Prince Royd, Huddersfield (Area C)

Arboricultural Impact Assessment

September 2024

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
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Comments

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1. Introduction

1.1. Waterman Infrastructure & Environment Ltd (Waterman) was commissioned by Kirklees Council to undertake a Baseline Arboricultural Survey and an Arboricultural Impact Assessment (AIA) of the Halifax Road Phase 5 Improvement Scheme (hereafter referred to as 'the Scheme').

1.2. West Yorkshire Combined Authority is developing a programme of transport schemes that increase housing, employment and economic growth across the Leeds City Region. Successful projects will reduce journey times, alleviate congestion and improve air quality. The Combined Authority's Delivery team is working in partnership with the officers in the five West Yorkshire districts and York to deliver the wide range of schemes.

1.3. As part of the 'City Deal' between West Yorkshire, York and central government, a transport fund, known as the West Yorkshire Plus Transport Fund has been created. This identified a Core 10-year package of measures that would enable change and deliver economic growth in the short to medium-term. The A629 Halifax to Huddersfield Corridor has been prioritised for delivery within the first five years of the West Yorkshire Plus Transport Fund. Kirklees Council and Calderdale Council are jointly developing a range of interventions proposed along the corridor which will be delivered in a number of phases.

1.4. Kirklees Council is responsible for delivering Phase 5 (the Scheme), which covers three key junctions between Huddersfield Town Centre and Ainley Top Roundabout (known as Areas A, B and D) together with the provision of a new off-road residents parking area (Area C). The Phase 5 proposals will improve access to the M62 from Huddersfield by relieving known congestion issues at the A629 junctions of 'Cavalry Arms' (Area B) and 'Blacker Road' (Area A) and its approach to and from Ainley Top (Area D). The overarching aim of the Scheme is to improve journey times for all road users between Huddersfield Ring Road and Ainley Top roundabout.

1.5. This report pertains to Area C, Prince Royd only. Area C is hereafter referred to in this report as the 'Site'. The proposals for the Site, hereafter referred to as the 'Development', include;

- New off-road parking arrangements for residents affected by parking restrictions (off Halifax Road (A629) within a currently wooded area);
- New road resurfacing (Halifax Road (A629));
- Footway improvements (on sections of either side of Halifax Road (A629));
- New soft landscaping including tree planting;
- A new controlled pedestrian crossing; and
- The inclusion of a parking restriction zone.

1.6. The Site is centred on ordnance survey grid reference SE 12059 18645 and comprises a section of Halifax Road and an area of land to the west of no. 83-103 Halifax Road. Arboricultural features within and directly adjacent to the Site (hereafter referred to as the 'Survey Area') comprise a woodland group, self-sown trees within a disused parking area and trees within private residential gardens.

1.7. This AIA documents the findings of arboricultural inspections at the Site. It then evaluates the direct and indirect effects of the Development on the tree stock present on or directly adjacent to the Site. Recommendations for mitigation and details of compensation, where required, are included.

2. Tree Survey Methodology

2.1. The arboricultural survey was based upon existing topographical information relating to the Site (Interlock Surveys drawing no. 180298 Rev. A Sheet 1 of 2 dated 24/05/2018) and was otherwise conducted in accordance with the principles outlined within BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations[1] (BS5837).

2.2. The inspections were undertaken on 11th July 2018 with additional redline boundary areas and features (T11-21) surveyed on 7th May 2020. This survey was further updated on the 23rd of July 2024 due to changes to the proposed drainage layout. The survey comprised a non-intrusive, visual survey undertaken at ground level, during which dimensional data and observational information were collected, where required. A DBH tape measure and Leica Disto™ laser distance meter were used in the collection of data presented in this report.

2.3. Each feature surveyed has been assigned a Category Grade in accordance with the BS5837 cascade chart shown in **Appendix A**. A schedule of existing trees is provided in **Appendix B**.

Root Protection Area

2.4. The Root Protection Area (RPA), as shown on **Drawings 1 and 2**, defines the minimum area around a tree that contains sufficient root volume to ensure the future well-being of the tree in the event of nearby soil disturbance. For a single stem tree, it is based on a calculation relating to the girth of the tree at 1.5m above ground level (assuming suitable rooting material surrounding the tree being 1m in depth). BS5837:2012 outlines the calculation of RPA as follows:

$$\text{RPA}(\text{m}^2) = \left(\frac{\text{stem diameter (mm) @ 1.5 m} \times 12}{1\ 000}\right)^2 \times \pi\ (3.142)$$

2.5. Trees with more than one stem below 1.5m above ground level are given an aggregate stem diameter using either of the following two calculations as outlined in BS5837:2012. This diameter is then used in the above calculation to estimate RPA:

a) For trees with two to five stems:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$

b) For trees with more than five stems:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

2.6. The RPA of existing tree stock is an important material consideration when considering Site constraints and planning development activities.

2.7. Construction activities, materials storage or changes in level should generally be avoided within the RPA of a tree to be retained. This is because these operations have the potential to damage or kill the tree, the safe retention of which may be a condition of planning permission. This is significant when considering construction in proximity to off-Site / third party land. Special construction techniques such as no-dig construction / permeable surfacing may be considered for light loadings,

[1] BS5837:2012 Trees in relation to design, demolition and construction – Recommendations, 2012, British Standards Institution.

e.g. pedestrian footpaths etc., within the RPA.

2.8. The RPA often varies in size to the physical area occupied by the canopy spread (due to particular tree species or management practices to artificially alter the canopy size). This is of particular importance when integrating new development in proximity of existing trees. Similarly, the canopy heights (as identified in the schedule of existing trees in Appendix B) should be considered as the usable space below a low branching tree will be severely restricted without specific arboricultural works to raise the canopy (which may not always be appropriate).

2.9. It should also be noted that BS5837:2012 states that although RPAs should be plotted as a circle centred on the base of the stem, pre-existing site conditions (e.g. roads, buried structures, underground services, tree pits) or other factors (soil type, topography and drainage) may influence the morphology of roots so that rooting has occurred asymmetrically and as such, the RPA may instead be represented as a polygon of equivalent area. On this Site, potential barriers to root growth include roads, pavements, retaining walls and potential foundation structures pertaining to the building(s) adjacent to trees, where present. It is unlikely that roots are absent in all of these areas, however, where such unfavourable conditions exist, the potential for root growth to be impeded is possible and as such, actual root morphology may differ from that indicated by the RPAs in the accompanying drawings**.**

Limitations

2.10. All trees were visually inspected from ground level with no climbing, boring or sampling undertaken. All measurements are metric and where qualified, approximate. The comments made are based on the observable factors present at the time of inspection, including weather, seasonality and access.

2.11. Direct access to several trees/groups bounding the Site was not possible due to access restrictions, as detailed within **Appendix B**.

2.12. Several trees (G1 – T5 and T9) as detailed within **Appendix B**, were not included on the topographical survey information provided. As such, their location on **Drawings 1 and 2** has been estimated.

2.13. This report is intended to assist with the planning and management of the proposed Development under current best practice.

2.14. The Arboricultural Survey and this report does not constitute a tree risk assessment. This report is not intended to confirm the safety, (or otherwise) of surveyed trees. References to defects or potential safety issues are not exhaustive and intended as a guide only to inform the provision of further resources / more detailed investigations. The person(s) responsible for the management of the trees surveyed within this report are recommended to commission a separate tree condition survey by a suitably qualified and experienced person in order to manage the Health and Safety aspects of trees under their control and discharge their reasonable 'Duty of Care' owed under the Occupiers' Liability Act 1984[2].

2.15. Owing to the changing nature of trees as living, dynamic features and other Site circumstances, the baseline survey results are representative of the arboricultural features on the date of survey only and are subject to change.

[2] Occupiers' Liability Acts 1957 and 1984. HMSO

3. Results

3.1. A total of 40No. trees, 2No. tree groups and 1No. woodland groups were recorded within the Survey Area as shown on **Drawing 1** and detailed in **Appendix B**. Where they exist within W3, significant trees have been surveyed as individual trees to assist with design development.

Photograph 1: G1

Photograph 2: W3 (and T11 in centre frame)

Photograph 3: Within W3

3.2. A summary of the trees surveyed, and their Category Grading is detailed in **Table 1** below;

Table 1: Category Grading of Existing Trees

Category	Quantity	Description
A	0	-
B	16	W3, G9, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T25, T31, T38, T43
C	26	G1, T2, T4, T5, T6, T7, T8, T10, T11, T22, T23, T24, T26, T27, T28, T29, T32, T33, T34, T35, T36, T37, T39, T40, T41, T42
U	1	T30

3.3. Where trees are graded 'C' i.e. of low quality and value, this is a result of their size, maturity and/or condition in the current Site context. Several of these features are however, considered to have the potential to increase in value as they mature and /or if subject to appropriate management activities. The 'B' grade features are considered to be of moderate quality and value under BS5837 and also within the context of the Site. This reflects the relative condition and size of these features, the amenity, habitat, landscape and cultural value they offer to the Site/adjacent land uses and their potential longevity in this context.

3.4. None of the trees surveyed are covered by Tree Preservation Order or Conservation Area designations.

4. Arboricultural Impact Assessment

4.1. This Arboricultural Impact Assessment has been undertaken by overlaying the Arboricultural Constraints Plan **(Drawing 1)** over the proposed Development layout drawing provided to Waterman IE by Kirklees Council (**Drawing 3**). The juxtaposition between the existing trees and the proposed layout has then been assessed by an arboricultural consultant and an assessment has been made as to which trees will need to be removed in order the implement the Development. The finding of this exercise can be seen on the Tree Removal and Protection Plan contained in this report as **Drawing 2**.

4.2. The assessment was undertaken by assessing the impact of the design proposals on the RPAs and the above ground parts of the trees.

4.3. This assessment considered factors such as:

- The loss of RPA through direct impact of works;
- Tree condition and therefore suitability for retention in proximity to re-aligned busy roads/high target areas; and
- Impact on stability of retained trees resulting from loss of neighbouring trees which may currently provide companion shelter.

Trees to be Removed

4.4. Based on the Development layout shown in **Drawing 3,** several trees will be lost as shown on **Drawing 2** and detailed in **Table 2.**

Table 2: Trees to be Removed

Category Grading	Tree/Group reference	Total
A	-	0
B	T12	1
C	T5, T6, T7, T10, T11, T26, T27, T28, T33, T34, T35, T36, T37	13
U	-	0
Total		

4.5. In the absence of compensation (i.e. replacement tree planting) the tree removal detailed in **Table 2** will have a minor negative impact on the treescape of the immediate area. Whilst sections of W3 will be removed to facilitate the Development (including the removal of T6, T7, T10, T11,T12, T26, T27, T28, T33, T34, T35, T36, T37) which are all spatially located within W3), the majority of W3 (which extends further south than the area surveyed) would be retained and would continue to function as a woodland group in this location.

Proposed New Tree Planting

4.6. 10No. new trees and a 36m length of new hedgerow planting is proposed as an integral part of the Development as shown within **Drawing 3**. Whilst adequate compensation for the quantum of tree removal is not possible within Area C itself, proposals for Area D of the Scheme (c.500m north west of Area C) involve the creation of a new woodland area and as such, when the Scheme is assessed as a whole, replacement planting is considered to provide sufficient compensation for the

impacts of the Scheme. Furthermore, a management strategy is to be implemented for the woodland retained within Area C (W3) which continues further north-west of the Site. Whilst this will predominantly be implemented to enhance biodiversity, consequential improvements in the overall value of the woodland are anticipated.

4.7. New tree planting will include a mix of species. The further diversification of species mix and age (heavy standards are proposed) across the Site will enhance the Site with regards to general environmental resilience and would be of assistance in longer term management.

Trees to be Retained

4.8. All remaining trees will be retained and integrated within the landscape masterplan as part of the Development. This includes the retention of the majority of W3 and trees located along Edgerton Road.

Protection of Existing Trees to be Retained

4.9. The below recommendations are aimed only at protecting the trees. They should be carried out in accordance with all current Health and Safety legislation and best practice. If other requirements mean that these precautions cannot be carried out, the retained Arboricultural Consultant should be contacted prior to making any changes.

Removal of Existing Trees

4.10. Removal of trees as identified within **Table 2** and **Drawing 2** (and adjacent shrub vegetation where required) will be undertaken prior to the installation of protection barriers as detailed below.

Site Monitoring

4.11. A retained Arboricultural Consultant will be appointed prior to the commencement of works on Site to ensure that protection measures are being implemented and where necessary, to advise on the likely implications of any root damage on the trees.

4.12. Prior to works being undertaken on Site, a pre-commencement meeting will be held with representatives of the main contractor, the retained Arboricultural Consultant and a representative of Kirklees Metropolitan Borough Council in order to finalise the tree protection methodologies. The extent of any on-going supervision will be agreed with Kirklees Metropolitan Borough Council during that meeting.

Tree Protection Fencing

4.13. Where existing trees are retained in proximity to construction work, tree protection will be required to mitigate for potential above and below ground impacts, and to ensure these trees are retained successfully.

4.14. Existing trees to be retained will be protected in accordance with the principles of BS5837 during both the site preparation and construction phases. This includes the installation of temporary tree protection fencing suitable for the purposes of excluding construction activities in the locations shown on **Drawing 2** prior to commencement of any demolition or construction works, with weatherproof signage as shown in **Appendix C**. Following the principles set out in section 6.2.2 of BS5837, these barriers should be "*fit for the purpose of excluding construction activity and appropriate to the degree and proximity of the work taking place around the retained trees*". At the Site, Heras style fencing

fixed to padded feet and cross braces is recommended, with examples contained in **Appendix D.** In practice, site hoarding may replace the requirement for tree protection fencing in certain locations, which will be confirmed by the retained Arboricultural Consultant during the pre-commencement meeting.

4.15. The area occupied by the canopy spread or RPA, (whichever is the greater) will be secured as a Construction Exclusion Zone (CEZ) where no unauthorised access or construction operations (including Site compounds / facilities / storage of materials) are permitted in order to protect the ground from compaction or excavation and canopies from physical damage.

4.16. Temporary tree protection fencing is not considered necessary around trees G1, T2, T4, T8, G9 or T15-T21 due to the location of these trees outside of the redline boundary (i.e. T16 and T17), protection via fencing of other trees closer to proposed works (T15) or the localised nature of adjacent resurfacing works and existing boundary features such as walls or fencing separating these trees from proposed works (G1, T2, T4, T8, G9 and T18-T21).

Construction Working Area

4.17. The spatial constraints of the Site will require some construction operations to be undertaken within the canopy spread and/or RPAs of existing trees to be retained, and outside of the areas protected by Tree Protection Fencing. In these instances, the area within the canopy spread and / or RPA of these trees (whichever is the greater) would become a **Construction Working Area (CWA)**.

4.18. Works within the CWA may include (but are not limited to);

- Removal and replacement of existing hard surfacing; and
- Construction of new soft/hard landscape.

4.19. The location/extent of the CWA will be identified and marked on Site during the pre-commencement meeting. Most tree roots can be expected to be found within the upper soil horizons (usually the top 600mm of field soil) and construction operations within the CWA will have regard to the potential presence and protection of tree roots within this location.

4.20. Works will be carefully planned and developed using the following Arboricultural Method Statement (heads of terms) detailed below, to manage and minimise damage to the retained trees;

- Select site access routes and construction plant that can safely access the Site given the physical constraints imposed by the height of the existing retained tree canopies;
- For construction purposes, systems for the control and suppression of dust, hydrocarbons, cementitious and other phytotoxic elements will be employed to prevent damage to the adjacent trees; and
- Do not store materials or construction plant within the canopy spread or RPA of trees to be retained.

4.21. Where access is required within CWAs, suitable ground protection will be installed on top of existing ground levels which is capable of avoiding compaction of the soil below.

4.22. Protection measures for specific construction tasks outlined in more detail below;

Installation of New Drainage Pipe Within W3

4.23. As shown within **Drawing 2** and detailed further within **Drawing 4**, a new length of 300mm diameter drainage pipe is to be installed within W3 to facilitate drainage from the existing watercourse located south-east of the Site into an existing outfall located within the north of the

Site. To facilitate this, a 600mm widthr trench will be dug using a mini-excavator or similar requiring no more than a 1.5-2m wide working area. Due to the low ground pressure exerted by the excavator, and as it will only be making two passes over any piece of ground (one when excavating the trench and one when backfilling) it is not felt that additional ground protection will be needed except for the storage of spoil (see paragraph 4.24). The drainage proposal has been designed with a level of in-built tolerance to allow for a certain level of localised deviation of pipe alignment and/or depth to facilitate tree retention where possible.

4.24. At this stage, only trees with trunk positions located directly on the proposed trench alignment and within the working area have been shown as removed on **Drawing 2.** To facilitate the retention of the remaining adjacent trees, the following precautions will be taken;

- All works will be done under direct supervision of the retained arboricultural consultant;
- Works will firstly be commenced outside of the RPAs of W3 and will proceed with care using mechanical excavation;
- Excavated material will be piled adjacent to the trench alignment on single thickness plyboard to protect the existing ground from disturbance;
- Where possible, roots over 25mm in diameter will be retained, unless their severance/removal is approved by the retained arboricultural consultant. Where the quantum of root severance required to facilitate the works is deemed to render retention of a tree currently shown as retained on **Drawing 2** unviable by the supervising arboricultural consultant, removal would be agreed with Kirklees Council;
- In agreement with Kirklees Council, where the quantum of additional tree removal (i.e. removal not currently shown on **Drawing 2**) is assessed to be significant (a threshold for action will be agreed at the pre-commencement site meeting), consultation with a representative of Kirklees Council will be undertaken to ascertain whether trenching works can continue along the current proposed alignment, or whether an alternative design (i.e. realignment of the proposed drainage route into the existing highway network) will be required;
- Should roots be left exposed overnight, they should be wrapped in dry hessian/straw; and
- Upon completion of the works, the trench should be back-filled with an inert granular material as specified within **Drawing 4** followed by native soil material, taking care to avoid damaging retained roots.

Removal and Replacement of Existing Hard Surface

4.25. As shown in **Drawing 2**, the removal and replacement of existing pavement surfaces with flexible paving systems is proposed within the RPAs of G1, T2, T4, T8, G9, T13, T15 and T19-T21. Where they exist within the CWA, the existing hard surfaces will act as ground protection for the majority of the works, however, in order to avoid damage to the roots of these trees, the following additional precautions should be followed when working within the RPAs of retained trees:

- The existing surface will be removed in a rolling operation with any plant working backwards across the existing surfaces (or from the adjacent carriageway). Should access be required in the RPA once the existing surfaces have been removed (such as the times between the removal of the existing surfaces and the installation of the new hard surfaces), suitable ground protection capable of avoiding compaction of the soil below will be installed;
- The existing surfaces (and sub-bases where necessary) will be removed using hand tools or small pedestrian operated plant only;

- Care will be taken to avoid damaging the existing soil present below the sub-base;
- Existing kerbs will be removed using hand tools where feasible and in such a way so as to avoid disturbing the surrounding soil; and
- Where tree roots are encountered during works, roots exceeding 25mm diameter will only be severed when approved by the retained arboricultural consultant. Where possible they will be retained intact and protected by dry hessian/straw (where left exposed overnight) and the new surface installed around them.

New Hard Surfacing within the RPAs of W3

4.26. As shown in **Drawing 2,** new hard surface is proposed within W3 for the installation of a new access track. In order to minimise damage to shallow tree roots, the following precautions will be taken;

- Suitable ground protection capable of avoiding compaction of the soil below will be installed within the CWA during works;
- Where tree roots are encountered during works, roots exceeding 25mm diameter will only be severed when approved by the retained arboricultural consultant. Where possible they will be retained intact and protected by dry hessian/straw (where left exposed overnight) and the new surface installed around them.

Landscaping within RPAs

4.27. Where soft landscaping and/or new fencing is proposed within the CEZs of retained trees, this will be undertaken as the last construction activities on Site. Prior to implementation, the existing tree protection fencing will be removed and all landscaping operations within the RPA will be undertaken using hand tools. Heavy machinery will not be used within the CEZs and RPAs of retained trees, unless suitable ground protection systems are installed.

4.28. Excavations required for planting pits and fence posts will be positioned to avoid large structural roots (those greater than 25mm in diameter) within the RPAs of retained trees.

4.29. Where there is a risk of soil compaction during the landscaping operations, suitable ground protection measures capable of avoiding compaction of the soil below will be installed.

Utility Connections

4.30. If for any reason services are required to be located within the RPAs of the retained trees, the following precautions will be followed:

- Mechanical trenching will not be permitted;
- To limit the extent of any excavations, where possible, services will be located within shared ducts;
- The preference will be to install the services using trenchless technology, but where this isn't viable, the trenches will be dug in accordance with BS5837 and NJUG Vol 4[3], using hand tools and under the supervision of the retained arboricultural consultant. Roots over 25mm in diameter will be retained. Where this is not possible, they will only be severed if approved by the retained arboricultural consultant;
- Should roots be left exposed overnight they should be wrapped in dry hessian; and

[3] http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf

- Any trenches within RPAs will be backfilled using the native material or another inert granular material taking care to avoid damaging the roots.

Tree Works

4.31. Should any tree surgery be proposed to retained trees, this would be undertaken by an Arboricultural Association Approved Contractor with works compliant with BS3998:2010 and BS5837, subject to consent by Kirklees Metropolitan Borough Council where required. Trees to be felled or vegetation to be removed should be clearly marked. Tree work should be timed to avoid the bird nesting season and other potential ecological constraints as detailed within Ecological Reports prepared for the Site. Care should be taken not to damage any surrounding vegetation to be retained.

5. Summary

5.1. This report provides a record of the baseline arboricultural conditions at the Site and an assessment of the impacts of the Development on existing tree stock.

5.2. The Development comprises site preparation and construction activities in proximity to existing trees and as such, the removal of several trees will be required. Existing trees to be removed to facilitate the Development are detailed on **Drawing 2** and in **Table 2.**

5.3. Existing trees to be retained will be protected in accordance with the principles of BS5837 during the construction works. The spatial constraints of the Site will require some construction operations to be undertaken within or directly adjacent to the canopy spread and/or RPAs of retained trees, but outside of the areas protected by the temporary protection fences. Within these areas, existing trees to be retained will be protected by means of a CWA where construction activities will be carefully managed following the principles outlined within this report to reduce impacts to these trees.

5.4. Replacement tree planting will be provided within the Site and wider Scheme to compensate for the loss of existing trees as a result of the Development.

DRAWINGS

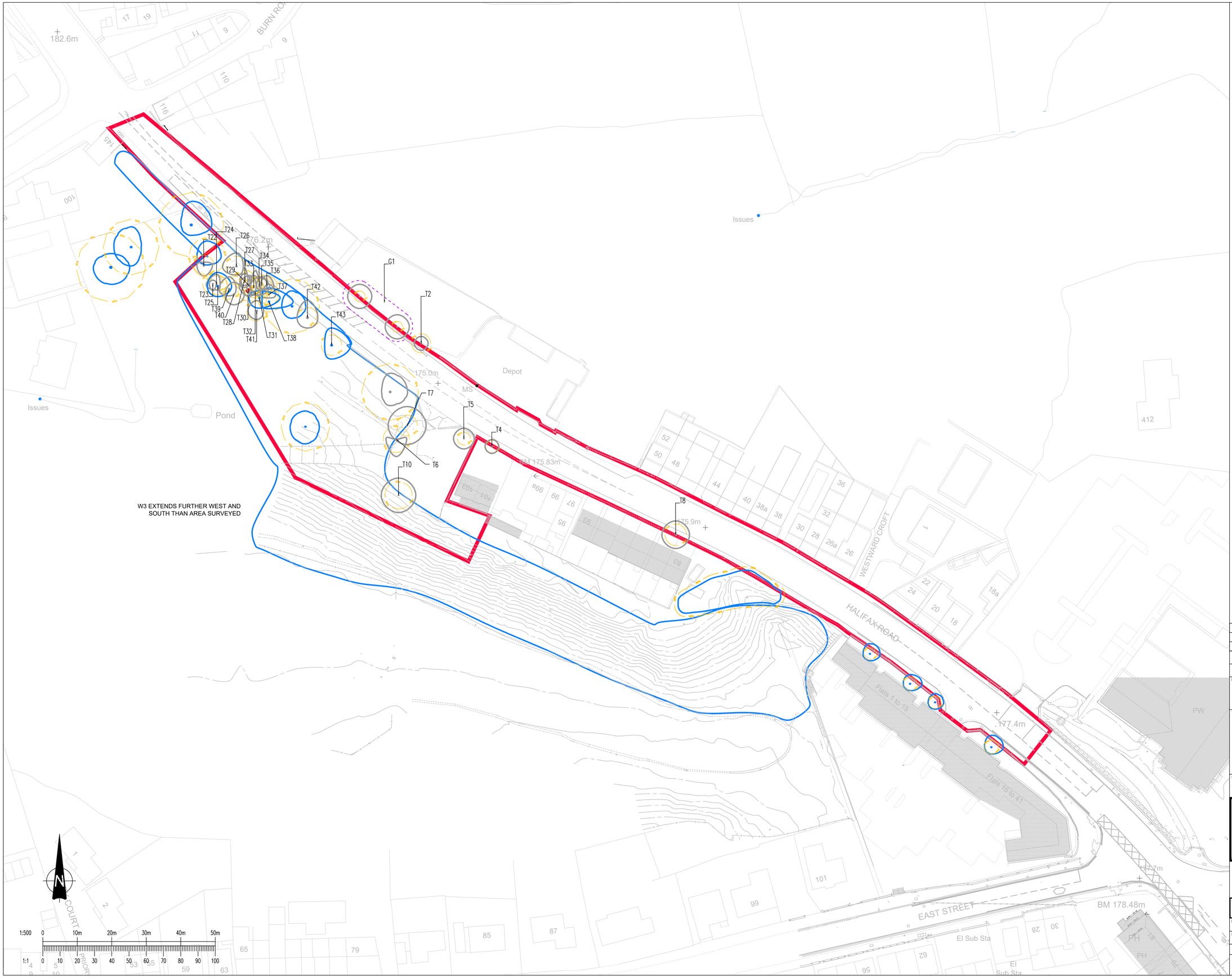
Drawing 1: Arboricultural Constraints Plan (ref.14496-WIE-ZZ-XX-SU-L-77005)

Drawing 2: Tree Retention and Removal Plan (ref. 14496-WIE-ZZ-DR-L-77015)

Drawing 3: Prince Royd Car Park Scheme Layout and Planting (Kirklees Council ref. TF5/Area C/LSC-01)

Drawing 4: Prince Royd Car Park Drainage - Tree Removal (Kirklees Council ref. TF5/Area C/P/ALT-DR)

DRAWING 1



LEGEND

- CATEGORY GRADE B Trees of moderate quality
- CATEGORY GRADE C Trees of low quality
- ROOT PROTECTION AREAS (RPA)
- INDICATIVE EXTENT OF GROUPED FEATURE
- SITE BOUNDARY

NOTES:

ROOT PROTECTION AREA
Root Protection Areas are calculated in accordance with BS5837: 2012. The precise morphology and disposition of roots may not be fully reflected by these areas, particularly where there are hard standings, however they provide a good indication of potential root constraint.

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH WATERMAN ARBORICULTURAL IMPACT ASSESSMENT

Status	Date	Description	By	Chk
P03	21.08.24	NEW PIPELINE ALIGNMENT		BM
P02	18.06.20	ADDITIONAL TREES ADDED		MC
P01	28.09.18	PRELIMINARY ISSUE		MC

Amendments

Project
PRINCE ROYD, HUDDERSFIELD

Title
ARBORICULTURAL CONSTRAINTS PLAN
Area C

Client
KIRKLEES METROPOLITAN BOROUGH COUNCIL

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Status
PLANNING

Designed By	Director	Waterman Ref
RA	RH	WIE14496-100
Drawn By	Date	Scales @ A1
MC	SEPT 2018	1:500

Project - Originator - Volume - Level - Type - Role - Number
14496-WIE-ZZ-XX-SU-L-77005

Revision
P03

File Path \\waterman-consulting.com\legacyfile\MR_WIE\Projects\WIE14496\7_CAD\7T_Art\SA\

WIE14496-100-77-SA-AREAB-C-SURVEY, WIE14496-100-77-SA-OS-SURVEY

DRAWING 2

LEGEND

- TREES, GROUPS OR HEDGES TO BE RETAINED
- TREES, GROUPS OR HEDGES TO BE REMOVED
- ROOT PROTECTION AREAS (RPA)
- TREE PROTECTION Refer to Detail.
- CONSTRUCTION WORKING AREA (Including Demolition) Refer to notes for details.

NOTES:

ROOT PROTECTION AREA
Root Protection Areas are calculated in accordance with BS5837: 2012. The precise morphology and disposition of roots may not be fully reflected by these areas, particularly where there are hard standings, however they provide a good indication of potential root constraint.

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TREES ASSUMED TO BE UNAFFECTED BY THE PROPOSED DEVELOPMENT

W3 EXTENDS FURTHER WEST AND SOUTH THAN AREA SURVEYED

300mm dia. pipe

Filter drain trench Type H

Proposed headwall - details refer to drawing H6CA Headwall -01 and 02

AREA B

AREA C

NEW GU CONNECTING INTO EXISTING GU CONNECTION.

NEW GU CONNECTING INTO EXISTING GU CONNECTION.

1:500 0 10m 20m 30m 40m 50m

1:1 0 10 20 30 40 50 60 70 80 90 100

P04	21.08.24	NEW PIPE ALIGNMENT	BM
P03	18.06.20	ADDITIONAL TREES ADDED	MC
P02	14.01.18	T4 and T9 switched to retain	LT
P01	28.09.18	PRELIMINARY ISSUE	LT
Status	Date	Description	By / Chk

Amendments

Project
Prince Royd, Huddersfield

Title
TREE RETENTION AND REMOVAL PLAN Area C

Client
KIRKLEES METROPOLITAN BOROUGH COUNCIL

waterman
2nd Floor South Central 11 Peter Street Manchester M2 5QR
t 0161 839 8392
mail@watermangroup.com www.watermangroup.com

Status: PLANNING

Designed By	RA	Director	RH
Drawn By	LT	Date	SEPT 2018
Waterman Ref			WIE14496-100
Scales @ A1			1:500

Project - Originator - Volume - Level - Type - Role - Number: 14496-WIE-ZZ-XX-DR-L-77015

Revision: P04

File Path: \\waterman-consulting.com\Legacy\file\MR_WIE\Projects\WIE14496_CAD\77_Arb\SA\

A1-Wat-BS-S, Proposed_Layout_AreaC, TF5-Area C-P-DR-Preferred Option Waterman AIA, WIE14496-100-77-SA-AREAC-SURVEY, WIE14496-100-77-SA-OS-SURVEY

DRAWING 3

TENDER ISSUE

HALIFAX ROAD

1 x *Sorbus aucuparia*

1 x *Sorbus aria*

1 x *Tilia cordata 'Streetwise'*

Under-story shrubs, wildflower plugs and bulbs to be planted in this woodland edge area after vegetation thinning has occurred.

Supply and spread organic non-peat compost into plant and tree pits; to hedge line and formal planting areas

Mark out planting areas prior to planting

Zone of influence whereby trees will need to be protected Refer to BS 5837-2012 Trees in relation to design, demolition and construction. Further trees may need to be removed (secondary) as this zone may be affected by the works. After construction this Zone will be replanted with Biodiversity enhancing plants.

Ground cover of Hedera helix 'Hibernica'
Shrubs: Cornus sanguinea;
Symphoricarpos alba; Rosa canina.
Sambucus nigra; corylus avelana

2 x *Carpinus betulus 'Frans Fontaine'*

2 x *Betula pedula* multi-stem

Ground cover of *Hedera helix 'Hibernica'*
Shrubs: *Cornus sanguinea; Symphoricarpos alba; Sambucus nigra; corylus avelana*

Filter drain trench Type H
Install a linear root barrier along length of filter drain.
Re-root 1000-ribbed or similar to be AGREE by Landscape Designer

1 x *Betula pedula* multi-stem

2 x *Populus alba*

Under-story shrubs, wildflower plugs and bulbs to be planted in this woodland edge area after vegetation thinning has occurred.

Length of species rich native hedgerow.
Plant instant hedgerow 36 meter length.

Supply and spread organic non-peat compost into plant and tree pits; to hedge line and formal planting areas

Ground cover of *Hedera helix 'Hibernica'*
Shrubs: *Cornus sanguinea; Symphoricarpos alba; Rosa canina; Sambucus nigra; corylus avelana*

Proposed headwall

Mark out areas to be planted prior to actual planting

174.000m

TREE AND SHRUB PLANTING PLAN - PRINCE ROYD CAR PARK

Shrub Species	Qty	Description	Size/height	Description
Cornus Sanguinea	57		40/60cm	Pot grown
Corylus avelana 'atropurpurea'	35		40/60cm	PG
Hedera helix 'Hibernica'	200	Ground cover	30/40cm	PG
Rosa canina	38		40/60cm	PG
Sambucus nigra	38		40/60cm	PG
Symphoricarpos alba	38		40/60cm	PG
Hedgerow species				
Crateagus monogyna		36m length		
Prunus spinosa		Instant hedge	1.8m	1m trough
Corylus avelana		containing a mix		
Cornus Sanguinea		of these species		
Acer campestre				
Ilex aquifolium				
Ligustrum ovalifolium		Instant hedge	1.8m	1m trough
Tree Species				
Betula pedula multi stem	3	Heavy standard	4 to 4.5m	Root ball
Populus alba	2	Heavy standard	4 to 4.5m	RB
Carpinus betulus 'Frans Fontaine'	2	Heavy standard	4 to 4.5m	RB
Sorbus alba	1	Heavy standard	4 to 4.5m	RB
Sorbus aucaparia	1	Heavy standard	4 to 4.5m	RB
Tilia cordata ' Streetwise'	1	Heavy standard	4 to 4.5m	RB

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Understory shrubs planted along boundary edges= 408 metres² plants at 500mm centres in 2 staggered rows (whips)

		%	
Blackthorn	Prunus spinosa	20	382
Dog Rose	Rosa Canina	15	287
Elder	Sambucus nigra	5	94
Hawthorn	Crataegus monogyna	50	955
Wild rose	Rosa avensis	10	191
		100	1909

For Shady Areas, Woodland Edges and Hedgerow

Wildflower plugs planted in groups of 10-15 per sq m = 715 of each

Garlic mustard	Alliaria petiolata	
Sweet cicely	Myrrhis odorata	
Selfheal	Prunella vulgaris	
Red campion	Silene dioica	
Ragged robin	Lychnis flos-cuculi	
Fox glove	Digitalis purpurea	4290

Native Wildflower Bulbs mix

Wild Garlic	Allium ursinum	
Wood Anemone	Anemone nemorosa	
Winter Aconite	Eranthis hyemalis	
Snakeshead lily	Fritillaria meleagris	
Common Snow drop	Galanthus nivalis single	
Bluebell	Hyacynthoides non scripta	
Lent Lily	Narcissus pseudonarcissi lobularis	

Planted in groups of 15-20 @ 20 bulbs per sq m = 818 of each — 5720

KEY

- Proposed planting
- Proposed area to be 150mm topsoil and grass seeded
- Proposed area (1:2 slope) to be 150mm topsoil and grass seeded
- 45 — Zone of influence where existing trees are to be protected (BS 5837-2012 -Trees in relation to construction). Vegetation clearance area. After construction this zone is to be planted with new species.This area to be improved by shrubs and ground layer wildflowers and bulbs
- Temporary fencing protective barrier to BS5837:2012 Figure 2. barriers location to be confirmed on site
- Root barrier 1.0mm thickness , 1kg/m2, 600mm depth, in 600mm deep trench
- Maintenance-Area C Prince Royd Car Park (behind proposed timber fence)
- Proposed gate
- Proposed 1m hard margin (block paving)
- Proposed Resin Surface Treatment to Tree Pit Aperture
- Proposed rebuild existing walls (300mm minimum above existing ground)
- Proposed boundary fence - Close Boarded Fence (1800mm height with concrete post)
- Proposed lighting column

NOTE

1. Drawing to be read in conjunction with TF5/Area/LSC/SD/1, 2 & 3
2. Mark out areas to be planted prior to actual planting.
3. All dimensions to be checked/verified on site if required with supervisor.
4. Supply and spread organic non-peat compost into plant and tree pits; to hedge line and formal planting areas
5. Any discrepancies noted on site are to be reported to the supervisor immediately.
6. Contractor to check existing and proposed levels at tie in points before commencement of works.

REF.	DATE	REVISIONS
A	28.03.24	Drawing Updated to Tender Issue

Kirklees COUNCIL

Streetscene and Housing Service
Highways and Operation Division
Flint Street, Fartown
Huddersfield HD1 6LG

SECTION: HIGHWAY DESIGN		
DRAWN: AM	CHECKED: MJR	
SCALE: 1:100@A1	PROJECT NO.: TF5	DATE: 01/11/2021

PROJECT
A629
HALIFAX ROAD (PHASE 5)

TITLE
PRINCE ROYD CAR PARK
LANDSCAPE PLAN
SCHEME LAYOUT AND PLANTING

DRAWING No. TF5/AREA C/LSC-01

CAD No.

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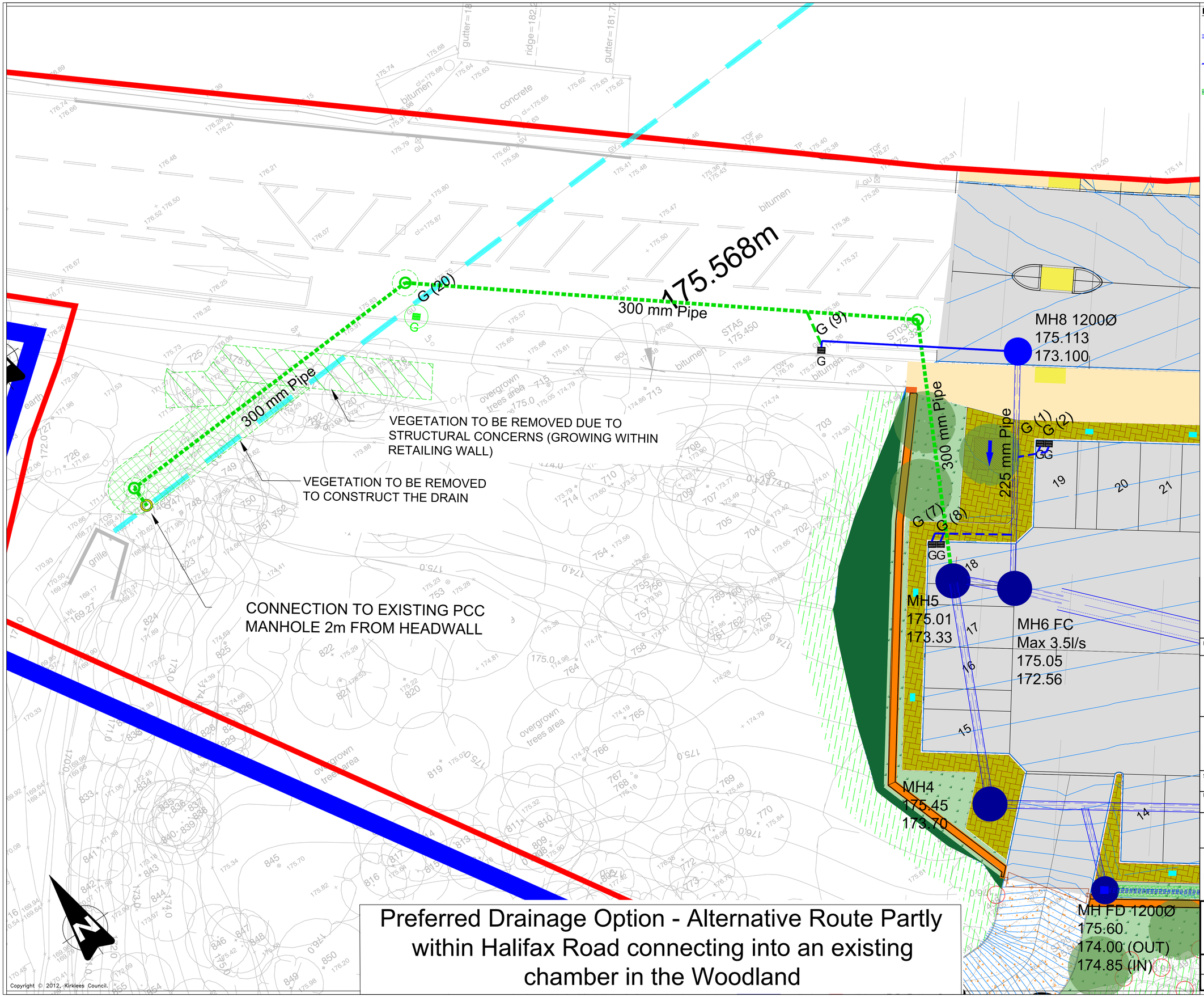
Kirklees Metropolitan Council, Licence Number: 100019241.
Date: 25.02.21

DRAWING 4



KEY

- PROPOSED MAIN DRAINAGE DETAILS AS SHOWN ON MANHOLE SCHEDULE, PLAN AND SECTION.
- PROPOSED HIGHWAY DRAINAGE 150 OR 225MM DIAMETER PIPEWORK.
- PROPOSED 225MM DIAMETER FILTER DRAIN WITH FILTER MEDIA AND GEOTEXTILE WRAP
- G — PROPOSED PRECAST CONCRETE GULLY PERMITTED DESIGN GROUP 1 TO STANDARD DETAILS DRAWING NO HD/SD/05/20, WITH D400 GULLY GRATE AND 150MM DIA PIPED CONNECTION UP TO 3M LENGTH AND 150 X 150/225 JUNCTION OR SADDLE CONNECTION AS NECESSARY TO RECEIVING PIPEWORK WITH FITTINGS.
- PROPOSED PRECAST CONCRETE GULLY PERMITTED DESIGN GROUP 1 TO STANDARD DETAILS DRAWING NO HD/SD/05/20B, WITH D400 GULLY GRATE AND 150MM DIA PIPED CONNECTION 150 X 150/225 JUNCTION ONTO EXISTING GULLY LEAD
- RED LINE BOUNDARY (PLANNING) / SITE EXTENTS
- PREFERRED DRAINAGE OPTION FOR OUTFALL FROM PRINCE ROYD CAR PARK TO THE EXISTING 900mm PCC SEWER.
- EXISTING 900mm PCC SEWER IDENTIFIED DURING CCTV SURVEY.

Preferred Drainage Option - Alternative Route Partly within Halifax Road connecting into an existing chamber in the Woodland

REF.	DATE	REVISIONS
A	28.03.24	Drawing Updated to Tender Issue

Kirklees COUNCIL

Highways Service
Highway Design & S278
Environment and Climate Change
PO Box 1720 Huddersfield HD1 9LE

SECTION: HIGHWAY DESIGN		
DRAWN: BD	CHECKED: MR	
SCALE: 1:100	PROJECT NO.: TF5	DATE: 28/05/2024

PROJECT
A629
HALIFAX ROAD (PHASE 5)

TITLE
PRINCE ROYD CAR PARK
PREFERRED DRAINAGE SOLUTION

DRAWING No. TF5/Area C/P/ALT-DR

CAD No.

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APPENDICES

A. Cascade Chart for Tree Quality Assessment (extract from BS5837:2012)

TREES FOR REMOVAL		
Category and Definition	**Criteria**	**Identification on Plan**
Category U Those 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 that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning); • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline; and • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low-quality trees suppressing adjacent trees of better quality. NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve.	DARK RED

TREES TO BE CONSIDERED FOR RETENTION				
Category and Definition	**Criteria - Subcategories**			**Identification on Plan**
	1 Mainly Arboricultural Values	2 Mainly Landscape Values	3 Mainly Cultural Values, including Conservation	
Category A **Trees of high quality** with an estimated remaining life expectancy minimum of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	MID BLUE
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

B. Tree Survey Schedule

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
G1	2No. Purple Plum *(Prunus cerasifera* ('Nigra')	Average (Av.) 5.0	Av. 130*	Av. 3.5	Varies	Av. 2.0 over pavement	P – Fair S – Fair	SM	Located on edge of vehicle depot. Minor epicormic growth present. Location approximated on Drawings.	None.	20+	C1
T2	Silver Birch *(Betula pendula)*	4.0	230*	Av. 2.0	Av. 2.2	Av. 2.5 over pavement	P – Good S – Poor	SM	Located on edge of vehicle depot. Has been topped at 3.5m Ht. with epicormic regrowth present. Location approximated on Drawings.	None	10+	C1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
W3	English Oak *(Quercus robur)*, Sycamore *(Acer pseudoplatanus)*, Elder *(Sambucus nigra)*, Ash *(Fraxinus excelsior)* and Hawthorn *(Crataegus monogyna)*, Willow *(Salix spp.)*, Horse Chestnut *(Aesculus hippocastanum)*, Holly *(Ilex aquifolium)*, Silver Birch *(Betula pendula)* and Aspen *(Populus tremula)*	To 15.0	Varies	Max. 6.0 (N) over carriageway	Varies	Max. 5.0 (N) over carriageway	P – Fair S – Fair	SM – M	Area of scrubby woodland growing in mutual competition with banked topography towards the south of the group. Historic pruning to reduce and raise canopies on N side over carriageway. Several multi-stemmed trees within. Significant decay cavities to some specimens within. Note; woodland extends further south than area surveyed.	None	40+	B1
T4	Conifer *(Cupressocyparis spp.)*	5.0	-	Av. 2.0	0.0	0.0	P – Fair S – Good	SM	Located within private residential garden adjacent to pavement. Some canopy dieback noted on N side adjacent to pavement. Location approximated on Drawings.	None.	20+	C1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T5	Sycamore *(Acer pseudoplatanus)*	4.0	M/S Av. 90	Av. 3.0	0.0	0.0	P – Good S – Poor	SM	Formed of stump regrowth from a previously felled tree. Scrubby vegetation growth and fly-tipping at base. No direct access. Location approximated on Drawings.	None.	10+	C1
T6	Common Alder *(Alnus glutinosa)*	12.0	160, 180, 210	0.0 3.0* 3.0* 5.0	M/S from base	2.0 (S)	P – Fair S – Fair	SM	Located on edge of W9. Historic limb removal on N side adjacent to access track with biased canopy as a result. In competition with adjacent trees.	None.	10+	C1
T7	Silver Birch *(Betula pendula)*	10.0	250*	Av. 5.5	Forks @ 3.5	1.0 (S)	P – Fair S – Fair	SM	Located on edge of W9. Deadwood within lower canopy. In competition with adjacent trees.	None.	20+	C1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T8	Ash *(Fraxinus excelsior)*	7.0*	260*	Av. 4.0	Forks @ 2.3	3.0 over pavement	P – Good S – Fair	SM	Located on the boundary between two private residential gardens. No direct access. Location approximated on Drawings.	None	20+	C1
G9	Ash *(Fraxinus excelsior)*, Silver Birch *(Betula pendula)*, Horse Chestnut *(Aseculus hippocastanum)* and Privet *(Ligustrum spp.)*	To 15.0	-	Overhangs road 5.0 from wall	-	2.5 over pavement	P – Fair S – Fair	Y – EM	Comprises the edge of W9. Growing in mutual competition. Large Ash located directly adjacent to boundary wall. Level change (up) into group from pavement level.	None.	40+	B1
T10	Goat Willow *(Salix caprea)*	12.0	M/S x 9 Av. 110	Av. 5.0	0.0	0.0	P – Fair S – Fair	SM	Located on edge of W9. Scrubby in form with deadwood noted within. Growing in mutual competition with W9.	None.	20+	C1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T11	Goat Willow *(Salix caprea)*	12.0	480, 400	5.5 2.5 5 4	1 (SE)	3	P – Fair S – Fair	EM	Located within W3. Twin-stemmed at ground level with a slightly unbalanced crown which overhangs the footpath. Leaning stems away from the road, vertical decay column running along the underside of the two main stems. 240 DBH Sycamore in W3 growing between and fused to the main stems.	None.	10+	C1
T12	Goat Willow *(Salix caprea)*	15.0	180, 230, 340, 360	4.5 4.5 5 5	1 (SE)	3	P – Good S – Good	M	Multi-stemmed at ground level with a balanced crown. Dense Ivy up the main stem. Deadwood lower crown. Acceptable condition at present.	None	40+	B1
T13	Sycamore *(Acer pseudoplatanus)*	13.0	290, 300, 330, 370	4.5 3 4 3.5	Av. 3	4	P – Good S – Good	EM	Multi-stemmed at ground level with a slightly unbalanced crown which overhangs the footpath. One stem touching wall. Deadwood lower crown.	None	40+	B1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T14	Sycamore *(Acer pseudoplatanus)*	15.0	440	4.5 3 4 2.5	3 (NE)	4	P – Good S – Good	EM	Single-stemmed and vertical with a slightly unbalanced crown. Minor bark damage to the buttress root.	None	40+	B1
T15	Sycamore *(Acer pseudoplatanus)*	17.0	290, 510	7 3 6 3	2 (W)	3	P – Good S – Good	M	Twin-stemmed at ground level with a slightly unbalanced crown which overhangs the boundary. Pruning wounds to the lower stem.	None	40+	B1
T16	Sycamore *(Acer pseudoplatanus)*	16.0	280, 320, 340, 370	6 5 3 5.5	Av. 1.5	0	P – Good S – Good	M	Multi-stemmed at ground level with a balanced crown. Dense Ivy up the stem but appears to have no significant defects.	None	40+	B1

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T17	Sycamore *(Acer pseudoplatanus)*	16.0	450, 470	4 5 5.5 5	2 (NW)	0	P – Good S – Good	EM	Twin-stemmed at ground level with a balanced crown. Dense Ivy up the stem but appears to have no significant defects.	None	40+	B1
T18	Himalayan Birch *(Betula utilis*)	9	170	3.5 2 3.5 2	1 (SE)	2	P – Good S – Good	EM	Single-stemmed with a slightly unbalanced crown. Low branching. Growing close to the building producing offset crown.	None	40+	B1
T19	Himalayan Birch *(Betula utilis)*	8	150	2.5 2 2.5 2	1.5 (NW)	2.5	P – Good S – Good	EM	Single-stemmed with a slightly unbalanced crown. Growing close to the building producing offset crown.	None	40+	B2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T20	Himalayan Birch *(Betula utilis)*	9	170	2.7 2 3.5 2	1 (NE)	1.5	P – Good S – Fair	EM	Single-stemmed with a slight lean and a reasonably balanced crown. Damage to stem from stake left in place for too long. Growing close to the building producing offset crown.	None	40+	B1
T21	Himalayan Birch *(Betula utilis)*	9	150	3 2 3 2	1.5 (SE)	2	P – Good S – Fair	EM	Single-stemmed with a slight lean and a reasonably balanced crown. Damage to the lower branch and main stem from stake left in place for too long. Growing close to the building producing offset crown.	None	20+	B2
T22	Hawthorn *(Crataegus monogyna)*	8	270, 250	1 2 2.5 3	2 (E)	2	P – Good S – Good	M	Co-dominant stems form at the base.	None	20+	C2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T23	Hawthorn *(Crataegus monogyna)*	2.5	90, 60	1 1 1 2	1.5 (W)	1.5	P – Fair S – Fair	Y	None.	None.	20+	C2
T24	Sycamore *(Acer pseudoplatanus)*	9.5	140, 165	3 3 1 1.5	2.5 (N)	2.5	P – Fair S – Fair	SM	Deadwood throughout the lower crown.	None.	10+	C2
T25	Sycamore *(Acer pseudoplatanus)*	14	300*, 340*, 290*	4 3 4 3	3 (N)	3	P – Fair S – Fair	20+	None.	None.	20+	B2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T26	Sycamore *(Acer pseudoplatanus)*	12	200*, 240*, 280*	4 4 2 2.5	4 (N)	5	P – Fair S – Fair	SM	Growing on/from an elevated section of the wall/bank.	None.	20+	C2
T27	Sycamore *(Acer pseudoplatanus)*	10	110, 230	2 1.5 1.5 2	4 (E)	4	P – Fair S – Fair	SM	Suppressed crown development by neighbouring trees.	None.	10+	C2
T28	Sycamore *(Acer pseudoplatanus)*	9	180, 140	3.5 1 1 1.5	3 (N)	5	P – Fair S – Fair	SM	Asymmetrical crown formation.	None.	10+	C2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T29	Sycamore *(Acer pseudoplatanus)*	14	285	3 3 2 3	5 (N)	5	P – Good S – Good	SM	None.	None.	20+	C2
T30	Hawthorn *(Crataegus monogyna)*	6	180, 50	Av. 0.5	0.5 (N)	4	P – Dead S – Dead	Dead	Despite being dead, its location has a low occupancy rate, therefore, it should be safe to retain for ecological purposes.	None.	<10	U
T31	Goat Willow *(Salix caprea)*	10	390	2 3 6 3	2.5 (E)	4	P – Fair S – Fair	EM	The stem has a considerable lean (east).	None.	20+	B2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T32	Goat Willow *(Salix caprea)*	8	200*	6 1.5 1.5 1	4 (N)	4	P – Fair S – Fair	SM	None.	None.	10+	C2
T33	Sycamore *(Acer pseudoplatanus)*	10	190*	3.5 2 2 2	4 (W)	4	P – Fair S – Fair	SM	None.	None.	20+	C2
T34	Sycamore *(Acer pseudoplatanus)*	14	245	2.5 2.5 3 2.5	5 (W)	5	P – Good S – Good	SM	None.	None.	20+	C2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T35	Elder *(Sambucus nigra)*	6	155	2.5 1.5 1.5 1.5	1.5 (E)	1.75	P – Fair S – Fair	EM	Situated 1.5m from the retaining wall.	None.	10+	C2
T36	Sycamore *(Acer pseudoplatanus)*	9	170, 185	3 2 2 1	1.5 (N)	1.5	P – Fair S – Fair	SM	Situated 1m from the retaining wall.	None.	20+	C2
T37	Hawthorn *(Crataegus monogyna)*	4	130	3 2 2 1	1 (N)	1	P – Fair S – Fair	SM	None.	None.	20+	C2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T38	Goat Willow *(Salix caprea)*	12	380*	4 2 7 2	3 (N)	5	P – Fair S – Fair	EM	Unable to access the stem/base - situated within dense shrub.	None.	20+	B2
T39	Sycamore *(Acer pseudoplatanus)*	14	280	3.5 3 2 2	1 (N)	6	P – Fair S – Fair	SM	Base and stem obscured by ivy.	None.	20+	C2
T40	Sycamore *(Acer pseudoplatanus)*	15	300	3.5 2.5 3 3	7 (S)	7	P – Fair S – Fair	SM	Base and stem obscured by ivy.	None.	20+	C2

Ref. No	Species	Height (m)	Stem Dia. (mm)	Canopy Spread (m) N W E S	Dir. of First Significant Branch (m)	Direction of Canopy Clearance (m)	Condition (P – Physiological, S – Structural)	Age	Observations and Conditions	Preliminary Management Recommendations	Est. Remaining Contribution (yrs)	BS5837: 2012 Cat.
T41	Silver Birch *(Betula pendula)*	14	310	3 2.5 2 2.5	5 (N)	5	P – Fair S – Fair	SM	None.	None.	20+	C2
T42	Sycamore *(Acer pseudoplatanus)*	15	460*	5 3 3 3	2.5 (S)	4	P – Fair S – Fair	EM	Situated 0.5m from the retaining wall.	None.	20+	C2
T43	Sycamore *(Acer pseudoplatanus)*	11	400*	5 2 5.5 4	2.5 (S)	1.5	P – Good S – Good	SM	Unable to access (surveyed from the footpath). Stem obscured by ivy. Estimated dimensions.	None.	40+	B2

Key to Schedule:

Height

Unless otherwise stated, tree heights are approximate and estimated in metres.

Stem Diameter

The stem diameter of single stemmed trees measured at 1.5m above ground level and in millimetres. Where stems fork or swell, the measurement is taken at the narrowest point below the fork or swelling. Where direct access was not available (i.e. due to dense vegetation/fences/ditches etc), the stem diameter has been estimated and identified by '*' within the schedule. Within woodlands and groups, the minimum/maximum range of stem diameters has been recorded.

Crown Spread

Radial crown spread of individual trees as measured in metres. These are recorded for each of the four cardinal points as access restrictions allowed. Where direct access was not available (i.e. due to dense vegetation/fences/ditches etc), the spread is estimated and identified by '*' in the schedule. The canopy shape for surveyed trees depicted on the accompanying drawings is representative of the canopy spread as measured or estimated during fieldwork on the Site.

Height of Crown Clearance and Canopy

The height of crown clearance, measured as the height above ground in metres of the first significant branch and the direction of growth. The height of canopy clearance is measured as the height above ground in metres of the main canopy.

Age Class

The age of each tree is defined as follows:

- Young (Y): Within the first 1/4 of useful life expectancy;
- Semi-mature (SM): Within the second 1/4 of useful life expectancy;
- Early Mature (EM): Within the third 1/4 of useful life expectancy;
- Mature (M): Within the fourth 1/4 of useful life expectancy;
- Over Mature (OM): Exceeded normal useful life expectancy; and
- Veteran (V): Significantly exceeded normal life expectancy and/or displays characteristics associated with a veteran tree[4].

Physiological and Structural Condition

The physiological and structural condition of each tree is summarised, highlighting features relevant to the assessment process. This includes cultural conditions e.g. context and growing environment which may also be of relevance.

Unless otherwise stated, trees were found to be displaying 'normal' characteristics for their age, species and context. The physiological condition for each tree is described as Good (G), Fair (F) or Poor (P) or may comprise a range where this relates to grouped features. Where appropriate, notes on structural integrity are provided on form, taper, forking habit, storm damage, decay, fungi, pests, etc. No invasive investigations or climbing inspections were carried out to confirm visual or audible signs of defect or debility and no tissue or

[4] http://www.ancienttreeforum.co.uk/ancient-trees/what-are-ancient-veteran-trees/

soil samples were taken for laboratory analysis. Where identified, external signs of substantial defects or debility have been recorded.

Estimated Remaining Contribution in Years

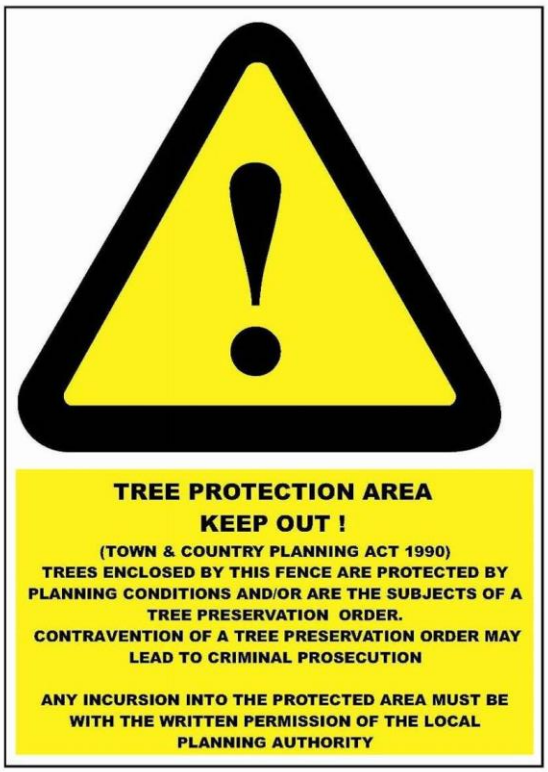
The Estimated Remaining Contribution (ERC) for each tree / group / woodland is based on species, context and existing physiological and structural condition of the tree. The ERC may affect the Development because the longer the tree is likely to live, the greater the contribution it will make and the greater the need for retention.

Category Grading

Each individual tree is given a Category Grading in accordance with BS5837: 2012 to reflect the overall arboricultural value and retention category. The Category Gradings are defined according to the following criteria, and are further divided into sub-categories based on arboriculture, landscape and/or historic value, as defined within BS5837:2012 (**Appendix A)**:

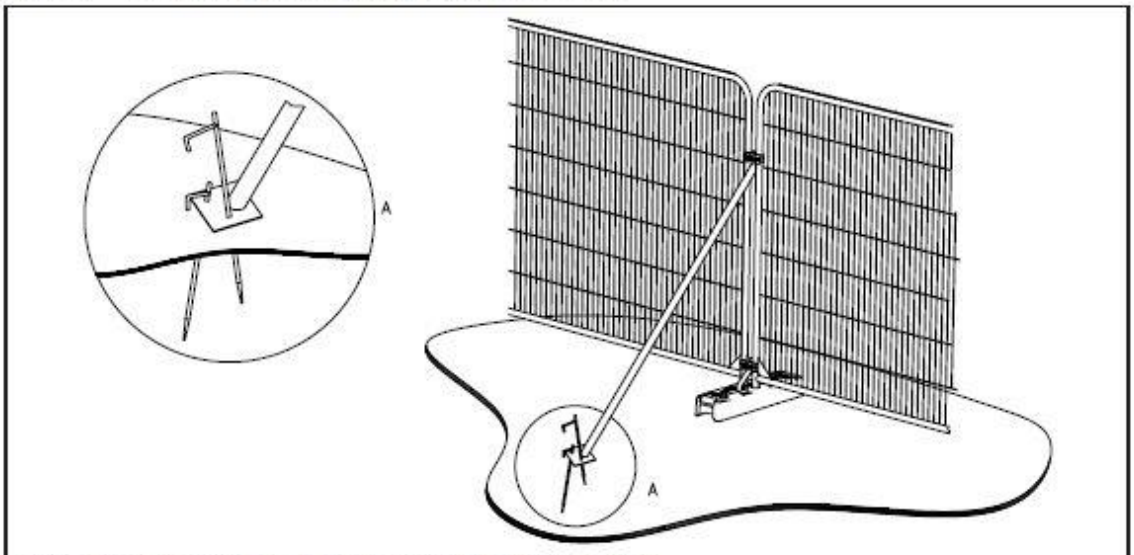
- **Category Grading A:** Trees of high quality and value, (with a suggested remaining life expectancy exceeding 40 years);
- **Category Grading B:** Trees of moderate quality and value, (with a suggested remaining life expectancy of at least 20 years);
- **Category Grading C:** Trees of low quality and value, (with a suggested remaining life expectancy exceeding 10 years or young/immature trees which may have the potential to attract a higher Grade as they mature); and
- **Category Grading U:** Trees which are in such a condition that they are unsuitable for retention in the context of the current land use for longer than 10 years.

C. Tree Protection Fencing (Example)

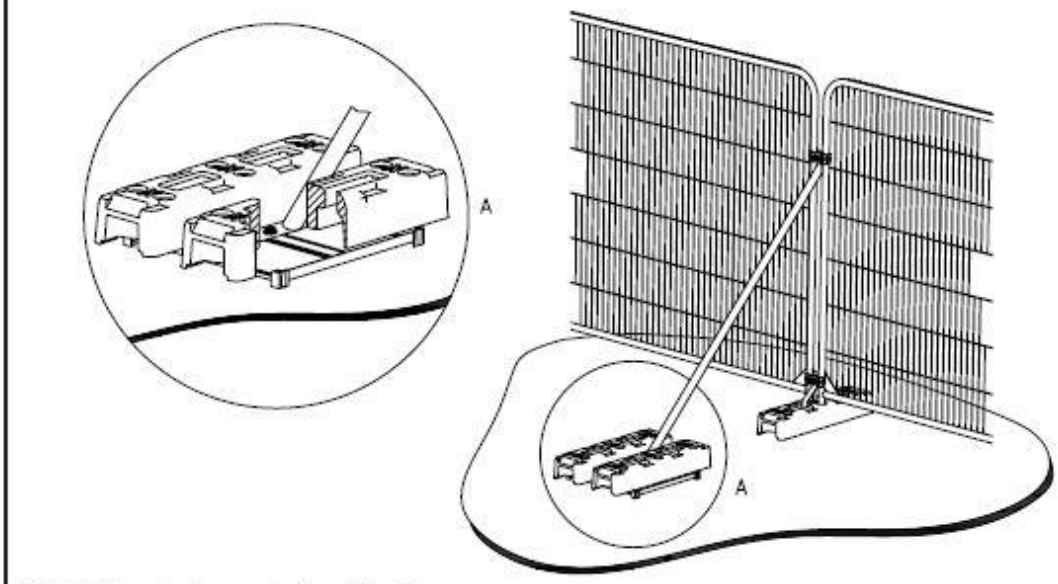


D. Tree Protection Fencing (Example)

Figure 3 **Examples of above-ground stabilizing systems**



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

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