Technical Note

PROJECT REF:	LD10848
SUBJECT:	Clarification Note for Barnsley Metropolitan Council – Arboriculture
DATE:	21st May 2024
PREPARED BY:	Alan Reid – Principal Arboriculturist
REVIEWED BY:	Tim Palmer – Technical Director (Ecology)
REVIEWED & APPROVED BY:	Moray Simpson – Technical Director (Arboriculture)

1 INTRODUCTION

1.1 Following the submission of a planning application for a mixed-use development to provide up to 1,560 new homes and up to 43 hectares of employment land (planning reference numbers 2021/1089 employment element and 2021/1090 residential element) a number of comments/ queries have been received from Barnsley Council's Biodiversity Officer and Tree Officer.

1.2 Wardell Armstrong, acting as lead arboriculture advisors for the proposed development scheme have been tasked with provision of clarifications to the Council's queries. This Technical Note provides clarifications relating to the ancient woodland (AW) only. Matters pertaining to the arboricultural clarifications for the rest of the site are to be provided in a separate clarification note.

1.3 The Tree Protection (TPP) Plan Ref. LD10361-030 Rev. B is referred to in this note and thus is included in Appendix 2.

2 ANCIENT WOODLAND CLARIFICATIONS

2.1 We note the Council's comments with regard to the potential for direct impacts to the AWs Ref. W1a and W1b. The comments from the Council are as follows:

- Clarification is required following further survey work to establish the least damaging methods of installing the surface water drainage outfalls within the AW buffer zone and AW.
- There are still uncertainties over what is proposed within the AW with regards to footpath construction.

2.2 By way of clarification, there will be no culverting of the existing watercourses within the AW or within the AW buffer zone.

2.3 Three surface water connections are proposed from the surface water attenuation basins to the existing water course within the AWs Ref. W1a and W1b, with each being required to deal with overflow at greenfield run-off rates from the attenuation basins.

2.4 Wardell Armstrong's Principal Arboriculturist met the Project's drainage expert, Nick Dunwoodie on site on 27th February 2024 to assess the least damaging routes for the three-surface water drainage runs to the watercourse within the AWs. Subsequent to this site meeting, a BS 5837 survey was undertaken of all trees within the AWs within influencing distance of the three drainage run locations with the trees plotted using sub-metre GPS. The locations of these surface water drainage runs are shown in Figure 1 below and on the appended TPP Ref. LD10361-030 Rev. B, along with the additional surveyed trees and trees required to be removed to enable the drainage to be installed.

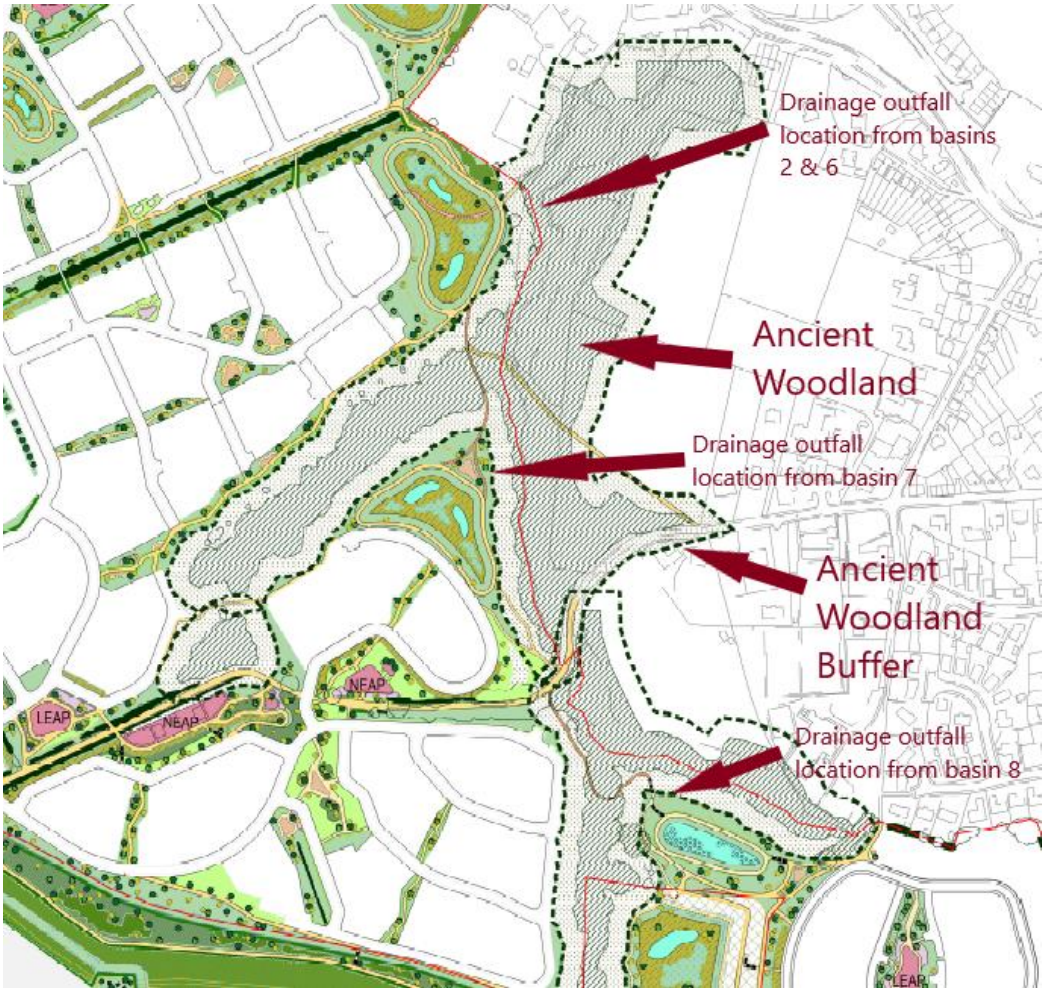

Figure 1: Locations of drainage surface water outfalls within AW including AW buffer zones

2.5 Note, that the proposed surface water drainage connections into AW from attenuation basins 7 and 8, is predominantly restricted to heavily grazed land within the AW's buffer zone, separated from the woodland by a steep-sided stream. The combined drainage outfall connection from basins 2 and 6 is terminated in boggy ground, where the extant anaerobic soil conditions has resulted in the decline of the health of the trees at this location.

2.6 A comparison of two potential methodologies for installing the drainage outfall connections within the AW and buffer zone was carried out to determine the least damaging option for the installation of the surface water drainage runs within the AWs and AW buffer zones, to protect undisturbed soil, trees and ground flora. The two potential options for installation are open trench excavation (according with NJUG Volume 4 guidelines[1]) and Horizontal Directional Drilling (HDD). This comparison in table format is included in Appendix 1. Following discussions with the drainage team experts this assessment has concluded HDD is the least damaging option.

2.7 The surface water drainage connection from the attenuation basins to the adjacent watercourse within the AWs and the AWs buffer zones will be made using HDD. This involves the launch of the drilling head from a 6m x 4m drive pit located outside the AWs buffer zones, from which point the piped connection is drilled beneath the AW buffer zones and Root Protection Areas of retained trees (at least 2m deep) before emerging at a pre-determined location within the AW, adjacent to the stream. The emergence point – the receptor pit, will be 4m x 2.5m and will be excavated by the use of an excavator.

2.8 Tree removals and height clearance pruning will be undertaken in accordance with BS 3998:2010 to provide clearance for the working area and receptor pit and drainage headwall at the approximate locations shown on the TPP Ref. LD10361-030 Rev. B. The pruning will be supervised and directed by the Project Arboriculturist. Heras protection fencing will be installed at the locations shown on the TPP Ref. LD10361-030 Rev. B. Ground protection will also be required to protect the adjacent retained trees RPAs and underlying soil structure. This will be appropriate to the weight loading and can be specified in an Arboricultural Method Statement (AMS), which can be conditioned by the Local Planning Authority (LPA), if required.

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[1] Volume 4 NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees
http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf

2.9 Excavations for the HDD receptor pit and drainage headwall will be undertaken using a 14t excavator with a travelling width of c2.6m and a height of c3.6m, extending to 6m with the boom extended, working from the ground protection at all times. The excavations will be supervised by the Project Arboriculturist, with any roots found of retained trees cleanly pruned to the edge of the excavation area. The excavated topsoil and sub-soil will be stored in separate piles, with these being replaced in the correct order when the exaction is back-filled.

2.10 The location of the required ground protection and the approximate working area and area to be excavated will be adjacent to the stream and are provided in further detail on the TPP Ref. LD10361-030 Rev. B and are shown in Figures 2 to 4 (below).

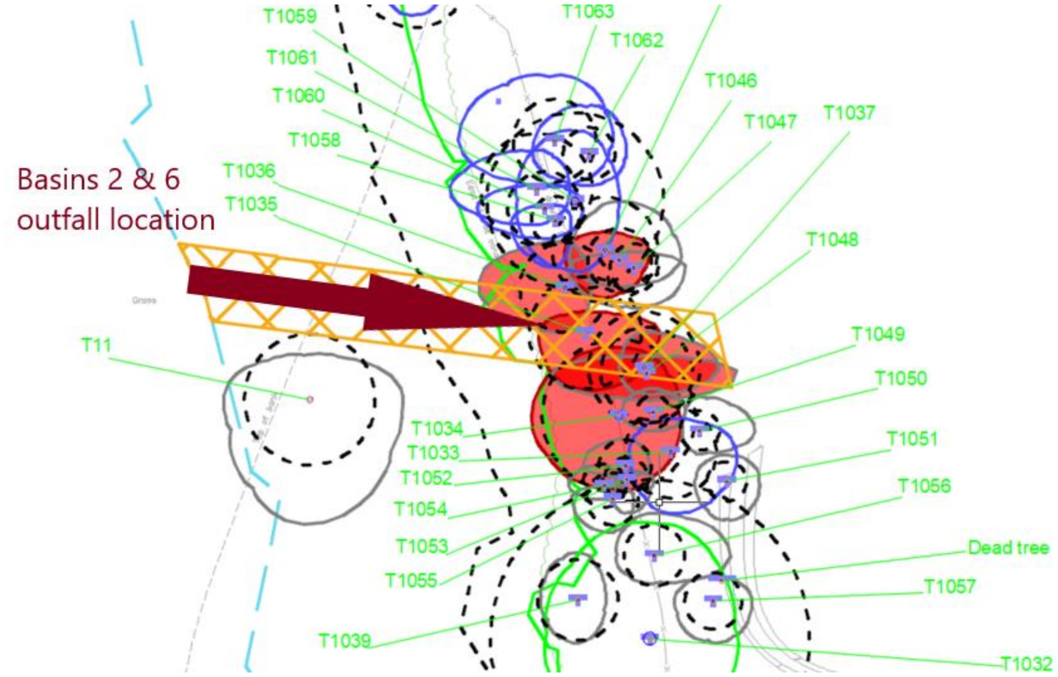

Figure 2: Location of drainage outfall from basins 2 & 6.

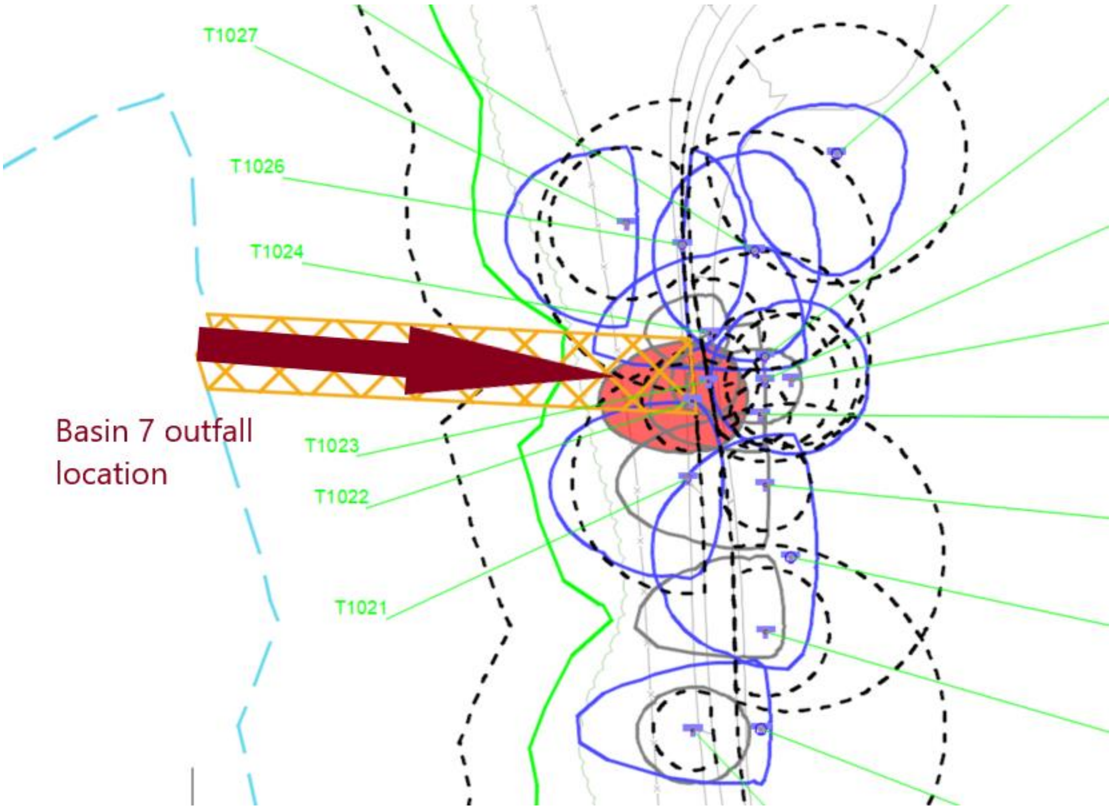

Figure 3: Location of drainage outfall from basin 7.

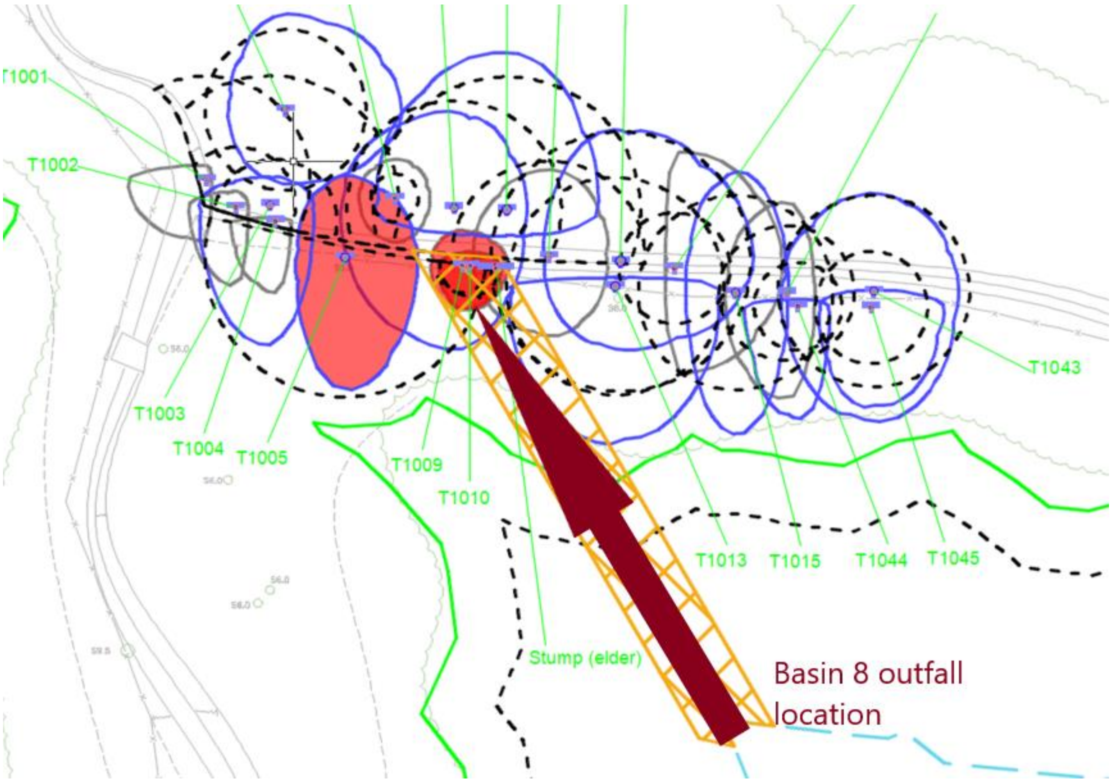

Figure 4: Location of drainage outfall from basin 8.

2.11 A new pre-cast concrete headwalls (Althon SFA10C Headwall/ Althon SFA6C Headwall) will be placed at the terminus of the HDD outfalls drainage run. The headwalls will be delivered to its final position by either dumper or trailer and manoeuvred into place by the excavator.

2.12 Footway locations within the AWs as shown on the TPP Ref. LD10361-030 Rev. B are indicative and their locations will be micro-sited to avoid impacts within the woodland where possible. The footways within woodland W1 will utilise either 'low-impact bark mulch' or no-dig construction, consisting of a three-dimensional geogrid sub-base with permeable 'Flexipave'[2] wearing course. The two footway types are shown on the Strategic Landscaping Area Plan Ref. P11754-00-001-GIL-0100 Rev. 10, latest revision dated 16/05/2024, by Gillespies. The footways' full specifications and installation methodologies can be included in an AMS, which can be conditioned conditioned by the LPA. Installing footways in the above-described ways is likely to have a low impact on the AWs.

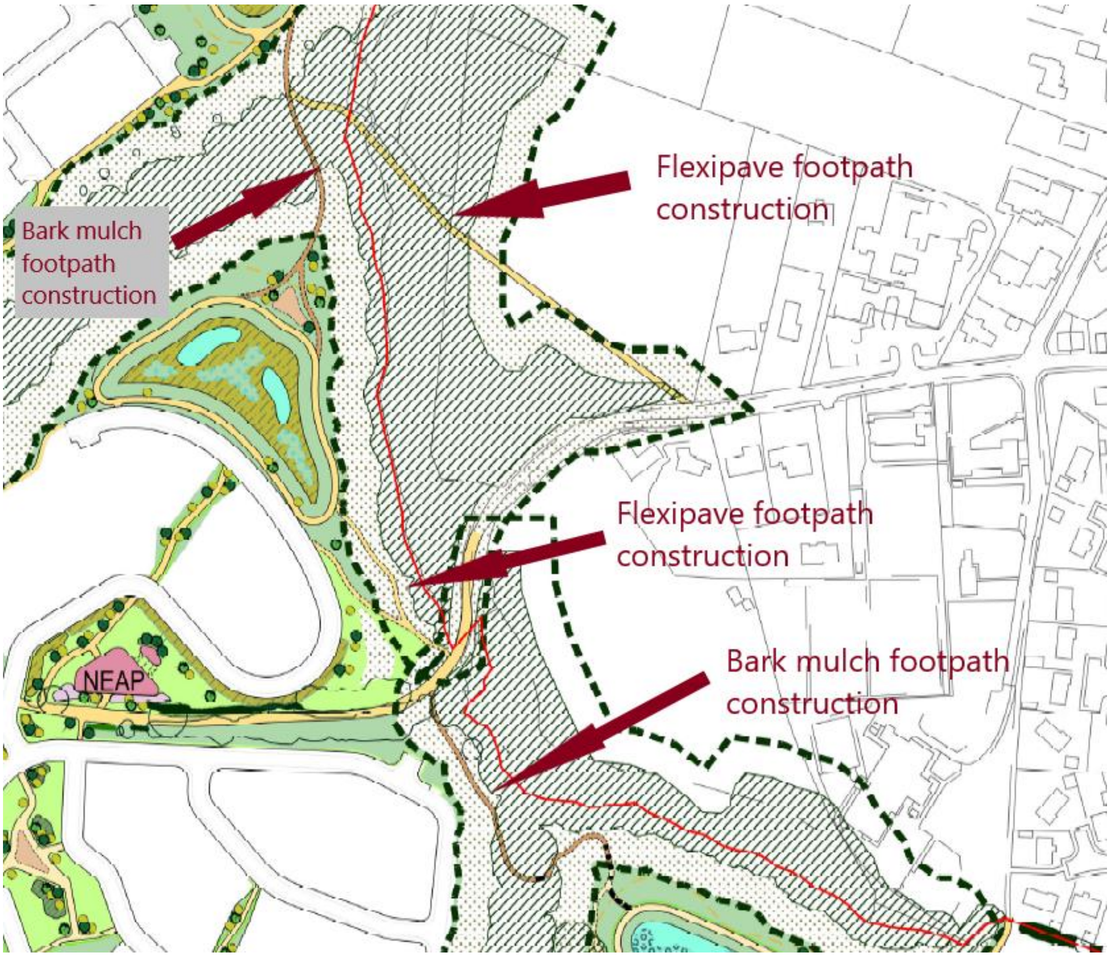

Figure 5: Footway construction methodologies within AWs and AWs buffer zones.

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[2] https://www.kbiuk.co.uk/

3 SUMMARY AND CONCLUSIONS

3.1 In summary, we conclude that there will be no significant adverse effects to Craven Wood AWs arising from the installation of the surface water drainage runs and footways.

3.2 Co-operation between design team and the arboricultural team has resulted in an agreement for the preferred surface water drainage outfall connection locations that minimises the impacts on the AWs. It is considered that impacts of the proposed drainage within the AWs are tolerable from an arboricultural and soil protection perspective.

3.3 The proposed footways within the AWs will be either very low impact informal bark mulch trails or more formal hard surfaced footways, with the latter being constructed using no-dig materials and construction methodology. The sub-base will consist of a three-dimensional geogrid charged with angular 2-40mm aggregate with no fines and the wearing course will consist of ‘Flexipave’. This will prevent compaction of the underlying soil and will enable the tree root gas diffusion process to be maintained e.g. oxygen in and carbon dioxide out. Both types of footways are to be micro-sited to avoid impacts on trees and ancient woodland indicator species ground and shrub layers where practical and feasible to do so.

3.4 The methodology and specification for the drainage and footways installation can be included in an AMS report and updated TPP.

Appendix 1: Drainage Installation Methods within Ancient Woodland Option Table

<table>
<tr><th colspan="2">Northern Surface Water Drainage Run Within Ancient Woodland Ref. W1b
(From Basins 2 & 6) - Options Pros and Cons Comparison</th></tr>
<tr><td colspan="2">• Total length of drainage run within ancient woodland buffer zone:- 16.5m.
• Total length of drainage run within ancient woodland canopy extent:- 13m.
• Total length of drainage run within ancient woodland Root Protection Areas (RPAs):- 10m.
• Boggy ground conditions present with waterlogged soil likely to be anaerobic, hence affected trees health declining.</td></tr>
<tr><th>Open Trench Excavated</th><th>Horizontally Directionally Drilled (HDD), With Last Section to Stream Edge Open Trench Excavated</th></tr>
<tr><td>No. of Trees Provisionally Requiring Removal To Enable Drainage:-
• Category U Quality:- 3 Trees (T1034, T1035, T1038);
• Category C Quality:- 3 (T1036, T1037, T1048).</td><td>No. of Trees Provisionally Requiring Removal To Enable Drainage:-
• Category U Quality:- 3 (T1034, T1035, T1038);
• Category C Quality :- 3 (T1036, T1037, T1048).</td></tr>
<tr><td>NJUG 4 Excavation Within Specific Retained Trees RPAs:-
• N/A.</td><td>Excavation Within Specific Retained Trees RPAs:-
• N/A.</td></tr>
<tr><td>**Pros**
• Excavations in RPAs, if in accordance with NJUG 4 guidance, can usually work around and retain significant tree roots.</td><td>**Pros**
• Surface soil within ancient woodland buffer zone would be undisturbed.</td></tr>
<tr><td>**Cons**
• Greater quantum of excavation of undisturbed surface soils within ancient woodland and the ancient woodland buffer zone required.</td><td>**Cons**
• Substantially less excavation of undisturbed surface soils within ancient woodland.</td></tr>
</table>

Surface Water Drainage Run Within Ancient Woodland Ref. W1b

(From Basin 7) - Options Pros and Cons Comparison

- Total length of drainage run within ancient woodland buffer zone:- 19m.
- Total length of drainage run within ancient woodland canopy extent:- 8m.
- Total length of drainage run within ancient woodland Root Protection Areas:- 6m.
- Ground significantly disturbed by grazing animals.

Open Trench with Section Within RPAs Of Retained Trees Manually Excavated To NJUG 4 Standard	**Horizontally Directionally Drilled, With Last Section to Stream Edge Manually Excavated To NJUG 4 Standard**
No. of Trees Provisionally Requiring Removal To Enable Drainage:- • Category C Quality:- 3 Trees (T1022, T1023, T1024).	No. of Trees Provisionally Requiring Removal To Enable Drainage:- • Category C Quality:- 3 Trees (T1022, T1023, T1024). •
NJUG 4 Excavation Within Specific Retained Trees RPAs:- • Category B Quality:- 2 Trees (T1021, T1026).	Excavation Within Specific Retained Trees RPAs:- • Category B Quality:- 2 Trees (T1021, T1026).
Pros • Access only required within a heavily grazed field to west of steep-sided stream bank. The stream provides a barrier to the undisturbed woodland soils to the east of the stream. • Excavations in RPAs, if in accordance with NJUG 4 guidance, can usually work around and retain significant tree roots.	**Pros** • Access only required to heavily grazed field to west of steep-sided stream, which provides a barrier to the undisturbed woodland soils to the east of the stream. • Surface soil within ancient woodland buffer zone would be undisturbed.
Cons • Greater quantum of excavation of undisturbed surface soils within ancient woodland and the ancient woodland buffer zone required. • Excavation may disturb significant roots within RPAs.	**Cons** • Substantially less excavation of undisturbed surface soils within ancient woodland.

<table>
<tr><th colspan="2">Southern Surface Water Drainage Run Within Ancient Woodland Ref. W1b
(From Basin 8) - Options Pros and Cons Comparison</th></tr>
<tr><td colspan="2">• Total length of drainage run within ancient woodland buffer zone:- 15m.
• Total length of drainage run within ancient woodland canopy extent:- 15m.
• Total length of drainage run within ancient woodland root protection areas:- 6m.
• Ground significantly disturbed by grazing animals.</td></tr>
<tr><th>Open Trench with Section Within RPAs Manually Excavated To NJUG 4 Standard</th><th>Horizontally Directionally Drilled, With Last Section to Stream Edge Manually Excavated To NJUG 4 Standard</th></tr>
<tr><td>No. of Trees Provisionally Requiring Removal:-
• Category C Quality:- 2 Trees (T1009, T1010);
• Category B Quality:- 1 Tree (T1005).</td><td>No. of Trees Provisionally Requiring Removal:-
• Category C Quality:- 2 Trees (T1009, T1010);
• Category B Quality:-1 Tree (T1005).</td></tr>
<tr><td>NJUG 4 Excavation Required Within Specific Retained Trees RPAs:-
• Category B:- 2 Trees (T1012, T1013).</td><td>Excavation Required Within Specific Retained Trees RPAs:-
• Category B:- 2 Trees (T1012, T1013).</td></tr>
<tr><td>Pros
• Access only required to heavily grazed field to south of steep-sided stream, which provides a barrier to the undisturbed woodland soils to the east of the stream.
• Excavations in RPAs, if in accordance with NJUG 4 guidance, can usually work around and retain significant tree roots.</td><td>Pros
• Access only required to heavily grazed field to south of steep-sided stream, which provides a barrier to the undisturbed woodland soils to the east of the stream.
• Surface soil within ancient woodland buffer zone would be undisturbed.</td></tr>
<tr><td>Cons
• Greater quantum of excavation of undisturbed surface soils within ancient woodland and the ancient woodland buffer zone required.
• Excavation may disturb significant roots within RPAs.</td><td>Cons
• Substantially less excavation of undisturbed surface soils within ancient woodland.</td></tr>
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