LAND PLANNING & DESIGN

CUNNANE STRATTON REYNOLDS

TREE SURVEY

Limerick City Greenway,
Limerick.

July 2024

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CONTENTS

SUMMARY

This report presents a record of those trees existing located along an existing pedestrian route following the southern bank of the River Shannon starting at the eastern side of University of Limerick campus and continuing west along the southern bank of the River Shannon as far as McLoughlin Road in the adjoining National Technology Park campus, where it then follows the Plassey Park Road out of the UL campus onto the Dublin Road and Annacotty. There is also a spur section through Kilmurray Student Village.

Trees have been surveyed as groups in the case of continuous areas of woodland that is broadly uniform in character, with any individual trees of particular merit or note within these groups being identified and surveyed individually, in accordance with BS 5837 (2012). Following initial site surveys undertaken in May and June 2021, the most recent survey was undertaken over February 2024 by Cunnane Stratton Reynolds arborist;

Keith Mitchell Diploma Arboriculture (Level 4)
Technician Member Arboricultural Association (UK)
Tree Risk Assessment Qualification (International Society of Arboriculture)
MA(Hons) Landscape Architecture
Member of the Irish Landscape Institute
Chartered Member of the Landscape Institute (UK)
Diploma EIA Management

This survey and report are based on the topographic site survey information supplied in the following drawing;

- Apex Surveys – 2D Topographic Survey Dwg 4566 04/05/21

A full survey record is presented in Appendix 1, together with accompanying drawings Tree Constraints Dwg No 21537_T_101, Arboricultural Impact Assessment Dwg No 21537_T_102 and Tree Protection Plan Dwg No 21537_T_103. After introducing the terms of reference and the methodology of the survey, the report summarises the survey findings in an overview of the existing tree cover within the site.

A total of one hundred and thirty two individual trees and twenty-four tree groups were recorded as part of the survey.

The proposed route contains a very large number of number of trees, with riparian tree cover being almost continuous along this the River Shannon section. Tree quality varies over the route, with a mix of trees from low to high quality in all stages of development from sapling to veteran – collectively providing an exceptionally valuable continuum of tree cover both in arboricultural and ecological terms. Every effort has been made to access all trees for inspection, however in many instances site conditions prevent full access and measurements may be visually estimated.

The report concludes with recommendations for protection measures to ensure the conservation of retention trees during the proposed development.

1. INTRODUCTION

Terms of Reference

Cunnane Stratton Reynolds (CSR) were instructed to undertake a tree survey, to inform the planning, design and layout of a proposed cycleway by Ryan Hanley Consulting Engineers.

Following site surveys, CSR considered those tree and tree groups that might potentially be impacted by the proposed development and produced a subsequent tree survey report presenting our findings, (in accordance with BS 5837:2012), together with recommendations for their best practice management in relation to the proposed development.

This involved a survey of the principal trees / tree groups concerned in accordance with BS 5837 (2012).

Documents supplied to CSR for purposes of conducting a tree survey include:

- Apex Surveys – 2D Topographic Survey Dwg 4566 04/05/21
- Ryan Hanley – Proposed Compounds and Tree Clearing Plates 1-50.

Site Inspection & Methodology

The site was surveyed in May and June 2021 as well as February 2024 by a qualified Arborist walking the route. A visual inspection from the ground was performed on all relevant existing trees / tree groups on site. Where access allowed, principal individual trees were examined, and critical measurements were taken and observations made.

A description was recorded of trees / group of trees, their species, age class, all relevant measured dimensions (height, stem diameter, crown spread radii and crown clearance height) and an assessment of the tree health / vitality, structural form, life expectancy and quality categorisation. Any recommended remedial works required were outlined in accordance with BS 5837 (2012).

The findings of the survey are recorded and presented in this Tree Survey Report and Tree Schedule (Appendix 1). A Tree Classification and Constraints drawing was produced to inform the planning and design process. An Arboricultural Impact Assessment and Tree Protection Proposals were considered on completion of the proposed scheme layout.

This report is subject to the scope and limitations as given at the end of the report.

Accompanying Drawings

The tree survey report should be read in conjunction with;

- Tree Classification & Constraints (Dwg No 21537/T/101).
- Arboricultural Impact Assessment (Dwg No 21537/T/102).
- Tree Protection (Dwg No 21537/T/103).

A1 size colour coded drawings accompany this report, (monochrome drawings should not be relied upon). These drawings are based upon the topographical drawings supplied to CSR.

Site Location

The site is located between the eastern edge of University of Limerick campus on the southern banks of the river Shannon, passes through the National Technology Park and extends to Annacotty village Dublin Road.

2. DESCRIPTION OF EXISTING TREES

2.1 The route of the proposed cycleway, (approximate route highlighted red – Fig 1), starts in the east as an existing pedestrian riverside pathway hugging the southern bank of the River Shannon before linking into an existing path and cycleway network through IDA Ireland national technology Park, before exiting on to Dublin Road and travelling eastward through Annacotty.

The path servicing the western portion of the route located in the University of Limerick campus is a well-defined and maintained bound gravel surface, averaging 1.8m in width and is raised above the adjoining river on top of the embankment. This section of the route can be described as high-quality riverside woodland with a broad age profile from large veteran trees to self-regenerating saplings and other understory species. Natural riparian tree species such as Willow, Alder and Ash dominate however a number of other species such as Beech and Oak are also present, which are of an age that suggest they were probably planted by the original estate owners prior to the development of the University on these lands.

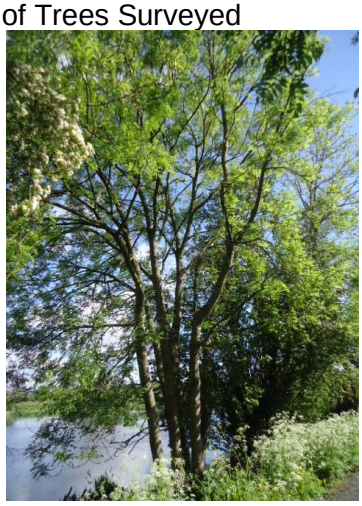
Approximately half-way along the route the path exits the University of Limerick campus and enters the adjoining IDA Ireland National Technology Park where it extends connections to existing footpaths and cycleways. Most of the trees in this section are relatively young roadside verge / street trees planted as part of the campus landscape scheme. The route exits the Technology Park at Dublin Road where it continues to the nearby Annacotty Village where it passes a mix of street trees .

Figure 1: Low resolution satellite image of approximate tree survey area in red (courtesy of Google Earth).

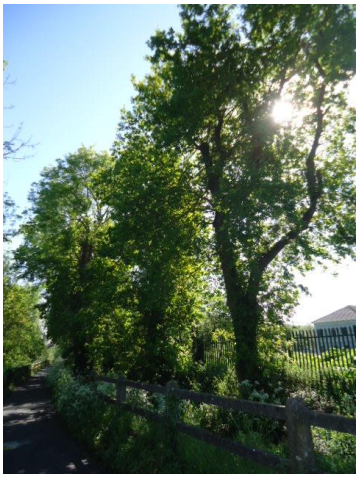
Their location, size and quality category may be reviewed with reference to the accompanying Tree Survey Dwg No 21537/T/101 and the tree survey (Appendix 1).

2.2 Photographic Summary of Trees Surveyed

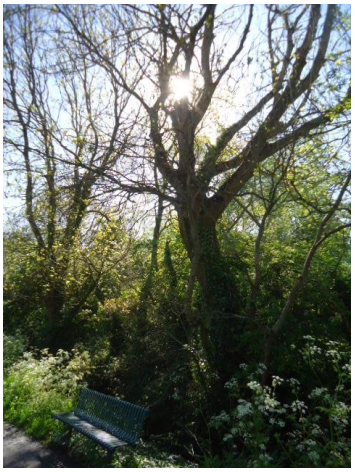
T1



T2



T3/T4/T5

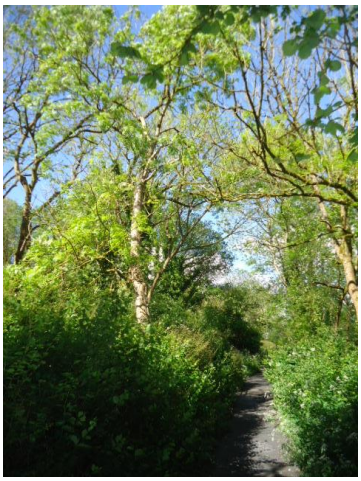


T6 / T7

T8

T9/T10

T11



T12

T13

Tree Group 22 (mixed broadleaf)

TG1

T14

T15

T16/T17

T18-T22

T23

T25

T25

T24

T26/T27/T28

T29

T31/T32

T33/T34

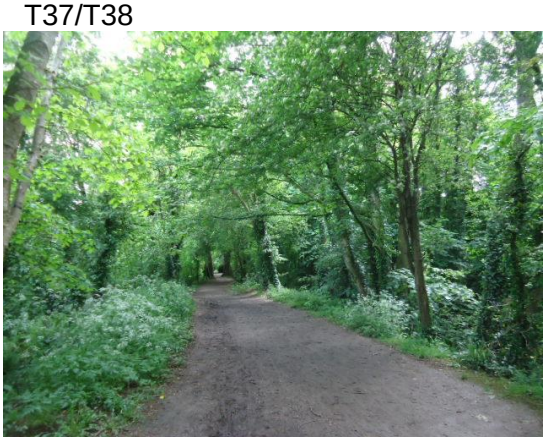
TG2

T35/T36/TG3/TG4

TG5

T37/T38

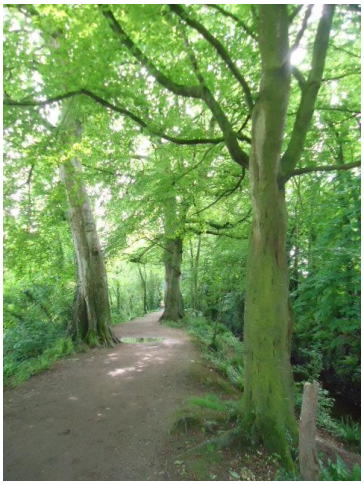
T37



T40/T41/T42/T43

T39

T41



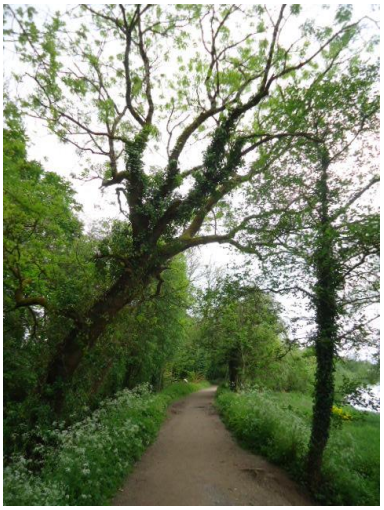
T44/T44A/T44B

T45

T46

T47/T48/T49/TG6

T8



T52

T53

TG9

TG9

TG9

TG9

TG10/T57/T58/59

T55/T56

T61

T62

T63/T64

T65 / T66

T67/TG12

Tree Group 23 (mixed broadleaf)

Tree Groups 13-20 (Willow scrub)

T835

T888

T887

Tree Group 21 (Alder Willow mix to waterside / mixed broadleaf to fieldside)

T836

T837

T838

T839/T840

T841

T842

T843

T844/T845/T846

T847

T848

T849

T850

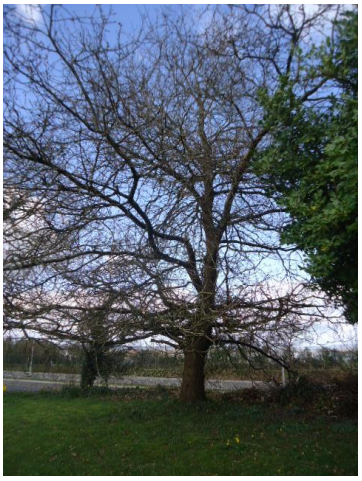
T851

T852

T853a/T853b

T854/T855/T856


T857


T858


T859


Tree Group 24


Tree Group 24

T860

T861

T862-T868

T869/T870/T871

T872/T873/T874/T875

T876

T877

T878

T879

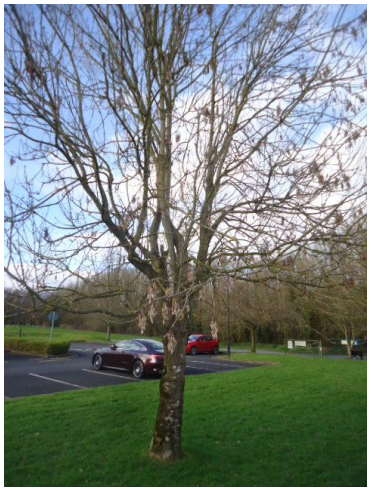
T880

T881

T882

T883

T884



T885

T886

2.3 The proposed route alignment stretches from beyond UL Boathouse in the west to just beyond Annacotty village in the east.

The first half of the proposed cycle route, starting at from UL Boathouse and moving from east is based on an existing pedestrian walkway along the south side of the river Shannons embankment. Dense native riparian woodland dominated by Alder and Willow is generally present on the riverbank side of the path with dense high-quality mixed broadleaf woodland composed mainly of native and naturalised tree species is generally present of the other side of the path.

The age profile of this woodland is balanced with a healthy understory of emerging saplings in addition to the upper canopy of middle aged and mature trees.

A number of the trees are of exceptional age and size and are probably originally associated with the historic Plassey House domain. Whilst many of these old trees have significant defects, (which is normal in trees of this age), there is evidence that they are being proactively managed in such as manner as they can be retained at an acceptable level of risk – for example trees with significant cavities resulting in structural weakness have been ‘monolithed’ or reduced to a safe height.

This is an appropriate management strategy and allows the retention of the significant benefits trees of this age offer such as ecological and habitat value, heritage value, genetic diversity and aesthetic benefit.

The significant size of many of these trees means that their root zones are likely to extend for significant distances as illustrated in the Classification & Constraints Dwg 21537_T_101.

The spur access departs from the riverside path at Kilmurry Village, running south east parallel to an established linear group of early mature mixed deciduous trees, (largely utilising existing pedestrian and vehicular surfaces).

The riverside path continues eastwards until just before the ruins of Castletroy, where it diverges from the river course to meet and follow McLoughlin Drive within the National Technology Park, where it passes a mix of young to early mature street trees. From this point the path links with existing active travel infrastructure on Plassey park Road before eventually exiting on to the Dublin Road. After a short distance it diverts on to the Ashgrove Road to Annacotty village passing a relatively small number of street and garden trees before crossing the Mulkear River and exiting the village at the St Vincent's Special School Entrance to rejoin the Dublin Road, where it runs parallel to an agricultural field with a number of mature trees before ending at the R506 junction.

Trees often become more valuable as collective groups, than they might be when considered solely as individuals in isolation - a grouping or woodland being generally of significant visual and ecological value. As such it should be noted that the cumulative value of evaluated Tree Groups often reflects an increased catergorised value than might be awarded to the constituent trees if they were assessed in isolation as individuals.

3. ARBORICULTURAL IMPACT ASSESSMENT

3.1 This section discusses the potential impact of the proposed development on the existing tree cover on site and considers the need for mitigation measures, in accordance with BS 5837 (2012), for sustainable development.

3.2 Category 'U' trees are recommended for immediate removal, (fell or monolith to safe height), on general management grounds, irrespective of site development – no U class trees were identified as such during this survey.

Direct Loss of Trees

3.3 The proposed greenway route alignment has in so far as possible sought to avoid direct conflict with existing trees in order to minimise impacts and tree loss.

In some cases the proposed alignment may not clash directly with the tree, but it may traverse a portion of the trees root protection area. Where feasible alternative non-dig construction method has been employed to avoid compromising the trees roots and loosing the tree.

There are situations however where avoidance or alternative construction methods are not possible for a variety of different reasons, resulting in the requirement to remove some trees to facilitate the proposed development.

The proposed scheme is currently in conflict with the following trees and or a significant portion of their calculated root protection area, making their retention unviable in the context of the proposed development.

Tag No	Tree Species	Tree Class	Number of trees
T6	Ash (Fraxinus excelsior)	B1	1
T7	Ash (Fraxinus excelsior)	B1	1
T12	Ash (Fraxinus excelsior)	B2	1
T41	Beech (Fagus sylvatica)	B1	1
T48	Sycamore (Acer pseudoplatanus)	B1	1
T49	Sycamore (Acer pseudoplatanus)	B1	1
T51	Sycamore (Acer pseudoplatanus)	B1	1
T837	Ash (Fraxinus excelsior)	C1	1
T840	Ash (Fraxinus excelsior)	C1	1
T841	Sycamore (Acer pseudoplatanus)	B1	1
T842	Sycamore (Acer pseudoplatanus)	B1	1
T843	Sycamore (Acer pseudoplatanus)	B1	1
T852	Sycamore (Acer pseudoplatanus)	B1	1
T853	Sycamore (Acer pseudoplatanus)	B1	1
T888	Ash (Fraxinus excelsior)	U	1
TG4	Mixed broadleaf	B2	Approx 21
TG8	White Willow (Salix Alba)	B2	5
TG20	White Willow (Salix Alba)	B2	Approx 10
TG21	Mixed broadleaf	B2	2
TG22	Mixed broadleaf	B2	Approx 15
TG24	Mixed broadleaf & Leylandii	B2	Approx 17

Indirect Impacts

3.4 Cognisance must also be given to indirect impacts - in particular care must be taken to ensure the proposed development and ancillary works do not represent an unacceptable conflict with the calculated 'Root Protection Area' of the existing trees proposed for retention.

Disturbance of 'Root Protection Area' may just as readily kill or destabilise a tree over time, by means of root damage/severance and or earth compaction/covering preventing essential transfer of water, air and nutrients to roots.

A significant portion of the proposed greenway proposes the use of a specialist non-dig construction method, (as detailed on the tree protection drawing Dwg 21537_T_103), as an alternative to traditional path construction method which allows the route to traverse portions of tree root protection areas without compromising the trees long term viability.

Good planning and site management therefore will be required during construction works to ensure these areas are not adversely impacted by construction activities. It is important that the site manager carefully review the tree protection drawing Dwg 21537_T_103, prior to commencement of works on site and raise any queries prior to commencement of works.

The use of tree protection fencing to exclude construction access to root protection areas of trees and hedgerows identified for retention, as illustrated in tree protection drawing Dwg 21537_T_103, will be critical to avoiding detrimental impacts and the long-term viability of the retained tree.

Proposed tree protection measures should be in place from the outset prior to the commencement of works. Any queries should be raised with the project Arborist prior to commencement of works on site.

Provided proper tree protection measures are adhered to it is not anticipated that any further trees will require removal due to indirect impact**s.**

Additional Considerations

3.5 Scrub and tree removal should take place outside the bird nesting season (1st March – 31st August).

'Ash dieback' is a disease caused by the *Hymenoscyphus fraxineus* fungi which is developing rapidly across Ireland since its presence was first detected in Ireland in 2012. The disease is spread by windborne spores and once a tree is infected it will lead to its terminal decline within a few years.

At present there is no available remedy and the outlook for the survival of Ash trees in Ireland is poor, with infection rates appearing to accelerate over the past couple of years. It is hoped that genetic diversity may mean some trees might prove resistant to the disease, however there is still great uncertainty at this time regarding survival rates. The Woodland Trust estimate that at least 80% of Ash trees in the UK will die.

The retention or removal of Ash trees must therefore be viewed in the context of Ash Dieback disease, and the likelihood that at least 80% of Ash trees are likely to die over the coming years.

New tree planting. The proposed development offers an opportunity for new tree planting which will assist in mitigating against proposed losses. It is suggested that a mix of species be planted using native and high ecological value non-native trees to mitigate against loss of existing trees and their associated ecological value.

Summary

3.6 Table 1 illustrates trees to be removed and their classification.

Table 1.

Tree Class	**Trees proposed for removal**
A Class Trees (High Quality)	0
B Class Trees (Moderate Quality)	82
C Class Trees (Low Quality)	2
U Class Trees (Recommended Removal)	1
TOTAL	**85**

Tree Protection

3.7 Adequate protection and so successful retention of those trees to be retained within the land take area, will be achieved by rigidly excluding all construction activities from tree root protection areas by fit for purpose barriers/fencing and/or additional ground protection.

3.8 Tree Protection Areas (TPAs) are proposed, as indicated on accompanying Tree Protection Plan (Dwg No 23375_T_103). Protective fence line locations and details for these fences are also illustrated on the plan.

Services

3.9 Any services that are planned as part of this project must also avoid designated ‘Root Protection Area’ of tree / tree groups for retention.

4. RECOMMENDATIONS – Arboricultural Method Statement

Recommendations for the specific measures advised regarding management of the trees in relation to this development are detailed within Appendix 1, (note some recommendations may be superseded by tree removal in some instances - if planning is granted). These recommendations should inform, and be referred to in, the method statements submitted for approval prior to commencement by the responsible building/engineering and landscape contractors whose works (subject to grant of permission) will affect retained trees and the Tree Protection Areas.

1. *Tree Works.*

Subject to the required permissions removal / felling works as specified on Dwg No 21537_T_102, should be performed prior to project commencement, by reputable contractors in accordance with BS 3998:2010 and current best practice. (Removal of scrub vegetation and ivy clearance should preferably be performed in winter outside of the bird nesting season. Tree felling should be preceded by a competent assessment as to the presence of any protected wildlife species, where required specialist advice should be sought if necessary).

2. *Protective Fencing.*

Protective fencing (barriers) should be erected in the positions and alignments as indicated on the Tree Protection Plan (Dwg No 21537_T_102).

Fencing should be in accordance with BS 5837:2012 unless otherwise agreed with the planning authority. Commencement of development should not be permitted without adequate protective fencing being in place. This fencing, enclosing the minimum tree protection areas indicated, must be installed prior to any plant, vehicle or machinery access on site. Fencing should be signed 'Tree Protection Area – No Construction Access'. Fencing is not to be taken down or re-positioned without written approval of the project Arborist. No excavation, plant or vehicle movement, materials handling or soil storage is to be permitted within the fenced tree protection areas indicated on plan.

4. *Non dig path construction*

The proposed development includes a section of footpath and cycleway which traverses root protection areas of trees proposed for retention. In order to achieve these without compromising the trees, a non-dig construction method such as Cellweb TRP, (installed in full accordance with manufacturers specifications), must be used in conjunction with a permeable asphalt surface finish, (refer to Dwg No 21537_T_103 for details).

5. *Landscape Works*

Proposed landscaping works including new planting, shall be performed in accordance with BS 5837:2012. During these works, the ground around retained trees must not compacted by vehicles, nor be mechanically excavated for planting, nor be significantly altered in terms of ground levels.

6. *Monitoring & Compliance*

As there are a number of critical tree protection works required in order to ensure the successful retention of many of the existing trees. It is therefore recommended that a professionally qualified Arborist be consulted on an ongoing basis as required by the principal contractor or developer during the construction phase to monitor compliance and advise as issues arise.

It is advised that tree protection fencing, any required special engineering and supervision works etc must be included / itemised in the main contractor tender document, including responsibility for the installation, costs and maintenance of tree protection measures throughout all construction phases.

Copies of the Tree Survey and all accompanying drawings, a copy of BS 5837:2012 and NJUG 4 (2007)*'Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees'* should all be kept available on site by the contractor during development. All works are to be in accordance with these documents.

Limitations and Scope of this Survey Report

This report covers only those trees individually inspected, (shown on the 'Tree Survey Drawings' and described in the 'Schedule'), reflecting the condition of those trees at the time of inspection. Inspection is limited to visual examination of the subject trees from the ground without; test boring, use of tomographic equipment, dissection, probing, coring, ivy removal or excavation to establish structural integrity.

The trees were not climbed and dimensions are approximate, but considered a reasonable reflection of the trees measurements. A number of trees were visually obscured by heavy ivy / epicormic growth / scrub vegetation, which could potentially hide from view existing faults or weaknesses, as such they would benefit from re-inspection upon removal of such growth. This survey can only therefore be regarded as a preliminary assessment.

There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future. The currency of this survey report and its recommendations is one year.

The accompanying drawings are illustrative and based on the land (topographical) survey information supplied; CSR Ltd accept no legal liability or responsibility for any errors in the information contained in the supplied drawings.

CSR Ltd accept no responsibility for the performance of trees subject to pruning or other site works (including construction activities) not performed in strict accordance with recommendations as specified in this report and/or in accordance with BS 3998:2010 and BS 5837:2012

All retained trees mentioned in this report should be subject to expert re-inspection within 12 months and prior to completion of development works and public occupancy of the site.

This report was produced as a part of a planning application for the scheme; the author accepts no responsibility or liability for actions taken by reason of this report by the client or their agents unless subsequent contractual arrangements are agreed. Public disclosure or submission of any part of this report without title, or permission from the author, renders this report invalid and legally inadmissible.

References/Bibliography

BS 5837 (2012). *Trees in Relation to Design, Demolition and Construction - Recommendations*. British Standards Institution. TSO, London.

BS 3998 (2010) *Tree Work - Recommendations*. British Standards Institution. TSO, London.

NJUG 4 (2007) *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2).* National Joint Utilities Group

TREE SURVEY KEY

Information in the attached schedule is given under the following headings:

Tree No.

Individual trees have been numbered and tagged on site with corresponding survey tag or treated as a group where appropriate (e.g. Woodlands/hedgerows) and illustrated on accompanying tree survey drawing.

Species

Common & Latin names of species are provided

Height

Overall estimated height given in meters (measured using Truplus 200 Laser Rangefinder).

Stem Diameter

The diameter of the main trunk taken at a height of 1.5m on a single stem tree, or, on each branch of multi-stemmed (MS) trees.

Crown Spread

The largest radius of branch spread is provided in meters for North / East / South and West directions.

Height of lowest branch

The distance between ground level and first significant branch or canopy (and direction of growth) given in meters (m).

Any measurement or dimension that has been estimated (for offsite or otherwise inaccessible trees where accurate data cannot be recovered) is identified by the suffix #.

Life stage

The tree's age is defined as:

Y = Young, in first third of life (tree which has been planted in the last 10 years or is less than 1/3 the expected height of the species in question).

MA = Middle Age, in second third of life (tree, which is between a 1/3 and 2/3's the expected height of the species in question).

M = Mature, in final third of life (tree that has reached the expected height of the species in question, but still increasing in size).

OM = Over mature (tree at the end of its life cycle and the crown is starting to break up and decrease in size).

V = Veteran Tree (exceptionally old tree).

Physiological Condition

The tree's physiological condition is defined as:

Good -Good vitality: normal bud growth, leaf size, crown density and wound closure

Fair - Average to below average vitality: reduced bud growth, smaller leaf size, lower crown density and reduced wound closure

Poor - Low vitality: limited bud growth, small chlorotic leaves, sparse crown, poor wound closure

Dead - No longer living.

Structural Condition

The trees structural condition is defined as:

Good - No major structural defects observed (possibly some minor defects)

Fair - Minor defects present, (such as bark wounds, isolated decay pockets or structure affected due to overcrowding), that could be alleviated by tree surgery/management

Poor - Major structural defects present such as extensive deadwood, decay or defective to the point of being dangerous. (Significant defects are noted e.g. decay, collapsing etc).

Preliminary Management Recommendations & Timescale

Recommendations actions based on limitations of survey – (may include further investigation and or assessment of suspected defects by means and or methods not undertaken / within the remit of this survey).

Estimated Remaining contribution (Years)

Life of the tree is given as;

10 < less than 10 years remaining
10 + in excess of 10 years remaining
20 + in excess of 20 years remaining
40 + in excess of 40 years remaining

Tree Quality Assessment 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 U trees (e.g. 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

• 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).

A High quality

Trees of high quality with an estimated remaining life expectancy of at least 40 years

A1 Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)

A2 Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features

A3 Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)

B Moderate quality

Those trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

B1 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.

B2 Trees present in numbers, usually growing 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.

B3 Trees with material conservation or other cultural value

C Low quality

Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

C1 Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.

C2 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.

C3 Trees with no material conservation or other cultural value.

APPENDIX 1

No	Species	Height (m)	Crown Spread (m) N/S/E/W	Diameter (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining years	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
1	Fraxinus excelsior	15	4/4/4/4	300x5	8.04	0m all	MA	40+	Good	Fair		B1	
2	Fraxinus excelsior	15	5/5/5/5	300x6	8.81	0m all	MA	40+	Good	Fair		B1	
3	Quercus robur	14	5/4/3/3	750	9.00	2m all	MA	40+	Good	Fair	Remove Ivy	A1	
4	Quercus robur	13	4/3/3/3	750	9.00	2m all	MA	40+	Good	Fair	Remove Ivy	A1	
5	Quercus robur	16	5/5/5/5	1200	14.40	4m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
6	Fraxinus excelsior	16	5/5/6/6	1000	12.00	4m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
7	Fraxinus excelsior	17	4/4/4/4	900	10.80	3m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
8	Fraxinus excelsior	11	4/4/4/4	250x3	5.20	1m all	MA	40+	Fair	Fair	Remove Ivy	B2	Ash dieback
9	Fraxinus excelsior	12	4/4/4/4	250x3	5.20	0m all	MA	40+	Fair	Fair	Remove Ivy	B2	
10	Fraxinus excelsior	11	3/3/4/4	250x4	6.00	0m all	MA	40+	Good	Fair	Remove Ivy	B2	
11	Fraxinus excelsior	12	3/3/3/3	350x2	5.94	0m all	MA	40+	Good	Fair	Remove Ivy	B1	
12	Fraxinus excelsior	10	3/3/3/3	220	2.64	3m s	Y	40+	Good	Good		B2	
13	Fraxinus excelsior	9	2/2/2/2	200	2.40	5m all	Y	40+	Good	Good		B2	
14	Populus nigra	6	1/1/1/1	80	0.96	2m all	Y	40+	Good	Good		C1	
15	Quercus robur	4	1/1/1/1	50	0.60	1m all	Y	40+	Good	Good		C1	
16	Fagus sylvatica	17	6/6/6/6	1250	15.00	3m all	M	40+	Good	Fair		A1	
17	Fagus sylvatica	15	5/5/5/5	950	11.40	4m all	M	40+	Good	Fair		A1	occluded wound
18	Fagus sylvatica	22	6/6/6/6	1200	14.40	4m all	M	40+	Good	Fair		A1	
19	Fagus sylvatica	20	6/5/5/5	1000	12.00	3m all	M	40+	Good	Fair	Remove Ivy	A1	
20	Fagus sylvatica	17	6/5/4/4	980	11.76	3m all	M	40+	Good	Fair	Remove Ivy	A1	
21	Fagus sylvatica	20	3/6/4/4	950	11.40	4m all	M	40+	Good	Fair	Remove Ivy	A1	
22	Fagus sylvatica	22	5/6/5/5	1100	13.20	4m all	M	40+	Good	Fair	Remove Ivy	A1	
23	Fagus sylvatica	16	5/6/5/5	980	11.76	4m all	M	10+	Good	Poor	Monolith	B1	cavity / split bole
24	Fagus sylvatica	18	6/4/5/5	970	11.64	5m all	M	40+	Good	Fair		A1	
25	Fagus sylvatica	15	5/8/5/5	1010	12.12	2m s	M	10+	Fair	Poor	Monolith	B1	decay cavity x2
26	Fagus sylvatica	17	7/0/5/5	950	11.40	6m all	MA	40+	Good	Fair	Remove Ivy	A1	
27	Fagus sylvatica	14	6/3/4/4	680	8.16	4m all	MA	40+	Good	Fair	Remove Ivy	A1	
28	Fagus sylvatica	18	7/2/5/5	720	8.64	5 n	MA	40+	Good	Fair	Remove Ivy	A1	
29	Fagus sylvatica	10	3/3/3/3	850	10.20	5m all	MA	20+	Good	Poor	Remove ivy	B1	monolith (cavity)
30	Fagus sylvatica	15	4/5/5/5	1000	12.00	6m all	MA	40+	Good	Fair	Remove Ivy	A1	heavily obscured
31	Fagus sylvatica	15	5/5/5/5	1100	13.20	4m all	M	40+	Good	Fair	Remove Ivy	A1	heavily obscured
32	Fagus sylvatica	15	5/5/5/5	1250	15.00	3m all	M	40+	Good	Fair	Remove Ivy	A1	
33	Quercus robur	9	3/3/3/3	350	4.20	1m w	Y	40+	Good	Fair		B1	
34	Fagus sylvatica	14	6/6/6/6	600	7.20	1m all	MA	40+	Good	Fair	Remove Ivy	A1	
35	Castanea sativa	11	5/5/4/4	900	10.80	4m n	M	20+	Good	Fair	Remove Ivy	B1	heavily obscured
36	Castanea sativa	8	4/4/6/6	900	10.80	0m all	M	20+	Good	Fair		B1	fallen tree
37	Castanea sativa	13	4/8/3/3	1400	15.00	1m s	V	20+	Fair	Fair	Remove Ivy	A1	
38	Fagus sylvatica	15	5/5/5/5	620	7.44	3m all	MA	40+	Good	Good	Remove Ivy	A1	
39	Fagus sylvatica	16	7/7/7/7	850	10.20	4m all	MA	40+	Good	Fair	Remove Ivy	A1	cavity
40	Fagus sylvatica	17	7/7/7/7	600	7.20	3m e/w	MA	40+	Good	Good		A1	

No	Species	Height (m)	Crown Spread (m) N/S/E/W	Dia' (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining. years	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
41	Fagus sylvatica	19	9/6/7/7	1300	15.00	8m all	OM	20+	Good	Poor		B1	cavity (fall to river)
42	Fagus sylvatica	19	5/8/5/5	660	7.92	4m all	MA	40+	Good	Fair		A1	
43	Fagus sylvatica	19	8/7/8/8	1280	15.00	5m all	M	40+	Good	Fair		A1	
44	Fagus sylvatica	18	8/5/5/5	1100	13.20	4m n	M	40+	Good	Fair		A1	
44a	Aesculus hippocastanum	15	7/2/4/4	650	7.80	3m all	MA	40+	Good	Fair		A1	
44b	Fagus sylvatica	18	7/7/7/7	980	11.76	4m e	M	40+	Good	Fair		A1	
45	Acer pseudoplatanus	13	4/6/5/2	700	8.40	2m e	MA	40+	Good	Fair		B1	
46	Fraxinus excelsior	16	6/6/6/6	700/400	9.67	1m n	MA	40+	Good	Fair		A1	
47	Quercus robur	17	9/9/9/9	800/700/ 500/400	14.88	0m all	M	40+	Good	Good		A1	exceptional
48	Acer pseudoplatanus	15	5/5/5/5	750	9.00	6m all	MA	40+	Good	Fair		B1	
49	Acer pseudoplatanus	15	5/5/5/5	750	9.00	8m all	MA	40+	Good	Fair		B1	
50	Fraxinus excelsior	16	5/5/5/5	900	10.80	3m all	MA	10<	Poor	Fair		C1	severe dieback
51	Acer pseudoplatanus	12	4/4/4/4	550	6.60	4m all	MA	40+	Good	Fair		B1	
52	Fraxinus excelsior	10	7/1/3/3	700	8.40	4m all	MA	40+	Fair	Fair		B1	overhangs path
53	Salix alba	19	7/6/5/5	1250	15.00	3m n/s	M	40+	Good	Fair		A1	
54					0.00				Dead			C1	
55	Ulmus sp.	18	5/5/5/5	900	10.80	8m all	MA	40+	Good	Fair		A1	
56	Ulmus sp.	18	5/3/3/0	1000	12.00	8m all	MA	40+	Good	Fair		A1	
57	Pinus sylvestris	18	5/5/5/5	750	9.00	4m all	MA	40+	Good	Fair		A1	
58	Fagus sylvatica	18	5/5/5/5	700	8.40	3m all	MA	40+	Good	Fair		A1	
59	Populus alba	20	6/6/6/6	860	10.32	8m all	M	40+	Good	Fair		A1	
60	Populus alba	20	7/7/7/7	870	10.44	7m all	M	40+	Good	Fair		A1	
61					0.00				Dead				
62	Aesculus hippocastanum	12	1/7/7/1	1000	12.00	0m all	OM	10+	Fair	Fair		B2	fallen tree regrowth
63	Salix alba	14	5/7/6/6	500x3	10.39	0m all	M	20+	Good	Fair		B2	fallen tree regrowth
64	Salix alba	14	5/7/6/6	500x3	10.39	0m all	M	20+	Good	Fair		B2	fallen tree regrowth
65	Alnus glutinosa	8	3/3/3/3	300x5	8.04	0m all	Y	40+	Good	Fair		B2	
66	Quercus robur	6	3/3/3/3	375	4.50	0m all	Y	40+	Good	Fair		B2	
67	Quercus robur	9	5/5/5/5	480	5.76	1m all	MA	40+	Good	Good		B1	
68	Crataegus monogyna	8	4/4/4/4	350x2	5.93	1m all	M	20+	Good	Good	Remove Ivy	B1	
69	Crataegus monogyna	5	2/0/2/2	180	2.16	3m all	MA	20+	Fair	Fair	Remove Ivy	C1	
70	Fraxinus excelsior	9	4/4/4/4	450x2	7.63	1m all	MA	10<	Poor	Fair	Fell	C1	Ash dieback
71	Fraxinus excelsior	10	2/4/4/6	200x3	4.15	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
72	Alnus glutinosa	13	2/3/3/3	375x2	4.50	1m n/s	MA	40+	Good	Fair	Remove Ivy & Crown Clean	B1	
73	Fraxinus excelsior	18	6/6/6/6	450x4	10.08	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
74	Fraxinus excelsior	20	7/7/7/7	480x4	11.52	1m all	MA	40+	Good	Fair	Remove Ivy & Crown Clean	A1	
75	Quercus robur	18	8/8/8/8	1250	15.00	6m all	M	40+	Good	Fair	Remove Ivy & Crown Clean	A1	exceptional
76	Aesculus hippocastanum	16	7/7/7/7	700	8.40	6m all	M	40+	Good	Fair	Remove Ivy & Crown Clean	A1	v good

Tag	Species	Height (m)	Crown Spread (m) N/S/E/W	Girth (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life stage	Estimated remaining contribution (years)	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
835	Salix alba		5/5/5/5	1250	15.00	0m all		20+	Fair	Fair		B1	branch split
836	Fagus sylvatica	28	5/4/5/5	850	10.20	8m nw		40+	Good	Fair	Crown Clean	A1	dead branch
837	Fraxinus exclesior	9	3/1/2/2	190	2.28	4m all		10<	Poor	Fair		C1	ash dieback
838	Fagus sylvatica	28	6/6/6/6	980	11.76	3m s		40+	Good	Fair	Crown Clean	A1	compression fork investigate
839	Fraxinus exclesior	9	1/2/2/2	180	2.16	3m all		10<	Fair	Poor		C1	Ash dieback
840	Fraxinus exclesior	9	1/2/2/2	170	2.04	3m all		10<	Fair	Poor		C1	Ash dieback
841	Acer pseudoplatanus	10	3/3/3/4	400	4.80	4m e/w		40+	Good	Fair		B1	
842	Acer pseudoplatanus	10	3/3/3/3	450	5.40	3m all		40+	Good	Fair		B1	
843	Acer pseudoplatanus	10	4/4/4/4	460	5.52	3m all		40+	Good	Fair		B1	
844	Fraxinus exclesior	10	2/2/2/2	230	2.76	4m all		10<	Fair	Poor		C1	
845	Acer pseudoplatanus	10	3/0/1/3	350	4.20	4m all		10<	Fair	Poor		C1	
846	Acer pseudoplatanus	9	2/2/2/3	330	3.96	4m all		40+	Good	Fair		B1	
847	Acer pseudoplatanus	10	4/4/4/4	420	5.04	4m all		40+	Good	Fair		B1	
848	Acer pseudoplatanus	10	4/4/4/4	400	4.80	4m all		40+	Good	Fair		B1	
849	Acer pseudoplatanus	9	4/3/4/4	400	4.80	3m all		40+	Good	Fair		B1	
850	Acer pseudoplatanus	6	3/3/3/3	340	4.08	2m n/s		40+	Good	Fair		B1	
851	Acer pseudoplatanus	10	4/4/4/5	420	5.04	3m all		40+	Good	Fair		B1	
852	Acer pseudoplatanus	10	4/3/4/4	450	5.40	4m all		40+	Good	Fair		B1	
853	Acer pseudoplatanus	11	3/3/0/5	400	4.80	3m e/w		40+	Good	Fair		B1	
853a	Acer pseudoplatanus	12	4/4/4/4	400x2	6.78	2m e/w		40+	Good	Fair		B1	in field
854	Acer pseudoplatanus	8	2/2/2/2	390	4.68	3m all		40+	Good	Fair		B1	
855	Acer pseudoplatanus	8	2/2/2/4	530	6.36	3m all		40+	Good	Fair		B1	
856	Acer pseudoplatanus	8	3/3/3/3	320	3.84	4m all		40+	Good	Fair		B1	
857	Quercus robur	12	3/6/3/5	480	5.76	2m all		40+	Good	Fair	Remove Ivy & Crown Clean	A1	
858	Fraxinus exclesior	13	3/5/5/5	610	7.32	2m all		10<	Poor	Fair		C1	Ash dieback
859	Quercus robur	11	5/5/5/5	800	9.60	1m all		40+	Good	Fair	Remove Ivy & Crown Clean	A1	
860	Quercus robur	9	3/4/4/4	360	4.32	3m all		40+	Good	Good		B1	
861	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
862	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
863	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
864	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
865	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
866	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
867	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
868	Salix alba	16	4/4/4/4	620	7.44	3m e/w		20+	Good	Good		B1	
869	Tilia euclora	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
870	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
871	Tilia cordata	8	3/3/3/3	390	4.68	3m all		40+	Good	Good		B1	
872	Acer platanoides	9	4/4/4/4	390	4.68	2m all		40+	Good	Good		B1	

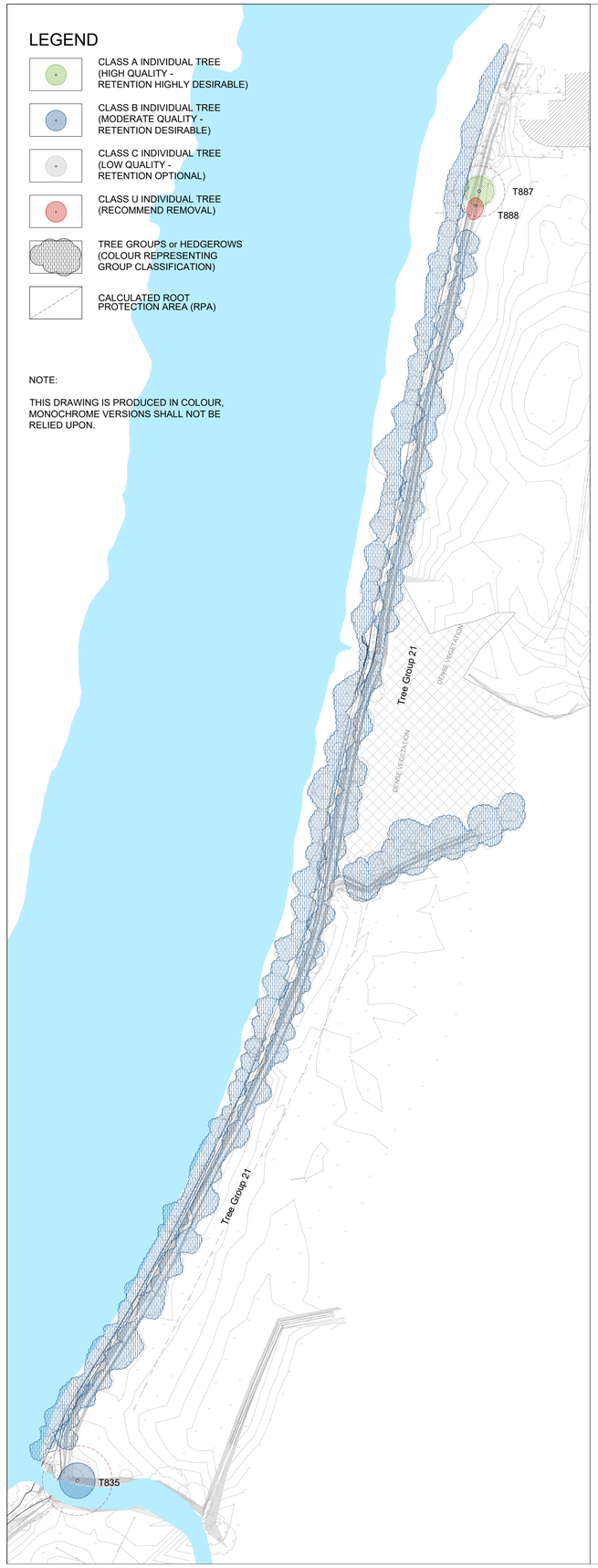
Tag	Species	Height (m)	Crown Spread (m) N/S/E/W	Girth (mm)@ 1.5m	RPA circle radius (m)	Lowest branch (m) & direction of growth	Life Stage	Estimated remaining contribution (years)	Physiological Condition	Structural Condition	Preliminary management recommendations	Category of retention + sub-category	Notes
873	Acer platanoides	8	4/4/4/4	360	4.32	2m all	MA	40+	Good	Good		B1	
874	Acer platanoides	8	4/4/4/4	470	5.64	2m all	MA	40+	Good	Good		B1	
875	Acer platanoides	7	4/4/4/4	370	4.44	2m all	MA	40+	Good	Good		B1	
876	Tilia cordata	7	3/3/3/3	340	4.08	2m all	Y	40+	Good	Good		B1	
877	Betula pendula	6	4/4/4/4	180x7	5.72	0m all	MA	40+	Good	Good		B1	
878	Quercus robur	5	3/3/3/3	180x2	3.05	0m all	Y	40+	Good	Fair		B1	prune compression bole
879	Fraxinus exclesior	7	2/2/2/2	200	2.40	2m all	Y	10<	Poor	Fair		C1	ash dieback
880	Aesculus hippocastanum	5	2/2/2/2	220	2.64	2m all	Y	40+	Good	Good		B1	
881	Quercus robur	7	3/3/3/3	290	3.48	2m all	Y	40+	Good	Good		B1	
882	Fraxinus exclesior	8	4/4/4/4	420	5.04	2m all	MA	10<	Fair	Fair		C1	Ash dieback
883	Quercus robur	7	3/3/3/3	250	3.00	0m all	Y	40+	Good	Good		B1	crown raise
884	Quercus robur	8	4/4/4/4	350	4.20	2m all	Y	40+	Good	Good		B1	
885	Fraxinus exclesior	7	3/3/3/3	350	4.20	2m all	MA	10<	Poor	Fair		C1	Ash dieback
886	Aesculus hippocastanum	6	3/3/3/3	340	4.08	2m all	Y	40+	Good	Good		B1	
887	Quercus robur	17	6/6/6/6	900	10.80	4m all	MA	40+	Good	Fair	Remove Ivy	A1	
888	Fraxinus exclesior	15	3/6/3/3	500	6.00	6m all	MA	40+	Poor	Poor	Fell	U	basal cavity / ash dieback
TG1	Willow						Y	40+	Good	Fair		C2	
TG2	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG3	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG4	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG5	Willow						Y	40+	Good	Fair		B2	
TG6	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG7	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG8	Willow						MA	40+	Good	Fair		B2	
TG9	Mixed broadleaf						MA	40+	Good	Fair		A2	
TG10	Willow / Mixed broadleaf						MA	40+	Good	Fair		B2	
TG11	Willow						Y	40+	Good	Fair		B2	
TG12	Willow						Y	40+	Good	Fair		B2	
TG13	Willow						Y	40+	Good	Fair		B2	
TG14	Willow						Y	40+	Good	Fair		B2	
TG15	Willow						Y	40+	Good	Fair		B2	
TG16	Willow						Y	40+	Good	Fair		B2	
TG17	Willow						Y	40+	Good	Fair		B2	
TG18	Willow						Y	40+	Good	Fair		B2	
TG19	Willow						Y	40+	Good	Fair		B2	
TG20	Willow						Y	40+	Good	Fair		B2	
TG21	Alder / Willow / Mixed Broadleaf						MA	40+	Good	Fair		B2	
TG22	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG23	Mixed broadleaf						MA	40+	Good	Fair		B2	
TG24	Mixed broadleaf						MA	20+	Good	Fair		B2	

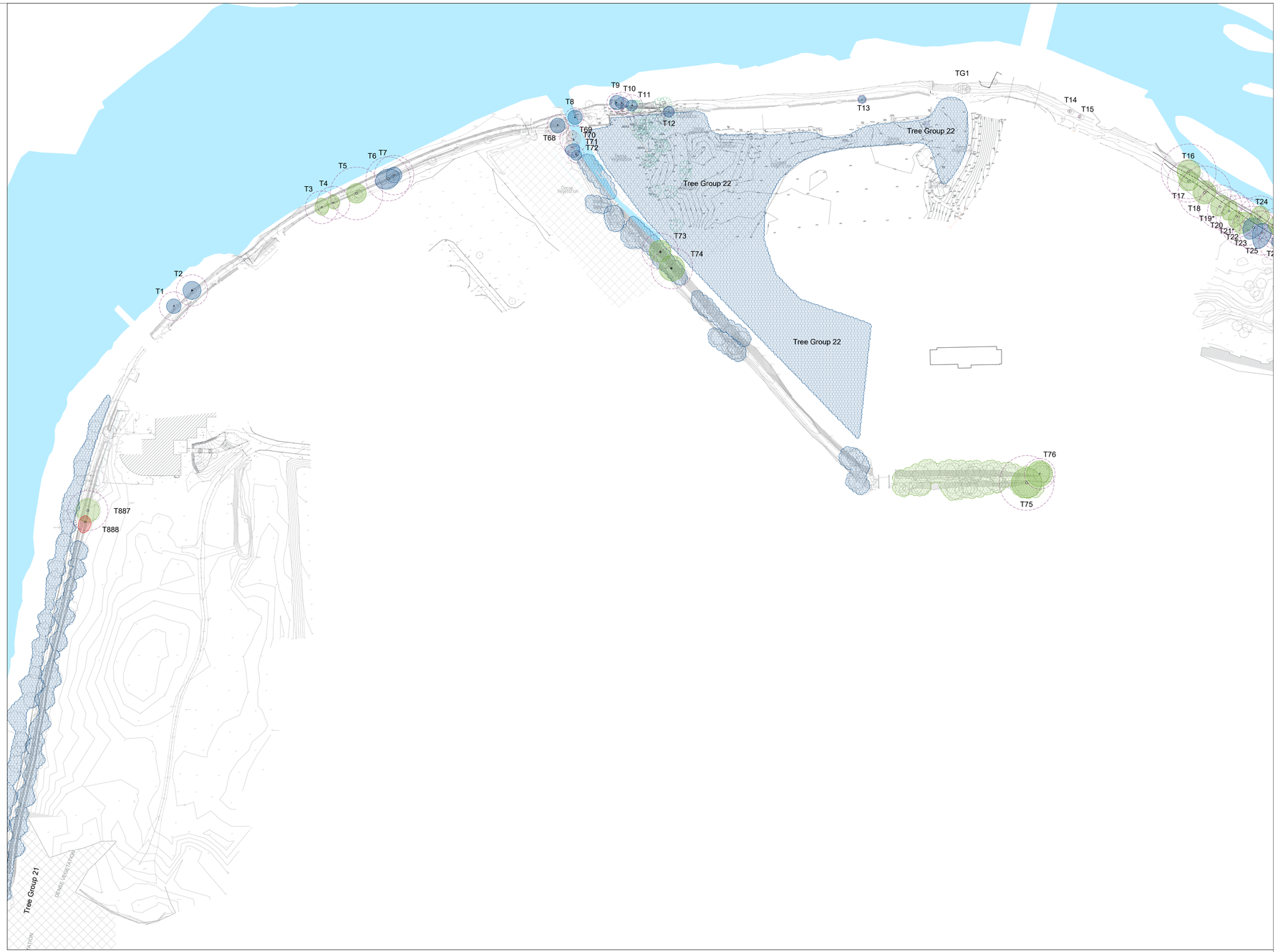
LEGEND

- CLASS A INDIVIDUAL TREE (HIGH QUALITY - RETENTION HIGHLY DESIRABLE)
- CLASS B INDIVIDUAL TREE (MODERATE QUALITY - RETENTION DESIRABLE)
- CLASS C INDIVIDUAL TREE (LOW QUALITY - RETENTION OPTIONAL)
- CLASS U INDIVIDUAL TREE (RECOMMEND REMOVAL)
- TREE GROUPS or HEDGEROWS (COLOUR REPRESENTING GROUP CLASSIFICATION)
- CALCULATED ROOT PROTECTION AREA (RPA)

NOTE:

THIS DRAWING IS PRODUCED IN COLOUR, MONOCHROME VERSIONS SHALL NOT BE RELIED UPON.





REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS

LAND PLANNING & DESIGN

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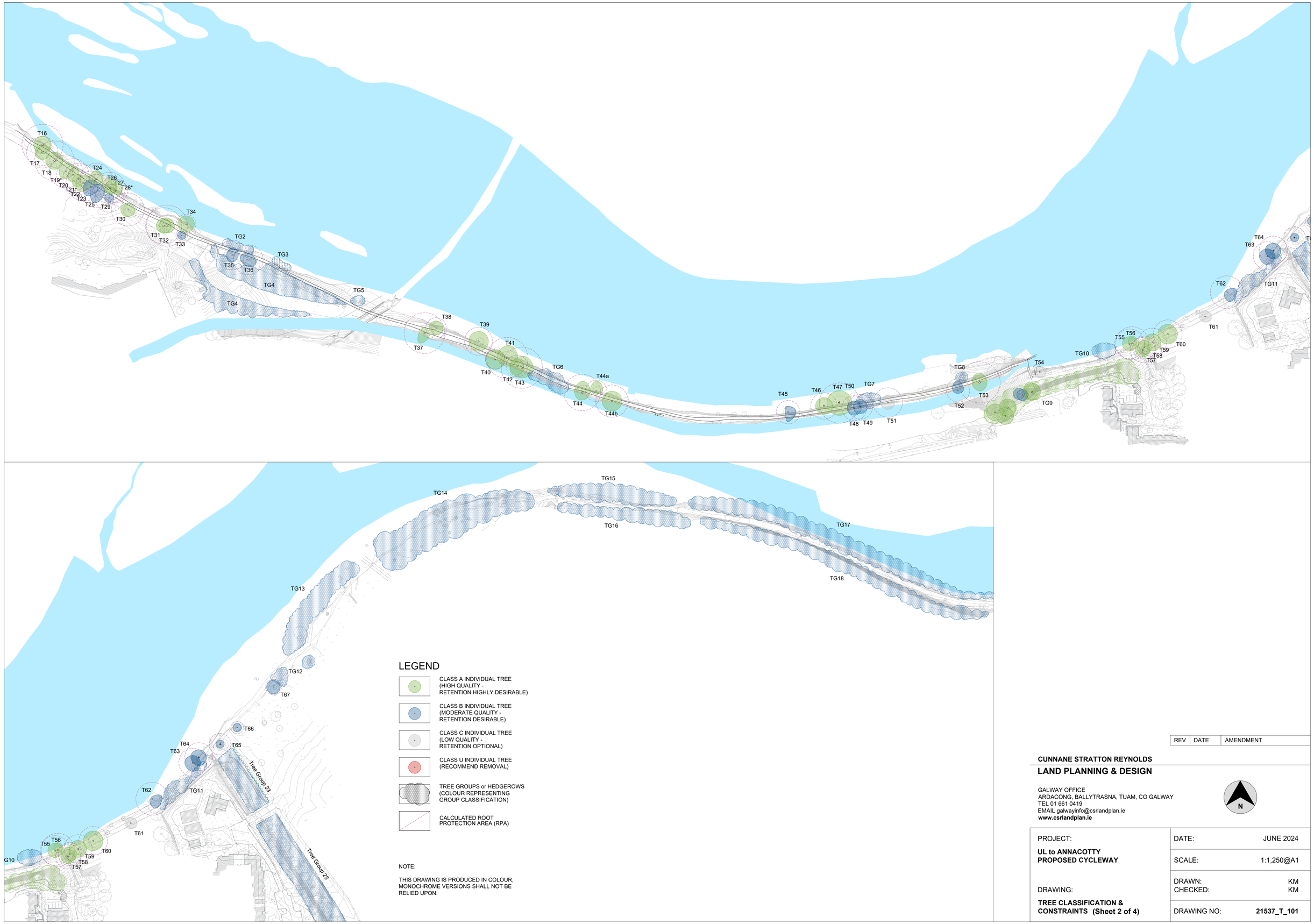
PROJECT: **UL to ANNACOTTY PROPOSED CYCLEWAY**	DATE: JUNE 2024
	SCALE: 1:1,250@A1
DRAWING: **TREE CLASSIFICATION & CONSTRAINTS (Sheet 1 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_101**



LEGEND

- CLASS A INDIVIDUAL TREE (HIGH QUALITY - RETENTION HIGHLY DESIRABLE)
- CLASS B INDIVIDUAL TREE (MODERATE QUALITY - RETENTION DESIRABLE)
- CLASS C INDIVIDUAL TREE (LOW QUALITY - RETENTION OPTIONAL)
- CLASS U INDIVIDUAL TREE (RECOMMEND REMOVAL)
- TREE GROUPS or HEDGEROWS (COLOUR REPRESENTING GROUP CLASSIFICATION)
- CALCULATED ROOT PROTECTION AREA (RPA)

NOTE:

THIS DRAWING IS PRODUCED IN COLOUR, MONOCHROME VERSIONS SHALL NOT BE RELIED UPON.

REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS

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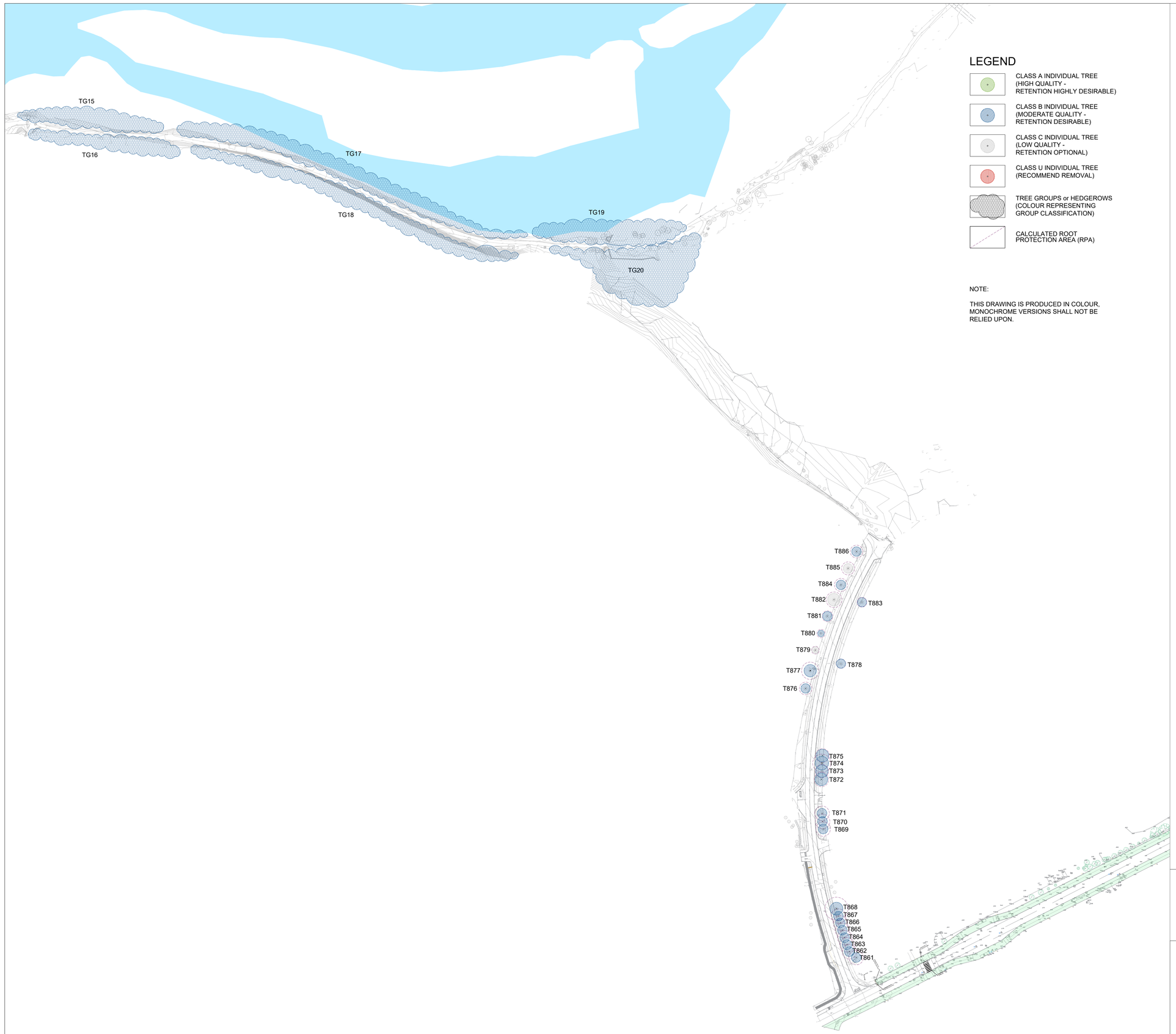
PROJECT: **UL to ANNACOTTY PROPOSED CYCLEWAY**	DATE: JUNE 2024
	SCALE: 1:1,250@A1
DRAWING: **TREE CLASSIFICATION & CONSTRAINTS (Sheet 2 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_101**



LEGEND

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- TREE GROUPS or HEDGEROWS (COLOUR REPRESENTING GROUP CLASSIFICATION)
- CALCULATED ROOT PROTECTION AREA (RPA)

NOTE:

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CUNNANE STRATTON REYNOLDS

LAND PLANNING & DESIGN

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PROJECT: **UL to ANNACOTTY PROPOSED CYCLEWAY**	DATE: JUNE 2024
	SCALE: 1:1,250@A1
	DRAWN: KM CHECKED: KM
DRAWING: **TREE CLASSIFICATION & CONSTRAINTS (Sheet 3 of 4)**	DRAWING NO: **21537_T_101**

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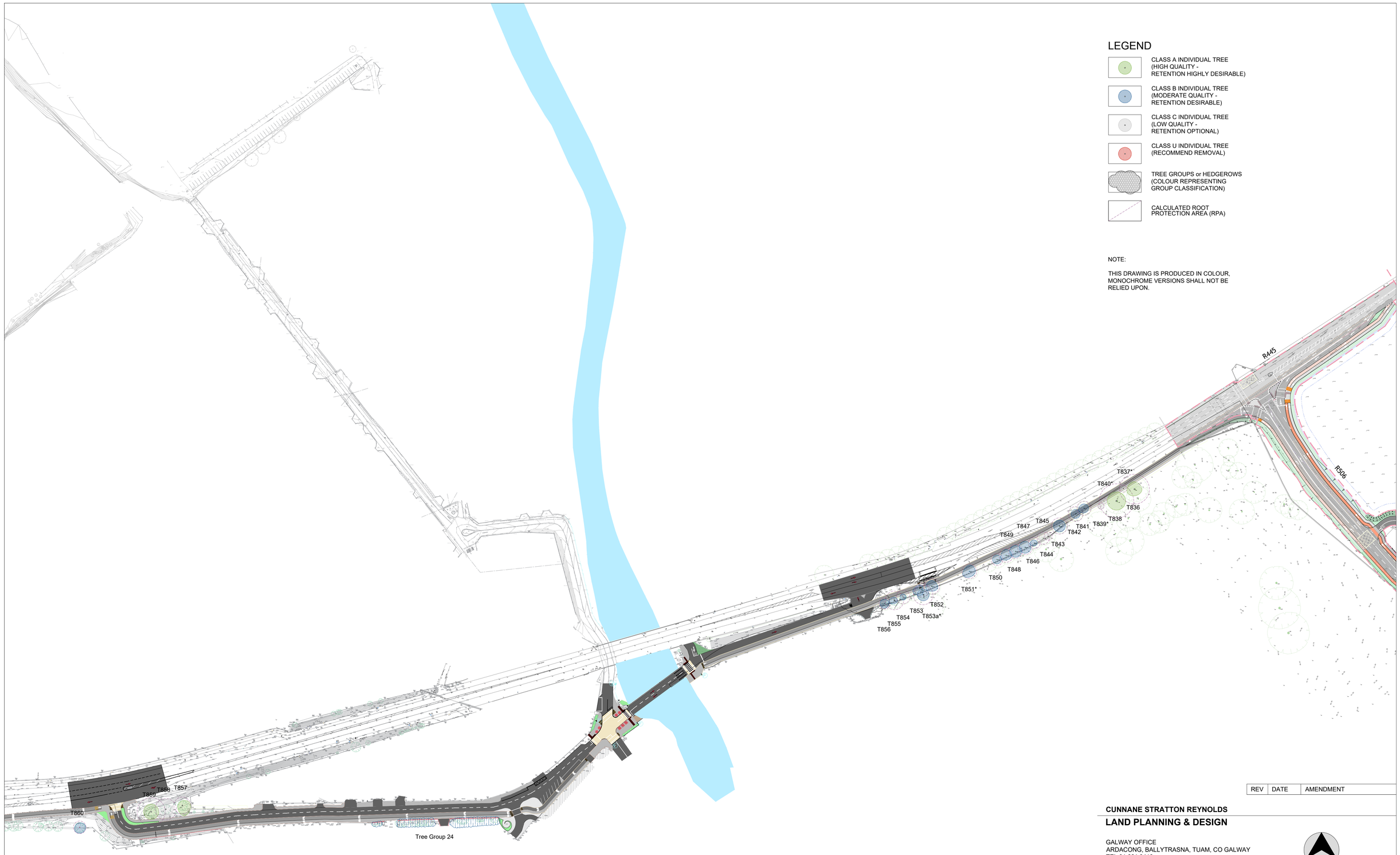

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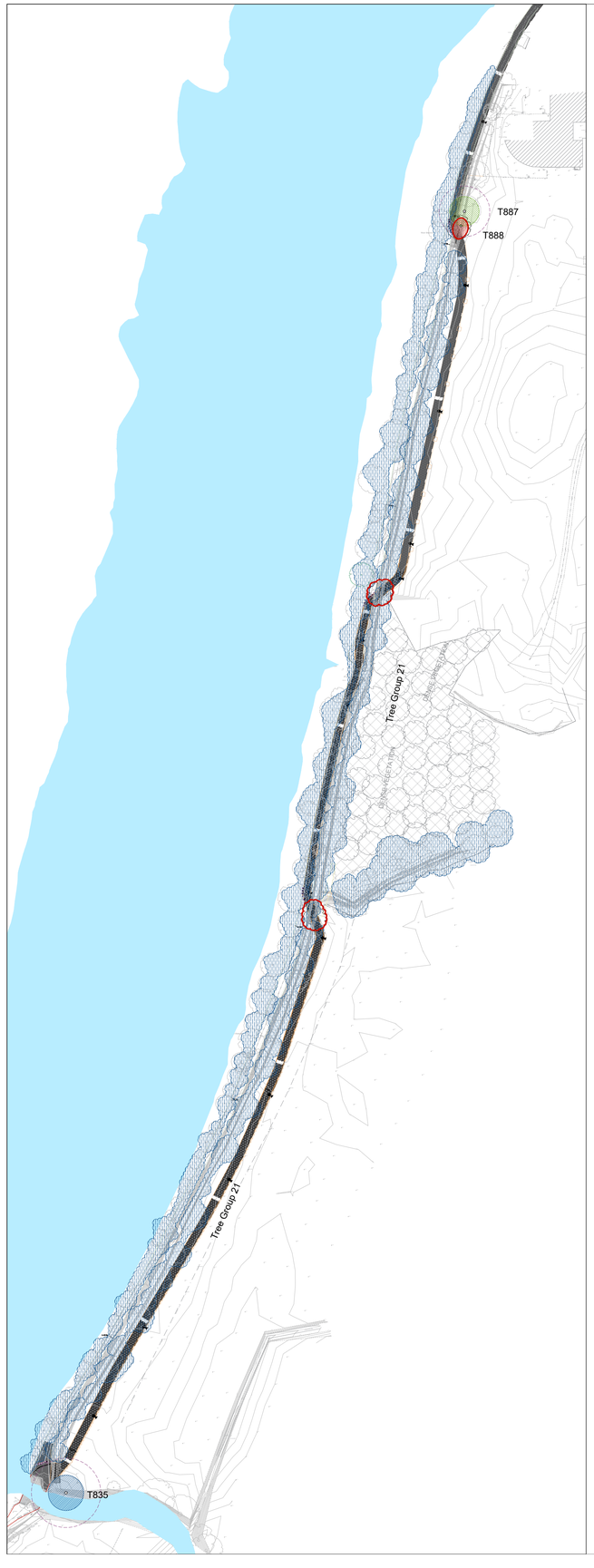

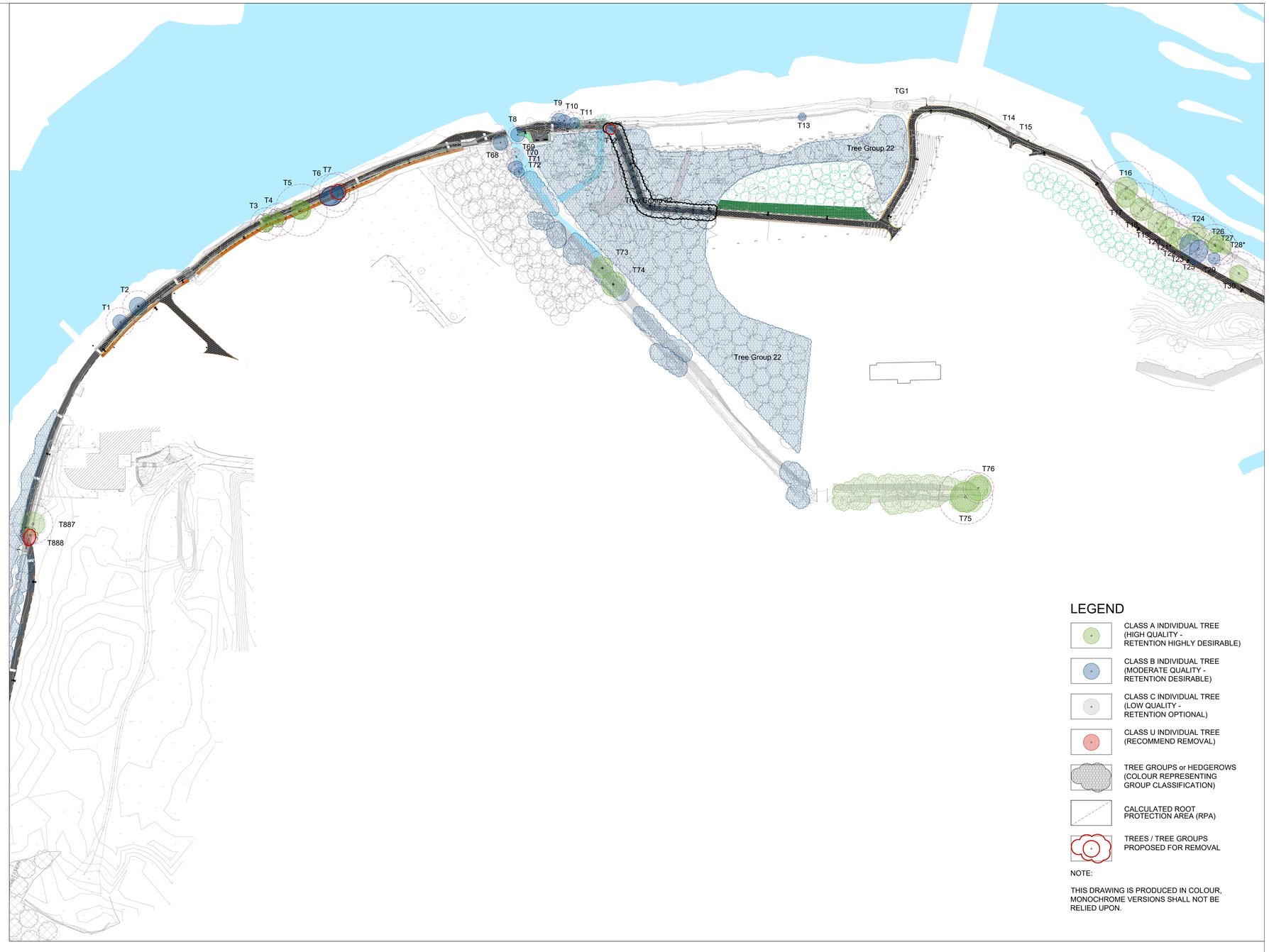

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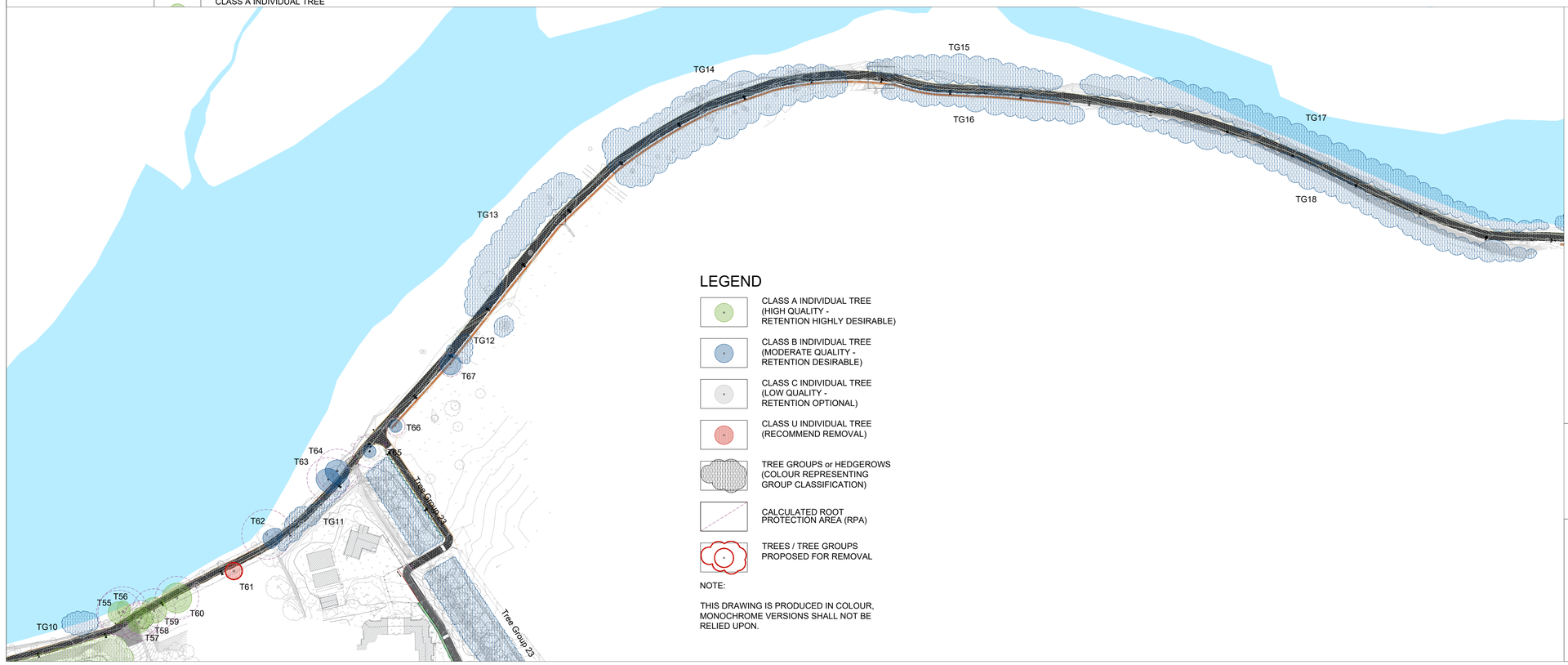
	SCALE: 1:1,250@A1
DRAWING: **ARBORICULTURAL IMPACT ASSESSMENT (Sheet 1 of 4)**	DRAWN: KM CHECKED: KM
	DRAWING NO: **21537_T_101**

LEGEND

CLASS A INDIVIDUAL TREE



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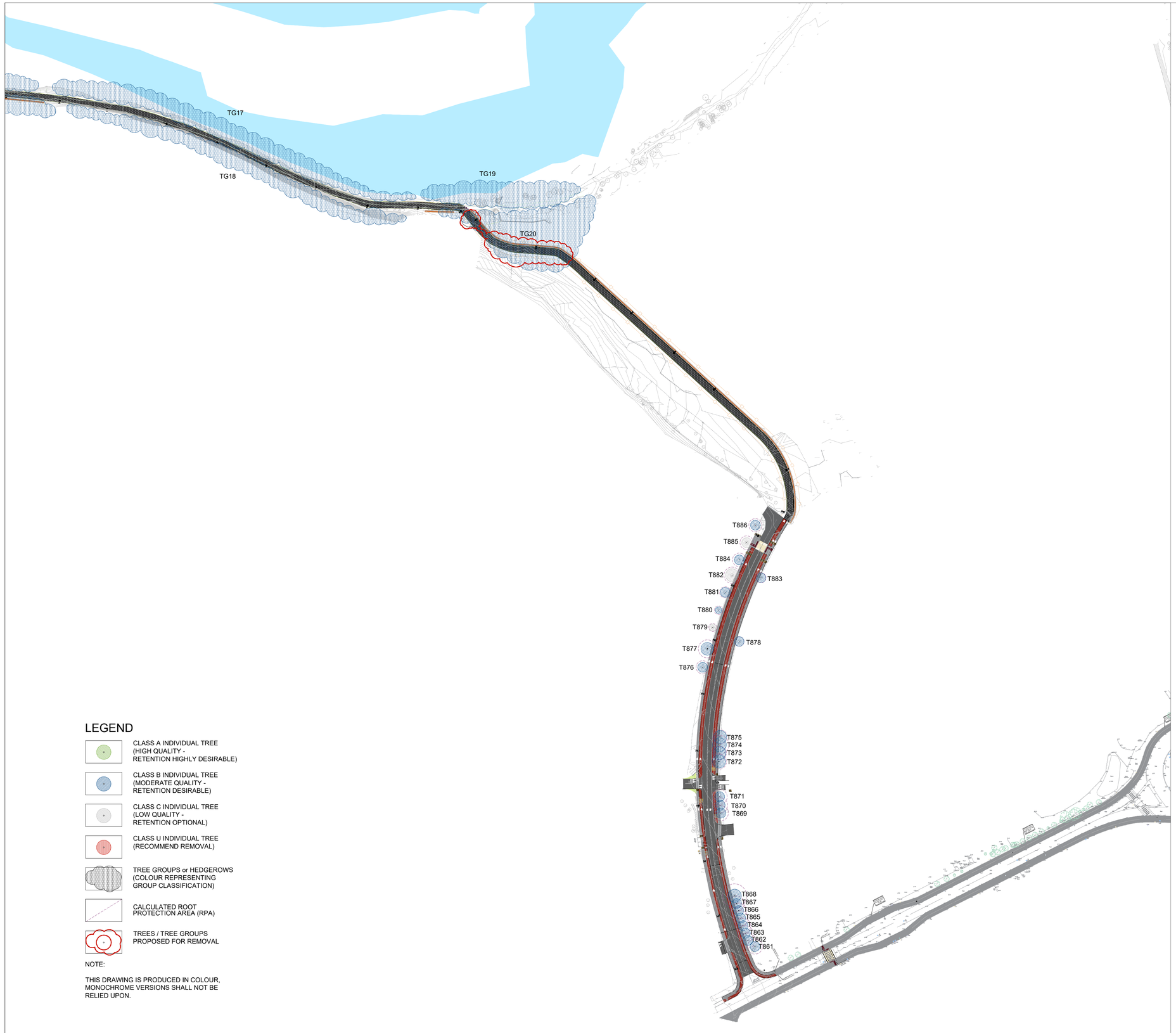
DRAWING: **ARBORICULTURAL IMPACT ASSESSMENT (Sheet 2 of 4)**	DRAWING NO: **21537_T_101**



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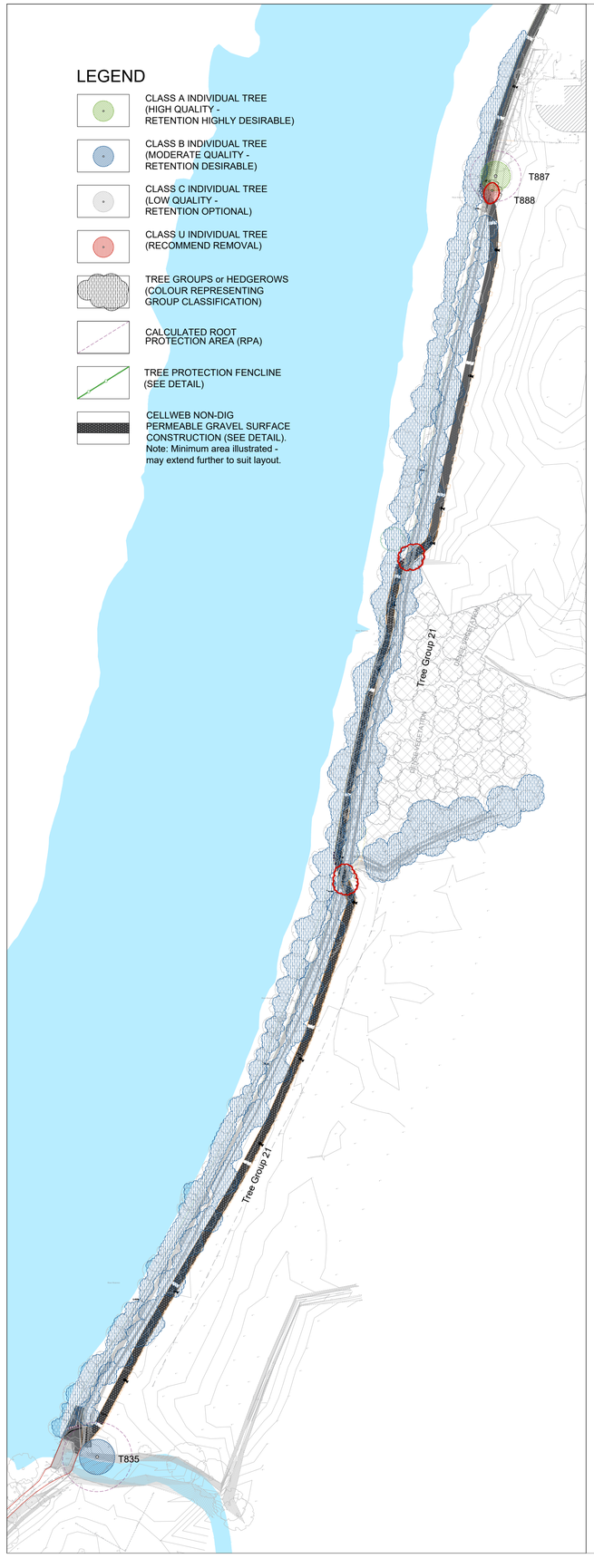

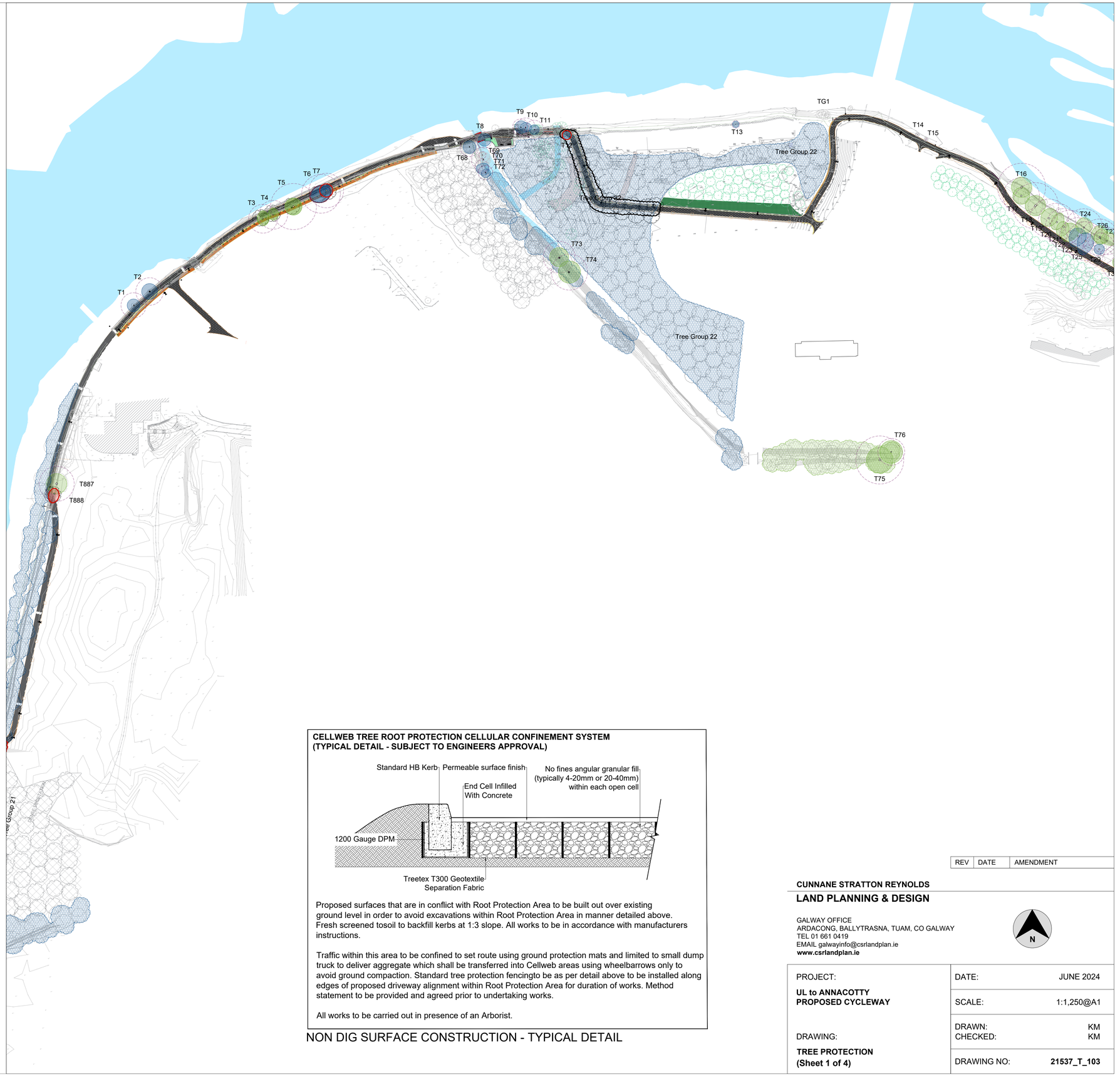

CELLWEB TREE ROOT PROTECTION CELLULAR CONFINEMENT SYSTEM (TYPICAL DETAIL - SUBJECT TO ENGINEERS APPROVAL)

Proposed surfaces that are in conflict with Root Protection Area to be built out over existing ground level in order to avoid excavations within Root Protection Area in manner detailed above. Fresh screened tosoil to backfill kerbs at 1:3 slope. All works to be in accordance with manufacturers instructions.

Traffic within this area to be confined to set route using ground protection mats and limited to small dump truck to deliver aggregate which shall be transferred into Cellweb areas using wheelbarrows only to avoid ground compaction. Standard tree protection fencingto be as per detail above to be installed along edges of proposed driveway alignment within Root Protection Area for duration of works. Method statement to be provided and agreed prior to undertaking works.

All works to be carried out in presence of an Arborist.

NON DIG SURFACE CONSTRUCTION - TYPICAL DETAIL

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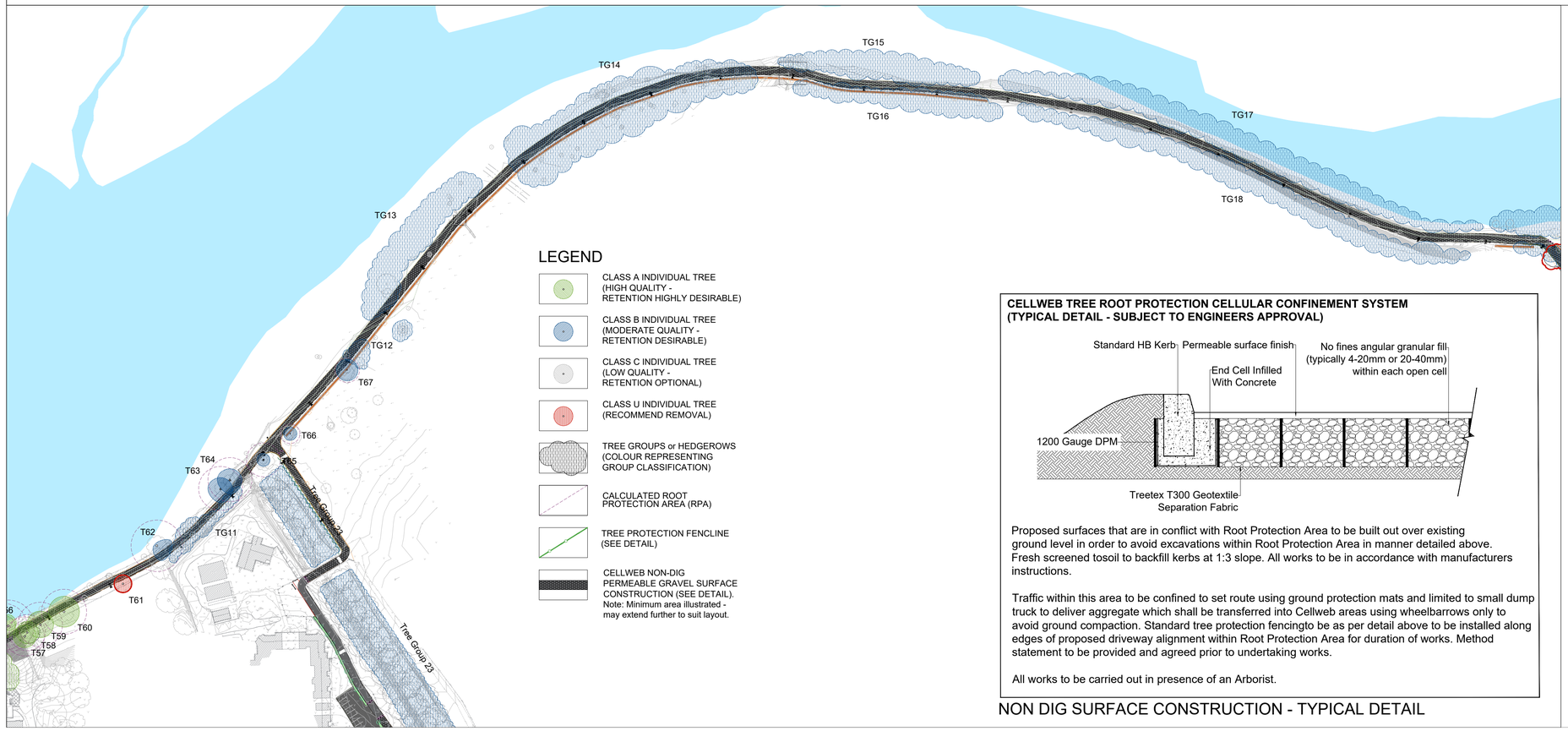

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NON DIG SURFACE CONSTRUCTION - TYPICAL DETAIL

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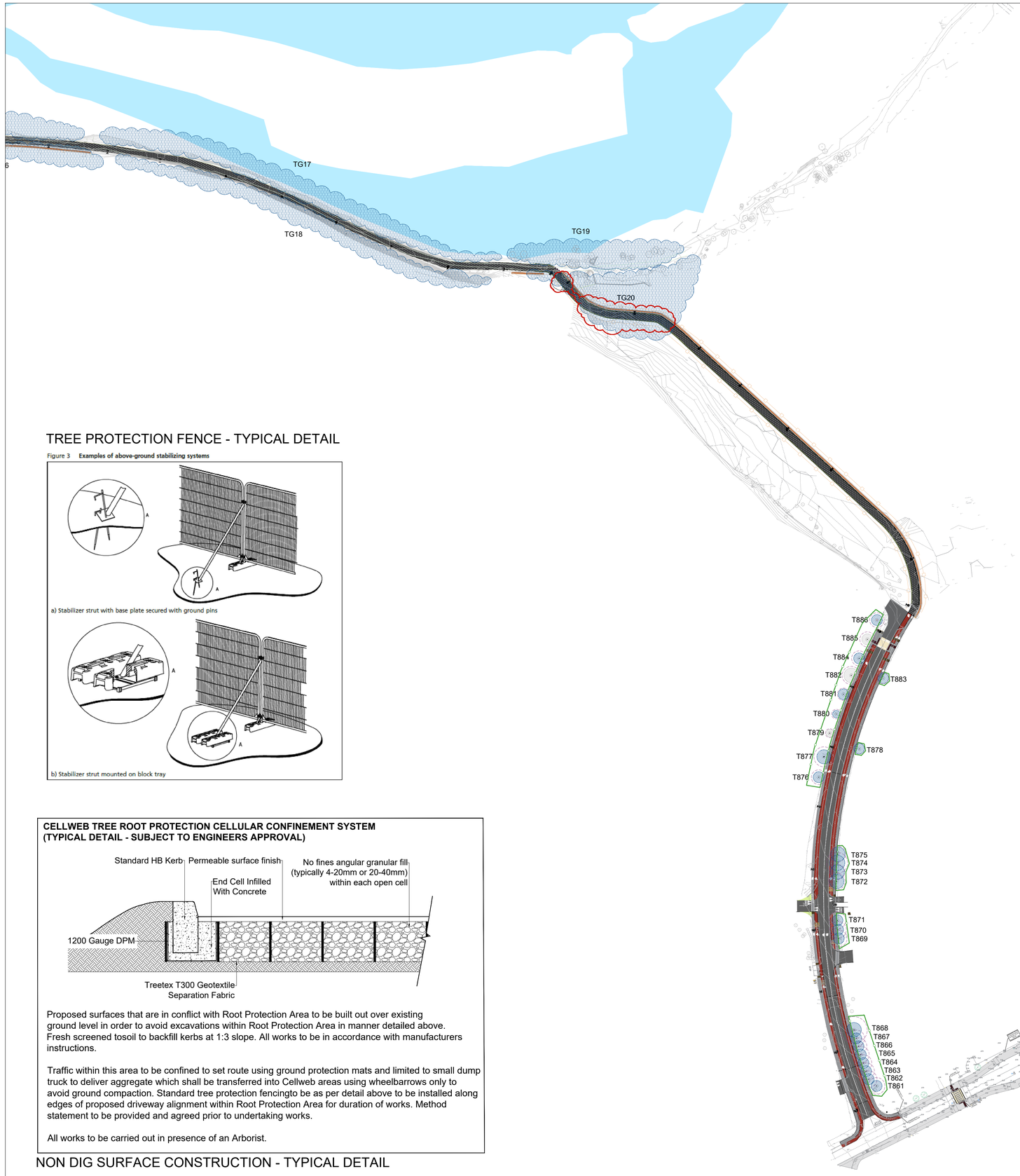

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TREE PROTECTION FENCE - TYPICAL DETAIL

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

CELLWEB TREE ROOT PROTECTION CELLULAR CONFINEMENT SYSTEM (TYPICAL DETAIL - SUBJECT TO ENGINEERS APPROVAL)

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TREE PROTECTION FENCE - TYPICAL DETAIL

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

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