Avon Gorge Woodlands SAC

Assessment based on construction works detailed in AmeyConsulting report (2018)

Reasonable worst case scenario developed in consultation with NR and NSDC used to determine the predict impact on the SAC and rare plants:

- No rare or notable plants need to be removed for vegetation clearance for geo-technical inspection.
- Each rock bolt will require 4 m^2 of vegetation removal for installation.
- No rare/notable plants will be removed or affected from removing loose blocks, rock scaling or individual trees causing root-jacking. If there is potential for plants to be damaged by material falling onto them from above, they will be protected, and this will be developed during the detailed design. Tree species causing root jacking have not been confirmed at this stage but will be confirmed at the detailed design stage.
- Light scaling will entail hand picking loose rocks using hand tools and can avoid rare or notable plants and is already carried out in the Avon Gorge in consultation with Natural England.
- The impact on rare whitebeam trees is predicted by calculating the percentage of the rock face area impacted by the construction works. This percentage was then used to calculate the predicted number of whitebeam trees to be removed. This assumes that whitebeams and rock bolts are distributed evenly across the rock face. This is unlikely to be the case, but locations of rock bolts cannot be determined until the detailed design stage.
- Two access routes and a site compound are proposed on FC land for construction works access (Compounds, Haul Roads, and Access to Works Plans, DCO Document Reference 2.29). Materials will be taken to the rock face areas by a 4 x 4 vehicle and a trailer. No vegetation clearance or works to upgrade the existing site compound area or access tracks are required for construction works access.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face Area 1 – Ancient Woodland habitat				
Vegetation removal and light scaling of rock escarpment, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks that are an immediate risk to the railway	5 rock bolts	Removal of 20 m^2 of ancient woodland (4 m^2 per rock bolt).	None present.
Rock Face Area 1a – Ancient Woodland habitat				
Vegetation removal and light scaling of rock escarpment, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks that are an immediate risk to the railway	None	None	Not inspected due to requiring rope access but previous surveys by Libby Houston indicate there are unlikely to be any rare plants present.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face Area 2 – Secondary (recent) woodland habitat				
None specified	Rock catch fence along top of cutting from tunnel portal at 122 mi 0565 yds to edge of old quarry at approximately 120 mi 0650 yds. Fence will be 2 m high and 78 m long. Rock blocks to be removed from slope to allow safe working below.		Removal of 390 m^2 of secondary (recent) woodland habitat for installation of rock fence (5 m x 78 m).	No rare whitebeams on cliff top. Avon whitebeam present on lower slopes on NR land (NR Rock Face ID03). NR confirm that they should be able to avoid rare whitebeams but cannot guarantee it at this stage. 13 Avon whitebeam present on NR Rock Face ID03 (Houston, 2017). Total area = 1570 m^2 Impacted area = 390 m^2 25% of trees = 3.25 **Assume 4 Avon whitebeam trees**
Rock Face Area 3 – Secondary (recent) woodland habitat				
No works required	No works required	No works required	No works required	No rare whitebeam or rare plants present and no works required.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face Area 4 – Secondary (recent) woodland habitat				
None specified	Notify land owner, recommend that block is monitored for signs of future movement.	No works required	No works required	No rare whitebeam or rare plants present and no works required.
Rock Face Area 5 – SAC grassland habitat				
Vegetation removal and light scaling of an area totaling 10 m^2, do not remove any rare/notable plants. Ecological watching brief	5 rock bolts to support wedge feature identified.		Removal of 20 m^2 of SAC grassland.	No rare whitebeams where works required, but are present on NR land below (Houston 2017). Fingered sedge (*Carex digitata*) at least 10 clumps. Bristol rock-cress (*Arabis stricta*) has been present in the past but not confirmed on this survey (rope access required). NR confirmed that rare species will be avoided by an Ecological watching brief. No impacts on rare plants.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face Area 6 – Ancient woodland habitat				
None specified	Targeted scaling on rock face to remove worst blocks (estimate 40% of rock face). Catch fence proposed between 122 miles 1494 yds to 122 miles 1551 yds. 2 m high, 52 m long.		Removal of 260 m^2 of ancient woodland habitat for installation of rock fence (5 m x 52 m). Assume scaling will avoid removal of rare plants	5 Wilmott's whitebeam on edge of quarry slab and 1 Wilmott's whitebeam in crack in slab. 3 observatory whitebeams present at base on NR land (Houston, 2017). Bristol rock-cress present in the adjacent quarry and occasionally plants occur along top edge of this cliff and rarely on the north face. Fingered sedge - at least 30 clumps recorded on slopes below the cave but not noted during this survey. It may still be present in low numbers. NR confirmed that rare species will be avoided by an Ecological watching brief. No impacts on rare plants.

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Rock Face Area 7 – Ancient woodland habitat				
None specified	Rock catch fence along cess 122 mi 1680 yds to 123 mi 0080 yds. Fence will be 2 m high and 147 m long. Scaling of escarpment and removal of blocks on slope to allow safe working below.		Confirmed removal of 3 m vegetation up slope and 1 m down slope for fence installation. Total removal of 588 m^2 of ancient woodland (4 m x 147 m).	1 Bristol whitebeam on woodland slope in middle of rock face. 1 Bristol whitebeam present on cliff top. No rare trees or plants noted along bottom where catch fence proposed but trunk of Bristol whitebeam on slope should be protected with temporary padding prior to and during scaling works to prevent damage. NR confirmed that padding of Bristol whitebeam tree would be undertaken with an Ecological watching brief. No impacts on rare plants.
Rock Face Area 8 – Ancient woodland habitat				
No works required	No works required	No works required	No works required	1 Bristol whitebeam on cliff top. No works required.
Rock Face Area 9 – Ancient woodland habitat				

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
Vegetation removal and light scaling of rock escarpment, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks that are an immediate risk to the railway	None	None	None present on third party rock face. 1 grey-leaved whitebeam *Sorbus porrigentiformis* on low cliff at south end, fingered sedge c. 50 plants, lily of the valley *Convallaria majalis (*abundant, IUCN Least Concern but mentioned on SSSI schedule) and angular Solomon's' seal (*Polygonatum odoratum*; a few plants, Nationally Scarce) are present on the adjacent NR land immediately to the east ((see Appendix 9.10 Flora Survey: Avon Gorge Woodlands SAC/Avon Gorge SSSI (DCO Document Reference 6.25) and Houston, 2017)) and are vulnerable to clearance during scaling works. It is assumed that the rare plants on adjacent land will not be affected. Avoidance

Vegetation clearance for inspection	Confirmed remediation works	Potential remediation works	Predicted impact on SAC	Predicted impact on rare whitebeam trees and other rare plants
				and protection to be confirmed during detailed design stage.
Rock Face Area 10 – Ancient woodland habitat				
No works required	No works required	No works required	No works required	Not investigated, probably no rare whitebeam or rare plants present based on existing data. No impact on rare plants.
Rock Face Area 11 – Ancient woodland habitat				
Vegetation removal and light scaling of rock escarpment, do not remove any rare/notable plants. Ecological watching brief	Remove loose blocks that are an immediate risk to the railway	None	None	None present.

Summary

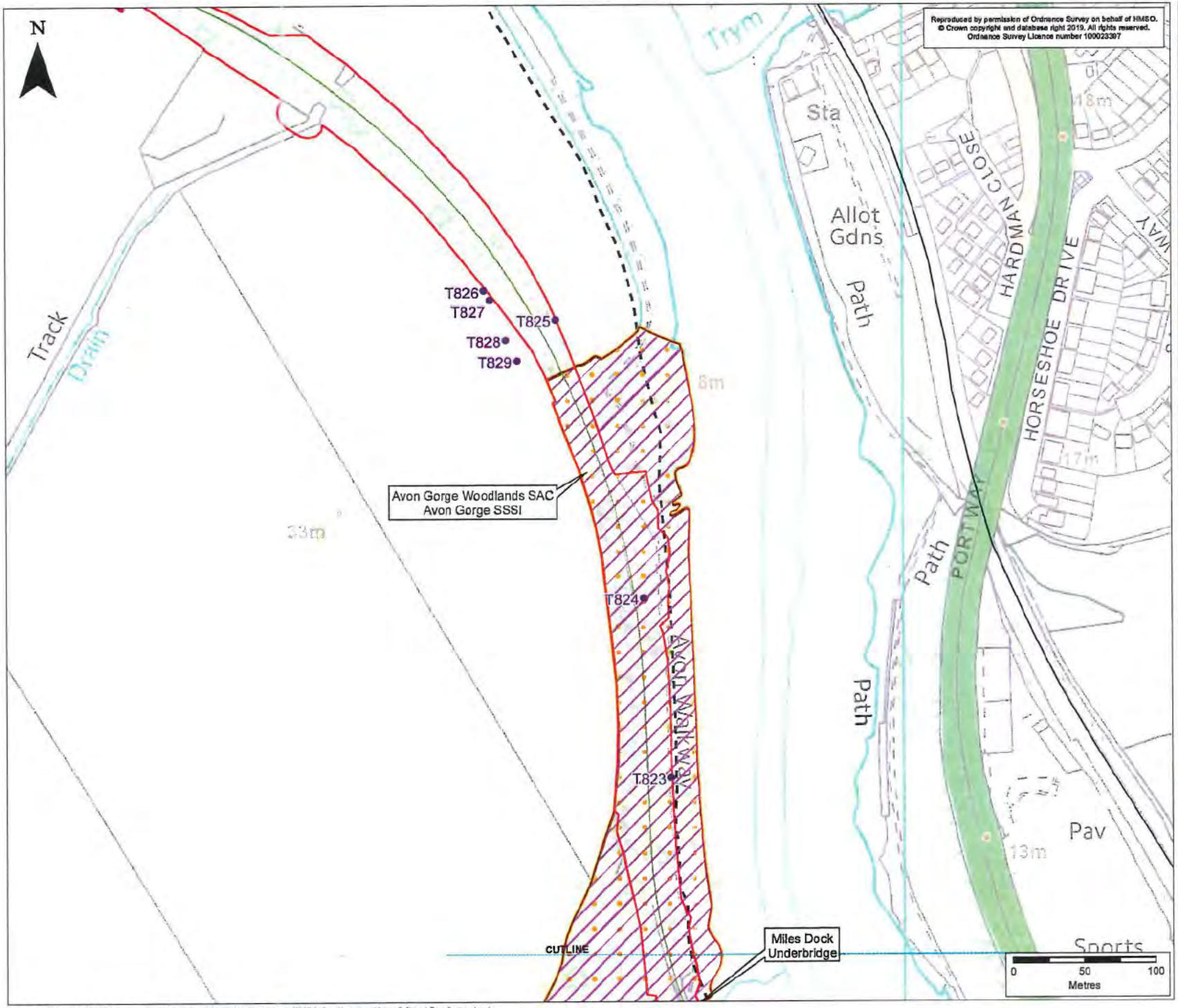
- Removal of 868 m^2 of ancient woodland
- Removal of 390 m^2 of secondary (recent) woodland
- Removal of 20 m^2 of SAC grassland
- Removal of 4 rare Avon whitebeam trees

References

AmeyConsulting (2018). Geotechnical Risk Assessment Avon Gorge. Report to NR.

Houston, L (2017). Survey of whitebeam and other *Sorbus* species on NR land within Avon Gorge SAC/SSSI. Spreadsheet of individual trees and accompanying notes, 11 August 2017. Report to NR.

Annex F Figures



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The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Order Limits
- **Portishead Branch Line**
- The Associated Development
- **Railway Line**
- Existing Railway Line
- Individual Trees
- Bristol City Council Boundary
- Special Area of Conservation
- Site of Special Scientific Interest

Note:

Rare Whitebeam (Sorbus) trees to be removed or coppiced.

Code	***Name***
EMI	*S.eminens*
BRI	*S.bristoliensis*
AVO	*S.avonensis*

Rev	By	Chkd	Apprvd	Date	Description
ES-A	EJ	CW	CF	04/10/2019	First draft

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 1
Tree Management
(Sheet 1 of 7)
APFP Regulation 5(2)(a)

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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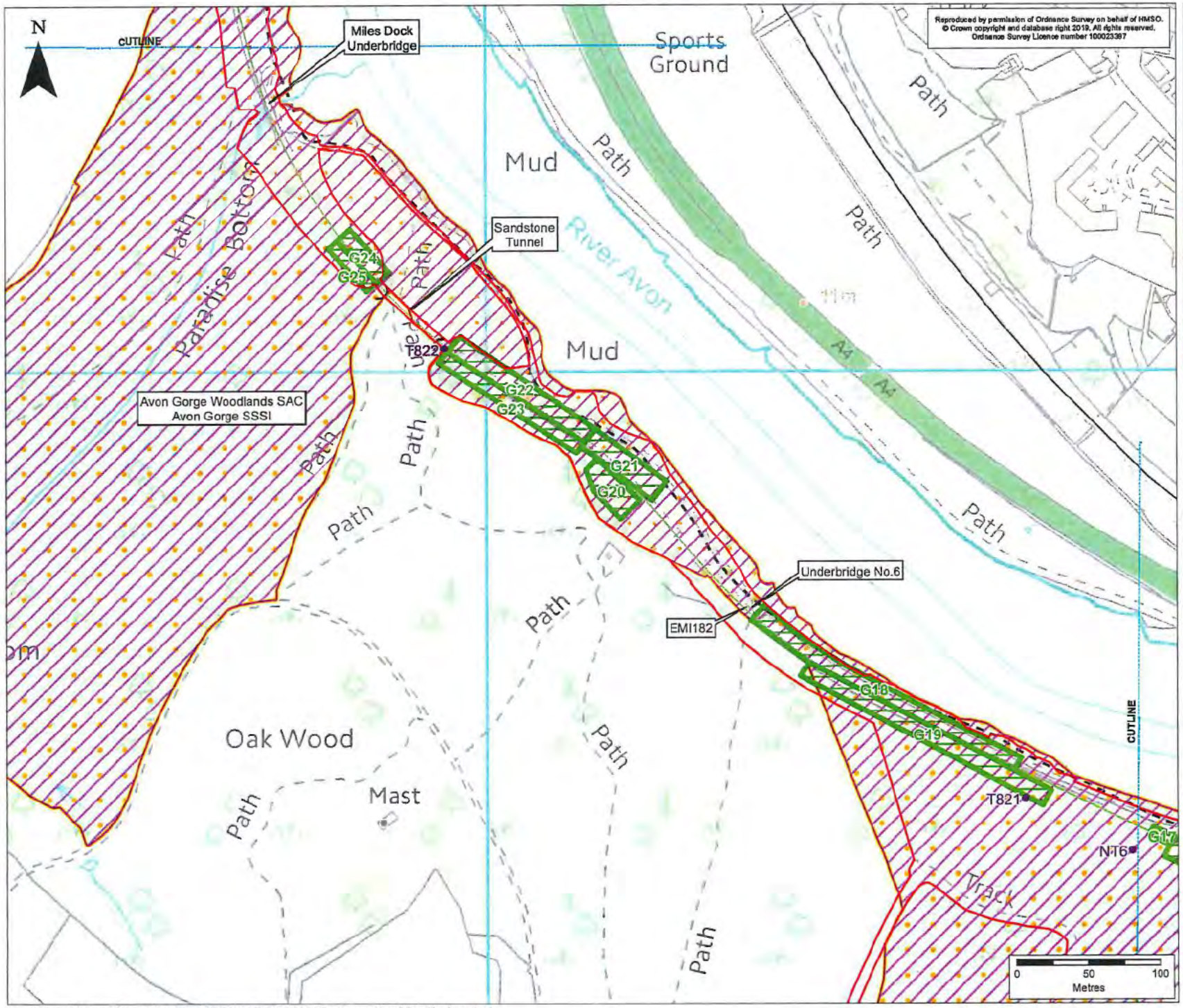

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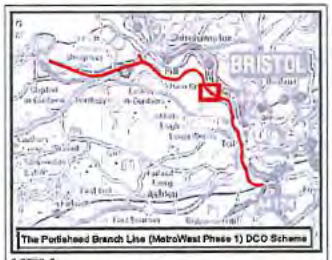

KEY

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Rev	By	Chkd	Apprvd	Date	Description
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Project:
Portishead Branch Line (MetroWest Phase 1)

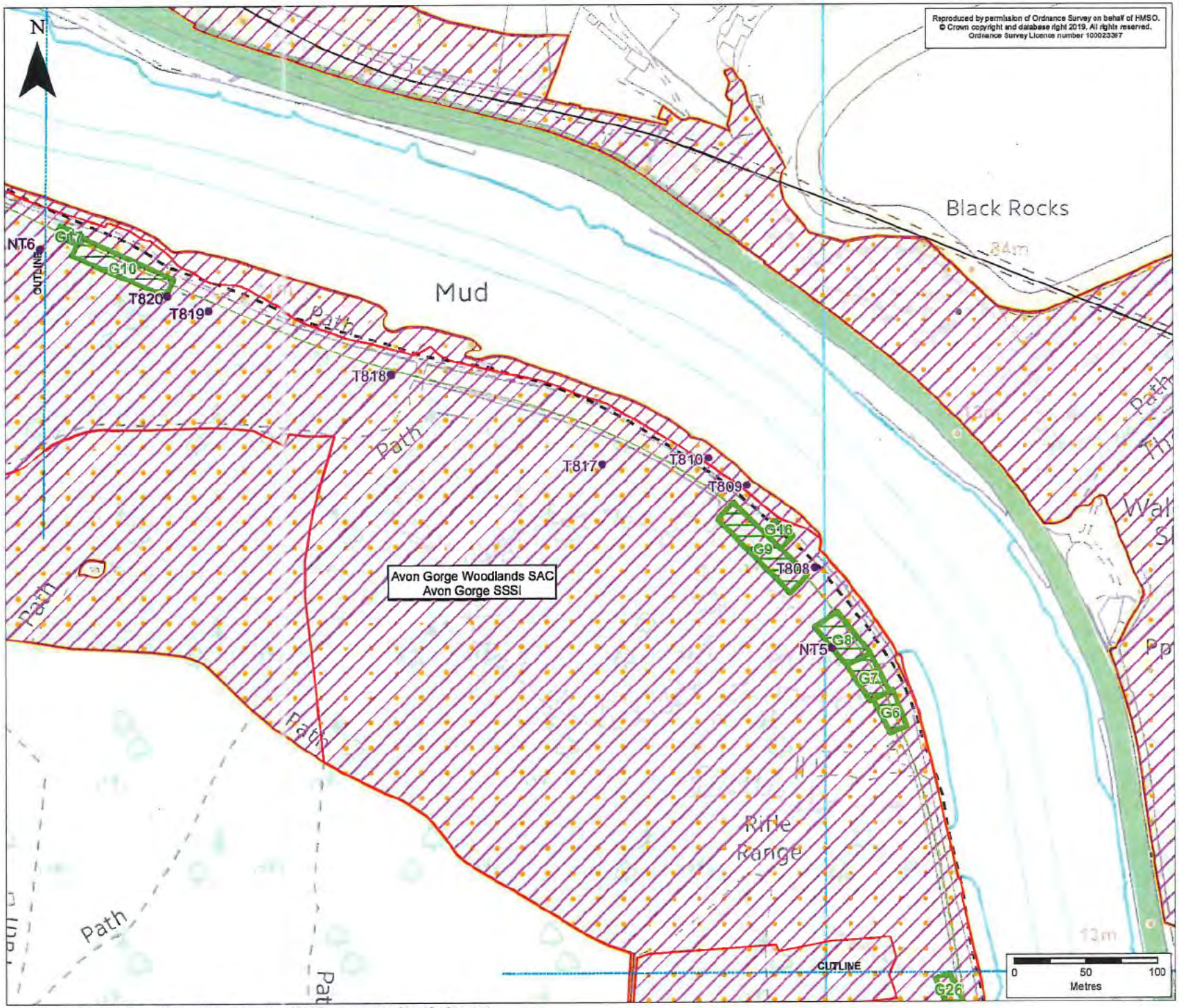
Drawing:
Annex F Figure 1
Tree Management
(Sheet 2 of 7)
APFP Regulation 5(2)(e)

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3



KEY

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Rev	By	Chkd	Apprvd	Date	Description
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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 1
Tree Management
(Sheet 3 of 7)
APFP Regulation 5(2)(a)

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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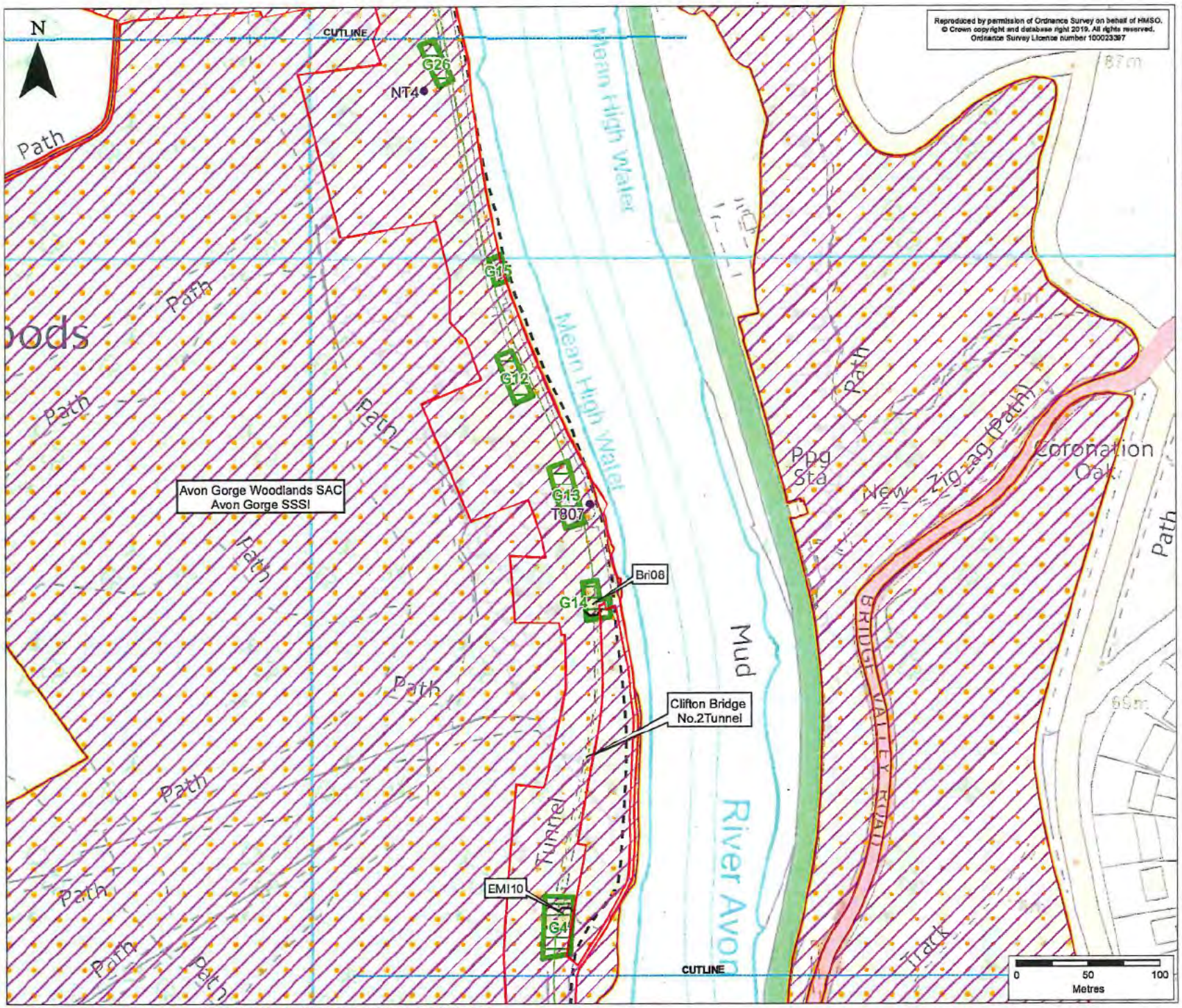

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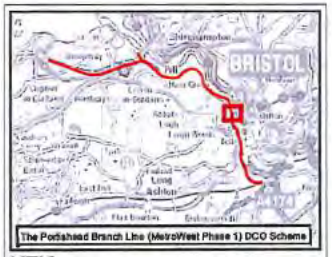

KEY

- Order Limits
- Portishead Branch Line
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- Railway Tunnel
- Individual Trees
- Bristol City Council Boundary
- Groups of Trees
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest

Note:

Rare Whitebeam (Sorbus) trees to be removed or coppiced.

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EMI	*S.eminens*
BRI	*S.bristoliensis*
AVO	*S.avonensis*

Rev	By	Chkd	Apprvd	Date	Description
ES-A	EJ	CW	CF	04/10/2019	First draft

Client: travelwest

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 1
Tree Management
(Sheet 4 of 7)
APFP Regulation 5(2)(a)

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A
Revision: ES-A
Drawing Scale: 1:2,500 @ A3

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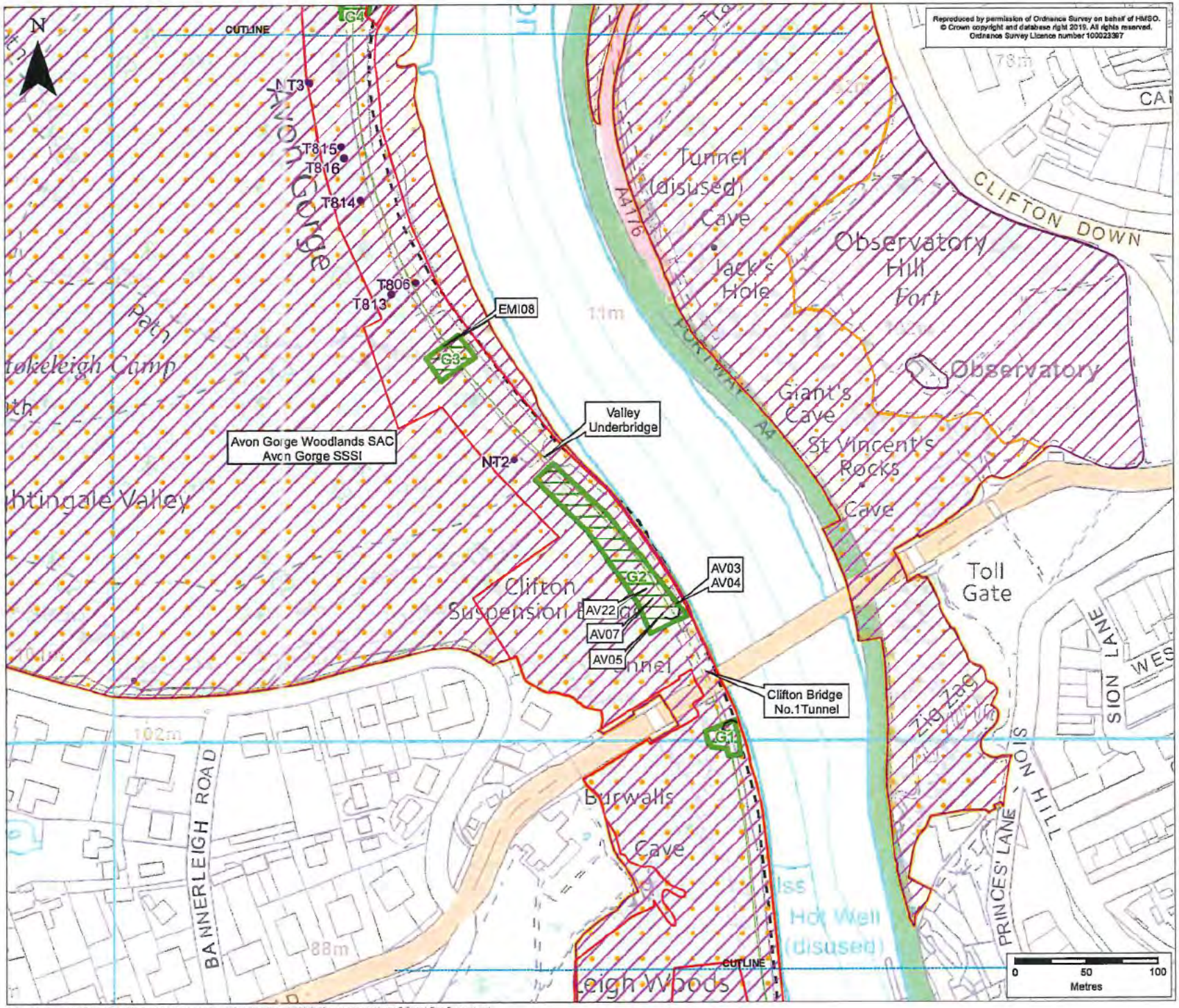

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KEY

- Order Limits
- Portishead Branch Line
- The Associated Development
- Section in Tunnel
- Railway Tunnel
- Individual Trees
- Bristol City Council Boundary
- Groups of Trees
- Special Area of Conservation
- Site of Special Scientific Interest

Note:

Rare Whitebeam (Sorbus) trees to be removed or coppiced.

Code	*Name*
EMI	*S.eminens*
BRI	*S.bristoliensis*
AVO	*S.avonensis*

Rev	By	Chkd	Approvd	Date	Description
ES-A	EJ	CW	CF	04/10/2019	First draft

Client

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Project: Portishead Branch Line (MetroWest Phase 1)

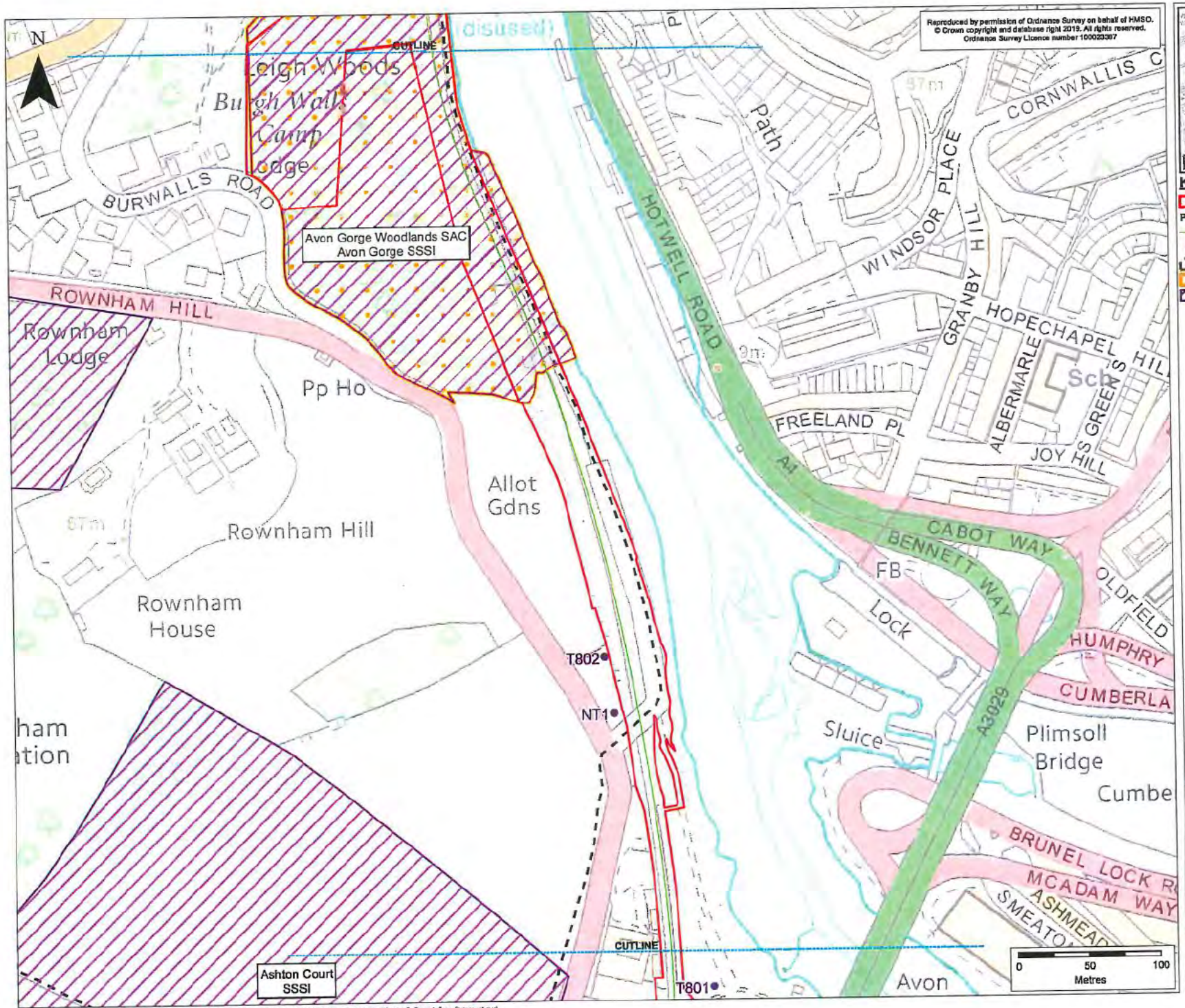
Drawing: Annex F Figure 1
Tree Management
(Sheet 5 of 7)
APFP Regulation 5(2)(a)

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3



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The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Order Limits
- Portishead Branch Line
- The Associated Development
- Individual Trees
- Bristol City Council Boundary
- Special Area of Conservation
- Site of Special Scientific Interest

Note:

Rare Whitebeam (Sorbus) trees to be removed or coppiced.

Code	Name
EMI	S.eminens
BRI	S.bristoliensis
AVO	S.avonensis

Rev	By	Chkd	Apprvd	Date	Description
ES-A	EJ	CW	CF	04/10/2019	First draft

Client

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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : Annex F Figure 1
Tree Management
(Sheet 6 of 7)
APFP Regulation 5(2)(a)

Drawn By :	Elijah Jeary	Date: 04/10/2019
Checked By :	Clare Williams	Date: 04/10/2019
Approved By :	Carolyn Francis	Date: 04/10/2019

Drawing No. : 674946-004-001 - A

Revision ES-A

Drawing Scale : 1:2,500 @ A3

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The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Order Limits
- Portishead Branch Line
- The Associated Development Works
- Individual Trees
- Bristol City Council Boundary
- Site of Special Scientific Interest

Note:

Rare Whitebeam (Sorbus) trees to be removed or coppiced.

Code	Name
EMI	S.eminens
BRI	S.bristoliensis
AVO	S.avonensis

Rev	By	Chkd	Apprvd	Date	Description
ES-A	EJ	CW	CF	04/10/2019	First draft

Client

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 1 Tree Management (Sheet 7 of 7) *APFP Regulation 5(2)(a)*

Drawn By:	Elijah Jeary	Date: 04/10/2019
Checked By:	Clare Williams	Date: 04/10/2019
Approved By:	Carolyn Francis	Date: 04/10/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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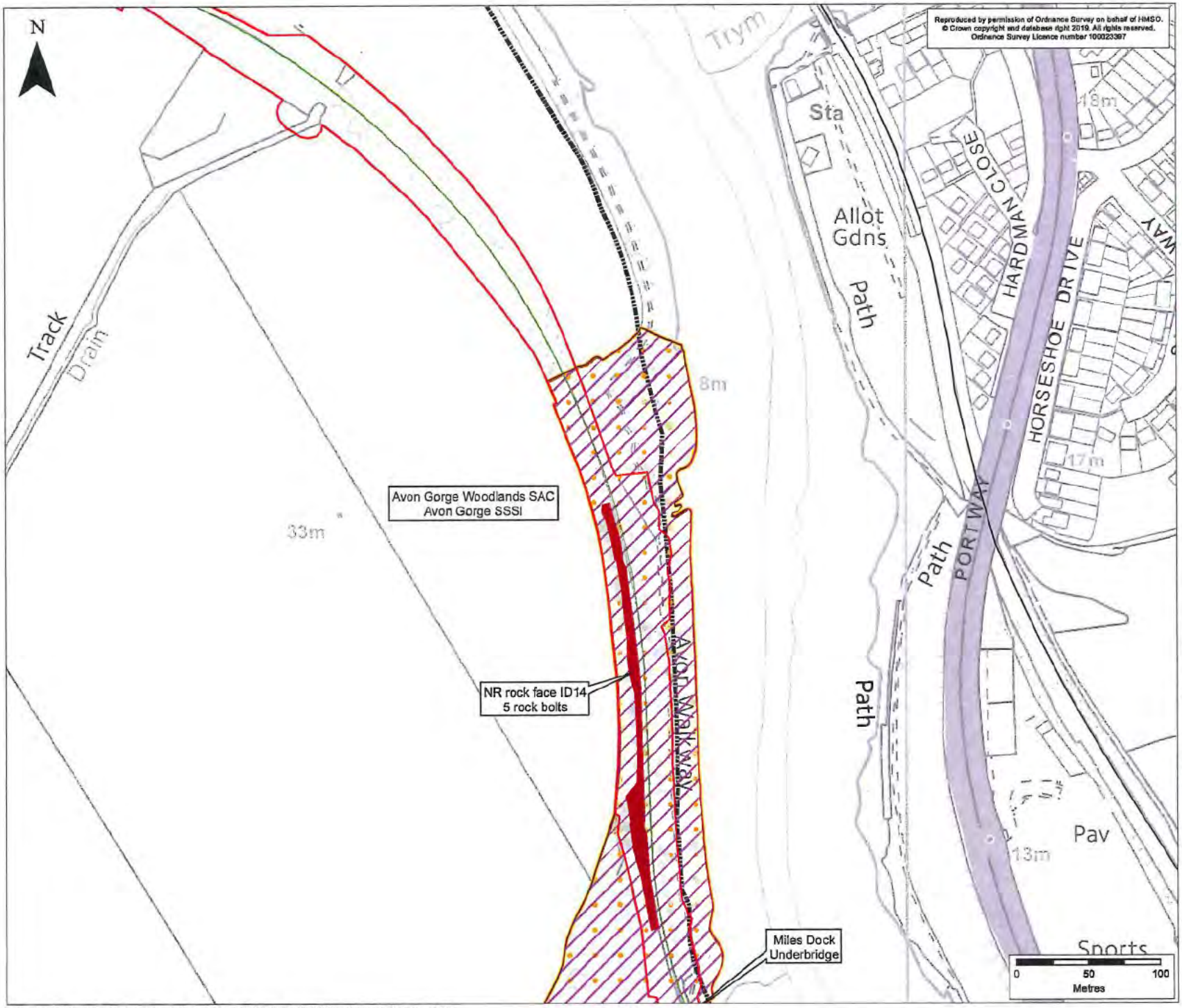

KEY

- Order Limits
- Portishead Branch Line
- The Associated Development Works
- Existing Railway
- Existing Railway Line
- Bristol City Council Boundary
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Approv	Date	Description
ES-A	MPC	CW	CF	08/11/2019	Fink draft

Client

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 1 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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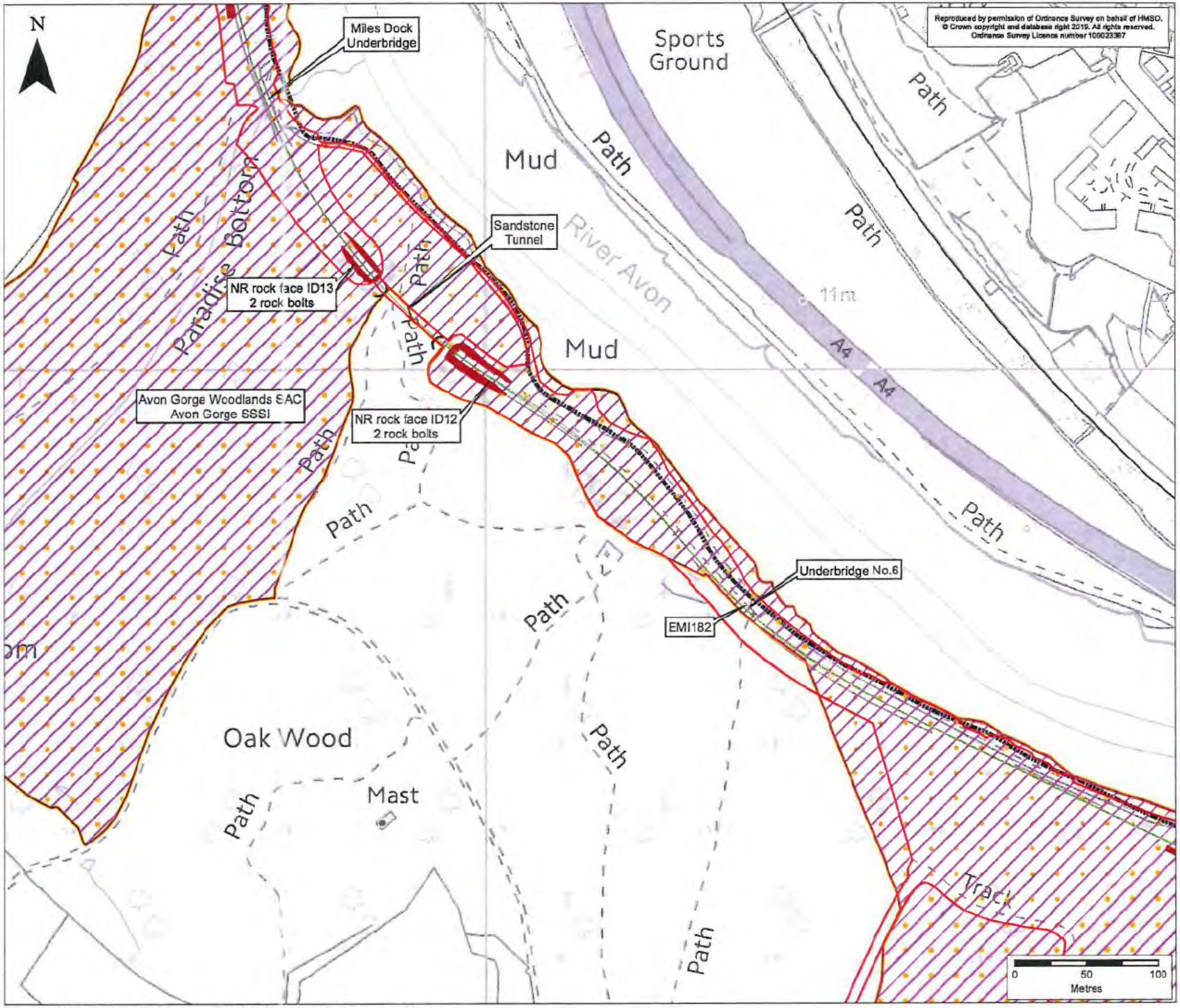

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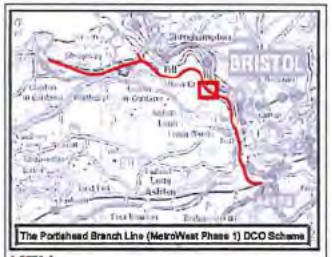

KEY

- Order Limits
- **Portishead Branch Line**
- The Associated Development Works
- **Existing Railway**
- Existing Railway Line
- Railway Tunnel
- Bristol City Council Boundary
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

Client: travelwest

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 2 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A
Revision: ES-A
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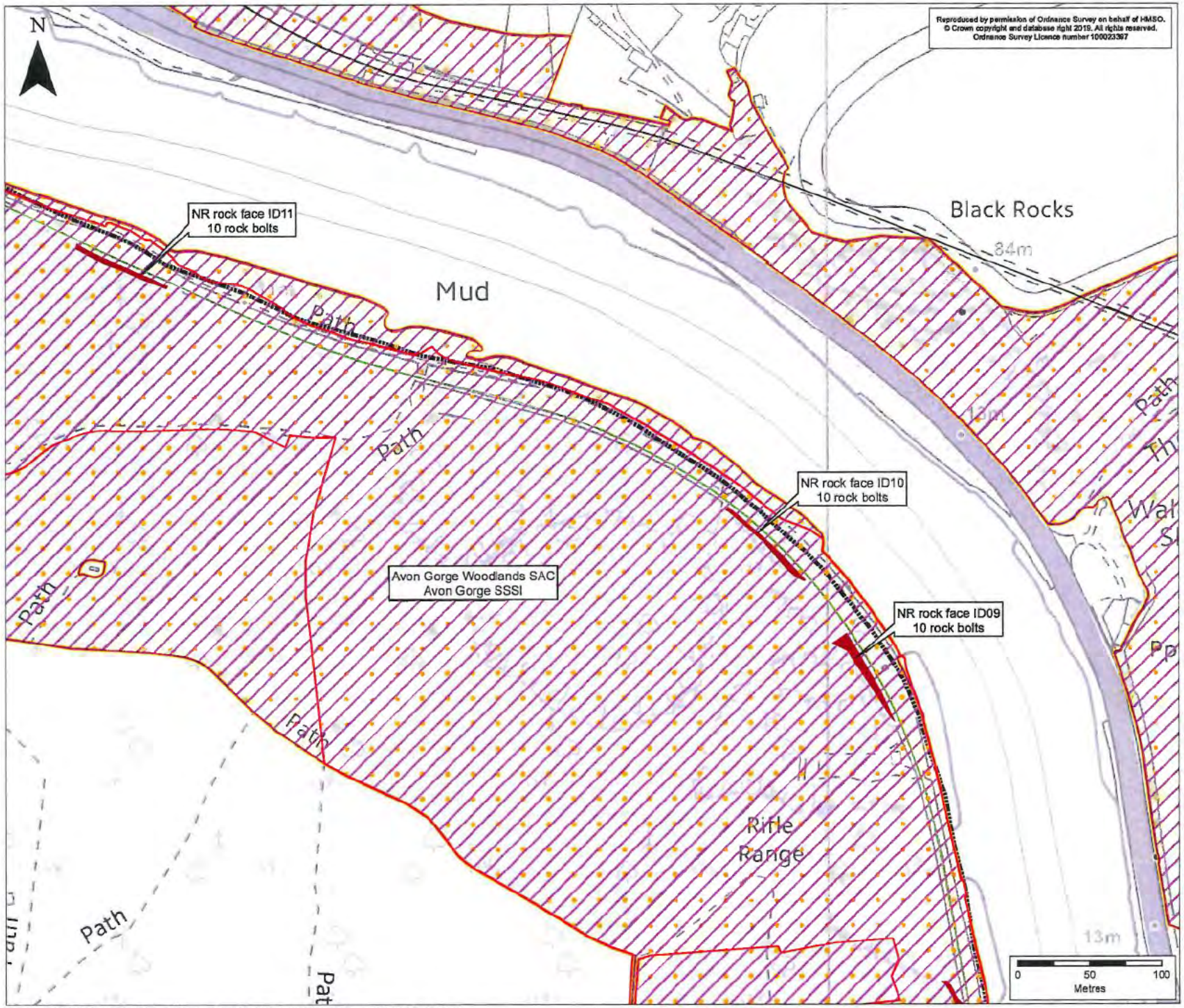

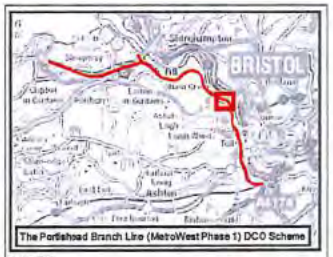

The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Order Limits
- **Portishead Branch Line**
- The Associated Development Works
- **Existing Railway**
- Existing Railway Line
- Bristol City Council Boundary
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 3 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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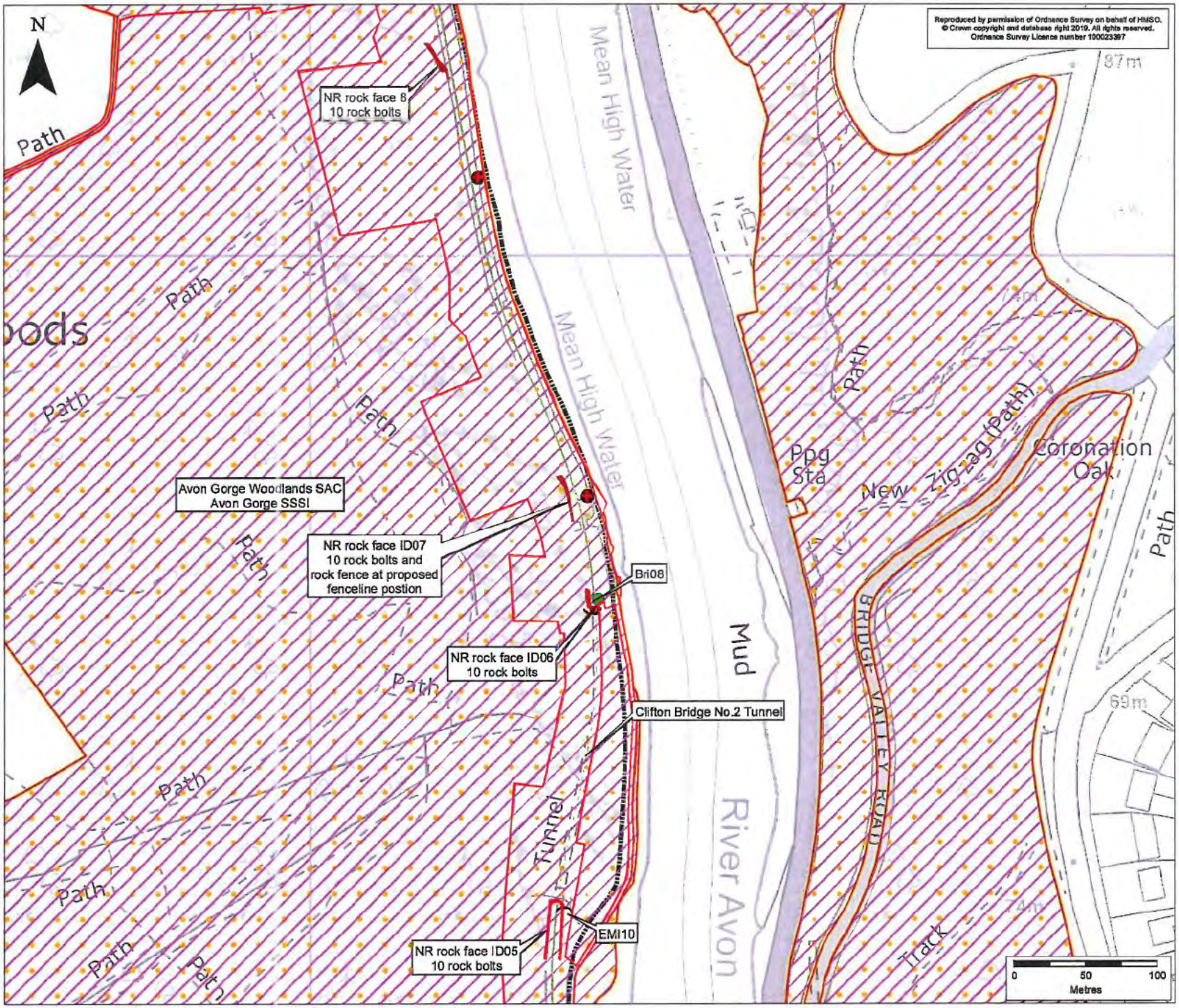

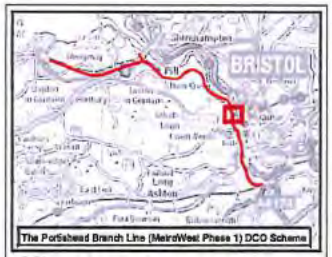

KEY

- Order Limits
- **Portishead Branch Line**
- The Associated Development Works
- Section in Tunnel
- Railway Tunnel
- Bristol City Council Boundary
- Location of Bristol Rock Cress (Arabis Stricta)
- Local Rebuild Retaining Walls
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

Client: travelwest

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 4 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A
Revision: ES-A
Drawing Scale: 1:2,500 @ A3

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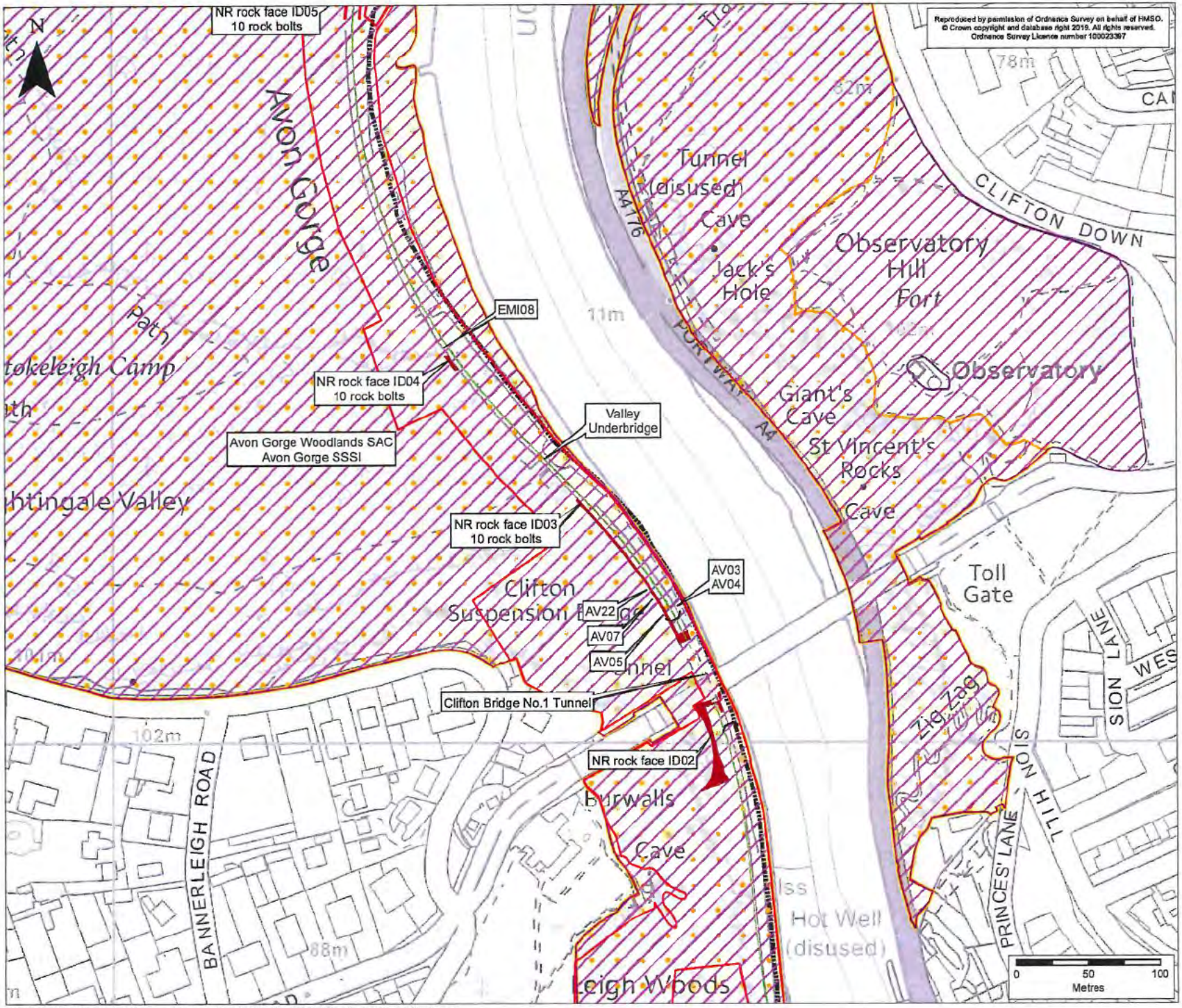

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The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

- Order Limits
- Portishead Branch Line
- The Associated Development Works
- Section in Tunnel
- Railway Tunnel
- Bristol City Council Boundary
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

Client

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 5 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A

Revision: ES-A

Drawing Scale: 1:2,500 @ A3

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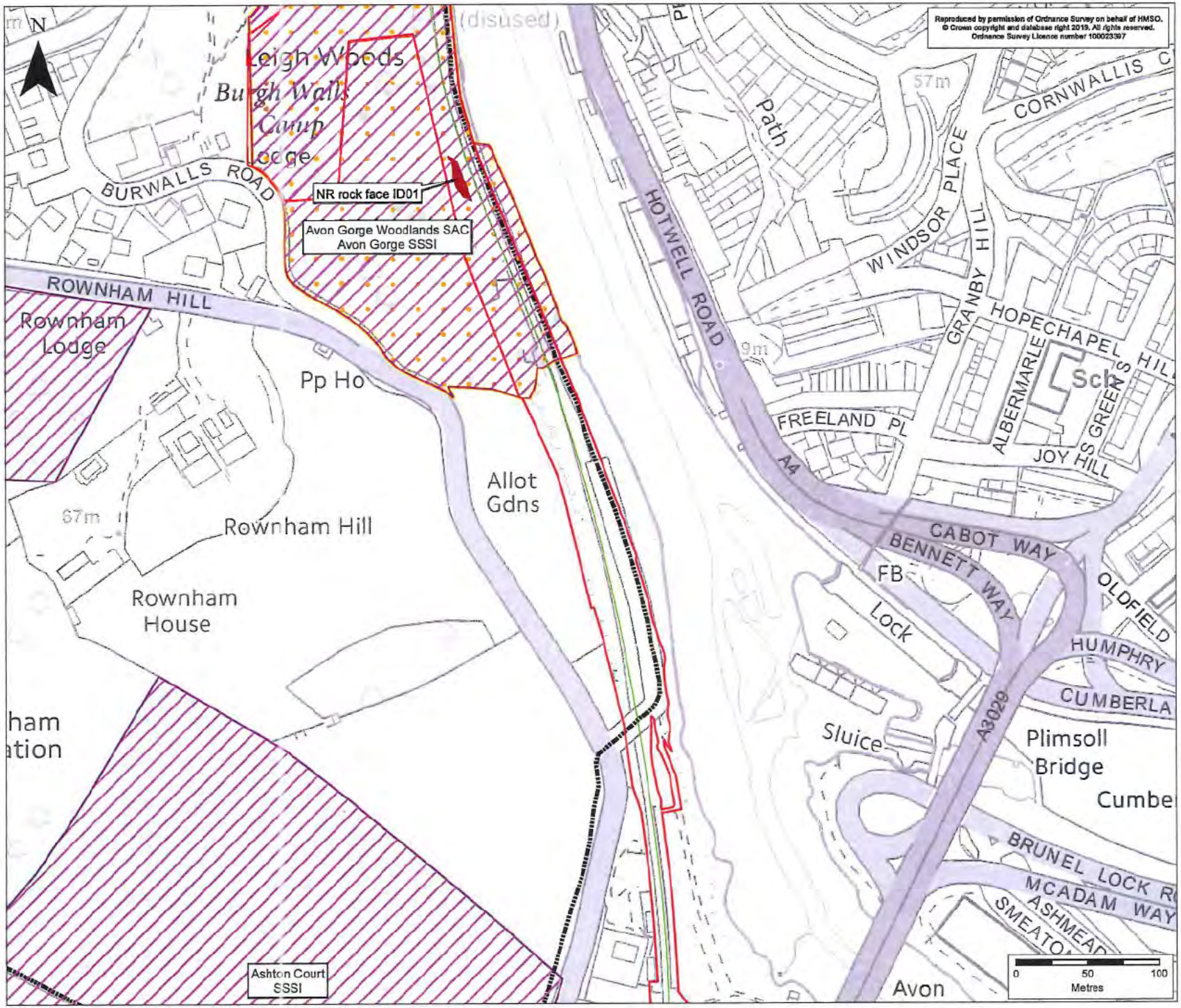

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KEY

- Order Limits
- Portishead Branch Line
- The Associated Development Works
- Bristol City Council Boundary
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Network Rail (NR) Rock Face Number and Potential Remedial Works

Rev	By	Chkd	Apprvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

Client: travelwest

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 2
Location of Network Rail Rock Faces
(Sheet 6 of 6)
APFP Regulation 5(2)(a)

Drawn By:	Martin Costello	Date: 08/11/2019
Checked By:	Clare Williams	Date: 08/11/2019
Approved By:	Carolyn Francis	Date: 08/11/2019

Drawing No.: 674946-004-001 - A
Revision: ES-A
Drawing Scale: 1:2,500 @ A3

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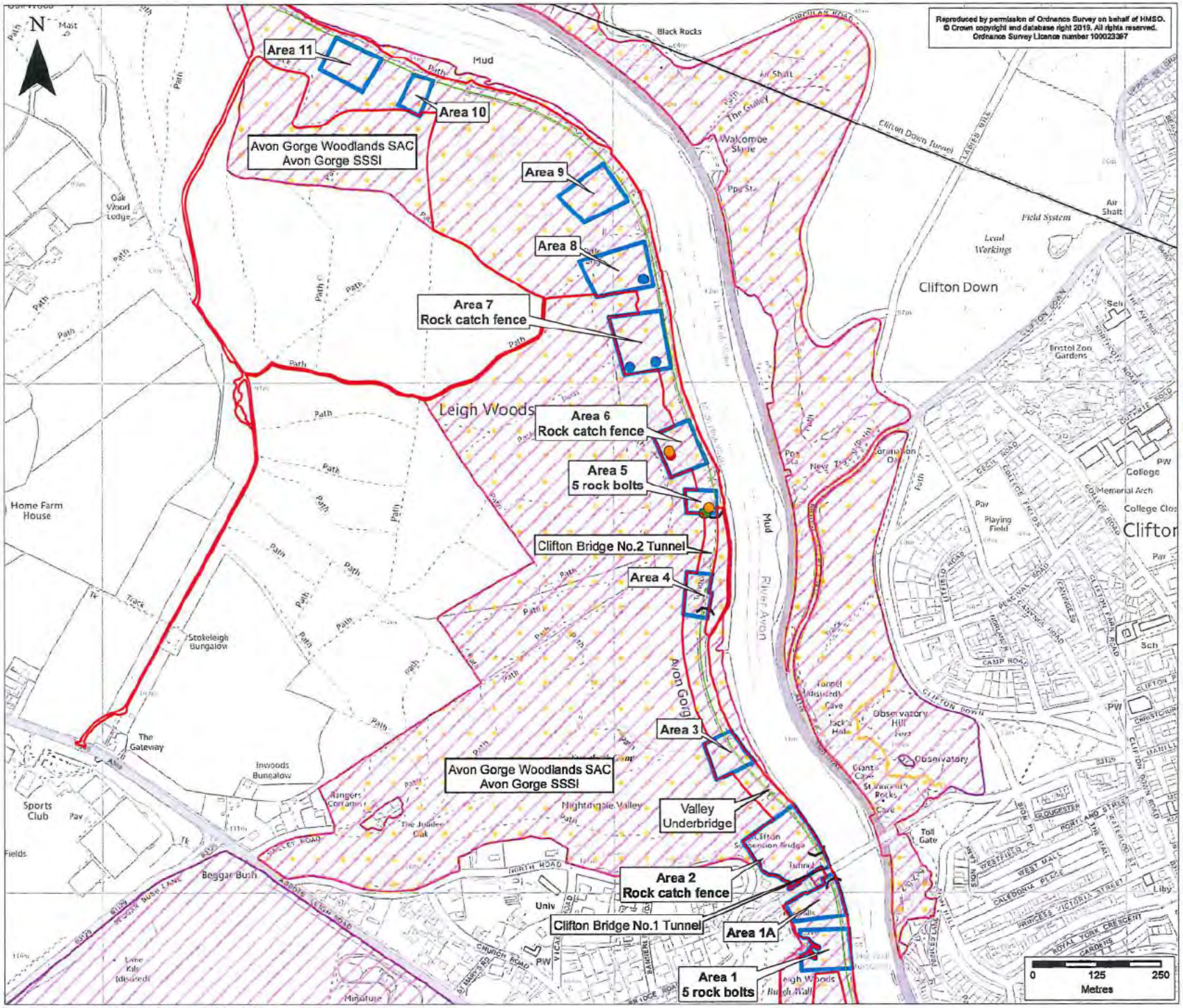

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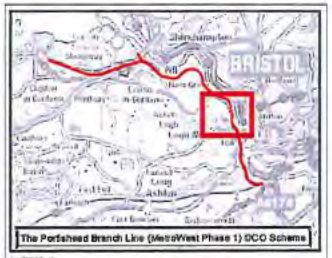

KEY

- Order Limits

Existing Railway

- Existing Railway Line
- Railway Tunnel

Portishead Branch Line

- The Associated Development
- Section in Tunnel

Ecological Features

- Bristol Rockcress (Arabis stricta)
- Bristol Whitebeam (Sorbus bristoliensis)
- Fingered Sedge (Carex digitata)
- Wilmott's Whitebeam (Sorbus wilmottiana)
- Special Area of Conservation
- Site of Special Scientific Interest (SSSI)
- Areas on third party land which may require geotechnical stabilisation works

Rev	By	Chkd	Approvd	Date	Description
ES-A	MPC	CW	CF	08/11/2019	First draft

Client: travelwest

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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Annex F Figure 3
Location of Third Party Rock Faces
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 08/11/2019
Checked By :	Clare Williams	Date: 08/11/2019
Approved By :	Carolyn Francis	Date: 08/11/2019

Drawing No. : 674946-004-001 - A
Revision: ES-A
Drawing Scale : 1:7,000 @ A3

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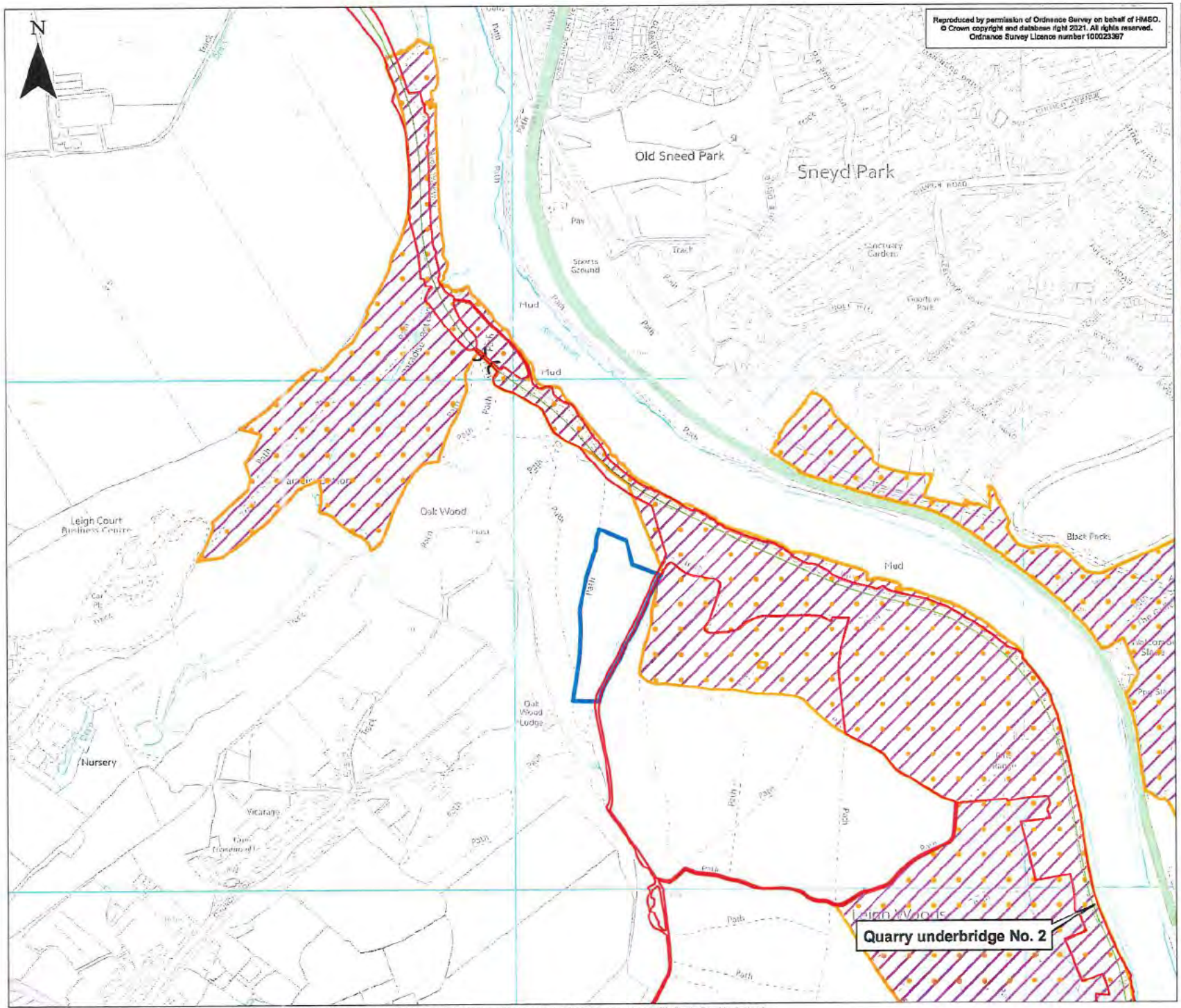

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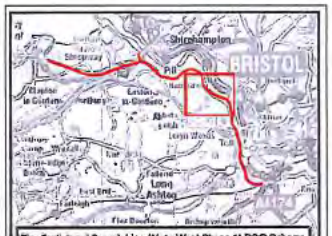

The Portishead Branch Line (MetroWest Phase 1) DCO Scheme

KEY

Order Limits

Portishead Branch Line

The Associated Development Works

Forestry Commission

Positive management area within Forestry Commission land

Environmental Constraints

Special Area of Conservation (SAC)

Site of Special Scientific Interest (SSSI)

0 200 400
Metres

Rev	By	Chkd	Apprvd	Date	Description
ES-B	MPC	CW	CF	04/03/2021	Revised Order Limits
ES-A	MPC	CW	CF	08/10/2019	First draft

Client

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Project : Portishead Branch Line (MetroWest Phase 1)

Drawing : Figure 4
Positive management area within Forestry Commission land
APFP Regulation 5(2)(a)

Drawn By :	Martin Costello	Date: 04/03/2021
Checked By :	Clare Williams	Date: 04/03/2021
Approved By :	Carolyn Francis	Date: 04/03/2021

Drawing No. : 674946 -012-001

Revision ES-B

Drawing Scale : 1:7,000 @ A3

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Annex G Management catalogue within NR land

Annex G Management catalogue within NR land

The 'gorge side' in this table refers to the rock face/woodland side of the railway line and the 'tow path side' refers to the side of the railway next to the tow path and River Avon.

Management to be read in conjunction with Annex F, Figure 1 Tree Management Plan.

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
122.22-122.23	G1 gorge side and tow path side	40 (20 x 2) - (both sides) x 8	320	Clifton Bridge No. 1 Tunnel southern portal rock face. Cotoneaster and holm oak on grassland habitat ivy on face, scrub at base. Remove non-native species. Light vegetation clearance required for detailed rock face geo-technical inspection (NR rock face ID02, Annex F, Figure 2).		SAC grassland
122.25-122.33	G2 gorge side	161 x 14.5	2334	Clifton Bridge No. 1 Tunnel northern portal and gorge side rock face. Two sides with whitebeam, including Avon whitebeam. Remove scrub and tree saplings except whitebeam. Re coppice on top of rock face and remove saplings except whitebeam. Light vegetation clearance required for detailed rock face geo-technical inspection (NR rock face ID03, Annex F, Figure 2).		Semi-natural ancient woodland
122.37.5-122.385	G3 gorge side.	15 x 13	195	Whitebeam on top of rock face, including Avon whitebeam. Some mature coppice.	Mature limes x 3 potential root stability.	Semi-natural

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
				Fell saplings around base of trees. Also large coppice on slope should be re-coppiced. Vegetation clearance required for detailed rock face geo-technical inspection (NR rock face ID04, Annex F, Figure 2).	Liaise with engineers.	ancient woodland
122.50.5-122.53	G4 – gorge side and tow path side	90 (45 x 2 – both sides) x 12	1080	Clifton Bridge No. 2 Tunnel southern portal rockface on 3 sides. Holm oak all round, mature and close to edge above rock face. Clear rock face of scrub saplings not whitebeam. Clear front 3m above tunnel entrance. Inspect holm oak, possibly remove 10-12 front trees in consultation with Engineer. Vegetation clearance required for detailed rock face geo-technical inspection (NR rock face ID05, Annex F, Figure 2).	Liaise with engineer regarding removal of holm oak	Semi-natural ancient woodland (gorge side) secondary (recent) woodland (tow path side)
123.12-123.14	G6 – gorge side	40 x 10	400	Cluster of whitebeams on and above rock face. Clear rock face scrub saplings leave whitebeam. Whitebeam are all semi mature and not health and safety risk. Remove group of young to semi mature holm oak above this, around whitebeam.		Semi-natural ancient woodland
123.14-123.15	G7 – gorge side	20 x 13	260	Whitebeam on top of rock face. Fell other species saplings around base of trees. Also large coppice on slope should be re coppiced. Mature limes x 3	Mature limes x 3 potential root stability. Assess works	Semi-natural ancient woodland

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
				potential root stability. Assess works required in liaison with Engineers.	required in liaison with Engineers	
123.15-123.17	G8 – gorge side	40 x 11	440	Clear rock face of scrub saplings not whitebeam. Coppice clear saplings above rock face. Vegetation clearance at the higher mileage required for detailed geo-technical inspection (NR rock face ID09, Annex F, Figure 2).	Inspect holm oak, possibly remove front trees approx. 10-12. Liaise with engineer.	Semi-natural ancient woodland
123.18.5-123.22	G9 – gorge side	70 x 9	630	Low rock face semi mature whitebeam scrub. Clear ivy and bramble saplings, leave whitebeam. Clear top edge of rock face. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID10, Annex F, Figure 2).		Secondary (recent) woodland
123.435-123.47	G10 – gorge side	70 x 17	1190	Low rock face with steep slope above rock face. Whitebeam at West end of rock face. Clear/coppice around whitebeam, leave whitebeam. Semi mature/mature lime above rock face. Liaise with engineers re stability and then inspect. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID11, Annex F, Figure 2).	Liaise with engineer regarding stability of lime tree and then inspect	Semi-natural ancient woodland

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
121.71-121.725	G12 – gorge side	30 x 8	240	1 whitebeam west end. Clear all vegetation around tree. Clear west lower rock face of vegetation except whitebeam. Mature multi stemmed lime on edge top of rock face along with other semi mature taller ash, liaise with Engineer re stability and possible removal.	Liaise with Engineer regarding stability and possible removal of mature lime and semi-mature ash.	Secondary (recent) woodland
123.02-123.04	G26 – gorge side	40 x 16	640	Light vegetation clearance required for detailed geo-technical inspection (NR rock face ID08, Annex F, Figure 2).		Semi-natural ancient woodland
122.66-122.68	G13 – gorge side	40 x 15	730	Cluster of whitebeam on rock face. Clear rock face of vegetation except whitebeam and leave mature lime to west. Main rock face - clear vegetation except whitebeam (one whitebeam in middle of rock face by track). Palisade fence in front. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID07, Annex F, Figure 2).		SAC grassland
122.625-122.64	G14 – gorge side	30 x 14	420	Clifton Bridge No. 2 Tunnel north portal. Several whitebeam mainly top of rock face. Clear rock face		SAC grassland

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
				except whitebeam. Holm oak and cotoneaster present and will be removed. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID06, Annex F, Figure 2).		
123.20-123.21	G16 – towpath side	20 x 10	200	Old common whitebeam coppice stool now 8 semi mature stems. Fell 2 sycamore to west and birch to east retain young holly and lime.		Secondary (recent) woodland
123.47-123.48	G17 – gorge side	20 x 2	40	Single whitebeam sapling. Crown lift lime branches over sapling. Remove other tree saplings within 1 m and all holm oak.		Semi-natural ancient woodland
123.53-123.635	G18 – tow path side	211 x 4	844	Narrow verge 1 m on tall retaining wall. Mainly young trees due to repeated clearance. Some more mature towards western end of G18. Whitebeam on edge and face of wall. Rock face - remove all vegetation except whitebeam and semi mature trees.		Secondary (recent) woodland
123.515-123.61	G19 – gorge side	191 x 2	382	Steep 5-6 m slope from track to 45 degree slope with forestry plantation trees. Number of large sweet chestnut coppiced trees on edge of the two slopes. Whitebeam towards top of slope. Clear slope to 4-5 m from track. Crown lift above whitebeam. Sweet chestnut is epicormic - remove. Leave rowan trees.		Semi-natural ancient woodland

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
123.69-123.71	G20 – gorge side	40 x 24	960	Steep rock face several whitebeam on top edge several on rock face. Clear rock face except whitebeam. Clear around whitebeam on rock face edge. Further inspection of trees on top of rock face.		Semi-natural ancient woodland
123.69-123.72	G21 – tow path side	60 x 22	1320	Rounded bank and steep face with semi mature oak, lime, saplings and grass. Some larger whitebeam. Clear semi mature saplings around whitebeam and crown lift above.		Semi-natural ancient woodland
123.72-123.78	G22 – tow path side	121 x 12	1452	Rock face into Sandstone Tunnel south portal. Clear vegetation except whitebeam and including rhododendron. Top edge of portal - 3 horse chestnut coppice stools. Remove front stems on each coppice stool. Last tree single oak coppice stem - fell. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID12, Annex F, Figure 2).		Semi-natural ancient woodland
123.72-123.78	G23 – gorge side	121 x 9	1089	Rock face into Sandstone Tunnel south portal. Clear rock face including rhododendron. Along top edge approximately 6-7 stems of birch, oak, tall etiolated - fell 12-24 months. One large and one semi- mature	Liaise with engineer re stability and possible further removal of	Semi-natural ancient woodland

Management schedule

Chainage	Site Plan Reference Annex F Figure 1	Length x width (approx.) (m)	Area (m^2)	Comment & Works	Further arboricultural survey	Existing Habitat type
				horse chestnut coppice - remove front stem. Liaise with engineers. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID12, Annex F, Figure 2).	other stems of horse chestnut coppice trees	
124.01-124.03	G24 – tow path side	40 x 9	360	Rock face into Sandstone Tunnel north portal. Generic clearance of rock face to top edge. Reduce any overhangs and further inspection of base of trees along top edge. Vegetation clearance required for detailed geo-technical inspection (NR rock face ID13, Annex F, Figure 2).	Further inspection of base of trees along top edge	Semi-natural ancient woodland
124.01-124.03	G25 – gorge side	40 x 11	440	Rock face into Sandstone Tunnel north portal. Generic clearance of rock face to top edge. Reduce any overhangs and further inspection of base of trees along edge Vegetation clearance required for detailed geo-technical inspection (NR rock face ID13, Annex F, Figure 2).	Further inspection of base of trees along top edge	Semi-natural ancient woodland
Total area			15,966			

Annex H
Rare whitebeam mitigation

SECTION 1

Introduction

1.1.1. This Annex sets out proposals for the planting of rare whitebeam species to replace those predicted to be lost as a result of the DCO Scheme. It describes the selection of appropriate planting sites, the recommendations for successful establishment of rare whitebeam trees and plans for monitoring. It also provides evidence of other successful whitebeam establishment projects. This Annex was updated in July 2020 as a result of discussions with Natural England, the Forestry Commission and Network Rail in relation to the selection of sites for planting with rare whitebeams and subsequent site evaluations and assessments. This has resulted in the development of two potential, alternative 'packages' for whitebeam planting, which are outlined below. The 2020 update of Annex H of the Avon Gorge Vegetation Management Plan (AGVMP) Ver. 02 superseded the version submitted as part of the DCO application. This current version (Ver. 03, March 2021) has been prepared to update on the whitebeam propagation programme.

1.1.2. This Annex has been compiled from four reports. Three reports were written by national rare whitebeam experts, Dr Tim Rich and Libby Houston, who are whitebeam specialists having studied them for over 20 years and who authored the current monograph on *Sorbus* for the Botanical Society of Britain and Ireland. The first report (dated 4 July 2017) was written after the experts surveyed four possible planting sites along the railway corridor on 18 May 2017. The second report (dated 18 June 2019) was written after three sites were further surveyed on 18 June 2019 following comments from Natural England (NE). The third report (dated July 2020) was written after another site was surveyed on 29 June 2020. The fourth report was written by Dr Tim Rich (dated August 2019) to provide a review of evidence of replanting whitebeams in the wild. The site in Leigh Woods detailed in this latter report was surveyed by Dr Rich and Ms Libby Houston on 8 October 2019 to provide information on the current condition of the planted whitebeams.

1.1.3. The DCO Scheme involves reopening the railway line between Bristol and Portishead to passenger trains which necessitates undertaking some rail improvement works in the Avon Gorge Site of Special Scientific Interest ("SSSI")/Avon Gorge Woodlands Special Area of Conservation ("SAC"). The section of the line currently carries freight only, and the higher safety standards for passenger trains requires some improvements which will result in the loss of some of the rare whitebeam trees along the railway in the Avon Gorge for improved visibility and safety.

1.1.4. The rare whitebeams are a designated feature of the SAC, and five species are found nowhere else in the world. Four of these are among the six species of rare whitebeam species that would be affected (Table 1).

Table 1: Whitebeam species affected by the DCO Scheme

Species	IUCN conservation status	Number of trees potentially affected
Avon whitebeam S. *avonensis*	Critically Endangered	12
Bristol whitebeam *S. bristoliensis*	Endangered	2
Round-leaved whitebeam *S. eminens*	Vulnerable	5
Grey-leaved whitebeam *S. porrigentiformis*	Nationally scarce	1
Leigh Woods whitebeam *S. leighensis*	Endangered	6
Wilmott's whitebeam *S. wilmottiana*	Endangered	1
Total		27

1.1.5. The key impacts are on the Avon whitebeam where 12 of the total population of c. 42 trees would be affected (29% of world population).

1.1.6. Where retention of these rare whitebeams is not acceptable for rail safety, it is proposed to replant new trees to replace those lost on a 2:1 basis. The aim of this report is to propose where these whitebeam trees can be planted and set out a monitoring programme. The report also provides evidence of whitebeam planting projects in Leigh Woods (Avon Gorge), Penmoelallt, Powys, North Devon and Arran.

1.1.7. A programme of seed collection and propagation has been put in place to provide sufficient saplings to compensate those lost. Collecting seed across a number of years and using different locations and methods for propagation aims to minimise the risks of failing to achieve sufficient germination and establishment of sufficient saplings of the rare species, some of which are inherently difficult to propagate. The fruit collections have been undertaken by rare whitebeam experts Tim Rich and Libby Houston.

1.1.8. The first collection was on 20 October 2016, when seed of four of the rare whitebeam species (*Sorbus avonensis, S. bristoliensis, S. eminens* and *S. leighensis*) was collected from NR land in the Avon Gorge with consent from NE. These have been grown on at Paignton Zoological Gardens. Table 2 shows the numbers of seeds sown in March 2017 (Palmer 2017) and the number of tree saplings that have been grown onto 12.5 Litre (L) pots (Paignton Zoological Gardens, Curator of Plants and Gardens, 2019 pers. comm.). The saplings are currently in 12.5l air pots and are at an optimal stage for planting in their final planting location (Annex I).

Table 2: Whitebeam seed collection and propagation from the 2016 seed collection

Total seed sown	Number of seeds sown 2017	Saplings in 12.5 L pots 2020
Avon whitebeam *S. avonensis*	117	5
Bristol whitebeam *S. bristoliensis*	230	7
Leigh Woods whitebeam *S. leighensis*	238	30
Round-leaved whitebeam *S. eminens*	204	30

1.1.9. A second collection of fruit from Avon whitebeam, Bristol whitebeam, grey-leaved whitebeam and Wilmott's whitebeam was undertaken on 24th September 2018. These have been grown on at Paignton Zoological Gardens where seeds were sown in December 2018 (Palmer 2018) and 2 Wilmott's whitebeam and 1 grey-leaved whitebeam have germinated (Paignton Zoological Gardens, Curator of Plants and Gardens, 2019 pers. comm.). In July 2020, these plants were reported to be between 5 and 40 cm in height, with one of the two Wilmott's whitebeam very weak and not growing as expected.

1.1.10. A third fruit collection was undertaken of Avon whitebeam, Bristol whitebeam, Leigh Woods whitebeam, round-leaved whitebeam, grey-leaved whitebeam and Wilmott's whitebeam on 23 October 2019. Seeds of all species and cuttings of Avon whitebeam were grown on at Paignton Zoological Gardens where 28 Leigh Woods seedlings were obtained but nothing from the other species or cuttings (Mortimer, 2020). Seeds were also given to Bristol University Botanic Gardens and Forestry Commission (FC), with germination results in 2020 shown in Table 3 below. These younger seedlings and small saplings are not included within the planting proposals detailed in this Annex, but will be considered for future planting and for replacement of any trees that fail to establish.

Table 3: Whitebeam germination from October 2019 seed collection

Whitebeam species	Paignton Zoological Gardens	Bristol University Botanic Gardens	Forestry Commission (Cheviot Trees)
Avon whitebeam *S. avonensis*	0	3 (2 alive in February 2021)	0
Bristol whitebeam *S. bristoliensis*	0	0	8
Leigh Woods whitebeam *S. leighensis*	28	13	2

Table 3: Whitebeam germination from October 2019 seed collection

Whitebeam species	Paignton Zoological Gardens	Bristol University Botanic Gardens	Forestry Commission (Cheviot Trees)
Round-leaved whitebeam *S. eminens*	0	3 (2 alive in February 2021)	2
Wilmott's whitebeam *S. wilmottiana*	0	11	3
Grey-leaved whitebeam *S. porrigentiformis*	0	12	25

1.1.11. In 2020, fruits were collected from common whitebeam *Sorbus aria* as well as Avon whitebeam, Bristol whitebeam and round-leaved whitebeam because common whitebeam is included in the planting proposals for Package 2 as a pollination resource for the rare species. Collections with good fruits were made for all four species, though the numbers of Avon whitebeams fruits were relatively low as only one accessible tree was in fruit in 2020. Fruits were sent to Bristol University Botanic Gardens and Ness Botanic Gardens. Germination from this seed collection is expected in spring 2021.

SECTION 2

Selection of Planting Sites

2.1. Approach to site identification

2.1.1. Replanting should be carried out where it is safe, practical, minimises impacts on other nature conservation interest and is suitable for whitebeams. The criteria considered for selection of sites for replanting were as follows:

- On NR land, or FC land[7].
- Sites where whitebeams will not affect safety on the railway in the future (e.g. on the embankments below the railway).
- Sites where competing vegetation can be managed safely in the short term until the trees are established.
- Sites where whitebeams can be monitored safely.
- Areas where there is no other significant nature conservation interest which may be affected.

[7] Following discussion with NE and FC in 2019 and 2020, the search area for suitable sites for whitebeam planting was extended to include FC land.

- Sites where the whitebeams will get enough light and will not be shaded out by other trees (at least in short to medium term).
- Areas where non-native invasive species are present and may be removed, creating places where whitebeams can be planted.
- Sites where soil conditions are suitable. These soils are usually calcareous soils over limestone or limestone rubble on embankments for all species, or some sandstone-derived more acidic soils are suitable for Bristol whitebeam, common whitebeam *Sorbus aria* and round-leaved whitebeam.
- Close to common whitebeam (*S. aria*) populations so pseudogamous pollination can be facilitated.
- Close to the existing whitebeams populations so they can contribute to metapopulation.

2.1.2. After a review of possible planting sites along the railway corridor, four sites were selected and assessed on 18 May 2017 by rare whitebeam experts Tim Rich and Libby Houston. Following further discussion with NR, two of these sites were confirmed as being suitable (Nightingale Valley and Miles Dock; Sites 1 and 2 on Figure 1).

2.1.3. In 2018 an additional site above Clifton Bridge No. 2 Tunnel (southern end) on NR owned land was assessed by the rare whitebeam experts and considered suitable for planting Avon whitebeam and Leigh Woods whitebeam. Planting at this site (Site 3 on Figure 1) has been approved by NR.

2.1.4. At the request of Natural England ("NE"), additional surveys were undertaken by rare whitebeam experts and an arboriculturalist in June 2019 on the three proposed planting sites on NR land to prepare the further information regarding proposed whitebeam planting sites. This was because NE expressed concern that planting out the whitebeams could have an adverse effect on the qualifying features of the Avon Gorge Woodlands SAC and asked for further information about the sites. In addition NE specifically requested that, as far as possible, tree species which are qualifying features of the SAC/SSSI should be retained, in particular existing whitebeams, small-leaved lime and any other ancient woodland indicator species. There was also some uncertainty as to whether the habitats of the planting sites were ancient woodland or secondary woodland, or were on made ground or natural woodland floor.

2.1.5. Further studies were therefore undertaken relating to the ecology of the three whitebeam planting sites on NR land in the Avon Gorge. These entailed the following:

- Detailed survey of existing vegetation including % dominance (cover as estimated by eye) of each species. Ash dieback disease is rife within the Avon Gorge, affecting both saplings and some larger tees; this was present at each site but is not noted separately.
- Detailed survey of age, height and stem diameter of small leaved lime, whitebeam and other ancient woodland indicator species. Trunk size was measured with a forestry tape and results were given in diameter at breast height ("dbh").

- The current habitat type e.g. semi-natural ancient woodland (particularly *Tilio-Acerion* woodland), secondary (recent) woodland, grassland (including type) or scrub. The Ancient Woodland Inventory (MagicMap, accessed 18 June 2019) was consulted for ancient woodland status.
- Planting density, distances apart of planted rare whitebeam and % of total area of each site required for planting. Management required for successful planting and long-term maturity of rare whitebeam (including consideration of shading out by overtopping).
- Investigation of the surface substrate of the embankment between the tow path and the freight line at the Nightingale Valley Bridge and Miles Dock planting sites by hand digging 1-3 pits at each site at a depth that would be dug for planting the tree saplings and recording the type of substrate present such as ballast, rubble, rock or earth and confirming whether substrate conditions were suitable for tree planting and whether sites were on natural landforms or made ground.
- Further assessment of the grassland site above Clifton Bridge No. 2 Tunnel (southern end). NE expressed concern that the grassland is SAC grassland or species-rich grassland and should be retained rather than planted with tree saplings. Consideration of removing more scrub of less ecological value should be made to determine whether this is more appropriate. The sites are within the SAC/SSSI and consent will be needed from Natural England to manage existing secondary (recent) woodland. The sites may support zoological nature conservation interests which has not been investigated.

2.1.6. At a site visit with NE in February 2020, the Applicant's justification for describing these embankment sites as secondary (recent) woodland was given: based on the size of the trees, that they are on made ground, and that there is photographic evidence that the embankments were largely clear of trees in the mid 20th century (as evidenced in a photograph of this area dating from 1937[8]). The Red Oak Plantation Site by Sandstone Tunnel (on FC land, Site 4 on Figure 1) was also visited and it was agreed that further assessment by the rare whitebeam experts for planting Bristol whitebeam and round-leaved whitebeam would be undertaken.

2.2. Outline of the Proposed Planting Packages

2.2.1. The original proposals for whitebeam planting were described in the previous version of Annex H of the AGVMP Ver. 01 (DCO Document Reference 8.12), which was submitted as part of the DCO application. This version of Annex H reports on changes made to these proposals, following meetings and a site visit with NE on 20 February 2020, consultations with the Forestry Commission and further site evaluations and assessments.

2.2.2. The comments made by NE, which have influenced the modifications to the proposals, are as follows.

[8] www.gettyimages.co.uk/photos/avon-gorge-1937?phrase=avon%20gorge%201937&sort=mostpopular#license www.gettyimages.co.uk (accessed 20.02.2020).

- The presence of small-leaved lime *Tilia cordata* and Avon whitebeam on the south-eastern side of the bridge at Nightingale Valley (Site 1a). Small-leaved lime is a key component of Tilio-Acerion woodland, which is a qualifying feature of Avon Gorge Woodlands SAC. However, the embankment to the north of Valley Bridge (Site 1b) is more open, obviously on made ground with lots of sycamore and no whitebeam. The made ground grades into ancient woodland.
- The density of ash *Fraxinus excelsior* and the presence of small amounts of species such as small-leaved lime and field maple *Acer campestre* at Miles Dock (Site 2) suggest a correspondence with the National Vegetation Classification (NVC) of W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. Although this is secondary (recent) woodland that has developed on the railway embankment, the vegetation composition corresponds with *Tilio-Acerion* woodland.
- The presence of calcareous grassland at Clifton Bridge No. 2 Tunnel (Site 3), which corresponds with the qualifying *Festuco-Brometalia* grassland feature of the SAC. NE has suggested that grassland should be retained and that some of the existing scrub and non-native species at this site should be cleared for whitebeam planting.
- A suggestion to look beyond NR land for suitable sites, hence the incorporation of the red oak plantation site in FC land (Site 4 on Figure 1).

2.2.3. As a result of these discussions, the planting proposals are presented as two, alternative packages, with the first package comprising the original planting sites detailed in Annex H of the DCO submission (AGVMP Ver. 01 DCO Document Reference 8.12), but with minor modifications to Site 3, and the second package adding the new planting site on FC land, but removing the sites which raised concerns with NE. Package 2 has been proposed in response to NE concerns over some aspects of Package 1 and hence is the preferred option. In refining Package 1, the Applicant used detailed survey data to identify the trees that contribute to the qualifying *Tilio-Acerion* woodland and that will be retained. Therefore, with careful site preparation to facilitate the success of whitebeam establishment, the introduction of whitebeam to these areas would ultimately improve the quality of existing *Tilio-Acerion* woodland. Table 4 outlines the two packages.

Table 4: Summary of the two planting packages

	Package 1	Package 2
Nightingale Valley (Site 1a)	✓	×
Nightingale Valley (Site 1b)	✓	✓
Miles Dock (Site 2)	✓	×
Clifton Bridge No. 2 Tunnel (Site 3)	✓ (with modifications to the original proposals)	✓ (with modifications to the original proposals)

Table 4: Summary of the two planting packages

	Package 1	Package 2
Red Oak Plantation (FC, Site 4)	×	✓

2.3. Ancient woodland status

2.3.1. Figure 1 shows the Ancient Woodland Inventory for Leigh Woods; none of the proposed planting sites are shown as Ancient Woodland in the inventory (NB the woodland west of the railway at Mile Dock North (Site 2) is ancient woodland and the woodland south of the railway at Sandstone Tunnel (Site 4) are ancient woodland but are not within the proposed planting sites).

2.3.2. The Portishead Branch Line was closed to passengers in 1964 and to all traffic in 1981. Historic photographs show that many habitats were much more open than today, especially the quarries, railway sides and the River Avon Tow Path. Photographs of the Avon Gorge near Clifton Bridge No. 2 Tunnel taken in 1937 show the land between the railway and the River Avon Tow Path as predominantly clear of trees. Following closure of the railway and cessation of quarrying activities and lack of vegetation maintenance, the open, rocky cuttings through the Avon Gorge would have provided ideal colonisation sites for many trees and shrubs, including whitebeams, and much is now tall secondary (recent) woodland.

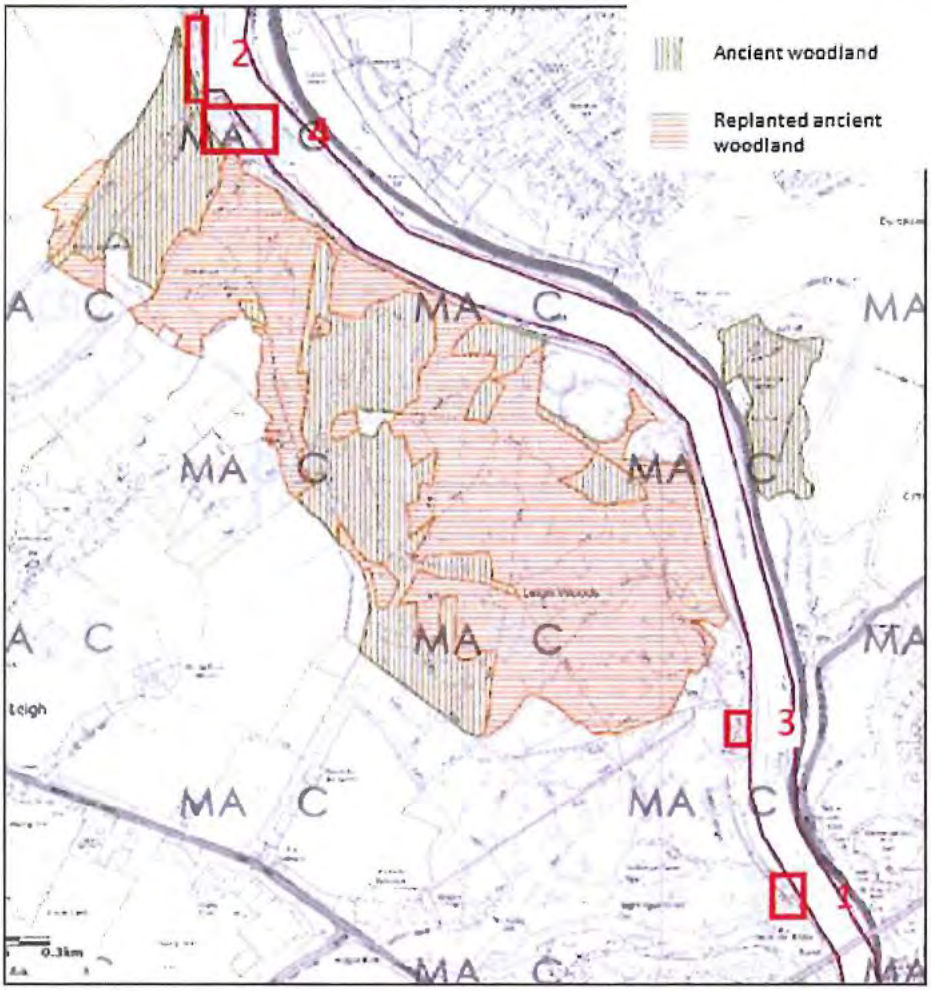

Figure 1. Map showing Ancient Woodland Inventory for Leigh Woods (accessed 18 June 2019) and the four planting sites.

SECTION 3

Package One Planting Proposals

3.1. Introduction

3.1.1. The sites proposed for planting that comprise Package 1 are those described in Annex H of the AGVMP Ver. 01 submitted as part of the DCO application (DCO Document Reference 8.12). The only changes are minor modifications to the planting proposals at Clifton Bridge No. 2 Tunnel (Site 3). In addition, some clarifications have been made to the text after comments from NE in relation to removal of existing trees and treatment of stumps, control of ivy and management of regeneration.

3.1.2. The proposals for site selection and preparation for whitebeam planting have evolved over time, in discussion with NE. A key change has been from the initial proposals for complete site clearance in advance of whitebeam planting to less intrusive site preparation, informed by detailed survey of the planting sites and identification of individual trees to be retained. This is in recognition of the existing value of these areas of *Tilo-Acerion* woodland and the aim is to retain as much of the existing interest as possible, whilst seeking to maximise the success of whitebeam planting and establishment. The site preparation also involves removal of any existing non-native species.

3.1.3. Package 1 includes planting at Nightingale Valley Site 1a, Nightingale Valley Site 1b, Miles Dock (Site 2) and Clifton Bridge No. 2 Tunnel (Site 3). The numbers of trees to be planted are summarised in Table 5.

Table 5. Number of trees planted at each site for Package 1

Package 1	Number affected by the DCO Scheme	Planting Site 1a	Planting Site 1b	Planting Site 2	Planting Site 3	Total planting
Avon whitebeam *S. avonensis*	12	3			2	5
Bristol whitebeam *S. bristoliensis*	2	3	4			7
Round-leaved whitebeam *S. eminens*	5			26		26
Grey-leaved whitebeam *S. porrigentiformis*	1				1	1
Leigh Woods whitebeam *S. leighensis*	6	2	11			13

Package 1	Number affected by the DCO Scheme	Planting Site 1a	Planting Site 1b	Planting Site 2	Planting Site 3	Total planting
Wilmott's whitebeam *S. wilmottiana*	1				2	2
Total	**27**	**8**	**15**	**26**	**5**	**54**

3.1.4. Trees affected by removal or coppicing are to be replaced by planting two trees for each tree lost. The number of individuals of each species replanted is determined by those grown from seed available at this stage and suitability for planting at the different sites. The number and species planted will be reviewed if more saplings are available prior to planting, especially for Avon whitebeam, which is predicted to have the greatest impact as a result of the DCO Scheme (12 trees are predicted to be removed or coppiced).

3.2. Planting site 1: Nightingale Valley embankments

3.2.1. The embankments between the railway and the River Avon Tow Path either side of the Nightingale Valley Bridge are potential Avon whitebeam planting sites which are close to the existing Avon whitebeam population on NR land. The proposed sites and planting plans are shown in Figure 2. Existing secondary (recent) woodland will need to be managed to reduce competition until rare whitebeam trees have established. The areas are adjacent to areas of National Trust land in Nightingale Valley bottom which have been cleared for woodland pasture in recent years. Both embankments will be easy and safe to manage with direct access. Some tall woody vegetation between the tow path and River Avon may also need management to reduce shading.

3.2.2. Site 1a is on the east-facing embankment between the freight line and River Avon Tow Path at Nightingale Valley, south of Valley Bridge (Figure 2). The site covers 350 m^2 south-east of Valley Bridge (35 m long and 10 m wide). The lower side is bounded by a wall c. 1.5 m tall and the upper side is fenced from the railway. The site is on made ground.

3.2.3. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary (recent) woodland which has developed on the railway embankment. Many trees show evidence of coppicing in the past, presumably from railway vegetation management. Holm oak *Quercus ilex*, which is a non-native species, is present in the shrub layer.

△ TREE - PROPOSED

O TREE - EXISTING, TO BE RETAINED

⊕ SOIL PITS

T TILIA CORDATA

SA SORBUS AVONENSIS

U ULMUS GLABRA

A ACER CAMPESTRE

AW AVON WHITEBEAM

B BRISTOL WHITEBEAM

L LEIGH WOODS WHITEBEAM

— PERMANENT LAND TAKE

1. THIS DRAWING IS NOT FOR CONSTRUCTION AND IS FOR A HIGH LEVEL PROPOSAL ONLY.
2. THIS DRAWING HAS NOT BEEN APPROVED BY NSDC, ALL FUTURE DESIGN WORK TO BE UNDERTAKEN WITH NSC INPUT.
3. THE EXACT POSITION OF THE PLANTED TREES WILL BE DICTATED BY GROUND CONDITIONS AND OBSTACLES.

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

Rev	By	Chkd	Apprvd	Date	Description
1-5 B	SJ	RS	CF	23/7/2020	For Issue

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Project
PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing
FIGURE 2
LOCATION OF PLANTING SITE 1 AT NIGHTINGALE VALLEY WITH PROPOSED PLANTING PLAN
(PACKAGE 1 - SITES 1A AND 1B)
APFP REGULATION 5(2)(a)

Drawn by: SJ	Date: 30/07/2019
Checked by: RS	Date: 23/07/2020
Approved by: CF	Date: 23/07/2020
Drawing No. 467470.BQ.04.20-200-A	Revision ES-B

Drawing Scale: 1:250 @ A1

Vegetation on SE side of Valley Bridge (site 1a)

3.2.4. The woodland canopy in Site 1a is 10-25 m tall, with 98% cover. Site 1a vegetation composition:

- *Acer pseudoplatanus* 67%
- *Betula pendula* 2%
- *Corylus avellana* 5%
- *Fraxinus excelsior* 10%
- *Quercus robur* 1%
- *Tilia cordata* 15%

Shrub layer 2-5 m, 15% cover:

- *Cornus sanguinea* 1%
- *Corylus avellana* 5%
- *Crataegus monogyna* 4%
- *Ligustrum vulgare* 1%
- *Quercus ilex* 3%
- *Sorbus avonensis* 1%
- *Ulmus glabra* 1%
- *Ulmus procera* 1%

Ground layer c. 10 cm, 100% cover:

- *Hedera helix* 98%
- *Asplenium scolopendrium* 4%
- *Rubia peregrina* 1%
- *Rubus fruticosus* 2%

Soil profiles on SE side of Valley Bridge (Site 1a)

3.2.5. Three soil pits were dug to verify the substrate and assess its suitability for planting whitebeams, all the soils investigated are suitable for planting whitebeams as detailed in Table 6 below.

Table 6 Soil profiles on SE side of Valley Bridge (Site 1a)

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
1	ST56329.73196	North-east facing man-made embankment	Surface: Leaf mould/ivy. 0-10 cm: brown earth with roots, some small clinker/stones. 10-40 cm+: larger ballast stones mixed with brown earth. 	yes
2	ST56333.73192	North-east facing man-made embankment	Surface: Leaf mould/ivy. 0-20 cm: brown earth with roots, some small clinker/stones. 20-40 cm+: larger ballast stones mixed with brown earth. 	yes
3	ST56338.73176	North-east facing man-	Surface: Leaf mould/ivy.	yes

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
		made embankment	0-25 cm: brown earth with roots, very few small clinker/stones. 25-40 cm+: larger ballast stones mixed with brown earth. 	

Site preparation and planting proposals for Site 1a

3.2.6. It is proposed to clear most of the trees and shrubs from the area and treat stumps with herbicide except for trees listed in Table 7 which will be marked and protected prior to clearance. Holm oak, which occurs at 3% cover in the shrub layer, will be removed. Control of ivy will be required longer term. The site may also benefit from removal of young trees along the east side of the tow path (not NR land) to provide additional light.

3.2.7. It is proposed to plant three Avon whitebeams, two Leigh Woods whitebeams and three Bristol whitebeam at this location (eight in total; Table 5 and Figure 2). Approximately 60% of this site will be required for planting.

Table 7. Trees to be retained on SE side of Valley Bridge (Site 1a)

Distance from south end	Species	Details
7.5 m	*Tilia cordata*	Dbh 270 mm, mature, height 20 m
8 m	*Tilia cordata*	Dbh 370 mm, mature, height 25 m
12 m	*Sorbus avonensis*	Dbh 85 mm, mature, height 12 m, split trunk, leaning sideways
At northern end	*Ulmus glabra*	Sapling, height 3-4m

3.2.8. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).

Site 1b Nightingale Valley (NE side of Valley Bridge)

This site is on the east-facing embankment between the freight line and River Avon Tow Path at Nightingale Valley, north of Valley Bridge (Figure 2). The planting site covers 550 m^2 north of Valley Bridge (55 m long and 10 m wide). The lower side is bounded by a wall c. 1.5 m tall, the upper side adjacent to the railway is unfenced. The site is on made ground.

3.2.9. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary woodland which has developed on the railway embankment. Some trees show evidence of coppicing in the past (railway vegetation management) and some younger trees at the south end are maidens. At the north end beyond 55 m, the woodland is developed over rocky ground which may be original woodland floor; this area will not be affected.

Canopy to 10-25 m tall, 100% cover:

- *Acer campestre* 4%
- *Acer pseudoplatanus* 4%
- *Corylus avellana* 20%
- *Crataegus monogyna* 4%
- *Fraxinus excelsior* 60%
- *Ulmus glabra* 2%
- *Ulmus procera* 10%

Shrub layer 2-5 m, 10-15% cover:

- *Cornus sanguinea* 1%
- *Corylus avellana* 5%
- *Crataegus monogyna* 3%
- *Ligustrum vulgare* 1%
- *Quercus ilex* 1%
- *Ulmus procera* 2%

Ground layer c. 10 cm, 98% cover:

- *Arum maculatum* 1%
- *Dryopteris filix-mas* 1%
- *Hedera helix* 90%
- *Asplenium scolopendrium* 4%
- *Rubus fruticosus* 10%

Soil profiles on NW side of Valley Bridge (Site 1b)

3.2.10. Three soil pits were dug to verify the substrate and assess its suitability for planting whitebeams, all the soils investigated are suitable for planting whitebeams as detailed in Table 8 below.

Table 8. Soil profiles on NW side of Valley Bridge (site 1b)

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
4	ST56272.73 255	North-east facing man-made embankment	Surface: Leaf mould/ivy, lots of cut decaying tree trunks 0-40+ cm: deep brown earthy loam with roots and some clinker, with larger stones 20 cm across at base. 	yes
5	ST56284.73 241	North-east facing man-made embankment	Surface: Leaf mould/ivy. 0-10 cm: brown loamy earth with a little clay with roots and small clinker/stones, possibly material discarded from railway bed. 10-20 cm: larger ballast stones mixed with brown earth. 20 cm+: larger stones and some earth 	yes

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
6	ST56290.73 230	North-east facing man-made embankment	Surface: Leaf mould/ivy. 0-40+ cm: deep brown earthy loam with roots and a little clinker/stones 5 cm across. No picture taken.	yes

Site preparation and planting proposals for Site 1b

3.2.11. It is proposed to clear most of the trees and shrubs from the area and treat stumps with herbicide except for trees listed in Table 9 which will be marked and protected prior to clearance. Control of ivy will be required longer term. The site may also benefit from removal of young trees along the east side of the tow path (not NR land) to provide additional light.

Table 9. Trees to be retained on NW side of Valley Bridge (Site 1b)

Distance from south end	Species	Details
2 m	*Ulmus glabra*	Dbh 125 mm, young maiden, height 10 m
8.5 m	*Acer campestre*	Dbh 150 mm, young-mature, height 12 m
9 m	*Acer campestre*	Dbh 130 mm, mature, height 12 m

3.2.12. Proposed planting: eleven Leigh Woods whitebeams and four Bristol whitebeams will be planted at this location (15 in total; Table 5 and Figure 2). Approximately 80% of this site will be required for planting.

3.2.13. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).

3.3. Planting site 2: Embankment north of Miles Dock Bridge

3.3.1. At the north end of Leigh Woods, the west-facing embankment above the saltmarsh is steep (c. 15 m tall) and provides a potential planting site which is open and not shaded (Figure 3). It is bounded by a wall at the bottom and at the north end it grades into more natural rock faces. It would require partial clearance of the existing secondary (recent) woodland. The Avon Gorge Tow Path here is too narrow for vehicle access.

3.3.2. The planting site covers 1,650 m^2 in total (110 m long and 15 m wide). The lower side is bounded by a wall c. 1.5 m tall, the upper side adjacent to the railway is unfenced. This is a railway embankment with made ground.

△ TREE - PROPOSED

O TREE - EXISTING, TO BE RETAINED

SOIL PITS

T TILIA CORDATA

S SORBUS EMINENS

U ULMUS GLABRA

R ROUND-LEAVED WHITEBEAM

— PERMANENT LAND TAKE

1. THIS DRAWING IS NOT FOR CONSTRUCTION AND IS FOR A HIGH LEVEL PROPOSAL ONLY.
2. THIS DRAWING HAS NOT BEEN APPROVED BY NSDC, ALL FUTURE DESIGN WORK TO BE UNDERTAKEN WITH NSC INPUT.
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DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

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ES-B	BJ	RS	CF	23/07/20	For Issue

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PORTISHEAD BRANCH LINE (METROWEST PHASE 1)

Drawing
FIGURE 3
LOCATION OF PLANTING SITE 2 ON EMBANKMENT NORTH OF MILES DOCK WITH PROPOSED PLANTING PLAN (PACKAGE 1)
APFP REGULATION 5(2)(o)

Drawn by: BJ	Date: 30/07/2019
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Drawing Scale: 1:250 @ A1

3.3.3. The woodland type is W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity. The woodland is secondary woodland which has developed on the railway embankment.

Canopy to 20-25 m tall, 98% cover:

- *Crataegus monogyna* 1%
- *Fraxinus excelsior* 90%
- *Tilia cordata* 2%
- *Ulmus glabra* 4%

Shrub layer 1-5 m, 60% cover

- *Acer campestre* 1%
- *Acer pseudoplatanus* 2%
- *Cornus sanguinea* 5%
- *Corylus avellana* 40%
- *Crataegus monogyna* 2%
- *Ilex aquifolium* 1%
- *Ligustrum vulgare* 10%
- *Rosa arvensis* 2%
- *Viburnum opulus* 1%

Ground layer c. 10 cm, 98% cover

- *Dryopteris filix-mas* 2%
- *Hedera helix* 95%
- *Lamiastrum galeobdolon* 1%
- *Mercurialis perennis* 1%
- *Asplenium scolopendrium* 4%
- *Rubia peregrina* 1%
- *Rubus fruticosus* 10%
- *Tamus communis* 1%

Soil profiles at Miles Dock (Site 2)

3.3.4. Three soil pits were dug to verify the substrate and assess its suitability for planting whitebeams, all the soils investigated are suitable for planting whitebeams as detailed in Table 10 below.

Table 10 Soil profiles at Miles Dock (site 2)

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
7	ST54841.75258	East facing man-made embankment	Surface: Leaf mould/ivy, lots of cut decaying tree trunks 0-7.5 cm: blackish stony earth with grit and small stones 7.5-40 + cm: light brown stony earth 	yes
8	ST54848.75230	East facing man-made embankment	Surface: Leaf mould/ivy. 0-40+ cm: brown clayey earth with little clinker/stones 	yes
9	ST54837.75292	East facing man-made embankment	Surface: Leaf mould/ivy. 0-50+ cm: deep brown soil with roots and Some loose	yes

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
			clinker/stones	

Site preparation and planting proposals at Miles Dock (Site 2)

3.3.5. It is proposed to clear most of the vegetation from the area and treat stumps with herbicide except for trees listed in Table 11 which will be marked and protected prior to clearance. Control of ivy will be required.

Table 11. Trees to be retained at Miles Dock (Site 2)

Distance from south end	Species	Details
0 m by wall	*Tilia cordata*	Dbh 5 mm, young coppice on corner of wall, c. 1.5 m tall
8 m by wall	*Sorbus eminens*	Dbh 230 mm, coppice, mature, height c. 17 m overhanging towpath
39 m	*Ulmus glabra*	Dbh 190 mm, mature, height 20 m
46 m	*Tilia cordata*	Dbh 130 mm, mature, height 12 m
47 m	*Tilia cordata*	Dbh 10 mm, young cut at 50 cm with two branches, height 4 m
48 m	*Tilia cordata*	Dbh 380 mm, mature, height 20 m
52 m by wall	*Tilia cordata*	Dbh 1000+ mm, huge mature with 3 main stems, height 25 m
56 m	*Ulmus glabra*	Dbh 210 mm, mature, height 20 m
58 m	*Tilia cordata*	Dbh 350 mm, mature, height 20 m
60 m by wall	*Tilia cordata*	Group of three stems from coppice stool with largest dbh 460 mm, mature
66 m	*Ulmus glabra*	Dbh 250 mm, mature, height 20 m
74 m	*Ulmus glabra*	Dbh 220 mm, mature, height 20 m
91 m	*Ulmus glabra*	Dbh 130 mm, mature, height 20 m

3.3.6. *Proposed planting*: it is proposed to plant 26 of the round-leaved whitebeam saplings at this location (Table 5 and Figure 3). Approximately 70% of this site will be required for planting.

3.3.7. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).

3.4. Planting Site 3: Land above Clifton Bridge No. 2 Tunnel, southern end

3.4.1. The third planting site is on land above Clifton Bridge No. 2 Tunnel on the line of the old informal 'goat' path (this path has now moved west c. 10 m away from the cliff edge after rock falls from the cliff edge). It is a steep (c. 30 degrees), east -facing slope with rocky soils 5-15+ cm deep with a cliff below. This is a small site of 30 m^2 in total (c. 10 m long and 3 m wide). The site is open and unfenced.

3.4.2. The site is considered by national whitebeam experts to be excellent for planting Avon whitebeam and Leigh Woods whitebeams as it meets the requirements for these species (although it has not been assessed for significant faunal interest and there are a few holm oak that require removal). It is also the most suitable of the three NR planting sites for planting Wilmott's whitebeam and grey-leaved whitebeam because these trees do not grow very tall.

3.4.3. The site is more than 100 m from the railway and will not affect rail safety in the future, it can be managed and monitored safely and does not appear to have any other significant nature conservation interest (provided the pale St John's-wort can be avoided). This site has enough light such that planting will not be shaded out by other trees, has suitable soils where whitebeams are already growing with many common whitebeam for pollination and is close to existing populations. There are also saplings of Bristol whitebeam nearby. There are a few non-native species present which can be managed as part of the replanting work.

3.4.4. Details are included of the whitebeams and trees on the adjacent National Trust land to ensure they are not affected by the proposed planting, as the area is not otherwise clearly delineated.

3.4.5. The land is shown in green on Figure 4a with an arrow indicating the planting site and is located at Grid reference ST 56179 73617.

Figure 4a Planting site above Clifton Bridge No. 2 Tunnel (southern end). (NR land ownership is shown in green).

3.4.6. An area of scrub c. 10 m long and 3 m wide on the west side of the relict path will be cleared of existing scrub to create an area for planting whitebeams. Clearance of scrub west of the path is the preferred option of NE, rather than planting in the more open area of false-brome grassland on the east side of the relict path. Trees to be retained and planting proposals are shown on Figure 4.

△ TREE - PROPOSED

○ TREE - EXISTING, TO BE RETAINED

T TILIA CORDATA

OAK QUERCUS ROBUR

SA SORBUS ARIA

SS SORBUS CF.SPECTUNS

SB SORBUS BRISTOLIENSIS

A AVON WHITEBEAM

W WILMOTTS WHITEBEAM

G GREY-LEAVED WHITEBEAM

— PERMANENT LAND TAKE

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ES-D	SJ	RS	CF	23/10/20	For issue

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PORTISHEAD BRANCH LINE (METROWEST PHASE 1)

Drawing
FIGURE 4
LOCATION OF PLANTING SITE 3 ABOVE CLIFTON BRIDGE No 2 TUNNEL(SOUTHERN END) WITH PROPOSED PLANTING PLAN (PACKAGE 1 AND PACKAGE 2)
APFP REGULATION 5(2)(o)

Drawn by: SJ	Date: 30/07/2019
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Drawing Scale: 1:50 @ A1

3.4.7. Site 3 is probably natural ground on the edge of the plateau, though modified by a path with a low 30 cm high mound of earth along its east side. The vegetation is open woodland edge and mixed scrub over a ground flora of false wood-brome *Brachypodium sylvaticum* and is NVC type is W21d *Crataegus monogyna – Hedera helix* scrub, *Viburnum lanata* subcommunity.

Canopy to 8-10 m tall, 20% cover:

- *Quercus robur* 6%
- Sorbus aria 6%
- Tilia cordata 8%

Shrub layer 1-4 m, 60% cover

- *Clematis vitalba* 2%
- *Cornus sanguinea* 2%
- *Corylus avellana* 2%
- *Cotoneaster sternianus* 1%
- *Crataegus monogyna* 5%
- *Daphne laureola* 1%
- *Ilex aquifolium* 1%
- *Ligustrum vulgare* 10%
- *Quercus ilex* 1%
- *Rosa canina* 2%
- *Sorbus aria* 4%
- *Sorbus avonensis* 1%
- *Sorbus bristoliensis* 1%
- *Sorbus* cf. *spectans* 1% (requires confirmation when in fruit)
- *Taxus baccata* 1%
- *Viburnum lantana* 10%

Ground layer c. 30 cm, 60% cover

- *Brachypodium sylvaticum* 50%
- *Briza media* 1%
- *Carex flacca* 2%
- *Dactylis glomerata* 2%
- *Eupatorium cannabinum* 1%
- *Festuca ovina* 1%
- *Hedera helix* 2%
- *Hieracium argillaceum* 1%
- *Hypericum perforatum* 1%

- *Rubia peregrina* 1%
- *Rubus fruticosus* 5%
- *Solidago virgaurea* 1%
- *Taraxacum* sp. 1%
- *Teucrium scorodonia* 2%
- *Viola hirta* 1%

3.4.8. The locally rare plant pale St John's-wort *Hypericum montanum* was seen here on the adjacent National Trust land in 2018 but was not seen on this visit; it is probably still present and will not be affected.

Soil profile above Site 3 Clifton Bridge No. 2 Tunnel

3.4.9. One soil pit was dug to verify the substrate and assess its suitability for planting whitebeams, the soil investigated was suitable for planting whitebeams as detailed in Table 12 below.

Table 12. Soil profile above Clifton Bridge No. 2 Tunnel

Soil pit	Grid reference	Assessment	Soil profile	Suitable for planting
10	ST56194.73628	Natural slope on edge of plateau, top locally modified by path	0-25 cm: shallow light brown loamy earth, fine, very few stones, lots of roots	yes

Site preparation and planting proposals at Site 3 Clifton Bridge No. 2 Tunnel

3.4.10. The area of scrub c. 10 m long and 3 m wide on the west side of the relict path will be cleared of existing scrub to create an area for planting whitebeams. This scrub will be cut and the stumps treated with herbicide (herbicide to be approved by NE). Any non-native woody species in the immediate area outside the immediate planting site such as Stern's cotoneaster *Cotoneaster sternianus* and holm oak will be removed and the stumps treated. Arisings will be placed within the adjacent scrub in a habitat pile. All trees listed in Table 13 will be retained and will be marked and protected prior to clearance.

Table 13. Trees to be retained above Clifton Bridge No. 2 Tunnel

Distance from south end	Species	Details
0 m	*Sorbus aria*	Dbh 175 mm, mature, height 8 m; not affected on National Trust land
1 m	*Quercus robur*	Dbh 360 mm, mature, height 10 m; not affected on National Trust land
1 m	*Sorbus aria*	Dbh 130 mm, mature, height 12 m; not affected on National Trust land
1 m	*Sorbus aria*	Coppice on cliff edge, dbh not recorded for safety reasons, c. 5 m tall; not affected on National Trust land
2 m	*Sorbus bristoliensis*	Dbh 5 mm, sapling, height 2 m; not affected on National Trust land
4 m	*Sorbus aria*	Coppice on cliff edge, dbh not recorded for safety reasons, c. 5 m tall; not affected on National Trust land
6 m	*Sorbus aria*	Dbh 90 mm, mature, height 6 m; not affected on National Trust land
6.5 m	*Tilia cordata*	Dbh 120 mm, mature, height 8 m; not affected on National Trust land
7 m	*Sorbus aria*	Dbh 40 mm, young, height 4 m
9 m	*Tilia cordata*	Coppice on cliff edge, dbh not recorded for safety reasons, 5 m tall
12 m	*Sorbus* group including Avon whitebeam and possible Observatory whitebeam	Group on cliff edge, dbh not recorded for safety reasons, c. 5 m tall

3.4.11. Proposed planting: it is proposed to plant five whitebeams; two Avon whitebeam saplings, two Wilmott's whitebeam and one grey-leaved whitebeam (total five, Table 5 and Figure 4).

3.4.12. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).

SECTION 4

Package Two Planting Proposals

4.1. Introduction

4.1.1. The sites proposed for planting which comprise Package 2 are as a result of discussions in 2019 and 2020 with NE and FC. Site 1a and Site 2 have been removed, and changes have been made to the planting proposals in Site 1b. The same minor modifications to the planting proposals at Clifton Bridge No. 2 Tunnel as those in Package 1 are proposed. A new site (Site 4) in FC land ownership is included in Package 2. In addition, some clarifications have been made to the text after comments from NE in relation to removal of existing trees and treatment of stumps, control of ivy and management of regeneration.

4.1.2. Package 2 includes planting at Nightingale Valley Site 1b, Clifton Bridge No. 2 Tunnel (Site 3) and the red oak plantation (Site 4). The numbers of trees to be planted are summarised in Table 14.

Table 14. Number of trees planted at each site for Package 2.

Package 2	Number affected by the DCO Scheme	Planting Site 1b	Planting Site 3	Planting Site 4	Totals planting
Avon whitebeam *S. avonensis*	12	3	2		5
Bristol whitebeam *S. bristoliensis*	2			7	7
Round-leaved whitebeam *S. eminens*	5			27	27
Grey-leaved whitebeam *S. porrigentiformis*	1		1		1
Leigh Woods whitebeam *S. leighensis*	6	12			12
Wilmott's whitebeam *S. wilmottiana*	1		2		2
Total	**27**	**15**	**5**	**34**	**54**

4.2. Planting Site 1b Nightingale Valley (NE side of Valley Bridge)

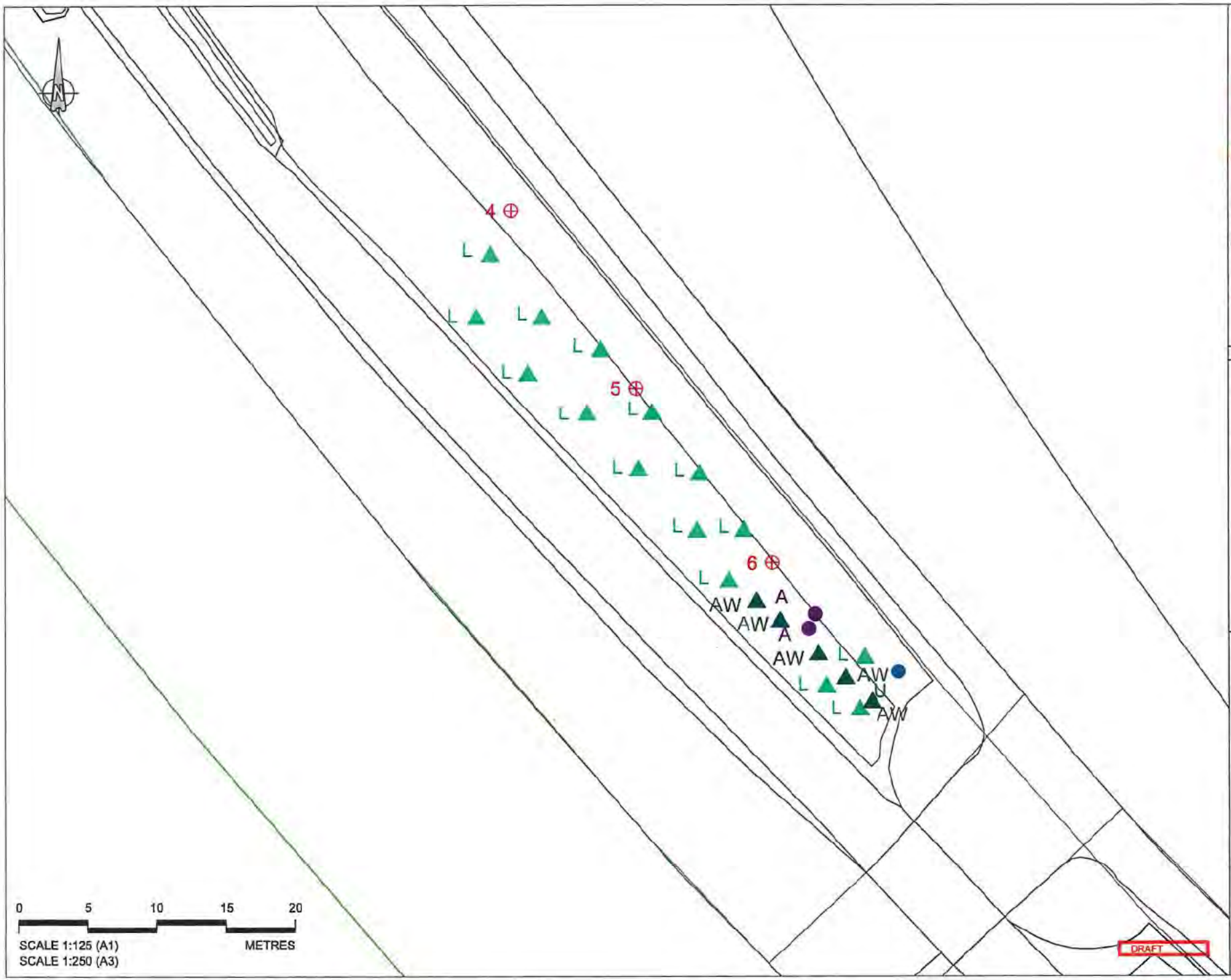
4.2.1. The existing vegetation and soil profiles of Site 1b are described under Package 1 in paragraphs 3.2.10 and 3.2.11 above. The planting proposals are different to Package 1 due to the removal of Site 1a from Package 2.

Site preparation and planting proposals at Site 1b (Package 2)

4.2.2. Proposed planting: three Avon whitebeams and twelve Leigh Woods whitebeams will be planted at this location (15 in total, Table 14; Figure 5). Approximately 80% of this site will be required for planting.

4.2.3. Site preparation: this site requires most of the trees and shrubs to be removed with stumps treated with herbicide except for the three trees listed in Table 9 above. Control of ivy will be required in the longer term. The site may also benefit from removal of young trees along the east side of the towpath (not NR land) to provide additional light.

4.2.4. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).



△ TREE - PROPOSED

O TREE - EXISTING, TO BE RETAINED

⊕ SOIL PITS

T TILIA CORDATA

SA SORBUS AVONENSIS

U ULMUS GLABRA

A ACER CAMPESTRE

AW AVON WHITEBEAM

L LEIGH WOODS WHITEBEAM

— PERMANENT LAND TAKE

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0 5 10 15 20

SCALE 1:125 (A1)
SCALE 1:250 (A3)
METRES

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Project
PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing
FIGURE 5
LOCATION OF PLANTING SITE 1B AT NIGHTINGALE VALLEY WITH PROPOSED PLANTING PLAN (PACKAGE 2)
APFP REGULATION 5(2)(o)

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Drawing Scale: 1:250 @ A1

4.3. Planting Site 3 Clifton Bridge No. 2 Tunnel

4.3.1. The existing vegetation and soil profiles of Site 3 are described under Package 1 in Section 3.4 above. The site preparation and planting proposals are also the same as those described in Package 1 (paragraphs 3.4.10 and 3.4.11, Table 13 and Figure 4 above).

4.4. Planting site 4 Red oak plantation, Sandstone Tunnel

4.4.1. The fourth planting site is an area of red oak plantation over sandstones (Figure 1). It is a slightly domed area bounded by the railway and Sandstone Tunnel on the south side and the River Avon Tow Path with a wall on the north side. There is an informal footpath through the middle. This is a large site 930 m^2 in total. It overlies sandstones of the Portishead Sandstone formation.

4.4.2. This area is proposed, independent of the Portishead Branch Line DCO Scheme, by FC and NE for replacement of the red oak plantation with native trees and shrubs such as hazel and small-leaved lime as part of wider improvements to the SAC woodlands.

4.4.3. The site is considered by national whitebeam experts to be a good site for planting Bristol whitebeam and round-leaved whitebeam. The site is not on NR land, and thus will require a legal agreement between the Applicant for the DCO Scheme North Somerset District Council and the FC. The plantings will not affect railway safety in the future, as the trees are planted away from risk of falling on the railway line itself and they can be managed and monitored safely without any need to enter railway land. There is only limited existing nature conservation interest as the site is a plantation, and the round-leaved whitebeams in the plantation can be protected during any management works. Replacing the non-native woody species such as red oak and rhododendron with whitebeams and native species will benefit the woodlands of the Avon Gorge as a whole, and is not at the expense of existing vegetation of value. By locating the whitebeams along the southern edge of the site they will benefit from the more open canopy conditions provided by proximity to the railway on SW- and SE-facing slopes, rather than being on more intrinsically shaded NE-facing slopes nearer to the tow path. The soil pits show the soils are freely-drained, red-brown earths suitable for growth of Bristol whitebeam, common whitebeam and round-leaved whitebeam. Further indications of soil suitability are that all three also occur on these soils either within the plantation already (round-leaved whitebeam, common whitebeam) or on the adjacent River Avon cliffs (all three species). Because the plantation already has round-leaved whitebeams and more are present with Bristol whitebeams on the adjacent River Avon cliffs, the planted trees will form part of the local metapopulation. Although common whitebeams, essential for pseudo-pollination of the rare species and thus seed set, are present in small quantity along the River Avon cliffs and as non-flowering shaded saplings in the plantation and by the adjacent tow path wall, they are not close enough to the rare species or frequent enough to provide a pollination resource for the rare whitebeams, so they will need to be planted too.

Vegetation of the red oak plantation (Site 4)

4.4.4. This is probably a natural ground form on the east side of Paradise Bottom valley. The site is largely occupied by a red oak plantation which has been planted on the slopes with easy access. The northern edge appears to be older woodland with pedunculate oak *Quercus robur* and small-leaved lime *Tilia cordata*. The plantation type does not equate to an NVC community.

Canopy to 25 m tall, 100% cover:

- *Betula pendula* 1%
- *Castanea sativa* 5%
- *Fagus sylvatica* 5%
- *Fraxinus excelsior* 2%
- *Quercus cerris* 2%
- *Quercus robur* 5%
- *Quercus rubra* 85%
- *Thuja plicata* 1%
- *Tilia cordata* 2%
- *Ulmus glabra* 1%

Shrub layer 1-5 m, 35% cover:

- *Acer pseudoplatanus* 1%
- *Cornus sanguinea* 1%
- *Corylus avellana* 3%
- *Cotoneaster horizontalis* 1%
- *Crataegus monogyna* 2%
- *Fraxinus excelsior* 1%
- *Ilex aquifolium* 1%
- *Ligustrum vulgare* 1%
- *Rhododendron ponticum* 33%
- *Sorbus aria* 1%
- *Sorbus aucuparia* 2%
- *Sorbus eminens* 1%
- *Sorbus torminalis* 1%
- *Thuja plicata* 1%
- *Viburnum lantana* 1%
- *Viburnum opulus* 1%

Ground layer c. 10-40 cm, 66% cover:

- *Asplenium scolopendrium* 4%

- *Hedera helix* 2%
- *Lonicera periclymenum* 2%
- *Luzula sylvatica* 60%
- *Pteridium aquilinum* 1%
- *Rubus fruticosus* 10%
- *Teucrium scorodonia* 1%
- *Vaccinium myrtillus* 1%

Soil profiles red oak plantation (Site 4)

4.4.5. Two soil pits were dug to verify the substrate and assess its suitability for planting whitebeams (Table 15). All the soils investigated are suitable for planting Bristol whitebeam, common whitebeam and round-leaved whitebeam.

Table 15. Soil profiles in red oak plantation

Soil pit	Grid reference	Ground assessment	Soil profile	Suitable for planting
1	ST54919.75096	Natural ground	Surface: Leaf mould, unrotted leaves, woodrush. 0-10 cm: mostly humus and roots, blackish, organic, minor soil component 10-25 cm: deep red-brown earth of sand and grit, no stones, free-drained 25 cm+: compact soil (not base rock) 	yes for *S. aria, S. bristoliensis* and *S. eminens*
2	ST55009.75042	Natural ground	Surface: Leaf mould, unrotted leaves. 0-11 cm: mostly humus and roots, blackish, organic, minor soil component 11-26 cm: deep red-brown earth of sand and grit, a few stones, free-drained	yes for *S. aria, S. bristoliensis* and *S. eminens*

Soil pit	Grid reference	Ground assessment	Soil profile	Suitable for planting
			26 cm+: compact soil (not base rock)	

Site preparation and planting proposals at Site 4

4.4.6. The rare whitebeams to be retained are listed in Table 16. Six round-leaved whitebeams currently occur in the plantation. Eleven round-leaved whitebeams occur on the tow path wall, so details of these have also been included as these are at risk during removal of existing vegetation. They are currently all shaded saplings, which will not flower and fruit but could be allowed to grow by appropriate management of the surrounding woodland. All the existing whitebeams will be marked and protected during any management works.

Table 16. Whitebeams to be retained at red oak plantation

GPS	Species	Location	Details
ST55005.75073	*Sorbus eminens*	in plantation 1 m from wall	height 7 m, dbh 2 cm maiden, sprawling, shaded by rhododendron
ST54940.75123	*Sorbus eminens*	in plantation	height 1.5 m, maiden, shaded sapling
ST55009.75044	*Sorbus eminens*	in plantation	height 3 m, dbh 1 cm maiden, shaded sapling
ST54983.75071	*Sorbus eminens*	in plantation	height 1 m, maiden, shaded sapling
ST54972.75087	*Sorbus eminens*	in plantation	height 0.5 m, coppice, shaded sapling
ST55039.75011	*Sorbus eminens*	in plantation	height 1 m, maiden
ST54993.75079	*Sorbus eminens*	on inside of wall	height 4 m, dbh 1 cm, coppice
ST54912.75162	*Sorbus eminens*	on wall	height 4 m, coppice
ST55038.75011	*Sorbus eminens*	outside of wall by tow path	height 0.75 m, maiden
ST55011.75067	*Sorbus eminens*	outside of wall by tow path	height 0.75 m, coppice
ST54970.75108	*Sorbus eminens*	wall top	height 5 m, coppice
ST55022.75054	*Sorbus eminens*	wall top	height 7 m, dbh 2 cm, coppice
ST54993.75080	*Sorbus eminens* x5	outside of wall by towpath	height 0.3-0.7 m, coppice, 5 saplings in clustered group within 1 m
ST54941.75126	*Sorbus torminalis*	inside plantation between wall and path	height 1 m, suckers, 6 suckers over distance of 5 m
ST54941.75129	*Sorbus torminalis*	on wall	height 7 m, dbh 3 cm maiden

4.4.7. In addition many other native trees will require retention, including frequent plants of rowan *Sorbus aucuparia* and two plants of common whitebeam (these may both be important for pollination of rare whitebeams), some large small-leaved limes and many regenerating saplings, a few wych elm trees and many large pedunculate oaks, especially along the north side. A full survey of these is required prior to felling the red oak and other non-native trees.

4.4.8. Proposed planting: it is proposed to plant seven Bristol whitebeams and 27 round-leaved whitebeams (34 trees; Table 14 and Figure 6). It is also proposed to plant 25 common whitebeams to provide a pollination resource for the rare species. The planting sites are specifically located where the trees will be in open conditions adjacent to the railway with minimal shade from adjacent woodland. Bristol whitebeams will grow upright and can thus be safely located above the western portal tunnel approach as they will not overhang the railway. Round-leaved whitebeams have a tendency to grow

towards light, so will be located on slopes where they will not grow towards the railway. Approximately 10% of this site will be required for planting.

- BRISTOL WHITEBEAM PLANTING AREA
- HAZEL SMALL LEAVED LIME REPLANTING
- ROUND LEAVED WHITEBEAM PLANTING AREA
- COMMON WHITEBEAM PLANTING AREA
- OAK-LIME EDGE WOODLAND TO BE RETAINED
- BEECH TO BE RETAINED
- EXISTING TREES TO BE RETAINED -WILD SERVICE TREE
- EXISTING TREES TO BE RETAINED -ROUND-LEAVED WHITEBEAM
- RED OAK PLANTATION SURVEY AREA
- WALL
- TOWPATH
- INFORMAL PATH
- FENCE LINES DEER/RABBIT COLUMNS 2m

1. THIS DRAWING IS NOT FOR CONSTRUCTION AND IS FOR A HIGH LEVEL PROPOSAL ONLY.
2. THIS DRAWING HAS NOT BEEN APPROVED BY NSDC, ALL FUTURE DESIGN WORK TO BE UNDERTAKEN WITH NSC INPUT.
3. THE EXACT POSITION OF THE PLANTED TREES WILL BE DICTATED BY GROUND CONDITIONS AND OBSTACLES.
4. WHITEBEAM PLANTING TO BE AT 5m CENTRES.

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

Rev	By	Chkd	Appvd	Date	Description
ES-A	BJ	RS	CF	23/07/2020	For issue

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Project
PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing
FIGURE 6
LOCATION OF PLANTING SITE 4
RED OAK PLANTATION WITH
PROPOSED PLANTING (PACKAGE 2)
APFP REGULATION 5(2)(o)

Drawn by: BJ	Date: 09/07/2020
Checked by: RS	Date: 23/07/2020
Approved by: CF	Date: 23/07/2020
Drawing No. 467470.BQ.04.20-200-E	Revision ES-A
Drawing Scale: 1:250 @ A1	

4.4.9. As both species can grow quite tall to 25 m, these will be planted at 5 m centres, allowing plenty of room for the canopies to develop.

4.4.10. Site preparation: this site requires most of the non-native trees and shrubs to be removed. Following a detailed survey to identify which trees are to be retained in addition to the rare whitebeams and agreement with NE, the felling will be implemented by the FC to remove the trees and arisings from site, taking particular care not to damage the existing rare whitebeams in the plantation.

4.4.11. Rhododendron *Rhododendron ponticum*, a Schedule 9 invasive species, forms large populations in this plantation where there has been limited unsuccessful control in the past. It is also present on the cutting sides of the railway on Network Rail land which will require control to prevent recolonisation. Rhododendron will be cut and stumps treated with herbicide (to be approved by NE). All arisings will be removed from site and disposed of following the regulations for Schedule 9 species. Similarly, the one plant of wall cotoneaster present will also be treated and removed.

4.4.12. The site may also benefit from removal of adjacent trees along the railway cuttings on Network Rail land to provide additional light.

4.4.13. The whitebeams will be planted as specified in the planting proposals (WYG, 2020). It is proposed by FC to replant the remaining area with a mixture of hazel and small-leaved lime.

4.4.14. On-going management: the site will be checked annually for ten years to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation affecting whitebeam growth if necessary (see section 5.1.8 Aftercare).

SECTION 5

Planting, Maintenance and Monitoring

5.1.1. Small-leaved lime, field maple, whitebeam and wych elm trees to be retained have been documented and mapped (Figures 2 to 5) and will be avoided when clearing sites for planting whitebeams. A detailed survey will be required at red oak plantation where only rare whitebeams have been mapped (Figure 6).

5.1.2. A specialist contractor will be employed to plant, manage and maintain the whitebeam trees. A contract will be written to specify e.g. plant protectors, handling plants, frost protection, timing of planting, planting depth, type of stakes and watering. It will also cover the maintenance of the plants for ten years after initial planting (year 1), including inspection intervals, plant circles and depth of mulch.

5.1.3. The planting of the whitebeam saplings will follow the guidance on planting and establishment of trees as detailed within *BS 8545:2014; Trees: from nursery to independence in the landscape – Recommendations. BS 4043 Recommendations for planting root balled trees, BS 4428 Code of practice for general landscape operations (excluding hard surfaces) and BS 5837 Trees in relation to design, demolition and construction.*

5.1.4. Saplings will be hardened off outside at Paignton during the winter before planting. The largest, healthiest plants will be selected from the stock. Prior to taking on site, the root balls will be soaked for 30 minutes to ensure they are fully hydrated. Saplings will be watered when planted and monthly for the first and second growing season if necessary.

5.1.5. Saplings will be planted out in early to mid-spring following construction (later if there is a long cold spell with frozen ground) before bud burst, using standard methods (see section 5.1.7. below).

5.1.6. The planting out will be documented and a report submitted to NR and NE, including a planting plan and tree numbers.

Initial planting

5.1.7. The whitebeam saplings to be planted will be approximately 3-5 years old and are currently being grown in 12.5 litre air-pots. These will then be planted in March in year 1 as follows:

- Prior to arrival on site and planting, the whitebeam saplings will be thoroughly watered.
- The whitebeam saplings should be planted between 3-5 m apart as they will not be thinned out and there needs to be enough room for their canopies to develop.
- The whitebeam saplings should not be planted directly under retained mature trees, so they are not shaded by overtopping. They should be planted between 3-5m from the base of larger trees depending on their canopy spread.

- The area around the planting site should be cleared of any vegetation such as ivy and other scrub so that the sapling growth is not impeded.
- A spade should be used to remove the top layer of soil which will contain a high percentage of roots from ivy and other vegetation.
- The hole should be dug slightly wider and deeper than the container of the whitebeam sapling. The soil around the edges should be loosened if required. As the soils contain a high stone and humus content there will be adequate drainage.
- The whitebeam sapling should be placed in the hole and the depth checked. The soil should be the same level as the top of the container (the steepness of the sloping site will need to be taken into consideration with regard the level of the soil on the high side of the planted whitebeam sapling).
- The whitebeam sapling should then be held upright and the soil gently pushed back, pressing it down onto the roots. The soil should not be over-compacted as this would stop water and air circulation, but the whitebeam sapling should be made secure.
- A cane should be pushed into the ground next to the whitebeam sapling, making sure it is stable.
- A solid tree guard or, if the trees are of a reasonable size, an open mesh guard, should be secured to protect the whitebeam sapling.
- The whitebeam sapling should be watered again if possible.

Aftercare

5.1.8. The initial planting will be undertaken in early March in year 1. Between April and September the saplings will be checked monthly to undertake watering if necessary and other care requirements such as removal of weed growth and removal of surrounding competing vegetation if necessary, check tree guard positioning to ensure trees are upright and firmly in the soil and tree survival, as stipulated in the contract. During the last visit each year each tree will be measured for height, and girth at 1.3 m (if tall enough), and when mature for fruit production, and health and insect/browsing will be assessed. If the tree has died, an assessment will be made for reason for death (if possible).

5.1.9. In year 2 after initial planting, the saplings will be checked in March and September to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation if necessary. If they are suffering from establishment issues such as desiccation this will be considered and frequency of management/monitoring increased to monthly if required between April and September inclusive. In March, any replacement planting will be carried out using stock reserved at Paignton Zoological Gardens and management/monitoring of new plants will be as detailed in Section 5.1.8.

5.1.10. In years 3 to 10 after initial planting, the saplings will be checked in March and September to undertake care requirements such as removal of weed growth and removal of surrounding competing vegetation if necessary. In March, any replacement planting will be carried out using stock reserved at

Paignton Zoological Gardens and management/monitoring of new plants will be as detailed in Section 5.1.8.

5.1.11. The aim will be to ensure survival of the trees and replace if necessary, and to learn about growth of these rare tees which can be used to inform potential future mitigation plantings.

5.1.12. Reports to NR and Natural England will be cumulative adding to existing data rather than each year reported in isolation to ensure data are not lost.

5.1.13. Guards can be removed when the tree trunks are 2 m tall or as specified in the contract. The old guards will be taken off site and completely removed from the SSSI.

5.1.14. A few trees of the remaining stock will be retained in cultivation for replacements if necessary. Surplus propagated whitebeams from more widespread species will be offered to the Avon Gorge SSSI landowners for planting.

Long term management

5.1.15. Longer term, management of adjacent trees could be required to prevent over-shading. Avon whitebeam, Leigh Woods whitebeam, grey-leaved whitebeam and Wilmott's whitebeam are all light-demanding species, but Bristol whitebeam and round-leaved whitebeam are moderately shade tolerant. The sites and planting plans have been selected as likely to have adequate lighting for the longer term and not to be shaded by adjacent woodland. The two embankment sites are located between the open railway and the open towpath, and the site at Clifton Bridge No. 2 Tunnel is open on the edge of the cliff.

SECTION 6

Discussion

Impacts on Avon Gorge Woodlands SAC features

6.1.1. The vegetation for each planting site has been described. At Nightingale Valley (Site 1) and Miles Dock (Site 2) the woodland type is secondary (recent) W8d *Fraxinus excelsior – Acer campestre - Mercurialis perennis* woodland, *Hedera helix* subcommunity developed on made ground on the railway embankments. Above Clifton Bridge No. 2 Tunnel (Site 3) the vegetation is W21d *Crataegus monogyna – Hedera helix* scrub, *Viburnum lanata* subcommunity. The red oak plantation is a plantation of *Quercus rubra*. None of the sites are listed on the Ancient Woodland Inventory.

6.1.2. The citation for the Avon Gorge Woodlands SAC indicates the two qualifying habitats listed in Annex I are *Tilio-Acerion* forests of slopes, screes and ravines (mixed woodland on base-rich soils associated with rocky slopes) and Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (dry grasslands and scrublands on chalk or limestone).

6.1.3. Taking a broad view, following the Interpretation manual of European Union habitats (Eur 27, July 2007) the secondary W8d *Fraxinus– Acer campestre – Mercurialis perennis* woodland, *Hedera helix* subcommunity woodlands on the railway embankments would qualify under *Tilio-Acerion* forests which include W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodlands in the United Kingdom. The *Tilio-Acerion* forests are defined as "Mixed forests of secondary species (*Acer pseudoplatanus, Fraxinus excelsior, Ulmus glabra, Tilia cordata*) of coarse scree, abrupt rocky slopes or coarse colluvions of slopes, particularly on calcareous, but also on siliceous, substrates". If the secondary (recent) woodland on railway embankments is included within this definition, then three areas totalling up to c. 2550 m^2 of *Tilio-Acerion* would be affected by the Package 1 planting proposals, though the ancient woodland trees within these would be retained. The planting proposals will avoid removal of existing small-leaved lime, field maple, whitebeam and wych elm trees. These trees will be retained and have been documented and mapped in this report..

6.1.4. Above Clifton Bridge No. 2 Tunnel (Site 3) the vegetation is W21d *Crataegus monogyna – Hedera helix* scrub, *Viburnum lanata* subcommunity which would not qualify under either *Tilio-Acerion* forests or Semi-natural dry grasslands (the latter interpreted as including calcicolous NVC communities CG1 to CG9 in the Interpretation manual of European Union habitats). The grassy layer under the young scrub is dominated by false wood-brome *Brachypodium sylvaticum* currently does not equate to the qualifying *Festuco-Brometalia* grassland of the SAC. However, the typical calcareous grassland species *Briza media* and *Carex flacca* are present in small amounts and therefore the planting proposals involve removal of encroaching scrub rather than to plant on grassland.

6.1.5. The red oak plantation is not a vegetation type protected within the Avon Gorge Woodlands SAC. The replacement with a more sympathetic hazel and small-leaved lime woodland with the whitebeams on the acidic

sandstone soils will enhance the woodlands within the SAC complementing the *Tilio-Acerion* forests of slopes, screes and ravines on base-rich soils for which the site is designated. The six round-leaved whitebeams within the plantation are part of the cited scientific interest of both the SAC and SSSI so will be protected during felling, and the woodland managed to allow them to grow and flower/fruit, enhancing the overall population.

Impacts on SSSI features

6.1.6. The Avon Gorge SSSI is designated for the screes, scrub, pockets of grassland and adjacent woodland which support an exceptional number of nationally rare and scarce plant species, and for its geology.

6.1.7. The planting site above Clifton Bridge No. 2 Tunnel (Site 3) would affect 30 m^2 of scrub, a feature cited in the SSSI schedule as supporting rare plants. The scrub here does already support three rare species of whitebeam which will be carefully avoided; the only locally rare plant present pale St John's-wort will not be affected.

6.1.8. The planting sites on the embankments are secondary semi-natural, broadleaved woodland, a feature also cited in the SSSI schedule. However, none of the rare and scarce plants cited in the schedule will be affected, and the rare whitebeams at Site 1a Nightingale Valley (Avon whitebeam) and Site 3 above Clifton Bridge No. 2 Tunnel (Avon whitebeam, Bristol whitebeam and Observatory whitebeam *Sorbus*.cf. *spectans*) will be carefully avoided. Ancient woodland trees (small-leaved lime, field maple, whitebeam and wych elm) will be retained when clearing sites for planting whitebeams.

6.1.9. The red oak plantation is not a vegetation type protected within the Avon Gorge Woodlands SSSI, and as for the SAC above, the replacement with a more sympathetic hazel and small-leaved lime woodland with the whitebeams on the acidic sandstone soils will enhance the range of woodlands within the SAC.

Substrates

6.1.10. The soil pits show the Nightingale Valley (Site 1) and Miles Dock (Site 2) soils are on made ground on the railway embankments. All are suitable for planting all whitebeams with a good layer of loam brown earths over rubble/clinker and are free drained. The soils all have roots from adjacent trees so the whitebeams will need planting and looking after with care.

6.1.11. The soils above Clifton Bridge No. 2 Tunnel are probably original and are suitable for planting all the whitebeam species.

6.1.12. The soils at red oak plantation (Site 4) are probably original and are suitable for planting Bristol whitebeam, common whitebeam and round-leaved whitebeam.

Planting plan

6.1.13. The planting plans are shown in Figures 2-6 with numbers summarised in Tables 4 and 5.

SECTION 7

Evidence of successful whitebeam planting projects

Introduction

7.1.1. WYG was commissioned in August 2019 to compile additional information, including case studies, to evidence the success of planting out and establishing whitebeam saplings grown from seed in the wild, as supporting evidence for the whitebeam mitigation strategy. The four case studies below have been compiled from data held by Dr Tim Rich, WYG Principal Ecologist, one of the national experts in whitebeams and author of the BSBI Sorbus handbook who has studied whitebeams for over 35 years.

7.1.2. The DCO Scheme involves reopening the railway line between Bristol and Portishead to passenger trains which necessitates undertaking some rail improvement works in the Avon Gorge Site of Special Scientific Interest ("SSSI")/Avon Gorge Woodlands Special Area of Conservation ("SAC"). The SAC is designated for the Annex I habitat 9180 *Tilio-Acerion* forests of slopes, screes and ravines woodlands which includes the presence of rare whitebeams *Sorbus* spp. The railway line currently carries freight only, and the higher safety standards for passenger trains require some improvement works which will result in the loss of some of the rare whitebeam trees along the railway, primarily for safety reasons. As part of the environmental impact assessment, a whitebeam mitigation strategy has been developed for the rare whitebeams aiming to replace each lost whitebeam with two individuals of the same species. The work has included field surveys, collection of seed, cultivation of saplings, selection of appropriate replanting sites and methods of planting saplings.

Methods

7.1.3. There is very little published work on the success of planting out and establishing whitebeam saplings in the wild but there are a number of examples where this has occurred in the wild/semi-wild (i.e. not in botanic gardens). The studies below have been compiled from largely unpublished data held by Dr Tim Rich, cross referenced to published work where planted trees have been previously noted.

7.1.4. For the cited case studies relatively little documentation about the original planting method or specifications was found, and no attempt has been made to trace any further documentation for this review. Dr Rich is unaware of any failed attempts to plant and establish whitebeams in the wild, though these may not have been reported.

7.1.5. One of the case studies in Leigh Woods was surveyed by Dr Rich and Ms Libby Houston on 8th October 2019 to gather current information on the condition of the planted whitebeams.

Results

Leigh Woods Avon Gorge

7.1.6. Rare whitebeams have been planted out in Leigh Woods, Avon Gorge for over 50 years, however no information was available regarding the original planting details and specification (e.g. cultivation of saplings etc) although they must have been grown from local seed. The whitebeams are thought to have been planted by Bob Russell, a former warden at Leigh Woods National Nature Reserve, in the 1970s as part of his research into the rare whitebeams. Some of his research, including seed germination trials, was published in his dissertation which was submitted as part of a requirement for promotion (Russell 1979), but this does not explicitly cite where or when trees were planted.

7.1.7. The main area where whitebeams were planted is in a line along on the southern edge of The Plain (ST556731). A range of species have been planted here including Bristol whitebeam *S. bristoliensis* (Houston et al. 2008) and Wilmott's whitebeam *S. wilmottiana* (Rich & Houston 2004).

7.1.8. A series of grey-leaved whitebeams *S. porrigentiformis* were planted out along the north side of Leigh Woods camp (ST559733; Photograph 1).

Photograph 1. Grey-leaved whitebeams planted on far side of fence, Leigh Woods Camp, 2004.

7.1.9. The planted whitebeams were surveyed by Dr Rich and Ms Libby Houston on 8th October 2019 to gather current information on the condition of the planted whitebeams. The information is provided in Table 12 and photograph 2 and 3. The location of the trees surveyed are shown on Figure 5.

Table 12 Measurements of planted whitebeams at Leigh Woods 8 October 2019, Tim Rich & Libby Houston

Species	Grid reference	Height (m)	Girth at 1.5 m (cm)	Fruit set	Notes
Bristol whitebeam	ST5565273144	8	45	Fruit	Multi-stemmed at 1.5 m, largest stem measured
Common whitebeam	ST5564773140	8	65	Fruit	Multi-stemmed at 1.5 m, largest stem measured
English whitebeam	ST5564173137	8	46	Fruit	
English whitebeam	ST5564373137	7	28	Fruit	
English whitebeam	ST5566473145	7	31	Fruit	Multi-stemmed at 1.5 m, largest stem measured
English whitebeam	ST5567273151	6	30	Fruit	Multi-stemmed at 1.5 m, largest stem measured
English whitebeam	ST5567673156	7	30	Fruit	Probable regrowth
Grey-leaved whitebeam	ST5598173319	4	13	Fruit	
Grey-leaved whitebeam	ST5598873329	8	34	Fruit	
Grey-leaved whitebeam	ST5598173325	6	12	Fruit	
Grey-leaved whitebeam	ST5597573326	8	26	Fruit	
Grey-leaved whitebeam	ST5596773326	7	17	Fruit	Probable regrowth
Grey-leaved whitebeam	ST5596173327	1.25	1	No	Young regrowth after being damaged by cattle
Grey-leaved whitebeam	ST5594673376	6	17	Fruit	
Grey-leaved whitebeam	ST5595073380	7	23	Fruit	
Hybrid whitebeam	ST5563873136	5	30	Fruit	Regrowth from tree blown over about 10 years ago
Mountain ash	ST5564373135	8	27	Fruit	
Wilmott's whitebeam	ST5565873145	8	52	Fruit	Multi-stemmed at 1.5 m, largest stem measured

Photograph 2. Whitebeams planted in a row along the edge of The Plain over c. 50 m, photo taken 8/10/19

Photograph 3. Whitebeams planted behind the safety fence in the edge of Leigh Woods Camp, photo taken 8/10/19

Penmoelallt, Powys

7.1.10. Following discovery of a second population of the very rare Ley's whitebeam *Sorbus leyana* at Penmoelallt, Powys by J. Evans in 1958, the FC collected seed from them in 1959 and grew on saplings (presumably in a forestry nursery). In April 1963, seven 2-year-old saplings were planted in three separate fenced enclosures on level ground above the cliffs adjacent to the wild plants. Six of these trees survived to the following year and by 1968 had grown to between 1.7 and 2.7 m tall. The fences around the enclosures were removed in the early 1990s. All six remaining trees survive to 2004 and 2010 (Photographs 4 and 5) and had a mean estimated height of 10 m and mean girth at 1.3 m of 58 cm and all have fruited (Rich et al. 2005). These trees were still present in 2018 (T. Rich personal observation). Deer and sheep graze these woodlands but have not affected the mature trees.

Photograph 4. One of the planted trees of Ley's whitebeam flowering at Penmoelallt in May 2010 (planted in 1963).

Photograph 5. One of the planted trees of Ley's whitebeam fruiting at Penmoelallt in August 2010 (planted in 1963).

North Devon

7.1.11. Following extensive damage to the woodlands of North Devon around Woody Bay by the hurricanes of 1987 and 1989, the National Trust replanted Devon whitebeam *Sorbus devoniensis* and Somerset whitebeam *S. subcuneata* specimens and possibly some of the other locally rare whitebeam species, together with other trees to restore the woodlands. No

information has been seen on the full details of what was planted where (although the seeds must have been sourced locally). The replanted trees are still easily identified by the stakes and the two trees observed by Dr Rich in 2015 were healthy and growing well (Photograph 6). Deer are widespread in these woodlands.

Photograph 6. Devon whitebeam planted out at Woody Bay, 2015, showing survival since planting in the early 1990s (note the stakes holding the original sapling)

Arran, Scotland

7.1.12. Royal Botanic Gardens Edinburgh and Scottish Natural Heritage (and its predecessors) and have studied the whitebeams of Arran since the 1970s. As part of a recent conservation project, three endemic species grown from seed from Arran origin have been planted out in an enclosure at the mouth of Glen Catacol and when visited in 2014 were growing well (Photograph 7).

The saplings of Arran whitebeam *S. arranensis* and Arran service-tree *S. pseudofennica* were most likely grown from seed; the sapling of the false rowan *S. pseudomeinichii* may have been grown from cuttings (Dr Rich collected seed of it for the Royal Botanic Gardens Edinburgh to grow during his 2014 visit). The saplings were quite large when originally planted and have to be protected from the high red deer grazing pressure on Arran.

Photograph 7. Arran Sorbus planting enclosure at mouth of Glen Catacol. September 2014.

Discussion

7.1.13. The case studies involve saplings of a range of different species of whitebeam grown from seed planted and out in the wild/semi-wild situations rather than in botanic gardens or arboreta. Whitebeams are usually propagated from seed, though rarely grafting or cuttings may be used for exceptionally rare species (for example, false rowan on Arran as above). The case studies demonstrate planted whitebeams can grow for long periods (at least 40 years) usually with successful flowering and fruiting, provided care is taken to protect them from grazing. However, given the lack of original documentation for these studies, the examples are based on the trees that have survived; the actual rates of survival from original plantings are unknown.

7.1.14. These four examples are from a range of wild (e.g. Woody Bay) and semi-wild situations (e.g. The Plain, Leigh Woods) which reflect the proposed planting sites for the DCO Scheme in the Avon Gorge. There are also numerous examples of rare whitebeams being grown and planted in botanical gardens, including Bristol University Botanic Garden, Royal Botanic Gardens Kew and The National Arboretum Westonbirt (cf. Rich et al. 2010, page 10). Care during planting and establishment and protection

from grazing is probably more important than the location in the wild/semi-wild *per se*.

7.1.15. Of the species affected by the DCO Scheme, Bristol whitebeam, Wilmott's whitebeam and grey-leaved whitebeam have already been successfully planted previously in Leigh Woods. There is no reason to suppose that Avon whitebeam *S. avonensis*, Leigh Woods whitebeam *S. leighensis* and round-leaved whitebeam *S. eminens* should not also be successfully planted out in the wild in the Avon Gorge, although there is no evidence to support this.

7.1.16. In addition, Dr Rich is involved in a conservation project to replant Llangollen whitebeam in North Wales (Rich et al. 2019), but as yet no plants have been planted out in the wild.

Summary

7.1.17. Case studies are described where whitebeams have been planted out in the wild/semi-wild situations at Leigh Woods, Penmoelallt, Woody Bay and Arran. The case studies involve a range of different species of whitebeam saplings grown from seed and demonstrate planted whitebeams can grow for long periods (at least 40 years) usually with successful flowering and fruiting, provided care is taken to protect them from grazing.

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Annex I Whitebeam seeds and saplings reports, Paignton Zoological Gardens

SORBUS CONSERVATION, NORTH SOMERSET COUNCIL / METROWEST PHASE1 / CH2M

July 24, 2020

SUMMARY

1. Cuttings 2019

In the autumn of 2019 a batch of hard wood cutting were taken of Sorbus avonensis. The material for the cutting was collected at the same time as the seed were harvested for the 2020 sowing. The cutting were prepared and place in a cold frame.

Spring 2020 as yet there have been little signs of growth of the cuts. It is anticipated that there will be a pore rate of success from these cuttings.

Update 24th July after some cutting started to show signs of budding there was hope of success sadly the buds have stated to fail and it is looking unlikely that the will be any positive results

2. 2020 Sowing

Seed was collect in the autumn of 2019 and bought back to Paignton zoo to be clean and stratified. During the stratification the seed was monitored for condition and any seeds that show signs of decay was removed. At this stage there was strong signs the many of the seed had become parasitized by insect larva before harvest. This is likely to have contributed to the pore viability of the seeds. Results seen below

Seed Sown	
avonensis	73
bristoliensis	60
wilmottiana	77
porrigentiformis	20
leighensis	60
eminens	15

Seed Germinated	
avonensis	0
bristoliensis	0
wilmottiana	0
porrigentiformis	0
leighensis	28
	0

The seed that did germinate has grown strongly making healthy young plants

Update 24th July The 2020 sorbus leighensis Continue to grow well and have now been move on to 2l pots

Catherine Mortimer, Head Gardener, catherine.mortimer@paigntonzoo.org.uk

3. Continued Monitoring of Established Plants Summer 2018 – 2019

The plant that were originally sown in 2018 continue to thrive and grow. They have been move up in to 12.5litre air pot and are now at a stage where for the optimal establishment they would benefit be planted in their final planting location.

Total plants in 12.5L Air pots	
avonensis	05
leighensis	30
bristoliensis	07
eminens	30

Current height of trees in centimetres	
avonensis	130>160
leighensis	80>160
bristoliensis	90>130
eminens	100>150

Above- Sorbus leighensis most recent photo

Left- Sorbus bristolensis most recent photo

4. Additional Plants

2019 Plants

	Quantity	Height	Pot size
Sorbus wilmottiana	2	5>40cm	3l,7.5l
Sorbus porrigentifomis	1	28cm	7.5

Catherine Mortimer, Head Gardener, catherine.mortimer@paigntonzoo.org.uk

It should be note that one of the *Sorbus wilmottiana* from the 2019 batch is very weak and has not putting substantial growth

Donations from Tim Rich

All plants in 9cm pots	Quantity	Height
Sorbus Leighensis	5	8>10cm
Sorbus eminens	10	10>15cm

Catherine Mortimer, Head Gardener, catherine.mortimer@paigntonzoo.org.uk

SORBUS CONSERVATION, NORTH SOMERSET COUNCIL / METROWEST

PHASE1 / CH2M

December 17, 2018

1. Additional Sowing, 2018

Seed Sown	
avonensis	345
bristoliensis	432
wilmottiana	282
porrigentiformis	188

6 additional batches of fruit were received on 26th of September 2018 and these fruit were from the 4 species listed above. With batches of seed from two differing harvest locations for both the S. avonensis and S. bristoliensis.

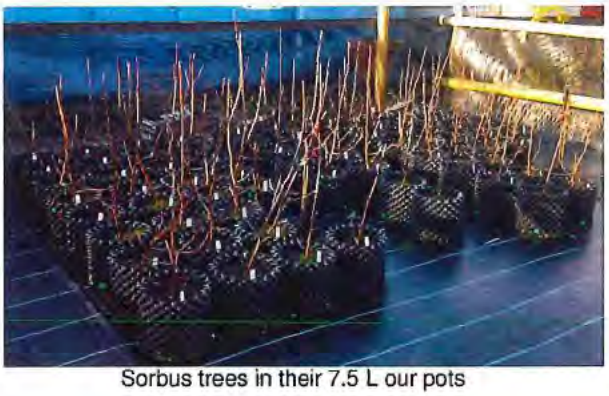
The seeds were extracted from the fruit and cleaned on arrival. Sowing was carried out immediately. The seed trays have been placed in a cool greenhouse to overwinter. Germination is expected in mid-March 2019 onwards

2. Monitoring of Established Plants Summer 18 – Autumn 18

Plants propagated from seed collected in 2016 have all now been potted up into 7.5 L pots. Throughout the summer there have been daily checks carried out for watering leading P&D inspection etc. There have been no further losses of plants this season.

Total plants in 7.5 L Air pots	
avonensis	05
leighensis	30
bristoliensis	08
eminens	30

Current height of trees in centimetres	
avonensis	50>80
leighensis	70>100
bristoliensis	30>60
eminens	30>80



Sorbus trees in their 7.5 L our pots

Catherine Mortimer, Head Gardener, catherine.mortimer@paigntonzoo.org.uk

Annex J Health and safety tree works

Annex J Health and safety tree works identified in 2017 and passed to NR for inclusion in emergency tree works and trees identified with bat roosting potential

Site Plan Reference Annex F Figure 1	Comment & Works	Further survey	Works Time Frame
NT1	Twin ash in woodland low rock? No access possible weak union at base. Further inspection remove stem toward track.	Further inspection of ash remove stem toward track	12 mths
NT2	Ash previous pollard re pollard or fell 12 mths		12 mths
NT3	Large mature ash ivy large broken but attached limb. Further inspection required, but probably fell as tall and no longer sheltered by woodland canopy.	Further inspection required	
NT4	2 Mature whitebeam growing out of rock 15 m from track 45 degree lean require felling for safety not on plan but marked with orange. Check.	Whitebeam not on plan	12 mths
NT5	4 stemmed beech on edge of rock face. Mature further inspection required.	Further inspection required	
NT6	Dead elm fell. 3-6 mths		3-6 mths
T801	Mature twin stemmed heavy ivy weighted to track reduce West limb by approx 5 m.		12 mths
T802	Large as on fence/bank possible remove for rock face works see B4		
T803 (not on Figure 1)	Coppice lime remove stem with tag. Lean parallel with track.		12 mths

Site Plan Reference Annex F Figure 1	Comment & Works	Further survey	Works Time Frame
T805	Tall ash 2 m from track right hand fork secondary (recent) fork old branch wound, decay. Remove right hand fork or fell whole tree. 12-18 mths		12-18 mths
T806	Dead elm 2.5 m from track 120 dbh. Covered ivy. Fell 6-12 mths		6-12 mths
T807	Common whitebeam mature multi stemmed good condition keep. Clear holm oak around tree. Opposite cluster of whitebeam.		
T808	Group of 7 dead birch fell. 3-6 mths.		3-6 mths
T809	Dead birch fell 3-6mths		3-6mths
T814	2 Lime 8 m from track 30 degree lean, main stem resting on adjoining elm. No damage visible from ground some epicormic around contact point (elm?). Climbing inspection? Or pollard to behind point of contact. 12-24 mths	Climbing inspection	12-24 mths
T815	Tall etiolated ash secondary (recent) stem decayed, honey fungus? Failure potential. Fell. Second dead tree 816 2 m away		12-18 mths
T816	Large dead elm remove top 5 m leave as standing deadwood.		12-18 mths
T817	Tall lime leaning towards the track; possible root movement. Pollard. 12 mths. Also dead cherry/lime - remove and young lime coppice – coppice again.		
T818	45 degree lean on mature lime. Previously marked. Fell 12 mths		12 mths

Site Plan Reference Annex F Figure 1	Comment & Works	Further survey	Works Time Frame
T819	Field maple coppice on embankment edge 4 dead stems. Fell 6-12 mths.		6-12 mths
T820	Oak coppice edge of start of rock face 1 dead stem and semi mature all branch, rest on top, remove 12 mths. Several old coppice stools near rock face edge potential for future failures as trees age.		12 mths
T821	semi mature lime coppice hit by fallen tree, still partially leaning on lifted root plate of coppice leaning into tree in front. Potential for further failure. Clear fallen tree, minimum coppice to make safe. 6 mths.		6 mths
T822	4 stem horse chestnut coppice above portal. Possible signs of honey fungus. Due to position above portal - fell 12-24 mths		12-24 mths
T823	Poor damaged ash with flaky bark. Cavities with bat potential. No risk to track.		
T824	Mature oak previous branch pruning dead stubs bats		
T826	Two large ash. Crowns weighted to track. Fell or reduce crowns by 6-8 m 50%.		12-18 mths
T827	5 dead elm fell		12 mths
Bat potential tree not requiring H&S works.			
T804	Sycamore with bat potential		
T810	Semi mature oak, twisted branch with branch wound and ivy. Bat potential. H&S okay		

Site Plan Reference Annex F Figure 1	Comment & Works	Further survey	Works Time Frame
T811	Oak with some old branch wounds. Bat potential.		
T813	Tall ash twin at 8 m with ivy some old branch wounds. Secondary (recent) semi mature limb failure at 5 m. Does not affect main stem, no works required. Bat potential.		
T825	3 stem mature ash with ivy. 2 m from track. Weighted away from track. Some bat potential.		

Annex K Bristol rock-cress conservation strategy

Letter Report

Site:	MetroWest project, Avon Gorge
Client:	Jacobs
Job Number:	A110942
Survey Type(s):	MetroWest Bristol rockcress (*Arabis scabra*) mitigation strategy
Date:	25 July 2019
File Location:	\\lds-dc-vm-002\Group Ecology\Projects\Projects A110000 on\A110942 Rock Inspection\REPORTS\Bristol rockcress mitigation strategy

1.0 Introduction

WYG were commissioned by Jacobs in May 2019 to prepare a Bristol rockcress *Arabis scabra* (=*Arabis stricta*) mitigation strategy for the MetroWest project between Bristol and Portishead. The project proposes to reopen the railway line between Bristol and Portishead to passenger trains which necessitates undertaking some rail improvement works in the Avon Gorge Site of Special Scientific Interest (SSSI)/Avon Gorge Woodlands Special Area of Conservation (SAC). The SSSI is designated for, amongst other things, the outstanding assemblage of nationally rare and scarce vascular plants with Bristol rockcress detailed in the SSSI citation. The SAC is designated for the 9180 *Tilio-Acerion* forests of slopes, screes and ravines woodlands with 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (this is the habitat in which the Bristol rockcress occurs) as present but not a primary reason for designation of the site. The railway line currently carries freight only, and the higher safety standards for passenger trains require some rock stabilisation works which could impact an area where the Bristol rockcress is recorded. During consultation with Natural England (NE) they requested a specific mitigation strategy be prepared to maintain the current population of Bristol rockcress and compensate for any impacts from the construction works.

This report has been compiled by Ms Libby Houston and Dr Tim Rich, WYG Principal Ecologist. Ms Houston has worked on the rare plants of the Avon Gorge for over 30 years and has regularly monitored and studied Bristol rockcress, including 2 complete censuses and more frequent population counts at key sites in the area. She is considered one of the foremost experts in the UK on the species. Dr Rich is the national authority on crucifer taxonomy and author of the BSBI Handbook *Crucifers of Great Britain and Ireland* (Rich 1991), and has seen Bristol rockcress regularly in Britain since 1982.

Plant nomenclature follows Stace (2019); the more familiar name *A. stricta* Hudson is preceded by the earlier *A. scabra* All.

1.1 Background

Botanical surveys carried out for the MetroWest project combined with other records, identified the occurrence of a population of the statutorily protected Bristol rockcress on rocks beside the railway line at the end of Clifton Bridge Tunnel No. 2 and in the adjacent Network Rail Quarry 1 (Figures 1 and 2; see also ES Appendix 9.11 Avon Gorge Vegetation Management Plan). For example, during a site visit on 15 December 2016, one Bristol rockcress plant was identified to the MetroWest project team on a ledge just outside the Portishead portal of Clifton Bridge Tunnel No. 2 (Figure 2). The proposed rock stabilisation works may affect part of the population of Bristol rockcress located at NR rock face number ID06 on the northern (Pill) end of Clifton Bridge Tunnel No. 2 at 122 ml 63 ch, where approximately 20 m^2 of rockface may require installation of rock bolts, and light vegetation clearance over the adjacent area of 555 m^2 of rockface.

Bristol rockcress is protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended; listed as *Arabis stricta*) and is listed in the *Vascular Plant Red Data Book* (Wigginton 1999). Bristol rockcress is very rare and confined to the Avon Gorge as a native plant. The Avon Gorge

population is believed to be a relict population from a more widespread distribution after the last glaciation, and is markedly disjunct from the rest of its native range in mountains from Spain to Switzerland.

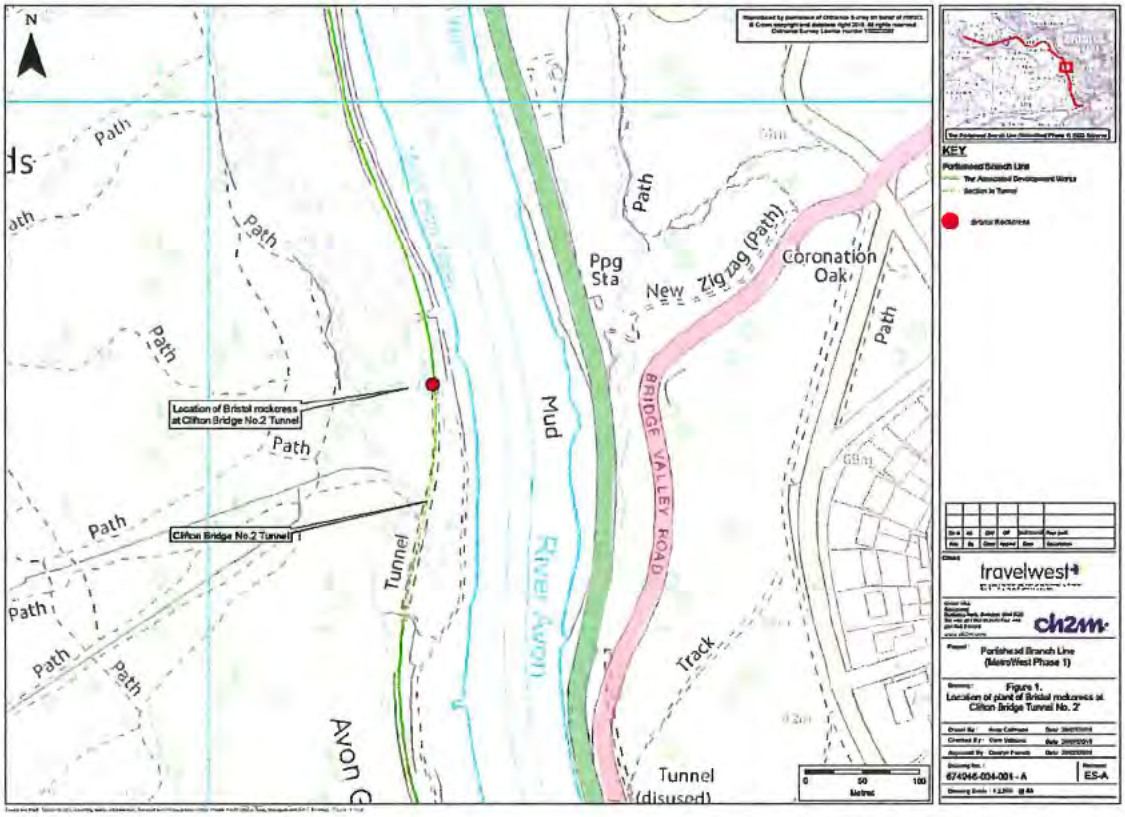


Figure 1. Location of plant of Bristol rockcress at Clifton Bridge Tunnel No. 2

Figure 2. Approximate location of Bristol rockcress on ledge just outside the Portishead portal of Clifton Bridge Tunnel 2. Inset bottom left: the Bristol rockcress plant in moss.

2.0 Bristol Rockcress Life Cycle and Ecology

The ecology of Bristol rockcress is described in the Biological Flora (Pring 1961) with additional detail in Lovatt (1982) and unpublished observations by Libby Houston and Tim Rich.

2.1 Life cycle

No long-term, detailed life history studies have been carried out, though some observations are available. Plants begin to flower when they are about 9 months old, and thereafter they flower and set seed every year. Individual plants have been observed to live for up to 4 years in the wild and in a cold frame but probably live longer (Pring 1961) as informal observations bear out. Lovatt (1982) reported that in cultivation he found plants to be monocarpic (i.e. flower once and die). In the wild, Bristol rockcress is probably a short-lived perennial.

Growth occurs all through year but maximum vegetative growth occurs in the spring and early autumn. Mature plants overwinter as evergreen rosettes. There is little or no vegetative reproduction. The rhizome branches slightly but the rosettes do not become separated from each other (Pring 1961). The original rosette is succeeded, or joined, by up to 4 or more in time on the same root. Between 2 and 4 rosettes appear to be the average, with 10 to 14 not uncommon. In stressed conditions, on rock but under dense ivy, a record 52 very stunted rosettes were found by Libby Houston on a single rootstock, but did not survive removal of the ivy.

Flowering mostly takes place from late March until early May and sometimes into June, though this can be varied by weather in different years (exceptionally a plant has even been seen flowering in September). It is unknown how plants are pollinated, but they are also self-compatible and a high percentage of flowers usually set fertile seed.

Most plants produce about 5 fruits per stem; at one site in 2019 Libby Houston observed as many as 75 fruits on the 21 stems of a healthy 11-rosette plant. Each fruit contains an average of 26 seeds. The seeds mature from June and are usually shed from July onwards, though some may still be found unshed the following spring. There is no specialised dispersal mechanism and seeds are not usually dispersed more than a few centimetres away from the parent. On an unbroken slope the effect of gravity has been observed to take a population gradually downhill even if into increasing shade. On the other hand, populations have recently been found at least 200 m from the nearest known seed source, one (NR Quarry 4) at about 60 m altitude.

There have been no studies of the seed bank in the wild, but casual observations suggest there is little or no seed-bank as if the plant becomes absent from a site, it usually remains so. Pring (1961) reported that seeds germinated well (60-90%) either from fresh seeds or those up to 3 years old which had been stored in dry conditions. Lovatt (1982) found that 7 year old seeds did not germinate.

Observations suggest that seedlings are prone to herbivory by slugs and/or snails, and seedling establishment may be a critical phase in the life cycle.

2.2 Habitats and vegetation

Bristol rockcress typically grows in rock crevices, and on rock ledges, shallow soil pockets and scree in grassland, scrub and open woodland on Carboniferous Limestone. The aspect may vary from southerly to northerly and the slope from flat to vertical, though it is most characteristic of south-facing slopes of c. 0-30 degrees (cf. Lovatt 1982 Figure IV/3.7). Such slopes are usually droughted in summer which kills competing vegetation.

One unusual site in the Gully, Clifton Downs is in open, sloping pine woodland where it grows amongst pine needles on the floor (Figure 3, part of site 3). Another unusual site is on the tarmac of a disused carpark in the Great Quarry where it grows in the crack between two courses of marking stone as well as the tarmac itself (Figure 3, part of site 4). A third unusual site is on rocks within the high tide flood zone of the River Avon in Leigh Woods. It once occurred in dense ivy at Penpole Point,

Shirehampton (c. 3-4 km north-west of Avon gorge) where some open patches were maintained by trampling, but has now been lost from this site. Although it is reported from open scree we rarely see it in this habitat.

Bristol rockcress is usually associated with calcicoles of nutrient-poor, dry vegetation such as *Festuca ovina, Hellanthemum nummularium* and *Poterium sanguisorba* subsp. *sanguisorba.* It does not tolerate competition well and cannot establish in closed turf, but will germinate readily in bare soil or in moss cushions. Most sites have minimal tree or shrub cover, though it can tolerate some shade but may not flower in deep shade.

Using data from thirty 25 cm x 25 cm quadrats (Lovatt 1982 Table IV/3.3), the Bristol rockcress microhabitat can be characterised as having an the average height of vegetation of 4.3 cm (10-90 percentiles = 1-7 cm) with average cover of bare ground/rock/rock fragments of 45% cm (10-90 percentiles = 12-71%), leaf litter cover of 5% cm (10-90 percentiles = 0-12%) and moss and lichen cover of 17% cm (10-90 percentiles = 0-38%). The average soil depth was 3.2 cm (10-90 percentile = 1-5cm).

The soils are usually fine calcareous (pH 7.4-8.1) rendzinas with small and large rock fragments and are freely drained, but it may also occur rooted directly into rocks or sometimes loose rubble. Pring (1961), using a calorimetric method, found medium to high nitrogen, phosphorus, potassium and manganese soil levels as with low aluminium and iron; further soil analyses would be desirable as these show some odd features such as high phosphorus which is normally insoluble above pH 6.7. Pring (1961) also noted Bristol rockcress can accumulate strontium, but there is no evidence that it is confined to strontium-rich soils (Lovatt 1982).

2.3 Distribution in Avon Gorge

The distribution of Bristol rockcress in the Avon Gorge is shown in Figure 3. The population which may be affected by the MetroWest project is site 12 (see also Table 1).

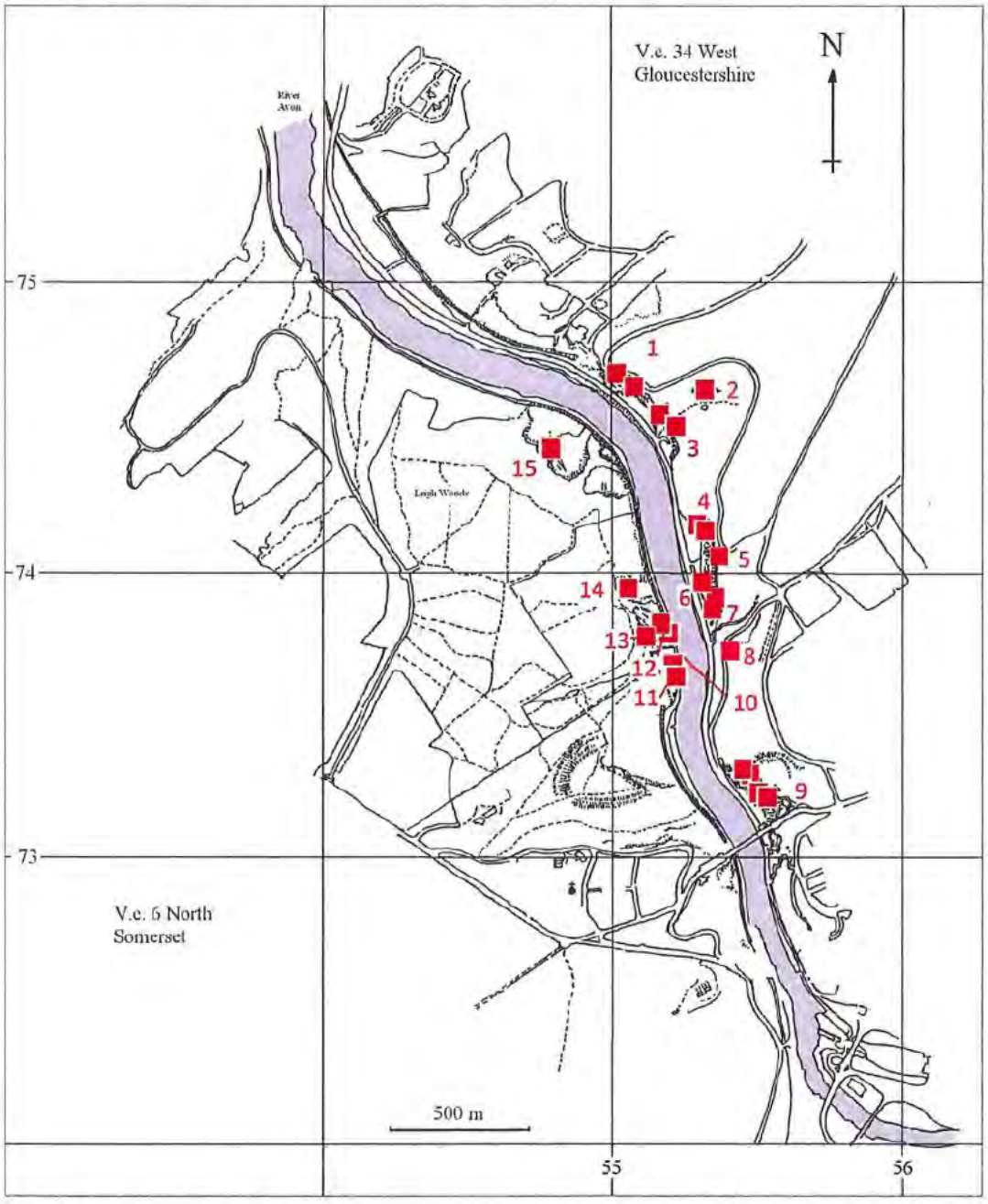


Figure 3. Distribution of Bristol rockcress in the Avon Gorge. Site numbering follows Table 1.

2.4 Population sizes in Avon Gorge

The overall population size and whether it is changing is difficult to assess as the number of plants has not been consistently counted by all recorders in different years. Importantly, most recorders counted the number of rosettes rather than number of plants. Seedlings were sometimes also noted but not counted in totals. Several estimates have been published, for example Lovatt (1982) listed between 4860 and 12147 rosettes (1977-1980 data) but not the number of individuals. Wigginton (1999) summarised the population status citing survey work by Ian Taylor of Natural England (Taylor's original report not seen); he cited 12 subsites within the Avon Gorge with total population estimates between 1977 and 1989 ranging from 500 to 5400 plants (though this refers at least in part to rosettes), and four subsites in Shirehampton with only 146 individuals in 1989. Green et al. (2000) suggested there were about 3000 plants on the Bristol side of the gorge and about 2000 on the Leigh Woods side.

The most recent systematic survey was by Ms Libby Houston in 1994 (Table 1) which estimated there were 3658 plants in 14 sites (excluding seedlings). It is now known from 15 sites in the Avon Gorge, though data from a partial survey 2007-2010 suggest the overall population is declining.

Table 1. Details of 1994 Bristol rockcress.

Site	Approx. grid reference	No. of plants	Details
1 Sea Walls	ST5606874645	216	skeletal soil on rocky edge, soil pockets & cracks in bare rock
2 Gully Outcrop	ST5632274644	187	broken grassland slope, shallow soil on rock, rock cracks
3 Gully, edge and south side	ST5617874534	34	open wooded slope under pines, pine needles in soil, soil pockets on open rock, soil on scree
4 Great Quarry base, N half	ST5630974174	358	soil slopes on rock & scree, soil pockets, cracks in steep rock
5 Great Quarry to Fairyland	ST5636673994	175	shallow soil on cliff-top rock, soil pockets & cracks on face
6 Great Quarry base, S half	ST5632573984	406	soil pockets on rock and rocky ledges, cracks in bare rock, tarmac
7 Fairyland	ST5638173878	232	soil slopes on rock & scree, soil pockets, cracks in bare rock
8 Bridge Valley Road	ST5640773772	123	soil pockets, cracks in steep rock, behind plastic mesh
9 St Vincent's Rocks	ST5643273345	612	soil slopes on rock, soil pockets, rock cracks, some mesh
10 Leigh Woods riverside rocks & towpath	ST5623273681	227	soil pockets, cracks in bare rock. NB 1 plant at tidal high water mark!
11 Donkey Slide south slopes and towpath	ST5621773698	77	soil pockets, sloping grassland, cracks in bare rock.
12 Donkey Slide north slopes	ST5620373754	168	shallow soil on rock slopes, soil pockets

Site	Approx. grid reference	No. of plants	Details
13 Quarry 1 (NE "Quarry 5")	ST5612973749	547	soil pockets, cracks in bare rock, sloping grassland
14 Quarry 2 (NE "Quarry 4")	ST56047 73946	296	soil on rock ledges, rock-cracks
15 Quarry 4 (NE "Quarry 2")	ST5576574440	not known	discovered 2001
	Total	**3658**	

Populations fluctuate sometimes quite markedly from year to year, though totals may be affected by the degree to which sites have been found accessible, or, after flowering, found at all. Since the rosette population totals reported in Lovatt (1982), two major sites have been located, one (the clifftop at Sea Walls; site 1) perhaps refound from the mid-nineteenth century, but the second in Quarry 4 (NE Quarry 2; site 15) was never in the historical record. The tarmac site (part of site 6) was first recorded in 2010, and is well-established. All 3 sites had several to many individuals when first discovered, whereas at another new site (St Vincent's Rocks Gully; part of site 9), where one rosette was found in 1997, the population expanded, shrank and disappeared again over about 15 years.

Lovatt (1982) found some evidence that plants were most abundant one or two years after hot, dry summers, assumed to be a consequence of open ground created by drought killing competitive plants giving new sites for seed germination and establishment. For example, there were good populations in 1978 two years after the 1976 drought Lovatt (1982); 2020 is thus predicted to be a good flowering year after the 2018 drought.

While the plant is still present in all its sites, in some cases only a very few plants remain where formerly there were many. The reason may be straightforward. The Dolomitic Conglomerate outcrop beside Bridge Valley Road where Lovatt (1982) recorded 2363 rosettes in 1978 was covered in plastic netting later that year, since when numbers have fallen (to 41 rosettes on 29 plants in 2010) as the habitat changed. At 7 sites at least, populations have shrunk drastically where major scrub clearance has been carried out, specifically for conservation of this species; e.g. at the south end of the Great Quarry where there were 212 rosettes (125 plants) scattered about a wide and deep area of rocks in 1994, there are now 26 rosettes (13 plants) in two groups at opposite edges of the site. The work was done with care; plenty of bare ground is now evident: another factor must be involved.

2.5 Genetic variation

No studies have been undertaken on the genetic/DNA variation in Bristol rockcress as far as we are aware.

3.0 Examples of Cultivation of Bristol Rockcress

Three examples of growing Bristol rockcress are given below, demonstrating that it is possible to establish and grow plants.

3.1 Bristol University Botanic Gardens

Bristol rockcress is included as part of a display on the Avon Gorge flora with other rarities at the Botanic Gardens. It has been grown for many years (https://botanic-garden.bristol.ac.uk/plant-collections-and-glasshouses/local-flora-and-rare-native-collection/avon-gorge-display/).

Some of these plants have been successfully planted in the small 'Bristol Rare Plants Garden' created by the Bristol Zoo Gardens, the Clifton Suspension Bridge Trust and Avon Gorge and Downs Wildlife Project on the Clifton side of the Suspension Bridge, where they have been grown since 2006.

3.2 Hope-Simpson transplant experiments

Hope-Simpson (1955; 1987), as part of research into explaining the restricted British occurrence of seven rare species, sowed seeds and planted plants of Bristol rockcress at Burrington Combe and Goblin Combe near Bristol. He reported in 1955 that two 'rootings' were successfully established at Burrington Combe and three at Goblin Combe (the number of initial failures was not reported), and that 24 seeds pressed lightly onto soil were successfully established at Burrington Combe and 70 at Goblin Combe. No plants were thought to have survived in 1987. Unfortunately full details of this study have not been published so why Bristol rockcress failed to establish is unknown as some of the other transplants such as spiked speedwell have flourished.

3.3 Establishment on walls in Somerset

Bristol rockcress plants introduced to a rock face at Cannington Park and to a wall at Wembdon in the 1920s by H. Corder were still present to at least 1995 (Green *et al.* 1997).

4.0 Mitigation Strategy

The mitigation strategy aims to collect seed and translocate plants from the construction work area prior to works commencing, cultivate them and collect seeds when being grown, then replant both plants and seed at the donor site. Any affected Bristol rockcress plants affected will be replaced on a 2 to 1 basis, with management and monitoring of the transplanted plants for five years after planting. This reintroduction site will be located as close to the existing site affected by the MetroWest project as possible where suitable habitat requirements exist, within Network Rail rock face ID06.

In addition to replanting on Network Rail rock face ID06, replanting will be undertaken at Quarry 1 (Table 1, Site 13) to further compensate for impacts. The Network Rail land includes a short section of east-facing rock face behind the railway fence along the edge of the quarry with safe off-line access where Bristol rockcress plants have on occasions been seen growing there historically.

As all potential replanting sites are within the Avon Gorge SSSI and this is a protected species under Schedule 8 of the WCA (as amended), consent for the removal of the plant will be sought from NE prior to works commencing.

4.1 Pre-construction surveys and planning

Prior to commencement of construction works during the detailed design stage of the proposed development, a detailed Bristol rockcress survey will be carried out to identify the location of individual plants. This will then be used to design works to reduce impacts where possible through siting of works, such as location of rock bolts, away from areas where plants have been recorded.

In addition, light vegetation clearance will be required on NR rock face ID06 (an area of 555 m^2 in total) to complete the full geo-technical inspection to inform the detailed design. All vegetation clearance will be completed under an ecological watching brief by a specialist botanist and will avoid any rare/notable plants including Bristol rockcress; as Bristol rockcress forms rosettes on the ground, it will not need to be removed to facilitate the full geo-technical inspection. Any further works arising from this inspection will be subject to a separate assessment.

Following detailed design of the works, an assessment will be completed on the number of plants that will be affected by the proposed rock safety works (both directly and indirectly). Any Bristol rockcress plants which cannot be avoided by the works will be marked carefully for transplant. The soils from these areas will be assessed by a soil specialist, and plans and costs established to collect and store soils for re-use following the standards in *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (DEFRA 2009).

Bristol rockcress plants adjacent to areas affected by rock works will also be clearly labelled and fenced with barrier tape and signage to ensure that they are not affected.

Costs will be obtained and contracts approved for cultivation of plants in an appropriate botanic garden (such as Bristol University Botanic Garden) prior to collection of any individuals from the wild.

As there are no genetic data available, material will be used from each different plant affected in equal proportions to maintain maximum genetic variation.

4.2 Collection of seed

Re-establishment from seed is considered likely to be the most successful method to provide additional plants to allow 2 to 1 replacement. If plants are flowering/fruiting ripe seeds will be collected from any plants affected by the works prior to construction and stored in optimum conditions (such as in the Millennium Seed Bank, Royal Botanic Gardens Kew). Seed typically ripens from June to July sometimes remaining on the plant until October and later. Seed from each plant will be kept separately to ensure the range of genetic variation can be maintained.

Once plants are in cultivation, seed will be collected from any successfully transplanted plants which flower/fruit; this will then be used for reintroduction.

4.3 Removal of plants and soil during site clearance

Any Bristol rockcress plants directly affected by the works will be translocated to a suitable botanic garden (such as Bristol University Botanic Garden) with a view to either replanting them at the receptor site or collecting seed from them for planting out; this would be best done in spring or autumn if the construction timetable allows. As far as we are aware, only Hope-Simpson (1955, 1987) has attempted transplanting established plants but he gave insufficient detail about his method, so this will be attempted as described in Sections 4.4 and 4.5 below.

Pring (1961) reported that the root system is fine and much branched with conspicuous lateral roots which may run through surface layer of soil to 15-20 cm before continuing into cracks in the rocks, or may pass directly into the rock. Hence the roots of each plant will be carefully excavated to maximise the amount of root extracted to increase the likely success of transplanting plants. Once extracted, the plants will be placed in a damp bag in a cool box and taken to the botanic garden where they will be planted out in garden soil in pots, initially using a mist unit to maximise chances of re-establishment. These transplants can then be weaned off and grown in a cold frame, protected from molluscs.

Where possible, soils will also be collected as these may contain Bristol rockcress seeds and seeds of associated species and these will be used to grow on the plants in the botanic garden. In the event that insufficient soil is available from the site clearance, soils will be made up from low nutrient mixtures, preferably mixed with fine limestone rubble. If excess soil is available, soil will be stored off-site, as advised by a soil specialist, for reuse.

4.4 Receptor site(s)

Two sites are proposed for replanting on Network Rail land:

- NR rock face ID06 (Chainage 122 mi 64 ch).
- Quarry 1, rock face adjacent to the railway (Chainage 122 mi 66-68 ch).

Within these site, the replanting will be carried out using seed and transplanting plants on stable rock slopes which will not be subject to further works, with suitable limestone ledges where a typical microhabitat can be created/maintained with open vegetation and soil depth of 1-5 cm. These sites are close to existing rockcress populations so gene flow can be maintained and plants can contribute to the metapopulation.

4.5 Transplant methods

4.5.1 Soils

As available, soils from the site will be used to create suitable microhabitats for Bristol rockcress with pockets of soil 1-5 cm deep, depending on the microtopography. This will be assessed once the rock safety works have been completed.

4.5.2 Original plants

If an appropriate-sized microhabitat can be found, the original plants will be transplanted into the new site in October maintaining as much soil around the roots as possible. Some initial watering will be required for the first month to allow establishment.

4.5.3 Seed

Seeds will be sown in autumn and spring on soil pockets 1-5 cm deep at an initial ratio of 10 seeds for each plant lost. These will be gently pressed into the soil but not buried deeper than 5 mm. Seeds from different plants will be used in equal proportions to maintain the genetic diversity.

4.5.4 Pot-grown plants from seeds

A stock of pot-grown plants grown from seed from the site/original plants will be maintained in the botanic garden for replacing any failed plants for five years after the initial planting (year 1). These will also be grown in similar proportions to ensure appropriate genetic representation.

4.5.5 Mollusc control

All transplant sites will likely require control of slugs and/or snails using ferric phosphate based pellets (such as Growing Success Advanced Slug Killer, Solabiol Garden Slug Killer, Sluggo Slug & Snail Killer or SlugClear Ultra3, subject to approval by Natural England). Metaldehyde pellets will not be used (these will be banned anyway in 2020). Copper-based pellets will not be used as these can also affect mycorrhizal fungi associated with plant roots (it is not known whether Bristol rock-cress has mycorrhizae or not - many Brassicaceae lack them). Given the rocky nature of the habitats, mollusc control by nematodes is unlikely to be successful.

4.6 Maintenance

Positive management is proposed on the rock face adjacent to the tunnel in a 420 m^2 area of SAC grassland (Network Rail Rock face ID06). This will entail clearance of any competing vegetation (excluding rare vegetation) including holm oak, cotoneaster, ivy and alien plant species. The light vegetation clearance and positive management will provide more open rock face which will benefit Bristol rockcress in the short term by reducing competition and shading. Typical plants associated with Bristol rockcress such as *Festuca ovina* will be tolerated.

In the longer term, NR land within the Avon Gorge SAC/SSSI will be managed under NR's Site Management Statement (SMS) and Vegetation Management Plan (ES Appendix 9.15). After completion of the actions set out in the current SMS (2018-2023) and the activities of the MetroWest DCO Scheme, NR will reassess its activities to develop a new SMS.

4.7 Monitoring

The Bristol rockcress receptor areas will be checked and monitored twice a year in Years 1 and 2, then annually in Years 3, 4 and 5 and Years 7 and 9. The aim will be to ensure survival of the rockcress and replace dead plants if necessary in years 1-5, and to learn about growth of the rockcress which can be used to inform potential future mitigation plantings in the long term.

The monitoring will be undertaken in April when plants flower, and vegetative rosettes searched for in the first two years in October. At each visit, the growth of each plant will be assessed by counting rosettes on each root stock together with the reproductive status (vegetative/flowering/fruiting).

Reports to Network Rail and Natural England will be cumulative adding to existing data rather than each year reported in isolation to ensure data is not lost and a comparison on mitigation effectiveness can be made.

4.7.1 Establishment and Monitoring program

Date	Task
Year 1 September	Assess and prepare transplant sites, prepare planting plans for October.
Year 1 October	Plant plants and sow autumn seeds unless long dry period predicted. Apply slug control.
Year 1 April	Count seedlings. Assess growth/flowering. Apply slug control if needed.
Year 2 October	Count plants. Assess growth/flowering. Restock if required as above. Assess competing vegetation and control if required. Submit report.
Year 2 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Submit report.
Year 3 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Add new replacement plants in October if required. Submit report.
Year 4 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Add new replacement plants in October if required. Submit report.
Year 5 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Add new replacement plants in October if required. Submit report.
Year 7 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Submit report.
Year 9 April	Monitor plants and reproductive status; assess competing vegetation and control if required. Submit report.

4.8 Detailed design stage

At the detailed design stage, the following further work will be needed:

- Finalise rock bolt locations (avoiding Bristol rockcress if possible).
- Locate any Bristol rockcress that needs to be translocated as a consequence of rock bolts.
- Locate transplant and planting sites at NR rockface ID06.
- Detailed survey of NR land within Quarry 1 and choice of additional planting sites.

Summary

Rock stabilisation works for the MetroWest project may affect a population of the statutorily protected Bristol rockcress *Arabis scabra* (=*Arabis stricta*) in the Avon Gorge SSSI at NR rock face number ID06 on the northern (Pill) end of Clifton Bridge Tunnel no. 2 at 122 mi 63 ch, where approximately 20 m² of rockface may require installation of rock bolts and light vegetation clearance over the adjacent area of 555 m² to enable a geotechnical rock inspection. Natural England have requested that a mitigation strategy be drawn up.

Bristol rockcress is a short-lived perennial plant which occurs in short (1-7 cm high), open (c. 50% cover) vegetation on rocky limestone slopes in the Avon Gorge on shallow soils 1-5 cm deep. The most recent systematic population survey in 1994 estimated there were 3658 plants in 14 sites. It is now known from 15 sites in the Avon Gorge, though data from a partial survey 2007-2010 suggest the overall population is declining.

Bristol rockcress is readily cultivated in Bristol University Botanic Gardens, and has been introduced to the wild in four sites with varying success.

The aim of the mitigation strategy is to replace any affected Bristol rockcress plants with at least twice as many plants as lost, which is to be maintained for five years. The following will be undertaken as part of Bristol rockcress mitigation strategy:-

- Surveys of affected plants and soils will be carried out prior to construction to define the scale of the mitigation programme, and plans and contracts put in place prior to any plants being removed. Plants will be avoided by careful siting of rock bolts if possible.
- If possible, seed will be collected prior to construction in June or July.
- Any affected plants will be collected together with existing soils prior to, or during, site clearance, preferably in autumn or spring. Transplanted plants will be grown in a botanic garden with a view to replacing them in the wild, or harvesting seed from them for reintroduction.
- The original plants and/or seed will be replanted/sown in appropriate microhabitats on the new rock face at NR rockface ID06 and in the Quarry 1 on the rock face adjacent to the railway (both NR land).
- Monitoring will be carried out twice a year for two years after initial planting (year 1), then annually for another 3 years then every two years up to 9 years after initial planting.
- Positive management is proposed on NR rock face ID06 (where Bristol rockcress is located) in a 420 m² area of SAC grassland.

5.0 References

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Annex L Avon Gorge Management of Arisings

SECTION 1

Introduction

1.1.1 The Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme ("the DCO Scheme") proposes to reopen the railway line between Bristol and Portishead to passenger trains. The railway line runs through the Avon Gorge Site of Special Scientific Interest ("SSSI") and the Avon Gorge Woodlands Special Area of Conservation ("SAC").

1.1.2 Rail upgrade and improvement works and their resulting operational activities, if not carefully managed, could impact the sensitive features of the Avon Gorge SAC and SSSI. Management of arisings during vegetation clearance of the DCO Scheme has been identified as one of the potential impacts.

1.1.3 Twenty-four areas were identified within the Avon Gorge where positive management by removal of vegetation such as holm oak *Quercus ilex* and cotoneaster *Cotoneaster* spp. to compensate for the construction impacts of the scheme are proposed. The locations of these are shown on Annex F-Figure 1 and referenced G1 to G26. These 24 areas were surveyed to identify suitable areas for temporary storage of arisings and areas where a small number of trees could be left to decompose for deadwood provision nearby.

1.1.4 A detailed pragmatic approach to arisings should be sought, as detailed below.

- Felled trees
    - No timber or arisings from invasive non-native species to be left on site so as to remove seed sources and natural regeneration. The majority of the felled trees will need to be removed from site. Timber cannot be chipped and left on site, it must be left as is or cut to facilitate decay, which provides habitats for invertebrates. Brash from felled trees should be removed from site.
    - The SAC objective (Natural England, 2019) allows for 3 to 5 fallen trees with a diameter of >300 mm per hectare to be left on site. The timber must not obstruct light for SAC qualifying habitats or rare species or smother other species or pose a risk to their stability.
- Brash
    - From trees, created through limb reduction or lifting should be removed from site. Where trees have been coppiced, a small percentage of brash (not from invasive non-native species) should remain on site and can be piled over each coppice stool to act as a physical barrier to help deter deer from eating shoots of new growth, although it cannot be assumed that a small amount of brash will provide the necessary deterrent, particularly if the deer population is high or Muntjac deer are present in the woodlands. The Forestry Commission ("FC") has confirmed, however, that they

have found that piling brash around coppiced trees is a good deterrent to deer browsing (FC, pers comm).

1.1.5 Any timber left on site must be safely stored so that it cannot slip and pose a risk to the railway, staff or members of the public or protected species.

1.1.6 If arisings cannot be removed immediately, they must be stored in a position of safety along the track or in an area of clearance (preferably areas of secondary (recent) woodland) which does not impact on any protected species. Arisings must be removed as soon as possible and this shall be monitored by the Ecological Clerk of Works.

SECTION 2

Survey methodology

2.1.1 A walkover of the site was undertaken by Libby Houston and Richard Thompson on 23 March 2020. Libby Houston is a botanist with extensive, specialist knowledge of the flora of the Avon Gorge and is a member of the Bristol Naturalists' Society, the Botanical Society of Britain and Ireland ("BSBI") and the Somerset Rare Plants Group. Richard Thompson is an ecologist at Jacobs with over 20 years of professional experience of botanical and habitat survey.

2.1.2 The survey was undertaken from the rail track. A search was made for suitable locations for temporary storage of arisings in proximity to proposed woodland management areas in accordance with the provisions set out in paragraph 1.1.4 and 1.1.5 of this Annex. In addition, areas were identified where a small number of trees will be stacked in a small pile and left to decompose for deadwood provision. All areas proposed for temporary storage of arisings and deadwood provision are within Network Rail ("NR") land. Each identified, suitable location was mapped and photographed, with notes made on its characteristics.

2.1.3 Survey areas are categorised into ancient semi-natural woodland or secondary woodland, which are described below.

- Ancient semi-natural woodland -
  The woodland is dominated by Small-leaved lime *Tilia cordata* with beech *Fagus sylvatica*, ash *Fraxinus excelsior* and wych elm *Ulmus glabra,* with yew *Taxus baccata* associated with the more natural slopes, rocky outcrops and cliffs. Much of this is diverse Ancient Woodland with uncommon species in the ground flora such as lily-of-the-valley *Convallaria majalis*. This woodland occurs on the natural rocks and slopes, for example around the Clifton Bridge No. 1 Tunnel portal, and small widths are included in the NR Land bordering the railway.

- Secondary woodland -
  Secondary woodland (taller than 5 m) is the main woodland type along the railway cuttings, in quarries, between the railway and the River Avon Tow Path, and between the tow path and the river, with lime *Tilia spp.*, oak *Quercus spp*, ash, sycamore *Acer pseudoplatanus*, wych elm, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, traveller's joy *Clematis vitalba*, bramble *Rubus fruticosus* and invasive non-native species such as holm oak and Norway maple *Acer platanoides*. Much of this woodland is not diverse, but the more open areas are a key habitat for some of the rare Whitebeams *Sorbus* spp., at least while the woodland is young.

2.1.4 Both ancient semi-natural woodland and secondary woodland are included in the qualifying *Tilio-Acerion* woodlands (European Commission 2007) for which the SAC is designated (mainly national vegetation classification ("NVC") types W8 and W9).

SECTION 3

Proposed locations for storage of arisings from woodland management

3.1.1 Table L1 details the proposed locations for temporary storage of arisings and deadwood provision from woodland management. These locations are also identified in Annex L - Figure 1. The nearest area for positive management is identified and also shown on Annex L - Figure 1.

3.1.2 A total of 22 temporary storage sites are identified, of which 13 are also suitable for a small number of trees to be stacked in a small area for provision of deadwood. Locations where temporary storage and deadwood provision is proposed must be agreed with NR. Storing arising would have to be authorised by the NR local Delivery Unit who maintain the line and will require areas for materials/plant/machinery storage and positions of safety. The same procedure applies to any NR workstreams along the Portbury Freight line that might be impacted by temporary storage of arisings.

3.1.3 Temporary storage of arisings will be for the duration of the line blockage only for locations 18 and 20 which are close to the railway. Other locations identified for temporary storage can be used for the duration of the tree works in the area where positive management is proposed plus a maximum of 2 months afterwards. This is detailed in Table L1.

3.1.4 It may be possible to chip arisings into 1 tonne bags to enable easier collection by a Rail Road Vehicle. Other arising may need to be banded whilst temporarily stored so that it cannot slip and pose a risk to the railway, staff or members of the public or protected species.

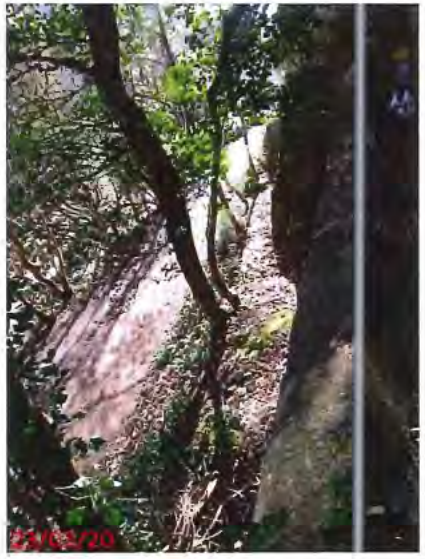
3.1.5 For deadwood provision, Table L1 details the proposed number of felled trees to be left at each location to comply with the SAC objective (Natural England, 2019) i.e. 3 to 5 fallen trees with a diameter of >300 mm per hectare to be left on site. NR land covers 11.5 hectares along the SAC and deadwood provision of 25 trees has been allocated. Table L1 sets out a proposed number of felled trees to be left at each of the 13 identified locations to give as even a spread as possible across NR land.

3.1.6 Any timber left on site for deadwood provision must be safely stored so that it cannot slip and pose a risk to the railway, staff or members of the public or protected species and important habitats such as SAC grassland.

Table L1: Proposed locations for temporary storage of arisings and deadwood provision from woodland management

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
1. Temporary - duration of the tree works in the area plus a maximum of 2 months afterwards.	G1	n/a	Area (approx. 1.5m x 4m) of bramble and buddleia adjacent to the tow path. Would need to remove buddleia and treat the stumps with herbicice to establish location for arisings. No arisings to be placed on area of patchy brambles to the north. Suitable for temporary storage. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
2. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G1	2	Area (approx. 6m x 4m) at base of quarry in secondary woodland, just behind the rail line fence. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
3. Temporary - duration of the tree works in the area plus a maximum of 2 months afterwards.	G2	n/a	Area of bare ground (approx. 1.5m x 4m) adjacent to the tow path below Clifton Bridge No. 1 Tunnel entrance. Secondary woodland. Suitable for temporary storage. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
4. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards)	G2	n/a	An approx. 30m x 1m band just behind the rail line fence above the tow path in secondary woodland. Some arisings left there already. Extent stops just to the south of the SSSI sign where the mitigation area starts. No arisings to be left beyond this point. Suitable for temporary storage. Two photos taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
5. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G2	2	Area (approx. 6m x 3m) behind the fence within land owned by NR and adjacent to the Valley Underbridge, on the Leigh Woods side in secondary woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
6. Temporary - duration of the tree works in the area plus a maximum of 2 months afterwards.	G3	n/a	Area (approx. 3m x 3m) just to the north of the rock outcrop with *Sorbus eminens*, behind the tow path wall. In ancient woodland. Suitable for temporary storage. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
7. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G3	2	Area (approx. 6m x 2m) on the Leigh Woods side opposite Arisings location number 6, just to the north of the rock face. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
8. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards)	G4	n/a	Area (approx. 3m x 6m) already used for arisings to the immediate south of G4 on the tow path side on the edge of secondary woodland. Suitable for temporary storage. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
9. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards)	G14	n/a	Area (approx. 2m x 4m) on the tow path side adjacent to Clifton Bridge No. 2 tunnel, below the cliff. The holm oak saplings in this area could be cleared and stumps treated with herbicide to increase the area available for arisings. Suitable for temporary storage. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
10. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G13	2	Area within NR land (approx. 6m x 3m) to the north of the cliff face on the Leigh Woods side, just behind the metal fence, on the edge of ancient woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
11. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G12	2	Area within NR land (approx. 6m x 3m) just to the north of the rock face, behind the fence on the Leigh Woods side, adjacent to a gate, on the edge of ancient woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
12. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G15	2	Area (approx. 3m x 6m) on the opposite side of the rail line from G15 on the edge of ancient woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
13. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G26	2	Arisings area (approx. 4m x 5m) to the north of the cliff face within NR land, just behind the fence on the Leigh Woods side, on the edge of ancient woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
14. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards)	G6, G7 & G8	n/a	Two areas (each approximately 4m x 2m in extent) to the north and south of a small ruined building, on the edge of secondary woodland. The southern location is situated opposite a number 50 marked in blue on the rock face. Clearing holm oak saplings and treating stumps with herbicide will create more space for arisings. The northern location is situated opposite a number 30 marked in blue on the rock face. Suitable for temporary storage. Three photos taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
15. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G8 & G9	2	Area (approx. 6m x 5m) at the base of an old small quarry between G8 and G9 in secondary woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
16. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G9 & G16	1	Area (approx. 2m x 5m) on the tow path side, just to the northwest of a common whitebeam and G16, in secondary woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
17. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G10 & G17	2	Area (approx. 3m x 6m) opposite the rock face on the tow path side in secondary woodland. Removing young holm oak and treating the stumps with herbicide from the area would create more space. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
18. Temporary - for the duration of the line blockage only	G18 & G19	n/a	A band approx. 1m x 30m on the edge of the ballast adjacent to a concrete post and wire fence is suitable for temporary storage for the duration of the line blockage only. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
19. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision	G19	2	Arisings to be left immediately northwest of G19 in a hollow by an old wall in secondary woodland, approximately 10m from the rail line. Area approx. 8m x 4m in extent. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
20. Temporary (for the duration of the line blockage only)	G20 & G21	n/a	Broad area of ballast (approx. 10m x 3m in extent) opposite a metal rock fall barrier just to the south of G21. Suitable for temporary storage for the duration of the line blockage only. Photo taken date: 23 March 2020	

Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
21. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision.	G22 & G23	2	Area of bare ground (approx. 10m x 3m) in the centre of G23 in a dip in front of an old mossy wall, 10m from the rail line. In ancient woodland. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

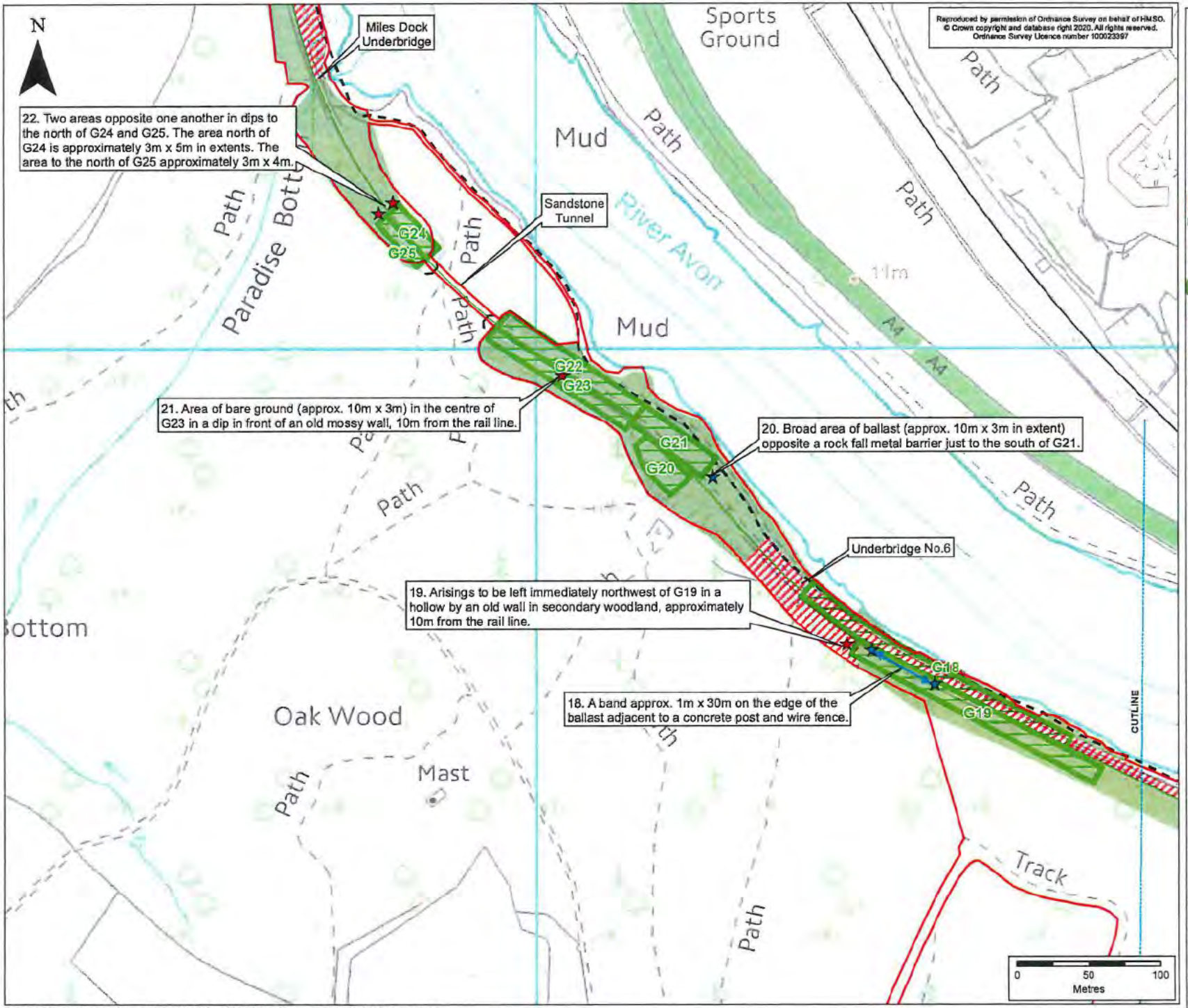
Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph
22. Temporary (duration of the tree works in the area plus a maximum of 2 months afterwards) and deadwood provision.	G24	2 (1 tree at each area)	Two areas opposite one another in dips to the north of G24 and G25. The area north of G24 is approximately 3m x 5m in extent. The area to the north of G25 approximately 3m x 4m. Suitable for temporary storage and deadwood provision. Photo taken date: 23 March 2020	

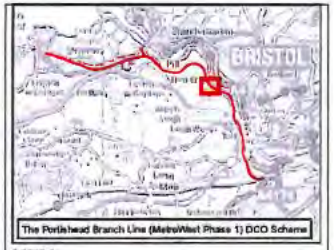
Arisings location number and temporary storage and/or deadwood provision	Nearest positive management areas (Figure 1)	Proposed number of felled trees to be left for deadwood provision	Location Description	Photograph

SECTION 4

References

Natural England (2019) *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Avon Gorge Woodlands Special Area of Conservation (SAC) Site Code: UK0012734.*





KEY

- Order Limits
- Bristol City Council Boundary
- Area suitable for temporary storage of arisings and deadwood provision
- Area Suitable for Temporary Storage
- Groups of Trees Proposed for Positive Management
- Ancient/Semi-natural Woodland
- Secondary Woodland

Portishead Branch Line

- The Associated Development

Railway Line

- Existing Railway Line
- Railway Tunnel

Rev	By	Chkd	Apprvd	Date	Description
ES-B	JG	RS	CF	18/09/2020	Second draft
ES-A	MC	RT	CF	23/03/2020	First draft

Client: travelwest

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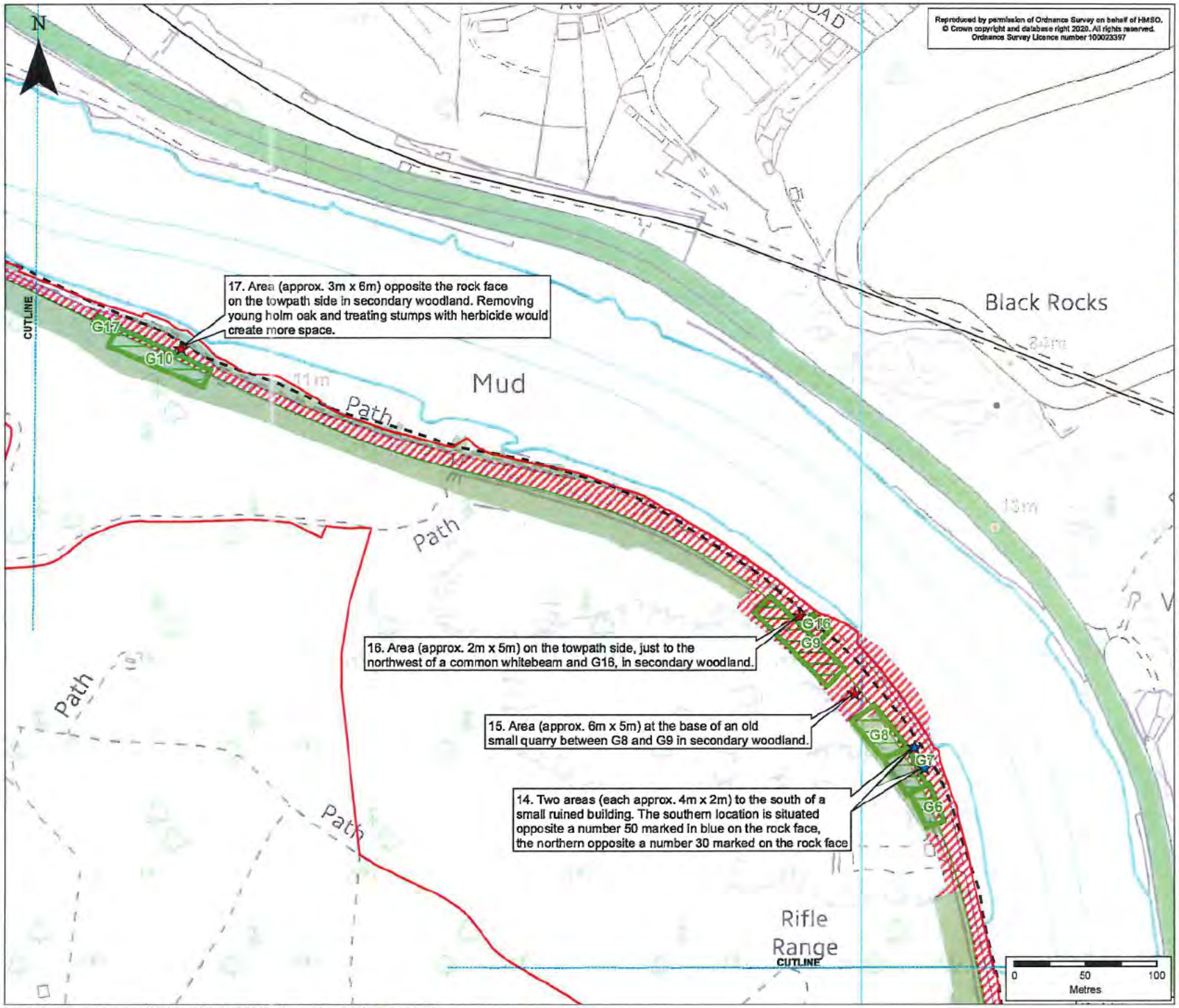
Project: Portishead Branch Line (MetroWest Phase 1)

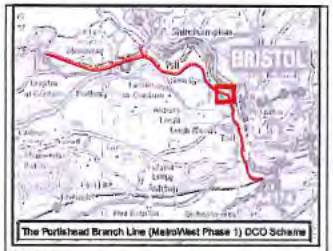
Drawing: Figure 1 Proposed locations for temporary storage of arisings and deadwood provision (Sheet 1 of 4)
APFP Regulation 5(2)(e)

Drawn By :	Jamie Gilham	Date: 18/09/2020
Checked By :	Richard Smedley	Date: 18/09/2020
Approved By :	Carolyn Francis	Date: 18/09/2020

Drawing No. : 674946-004-101 - A
Revision: ES-B
Drawing Scale : 1:2,500 @A3

Document Path: I:\wet\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Tree_Management\Proposed_Locations_for_Arisings_v3.mxd





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- Ancient/Semi-natural Woodland
- Secondary Woodland

Portishead Branch Line

- The Associated Development Works

Railway Line

- Existing Railway Line

Rev	By	Chkd	Apprvd	Date	Description
ES-B	JG	RS	CF	16/09/2020	Second draft
ES-A	MC	RT	CF	27/08/2020	First draft

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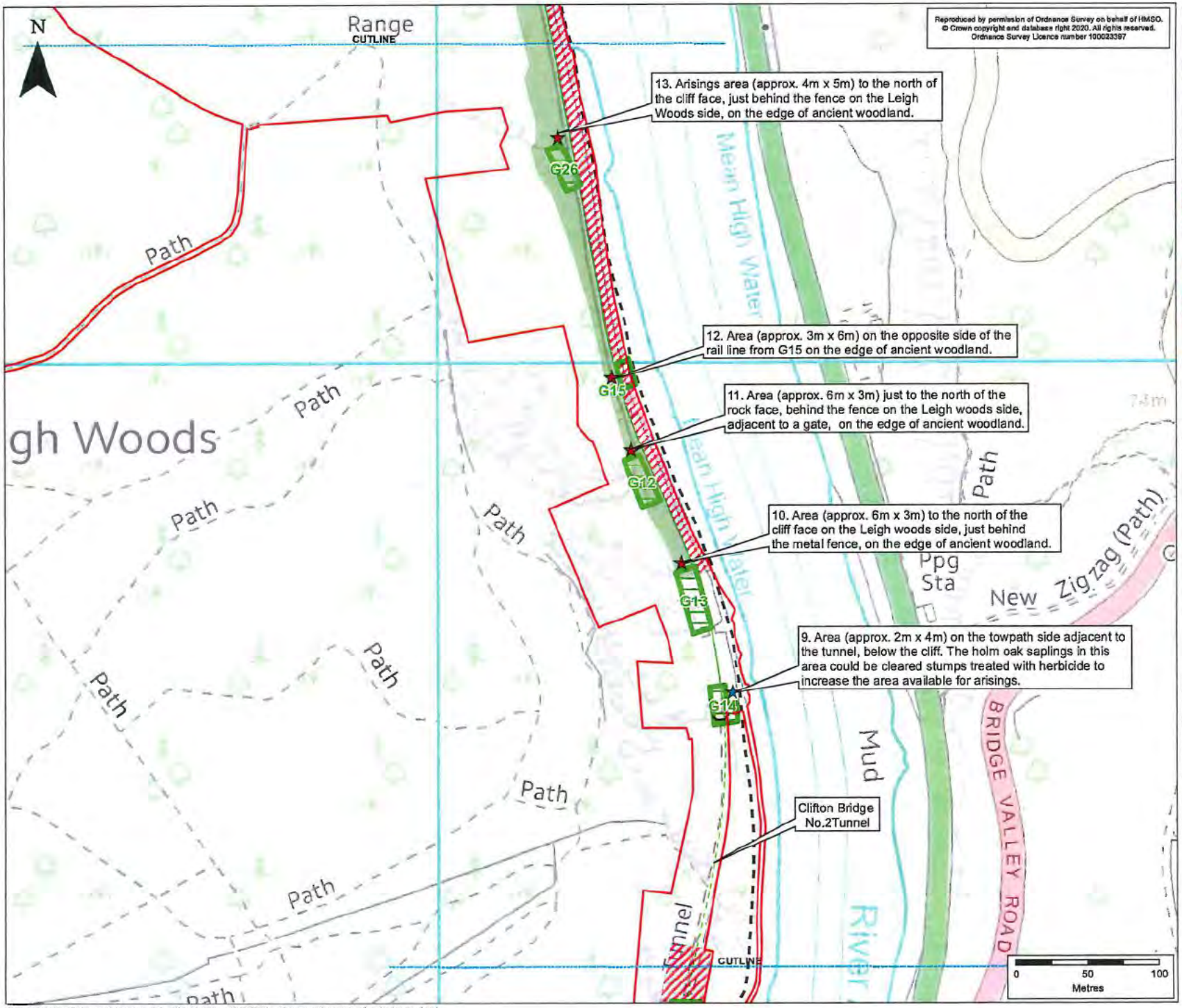
Drawing: Figure 1 Proposed locations for temporary storage of arisings and deadwood provision (Sheet 2 of 4)
APFP Regulation 5(2)(a)

Drawn By :	Jamie Gillham	Date: 16/09/2020
Checked By :	Richard Smedley	Date: 16/09/2020
Approved By :	Carolyn Francis	Date: 16/09/2020

Drawing No. : 674946-004-101 - A
Revision: ES-B
Drawing Scale : 1:2,500 @ A3



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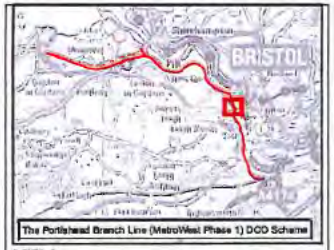

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Portishead Branch Line

- The Associated Development Works
- Section in Tunnel
- Railway Tunnel

Rev	By	Chkd	Approd	Date	Description
ES-B	JG	RS	CF	18/09/2020	Second draft
ES-A	MC	RT	CF	23/06/2020	First draft

Client: travelwest

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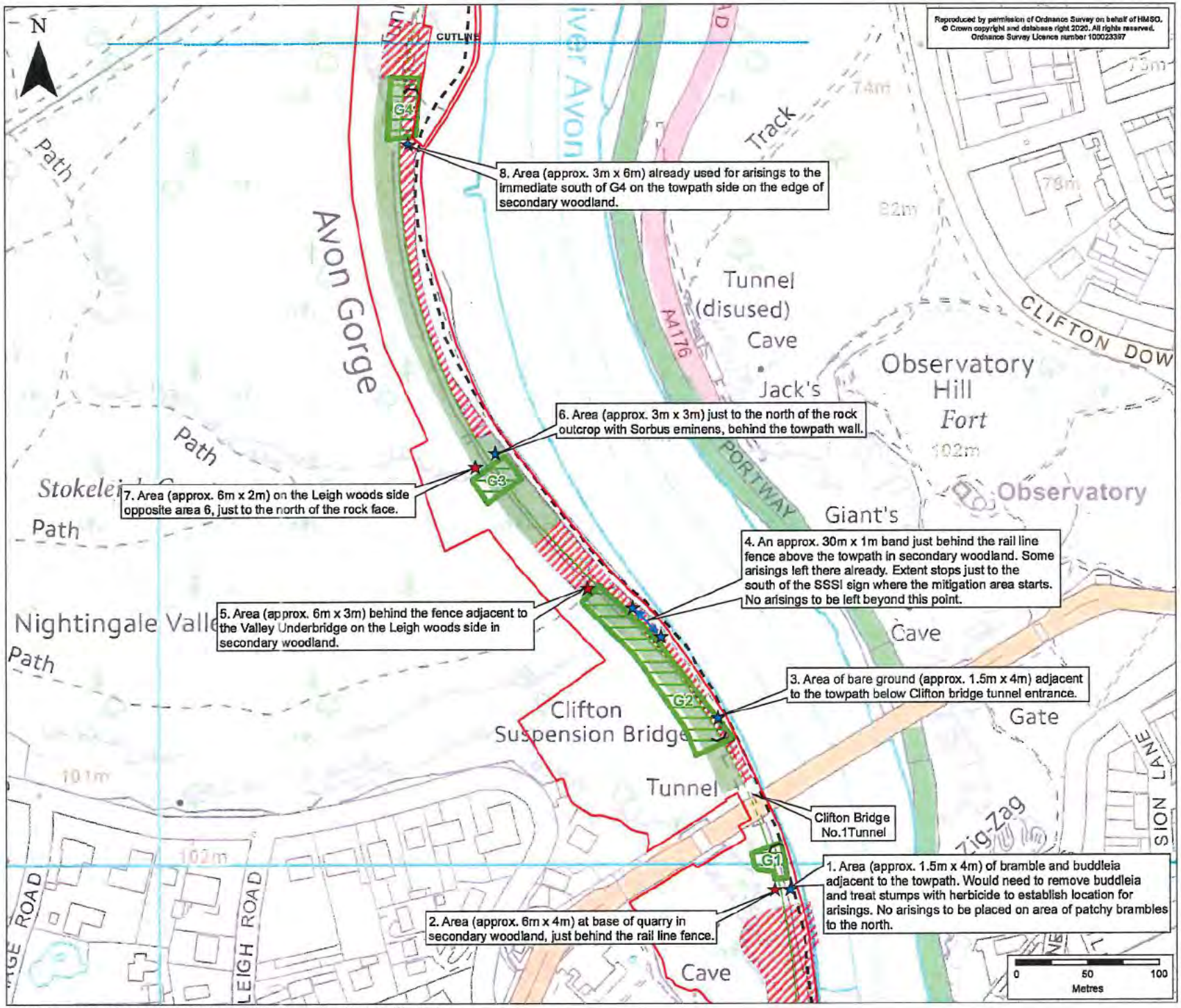
Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Figure 1 Proposed locations for temporary storage of arisings and deadwood provision (Sheet 3 of 4)
APFP Regulation 5(2)(e)

Drawn By:	Jamie Gilham	Date: 18/09/2020
Checked By:	Richard Smedley	Date: 18/09/2020
Approved By:	Carolyn Francis	Date: 18/09/2020

Drawing No.: 674946-004-101 - A
Revision: ES-B
Drawing Scale: 1:2,500 @A3

Document Path: U:\ne\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXDs\Tree_Management\Proposed_Locations_for_Arisings_v3.mxd



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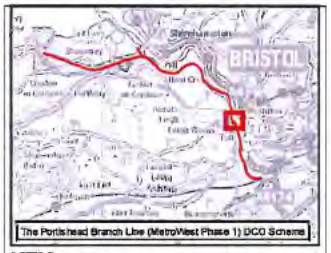

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ES-B	JG	RS	CF	18/09/2020	Second draft
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Project: Portishead Branch Line (MetroWest Phase 1)

Drawing: Figure 1 Proposed locations for temporary storage of arisings and deadwood provision (Sheet 4 of 4)
APFP Regulation 5(2)(a)

Drawn By :	Jamie Gilham	Date: 18/09/2020
Checked By :	Richard Smedley	Date: 18/09/2020
Approved By :	Carolyn Francis	Date: 18/09/2020

Drawing No. : 674946-004-101 -A
Revision: ES-B
Drawing Scale : 1:2,500 @ A3

Document Path: U:\wo\Environmental_Assessment\Projects\MetroWest Phase 1\GIS\MXD\Tree_Management\Proposed_Locations_for_Arisings_v3.mxd

Annex M Woodland Management Plan, Forestry Commission positive management area

Woodland Property Name	Portishead Branch Line (MetroWest Phase 1) compensation by positive management, FC land Leigh Woods.	
Unique Reference		
Plan Period dd/mm/yyyy (ten years)	**Approval Date:** 01/09/2020	**To:** 01/09/2030
Five Year Review Date	01/09/2025	

Approval Criteria – FC Office Use Only

The UKFS states that a management plan should:

UKFS	Approval Criteria	FC Approval & Notes
State the objectives of management, and how sustainable forest management is to be achieved	Have objectives of management been stated? Consideration given to economic, environmental and social factors (Section 2.2)	
Provide a means to communicate forest proposals and engage interested parties	Have work proposals been communicated in the management strategy (section 6) and felling & restock table (section 8) and potential interested parties identified in Section 7	
Serve as an agreed statement of intent against which implementation can be checked and monitored	Has a five year review period been stated below and achievements recorded in section 3	
Approving Officer Name		Plan approved ☐

To Maximise Functionality

- Connect to the internet;
- Enable macros when prompted;
- where the text is blue and underlined additional information is available, hover over the text with your mouse and double click to open;
- where you see the symbol, left click on it and press the F1 key for a further explanation of the detail required;
- throughout the document where you see **'Add Box'** double click on the text and additional boxes will appear (enable macros first).

1. Property Details

Name	Forestry Commission	Owner x	Tenant ☐
Email		Contact Number	
Address	West England Forest District		
Agent Name (if applicable)		Bruce Macfarlane	
Contact Number	07931 762309	Email	bruce@coastaltree.co.uk
County	Somerset	Nearest Town	Bristol
Grid Reference	ST55117451	Local Authority	North Somerset
Management Plan Area (Hectares)		3.14	
List the maps associated with this management plan		Site plan with woodland compartments Plan showing woodland designations Plan showing SSSI/SAC Designations	
Do you intend to apply for a felling licence with this management plan?		Yes ☐	No ☐ No

2. Vision and Objectives

To develop your long term vision, you need to express as clearly as possible the overall direction of management for the woodland and how you envisage it will be in the future.

2.1 Vision

Describe your long term vision for the woodland(s).

To improve the condition of this section of Leigh Woods towards its *Tilio-acerion* woodland type, for which the Avon Gorge Woodlands SAC is designated. This is to be achieved by selective removal of non-native species and encouragement of desirable understorey species. Targeted coppicing of small coupes of old small leaved lime coppice stools will be undertaken to reinstate areas of rotational lime coppice. This will help to reduce the collapse of these neglected coppice stools and prolong their life and will open up the canopy encouraging a more diverse understorey and woodland floor fauna.

2.2 Management Objectives

State the objectives of management, and how sustainable forest management is to be achieved. Objectives are a set of specific, quantifiable statements that represent what needs to happen to achieve the long term vision.

No.	Objectives (including environmental, economic and social considerations)
1	To increase biodiversity within the woodland
2	Maintain the naturalness of the woodland which has developed because of minimal management partially due to the steep sloping terrain of this section of wood.
3	To improve the condition of the small leaved lime ancient coppice and therefore improve the condition of the Tilio-Acerion woodland
4	Although outside the Avon Gorge Woodlands SAC and SSSI improve the condition of the woodland in line with the designations objectives.
5	Minimise impact of any tree works on the wider landscape character of the area, especially when viewed from the residential areas of Bristol to the north of the woodland.
6	Maintain safe public access on footpaths along site boundaries and to manage the recreational mountain bike use in woodland away from the designated trails.
7	Monitor progress of Ash Dieback (*Hymenoscyphus fraxineus*) within wood and development management strategy for removal of dangerous trees close to footpaths and management of trees within wood interior.

Add Box

3. Plan Review - Achievements

Use this section to identify achievements made against previous plan objectives. This section should be completed at the 5 year review and could be informed through monitoring activities undertaken.

Objective	Achievement

Add Box

4. Woodland Survey

This section is about collecting information relating to your woodland and its location, including any statutory constraints: designations, European Protected Species etc. Woodland information for your property can be found on the 'Magic' website or the Forestry Commission Land Information Search.

Brief description of the woodland property

This small area (3.14ha) of wood sits within the Leigh Woods/Avon Gorge Woodland on the steep sided Avon Gorge to the south of the River Avon. The area of wood runs north to south along the eastern slope of a valley leading down to the River Avon Towpath and the Portbury to Bristol single track freight railway line.
The wood is owned by the Forestry Commission and is designated as Ancient Semi-Natural Woodland with a small area to the northern end being Ancient Replanted Woodland. This section of wood sits outside the Avon Gorge SSSI and Avon Gorge Woodlands SAC.

Fig 1: Plan Showing Site and Woodland Designations

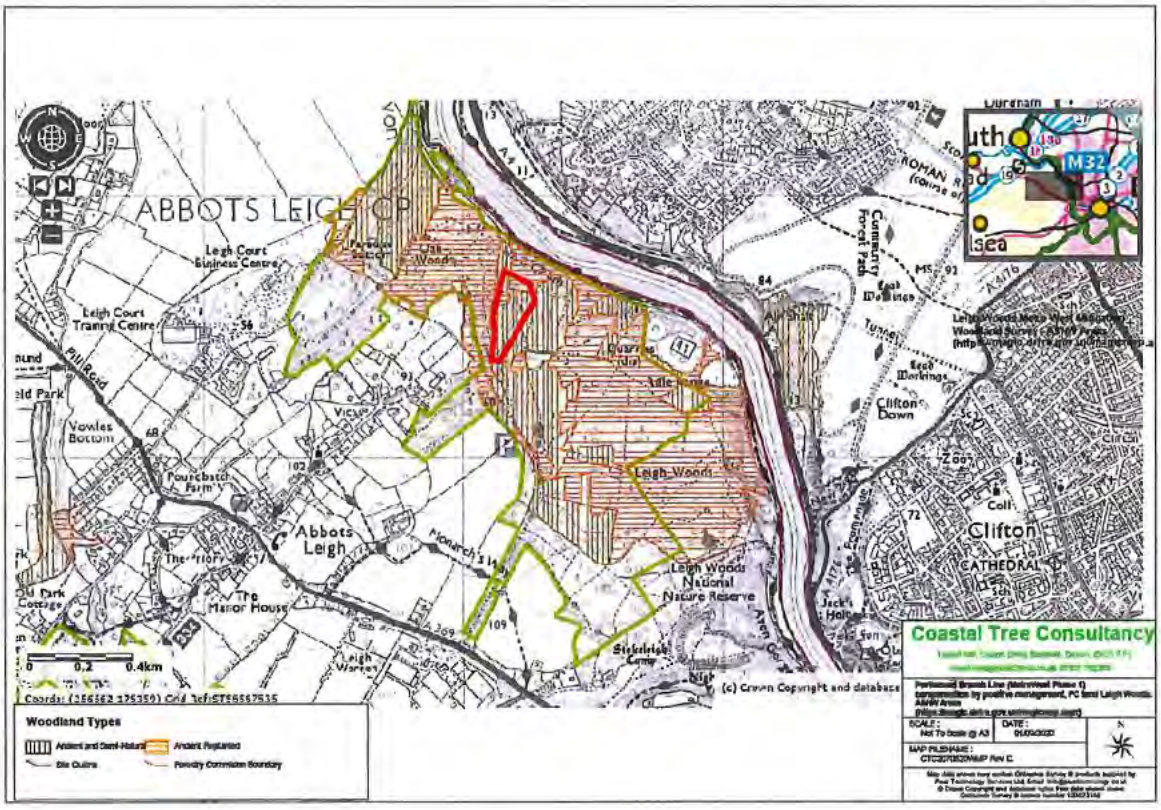
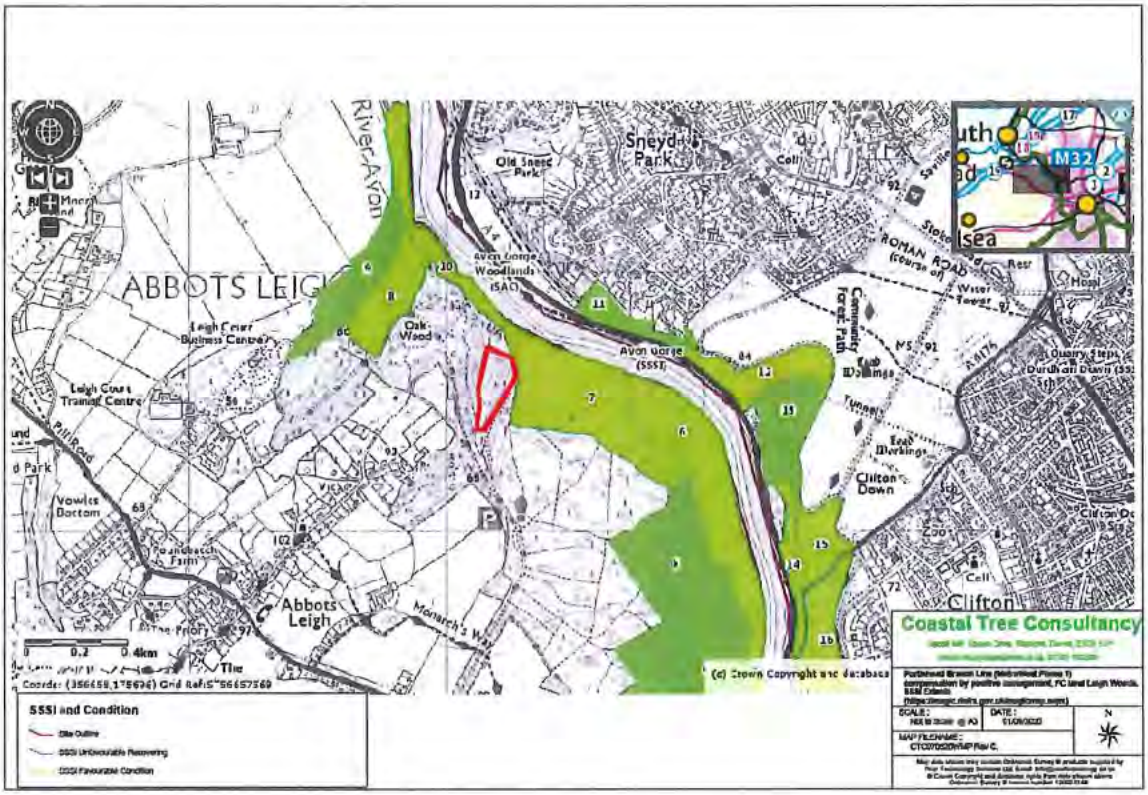


Fig 2: Plan showing Site and SSSI and SAC Area with Gorge



Due to its importance at the European level the majority of the Avon Gorge SSSI is also designated as Avon Gorge Woodlands SAC for its Tilio-acerion woodlands of slopes, screes and ravines, calcareous grassland and associated flora. Although the site is outside these designations it is immediately adjacent to the western edge of the designation and the majority of the wood exhibits the characteristics of the Tilio-accerion woodland.

Within the Gorge the Tilio-acerion woodand Small-leaved lime (*Tilia cordata*) and ash (*Fraxinus excelsior*) are most highly represented with an understorey of field maple (*Acer campestre*), wych elm (*Ulmus glabra*), hazel (*Corylus avellana*), yew (*Taxus bacata*) and the occasional wild service tree (*Sorbus torminalis*) and hawthorn (*Cratageus monogyna*). Privet (*Ligustrum vulgare*), spindle (*Euonymus europaeus*), dogwood (*Cornus sanguinea*) are common components of the shrub layer.

Within the 3.14ha these species are present with Beech (*Fagus silvatica*) and Wild Cherry (*Prunus avium*) are also widely present with some Oak (*Quercus petraea*) and Sweet chestnut (*Castenea sativa*), Sycamore (*Acer pseudoplatanus*) and Birch (*Betula pubescens*) present in smaller numbers.

The wider native woodland was once managed as coppice with standards, as evidenced by the very old and some more recent lime, oak and hazel coppice stools throughout Leigh Woods. Large areas of native woodland were felled by the Forestry Commission during the Second World War and replanted with a variety of conifers in the 1950s.

The wood is bordered to the east by an access track suitable for vehicles and slopes down to a wide footpath along the western boundary leading down to the River Avon. Within the wood, especially towards the northern end there are a number of unofficial downhill mountain bike tracks winding through parts of the block of conifers to the north of compartment 2. The Avon Gorge Woodland is well visited by walkers/runners and bike riders and the paths bordering this small section of wood would be classed as well used by the general public.

Although the wood extends down the slope toward the railway line it is separated from the track by another strip of woodland.

Surveyed Compartments

Compartment 1. At the southern end of the wood Cpt 1 has the most diverse selection of species and the highest number of small leaved lime coppice stools. The coppice stools range from young through partially coppiced old stools with one or more standard stems remaining, too old trees where no recent coppicing has taken place. There are a good number of single stemmed lime trees of varying age groups making up the woodland canopy, along with the mature ash, beech, cherry and wych elm. A good understorey of hazel, holly, yew, spindle, dogwood and field maple, with some sycamore saplings present to the west of the compartment.

There are two areas (Approximately 30m x 30m & 40m x 10m) as shown on the Compartment plan that would be suitable for coppicing the old lime stools. The mixed size and ages of the stools within these areas will allow a selection of different size and age stools to be included within any coppice coupes selected.

To ensure successful regeneration of any coppiced coupes they will need to be protected by deer fencing which will be removed once the coppice is established. The coppice stools will require yearly checking until established, to ensure healthy growth and possible thinning of vigorous coppice growth and remove any competing natural regeneration around the new coppice stools.

Towards the western side of the compartment mature ash makes up a greater part of the upper canopy. These trees are affected by ash dieback and their crowns are sparse, this is allowing a thicker understorey to regenerate which will require selective thinning to encourage desirable species such as lime, wych elm, field maple and spindle.

There are a small number of Lawson cypress saplings towards the north of the compartment

Percentage trees cover;

- Small leaved lime 50%
- Wych elm 10%
- Ash 10%
- Beech 10%
- Cherry 5%
- Hazel, Holly, Spindle, Dogwood, Field maple, Sycamore 15%

Compartment 2. This compartment is less dense than Cpt1 and extends down into the slightly wetter valley bottom. The slope within the wood steepens towards the western side, but flattens into the valley bottom where some willow is present. There is an increase in conifer saplings (Lawson cypress with some *Thuja plicata* [*westen red cedar*]) and some isolated standard conifers towards wood land to the north of compartment 2 which consists mainly of mature conifer species. More Sessile oak and Sweet chestnut are present along with Downy birch on the lower slopes. The understorey is less dense and the number of lime coppice stools is reduced and there is a greater distance between stools.

There is potential for an 30m x 30m area of coppicing towards the lower western slope of this compartment. To ensure successful regeneration of any coppiced coupes they will need to be protected by deer fencing which will be removed once the coppice is established. The coppice stools will require yearly checking until established, to ensure healthy growth and possible thinning of vigorous coppice growth and remove any competing natural regeneration around the new coppice stools.

Percentage trees cover;

- Small leaved lime 35%
- Wych elm 5%
- Ash 20%
- Beech 10%
- Cherry 5%
- Birch 5%
- Conifer species 5%
- Hazel, Holly, Spindle, Dogwood, Field maple, Oak, Sweet chestnut & willow 15%

Fig 3: Site Plan of Wood Showing Surveyed Compartments

5. Woodland Protection

This section allows you to consider the potential threats facing your woodland(s). Where relevant, under the following headings, describe any potential threats and as informed by both the likelihood of presence and potential impact, communicate any required management response. This could, for example, be providing information in relation to putting in place a plan, monitoring or direct action.

Plant Health
Ash dieback (*Hymenoscyphus fraxineus*). Dieback is present within all compartments of the woodland in both mature and young trees. This is affecting the canopy cover of the woodland and as it advances within the mature trees it may compromise the safety of the general public using the woodland trails. A management strategy for tackling the disease will be required and monitoring of the wood's ash population will be required on a regular basis.
Deer
Deer are present within the Avon Gorge Woodland, any coppicing of the small leaved lime will require a perimeter deer fence around the coppice coupe to protect the new regrowth from browsing.

Grey Squirrels
Grey squirrels are present within the wood and are likely to cause damage to beech, sycamore and other trees. However there was no evidence that grey squirrels are currently a problem within this small area of the wider woodland. The wood can be monitored for present of and damage by grey squirrels.
Livestock and Other Mammals
There was no evidence of any extensive badger activity and there is unlikely to be an impact from domestic livestock.
Water & Soil (soil erosion, acidification of water, pollution etc)
The wood is on a valley side with a shallow soil over limestone rock. A healthy understorey and ground flora will reduce the risk of soil erosion.
Environmental (flooding, wind damage, fire, invasive species etc)
There are a number of invasive species present within the Avon Gorge Woodland including; Buddleia (*Buddleja davidii*), cotoneaster (*Cotoneaster horizontalis*), holm oak (*Quercus ilex*), laurel (*Prunus laurocerus*) and rhododendron (*Rhododendron ponticum*), along with non-native tree species such as sycamore, red oak and beech. Some control of laurel was evident within the wood and regrowth from cut stumps was present. There is evidence of wind throw on the slopes with wild cherry and old coppice stems of lime being particularly affected. Flooding from the River Avon would be rare and only happen with some very high spring tides.
Climate Change Resilience (provenance, lack of diversity, uniform structure)
Developing a more diverse species and age mix, which could include allowing less desirable species such as sycamore have a greater presence, will help create a more climate change resilient woodland.

6. Strategy

This section requires a statement of intent, setting out how you intend to achieve your management objectives and manage important features and issues identified within the previous sections of the plan. The information provided should be succinct.

Mgt Objective/Feature	Outline Work Prescriptions/Operations	Year
Compartment 1		
Restore ancient coppice stools	Coppice 30x30m coupe(s) of small leaved lime, selecting stools judged to have good chance of regeneration	2
Protect coppice regeneration	Installation of temporary deer fencing	2
Manage coppice regrowth	Thin excessive growth, remove competing natural regeneration around coppice stools	Until established
Manage understorey regeneration	Thinning dense areas favouring native species, removing sycamore, conifer species, beech, cherry.	1,5,10

Removal of undesirable tree species	Selective removal of mature cherry, Lawson cypress, beech	1,5,10
Control invasive species	Remove and chemically treat stumps of any invasive species; e.g. laurel, holm oak	All years
Manage ash population	Annual inspection of extent of Ash Dieback, remove tree posing health and safety risk	All years
	Development Ash Dieback management Strategy for the period of this Management Plan	1
Improve knowledge of ancient/veteran tree population	Record position of trees deemed to be ancient/veteran.	2
Compartment 2		
Restore ancient coppice stools	Coppice 30x30m coupe(s) of small leaved lime, selecting stools judged to have good chance of regeneration	2
Protect coppice regeneration	Installation of temporary deer fencing	2
Manage coppice regrowth	Thin excessive growth, remove competing natural regeneration around coppice stools	Until established
Manage understorey regeneration	Thinning dense areas favouring native species, removing sycamore, conifer species, beech, cherry.	1,5,10
Removal of undesirable tree species	Selective removal of mature cherry, Lawson cypress, beech	1,5,10
Control invasive species	Remove and chemically treat stumps of any invasive species; e.g. laurel, holm oak	All years
Manage ash population	Annual inspection of extent of Ash Dieback, remove tree posing health and safety risk	All years
	Development Ash Dieback management Strategy for the period of this Management Plan	1
Improve knowledge of ancient/veteran tree population	Record position of trees deemed to be ancient/veteran.	2

Add Box

7. Stakeholder Engagement

There can be a requirement on both the FC and the owner to undertake consultation/engagement. Please refer to Operations Note 35 for further information.

Work Proposal	Individual/ Organisation	Date Contacted	Date feedback received	Response	Action

Add Box

8. Felling & Restocking

Should you wish to associate a felling licence with your management plan please complete the table below. Set out your felling intentions by identifying individual species where they comprise more than 20% of the volume to be felled. Individual species at or below 20% need to be grouped as MB (mixed broadleaf) and/or MC (mixed conifer).

Cpt(s)	Sub Cpt	Fell-ing Type	Species	Area of Felling (ha)	Est Volume M^3 (Bdlv/Con)	Pref Fell Year	Restock Species	Restock Area (ha)	% of Total Restock Area	Map No	TPO	Designation
1	*1a, 1b*	*CF*	*BE, MB, JL, MC*	*1.3*	*100/200*	*16/17*	*OK/BI/BE/WCH*	*1.3*	*100*	*1*	*No*	*No*

9. Monitoring

Indicators of success should be defined for each management objective and then checked at regular intervals. Use the below section to identify when and how monitoring is to be carried out. The data collected will help to evaluate progress.

Management Objective	Indicator of Success	Method of Assessment	Frequency of Assessment	Responsibility	Assessment Results
Restore ancient coppice stools	Good regrowth	Visual inspection	Yearly		
Protect coppice regeneration	No animal damage to regrowth	Visual inspection and inspection of fencing	Yearly – fencing can be removed once regrowth established (3-5yrs)		
Manage coppice regrowth	Thin excessive growth, remove competing natural regeneration around coppice stools	Visual inspection	Until established		
Manage understorey regeneration	Diverse well spaced understorey	Visual inspection	Every 2-3yrs		
Removal of undesirable tree species	Desirable native species thriving	Visual inspection	Every 2-3yrs		

Control invasive species	Less regrowth of treated stumps	Visual inspection	Yearly		
Manage ash population	Health and safety of general public maintained. Reduction in cases of ash dieback	Reported incidents of tree failure. Visual inspection of ash population	When reported by public or during routine inspections Yearly		
Improve knowledge of ancient/veteran tree population	Record of ancient and veteran trees	Detailed survey of ancient and veteran trees	On going.		

Add Box

THE CORPORATE SEAL OF THE SECRETARY OF STATE

FOR ENVIRONMENT FOOD AND RURAL AFFAIRS hereunto

affixed is authenticated by the signature of:)

[redacted]

Authorised by The Secretary of State for Environment

Food and Rural Affairs

Executed as a deed by affixing the common seal of
North Somerset District Council in the presence
of

Head of Legal and Democratic Services / .....

Solicitor for the Council

(please print name) .....