



**Tree Survey Report
Flood Relief Scheme
Ballyhale
Co. Kilkenny**

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1.0 Introduction

There are plans to upgrade flood protection structures along parts of the stream running through Ballyhale, Co. Kilkenny. There are numerous trees and hedges along the watercourse and on the adjacent lands. This report has been prepared to provide an arboricultural assessment of the trees and hedges to provide input into the design and planning for the new flood defence works. Parts of the village centre, and areas intended for specific works close to the church and school were inspected and assessed in greater detail, with the rest of the hedgerows and tree groups etc. being assessed and described in more general terms.

2.0 Report Limitations

- The inspection has been carried out from ground level using visual observation methods only.
- Trees are living organisms whose health and condition can change rapidly. Trees should be checked on a regular basis, preferably once a year. The conclusions and recommendations of this report are valid for one year.
- The fruiting bodies of some important species of decay fungi only emerge at certain times of the year and may not have been visible during this inspection.
- There is no such thing as a 100% safe tree in all conditions, since even perfectly healthy trees may fall or suffer branch break.
- Some of the individual trees were not plotted by topographic survey methods. Where such trees are plotted onto the tree survey drawing, their positions should be regarded as indicative.

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3.0 Survey Methodology

The trees and hedges were assessed from ground level using Visual Tree Assessment (VTA) techniques and relevant observations and findings were recorded. The areas highlighted for more detailed examination were inspected and assessed in compliance with the industry standard document BS5837: *Trees in relation to design, demolition and construction (2012)*.

3.1 Survey Key

Tree Species

Common and botanical names of the tree species were recorded.

Stem Diameter (Dbh)

Measurements are in millimetres and taken at 1.5m from ground level, multiple stems (St) are recorded as a function of the BS:5837 RPA formulae described below.

Tree Height and Spread

Measurements are in metres as recorded by a *Truepulse* laser device.

Tree age classes

Age classes were recorded as:

Y	Young	Recently planted (with 5 years or so)
SM	Semi-Mature	Well established young tree
EM	Early Mature	Established tree not yet fully grown
M	Mature	Full or near full grown tree
LM	Late Mature	Older specimen in full maturity
OM	Over Mature	Reached full maturity now declining through natural causes
Vet	Veteran	Notable due to large size, old age, ecological importance

Tree Physiological and Structural condition

Tree condition was graded as

Good:	No obvious defects visible, vigour and form of tree good.
Fair:	Tree in average condition for its age and the environment.
Poor:	Tree shows signs of ill health/structural defect
Bad:	Tree in seriously bad health/major structural problem

Work Recommendations

Preliminary management recommendations are made where necessary and pertain to current site conditions unless otherwise stated.

3.2 Tree Retention Category (Cat) (BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations)

The tree retention category system grades a tree's suitability for retention within a development:

- A** Indicates a tree of high quality and value. These are trees that are particularly good examples of their species, which also provide landscape value. These trees are in such a condition as to be able to make a substantial contribution. (A minimum of 40 years is suggested)
- B** Indicates a tree of moderate quality and value. Trees that might be included in the high category, but are downgraded because of impaired condition. These trees are in such a condition as to make a significant contribution. (A minimum of 20 years is suggested)
- C** Indicates a tree of low quality and value - trees with an estimated remaining life expectancy of at least 10 years, or trees with a stem diameter of below 150mm and/or <10m in height.
- U** Trees that are 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.

Sub Categories

Tree categories may be further categorised using the following sub-categories (e.g. C1, C2 or C3) - 1 mainly Arboricultural qualities, 2 mainly landscape qualities, 3 mainly cultural values.

3.3 Root Protection Area

The Root Protection Area (RPA) is the minimum area around individual trees to be protected from disturbance during construction works; RPA is recorded as a radius in metres measured from the tree stem and is shown on the tree survey/constraints drawing as a circle with the tree stem in the centre.

For single stem trees, the root protection area (RPA) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

For trees with more than one stem, one of the two calculation methods below should be used.

The calculated RPA for each tree should be capped to 707 m².

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

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

b) For trees with more than five stems, the combined stem diameter should be calculated as follows:

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

4.0 Findings

The trees and hedges were assessed during a series of site visits in early July 2021. The preliminary findings of the survey are detailed in the tree survey schedule appended to this report. Tree and hedge location, RPAs and crown shapes are shown on the tree survey/constraints plan drawing 21044_TS. The findings of the field survey are summarised below.

The vast majority of the tree cover within the survey area was located within established traditional agricultural field boundary hedges or linear tree groups (of a similar species mix) running alongside the banks of the watercourse or alongside drainage ditches.

These hedges and groups were populated predominantly by Ash (*Fraxinus excelsior*) and Hawthorn (*Crataegus monogyna*), with the Ash often growing into larger emergent trees along the hedges and the Hawthorn forming the lower understorey. Smaller numbers of Sycamore (*Acer pseudoplatanus*), Oak (*Quercus robur*), Spruce (*Picea spp.*) and Alder (*Alnus glutinosa*) trees were also found along the hedges and groups, with Blackthorn (*Prunus spinosa*), Elder (*Sambucus nigra*), Willow (*Salix spp.*) and Hazel (*Corylus avellana*) making up the rest of the hedgerow bushes. Tree group and hedge condition was variable, with most of the understorey species being in reasonable health, however, many of the Ash trees are showing signs of significant crown dieback associated with infection by the fungal disease commonly known as Ash Dieback disease (ADB). The disease is widespread across the survey area and was seen to be affecting both younger and older trees.

There are several small clusters of young trees and bushes along the exposed sections of stream through the centre of the village, these are mostly of relatively small size and value/quality and were graded category C (low value).

The most significant arboricultural features within the survey area are the Common Lime (*Tilia x europaea*) trees located on pastureland to the west of the churchyard. These four trees are substantial specimens of considerable age and size and are of high amenity and heritage value. One of the trees (T11) has developed a structurally defective union as the main stem divides and so was downgraded to category B (moderate value) as per BS5837. The other three trees (T10, T12-13) were graded category A (high value).

5.0 Arboricultural Impact Assessment

The proposed flood relief works will require that some trees are removed to facilitate the project, however, the trees proposed for removal are all of comparatively low value (category C), and overall, the impact of the works will be low. The individual trees and tree groups proposed for removal are highlighted on the project drawings and include:

1x Ash at the eastern end of hedge H1

Trees T3, T4, T5, T6 and T7

3x young Ash trees (labelled T15)

4x young Ash and Sycamore group G2

Young Ash tree T21

Young coppice growth group G3

Young trees T22, T23 and T24

There are trees of greater value and significance present in the vicinity of some of the proposed works and these will need to be protected during the construction phase of the project. Trees can be seriously impacted when root spread is damaged by direct root severance and/or root death caused by soil compaction from machinery or materials storage etc. Bark and branch damage can also be caused by direct impact from machinery and vehicles etc. unless adequate care is taken.

Where significant activity is planned in such close proximity to trees that they would become significantly compromised, these trees should be removed or coppiced (cut to stump and left to regenerate) rather than be damaged and left to deteriorate or become a hazard. The retention of damaged trees may result in (often expensive) remedial action being required in the future, and it would be better if lower value trees were removed prior to the works commencing and then preferably replaced with fresh planting following completion of the works.

Project areas requiring specific tree protection attention are shown below, with more general tree protection recommendations listed in section below.

6.0 Tree Protection Measures

6.1.1 D-001 St Martins Church

The works in this area must be well planned and supervised to avoid any unintended negative impacts on the four mature Lime trees (T10-13) located west of the watercourse. These trees are of *very high* amenity and heritage value and *must* be protected from construction activity during the proposed building works. The key recommendation in this area is that the construction activity should not cross the watercourse to the west bank which is, in effect, one large tree root zone. If machinery etc. *must* cross over the land within the root protection areas (RPAs as shown on the tree survey drawing) of these trees for reasons that are unavoidable and unforeseen, they *must* use suitable ground protection (such as ground protection mats) that prevents any significant soil compaction. If direct supervision of the works to prevent encroachment into the RPAs of the trees is not practical, then the trees should be protected by temporary 'construction-proof' fencing positioned along the west bank of the watercourse, with the fencing clearly labelled as not to be moved.

6.1.2 E-002 Tree Group G8 South of Proposed New Wall and Embankment

The building of the new flood wall and embankment south of the road bridge and private houses will obviously require considerable construction activity, some of which will be near the northern end of the riparian tree group (G8) following the river channel to the south. This group should be protected from excessive encroachment beyond which is essential during the works; temporary protection fencing should be erected approximately 4m from the trees stems of group G8 following the felling of trees T3-T6 to prevent machinery, haulage vehicles etc. from compacting the root zones of the trees being retained along the river.

6.1.3 E-004 Trees T17-18 East of Proposed New Embankment

The earthworks needed to create the proposed new embankment (004) between the main river channel to the east and watercourse to the west should be undertaken in such way that the heavy activity does not encroach into the RPAs of the trees labelled T17 and T18. The embankment has been designed to avoid the trees RPAs but it is important that the actual building activity be kept away from the trees by a line of temporary protective fencing, clearly labelled as above, until the embankment is completed.

6.1.4 P-002 Hazelbrook

The proposed channel realignment and revised fencing layout in the Hazelbrook cul de sac should be carried out with a minimum of encroachment towards the landscape trees located in the green open space between the houses and river channel. All works should be kept outside of the nominal RPAs of the trees making up groups G6 and G7 and tree T30 by way of temporary fencing for the duration of the works.

6.1.5 G-004 Tree Group G20 South of the Prendergast Tyres Premises

The proposed works to the river channel just east of the R448 (south of Prendergast Tyres) should be undertaken with due care and attention regarding the western end of the mixed tree group G20 growing along the south bank of the river. Construction machinery should avoid accessing the south side of the riverbank if at all practicable.

6.2 Tree Protection - General Recommendations

The tree protection measures should be in accordance with BS5837 (2012) *Trees in relation to design, demolition, and construction – Recommendations*.

The project managers should appoint a qualified arborist to provide advice and guidance to the contractors carrying out the works. The arborist should meet the contractors on-site prior to works commencing and go through the tree protection measures, explaining the recommended procedures and emphasising the importance of protecting the trees during the course of the project. The project arborist should be available to attend the site on a regular basis to aid and advise the tree protection setup.

Tree protection fencing should be erected around any undisturbed ground within the RPAs of trees being retained to prevent construction activity and machinery encroaching onto exposed soil, where it could cause compaction and root damage. The fencing and protective structures should be erected before site works commence and will not be removed or moved unless authorised by a qualified arborist.

Where site machinery must encroach upon original soil surfaces or ground exposed by the removal of the existing hard surfacing within the RPAs of the trees to be retained for reasons unforeseen and unavoidable; suitable ground protection should be put in place to prevent any significant soil compaction or root damage near the trees; this should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight.

Where an existing hard surface is removed within the RPA of a tree being retained, care should be taken not to disturb tree roots that might be present beneath it. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground. If a new hard surface is to be laid, it might be preferable to leave any existing sub-base in situ, augmenting it where required.

Any new underground services such as electricity cables, water pipes etc. will be routed away from the root protection areas of the trees to be retained; where this is not possible for reasons unforeseen, the services should be installed using specialist methodology (such as *Airspade* excavation, Air Vacuum truck or Mole drilling) that ensures minimal impact on any tree roots.

All exposed roots and/or soil profiles containing roots of trees to be retained should be kept damp in dry conditions by regular watering and be covered with a double layer of hessian fabric to prevent desiccation. Where backfill is required, this should be of good quality topsoil, structural soil, or clean sand.

Root severance should be avoided where possible, with no roots >25mm being cut without consultation with the project arborist. Where roots have to be cut back, they should be pruned with saw or secateurs to leave a clean cut.

All site offices, materials storage, staff parking etc. should be located outside of the RPAs of the trees being retained.

Where facilitation pruning is required to shorten or remove branching from trees being retained, this work should be carried out by qualified and experienced tree surgeons working to *BS3998 (2010) Tree Work – Recommendations*.

7.0 Site Photographs



1. Semi mature Sycamore trees (T7) on either side of the stream bank (with trees T3-T6 behind)



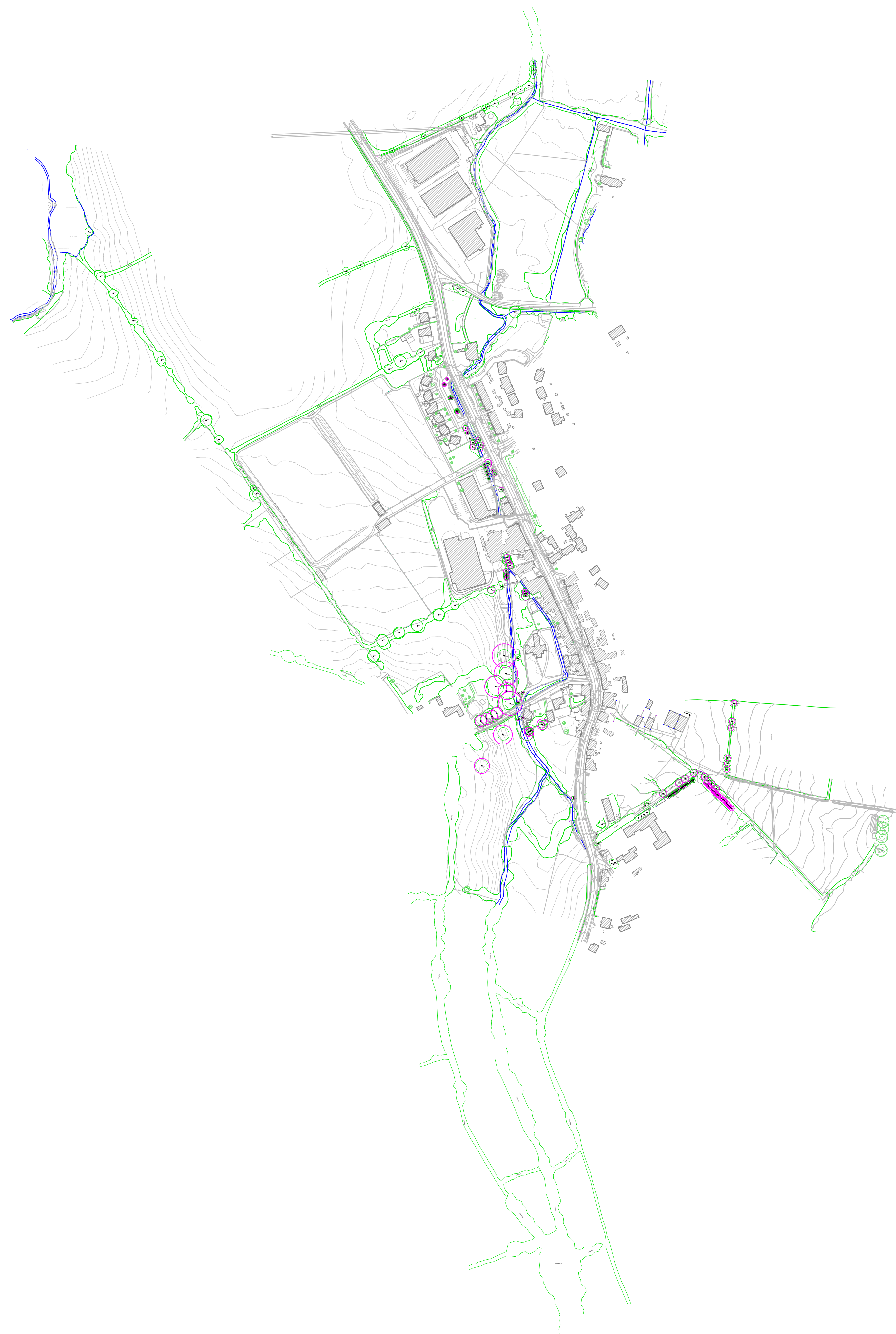
2. Large mature Lime trees (T10-T12) close to the church; these are very high value trees



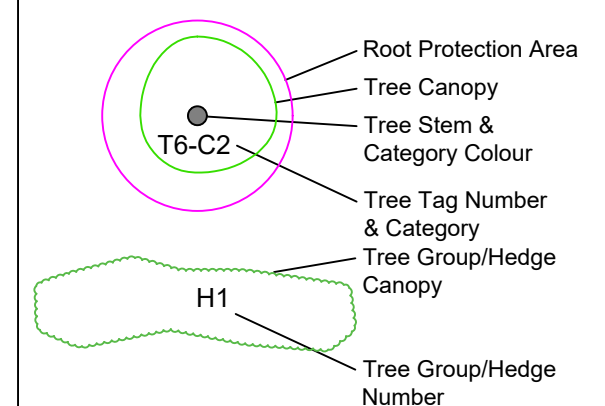
3. Young Sycamore and Ash trees (G4 and T26) along the river channel



4. Amenity planting (G5, G6 and G7) in Hazelbrook



LEGEND



- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
- Category U Trees (Poor Condition)

NOTES:
 Please see Tree Survey Report for further detail.
 All drawings to be read in conjunction with the consulting architects and engineers drawings.

Darwin Tree Specialists Ltd

Galbertstown, Holycross,
 Thurles, Co. Tipperary.
 0504 43837 / 087 2246296

Project Name: Ballyhale Flood Relief Scheme, Ballyhale Co. Kilkenny

Drawing Title: Tree Survey/Constraints Plan

Drawing Number: 21044_TS_Overview

Client: Kilkenny Co Co

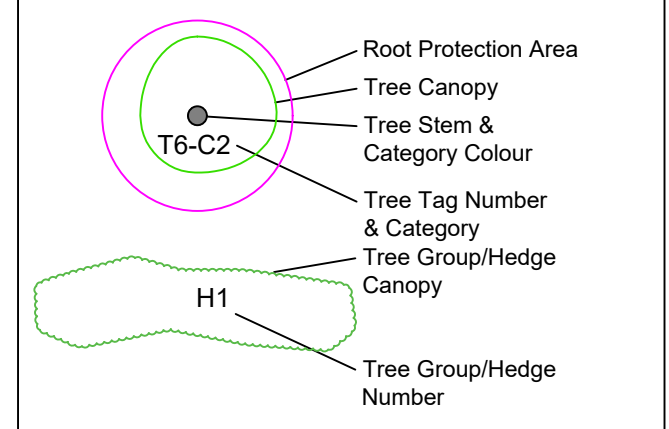
Agent:

Date: 09/07/2021

Scale: Not to Scale



LEGEND



- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
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Project Name: Ballyhale Flood Relief Scheme, Ballyhale Co. Kilkenny

Drawing Title: Tree Survey/Constraints Plan

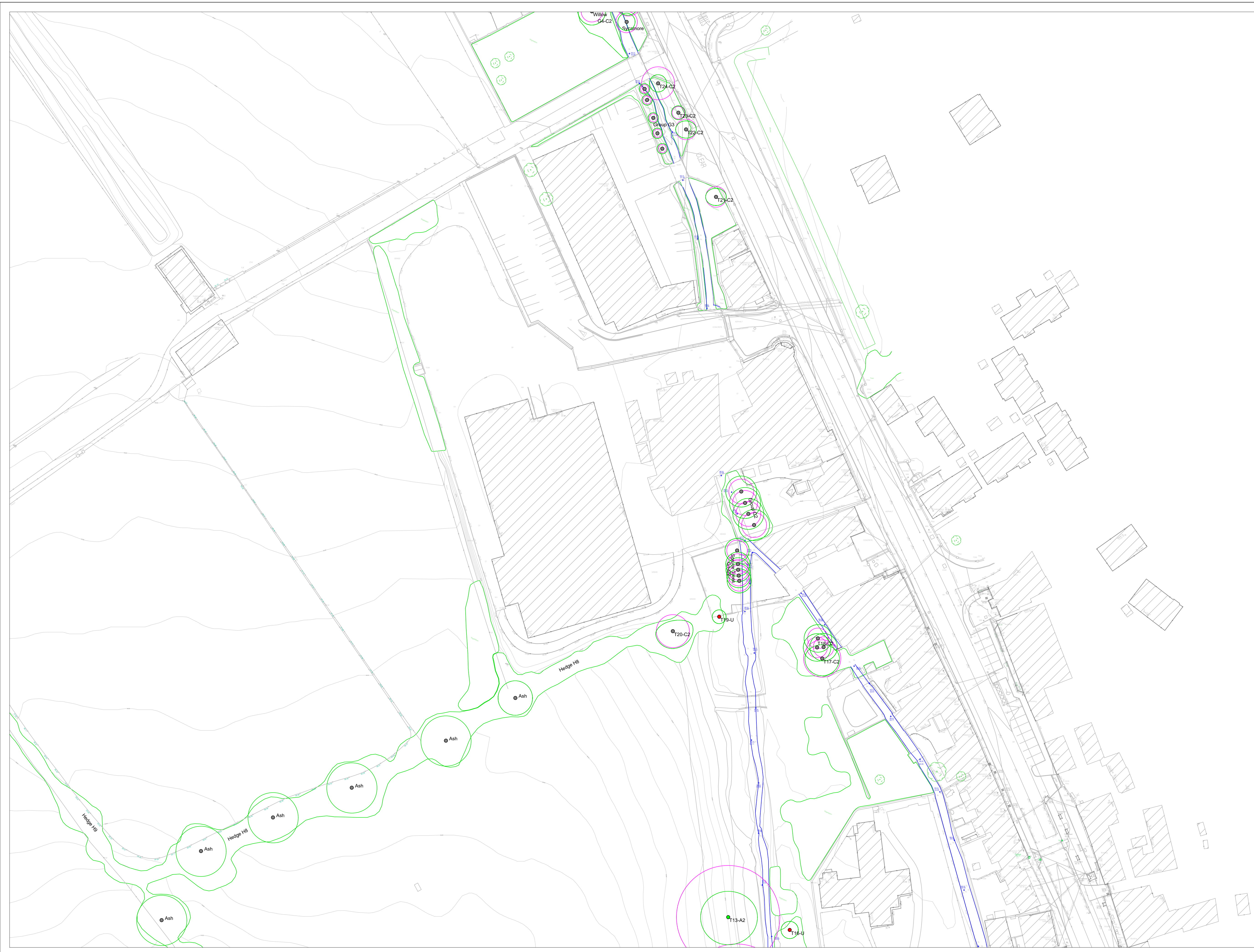
Drawing Number: 21044_TS_H1

Client: Kilkenny Co Co

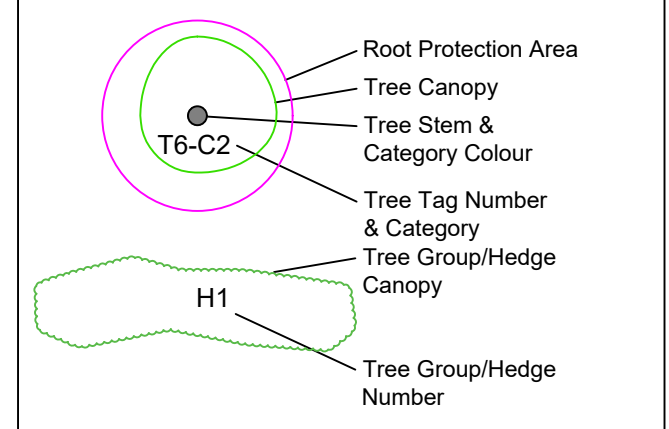
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Date: 09/07/2021

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LEGEND



- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
- Category U Trees (Poor Condition)

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Drawing Title: Tree Survey/Constraints Plan

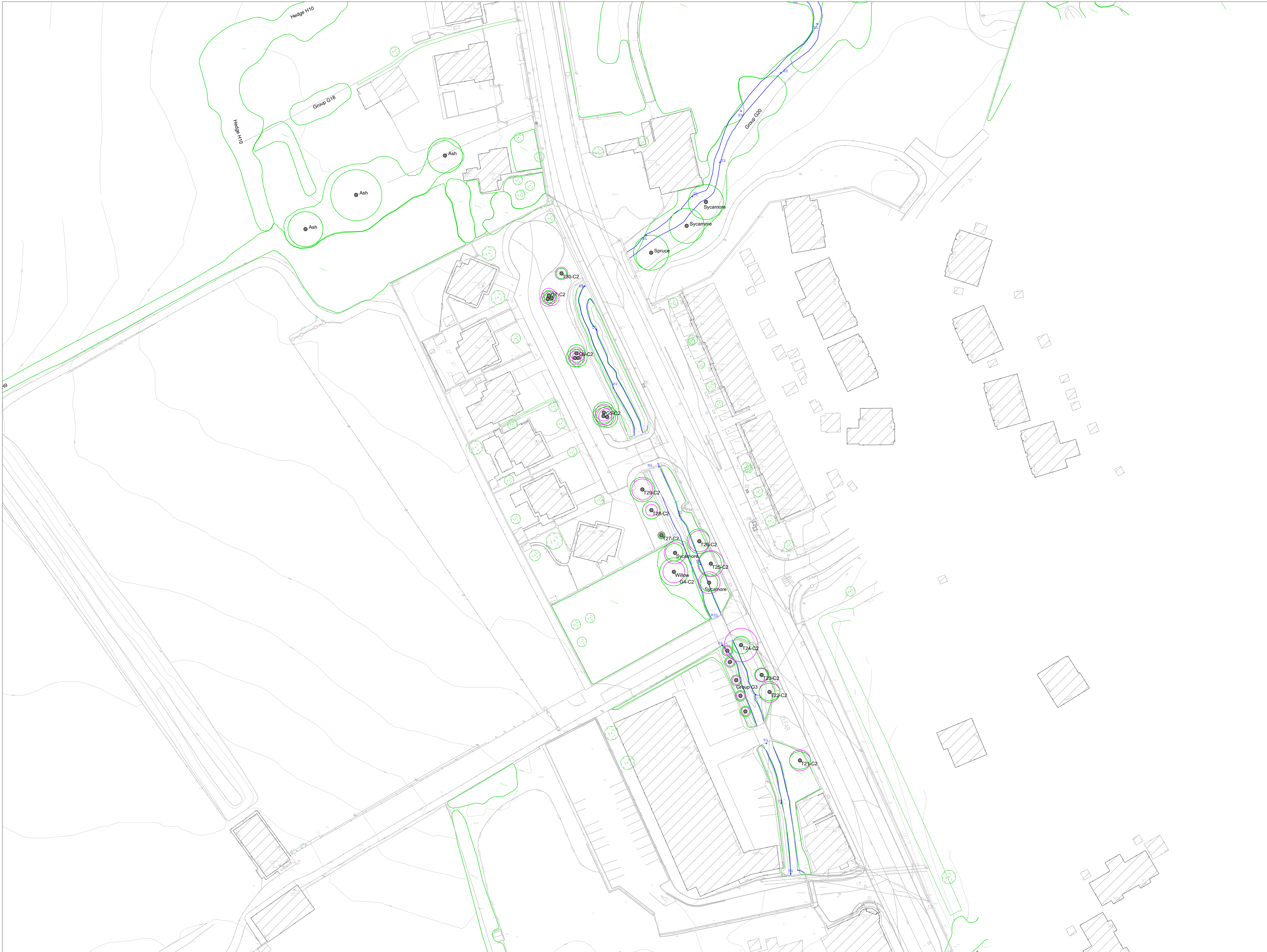
Drawing Number: 21044_TS_H2

Client: Kilkenny Co Co

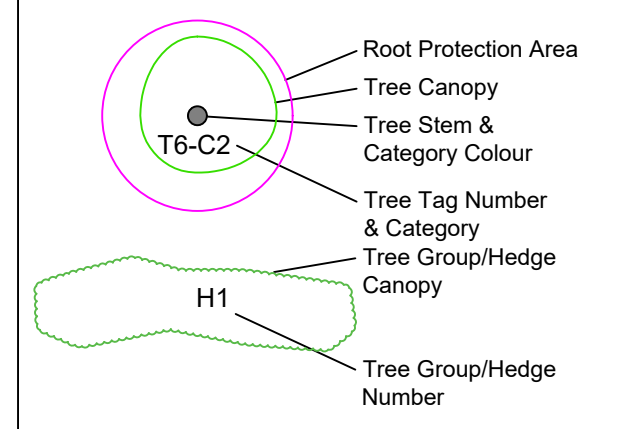
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Date: 09/07/2021

Scale: 1:500@A1



LEGEND



- Category A Trees (high value)
- Category B Trees (moderate value)
- Category C Trees (low value)
- Category U Trees (Poor Condition)

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Project Name: Ballyhale Flood Relief Scheme, Ballyhale Co. Kilkenny

Drawing Title: Tree Survey/Constraints Plan

Drawing Number: 21044_TS_H3

Client: Kilkenny Co Co

Agent:

Date: 09/07/2021

Scale: 1:500@A1