



## **Arboricultural Method Statement**

**Plus**

**(Arboricultural Impact Assessment with Addendum  
and Tree Survey)**

**Westwood Mill  
Linthwaite**

Report reference: AR-3976-03 AMS  
June 2020

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Report Title: Arboricultural Method Statement  
Westwood Mill, Linthwaite

Report Reference: AR-3976-03 AMS

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## **Executive summary**

1. This Arboricultural Method Statement has been based upon the tree survey, referenced AR-3976-01, carried out by Brooks Ecological. The tree survey revealed a total of fifty-seven individual trees and ten groups of trees. Of these, one tree was identified as retention category 'A', thirty-eight trees/groups were identified as retention category 'B' and twenty-seven trees/groups were identified as retention category 'C'. There were no retention category 'U' trees identified.
2. As a whole, the trees on this site are in a fair condition and provide a moderate to high amenity to the surrounding area.
3. This report should be read in conjunction with the attached Tree Protection Plan Ref: DR-3976-02 A Tree Protection Plan and issued Tree Report Ref: AR-3976-02 AIA.
4. A development plan has been provided by the client Westwood Wilson Ltd, to enable an arboricultural impact assessment of the proposed works on the existing relevant trees within the Site. The proposed development consists of new residential properties with associated garden space and car parking. It is proposed that the existing mill buildings are converted. Further to this a new access road, public open space, additional car parking and a settling pond are proposed. The existing mill pond is to be reinstated. Landscaping with tree planting is proposed within the Site.
5. The recommendations in this Arboricultural Method Statement are of a preliminary nature and are subject to comments from Kirklees Council, in line with the current planning application.

## **Introduction**

### *Purpose of the Report*

6. This report has been commissioned by to provide professional independent, detailed arboricultural advice on relevant trees at land Westwood Mills, Low Westwood Lane, Linthwaite (grid reference SE09571459). This Arboricultural Method Statement aims to offer professional advice and necessary recommendations to ensure effective tree protection during the proposed development.
7. The report has been undertaken in accordance with BS 5837:2012 'Trees in relation to construction – Recommendations'.

8. The recommendations outlined within this report are based on the plans provided by the client, as well as information on trees from Tree Survey (Ref: AR-3976-01 dated March 2020). A development masterplan has been supplied by the client.
9. This Method Statement should be included as part of any specifications and schedules of works supplied to all construction contractors.

#### *Limitations*

10. All findings and recommendations are based on visual observations conducted from ground level during the site visit only. No other diagnostic procedures were used to establish any extent of internal decay nor was a climbing inspection undertaken.
11. All measurements were obtained with the use of a clinometer and an electronic distometer. On occasion, it is not viable to provide accurate measurements due to restricted access or other mitigating circumstances on site, and the data may be estimated.

#### *Site Description*

12. Land Use – The Site consists of a former mill complex which has fallen into ruin, subsequently becoming overgrown. It is located within Linthwaite, a village in Kirklees c.4.5km south west of Huddersfield. The River Colne binds the Site to the south with the Huddersfield Narrow Canal to the north. The Site tapers towards its western edge where these two waterways nearly meet. To the east lies Low Westwood Lane.
13. Limitations of the survey included difficulty of access to some trees for measurement due to thick undergrowth, fences, walls or steep gradient. In such cases estimated measurements were taken and noted in the schedules below.

### **Site preparation prior to any development commencing**

14. This document has been compiled to support a full planning application at land Westwood Mills, Low Westwood Lane, Linthwaite (grid reference SE09571459).

15. A development plan has been provided by the client Westwood Wilson Ltd, to enable an arboricultural impact assessment of the proposed works on the existing relevant trees within the Site. The proposed development consists of new residential properties with associated garden space and car parking. It is proposed that the existing mill buildings are converted. Further to this a new access road, public open space, additional car parking and a settling pond are proposed. The existing mill pond is to be reinstated. Landscaping with tree planting is proposed within the Site.

*Proposed tree removal to facilitate development*

16. Twenty individual trees (T4, T8, T11, T15, T19, T20, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T46 & T48) and six groups (G7, G12, G16, G36, G45 & G50) are expected to be removed to facilitate the proposed development.

*Tree Works*

17. Prior to any development commencing on site the first operation will be to carry out the necessary tree works. All tree works should conform to BS 3998:2010 – Recommendations for tree works. All tree works should be formally approved from the local planning authority before beginning.
18. Those trees which overhang the public footpaths or public highways shall require future maintenance to maintain clearance heights for vehicular or pedestrian traffic. These heights should be 5.6m above a road and 2.5m above a footpath.
19. Necessary tree works are detailed within the submitted Arboricultural Impact Assessment.
20. It is recommended that all tree works are supervised by Brooks Ecological.

*Tree protection barriers*

21. Once the necessary tree works are complete, the protective barriers should be fully installed. No other work should commence until this happens – this includes movement of materials, supplies or machinery onto the site and any excavations or soil stripping. Once the barriers are properly erected in their correct positions, they should not be removed or altered in any way without prior approval from the local planning authority.

22. All tree protection barriers should be constructed in accordance with BS 5837:2012 default specification fencing (example shown at Appendix 2) and should be located as shown in on the DR-3976-02 Tree Protection Plan - Appendix 3.
23. The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed.
24. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots.
25. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared. Details any existing underground services should be provided by the client and this AMS revised.
26. This fencing will create construction exclusion zones in order to protect the retained trees root protection areas. No pedestrians, vehicles, materials or equipment should be allowed within these fenced areas at any time.
27. Clear notices are to be fixed on the outside of the barriers with wording such as: 'NO ACCESS PROTECTED AREA – NO STORAGE OR WORK WITHIN THIS AREA'.
28. All construction and other relevant personnel are to be informed at site induction of the role of the exclusion barriers and their importance.
29. All tree protective fencing should remain intact until **ALL** works within the area are completed.
30. Where facilitation access is authorised within the RPA, temporary ground protection should be installed prior to work starting on Site. The temporary ground protection should be capable of supporting the weight of any traffic/machinery using the Site without being distorted or causing compaction to the ground. It is recommended that the ground of the possible Site compound/storage area is covered in temporary ground protection to minimise soil damage by compaction and conserve soil health through to post-construction planting in this area. T1, T2, T3, T5, T6, T10, T13, T14, T18, T37, T38, T40, T42 & T44 will require robust ground protection.

31. Regular brief reports, including photos, should be submitted to Leeds City Council's tree officer, as requested by Kirklees Council.
32. It is proposed that a series of mitigation measures should be set in place to improve the soil environment that is used by these trees for growth plus a treatment of mycorrhizal fungi every two years.
33. All tree protective fencing should remain intact until **ALL** works are completed.

#### *Site inspection*

34. Once the necessary tree works have been carried out and the protection barriers are fully installed, it is recommended that no work should commence until the local planning authority and/or Brooks Ecological are invited to carry out a site visit to ensure that it meets all requirements.
35. Regular brief reports, including photos, should be submitted to Kirklees Council's tree officer.

### **Development phase**

#### *Construction*

36. It is noted that there are minor encroachments within the RPA's of T1, T2, T3, T5, T6, T10, T13, T14, T18, T37, T38, T40, T42 & T44 with the construction of new access road. It is recommended that prior to any mechanical machinery entering these areas, the roots are cut back using clean, straight cuts with sharp tools. This will minimise the extent of wounding and save unnecessary root ripping with heavy machinery.
37. If the areas are to be left overnight, roots can become desiccated quickly and must therefore be covered with a dry cloth, to prevent freezing or a wet cloth on warm days.
38. Kirklees Council request that **ALL** construction works within or adjacent to RPA's are supervised by Brooks Ecological.
39. Regular brief reports, including photos, should be submitted to Kirklees Council's tree officer.



40. All tree protective fencing should remain intact until **ALL** works are completed.

*Services, drainage and contractor's area*

41. The service alignments, drainage strategy, proposed contractor's area have not been indicated however, it is recommended that an Arboricultural Method Statement is submitted to describe the tree protection with regard to these aspects in due course.

## **Post development phase**

*Mitigation measures*

42. A Detailed Planting Plan has been commission. Please refer to the Biodiversity Management Plan and Public Open Space Strategy Ref: R-3976-04.03 at Appendix 3.
43. It is proposed that a series of mitigation measures should be set in place to improve the soil environment that is used by T1, T2, T3, T5, T6, T10, T13, T14, T18, T37, T38, T40, T42 & T44 for growth.
44. Sub-soil aeration using compressed air should be carried out to help improve the soils health and structure.
45. A treatment of mycorrhizal fungi every two years is also recommended.
46. Any cultivation operations within these RPA's should be undertaken carefully by hand with the use of no heavy mechanical machinery.
47. All works within RPA's should supervised by Brooks Ecological.
48. Regular brief reports, including photos, should be submitted to Kirklees Council's tree officer.

*Removal of protective barriers*

49. Once every aspect of the construction is complete and all machinery and materials are off site, the protective barriers can be dismantled.

*Completion meeting*

50. Upon completion of all the works specified, it is recommended that the local planning authority are invited to meet on site to check that all works are completed satisfactorily and to discuss any remedial works as required.

**General principles for tree protection**

51. A copy of this Arboricultural Method Statement and appendices should be retained on site at all times.
52. If 360 degree excavators are to be used on this site during construction, at no time should the excavating arm encroach over the position of the protective barriers.
53. No fires at all on site.
54. A designated storage area should be created away from the root protection areas of any retained tree on site. All materials should be stored within this compound.
55. Care must be taken to avoid leakage of any noxious materials on to the soil.

## Timescale of Works

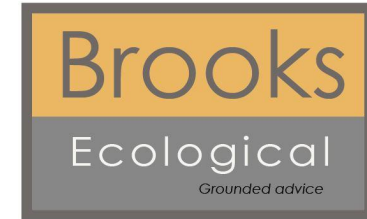
The timescale for arboricultural requirements are summarised below:

Timescale	Action
Stage 1	Approval for works is obtained via Local Council.
Stage 2	Undertake the tree works
Stage 3	Install the protective barrier around highlighted trees (as detailed DR-3976-02 A TPP)
Stage 4	Brooks Ecological to inspect the barrier prior to any on site construction. Once inspected, the protective barrier must not to be moved or breached until <b>ALL</b> works have been completed. Regular brief reports, including photos, should be submitted to Local Council's tree officer.
Stage 5	Undertake construction. Arboricultural supervision required when working within RPA's.
Stage 6	Prior to any mechanical machinery entering the area, the roots are cut back using clean, straight cuts with sharp tools. This will minimise the extent of wounding and save unnecessary root ripping with heavy machinery. Arboricultural supervision required when working within RPA's.
Stage 7	Following the completion of the construction phase and when all site traffic and machinery has left, the protective barrier and can be removed.
Stage 8	Post construction remedial tree works to be undertaken, if required. Landscaping. Mitigation measures.

## Relevant Contact Details

Contact Name	Company	Contact Number
Victoria Black - Arboricultural Consultant	Brooks Ecological	01943 884451

**Appendix 1:** AR -3976-02 Arboricultural Impact Assessment (and Tree Survey)



**Arboricultural Impact Assessment  
(including Tree Survey)**

**Westwood Mill,  
Linthwaite**

Report reference: AR-3976-02  
June 2020

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Report Title:	Arboricultural Impact Assessment Westwood Mill, Linthwaite
Report Reference:	AR-3976-02
Written by	Laura Buckley BA(Hons) DipLA MSc TechArborA Senior Arboricultural Consultant
Technical review:	Victoria Black FdSc Arb Principal Arboricultural Consultant
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Tree Survey including Tree Constraints Plan DR-3976-01-A  
Tree Protection Plan DR-3976-02-A

## Summary Statement

The Site consists of a former mill complex which has fallen into ruin, subsequently becoming overgrown. It is located within Linthwaite, a village in Kirklees c.4.5km south west of Huddersfield. The River Colne binds the Site to the south with the Huddersfield Narrow Canal to the north. The Site tapers towards its western edge where these two waterways nearly meet. To the east lies Low Westwood Lane.

The tree survey revealed a total of fifty-seven individual trees and ten groups of trees. Of these, one tree was identified as retention category 'A', thirty-eight trees/groups were identified as retention category 'B' and twenty-seven trees/groups were identified as retention category 'C'. There were no retention category 'U' trees identified.

This report should be submitted as part of the current planning application to Kirklees Council. The proposed development consists of new residential properties with associated garden space and car parking. It is proposed that the existing mill buildings are converted. Further to this a new access road, public open space, additional car parking and a settling pond are proposed. The existing mill pond is to be reinstated.

This report should be read in conjunction with the attached Tree Protection Plan Ref: DR-3976-02 A, Tree Constraints Plan and issued Tree Report Ref: AR-3976-01 TS.

## Introduction

### *Purpose of the report*

1. This report has been commissioned by Westwood Wilson Ltd to provide professional independent, detailed arboricultural advice on relevant trees present at land Westwood Mills, Low Westwood Lane, Linthwaite (grid reference SE09571459).
2. A development masterplan plan have been provided by the architect/client to enable an impact assessment of the proposed works on the existing relevant trees within the Site.

## Impact Schedule

The following schedule identifies the individual tree and its retention category with the main feature(s) of the proposed works likely to cause an impact. The tree references are shown on the tree constraints plan and the tree protection plan. Any mitigation measures are noted.

Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T1</b>	Sycamore	B1	Road resurfacing.	Retain. Minor canopy lift. Approx 10% root protection area (RPA within road.	Tree protection barrier to BS5837:2012.
<b>T2</b>	Sycamore	C1	Road resurfacing.	Retain. Minor canopy lift. Approx 10% root protection area (RPA within road.	Tree protection barrier to BS5837:2012.



Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T3</b>	Sycamore	B1	Road resurfacing.	Retain. Approx 20% root protection area (RPA) within road.	Tree protection barrier to BS5837:2012.
<b>T4</b>	Ash	C1	Road resurfacing.	Remove.	Off-set tree planting.
<b>T5</b>	Sycamore	B1	Road resurfacing.	Retain. Approx 25% RPA within road.	Tree protection barrier to BS5837:2012.
<b>T6</b>	Sycamore	B1	Road resurfacing.	Retain if possible. New road crosses into RPA and road resurfacing.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>G7</b>	Sycamore	B2	Road resurfacing.	Remove.	Off-set tree planting.
<b>T8</b>	Sycamore	B1	Road resurfacing.	Removal likely. New road in approx 28% RPA.	Off-set tree planting.
<b>T9</b>	Sycamore	C1	Road construction.	Retain. RPA at edge of road.	Tree protection barrier to BS5837:2012.
<b>T10</b>	Sycamore	B1	Road construction.	Retain if possible. Road within approx 20% RPA.	Tree protection barrier to BS5837:2012.
<b>T11</b>	Goat Willow	C1	Road construction.	Remove.	Off-set tree planting.
<b>G12</b>	Sycamore	B1	Road construction, new dwellings and gardens.	Remove.	Off-set tree planting.
<b>T13</b>	Sycamore	B1	Road construction.	Retain if possible. New road crosses into approx 10% RPA.	Tree protection barrier to BS5837:2012.
<b>T14</b>	Sycamore	B1	Road construction.	Retain if possible. New road crosses into approx 15% RPA.	Tree protection barrier to BS5837:2012.
<b>T15</b>	Sycamore	B1	Road construction.	Remove.	Off-set tree planting.
<b>G16</b>	Goat Willow and Sycamore	C1	Building construction.	Remove.	Off-set tree planting.

Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>G17</b>	Sycamore	B1	Road construction.	Retain.	Tree protection barrier to BS5837:2012.
<b>T18</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 28%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>T19</b>	Sycamore	B1	Car park construction.	Remove. Stem at edge of car park bay and approx 45% RPA incursion.	Off-set tree planting.
<b>T20</b>	Hawthorn	C1	Driveway construction.	Remove.	Off-set tree planting.
<b>T21</b>	Oak	B1	General construction.	Retain. No impact expected.	Tree protection barrier to BS5837:2012.
<b>T22</b>	Oak	B1	General construction.	Retain. No impact expected.	Tree protection barrier to BS5837:2012.
<b>T23</b>	Hawthorn	C1	General construction.	Retain. No impact expected.	Tree protection barrier to BS5837:2012.
<b>T24</b>	Goat Willow	C1	Driveway construction.	Remove.	Off-set tree planting.
<b>T25</b>	Sycamore	B1	Building construction.	Remove.	Off-set tree planting.
<b>T26</b>	Sycamore	B1	Building construction.	Remove.	Off-set tree planting.
<b>T27</b>	Sycamore	B1	Building construction.	Remove.	Off-set tree planting.
<b>T28</b>	Sycamore	A1	Building construction.	Remove.	Off-set tree planting.
<b>T29</b>	Sycamore	B1	Building and access construction.	Remove.	Off-set tree planting.
<b>T30</b>	Goat Willow and Sycamore	C1	Removal of existing infrastructure. Laying out of The Green.	Remove.	Off-set tree planting.

Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T31</b>	Goat Willow	C1	Removal of existing infrastructure. Laying out of The Green.	Remove.	Off-set tree planting.
<b>T32</b>	Goat Willow	C1	Removal of existing infrastructure. Laying out of The Green and car park construction.	Remove.	Off-set tree planting.
<b>T33</b>	Goat Willow	C1	Removal of existing infrastructure. Laying out of The Green.	Remove.	Off-set tree planting.
<b>T34</b>	Sycamore	C1	Removal of existing infrastructure. Laying out of The Green and car park construction.	Remove.	Off-set tree planting.
<b>T35</b>	Sycamore	C1	Removal of existing infrastructure. Laying out of The Green.	Remove.	Off-set tree planting.
<b>G36</b>	Sycamore	C1	Building construction.	Remove.	Off-set tree planting.
<b>T37</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 5%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>T38</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 13%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>T39</b>	Sycamore	B1	Road construction.	Retain. Road at edge of RPA.	Tree protection barrier to BS5837:2012.

Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T40</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 10-15%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>T41</b>	Sycamore	B1	Road construction.	Retain. Road at edge of RPA.	Tree protection barrier to BS5837:2012.
<b>T42</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 10-18%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>T43</b>	Sycamore	B1	Road construction.	Retain. Road at edge of RPA.	Tree protection barrier to BS5837:2012.
<b>T44</b>	Sycamore	B1	Road construction.	Retain if possible, Road incursion into RPA approx 10-11%.	Tree protection barrier to BS5837:2012 and area of hand toll use only in RPA.
<b>G45</b>	Mixed	B2	Road construction, gardens, fencing.	Remove.	Off-set tree planting.
<b>T46</b>	Mixed	B2	Recreation of Mill Pond.	Remove.	Off-set tree planting.
<b>G47</b>	Mixed	B2	Car parking construction.	Retain.	Tree protection barrier to BS5837:2012.
<b>T48</b>	Hawthorn	C1	Car parking construction.	Remove.	Off-set tree planting.
<b>T49</b>	Hawthorn	C1	Car parking construction.	Retain.	Tree protection barrier to BS5837:2012.
<b>G50</b>	Birch	C1	Building construction, car parking and roads.	Remove.	Off-set tree planting.
<b>T51</b>	Ash	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.

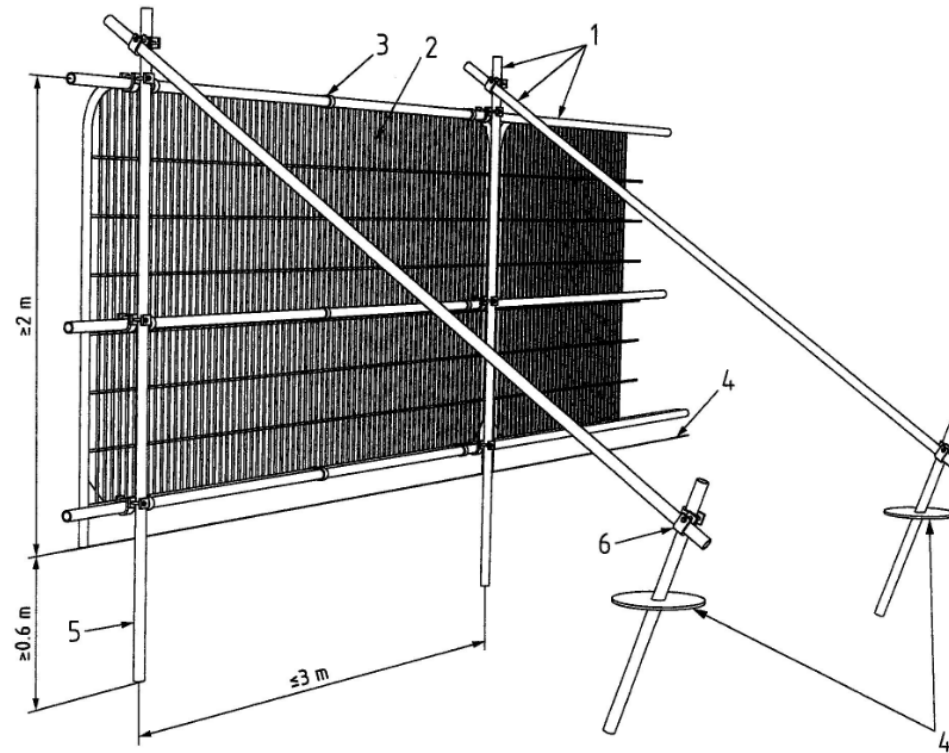
Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T52</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T53</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T54</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T55</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T56</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T57</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T58</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T59</b>	Sycamore	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T60</b>	Goat willow	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T61</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T62</b>	Sycamore	C1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T63</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T64</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.

Tree ref.	Species	Retention category	Proposal feature	Impact	Mitigation
<b>T65</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>T66</b>	Sycamore	B1	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.
<b>G67</b>	Mixed	B2	Road resurfacing at roadside.	No impact expected.	Tree protection barrier to BS5837:2012.

## Implications for retained trees

### *Tree protection*

3. Trees and tree groups should be protected from unwanted damage during construction works with temporary tree protection barriers. The barriers should be erected to the outer edge of the tree canopy or the edge of the RPA, whichever is the furthest away from the tree, unless otherwise indicated on the Tree Protection Plan.
4. Tree protection barriers should be the default specification for protective barrier, Figure 2, BS 5837: 2012 Trees in relation to design, demolition and constructions – Recommendations. Where Site circumstances prevent the use of the default barrier, an alternative specification would be recommended by the project arboriculturist with agreement of the local planning authority. The recommended locations for tree protective barriers are shown in Appendix 2 Tree Protection Plan.



**Key**

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

**Figure 1**

5. All-weather notices should be attached to the barrier with words such as: "Construction exclusion zone – no access".

6. Where facilitation access is authorised within the RPA, temporary ground protection should be installed prior to work starting on Site. The temporary ground protection should be capable of supporting the weight of any traffic/machinery using the Site without being distorted or causing compaction to the ground. It is recommended that the ground of the possible Site compound/storage area is covered in temporary ground protection to minimise soil damage by compaction and conserve soil health through to post-construction planting in this area. T1, T2, T3, T5, T6, T10, T13, T14, T18, T37, T38, T40, T42 & T44 will require robust ground protection.

#### *Tree work*

7. Where pruning work is necessary and authorised to roots or branches of retained trees to enable facilitation works, it should be carried out by a competent contractor in accordance with BS 3998: 2010 Tree Works – Recommendations.
8. Roots smaller than 25mm diameter may be pruned back where necessary, making a clean cut with a suitable sharp tool, except where they occur in clumps. Roots in clumps or larger than 25mm diameter should be severed only following consultation with an Arboriculturist, as such roots may be essential to the health and stability of the tree.

#### *Demolition*

9. Demolition is not expected within the proposed Site works.

#### *Drainage and utilities*

10. Drainage and utilities are expected to be included within the proposed Site works and should not involve digging or trenching within RPA's.

### **Trees to be removed**

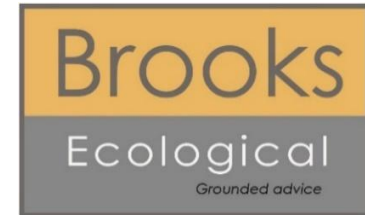
11. Twenty individual trees (T4, T8, T11, T15, T19, T20, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T46 & T48) and six groups (G7, G12, G16, G36, G45 & G50) are expected to be removed to facilitate the proposed development.



## **Mitigation**

12. *A Detailed Planting Plan has been commission. Please refer to the Biodiversity Management Plan and Public Open Space Strategy Ref: R-3976-04.03 at Appendix 3.*

# Tree Survey



## Tree Survey

**Westwood Mills, Linthwaite**

Report reference: AR-3976-01  
February 2020

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Report Title: Tree Survey  
Westwood Mills, Linthwaite

Report Reference: AR-3976-01

Written by: Victoria Black FdSc Arb  
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## Summary Statement

The Site consists of a former mill complex which has fallen into ruin, subsequently becoming overgrown. It is located within Linthwaite, a village in Kirklees c.4.5km south west of Huddersfield. The River Colne binds the Site to the south with the Huddersfield Narrow Canal to the north. The Site tapers towards its western edge where these two waterways nearly meet. To the east lies Low Westwood Lane.

This report should be read in conjunction with the attached Tree Constraints Plan Ref: DR-3976-01-A.

## Introduction

### *Purpose of the report*

13. This report has been commissioned to provide professional independent, detailed arboricultural advice on all relevant trees present at land Westwood Mills, Low Westwood Lane, Linthwaite (grid reference SE09571459).
14. This report has been undertaken in accordance with BS 5837:2012 Trees in relation to construction – Recommendations.
15. The client has provided a topographical plan.
16. All findings and recommendations are based on visual observations conducted from ground level during the Site visit only. No other diagnostic procedures were used to establish any extent of internal decay nor was a climbing inspection undertaken.
17. All measurements were obtained with the use of a clinometer and an electronic distometer. On occasion it is not viable to provide accurate measurements due to restricted access or other mitigating circumstances on site, and the data may be estimated.

### *Legal implications of work to trees*

18. Due to the potentially large penalties for illegally carrying out work to protected trees, it is recommended that a check with the local planning authority is carried out prior to any tree works being undertaken and any required consents such as for work to trees with Tree Preservation Orders and/or Conservation Areas are obtained before work to trees on site. Additionally, work to trees at certain times of the year may contravene sections of the Wildlife and Countryside Act regarding nesting and roosting of protected species.
19. Every tree owner has a general duty of care to ensure their tree(s) does not pose an unacceptable risk to other people on or adjacent to their land. The landowner will only be liable for injury or damage caused by trees if they are found to be negligent.
20. There is no legal obligation for a tree owner to cut back growth from a neighbouring property. However, under Common law of tort of nuisance, an affected neighbour has the right to cut back roots or branches that encroach onto a neighbouring property back

to the boundary of the land owned by the person abating the nuisance without the neighbour's consent (with the exception of TPO's or CA's). The person abating the nuisance has a duty to exercise reasonable care in carrying out work as a failure to do so may lead to liability in negligence (for example where removal of roots makes a tree unstable).

#### *Site description*

21. The Site consists of a former mill complex which has fallen into ruin, subsequently becoming overgrown. It is located within Linthwaite, a village in Kirklees c.4.5km south west of Huddersfield. The River Colne binds the Site to the south with the Huddersfield Narrow Canal to the north. The Site tapers towards its western edge where these two waterways nearly meet. To the east lies Low Westwood Lane.
22. The wider landscape is largely made up of agricultural land punctuated by small hamlets and villages. Urban development increases in density to the north east within proximity of Huddersfield town centre.

#### *Survey conditions*

23. The trees were surveyed in cool, cloudy conditions with occasional showers on 17<sup>th</sup> February 2020.

### **Tree data abbreviations and survey methodology**

T	Tree	GL	Ground level
G	Tree group	MS	Multi-stemmed
H	Hedge	AFP	Access facilitation pruning
OSB	Outside Site boundary	Ave	Average dimension
#/est	Estimated dimension	Typ	Typical dimension
N	North	E	South
S	South	W	West
Min	Minimum	Lwr	Lower
adj	Adjacent	Ht	Height

24. The trees were assessed visually from ground level. Where access to a tree is restricted this is noted in the schedule.
25. The tree reference numbers refer to the attached Tree Constraints Plan (TCP) references. The trees were not tagged for this survey.
26. The tree species is listed by common name in the schedules, with a key to scientific names below:

Common name	Botanical name	Common name	Botanical name
Alder (common)	<i>Alnus glutinosa</i>	Goat willow	<i>Salix caprea</i>
Alder (grey)	<i>Alnus incana</i>	Hawthorn	<i>Crataegus monogyna</i>
Apple	<i>Malus domestica</i>	Hazel	<i>Corylus avellana</i>
Aspen	<i>Populus tremula</i>	Holly	<i>Ilex aquifolium</i>
Ash	<i>Fraxinus excelsior</i>	Hornbeam	<i>Carpinus betulus</i>
Beech	<i>Fagus sylvatica</i>	Larch	<i>Larix decidua</i>
Birch (silver)	<i>Betula pendula</i>	Lime (common)	<i>Tilia x europaea</i>
Birch (downy)	<i>Betula pubescens</i>	Lime (small-leaved)	<i>Tilia cordata</i>
Chestnut (sweet)	<i>Castanea sativa</i>	Maple (field)	<i>Acer campestre</i>
Chestnut (horse)	<i>Aesculus hippocastanum</i>	Maple (Norway)	<i>Acer platanoides</i>
Cherry (wild)	<i>Prunus avium</i>	Poplar (black)	<i>Populus nigra</i>
Cherry (bird)	<i>Prunus padus</i>	Oak (sessile)	<i>Quercus petraea</i>
Cherry (Japanese)	<i>Prunus serrulata</i>	Oak (pendunculate)	<i>Quercus robur</i>
Leyland Cypress	<i>X Cupressocyparis leylandii</i>	Rowan/mountain ash	<i>Sorbus aucuparia</i>
Elm (English)	<i>Ulmus procera</i>	Sycamore	<i>Acer pseudoplatanus</i>
Elm (wych)	<i>Ulmus glabra</i>	Weeping willow	<i>Salix chrysocoma</i>
		Whitebeam (Swedish)	<i>Sorbus intermedia</i>

27. Measurement of the existing height above ground level of the first significant branch and the direction of growth and the height of the canopy. This informs ground clearance, crown/stem ratio and shading.
28. The stem/trunk diameter is measured with a diameter tape at 1.5m from ground level around the stem for single stem trees and for multi-stemmed trees and other variants in accordance with Annex C of the British Standard. Where access restricts measurement of the tree, an estimate has been made, denoted by '#'.
29. Canopy spread is measured with an electronic distometer. The close-spacing of some of the trees impeded measurements of canopy spread and height and estimates were made.
30. The age of the tree is based on the typical longevity of the particular tree species. The age classes are: young (Y), semi-mature (SM), early mature (EM), mature (M), over-mature (OM) and veteran (V).
31. The physiological condition of the tree is an assessment of its likely health, vigour and stress. The classes for physiological condition are: good, fair, poor and dead.
32. Structural condition includes tree form, visible defects, irregularities and influencing factors.
33. Preliminary management recommendations note work (with prior approval where necessary) to promote the health and longevity of the tree and/or improve safety and/or increase habitat potential.
34. The life expectancy (life exp.) is the estimated remaining contribution in years, (<10, 10+, 20+, 40+).
35. The retention category (ret cat) for each tree is assessed in accordance with BS 5837: 2012 Table 1, summarised as below:

<b>Category A</b>	Trees of high quality with an estimated remaining life expectancy (ERC) of at least 40 years. Green canopy outline on plan.
<b>Category B</b>	Trees of moderate quality with an estimated ERC of at least 20 years. Blue canopy outline on plan.



**Category C**

Trees of low quality with an ERC of at least 10 years, OR young trees with a stem diameter below 150mm. Grey canopy outline on plan.

**Category U**

Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Trees unsuitable for retention. Dark red canopy outline on plan.

36. Sub- categories of 1, 2 or 3 are included in the tree data tables and are defined as follows:

**Sub-category 1** trees are those with 'mainly arboricultural value'

**Sub-category 2** trees are those with 'mainly landscape value'

**Sub-category 3** trees are those with 'mainly cultural or conservation value'.

37. The root protection area (RPA) in m<sup>2</sup>is for layout purposed and indicates the 'minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority'. The RPA is calculated in accordance with BS 5837: 2012 Annex D. Where Site features are likely to have distorted the typical RPA, a polygon of the same area is estimated on plan to reflect a more realistic shape, in accordance with the British standard.

### **Tree data**

38. The following schedule contains the tree data obtained on site:

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T1</b>	Sycamore	EM	16	1.8 NE	428	N 5.5 E 5.3 S #5.5 W 4.73	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy. Covered in lichen. Cavities noted throughout. Overhanging road and river.	Crown clean and monitor cavities.	20-40	B1
<b>T2</b>	Sycamore	EM	16	1.5 E	300 270 260 100 120	N 7.4 E #7 S #5 W #6	Fair	Fair. Multi-stemmed at base with a balanced canopy. Covered in lichen. Minor cavities throughout. Limited inspection as on rivers edge.	Monitor cavities.	20-40	C1
<b>T3</b>	Sycamore	M	17	2.5 NE	616	N 6.92 E #7 S #7 W 7.29	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Deadwood and stubs evident throughout canopy. Minor cavities throughout. Soil pocket at union. Overhanging road and river.	Crown clean and monitor.	20-40	B1
<b>T4</b>	Ash		16	5	316	N #6 E #6 S #6.5 W #7	Fair	Fair. Twin-stemmed at 4m with a balanced canopy. Covered in ivy. Deadwood and stubs evident throughout canopy. Overhanging road and beck. Limited inspection.	Crown clean.	20-40	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T5</b>	Sycamore	M	18	5 N	659	N 7.03 E 7.4 S #6 W 5.77	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Overhanging road and river.	Crown clean and monitor cavities.	20-40	B1
<b>T6</b>	Sycamore	M	18	5 N	1027	N 7.72 E 6.14 S #7 W #7	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Covered in ivy. Overhanging road and river.	Crown clean.	20-40	B1
<b>G7</b>	Sycamore		To 15	0+	To 300	See plan	Good	Fair. Scrappy group located on edge of beck. Deadwood and stubs evident throughout. Good screenage. Some poorer trees. Overhanging road.	Crown clean.	20-40	B2
<b>T8</b>	Sycamore	M	17	7 N	788	N 6.32 E 6.69 S #7 W #5.77	Good	Fair. Twin-stemmed at 2.2m with a balanced canopy. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Covered in ivy. Overhanging road and river.	Crown clean and monitor cavities.	20-40	B1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T9</b>	Sycamore		17	7 E	417	N 3.37 E #4 S #6 W #4	Fair	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy. Covered in ivy. Located on rivers edge.	Crown clean.	20-40	C1
<b>T10</b>	Sycamore	M	17	2 W	592	N 5.68 E #6 S #6 W #6	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Deadwood and stubs evident throughout canopy. Covered in lichen. Minor cavities throughout. Overhanging river.	Crown clean and monitor cavities.	20-40	B1
<b>T11</b>	Goat Willow	EM	16	0+	To 180x5	N 10.6 E #5 S #5 W #5	Fair	Fair. Multi-stemmed at base with a balanced canopy. Typ. of species. Deadwood and stubs evident throughout canopy. Semi-collapsed state. Scrappy looking. Limited inspection as in dense bramble.	No action required.	20-40	C1
<b>G12</b>	Sycamore	EM	To 17	1+	380 + 350 + 360	See plan	Good	Fair. Three trees growing close together. Epicormic growth at base. Deadwood and stubs evident throughout canopy. Located in dense bramble.	Crown clean.	20-40	B1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T13</b>	Sycamore	M	17	3.5 N	692	N 8.54 E #7.5 S #7.5 W #7.5	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Covered in lichen. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean and monitor cavities.	20-40	B1
<b>T14</b>	Sycamore		17	3 E	665	N 5.83 E 4.55 S #5 W #5	Good	Fair. Twin-stemmed at 2m with a balanced canopy. Major bark wound to NE with decay. Minor cavities throughout. Overhanging river.	Crown clean and monitor bark wounds.	20-40	B1
<b>T15</b>	Sycamore	M	17	4 N	820	N 6.39 E 7.9 S 6.84 W 6.8	Good	Fair. Multi-stemmed at 2m with a balanced canopy. Some include bark at unions. Wide spreading canopy with deadwood and stubs evident throughout. Overhanging building.	Crown clean.	20-40	B1
<b>G16</b>	Goat Willow and Sycamore		To 15	0+	To 300	See plan	Fair	Fair. Multi-stemmed at base with an unbalanced canopy. Typ. of species. Growing on top of wall.	No action required.	20-40	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
T17	Sycamore		17	1.9	450 270 37	N 8.3 E 8 S #6.5 W 8	Good	Fair. Multi-stemmed at base with a balanced canopy. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Covered in ivy. Overhanging river.	Crown clean.	20-40	B1
T18	Sycamore		17	2.5	460 280 300 1900	N 7.3 E 6.9 S #6 W #5.8	Good	Fair. Multi-stemmed at base with a balanced canopy. Minor cavities throughout. Deadwood and stubs evident throughout canopy. Covered in ivy. Epicormic growth at base. Overhanging river.	Crown clean and clear epicormic growth.	20-40	B1
T19	Sycamore	M	17	1.8	589	N 5.84 E 6.28 S 6.54 W 5.3	Good	Fair. Twin-stemmed at 0.5m with a balanced canopy. Included bark at union. Deadwood and stubs evident throughout canopy.	Crown clean and monitor included bark.	20-40	B1
T20	Hawthorn	EM	6	0	To 100x6	N 3.5 E 3.5 S 3.5 W 3.5	Fair	Fair. Multi-stemmed at base with a balanced canopy. Typ. of species.	No action required.	20-40	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
T21	Oak	EM	16	1.5 N	465	N #7 E #5 S #3 W #5	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Barbed wire growing into stem. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	B1
T22	Oak	EM	15	2 N	445	N #7 E #5 S #3 W #5	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	B1
T23	Hawthorn	EM	6	0	To 100x4	N 3 E 3 S 3 W 3	Fair	Fair. Typical of species. No major visible defects noted.	No action required.	20-40	C1
T24	Goat Willow	EM	16	1 N	350 at base	N 7 E 7 S 7 W 7	Fair	Fair. Multi-stemmed at 1.5m with a balanced canopy. Included bark at unions. Typ. of species. Deadwood and stubs evident throughout canopy. Limited inspection as located in dense bramble.	No action required.	20-40	C1
T25	Sycamore	EM	16	1.6	376	N 5 E 6 S 6 W 3	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy. Growing close to T26.	Crown clean.	20-40	B1



Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T26</b>	Sycamore	EM	16	1.8	350 200 300	N 6 E 3 S 2 W 4	Good	Fair. Multi-stemmed at base with an unbalanced canopy. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	B1
<b>T27</b>	Sycamore	EM	16	2	637	N 5 E 3 S 2 W 3	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	B1
<b>T28</b>	Sycamore	M	20	2.2	1001	N 10.5 E 10.5 S 10.5 W 10.5	Good	Fair. Single-stemmed and vertical with a balanced canopy. Sucker growth with some bark wounds noted. Small holly near base.	No action required.	20-40	A1
<b>T29</b>	Sycamore		17	0.5	#450 #400 #250	N 10 E 10 S 10 W 10	Good	Fair. Multi-stemmed at base with a balanced canopy. Deadwood and stubs evident throughout canopy. No inspection as covered in ivy.	Remove ivy and re-inspect.	20-40	B1
<b>G30</b>	Goat Willow and Sycamore		To 11	0+	To 200	See plan	Fair	Fair. Scrappy group along poly tunnel. Typ. of species. Covered in ivy. Deadwood and stubs evident throughout canopy.	No action required.	10-20	C1
<b>T31</b>	Goat Willow		8	0	To 150	N 4 E 4 S 4 W 4	Fair	Fair. Scrappy group along poly tunnel. Typ. of species. Deadwood and stubs evident throughout canopy.	No action required.	10-20	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T32</b>	Goat Willow		8	0	To 150	N 3.5 E 3.5 S 3.5 W 3.5	Fair	Fair. Scrappy group along poly tunnel. Typ. of species. Deadwood and stubs evident throughout canopy.	No action required.	10-20	C1
<b>T33</b>	Goat Willow		8	0	To 150	N 3 E 3 S 3 W 3	Fair	Fair. Scrappy. Typ. of species. Deadwood and stubs evident throughout canopy.	No action required.	10-20	C1
<b>T34</b>	Sycamore		15	1.8	360 100	N 4 E 4 S 4 W 4	Fair	Fair. Twin-stemmed at 0.5m with a balanced canopy. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	C1
<b>T35</b>	Sycamore		15	2	220 300	N 3.5 E 3.5 S 3.5 W 3.5	Fair	Fair. Twin-stemmed at 0.5m with a balanced canopy. Deadwood and stubs evident throughout canopy.	Crown clean.	20-40	C1
<b>G36</b>	Sycamore		To 16	0+	To 350	See plan	Fair	Fair. Single-stemmed and vertical with an unbalanced canopy. Deadwood and stubs evident throughout canopy. Typ. of species.	No action required.	20-40	C1
<b>T37</b>	Sycamore	M	16	2	650	N 5.5 E 5.4 S 5.5 W 7	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T38</b>	Sycamore	M	16	2	718	N 7 E 7 S 5 W 6	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>T39</b>	Sycamore	M	16	2	541	N 5 E 6 S 4 W 3	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>T40</b>	Sycamore	M	16	2	712	N 6 E 9 S 8 W 5	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>T41</b>	Sycamore	M	16	2	452	N 7 E 8 S 5 W 6	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T42</b>	Sycamore	M	16	2	737	N 4 E 4 S 6 W 7	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>T43</b>	Sycamore	M	16	2	551	N 5 E 6 S 8 W 3	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>T44</b>	Sycamore	M	16	2	670 270 280	N 7 E 6 S 5 W 3	Good	Fair. Single-stemmed and vertical with an unbalanced canopy. Minor cavities noted throughout. Deadwood and stubs evident throughout canopy. Overhanging river.	Crown clean.	20-40	B1
<b>G45</b>	Mixed	Y SM EM	To 16	0+	To 300	See plan	Good	Fair. Dense group. Some poorer trees. Located along beck.	No action required.	20-40	B2

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>G46</b>	Mixed		To 17	0+	To 300	See plan	Good	Fair. Dense group of goat willow, alder, birch and hawthorn. Some poorer trees. Deadwood and stubs evident throughout canopy. Bark wounds noted throughout.	Requires Management.	20-40	B2
<b>G47</b>	Mixed	Y SM EM	To 17	0+	To 350	See plan	Good	Fair. Contains sycamore, pine, ash, poplar and alder. Just outside redline boundary with some overhang.	No action required.	20-40	B2
<b>T48</b>	Hawthorn	EM	6	0.5	To 155	N 3 E 3 S 3 W 3	Fair	Fair. Multi-stemmed at base with a balanced canopy. Typ. of species. Located in bramble.	No action required.	10-20	C1
<b>T49</b>	Hawthorn	EM	6	0.5	To 155	N 3 E 3 S 3 W 3	Fair	Fair. Multi-stemmed at base with a balanced canopy. Typ. of species. Located in bramble.	No action required.	10-20	C1
<b>G50</b>	Birch	Y	To 8	0+	To 150	See plan	Fair	Fair. Young self-sown birch.	No action required.	20-40	C1
<b>T51</b>	Ash	SM	14	2.2	#250	N 3 E 1 S 3 W 3	Fair	Single stemmed and vertical with an unbalanced canopy. On lower ground. Limited inspection.	No action required.	20-40	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T52</b>	Sycamore	EM	16	2	#290 & 350	N 6 E 4 S 6 W 6	Good	Fair. Twin stemmed at 1m with a balanced canopy. Minor deadwood and stubs noted in canopy. On lower ground. Limited inspection.	No action required.	20-40	B1
<b>T53</b>	Goat willow	SM	8	1.6	180	N 2 E 2 S 1 W 3	Fair	Fair. Multi stemmed at 1.9m with an unbalanced canopy. Leaning to the	No action required.	20-40	C1
<b>T54</b>	Goat willow	SM	9	3	140 & 160	N 1 E 0 S 1 W 2	Fair	Fair. Twin stemmed at 0.5m with an unbalanced canopy. Deadwood and stubs noted in canopy.	No action required.	20-40	C1
<b>T55</b>	Goat willow	M	15	1.3	280 & 310	N 5 E 4 S 5 W 5	Fair	Twin stemmed at 0.5m with an unbalanced canopy. Overhanging road. Bark wound with decay at base. Large dead section. Deadwood and stubs noted within canopy.	Monitor bark wound. Crown clean.	10+	C1
<b>T56</b>	Goat willow	SM	8	6	210	N 2 E 2 S 2 W 2	Fair	Twin stemmed at 2.5m with a balanced canopy. High canopy.	No action required.	20-40	C1
<b>T57</b>	Goat willow	EM	9	2	330	N 6 E 1 S 3 W 3	Fair	Twin stemmed at 1m with an unbalanced canopy. Growing against T58 – bases are touching. Large section dead.	Crown clean. Monitor base.	10+	C1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T58</b>	Sycamore	EM	13	2	360	N 5 E 5 S 5 W 5	Good	Single stemmed and vertical with a balanced canopy. Minor deadwood noted.	Crown clean	20+	B1
<b>T59</b>	Sycamore	SM	4	0+	To 100	N 1.5 E 1.5 S 1.5 W 1.5	Fair	Re-growth from old multi stemmed stump. Scrappy	No action required	10+	C1
<b>T60</b>	Goat willow	M	16	2.3	#550	N 5 E 0 S 4 W 4	Fair	Multi stemmed at 2m with an unbalanced canopy. Decaying stub at 2m. Limited inspection.	Crown clean and remove decaying stub	20+	C1
<b>T61</b>	Sycamore	M	16	4	#340 360 200	N 2 E 2 S 5 W5	Good	Multi stemmed at ground level with an unbalanced canopy. Deadwood and stubs noted.	Crown clean	20+	B1
<b>T62</b>	Sycamore	EM	16	3	180 100 310	N 4 E 2 S 3 W5	Fair	Multi stemmed at ground level. Bark wounds noted to north. Covered in dense ivy. Deadwood and stubs noted within canopy.	Monitor bark wounds. Crown clean	10+	C1
<b>T63</b>	Sycamore	M	17	3.5	380 350	N 6 E 1 S 4 W 3	Good	Twin stemmed at ground level with an unbalanced canopy. Included bark at union. Deadwood and stubs noted within canopy.	Monitor Included bark. Crown clean	20+	B1
<b>T64</b>	Sycamore	M	17	4	410 320 140	N 5 E 6 S 1 W 4	Good	Twin stemmed at ground level with an unbalanced canopy. Possibly two trees. Previous pruning wounds.	Crown clean	20+	B1

Ref	Species	Life stage	Ht (m)	Can Ht (m)	Stem diam (mm)	Canopy spread (m)	Physiological	Structural condition	Recommendations	Life exp. (yrs)	Ret cat
<b>T65</b>	Sycamore	M	16	5	450 360	N 2 E 6 S 3 W 2	Good	Twin stemmed at ground level with an unbalanced canopy. Previous pruning wounds.	Crown clean	20+	B1
<b>T66</b>	Sycamore	M	16	3	320 340	N 1 E 5 S 2 W 3	Good	Twin stemmed at 1 m with an unbalanced canopy. Deadwood and stubs.	Crown clean	20+	B1
<b>G67</b>	Mixed	Y-EM	To 15	0+	To 300	See plan	Good	Contains sycamore, goat willow, ash, hawthorn and elm. Deadwood and stubs noted.	No action required	20+	B2

## Findings

### *Tree descriptions and recommendations*

41. The tree survey revealed a total of fifty-seven individual trees and ten groups of trees. Of these, one tree was identified as retention category 'A', thirty-eight trees/groups were identified as retention category 'B' and twenty-seven trees/groups were identified as retention category 'C'. There were no retention category 'U' trees identified. Please refer above for retention category and definition criteria.



42. It has been recommended that trees T1, T2, T3, T4, T5, T8, T10, T13, T14, T19, T55, T57, T60, T62 & T63 are monitored annually to assess if their condition is still acceptable.
43. Light pruning works have been recommended to T1, T3, T5, T6, G7, T8, T10, G12, T13, T14, T15, T17, T18, T19, T21, T22, T25, T26, T27, T34, T35, T37, T38, T39, T40, T41, T42, T43, T44, T55, T57, T58, T60, T61, T62, T63 & T64 on this site, for reasons of public safety and to ensure the long-term health of the trees, as detailed at Appendix 1.
44. Those trees which overhang the public footpaths or public highways, detailed IN Tree Data, shall require future maintenance to maintain clearance heights for vehicular or pedestrian traffic. These heights should be 5.6m above a road and 2.5m above a footpath.



**Figure 1**

Looking east along the roadway at the sycamores lining the river in the south east corner of the Site.



**Figure 2**

A view of the sycamores (T37 to T44) along the southern boundary of the Site, with the river running behind.



**Figure 3**

A typical view of G46 located within a former mill pond.



**Figure 4**

Looking west at T21, T22 and T23 at the western tip of the Site.



**Figure 5**

View of elder located along the canal towpath, offsite to the north.



**Figure 6**

View south of G47, most of which is located beyond the Site boundary.



**Figure 7**

Copse of self-sown trees in the east, typical across the Site.

**Figure 8**

View of sycamore T29 covered in dense ivy.





**Figure 9**

G30 – scrappy group of goat willow and sycamore located next to poly tunnel.



**Figure 10**

View west of T31 to T35, goat willow and sycamore. Located along edges of former poly tunnel.



**Figure 11**

Looking east at G45, a mixed group running along the beck behind.





**Figure 12**

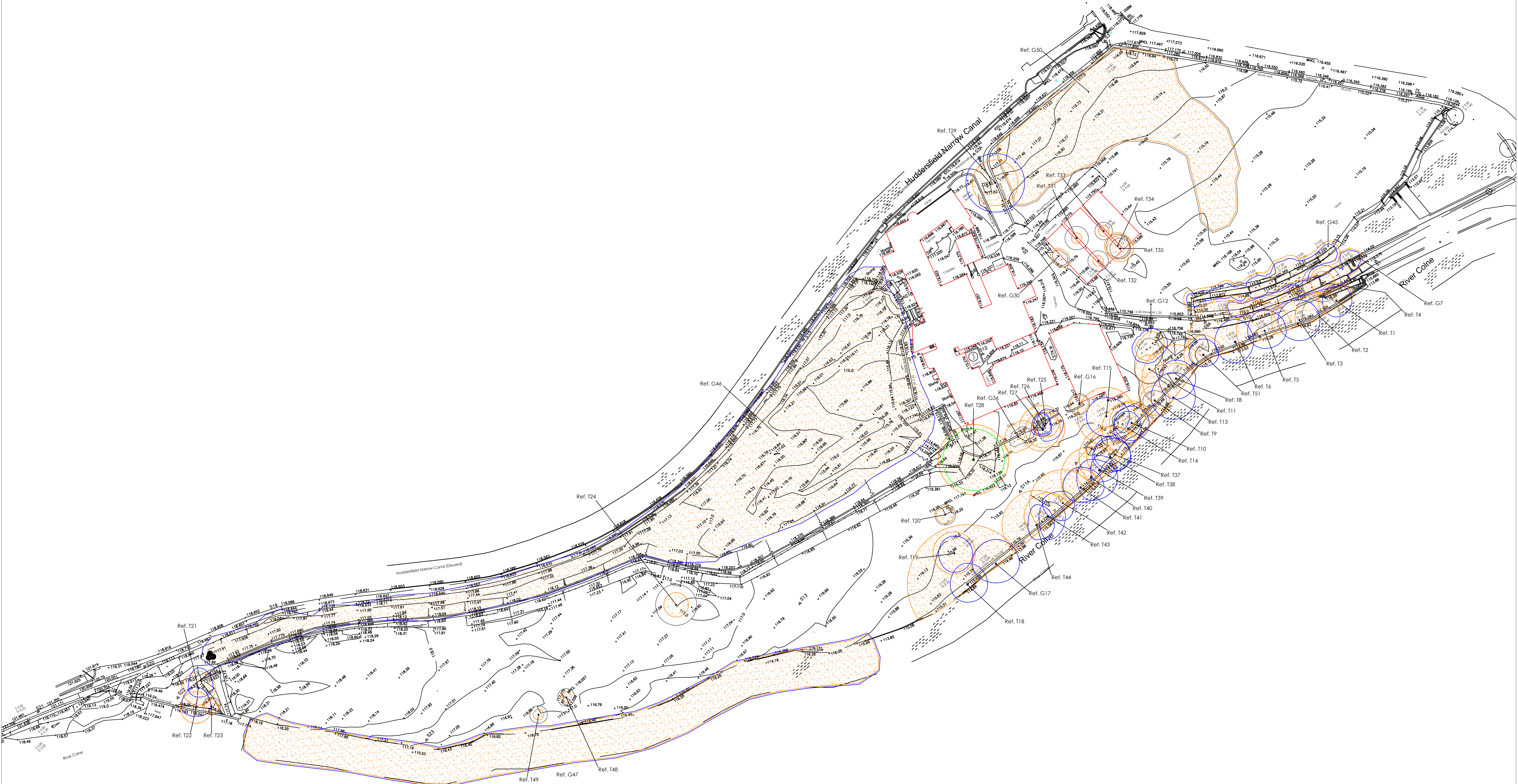
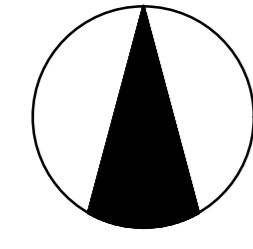
View of major bark wound found on sycamore T14.



**Figure 13**

Looking at G16, goat willow and sycamore. Growing on wall.

**DR-3976-01-A Tree Constraints Plan**



**NOTE**  
This plan is for guidance only and should not be scaled from.  
The original of this drawing was produced in colour - a monochrome copy should not be relied upon.  
The positions of the tree groups and some trees are estimated only.

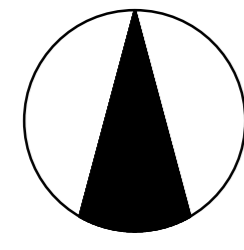
KEY  
BS5837:2012 Retention categories:

Retention category A	
Retention category B	
Retention category C	
Category U	
Roof Protection Area (RPA)	

Westwood Mill, Linthwaite  
Tree Constraints Plan  
Dwg. No. DR-3976-01  
Scale: 1:500 @A0 Date: Feb. 2020



**DR-3976-02 Tree Protection Plan**



**NOTE**  
 This plan is for guidance only and should not be scaled from. The original of this drawing was produced in colour - a monochrome copy should not be relied upon.  
 The positions of the tree groups and some trees are estimated only.  
 Refer to Ecological Design Strategy for information on tree planting.



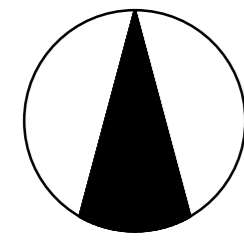
Rev. A 24.06.20 Revised layout.

KEY	
BS5837:2012 Retention categories:	
Retention category A	
Retention category B	
Retention category C	
Category U	
Root Protection Area (RPA)	
Tree to be removed	
Tree Protection Barrier	
Area of hand tools only	

Westwood Mill, Linthwaite  
 Tree Protection Plan  
 Dwg. No. DR-3976-02-A  
 Scale: 1:500 @A0 Date: June 2020



**DR-3976-03 Shading Plans**



**NOTE**  
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 The positions of the tree groups and some trees are estimated only.



Location: 53.6252 N 1.8458' W

**KEY**

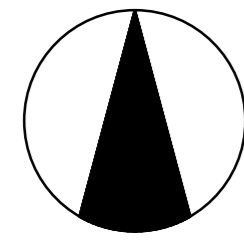
B55837:2012 Retention categories:

Retention category A	
Retention category B	
Retention category C	
Category U	
Root Protection Area (RPA)	
Tree to be removed	
Tree Protection Barrier	
Area of hand tools only	

Westwood Mill, Linthwaite  
 Tree Shadow Plan 15 June 12pm  
 Dwg. No. DR-3976-03  
 Scale: 1:500 @A0 Date: June 2020







**NOTE**  
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 The positions of the tree groups and some trees are estimated only.



Location: 53.6252 N 1.8458 W

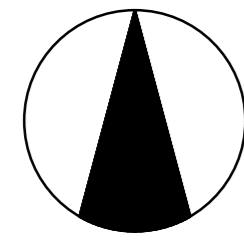
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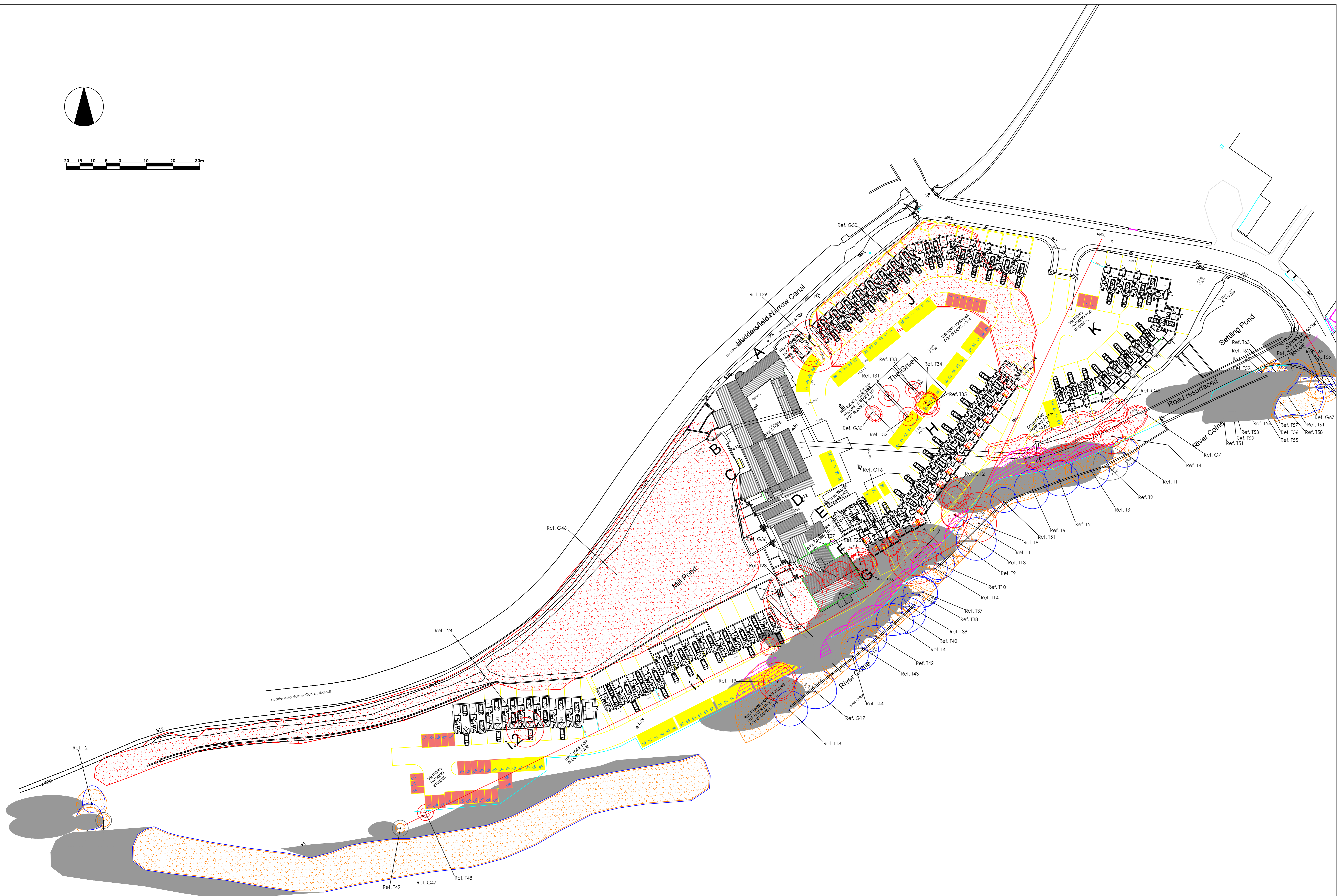
Retention category A	
Retention category B	
Retention category C	
Category U	
Root Protection Area (RPA)	
Tree to be removed	
Tree Protection Barrier	
Area of hand tools only	

Westwood Mill, Linthwaite  
 Tree Shadow Plan 15 Sept 3pm  
 Dwg. No. DR-3976-03  
 Scale: 1:500 @A0 Date: June 2020





**NOTE**  
 This plan is for guidance only and should not be scaled from. The original of this drawing was produced in colour - a monochrome copy should not be relied upon.  
 The positions of the tree groups and some trees are estimated only.



Location: 53.6252 N 1.8458 W

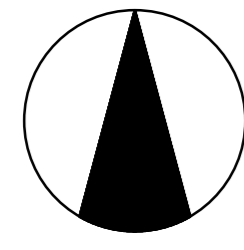
**KEY**

B55837:2012 Retention categories:

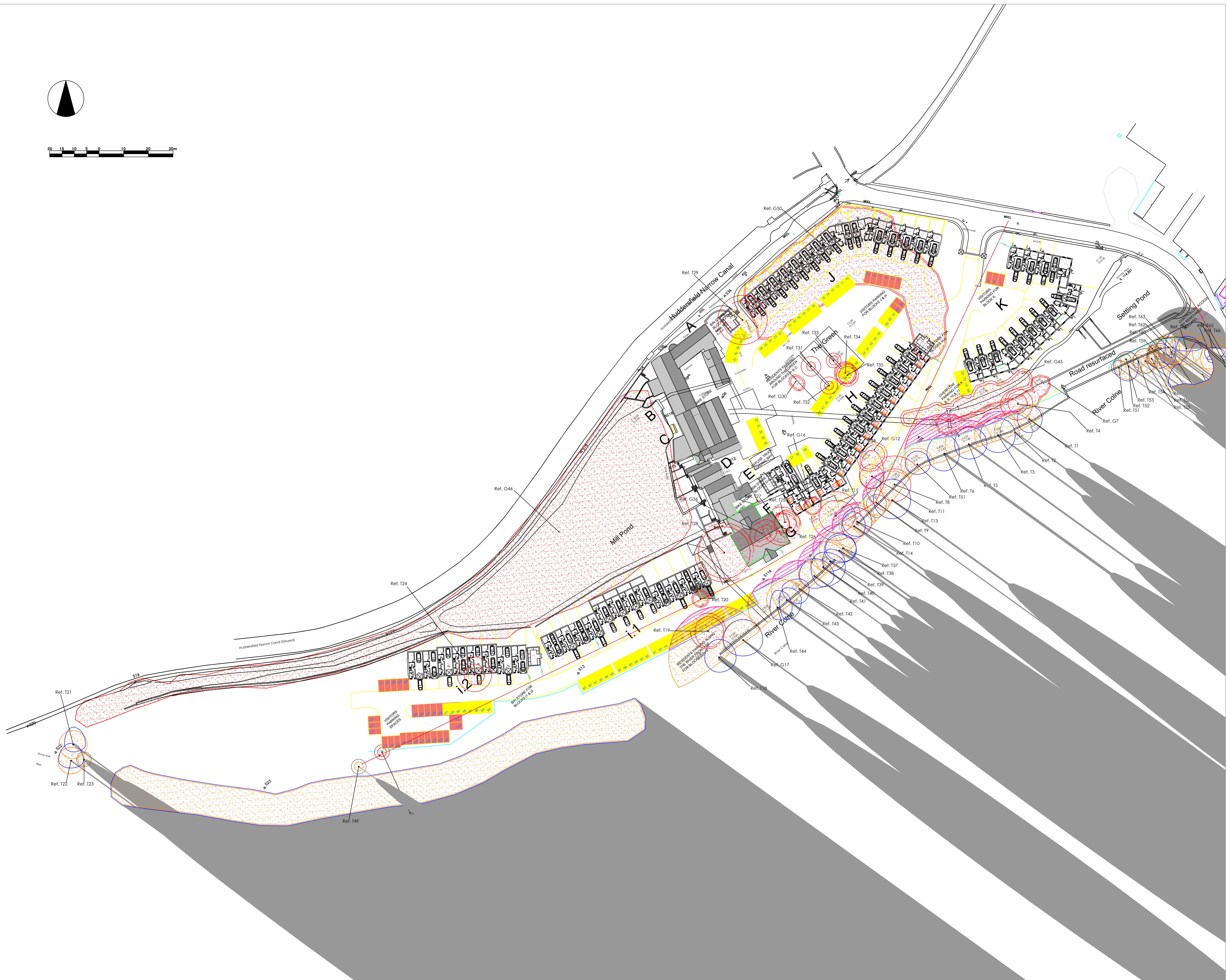
Retention category A	
Retention category B	
Retention category C	
Category U	
Root Protection Area (RPA)	
Tree to be removed	
Tree Protection Barrier	
Area of hand tools only	

Westwood Mill, Linthwaite  
 Tree Shadow Plan 15 June 7am  
 Dwg. No. DR-3976-03  
 Scale: 1:500 @A0 Date: June 2020





**NOTE**  
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 The positions of the tree groups and some trees are estimated only.



Location: 53.6252° N 1.8458° W

**KEY**

BS5837:2012 Retention categories:

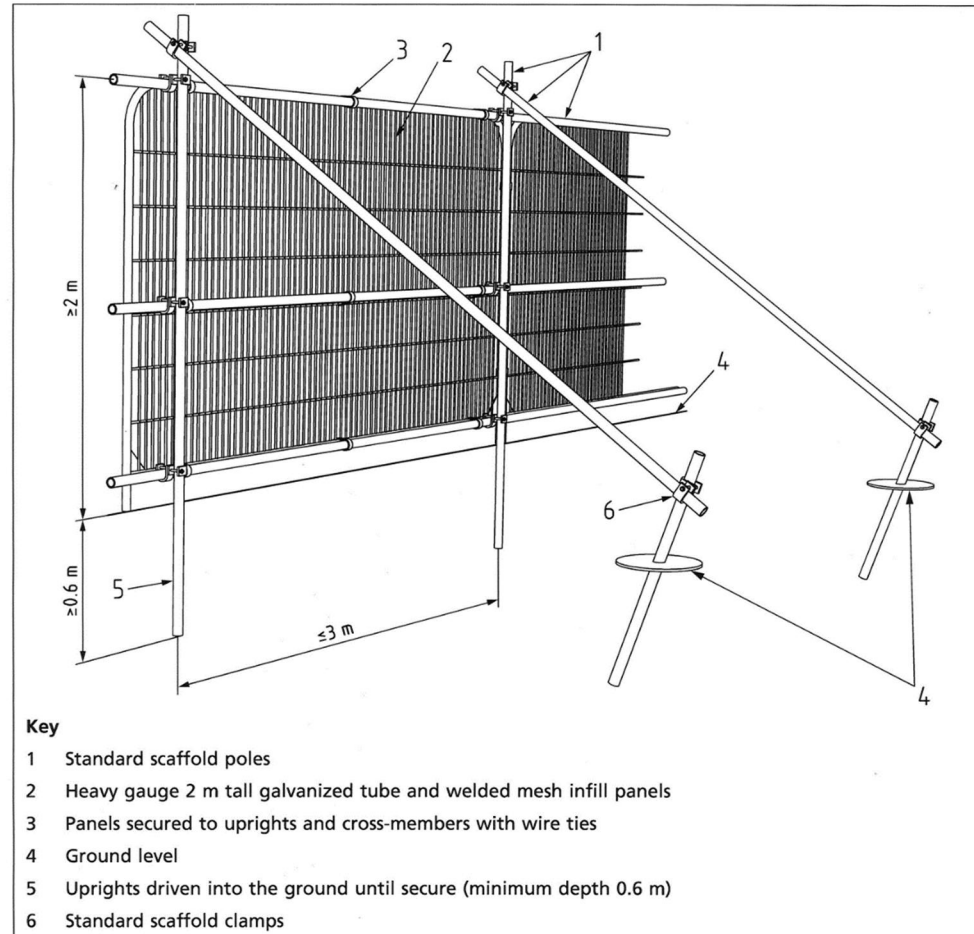
Retention category A	
Retention category B	
Retention category C	
Category U	
Root Protection Area (RPA)	
Tree to be removed	
Tree Protection Barrier	
Area of hand tools only	

Westwood Mill, Linthwaite  
 Tree Shadow Plan 15 June 8pm  
 Dwg. No. DR-3976-03  
 Scale: 1:500 @A0 Date: June 2020

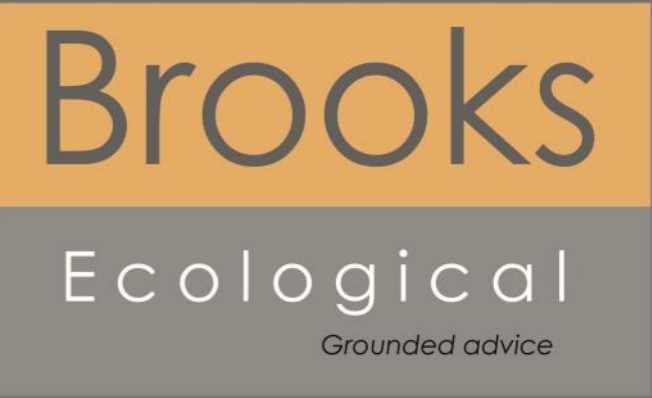


## Appendix 2: Tree Protection Barriers

### Protective Barrier to BS 5837:2012



**Appendix 3:** Biodiversity Management Plan and Public Open Space Strategy



**Biodiversity Management Plan and  
Public Open Space Strategy**  
Westwood Mills, Linthwaite



Report Reference:	Biodiversity Management Plan and Public Open Space and Strategy Westwood Mills, Linthwaite
Report Reference:	R-3976-04.3
Written by:	Peter Brooks BSc (Hons), MA, MCIEEM, CEnv Managing Director and,  Tamsin Harrison BSc Landscape Architecture and Ecology Principal Landscape Architect
Technical review:	Victoria Baker BSc (Hons) MSc GradCIEEM Ecologist
QA review:	Sam Kitching BSc (Hons) Grad CIEEM Ecologist
Approved for issue:	Peter Brooks BSc (Hons), MA, MCIEEM, CEnv Managing Director
Date:	22.01.20

The information which we have prepared and provided is true and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report does not constitute legal advice.

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 Registered in England Number 5351418



# Introduction

This Biodiversity Management Plan and Public Open Space Strategy (The Plan) is produced to show how biodiversity is a central consideration at this site and to show how biodiversity and public accessibility and human wellbeing are intimately linked.

The Plan is produced with reference to Chapter 11 of British Standard 42020.

In producing this plan, the following information sources are referred to:

To provide information on the Site's ecological value, the following studies have been carried out; with the relevant reports produced being:

Preliminary Ecological Appraisal Report: R-2506-01– Brooks Ecological, 2016

Updating Ecological Appraisal: P-3976-01– Brooks Ecological, 2019

Riparian Mammal Survey: R-3976-01– Brooks Ecological, 2019

Bat Emergence Survey: R-3976-02– Brooks Ecological, 2019

Interim Bat Activity Survey: R-3976-03– Brooks Ecological, 2019

## Aims of the Plan

To create a robust semi-natural landscape that will support high volumes of invertebrates and small mammals, which will attract predatory birds, larger mammals and amphibians. To bring ponds back into early successional stages which can support more aquatic wildlife. To protect riparian corridors. The landscape is to be freely accessible to site users and to encourage interaction between children in particular and the natural world to help engender 'ownership' of the open spaces.

## Scope of Plan

This plan relates to the sites open spaces as illustrated right.

## Delivering the Plan

The Developer is responsible for the creation and establishment works for a five-year period.

The Developer will appoint either a Specialist Ecological Management Company (SEMC) or a company working under the direction of an Ecological Clerk of Works (ECoW) to oversee the delivery of this plan prior to any work commencing on site.

The ECoW would be a qualified Ecologist and member of the Chartered Institute of Ecology and Environmental Management, or be otherwise approved by the LPA.

After year five, this plan will be the responsibility of a Site Management Company.



 Plan Boundary

0 50 100 m





# Themes

This site presents a great opportunity to inspire people to engage with the natural world, creating new accessible greenspaces linked to existing footpaths.

The main themes for biodiversity enhancements are focussed on creating new aquatic habitats and encouraging increases in invertebrate and small mammal populations.



## Natural play, natural locally sourced materials



## Birds

Enhancing habits for birds, encouraging growth of plants with berries. Creating new nesting opportunities.



## Deadwood for fungi and invertebrates

Accumulated deadwood and chippings spread on woodland floors are slowly broken down by fungi, whilst wood piles make homes for invertebrates, amphibians and small mammals. They also slow the release of carbon into the atmosphere.



## Food for pollinators

Maximising the range and flowering period of pollen and nectar bearing plants increases potential invertebrate biomass and diversity.



## Ponds

Introducing ponds into a site is a big win for biodiversity as they are rapidly colonised by aquatic invertebrates, amphibians and fish.



# Constraints

*This is a sensitive site with a number of key constraints that need to be considered when delivering the development and putting in place many of the measures in this document.*

1. The site contains a Local Wildlife Site and this LWS has records of the protected plant species floating water plantain.
2. The site will support many birds during the nesting season.
3. The site lies in the Kirklees Wildlife Habitat Network so the ability for the site to allow wildlife to pass through freely needs to be retained.
4. Sensitive aquatic habitats enclose the site; the River Colne and the Huddersfield Narrow Canal. These are at pollution risk.
5. The site supports Invasive Non-Native Plant species and development could lead to their spread on or off site.



Invasive non-native plants present



Nesting birds will be present throughout

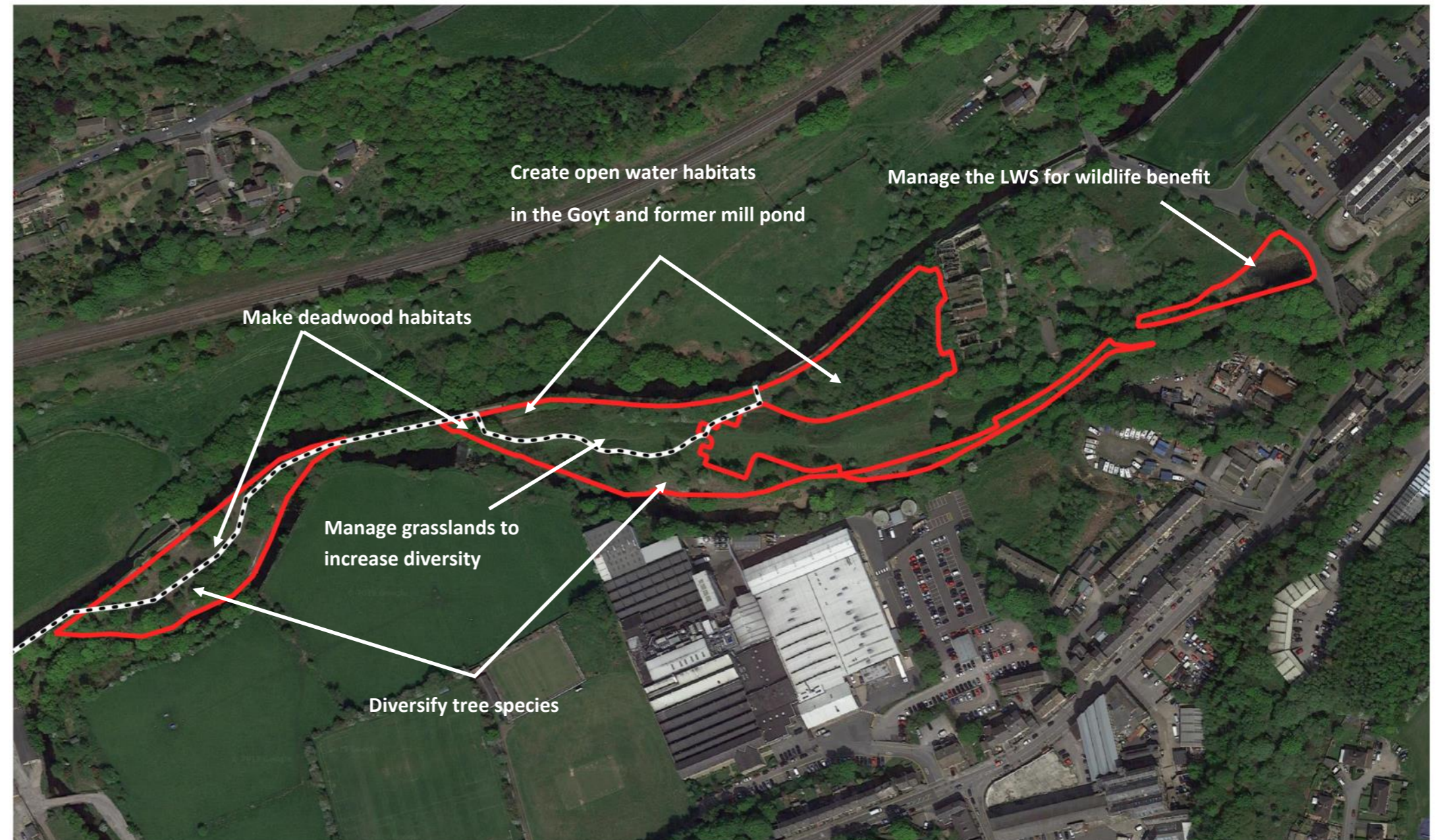
Plan Boundary



# Opportunities

*The development will be an important driver to increasing public access, be a good educational resource and will bring some neglected habitats back to life and into active management.*

1. There is the potential to secure the future of the protected floating water-plantain and aquatic habitats by preventing pond infilling with reedmace.
2. New aquatic habitats will be restored from drained former mill pond and goyt through dredging and reprofiling.
3. Control of invasive plants allows native species to colonise or be reseeded (to be detailed in a CEMP: biodiversity).
4. Loss of wildflower grasslands to lower-value scrub can be halted.
5. Tree species diversity can be increased and linear habitats reinforced by planting.
6. There is great scope to increase the accumulations of dead wood habitat on site.
7. Significant potential to introduce a programme of engagement and education encouraging volunteer involvement to deliver habitat restoration and installation works, increasing local understanding of the ecological issues and opportunities offered on the site.
8. The site landscape is designed to be fully publicly accessible enabling members of the public to enjoy a wide variety of grassland through to woodland and wetland habitats. This site represents a unique development solution in terms of the proportion of retained and visually and/or physically accessible open space to be enjoyed by the public which, inclusive of grasslands, woodlands, wetland areas, formal and informal open green space provision, currently stands at approximately 55% accessible open space.



access  
 - - - path  Plan Boundary

0 50 100 m  


# Interaction with the landscape - Informal Play

## Rationale

To inspire children to use the resources around them imaginatively for the purposes of self-led play and creative thinking. Helping children to value the natural world is pivotal to preserving biodiversity.

## Objectives

1. Use natural materials such as wood, rope, willow.
2. Re-use materials found on site.
3. Encourage use of the landscape for informal creative play by providing materials, starting examples of woodland dens for children to take over and modify, creating semi-natural tracks through the landscape leading to areas suitable for play.
4. Enable children to interact with the elements around them by enabling natural water play, providing materials which can be used to make sound if it is windy or if the materials are hit, explore opportunities to play with light and reflection.
5. Install child friendly information on wildlife they could look for in each area.

## Specification

Use natural materials where possible to fix / secure structures or simply provide materials from within the site and allow the children to create their own structures.

If nails/screws/bolts are required, ensure there are no sharp edges or loose fittings that could cause potential damage to users. Avoid the use of these elements as far as possible.

Safety measures to be provided near water.

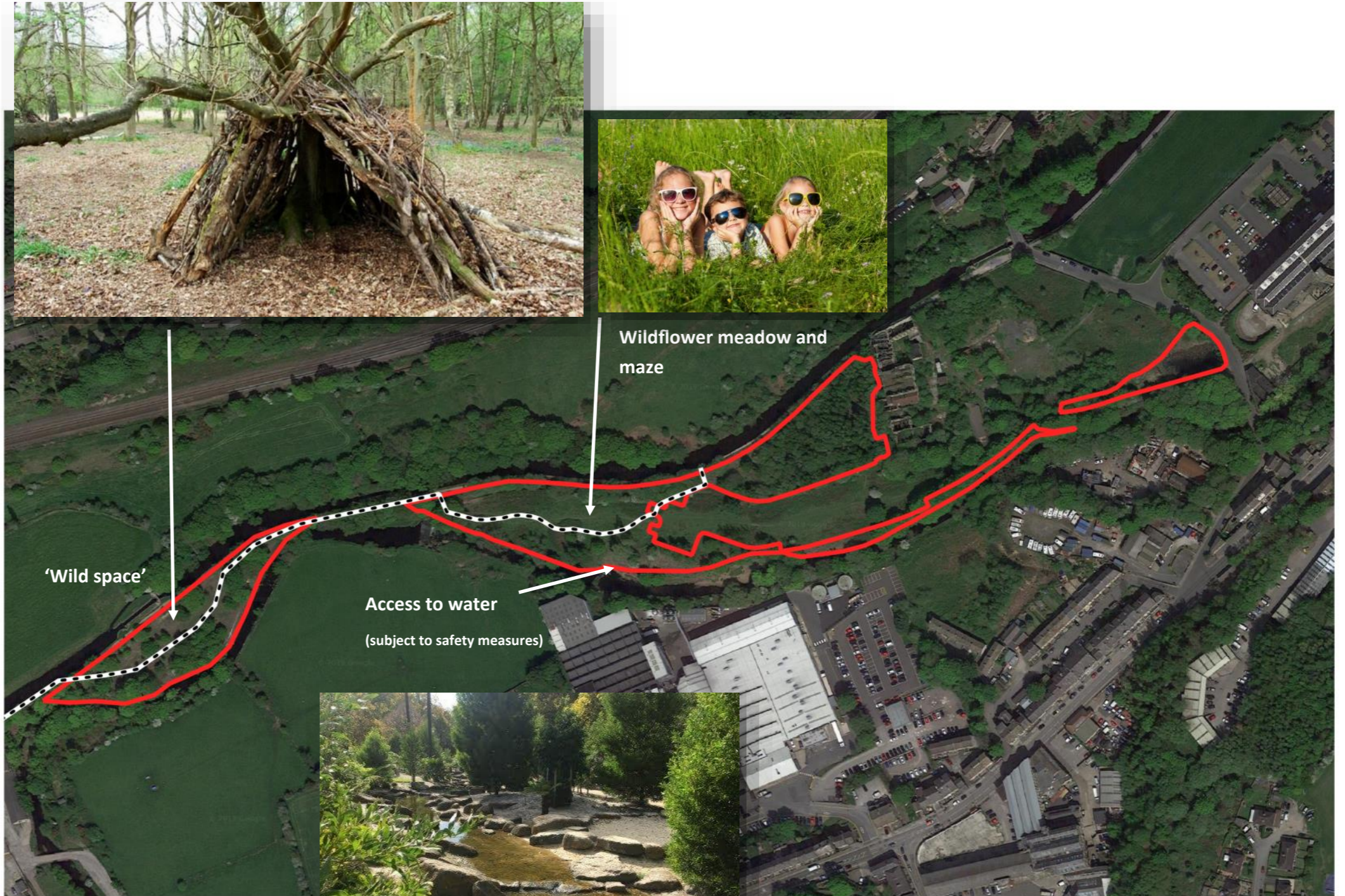
## Management

Year 1

Consider temporary signage to indicate that play is permitted, to be removed after the first year.

Year 2 onwards

Ensure continuous replenishment of materials year on year.  
Mow grasslands to create mazes of paths through tall wildflower grassland.



access  
- - - path  Plan Boundary



# Interaction with the landscape - Formal Play

## Rationale

To inspire children to use the resources around them imaginatively while still providing a safe play environment for younger children, using natural materials in natural colours and finishes.

## Objectives

1. Use natural materials such as wood, rope, willow, woodchip
2. Re-use materials found on site where possible
3. Create play opportunities which develop motor skills, problem solving, creative imaginary play, emotional learning
4. Features do not have to be restricted to the designated play area, opportunities for play and interaction with the environment should be provided along the access routes as well as within the wider grassland and woodland areas.
5. Include seating opportunities particularly in the formal play area for the use of supervising parents

## Specification

Use natural materials where possible to fix / secure structures.

Where nails/screws/bolts are required, ensure there are no sharp edges or loose fittings that could cause potential damage to users.

Surround play features with natural floor material such as grassland or wood chip.

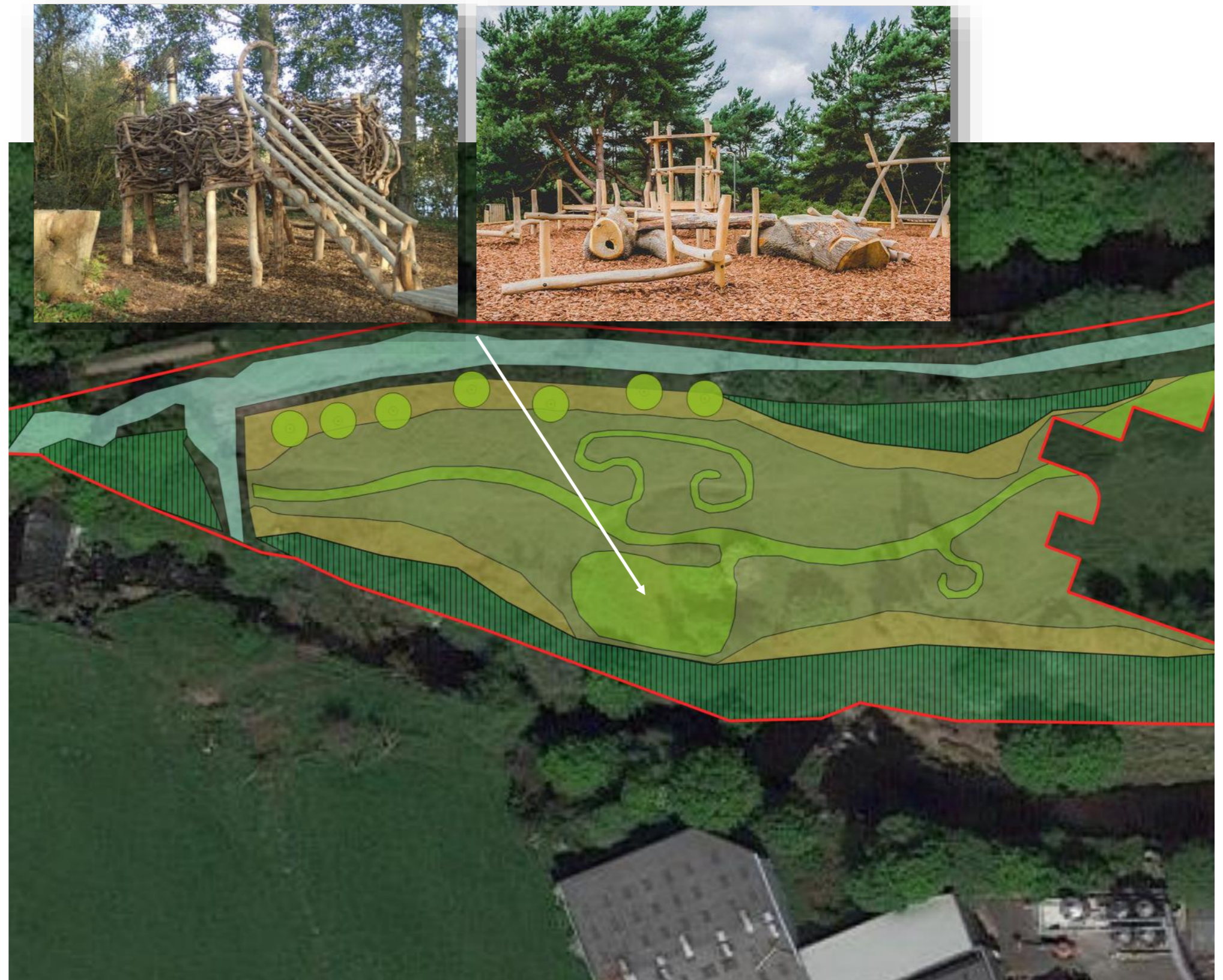
## Management

Year 1

Low level maintenance, damage checks.

Year 2 onwards

Ensure play features are in sound condition, perform repairs or replacements as necessary, allow for the form of features to change and evolve year on year to retain interest.



# LWS Management

## Rationale

*This water body is filling in with reedmace and will dry out without intervention. Maintaining the pond as a healthy balance of open water to marginal vegetation will maximise the ecological value of the habitat and increase its ecological longevity. Open water helps support the rare and protected plant *Luronium natans* which has been recorded here in the past.*

## Objectives

1. Floating water plantain if present increases by year 5.
2. Trees and shrubs rooted not allowed to grow in the mill ponds walls.
3. Open water makes up 75% of area at year 1.
4. Emergent vegetation never attains more than 50% cover.
5. A continuous and diverse belt of emergent and marginal herbaceous plants is maintained.

## Specification

Survey for floating water plantain (*Luronium natans*) and securing any license that may be needed and acting under the agreed method statement and CEMP (Biodiversity).

Woody vegetation removed under ECoW direction. Dredging carried out under ECoW supervision to leave shallow edges that can re-vegetate. Diversify marginal species through plug planting from schedule (overleaf).

## Management

**Year 1 –2** weed management.

**Year 3 onwards** periodic pond clearance to prevent infilling.

## Monitoring

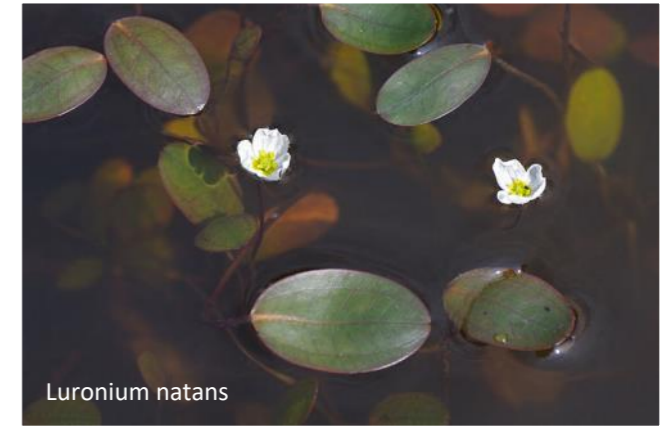
Year 3 and 5 Ecologist to record according to objective 1– 4.

### Output

ECoW report.

### Remedial actions

Pond reprofiling and reseedling. Weed management. Re-dredge if it fills in too quickly.



Luronium natans

<https://commons.wikimedia.org/wiki/File:LuroniumNatans2.jpg>



BMP  Plan Boundary  
 LWS



# Pond and Goyt Restoration

## Rationale

Neither mill pond or goyt hold water and they are infilled with birch and invasive scrub. These will be made structurally sound and made to hold water again which will have significant benefits for wildlife.

## Objectives

1. Both features hold water permanently.
2. Open water makes up a minimum of 85% of area at year 5.
3. Vegetation never attains more than 75% cover from year 4 onwards.
4. A continuous and diverse belt of emergent and marginal herbaceous plants in all ponds.
5. Installation of information panels explaining the site's history and ecology for educational purposes.

## Specification

Woody vegetation removed under ECoW direction acting under a Construction Environment Management Plan- CEMP (Biodiversity). Dredging carried out under ECoW supervision to leave shallow edges that can re-vegetate.

Seed exposed muddy margins with Emorsgate seeds EP1.

Plant marginal and emergent plug plants as schedules at 5 plants per linear m (shore and bank length). Planting to be directed by ECoW.

## Management

Year 1 –2 weed management.

Year 3 onwards periodic clearance to prevent infilling.

## Monitoring

Year 3 and 5 Ecologist to record according to objective 1– 4.

### Output

ECoW report.

### Remedial actions

Reseeding and replanting if required.

## Marginal plants

Scientific	English
<i>Eupatorium canabium</i>	Hemp agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Angelica sylvestris</i>	Angelica
<i>Sanguisorba officinalis</i>	Great burnet
<i>Scrophularia nodosa</i>	Figwort
<i>Valeriana officinalis</i>	Valerian
<i>Pulicaria dysenterica</i>	Fleabane

## Marginal Plants

Scientific	English
<i>Iris pseudacorus</i>	Yellow flag
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Caltha palustris</i>	Marsh marigold
<i>Mentha aquatica</i>	Water mint



BEMP  
 Birch clearance and dredging  
 Plan boundary



# Surface water runoff management—swales

## Rationale

The site is designed to manage surface water runoff using natural landscape features rather than engineered solutions, within a context of significant on site water bodies. Swales help to temporarily capture runoff, releasing it slowly into the surrounding water table thereby preventing flooding issues.

## Objectives

1. Temporarily hold water during periods of heavy rainfall.
2. Use planting to treat the water and cleanse it before it is released.
3. Contribute additional wildlife habitat opportunities.
4. Year round species rich planting strip which can tolerate dry conditions as well as waterlogged conditions during heavy rainfall.
5. Ensure ground level within the swale never increases beyond that originally specified in relation to surrounding ground level.

## Specification

Create a below ground level running trench with sloping sides to capture runoff in times of heavy rainfall as shown opposite, in accordance with the SUDs report.

Seed exposed muddy margins with Emorsgate seeds EP1.

## Management

Year 1 –2 weed management.

Year 3 onwards ensure continuation of function by maintaining as built ground levels.

## Monitoring

Year 3 and 5 Ecologist to record according to objective 1– 5.

## Output

ECoW report.

## Remedial actions

Weeding, reseeding and replanting if required.

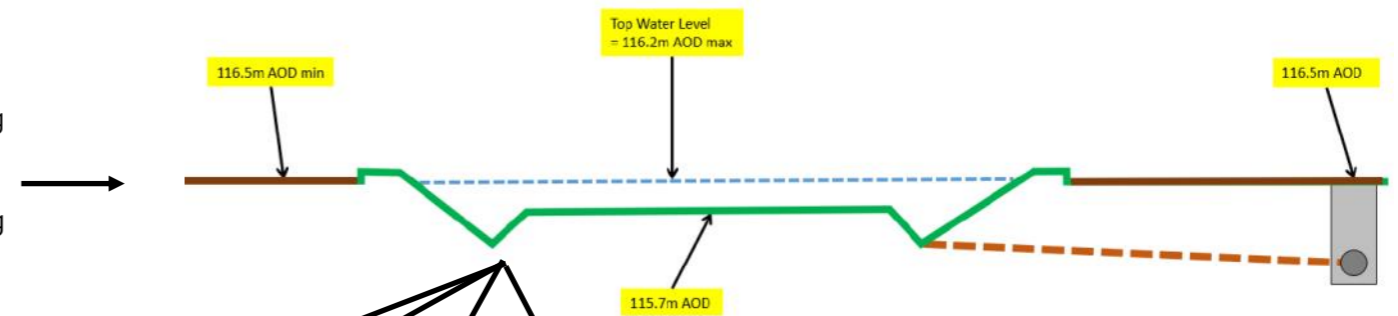
Removal of infill material to retain function if required.

## Marginal plants

Scientific	English
<i>Eupatorium canabium</i>	Hemp agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Angelica sylvestris</i>	Angelica
<i>Sanguisorba officinalis</i>	Great burnet
<i>Scrophularia nodosa</i>	Figwort
<i>Valeriana officinalis</i>	Valerian
<i>Pulicaria dysenterica</i>	Fleabane

## Marginal Plants

Scientific	English
<i>Iris pseudacorus</i>	Yellow flag
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Caltha palustris</i>	Marsh marigold
<i>Mentha aquatica</i>	Water mint





# Flood management—'two-stage channel'

## Rationale

This two-stage drop in the topography of the river bank provides a water containment area in times of increased river flow, increasing the capacity of the channel. Vegetating the created channel reduces the velocity of the water which protects the structure of the bank and reduces the potential for erosion.

## Objectives

1. Temporarily contain floodwaters during periods of heavy rainfall.
2. Use planting to reduce velocity of floodwaters minimising damage.
3. Contribute additional wildlife habitat opportunities.
4. Year round species rich planting strip which can tolerate dry conditions as well as waterlogged conditions during heavy rainfall.
5. Ensure ground levels within the designed channel feature never increase beyond that originally specified in relation to the adjacent road level.

## Specification

Create a stepped and vegetated bank between the river and the new access road and parking provision.

Seed exposed muddy margins with Emorsgate seeds EP1.

Interplant with shrubs increasing in density on level 2.

## Management

Year 1 –2 weed management.

Year 3 onwards ensure continuation of function by maintaining as built ground levels.

## Monitoring

Year 3 and 5 Ecologist to record according to objective 1– 5.

### Output

ECoW report.

### Remedial actions

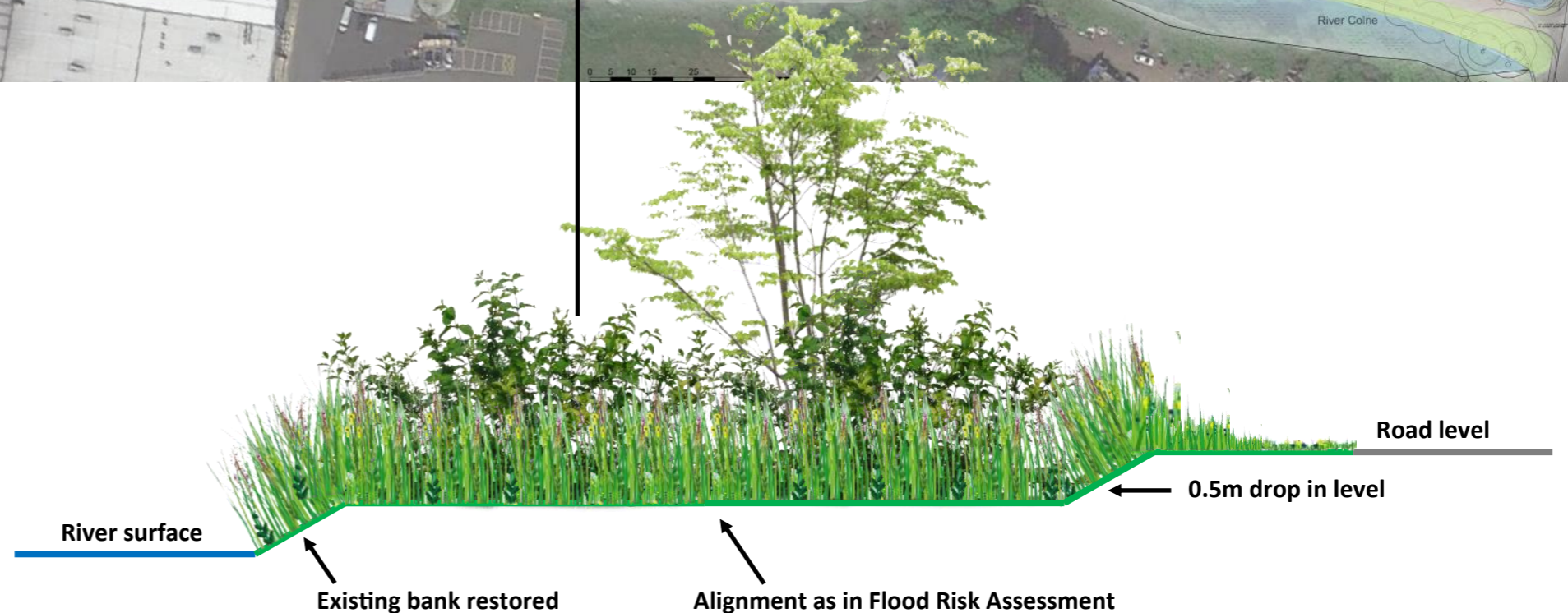
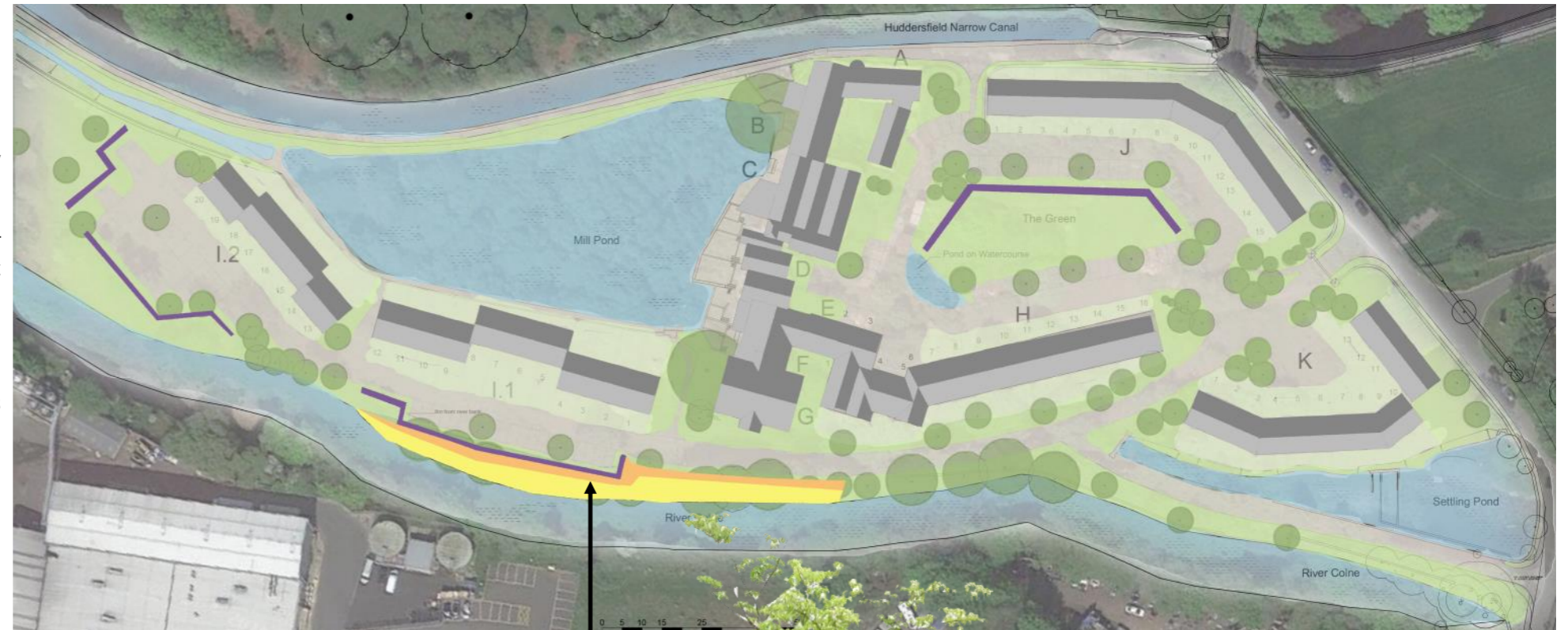
Weeding, reseeding and replanting if required. Removal of infill material to retain function if required.

## Marginal plants

Scientific	English
<i>Eupatorium canabium</i>	Hemp agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Angelica sylvestris</i>	Angelica
<i>Sanguisorba officinalis</i>	Great burnet
<i>Scrophularia nodosa</i>	Figwort
<i>Valeriana officinalis</i>	Valerian
<i>Pulicaria dysenterica</i>	Fleabane

## Shrubs

Scientific	English
<i>Cornus alba</i>	Dogwood
<i>Corylus avellana</i>	Hazel
<i>Sambucus nigra</i>	Common elder
<i>Frangula alnus</i>	Alder buckthorn



# Wildflower - Seeding, Plug Planting and Establishment

## Rationale

The figure below shows an estimation of the areas that may be disturbed or reprofiled through construction or dredging. In both cases, the rationale is to maximise the number of flowering plants to benefit invertebrates and in turn, larger fauna that will prey upon these. This will be achieved through a combination of wildflower seeding, plug planting and wildflower management.

## Objectives

1. Ensure that all seeding in the locations shown are subject to wildflower seeding and plug planting (grass only mixes not used).
2. Ensure that flowering plants attain, and remain at, no less than 50% of the sward.
3. Ensure that plants can flower (are not cut too often).

## Specification

Emorsgate EM1 seed mix or similar.

Naturescape N4 Summer Flowering plug plant mix or similar

### Preparation

Topsoil removed or inverted (spread beneath subsoil) as per CEMP (Biodiversity). This will be loose tipped and spread with back actor to avoid compaction, and harrowed to a fine tilth ready for seeding.

### Seeding

Seed or plant according to supplier's instructions. If soils have been spread before September, any weed growth that has established in the meantime will be sprayed off with glyphosate and a seedbed be re-prepared.

Seed will either be broadcast by hand or by approved lightweight machinery at c. 40Kg /Ha. Following seeding the area will be lightly rolled to incorporate the seed with the growing substrate.

## Year 1 Management

### Year 1

Use a weed wipe three times in year 1 to kill off weeds - Spear thistle, creeping thistle, broad-leaved dock, clustered dock, wood dock, curled dock, nettle, ragwort and others according to ECoW recommendations. Operative must be proven competent in identifying these in their early stages to prevent killing off sown wildflowers.

## Monitoring

Year 2 Ecologist survey to record relative cover values according to objective 1, - 3

### Output

ECoW report

### Remedial actions

Localised weed control or over sowing with wildflower seed under the instructions of the ECoW.



BMP  Plan Boundary  
 seeding and planting

0 50 100 m



# Native Tree Planting

## Rationale

The retained trees and developing open woodland can be diversified to make them more ecologically resilient and provide food sources for wildlife.

## Objectives

1. 80% successful establishment.
2. Diversify tree species while using locally prevalent species .
3. Help create a well balanced stratified canopy.
4. Maintain a connected largely continuous canopy .

## Specification

- Plant in non-grid, naturalistic patterns. Plant to schedule adjacent.
- Plant with UK provenance trees and shrubs from schedule 1 Set out in liaison with ECoW .
- Plant in staked tree shelters (rabbit gauge).

## Management

### Year 1-5

Standard landscape establishment maintenance

### Remedial actions

Localised weed control or replanting of failed material under the instructions of the ECoW

## Monitoring

Year 3 and 5 Ecologist to record according to objective 1- 4.

### Output

ECoW report

### Remedial actions

Replanting if required

## Schedule 1 New trees

Scientific	English	Stock	Groupings
<i>Quercus petraea</i>	Sessile oak	1+1 BR	groups 1-3
<i>Malus sylvestris</i>	Crab apple	1+1 BR	groups 3-5
<i>Prunus avium</i>	Wild Cherry	1+1 BR	groups 1-5
<i>Prunus padus</i>	Bird Cherry	1+1 BR	groups 1-6
<i>Sorbus aucuparia</i>	Rowan	1+1 BR	groups 1-7
<i>Betula penula</i>	Silver birch	1+1 BR	groups 1-8
<i>Alnus glutinosa</i>	Alder	1+1 BR	groups 1-9



# Dead wood habitat

## Rationale

Woodlands make better habitats where deadwood can accumulate or chippings are spread, which are then slowly broken down by fungi. Wood piles make homes for invertebrates, amphibians and small mammals.

## Objectives

1. 50% of cleared timber to be reused on site to assist with carbon accumulation.
2. Zero carbon emissions from taking wood off site to burn.
3. At least 10 species of wood rotting fungi found on site by year 10.
4. Significant dead wood resource still present at year 5.

## Specification

Felled timber from site clearance to be retained on site and stacked in log piles in retained treed areas. Chip brash and spread under retained trees. Secure round wood piles with wire. Use chipped wood for footpaths.

## Management

Non-intervention.

## Monitoring

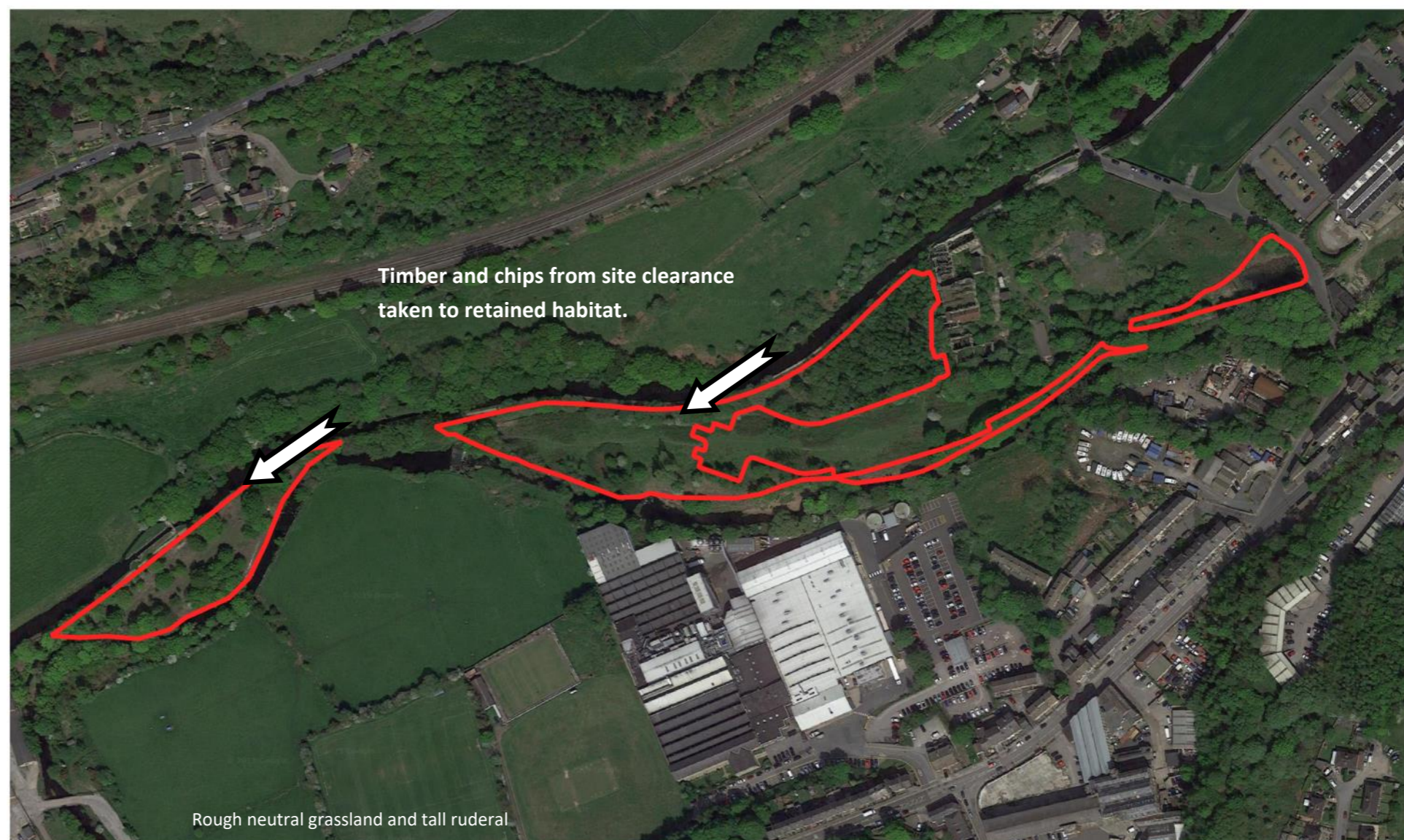
Ecological Clerk of Works year 2 and 5 monitoring visit to check wood is still on site and assess fungi baseline to objective 3.

## Output

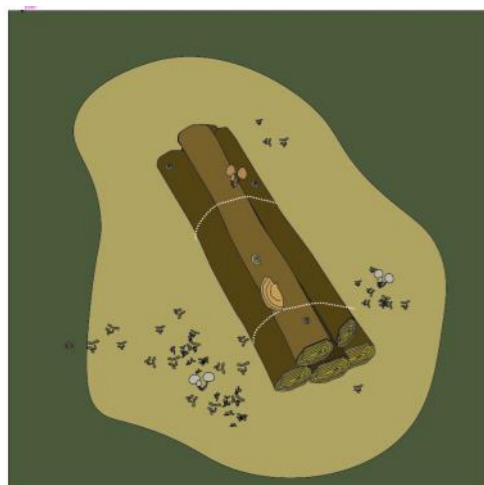
ECoW report year 3 and 5.

## Remedial actions

Re-stack and rewire as required.



Plan Boundary



# Dark zones

## Rationale

To maintain the function of the Wildlife Habitat Network and ensure that the development does not deter nocturnal animals from continuing to use the site for commuting and foraging, controlled dark zones will be included.

## Objectives

1. Dark and controlled light zones delivered per plan.
2. Protected dark zones remain fully dark.
3. Controlled light zones with low level lighting.

## Specification

Lighting strategy to be produced.

## Management

N/A

## Monitoring

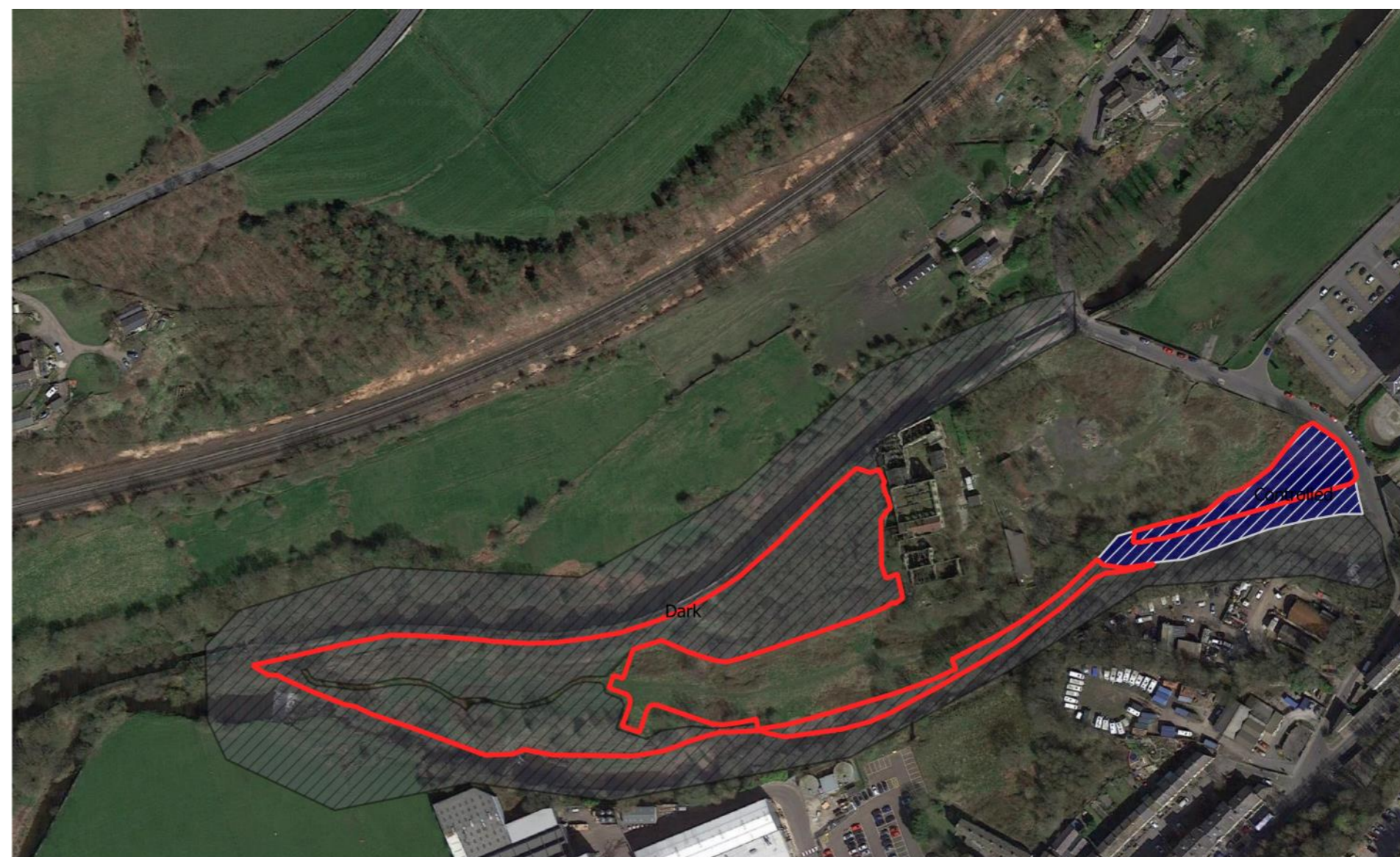
ECoW to check lighting compliance upon first occupation.

## Output

ECoW report year 3 and 5.

## Remedial actions

Modify light timings and/or replace/install mitigation fencing or planting.



# Wildflower Grassland - Management – Regular cutting

## Rationale

Regularly cut areas are important to make Sites look cared for, these need not be 'green deserts' but should provide nectar and pollen food sources for creatures vital to ecosystem health. Flowers with low growth points that are resistant to regular cutting include Clovers (*Trifolium spp*), Bird's-foot trefoil (*Lotus corniculatus*), daisy (*Bellis perennis*) and autumn hawkbit (*Leontodon autumnalis*).

## Objectives

1. Flowering plants (forbs) allowed to colonise/ remain in the sward.
2. Flowers can be seen in bloom from April through to September.
3. Competitive weeds no more than 10% cover.

## Specification

Area seeded with flowering lawn mix to suppliers instructions where soils have been disturbed during construction.

## Management

Year 1

Establish to suppliers instructions.

Year 2 onwards

Regular cuts in growing season, drop arisings to rot in situ. Periodic relaxation of cutting (less frequent) in June-July is beneficial.

## Monitoring

Year 2 Ecologist to record according to objective 1-3.

Year 5 Ecologist to record according to objective 1-3.

Output

ECoW report

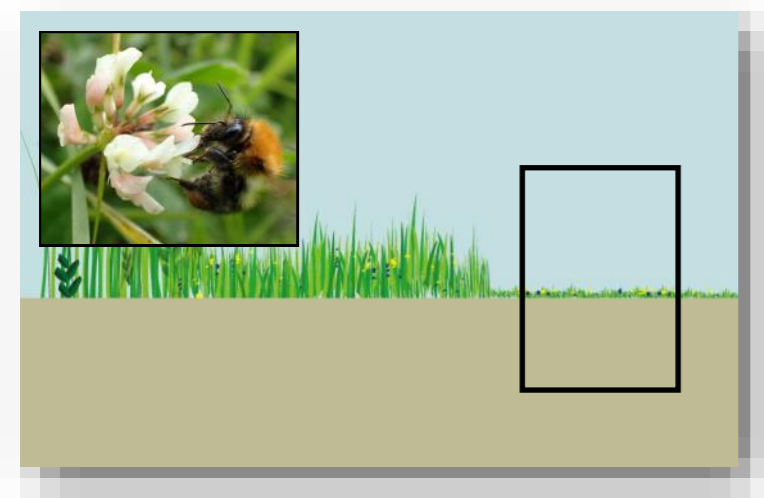
Remedial actions

ECoW to liaise with contractor to amended cutting regime



□ Plan Boundary Management  
□ Regular mowing

0 50 100 m



# Wildflower Grassland - Management – Annual cutting

## Rationale

Grassland cut once or twice a year can make great habitats for invertebrates and amphibians and in summer make attractive flower-filled habitats for people to enjoy. Once cut, these areas are good for people to enjoy and walk on so make good multi-use spaces. Managing for wildlife also means there is less need to use chemical fertilisers or pest treatments so make healthy sustainable environments.

## Objectives

1. Flowering plants (forbs) make up no less than 40% of the sward.
2. Flowers in bloom from April through to September.
3. Competitive weeds and Scrub no more than 10% cover.
4. INNS absent at year 3.

## Specification

N/A

## Management

Year 2 onwards.

August-September –annual cut and remove arisings.

## Monitoring

Year 2 Ecologist to record according to objective 1– 4.

Year 5 Ecologist to record according to objective 1-4.

## Output


ECoW report.


## Remedial actions

ECoW to liaise with contractor to amended cutting regime.

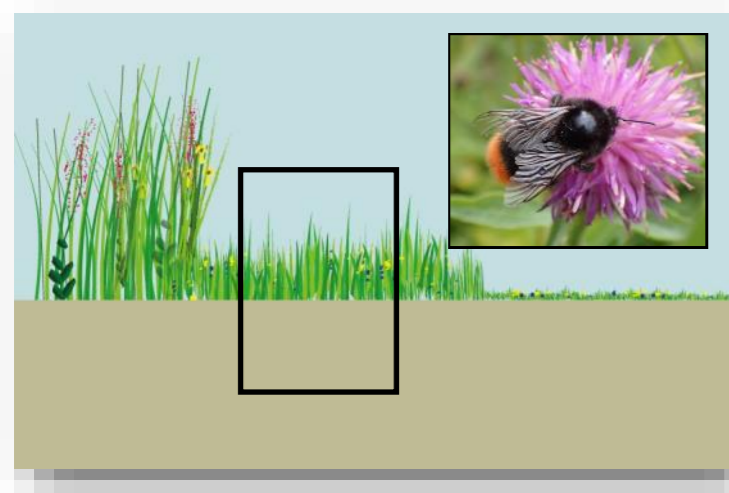


 Plan Boundary Management

 Regular mowing

 Annual mowing

0 50 100 m

# Wildflower Grassland - Management – No cut areas

## Rationale

Strips and islands of grassland to be available to act as faunal refuges and habitat for small mammals and invertebrates that depend on coarse vegetation with a thatch layer.

## Objectives

1. 30% of the grasslands on site remain uncut in any one year.
2. Thatch present in uncut areas.
3. Evidence of voles found in retained grasslands by year 5.
4. No Invasive Non-Native weeds present from year 2-onwards.

## Specification

N/A

## Management

No grass cutting carried out, litter pick regularly, remove woody vegetation (if establishing) on a three year cycle. Enter into INNS management regime.

## Monitoring

Year 2 Ecologist to record according to objective 1- 4.

Year 5 Ecologist to record according to objective 1- 4.

### Output

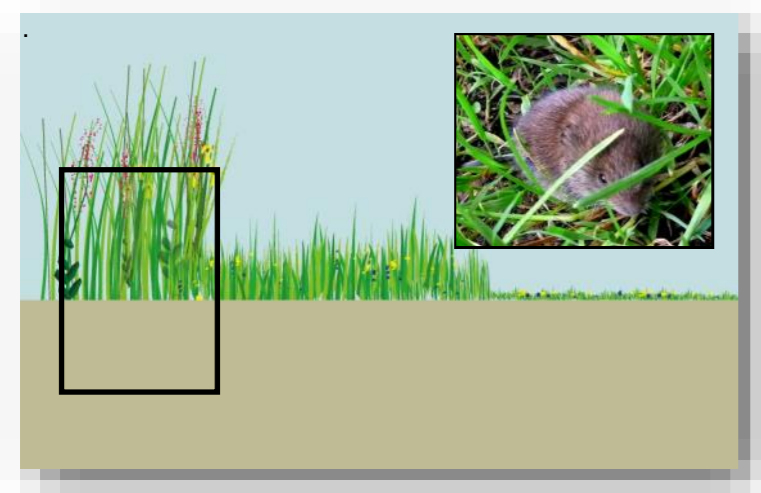
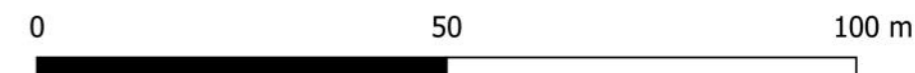
ECoW report

### Remedial actions

ECoW to liaise with contractor to amended cutting regime, additional efforts to manage INNS, especially Himalayan balsam which is most likely to spread on site.



- Plan Boundary Management
- Regular mowing
- Annual mowing
- Left uncut







# Works Schedule

## Pre-clearance

Task	ECoW to direct	ECoW to carry out
Produce CEMP (Biodiversity) based on completed survey work to include floating water plantain survey.		yes

## During-clearance

Task	ECoW to direct	ECoW to carry out
Follow requirements for fencing, survey and methods in CEMP Biodiversity	yes	yes
Retain materials suitable for play use		

## During development

Task	ECoW to direct	ECoW to carry out	Year 1	Year 2	Year 3	Year 4	Year 5	6+
Vegetation clearance and dredging and timber placement	yes		October-February	October-February				
Seed and plant wildflower habitats	yes		As needed according to ECoW instructions	As needed according to ECoW instructions				
Establishment management of wildflowers	yes			April-September				
Establishment of play features								
Manage wildflower areas	yes			April-Sept	April-Sept	April-Sept	April-Sept	April-Sept
ECoW Monitoring		yes	yes		yes		yes	