

ENVIRONMENTAL STATEMENT (VOLUME III)

Appendix 9-11 Arboricultural Impact Assessment (Clean)

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 5(2)(a)

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1. INTRODUCTION

1.1. BACKGROUND

- 1.1.1. The focus of this report is the Development Consent Order (DCO) Proposed Development. The DCO Proposed Development includes Ince Above Ground Installation (AGI) to Stanlow AGI Pipeline, Stanlow AGI to Flint AGI Pipeline, Flint AGI to Flint Connection Pipeline, four AGIs, six Block Valve Stations (BVS), other above ground infrastructure including Cathodic Protection (CP), connections infrastructure including power utilities, and temporary ancillary works including compounds and temporary access tracks.
- 1.1.2. Open-cut trenching methods will be used for the majority of the Newbuild Carbon Dioxide Pipeline. For complex crossings to avoid disruption to utilities, major highways, railways, watercourses, particular environmental sensitivities, e.g., ancient woodland and veteran trees, trenchless construction methods will be used.
- 1.1.3. A full description of the DCO Proposed Development is provided in **Chapter 3 – Description of the DCO Proposed Development (Volume II)** and subsequent addenda.

1.2. SCOPE OF REPORT

- 1.2.1. The purpose of this report is to identify all trees which have the potential to be affected by the DCO Proposed Development, assess the preliminary impact of the DCO Proposed Development on those trees, and to recommend protection measures as are necessary to ensure the health of retained trees.
- 1.2.2. The scope and level of detail included within this report is commensurate with that required for the adequate consideration of arboricultural features as part of the DCO Proposed Development.
- 1.2.3. Information provided complies with the requirements of British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations and includes reference to the following:
- desk study search for baseline information on arboricultural statutory designations;
 - results of a BS 5837 walkover survey;
 - an Arboricultural Impact Assessment (AIA); and,
 - an Outline Arboricultural Method Statement (AMS).
- 1.2.4. Impacts should be defined as arboricultural removals and matters that need to be addressed within an AMS. As explained further in **Section 1.3** given the Preliminary Design stage, the impacts assessed are preliminary in nature.
- 1.2.5. This report presents the findings based on the seven sections of the DCO Proposed Development, as described in **Chapter 3 – Description of the DCO**

Proposed Development (Volume II) and Sections 1-6 are shown on the Preliminary Constraints and Impacts Plan (**Annex D**) and Section 7 is shown fully on the Tree Removal and Protection Plan (Section 7 of DCO Proposed Development) (**Annex E**).

1.2.6. This **Revision B** of **Appendix 9-11 Arboricultural Impact Assessment** replaces and supersedes **Revision A (APP-115 to APP-116)**. **Appendix 9.11 (Revision B)** provides an updated arboricultural impact assessment in response to the following proposed design changes as outlined in **Table i.i** of **Chapter I** of the ES Addendum:

- Relocation of Cornist Lane BVS (PS01).
- Removal of slurry tank at New Bridge Farm and construct pipeline outside of 15m ancient woodland buffer (PS02a).
- Retain slurry tank at existing location at New Bridge Farm and the pipeline constructed within the 15m ancient woodland buffer (PS02b).
- Avoidance of Veteran trees around Backford Brook (PS04).

1.3. LIMITATIONS AND ASSUMPTIONS

- 1.3.1. TPOs may be made whenever a local planning authority deems it appropriate with only those persons interested in the land served with a copy of the Order. Because of this, any reference to the presence of TPOs is only valid on the date at which the desk study search was undertaken.
- 1.3.2. Trees are influenced by a variety of environmental variables and their health and condition can rapidly change. Because of this, any recommendations made within this report are valid for a period of 24 months from the date of survey, when any site conditions change or pruning or other works unspecified in the report are carried out to, or affecting, the subject trees, whichever is the sooner.
- 1.3.3. This report does not constitute a health and safety survey. Where concerns for health and safety from trees exist then necessary and appropriate tree inspections should be carried out.
- 1.3.4. Owing to the Preliminary Design Stage, the assessment approach follows a reasonable worst-case basis, which is further discussed in Section 2.
- 1.3.5. Where topographical data wasn't available, the position of arboricultural features has been estimated using aerial photography and on-site GPS. The position and extent of these features should be regarded as approximate only.
- 1.3.6. Due to design development and access restrictions some areas were unable to be surveyed as part of this assessment and so have not been assessed. These areas are shown on the Preliminary Constraints and Impacts Plan as 'Areas Not Surveyed'. These areas should be surveyed and assessed at the detailed design stage.

1.4. RELEVANT LEGISLATION, POLICY AND GUIDANCE

- 1.4.1. This report has been compiled with reference to the following legislation, policy and guidance.

LEGISLATION

Town and Country Planning Act 1990

- 1.4.2. The Town and Country Planning Act (as amended by the Planning Act 2008) sets out the general duties of planning authorities in relation to tree preservation and planting of trees. This Act provides the law in which TPOs and trees in conservation areas are protected.

Town and Country Planning (Tree Preservation) (England) Regulations 2012

- 1.4.3. These Regulations, which apply in relation to England only, substantially revoke and replace the Town and Country Planning (Trees) Regulations 1999. They provide further statutory considerations in relation to TPOs and trees in conservation areas.

Town and Country Planning (Trees) (Amendment) (Wales) Regulations 2017

- 1.4.4. These Regulations, which apply in relation to Wales only, amend the Town and Country Planning (Trees) Regulations 1999. They provide further statutory considerations in relation to TPOs and trees in conservation areas.

NATIONAL POLICY

Planning Policy Wales (February 2021)

- 1.4.5. Planning Policy Wales sets a strong presumption against removal of trees, woodlands and hedgerows as they should be protected for their wildlife habitat and landscape character. It also states ancient woodland and individual ancient and veteran trees are irreplaceable habitat and should be afforded protection from development unless there are significant and clearly defined public benefits.

National Planning Policy Framework (NPPF) (revised 20 July 2021)

- 1.4.6. The NPPF sets a precedent that development should be refused if it causes the loss or deterioration of veteran and ancient trees and ancient woodland as these are considered 'irreplaceable habitats' unless there are exceptional reasons and appropriate compensation is given.

LOCAL POLICY

Flintshire County Council, Local Development Plan (2015-2030) (24 January 2023)¹

- 1.4.7. The DCO Proposed Development has taken cognisance of Flintshire County Council's Local Development Plan in particular Policy EN7 Development Affecting Trees, Woodlands and Hedgerows. It is recognised that proposals that will result in significant loss of, or harm to, trees, woodlands or hedgerows of biodiversity, historic, and amenity value will not be permitted, that development should maximise retention of these features, and where loss is expected it should be mitigated by planting that results in net biodiversity gain (**Ref. 1**).

Flintshire County Council, Supplementary Planning Guidance Note No.04 Trees and Development (17 January 2017)²

- 1.4.8. The DCO Proposed Development recognises the additional guidance related to tree assessment and protection detailed within Flintshire Council Council's Supplementary Planning Guidance Note No.4 Trees and Development (**Ref. 2**). The DCO Proposed Development specifically recognises that large developments are required to have a comprehensive tree survey conducted in accordance with BS 5837.

Cheshire West and Cheshire Council, Local Plan (Part Two) Land Allocations and Detailed Policies (adopted 18 July 2019)³

- 1.4.9. The DCO Proposed Development has also taken cognisance of the Cheshire West and Cheshire Council's Local Plan in particular Policy DM 45 – Trees, woodland and hedgerows. This policy recognises the need to conserve and enhance existing trees, woodland, orchards and hedgerows and where not possible development should include replacement trees. Particular attention should be given to veteran trees and ancient woodland as they are considered irreplaceable habitat (**Ref. 3**).

GUIDANCE

British Standards Institute. BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. London: BSI

- 1.4.10. The British Standard BS5837 gives recommendations on guidance on the relationship between trees and design, demolition and construction processes. It sets out principles and procedures to be applied to achieve harmonious and

sustainable relationship between trees and development and is applicable whether or not planning permission is required (**Ref. 4**).

1.5.

ABBREVIATIONS OF TERMS USED

Table 1-1 List of abbreviations used within this report

Acronym	Definition
AIA	Arboricultural Impact Assessment
AMS	Arboricultural Method Statement - A methodology for the implementation of any aspect of development which is within the root protection area, or has the capacity to adversely affect, any retained tree.
BS 5837	British Standard BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' - This standard 'gives recommendations and guidance on the relationship between trees and the design, demolition and construction process. It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures'.
CEZ	Construction Exclusion Zone - An area within which all site clearance and construction activities, access and storage of materials are prohibited.
RPA	Root Protection Area - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's vitality.
TPO	Tree Preservation Orders - An order made by the Local Planning Authority to protect specific trees, groups of trees or woodlands in the interests of amenity.

2. ARBORICULTURAL METHODOLOGY

2.1. STUDY AREA

- 2.1.1. The Study Area comprises the Newbuild Infrastructure Boundary plus a buffer of up to 15m. The purpose of the 15m buffer is to ensure compliance with BS 5837 which recommends that all arboricultural features whose Root Protection Areas (RPAs) may be impacted are identified, surveyed and included within the assessment.

2.2. BASELINE DATA COLLECTION

- 2.2.1. Baseline data collection has been undertaken with reference to BS 5837 and has been undertaken using the following data sources:

- an arboricultural desk study; and
- a walkover survey of noteworthy arboricultural features within the Study Area.

2.3. DESK STUDY

- 2.3.1. A desk study was undertaken on 07 July 2022 as a means of identifying statutory and non-statutory arboricultural constraints within the Study Area. Details of the desktop study method are set out in **Annex A**.

2.4. WALKOVER SURVEY

- 2.4.1. A walkover survey was undertaken between April and May 2022 to identify arboricultural features within the Sections 1-6 Study Area. A walkover survey for Section 7 was undertaken in March 2022. To support the proposed design changes associated with the ES Addendum, additional surveys were undertaken in December 2022; the data of which has been used to update this report.
- 2.4.2. The surveys were undertaken to comply with BS 5837 and details of the methods used are presented in **Annex A**.

2.5. ASSESSMENT METHODOLOGY

- 2.5.1. Owing to the Preliminary Design Stage, the assessment approach follows a reasonable worst-case basis. For reasons of buildability and the large number of tree features, an automatic script has been used to provide a Red Amber Green (RAG) assessment approach for trees. A script has been designed within a Geographical Information System (GIS) process where all trees within an indicative 32m buffer of the Carbon Dioxide Pipeline have been automatically assessed as 'removed' (Red). Trees outside this area but within the Newbuild Infrastructure Boundary have been assessed as 'at risk of removal but aiming to retain' (ARAtR) (Amber). For the purpose of this assessment, these ARAtR

trees are not considered to require removal however this assumes appropriate mitigation will be adhered to and specified in a site-specific Arboricultural Method Statement (AMS) and shown on a Tree Protection Plan (TPP). All trees outside the Newbuild Infrastructure Boundary within the study area have been assessed as 'retained with protection measures' (RwPM) (Green). Tree groups which straddle assessment boundaries are assessed using a worst case approach e.g. if a tree group is located between Red and Amber it will be assessed as 'partial removal' (Red).

- 2.5.2. However, some manual adjustment to the script results has been deemed necessary. Trees have been individually assessed where they are located within close proximity to a BVS, in areas of trenchless crossings, or where the tree has been identified as a veteran tree. A veteran tree workshop was undertaken with the client on 17 June 2022 to determine potential impacts on veteran trees and, where feasible, embed mitigation into the design development to allow retention of these important features. Although the automated script of RAG is shown on the Preliminary Constraints and Impacts Plan, where retention has been deemed possible, the RPAs of veteran trees have been manually amended to a hatched green. The assessment boundaries showing results of the RAG assessment are displayed on the Preliminary Constraints and Impacts Plan (as Annex D).
- 2.5.3. The impacts reported for tree features within Section 7, notably at Cornist Lane, Pentre Halkyn and Babell Block Valve Stations (BVS) have also been reported in a separate Arboricultural Impact Assessment concerning the separate TCPA Proposed Development as is described in **Chapter 3 – Description of the DCO Proposed Development (Volume II)**. Because they are isolated sections of work where the flexibility sought for pipeline construction is not applicable, the impact assessment for these features did not follow the above RAG assessment approach but have been assessed on a case-by-case basis, the results of which are displayed on a Tree Removal and Protection Plan (Section 7 of DCO Proposed Development) (Annex E).
- 2.5.4. A 'noteworthy' tree survey was provided for Sections 1-6, focusing on high quality (A grade as determined by BS 5837 and explained in Annex A) and moderate quality (B grade) tree features. According to BS 5837, low quality features (C grade) need not place a significant constraint on development and as such low quality trees have been surveyed by desktop only with limited feature data collected. The details collected by this proportionate methodology is described further in Annex A. Tree survey data for Sections 1-6 is present within a tree survey schedule in Annex B. As trees associated with Section 7 were surveyed as part of the TCPA Proposed Development with a full tree survey being provided, and the results presented in a separate tree survey schedule within Annex C.
- 2.5.5. The indicative RPAs used at this Preliminary Design stage are based on a circle and are shown in the Preliminary Constraints and Impacts Plan at Annex D and the Tree Removal and Protection Plan (Section 7 of DCO Proposed

Development) at Annex E. In line with a noteworthy survey, RPAs are shown on the Preliminary Constraints and Impacts Plan for moderate and high quality features only.

2.6. NEWBUILD INFRASTRUCTURE BOUNDARY DESIGN DEVELOPMENT, IMPACT AVOIDANCE AND EMBEDDED MITIGATION

2.6.1. The following measures are committed to and form part of the design through embedded mitigation. They are included in the **Register of Environmental Actions and Commitments (REAC) (Document reference D.6.5.1)** and will be secured via the Construction Environmental Management Plan (CEMP). Further embedded mitigation in relation to existing hedgerows, trees and woodlands and mitigatory planting is detailed in **Chapter 9 – Biodiversity (Volume II)** and **Chapter 12 – Landscape and Visual (Volume II)**.

- The detailed design alignment of the Newbuild Carbon Dioxide Pipeline will, wherever practicable, be micro-sited to, avoid locally valued landscape features including woodland, hedgerows, and field drains, including root protection zones of existing mature trees (**D-LV-005 of the REAC**);
- Micro-siting techniques will be employed throughout the detailed design of the DCO Proposed Development, including during pre-construction and construction to avoid waterbodies, sensitive habitats, trees (including ancient and veteran trees and trees covered by Tree Preservation Orders and trees within Conservation Areas), hedgerows, etc., as much as practicably possible. Where opportunities exist for routing through existing gaps in hedgerows, scrub and woodlands, avoiding the need to remove vegetation, these will be prioritised (**D-BD-009 of the REAC**);
- Where practicable, areas of woodland and trees within the Newbuild Infrastructure Boundary will be retained and exclusion buffers clearly demarcated (where woodland does not encroach into the 32 m construction corridor). Identified woodlands include (shown on Figure 9.11.1 within Appendix 9.11 – Arboricultural Impact Assessment Report, Volume III), but are not limited to:
 - G978
 - G552
 - G328
 - G109

The extent of demarcation of retained woodlands/trees will be driven by assessed Root Protection Areas (RPA) of retained trees. Where encroachment within RPAs is required to facilitate construction, ECoW and arboriculturist advice will be sought to discuss sensitive working methods in order to protect retained trees. (**D-BD-010 of the REAC**)

- Where trees (stems) sit outside of the Newbuild Infrastructure Boundary, the Root Protection Areas (RPAs) of these trees will be protected and retained.

Protective measures will be detailed within a site-specific Arboricultural Method Statement (AMS) and shown on a Tree Protection Plan (TPP) and where necessary, working methods will be monitored by a suitable Arboricultural Clerk of Works (ACoW). The Construction Contractor will prepare the AMS following detailed design and will ensure works within root protection areas will be appropriately supervised in line with BS5837:2012 **(D-LV-014 of the REAC)**.

- Hedgerows, trees and woodland which are located between trenchless crossing entry/exit pits (i.e. that the Newbuild Carbon Dioxide Pipeline will cross via trenchless method) will be protected and retained, unless otherwise required for access **(D-LV-028 of the REAC)**;
- Construction works will utilise existing accesses wherever practicable. Where new temporary construction accesses are required in existing hedgerows, the width to be lost will be kept to the minimum practicable and will not exceed 15m. Hedgerows, trees and woodland outside of this 15m will be protected and retained. Protective measures will be detailed within a site-specific Arboricultural Method Statement (AMS) and shown on a Tree Protection Plan (TPP) and where necessary, working methods will be monitored by a suitable Arboricultural Clerk of Works (ACoW) **(D-LV-030 of the REAC)**.;
- The detailed design will seek to minimise the loss of tree groups G576 and G578 which are anticipated to be impacted to make way for a temporary access track **(D-LV-030 of the REAC)**.
- Ancient Woodland areas will be protected with a minimum 15m works exclusion zone. Where environmental mitigation works, drainage works or in areas restricted by existing infrastructure, tree protection measures will be detailed within a site-specific Arboricultural Method Statement (AMS) and shown on a Tree Protection Plan (TPP). Where necessary, working methods will be monitored by a suitable Arboricultural Clerk of Works (ACoW). The Construction Contractor will prepare the AMS approved as part of the CEMP. **(D-LV-015 of the REAC)**.

2.6.2. Through the employment of embedded mitigation including some of those listed above, the vast majority of veteran trees have been assessed as retained with protection measures (32 out of 35 features) with three features assessed as at risk of removal but aiming to retain. The Proposed Development will seek to protect and retain all veteran trees at the construction phase.

3. ARBORICULTURAL SURVEY FINDINGS

3.1. ARBORICULTURAL FEATURES

Section 1

- 3.1.1. Section 1 is located entirely within the Cheshire West and Chester Council (CWACC) Local Authority boundary.
- 3.1.2. There are no arboricultural features protected by TPOs or conservation areas. The desk study also found no records of ancient or veteran trees nor ancient woodland.
- 3.1.3. The Study Area in Section 1 consists predominantly of arable agricultural land to the south and east of Elton Green. Part of the Study Area in Section 1 is located within industrial land where access was unavailable for the surveys, although vegetation cover as apparent on aerial photography appears to be low. Arboricultural features are predominantly associated with agricultural field boundaries with some landscape screening present around the M56 Junction services and adjacent to road infrastructure.
- 3.1.4. A total of 123 arboricultural features, consisting of 78 individual trees and 45 groups of trees, were surveyed within the Study Area in Section 1.
- 3.1.5. A summary of tree quality categories is in **Table 3-1**.

Table 3-1 Summary of BS 5837 tree quality categories for Section 1

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	1	0	1
Category B	Moderate	28	14	42
Category C	Low	40	31	71
Category U	Very Low	9	0	9
Total	-	78	45	123

Section 2

- 3.1.6. Section 2 is located entirely within the CWACC's boundary.
- 3.1.7. There are no arboricultural features protected by TPOs within the Study Area in Section 2. The desk study also found no records of ancient or veteran trees nor ancient woodland.
- 3.1.8. The Study Area in Section 2 intersects the Chester Canal Conservation Area (West) at two points and at the most westerly point the G868 survey feature is located within this conservation area boundary. Two additional conservation

areas (Thornton le Moors Conservation Area and Picton Conservation Area) are located fully outside of the Newbuild Infrastructure Boundary.

- 3.1.9. The Study Area in Section 2 consists predominantly of arable agricultural land located between Thornton-le-Moore and Liverpool Road near Backford. Arboricultural features are predominantly associated with agricultural field boundaries.
- 3.1.10. A total of 276 arboricultural features, consisting of 191 individual trees and 85 groups of trees, were surveyed within the Study Area in Section 2.
- 3.1.11. A summary of tree quality categories is in **Table 3-2**.

Table 3-2 Summary of BS5837 tree quality categories for Section 2

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	41	14	55
Category B	Moderate	55	27	82
Category C	Low	88	43	131
Category U	Very Low	7	1	8
Total	-	191	85	276

- 3.1.12. There are 11 surveyed features that have been assessed as veterans and Category A within the Study Area in Section 2. These are predominantly ash, with one oak and one hawthorn.

Section 3

- 3.1.13. The Study Area in Section 3 is located predominantly within the CWACC’s boundary, but part of the Section intersects FCC’s Boundary too. This means Section 3 is located within both England and Wales.
- 3.1.14. One conservation area ‘Chester Canal Conservation Area (West)’ is located within the Study Area in Section 3 however is fully located outside of the Newbuild Infrastructure Boundary.
- 3.1.15. There are no arboricultural features protected by TPOs within the Study Area in Section 3. The desk study found no records of ancient or veteran trees nor ancient woodland within the Study Area in Section 3.
- 3.1.16. The Study Area in Section 3 consists predominantly of arable agricultural land located between Liverpool Road near Backford and Sealand Road south of Saughall. Arboricultural features are predominantly associated with agricultural field boundaries.

- 3.1.17. The additional surveys associated with the proposed design changes associated with the ES Addendum included 8 new features within Section 3, consisting of seven individual trees and one group.
- 3.1.18. A total of 264 arboricultural features, consisting of 198 individual trees and 66 groups of trees, were surveyed within the Study Area in Section 3.
- 3.1.19. A summary of tree quality categories is in **Table 3-3**.

Table 3-3 Summary of BS5837 tree quality categories for Section 3

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	49	6	55
Category B	Moderate	87	23	110
Category C	Low	56	37	93
Category U	Very Low	6	0	6
Total	-	198	66	264

- 3.1.20. There are 15 surveyed features that have been assessed as veterans and Category A within the Study Area in Section 3. These are predominantly oak and willow with one poplar and one alder.

Section 4

- 3.1.21. Section 4 is located entirely within the FCC’s boundary.
- 3.1.22. There are no arboricultural features protected by TPOs or conservation areas within the Study Area in Section 4. The desk study also found no records of ancient or veteran trees.
- 3.1.23. Ancient Semi Natural Woodland as identified on the Natural Resource Wales ancient woodland inventory is located within the Study Area in Section 4 but outside of the Newbuild Infrastructure Boundary, and is partially covered by survey feature G618.
- 3.1.24. The Study Area in Section 4 consists predominantly of arable agricultural land located around Sealand and Queensferry although some sections lies within or adjacent to urban and residential land associated with towns. Arboricultural features are predominantly associated with agricultural field boundaries.
- 3.1.25. A total of 229 arboricultural features, consisting of 147 individual trees and 82 groups of trees, were surveyed within the Study Area in Section 4.
- 3.1.26. A summary of tree quality categories is in **Table 3-4**.

Table 3-4 Summary of BS5837 tree quality categories for Section 4

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	19	5	24
Category B	Moderate	49	34	83
Category C	Low	76	43	119
Category U	Very Low	3	0	3
Total	-	147	82	229

3.1.27. There are seven surveyed features that have been assessed as veterans and Category A within the Study Area in Section 4. These consist of three ash, three oak and two mixed broadleaves groups.

Section 5

3.1.28. The Study Area in Section 5 is located entirely within the FCC’s boundary.

3.1.29. There are no arboricultural features protected by TPOs or conservation areas within the Study Area in Section 5. The desk study also found no records of ancient or veteran trees.

3.1.30. There are three areas of ancient woodland as identified on the Natural Resource Wales ancient woodland inventory within the Study Area in Section 5 around Northop Hall. Two areas of Restored Ancient Woodland Site are located within the Study Area in Section 5 but outside of the Newbuild Infrastructure Boundary and one area of Ancient Semi Natural Woodland is almost completely encapsulated within the Newbuild Infrastructure Boundary.

3.1.31. The Study Area in Section 5 consists predominantly of arable agricultural land located around Ewloe and Northop Hall. Arboricultural features are predominantly associated with agricultural field boundaries.

3.1.32. The additional surveys associated with the proposed design changes associated with the ES Addendum included 51 new features within Section 3, consisting of 42 individual trees and nine groups.

3.1.33. A total of 362 arboricultural features, consisting of 242 individual trees and 120 groups of trees, were surveyed within the Study Area in Section 5.

3.1.34. A summary of tree quality categories is in **Table 3-5**.

Table 3-5 Summary of BS5837 tree quality categories for Section 5

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	43	11	54
Category B	Moderate	83	42	125
Category C	Low	112	67	179
Category U	Very Low	4	0	4
Total	-	242	120	362

3.1.35. There are three surveyed features, an ash tree, a sycamore and a group of mixed broadleaves, that have been assessed as veterans and Category A within the Study Area in Section 5.

Section 6

3.1.36. The Study Area in Section 6 is located entirely within the FCC’s boundary.

3.1.37. There are no arboricultural features protected by TPOs or conservation areas within the Study Area in Section 6. The desk study also found no records of ancient or veteran trees.

3.1.38. There are two areas of ancient woodland as identified on the Natural Resource Wales ancient woodland inventory within the Study Area in Section 6 at and near Leadbrook Wood. The area within Leadbrook Wood is Restored Ancient Woodland Site whilst the other area to the north is Ancient Semi Natural Woodland. Both areas are within the Study Area in Section 6 but are located outside of the Newbuild Infrastructure Boundary.

3.1.39. The Study Area in Section 6 consists predominantly of arable agricultural land located between Northop Hall and Flint. Arboricultural features are predominantly associated with agricultural field boundaries.

3.1.40. A total of 70 arboricultural features, consisting of 50 individual trees and 20 groups of trees, were surveyed within the Study Area in Section 6.

3.1.41. A summary of tree quality categories is in **Table 3-6**.

Table 3-6 Summary of BS5837 tree quality categories for Section 6

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	15	4	19
Category B	Moderate	25	10	35
Category C	Low	8	6	14
Category U	Very Low	2	0	2
Total	-	50	20	70

Section 7

- 3.1.42. Section 7 is located entirely within the FCC's boundary.
- 3.1.43. There are no arboricultural features protected by TPOs or conservation areas within the Study Area in Section 7. The desk study also found no records of ancient or veteran trees nor ancient woodland.
- 3.1.44. The Study Area in Section 7 consists predominantly of arable agricultural land located between the west of Flint and north-west of Babell. The arboricultural features are mostly typical individual and grouped field boundaries and hedgerows associated with agriculture.
- 3.1.45. The additional surveys associated with the proposed design changes associated with the ES Addendum included 21 new features within Section 7, consisting of ten individual trees and 11 groups.
- 3.1.46. A total of 76 arboricultural features, consisting of 32 individual trees and 44 groups of trees, were surveyed within the Study Area in Section 7.
- 3.1.47. A summary of Block Valve Stations tree quality categories is in **Table 3-7**.

Table 3-7 Summary of BS5837 tree quality categories for Section 7

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	3	0	3
Category B	Moderate	18	41	59
Category C	Low	17	8	25
Category U	Very low	3	0	3
Total	-	41	49	90

Overview of arboricultural survey findings

- 3.1.48. Overall, a total of 1,414 arboricultural features, consisting of 947 individual trees and 467 groups of trees, were surveyed within the seven sections of DCO Proposed Development.
- 3.1.49. Approximately, 15% of the features have been assessed as being of high quality, 38% of moderate quality, 45% of low quality and 2% of very low quality. A summary of the identified arboricultural features within the Study Area is provided in **Table 3-8**.

Table 3-8 Summary of BS5837 tree quality categories for DCO Proposed Development

BS 5837 Category	Quality	Individual Trees	Groups	Total
Category A	High	171	40	211
Category B	Moderate	345	191	536
Category C	Low	397	235	632
Category U	Very low	34	1	35
Total	-	947	467	1414

- 3.1.50. There are 35 surveyed features that have been assessed as veterans and Category A within Study Area. These consist of 31 individual trees and four groups with oak, willow, ash, hawthorn and mixed broadleaves groups present.
- 3.1.51. Tree survey data for Sections 1 – 6 is presented within a tree survey schedule in **Annex B** and shown on the Preliminary Constraints and Impacts Plan (**Annex D**) whilst tree survey data for Section 7 is presented within a separate tree survey schedule in **Annex C** and shown on a Tree Removal and Protection Plan (Section 7 of the DCO Proposed Development) (**Annex E**).

4. ARBORICULTURAL IMPACT ASSESSMENT

4.1. SCOPE OF ASSESSMENT

- 4.1.1. The scope of the AIA is to evaluate the preliminary effects of the DCO Proposed Development on arboricultural features and where possible recommend mitigation.
- 4.1.2. The assessment includes specific reference to the effects of tree loss and other potentially damaging activities which could foreseeably occur in the vicinity of retained trees.
- 4.1.3. Mitigation and best practice that may be applicable and is commensurate with the level of design detail available at this stage is summarised and discussed in the outline AMS.
- 4.1.4. The DCO Proposed Development design is displayed on the Preliminary Constraints and Impacts Plan at **Annex D** and Tree Removal and Protection Plan (Section 7 of the DCO Proposed Development) at **Annex E**.

4.2. ARBORICULTURAL FEATURES TO BE REMOVED

- 4.2.1. As mentioned in Section 1.2, the impact assessment has been split into the seven Sections of the DCO Proposed Development. The impact assessment results for Sections 1-7 are provided within Tables 4-1 to 4-7 below with an overview of total impacts for the DCO Proposed Development provided in Table 4-8.
- 4.2.2. The colours of the RAG assessment are provided in combination with the specific impact for individual trees and tree groups. Partial removal refers to groups that require one or more trees to be removed but where trees elsewhere within the group can still be retained. The tree impacts are also shown on the tree survey schedules within **Annex B** and **Annex C**.
- 4.2.3. The proposed design changes require an additional two removals from Section 3 and three removals from Section 5. However the proposed design changes in Section 3 have avoided the removal of seven trees, five of which are high quality and three of these being assessed as veterans.

SECTION 1

Table 4-1 Summary of RAG impact assessment for Section 1 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	8	-	38	32	78
Groups	0	5	12	28	45
Total	8	5	50	60	123

SECTION 2

Table 4-2 Summary of RAG impact assessment for Section 2 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	26	-	91	74	191
Groups	0	20	47	18	85
Total	26	20	138	92	276

SECTION 3

Table 4-3 Summary of RAG impact assessment for Section 3 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	16	-	100	82	198
Groups	1	13	34	18	66
Total	17	13	134	100	264

SECTION 4

Table 4-4 Summary of RAG impact assessment for Section 4 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	14	-	53	80	147
Groups	0	18	43	21	82
Total	14	18	96	101	229

SECTION 5

Table 4-5 Summary of RAG impact assessment for Section 5 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	51	-	110	81	242
Groups	1	39	51	29	120
Total	52	39	161	110	362

SECTION 6

Table 4-6 Summary of RAG impact assessment for Section 6 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	9	-	17	24	50
Groups	0	7	7	6	20
Total	9	7	24	30	70

SECTION 7

Table 4-7 Summary of RAG impact assessment for Section 7 features

Feature	Removed	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	2	-	30	9	41
Groups	3	9	29	8	49
Total	5	9	59	17	90

SUMMARY OF THE ARBORICULTURAL FEATURES TO BE REMOVED

- 4.2.4. Table 4-8 below displays that the majority of tree features, (83%), within the Study Area have the potential to be retained given application of suitable mitigation, as will be described within a site specific Arboricultural Method Statement and shown on a Tree Protection Plan.

Table 4-8 Summary of RAG impact assessment DCO Proposed Development

Feature	Removal	Partial Removal	At Risk of Removal Aiming to Retain (ARAtR)	Retained with Protection Measures (RwPM)	Total
Trees	126	-	439	382	947
Groups	5	111	223	128	467
Total	131	111	662	510	1414

- 4.2.5. As stated in paragraph in **Section 1.3**, mitigation has been embedded into the Preliminary Design of the DCO Proposed Development to ensure impacts on veteran trees are minimised as far as reasonably practicable. Out of the 35 features assessed as veterans, three features (T1056, T1048 and T1074) located within Section 2 are assessed as at risk of removal but aiming to retain and the DCO Proposed Development will seek to retain these with all other veterans during construction.

4.3. OTHER POTENTIAL ARBORICULTURAL IMPACTS

- 4.3.1. Other potential arboricultural impacts result from activities that do not require the direct removal of the tree, but have the potential, without mitigation, to

cause damage to retained arboricultural features. **Table 4-1** provides the potential cause of damage of features and mitigatory measures which are proposed. Implementation of the recommended mitigation measures in Table 4-9 as well as the embedded mitigation in section 2.6 will be sufficient to ensure that arboricultural features can be retained without significant loss of value or a notable reduction in tree health or longevity.

- 4.3.2. As stated in **Section 1.3**, at this Preliminary Design stage, a precautionary approach has been taken to assess other potential arboricultural impacts. It is assumed that all trees within the Newbuild Infrastructure Boundary that are not located within the 32m construction working width (i.e. all Amber trees), have the potential to be encroached by some works associated with the construction of the DCO Proposed Development. However, it is also considered that these features can be retained with use of construction exclusion zones (CEZs) incorporating the Root Protection Areas (RPAs) and created by the erection of protective fencing, or other applied mitigation.
- 4.3.3. Regarding the proposed permanent access track to Babell BVS in Section 7, full exclusion is not feasible as the track directly encroaches within a RPA. The encroached feature is of low quality (G93a) and in this instance, special protection measures are required. Special protection measures, as detailed in **Table 4-1**, will also be applicable for the remaining groups of trees that require partial removal.

Table 4-9: Other potential arboricultural impacts, proposed mitigation and likely effects

Feature	Cause of Impact	Potential Impact	Mitigation Measures
<p>G93a and remaining trees within partially removed groups</p>	<p>Earthworks and use of machinery associated with the construction.</p>	<p>Significant encroachment of RPAs possibly severing feeder and/or structural roots as well as disturbing soil composition and reducing the available rooting area.</p> <p>Significant encroachment of canopy area possibly requiring canopy reduction which would reduce photosynthesising capability and create stress that may cause a decline in tree health.</p> <p>Significant below or above ground impacts described above is likely to cause the decline and ultimate death of trees if not appropriately mitigated.</p>	<p>Special site-specific measures may include one or a combination of the following in the areas of special measures as show on the Preliminary Constraints and Impacts Plan: design refinements to avoid or reduce encroachment, micro-siting, working from track side, hand digging and ‘no dig’ solutions such as geocellular ground protection and protective fencing.</p> <p>Where works within an RPA are required, supervision to be conducted by an Arboricultural Clerk of Works (ACoW) and any additional recommendations to be followed.</p>
<p>All other retained features (Amber and Green)</p>	<p>Working space requirements during construction (below ground impact).</p>	<p>Soil compaction and root damage for construction working space requirements.</p> <p>Loss of vitality and decline in health. Reduction in quality of trees / potential death of trees.</p>	<p>Where possible, establish a construction exclusion zone (CEZ) within an AMS for duration of construction which is demarcated by a tree protection fence.</p> <p>Where access only is required temporary ground protection measures will be installed to prevent soil compaction and root damage.</p> <p>Where works within an RPA are required, supervision to be conducted by ACoW and</p>

Feature	Cause of Impact	Potential Impact	Mitigation Measures
			any additional recommendations to be followed.
All other retained features (Amber and Green)	Working space requirements during construction. (above ground impact).	Injurious contact with above ground elements of retained trees. Loss of vitality and decline in health. Reduction in quality of trees / potential death of trees.	Establish a CEZ within an AMS for duration of construction and arboricultural supervision during construction near trees. Requirements for pruning to avoid injurious contact are to be determined with arboricultural supervision prior to commencing all activities.

4.4. COMPENSATION PLANTING

4.4.1. The DCO Proposed Development has been designed to avoid impacting on trees and vegetation where reasonably practicable. However, unavoidable tree loss will be mitigated through the implementation of landscape design including new tree planting (refer to **Chapter 12: Landscape and Visual (Volume II)**) New tree planting will use local provenance stock of native species with awareness to pests and diseases, with species and numbers agreed with the local planning authorities. The proposed landscape designs are shown on the following drawings:

- Flint AGI Landscape Layout (EN070007-D.2.14-LAY Sheet 0)
- Northop Hall AGI Landscape Layout (EN070007-D.2.14-LAY Sheet 1)
- Ince AGI Landscape Layout (EN070007-D.2.14-LAY Sheet 2)
- Aston Hill BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 3)
- Mollington BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 4)
- Rock Bank BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 5)
- Babell BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 6)
- Pentre Halkyn BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 7)
- Cornist Lane BVS Landscape Layout (EN070007-D.2.14-LAY Sheet 8)

4.5. OUTLINE ARBORICULTURAL METHOD STATEMENT

4.5.1. An outline arboricultural method statement (AMS) is included in **Annex F**. The AMS adopts a precautionary approach to tree protection and addresses known construction activities which have the potential to cause damage to retained trees.

4.5.2. The AMS addresses, in principle, the following matters:

- arboricultural monitoring;
- tree protection fencing;
- temporary hard surfaces in RPAs;
- installation of underground services; and
- soft landscaping.

4.5.3. The Outline AMS will be a 'live document' and will be developed further by the Main Contractor(s) into a 'full' Arboricultural Method Statement to reflect the Detailed Design of the DCO Proposed Development. It will also be reviewed, as necessary throughout the subsequent design and construction stages.

4.5.4. All tree works undertaken must comply with British Standard 3998:2010 – Tree Work Recommendations and should therefore be carried out by skilled tree surgery contractors.

4.5.5. In instances where works unspecified in this report are to be undertaken, and which may impact trees, a further search for the presence of TPOs should be carried out prior to commencement.

4.6. SUMMARY AND CONCLUSIONS

4.6.1. A walkover survey of arboricultural features within the Study Area was undertaken between March and May 2022, with additional surveys in December 2022 to support the proposed design changes associated with the ES Addendum. The arboricultural surveys were undertaken in accordance with BS 5837.

4.6.2. A desk study was undertaken on 07 July 2022 which established there are no arboricultural features protected by TPOs within the Study Area. The desk study also found no records of ancient or veteran trees however the walkover identified 35 veteran features.

4.6.3. The desk study identified three conservation areas within the Study Area for Section 2 and Section 3. Thornton-le-Moor Conservation Area, Picton Conservation Area and Chester Canal Conservation Area are all located within Cheshire West and Chester Local Authority area. The desk study also identified six areas of ancient woodland between Sections 4-6 of the Study Area.

4.6.4. A total of 1,414 arboricultural features, consisting of 947 individual trees and 467 groups of trees, were surveyed within the DCO Proposed Development Study Area. Of these, 211 were assessed as high quality, 536 as moderate, 632 as low and 35 as very low quality features.

4.6.5. To facilitate construction of the DCO Proposed Development, 132 features have been preliminary assessed as requiring removal and another 111 grouped features as requiring partial removal.

4.6.6. Table 4-9 below provides a summary of the RAG impact assessment results in relation to the tree feature qualities.

Table 4-10 Summary of RAG impact assessment in relation to tree grades

BS5837: 2012 Grade	RAG Status			Total
	Removal / Partial Removal	At risk but aiming to retain	Retained with protection measures	
A	31	90	90	211
B	80	260	196	536
C	132	291	209	632
U	2	18	15	35
Total	245	659	510	1414

- 4.6.7. Out of the 35 features assessed as veterans, three trees (T1056, T1048 and T1074) are assessed as at risk of removal but aiming to retain however the Proposed Development will seek to protect and retain all veteran trees at the construction phase.
- 4.6.8. The remaining 1,171 Amber and Green features will be retained through use of protective measures during construction. These measures will be detailed within a detailed AMS which sets out the principles for tree protection whilst a Tree Protection Plan (TPP) will be used to detail the specific locations where these protective measures are required.
- 4.6.9. An Arboricultural Impact Assessment (AIA) will be undertaken for the Detailed Design of the DCO Proposed Development to accompany the site-specific AMS and TPP.

4.7. REFERENCES

- 1 - Flintshire County Council (2023). Local Development Plan - Flintshire 2015-2030. Available here: <https://www.flintshire.gov.uk/en/Resident/Planning/Flintshire-Local-Development-Plan.aspx> [Last accessed: 22/03/23]
- 2 - Flintshire County Council (2017). Supplementary Planning Guidance Note. No.04 Trees and Development. Available from: <https://www.flintshire.gov.uk/en/PDFFiles/Planning/Adopted-SPGNs/SPGN-No-4.-Trees-and-Development.pdf> [Last accessed: 18/08/22]
- 3 - Cheshire West and Chester Local Council (2019). Cheshire West and Chester Local Plan. Available from: <https://consult.cheshirewestandchester.gov.uk/kse/event/34617/section/5428432> [Last accessed: 18/08/22]
- 4 - British Standards Institute (2012). BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. London: BSI

ANNEX A – ARBORICULTURAL SURVEY AND DESK STUDY METHODOLOGY

METHOD OF BASELINE DATA COLLECTION

Baseline data collection has been undertaken with reference to BS 5837 and uses the following data sources:

- an arboricultural desk study, and;
- a walkover survey of all arboricultural features within the Study Area.

DESK STUDY

The arboricultural desk study for the DCO Proposed Development was undertaken on 07 July 2022. The desk study reviewed existing arboricultural information available in the public domain.

TPOs and Conservation Areas

CWACC is responsible for implementing legal controls imposed through TPOs and Conservation Areas within Sections 1 and 2 and most of Section 3 within the Study Area. FCC is responsible for implementing these legal controls within Sections 4 to 7 and part of Section 3 within the Study Area. Data was assessed using their publicly accessible information (**Ref. 1**) (**Ref. 2**) and the results are summarised in **Section 3 – Arboricultural survey findings** of this AIA.

Ancient Woodland

The potential presence of ancient woodland within the Study Area was assessed using the web-based Lle Map Browser (Wales) database (**Ref. 3**) and the MAGIC map database (England) (**Ref.4**) and the results of which are provided in **Section 3 – Arboricultural survey findings** of this AIA.

Ancient and Veteran Trees

The potential presence of ancient and veteran trees within the study area was checked using the Woodland Trust's Ancient Tree Inventory (**Ref. 5**) and the results of which are provided in **Section 3 - Arboricultural survey findings** of this AIA.

WALKOVER SURVEY

For Sections 1-6 a 'noteworthy' walkover survey was undertaken on trees between a period of April and May 2022 and undertaken in accordance with the following criteria:

- A noteworthy tree survey collects BS5837 survey information for high and moderate quality features whilst the location of stems only has been recorded for low and very low quality features.

- Arboricultural features have been recorded as individual trees or tree groups where this has been deemed appropriate. Tree groups have been recorded on the basis that they form distinct arboricultural features either aerodynamically, visually or because they contain trees of similar cultural and biodiversity value.
- The trees have been visually inspected from ground level only.
- No tissue samples were taken nor was any internal investigation of the subject trees undertaken.
- Tree heights have been calculated using a clinometer and crown spreads have been estimated to the nearest 1m.
- Notes have been recorded where they relate to the quality of the arboricultural feature.

Tree features associated with Section 7 were surveyed as part of the TCPA Proposed Development in March 2022 where a full tree survey in accordance with BS 5837 was provided as opposed to a noteworthy tree survey.

To support the proposed design changes associated with the ES Addendum, additional surveys were undertaken in December 2022 in accordance with BS 5837.

Stem diameters have been measured in accordance with Annex C of BS 5837. Diameters of single stem trees on level ground have been measured at 1.5m above ground level. The diameters of other commonly encountered stems have been measured as per the guidance. The combined stem diameters for multi-stemmed trees have been calculated in accordance with BS 5837 paragraph 4.6.1.

By default, Root Protection Areas (RPAs) are calculated as an area equivalent to a circle with a radius 12 times the stem diameter. A precautionary approach has been used for veteran trees where a 15m buffer the tree stem, has been applied to ensure consistency with the DCO Proposed Development's approach to ancient woodland. The shape of RPAs can be adjusted to ensure that sufficient area, and therefore soil volume is protected. An adjusted RPA has not been drawn but the location of the tree protection fence provides sufficient area around the retained trees to ensure protection during construction.

QUALITY ASSESSMENT

The quality of arboricultural features has been determined in accordance with BS 5837 Table 1 a copy of which is provided in Insert 1. The purpose of the quality assessment is to enable informed decisions to be made regarding the removal and retention of arboricultural features in the context of development. For an arboricultural feature to be included within a particular quality category it will accord with the description provided.

The quality of high and moderate quality arboricultural features are defined based on its sub-category. Sub-categories carry equal weight, do not influence retention priority and are simply included to indicate the primary value associated with each surveyed item. Sub-categories 1, 2 and 3 are intended to reflect arboricultural, landscape and cultural values, respectively.

The quality and sub-category assigned to each arboricultural feature are identified within the Arboricultural Survey Schedule included in **Annex B** of this report.

REFERENCES

- 1 - Cheshire West and Chester Local Authority (2022). Public Map Viewer [online]. Available at: https://maps.cheshirewestandchester.gov.uk/cwac/webmapping?&e=351493.96&n=364458.00&layers=AM_V_IDOXTreePreservation_POINT_CURRENT_RestrictedFields.AM_V_IDOXTreePreservation_POLY_CURRENT_RestrictedFields&s=200000.00&bm=oscolour (Last Accessed: 08/07/22)
- 2 - Flintshire County Council (2022). Interactive mapping search for TPOs and Conservation Areas [online]. Available at: <https://fccmapping.flintshire.gov.uk/connect/analyst/mobile/#!/main?mapcfg=TreePreservationOrders> (Last Accessed 06/04/22)
- 3 - Welsh Government and Natural Resources Wales (2022). Geo-Portal for Wales – Lle Map Browser [online]. Available at: <http://lle.gov.wales/map#b=europa&l=2042;&m=-3.32655,53.34055,14> (Last Accessed: 08/07/22)
- 4 - Magic (DEFRA) (2022), Multi Agency Geographic Information for the Countryside [online] Available at: < <https://magic.defra.gov.uk/MagicMap.aspx>> [Accessed 12 May 2022].
- 5 - Woodland Trust, Ancient Tree Inventory – tree search [online]. Available at: <https://ati.woodlandtrust.org.uk/tree-search/?v=2028744&ml=map&z=14&nwLat=53.36264753705163&nwLng=-3.4070289204979542&seLat=53.324779658439155&seLng=-3.2422339986229542> (Last Accessed: 18/07/22)

Insert 1- BS 5837 Table 1 - Cascade Chart for Tree Quality Assessment

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
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	<ul style="list-style-type: none"> 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 <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	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)	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)	See Table 2
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 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	Trees with material conservation or other cultural value	See Table 2
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 150 mm	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	See Table 2

NOTES AND LIMITATIONS

Arboricultural survey data is of a preliminary nature whereby intrusive investigations have not been carried out and data has been collected based on a desk study and ground level walkover survey only.

Only defects visible from the ground have been noted and each individual feature may not have been inspected closely due to access difficulties, the presence of dense ivy, other vegetation or safety constraints. Safety related features have not been recorded on the basis that the arboricultural features will be subject to a normal programme of tree hazard assessment and only those features which materially affect the quality of the feature or pose a real and immediate safety concern have been recorded.

Arboricultural survey data is typically valid for a period of two years. After two years it is recommended that the trees are reinspected to see whether their condition has materially changed. Significant environmental events (such as extreme weather conditions) or changes to the identified baseline conditions may render the data invalid within a shorter timescale.

Whilst arboricultural surveys are not seasonally limited it is the case that certain pests and diseases may be more or less evident at different times of the year. This is especially true of certain wood decaying fungi such as the Giant Polypore (*Meripilus giganteus*) where fruiting bodies are short-lived, and the early stages of root decay may not result in other identifiable symptoms. Walkover survey data is therefore based on observations made at the time of the walkover survey and may be subject to change should further or more detailed inspections be undertaken.

Where topographical data wasn't available, the position of arboricultural features has been estimated using aerial photography and on-site GPS. The position and extent of these features should be regarded as approximate only.

The noteworthy survey has resulted in the location of stems only being recorded for low and very low quality trees within Sections 1 - 6.

ANNEX B – ARBORICULTURAL SURVEY SCHEDULE

EXPLANATORY NOTES

The schedule provides the survey data of each surveyed feature and should be used in conjunction with the Preliminary Constraints and Impacts Plan (Annex D) to elicit an understanding of the features geographical location and anticipated impacts in relation to the DCO Proposed Development.

Reference Abbreviations

- G – Group
- T - Tree

Measurements

Height of trees was measured with a clinometer.

Stem diameter measurements are in accordance with BS 5837:2012.

Crown spreads have been estimated as a maximum diameter.

Crown height is an estimate of the lowest point of foliage above ground level of the tree indicating the clearance below the tree.

Assessments

Life stage:

- SM – Semi-mature – <25% estimated life expectancy
- EM – Early Mature – < 50% estimated life expectancy
- M – Mature – >50% estimated life expectancy

Estimated remaining contribution - <10 years, 10+ years, 20+ years or 40+ years.

BS 5837 Category – A, B, C or U with a single sub-category recorded as 1, 2 or 3.

Root Protection Area

RPA is the radius of a circular Root Protection Area associated with the tree as measured from the centre of the stem. The RPA for groups is the equivalent RPA for the largest tree in that group and is illustrated in the Preliminary Constraints and Impacts Plan at **Annex D**.

ANNEX C – ARBORICULTURAL SURVEY SCHEDULE (SECTION 7)

Explanatory Notes

The schedule provides the survey data of each surveyed feature and should be used in conjunction with the Tree Removal and Protection Plan (Annex E) to elicit an understanding of the features geographical location and anticipated impacts in relation to the DCO Proposed Development.

Reference Abbreviations

- G – Group
- T – Tree

A suffix of 'a' is added to the tree numbers for Section 7 to avoid reference clashes between the trees surveyed as part of the TCPA Proposed Development and those surveyed for the DCO Proposed Development.

Measurements

Height of trees was measured with a clinometer.

Stem diameter measurements are in accordance with BS 5837:2012.

Crown spreads have been estimated in the four cardinal points.

LCH is the lowest canopy height. It is an estimate of the lowest point of foliage above ground level of the tree indicating the clearance below the tree.

LBH is the lowest branch height and is the height above ground level of the first branch union.

Assessments

Life stage:

- Y – Young – planted within the last three years (unless heavy/extra heavy standard)
- SM – Semi-mature – <25% estimated life expectancy
- EM – Early Mature – < 50% estimated life expectancy
- M – Mature – >50% estimated life expectancy

Physiological condition – Good, Fair Poor or Dead

Structural condition – Good, Fair, Poor or Unstable

Estimated remaining contribution - <10 years, 10+ years, 20+ years or 40+ years.

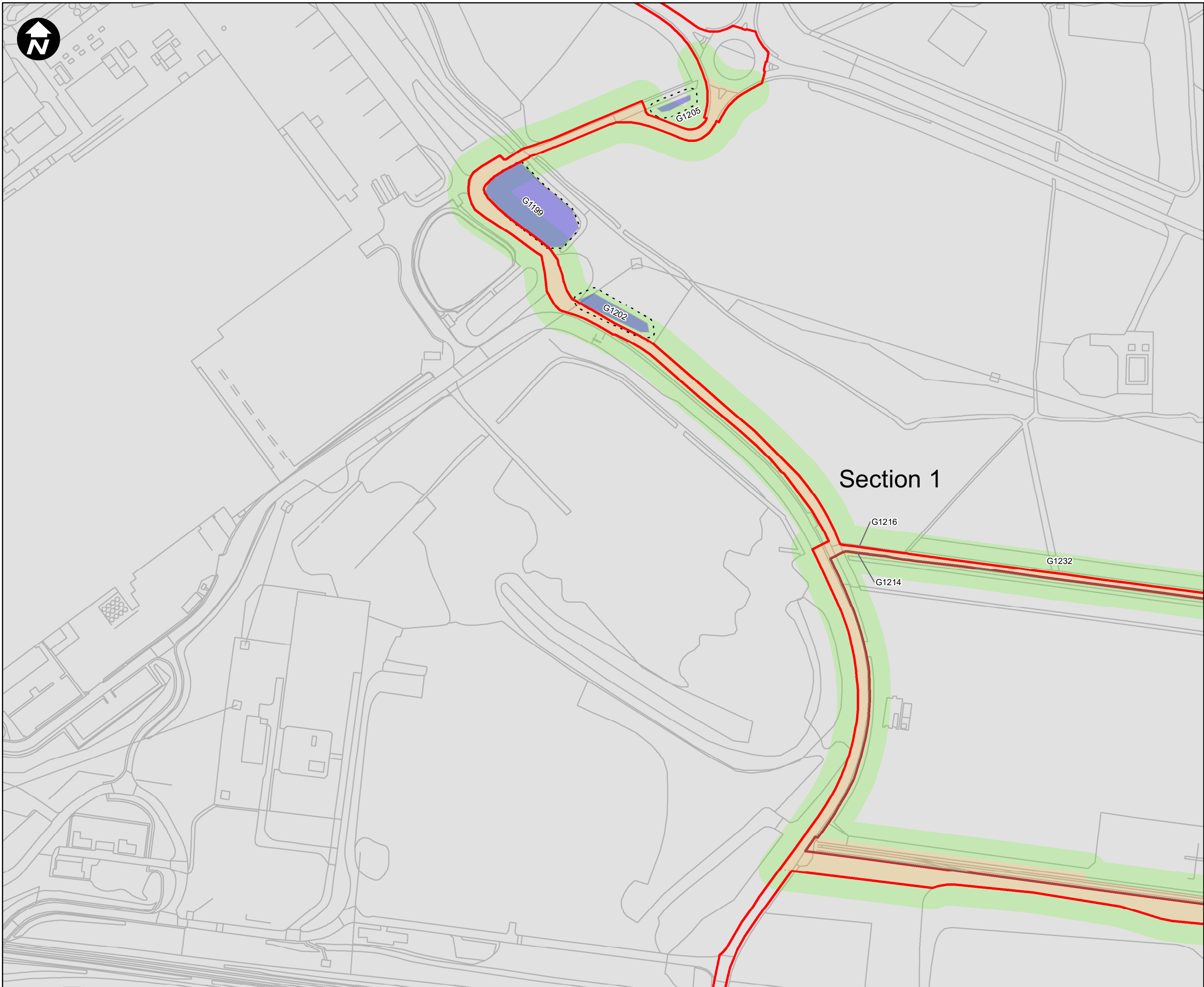
BS 5837 Category – A, B, C or U with a single sub-category recorded as 1, 2 or 3.

Root Protection Area

RPA is the radius of a circular Root Protection Area associated with the tree as measured from the centre of the stem.

The RPA for groups is the equivalent RPA for the largest tree in that group and is illustrated in the Tree Removal and Protection Plan (Section 7 of the DCO Proposed Development) at **Annex E**.

ANNEX D – PRELIMINARY CONSTRAINTS AND IMPACTS PLAN



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	 A
● B	 B
● C	 C
● U	 U

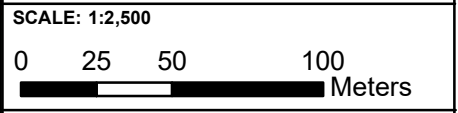
- Preliminary Removals
- Root Protection Areas (RPA)
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

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Preliminary Constraints and Impacts Plan
Page 1 of 46

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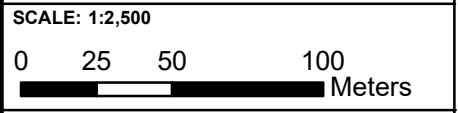
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Section 1

Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
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- Green - Retained
- Constructions Layers**
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- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

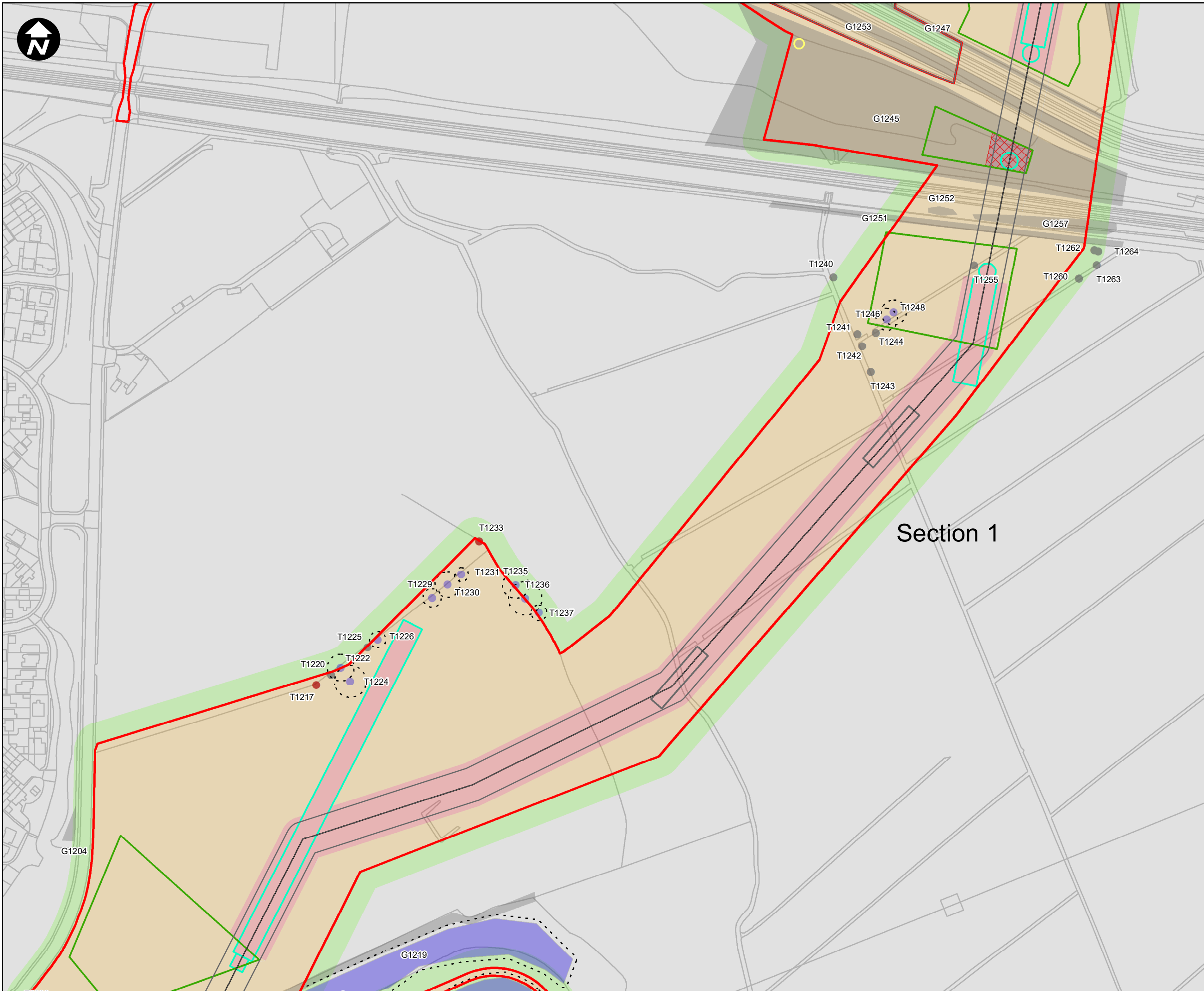
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EN070007-PA-PEI-3.1-Sheet 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment
 - Red - Removed
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- Constructions Layers
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access - Existing Access Point
 - Construction Access - New Access Point
 - Localised Compound

SCALE: 1:2,500

0 25 50 100 Meters

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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

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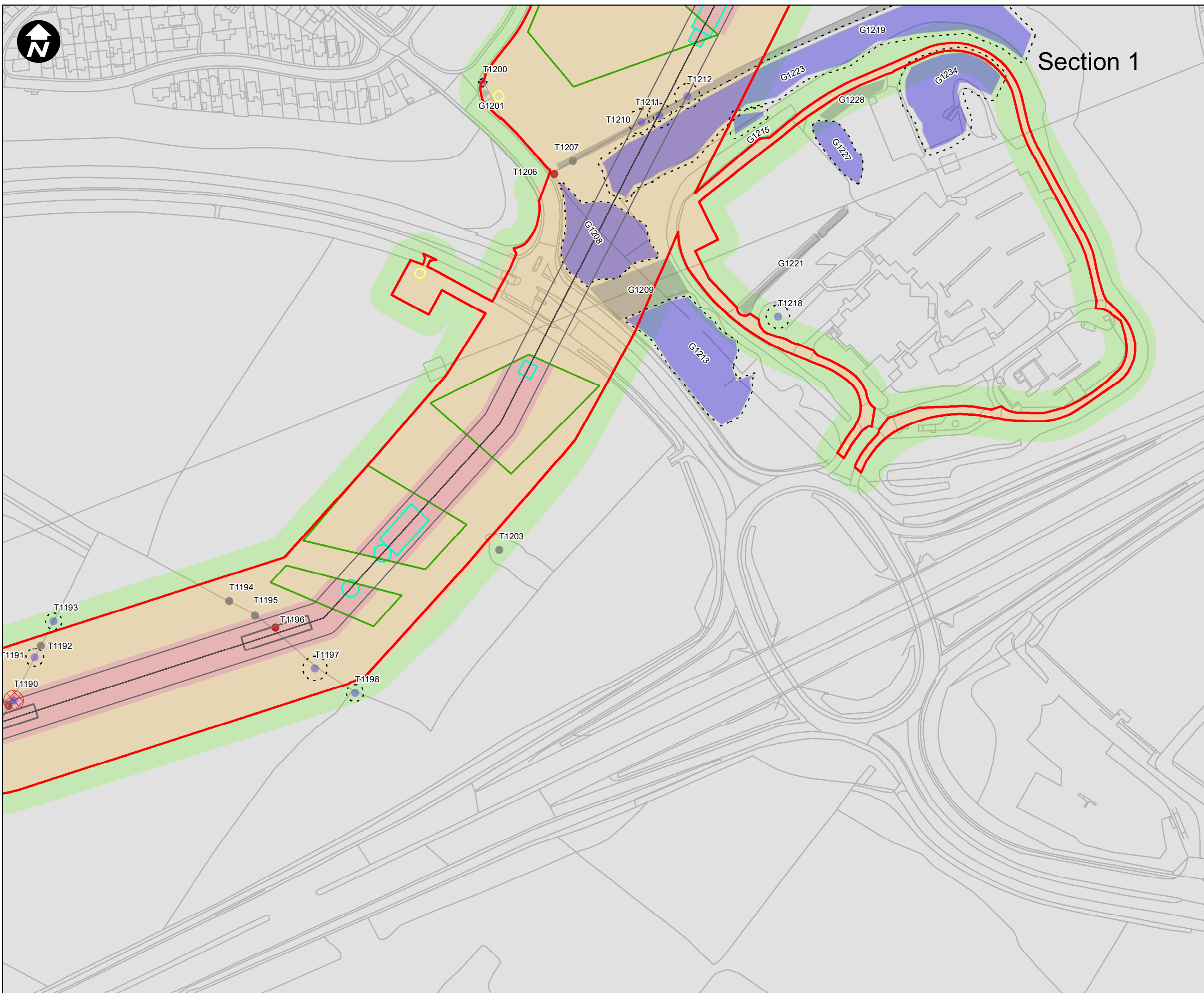
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Section 1



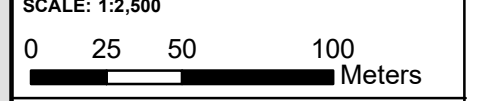
Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment
 - Red - Removed
 - Amber - At Risk
 - Green - Retained
- Constructions Layers
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access - Existing Access Point
 - Construction Access - New Access Point
 - Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

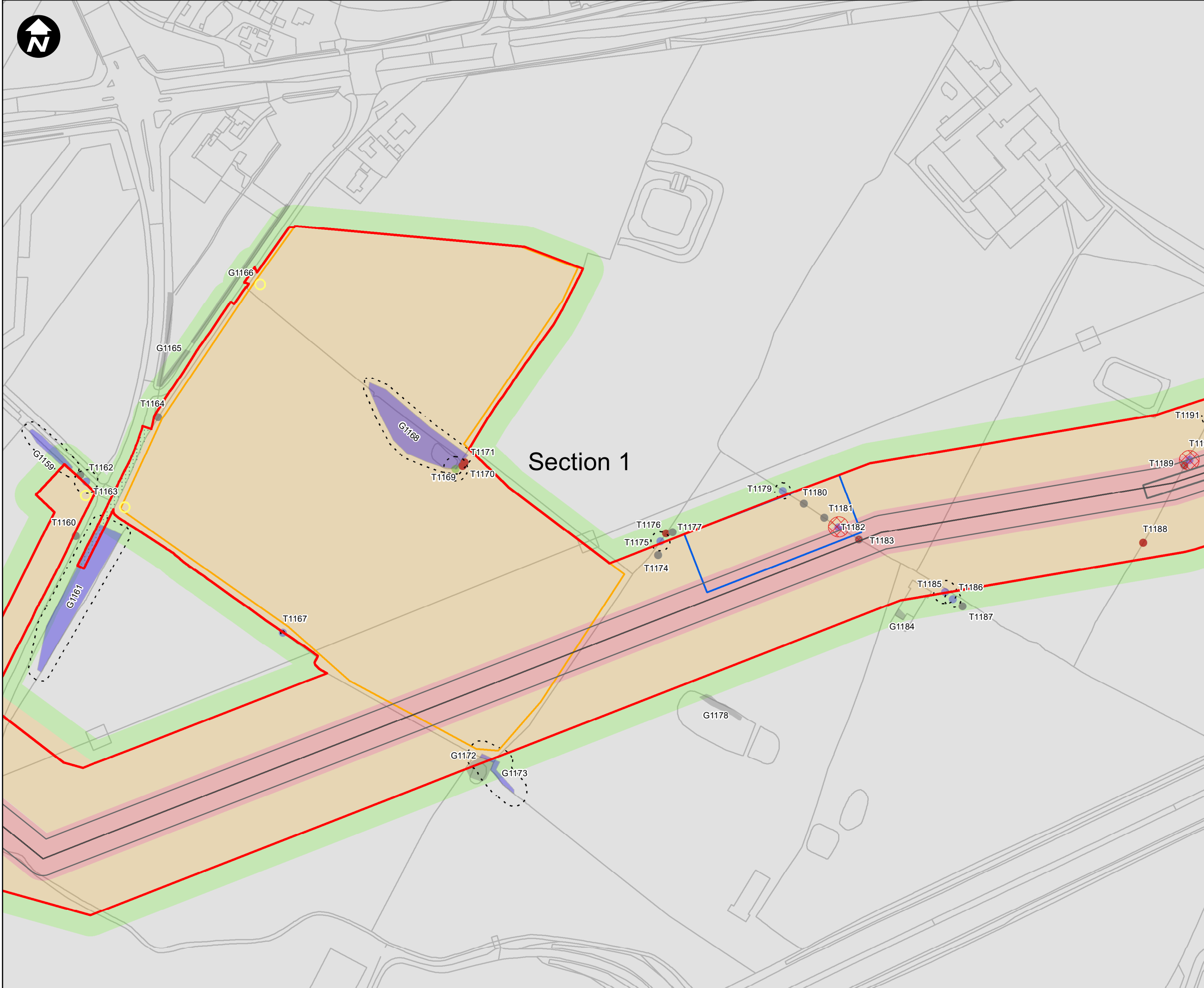
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SCALE @ A3 SIZE	DATE	REVISION
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EN070007-PA-PEI-3.1-Sheet 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

SCALE: 1:2,500



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PROJECT TITLE
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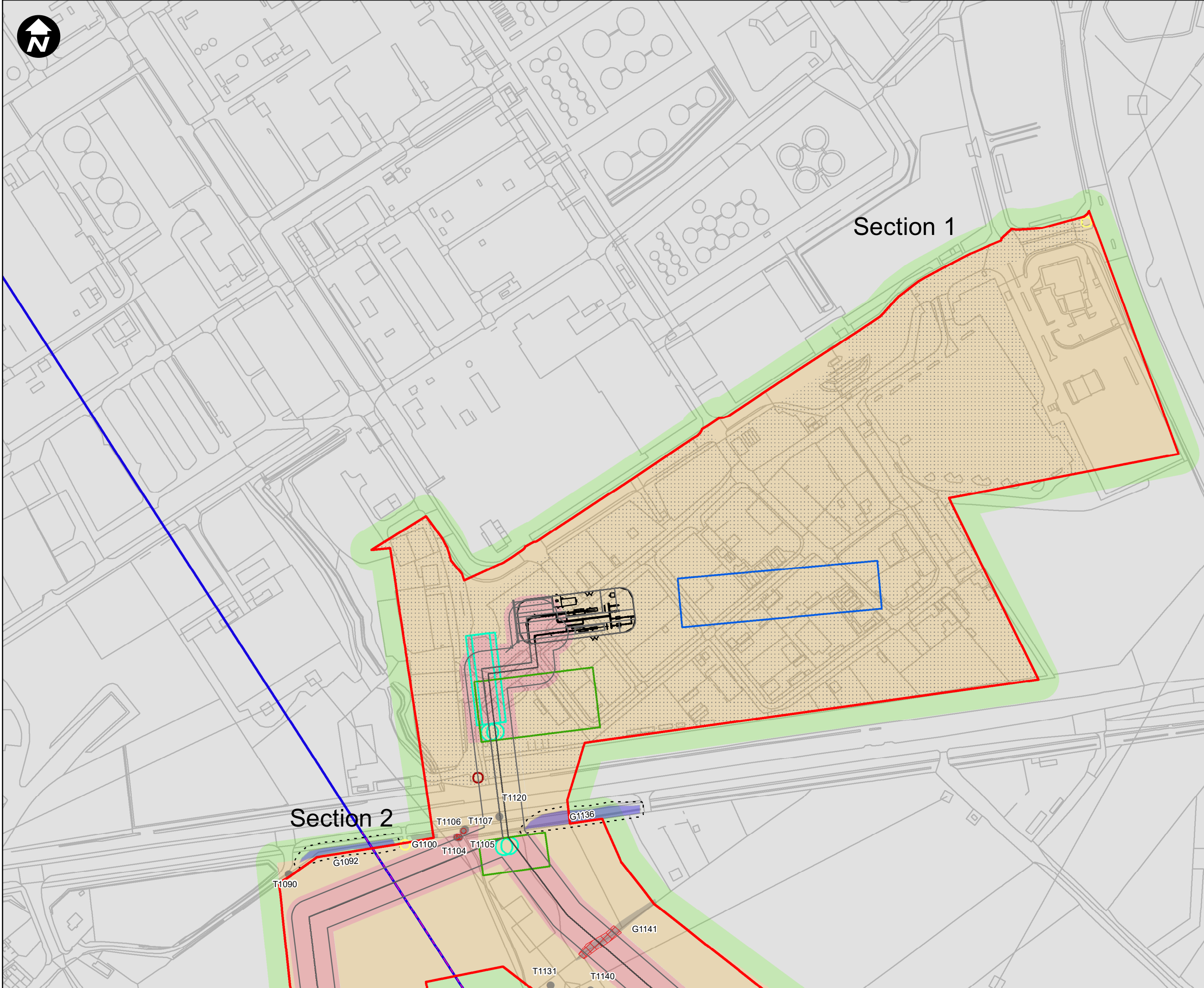
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Page 5 of 46**

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EN070007-PA-PEI-3.1-Sheet 5



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U
- A
- B
- C
- U

Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

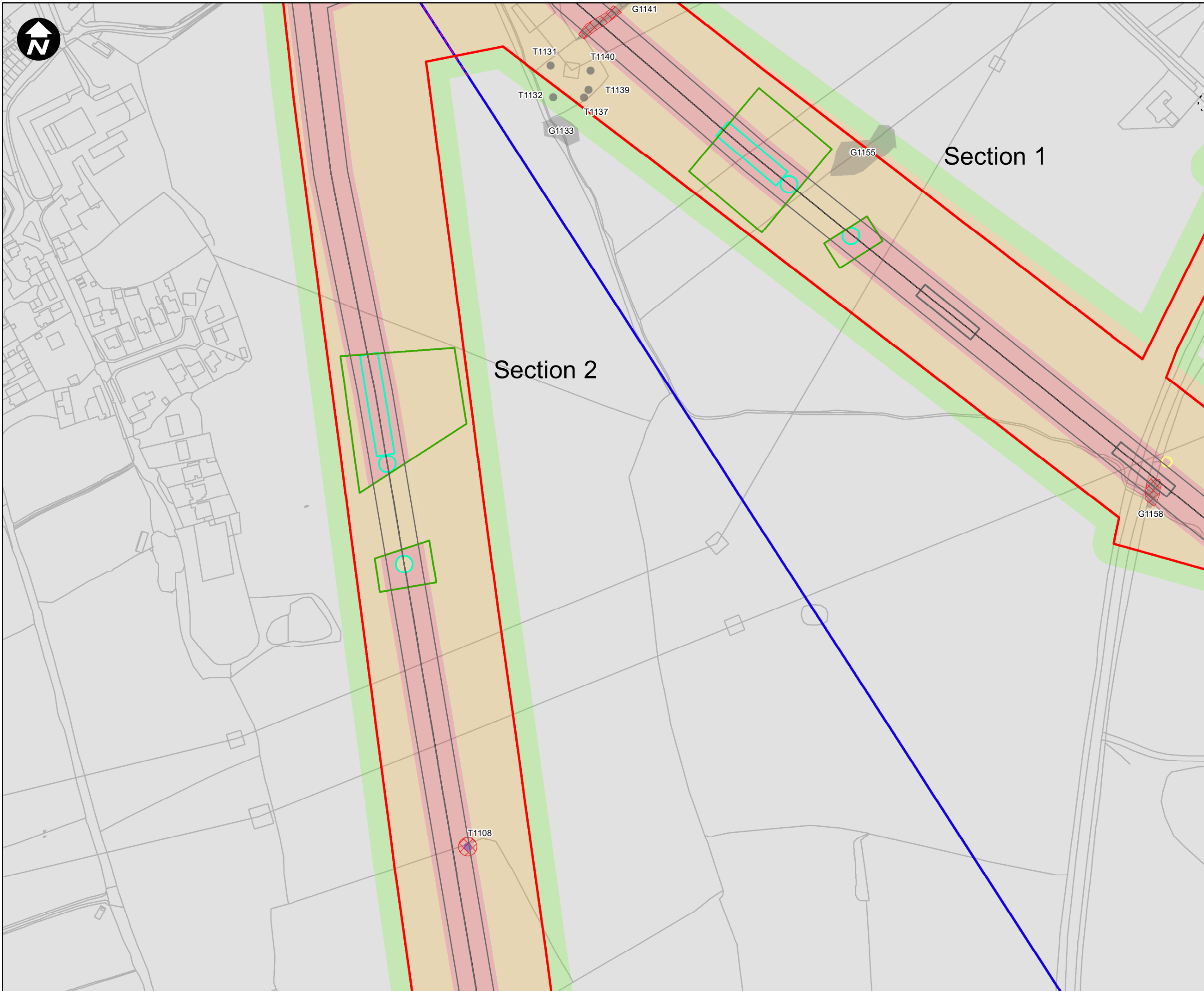
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Page 6 of 46**

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SCALE @ A3 SIZE	DATE	REVISION
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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	 A
● B	 B
● C	 C
● U	 U

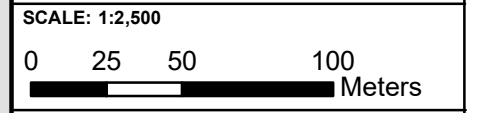
- Preliminary Removes
- Root Protection Areas (RPA)
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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 EN070007-PA-PEI-3.1-Sheet 7



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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
 - A
 - B
 - C
 - U
- Preliminary Removals
- Root Protection Areas (RPA)**
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's**
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
 - Red - Removed
 - Amber - At Risk
 - Green - Retained
- Constructions Layers**
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access - Existing Access Point
 - Construction Access - New Access Point
 - Localised Compound

SCALE: 1:2,500



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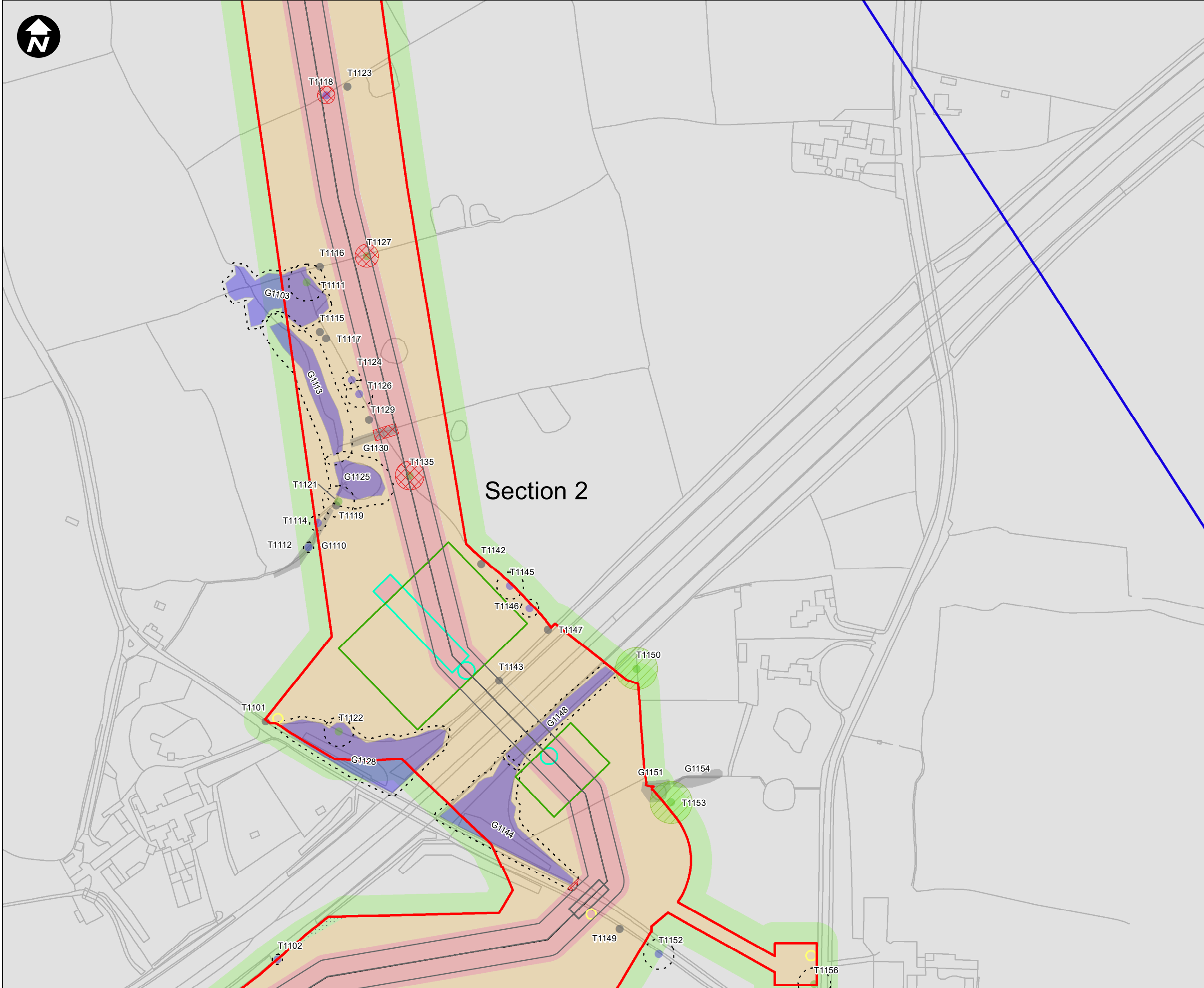
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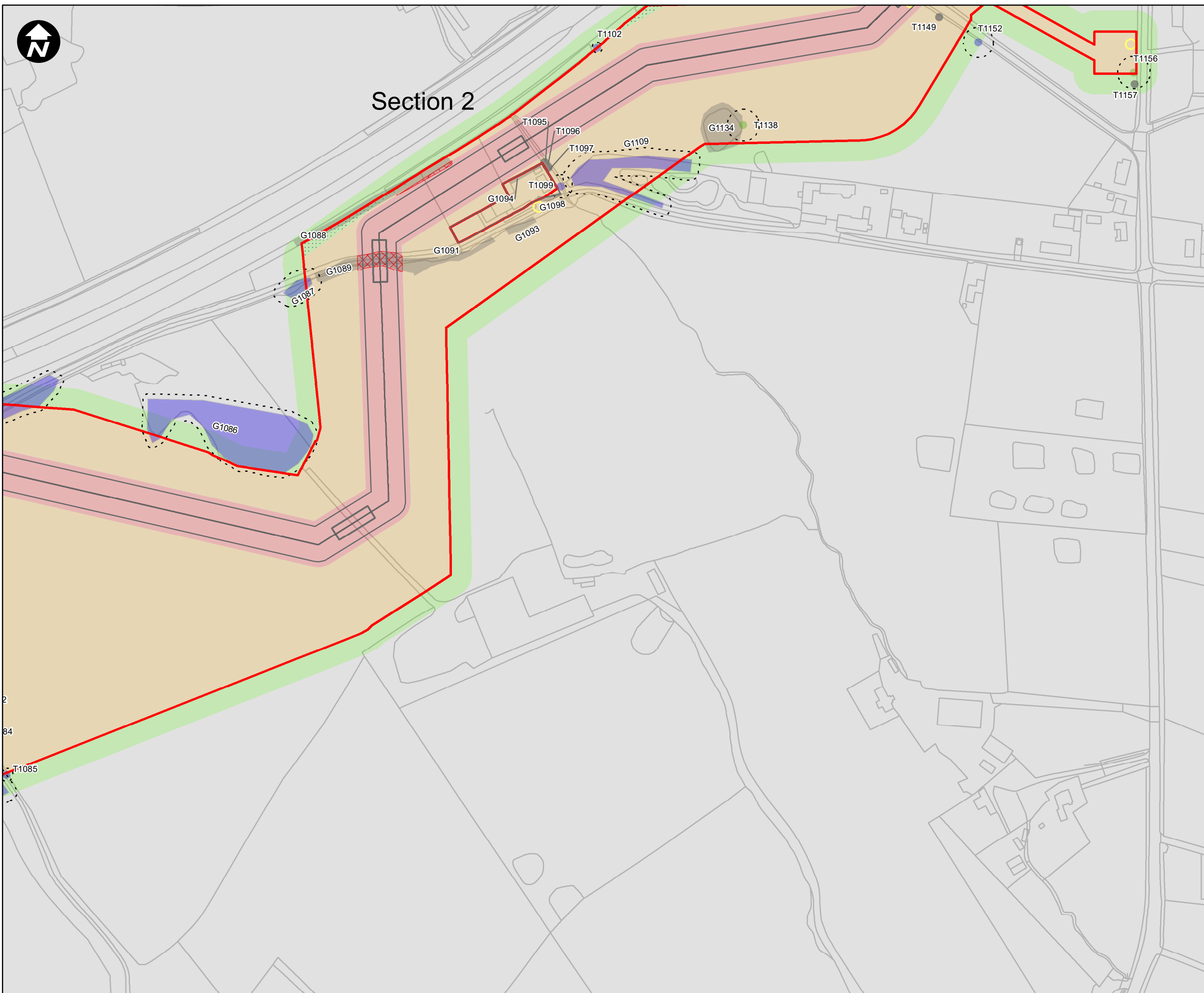
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Section 2





Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

	A		A
	B		B
	C		C
	U		U

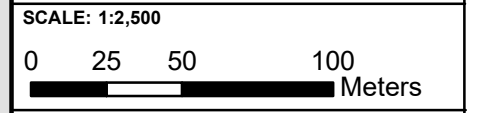
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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Page 9 of 46**

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1:2,500	14/03/2023	B

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EN070007-PA-PEI-3.1-Sheet 9



Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removes

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

SCALE: 1:2,500

0 25 50 100 Meters

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Page 10 of 46

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EN070007-PA-PEI-3.1-Sheet 10



Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

SCALE: 1:2,500

0 25 50 100 Meters

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HyNet North West

PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

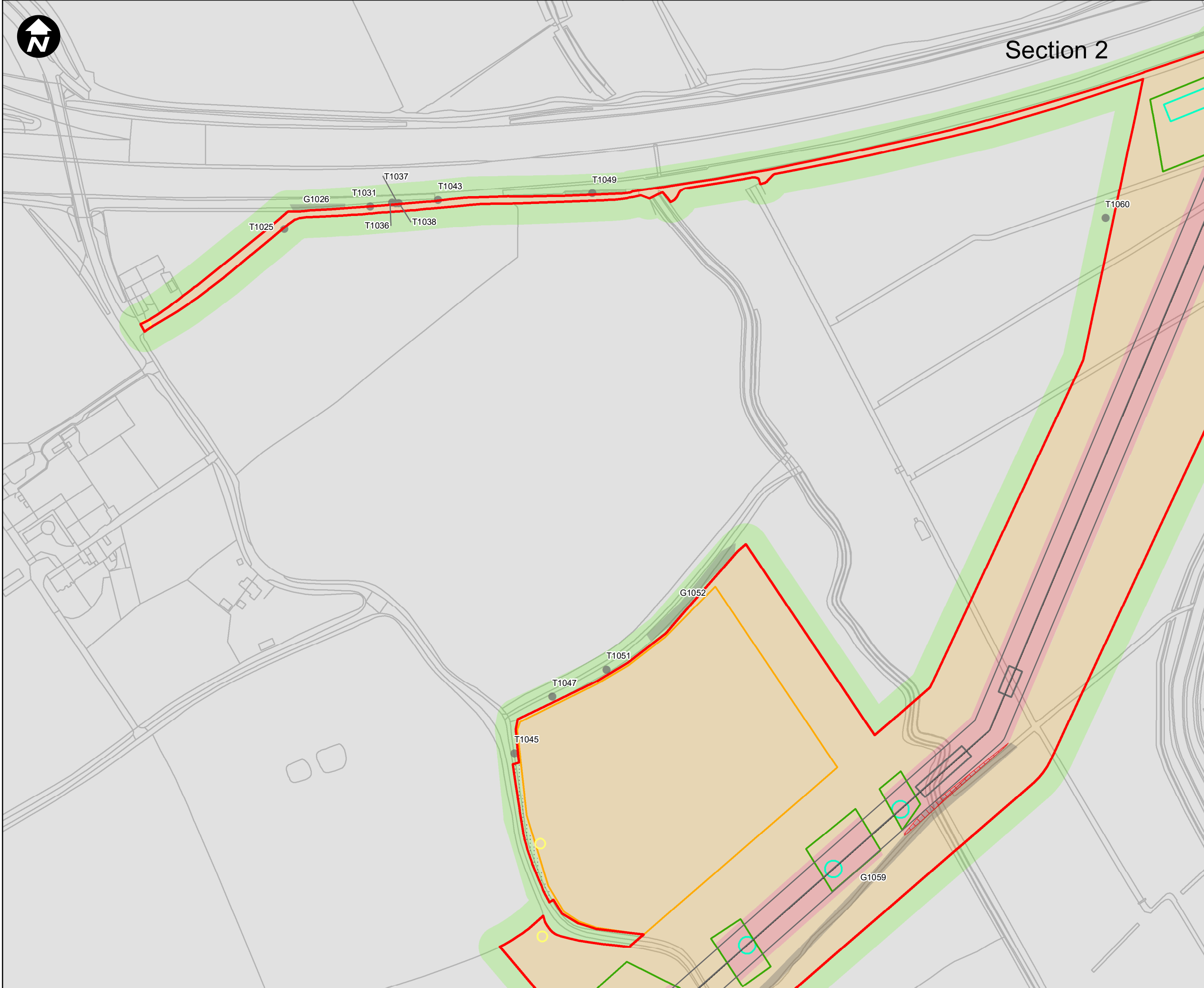
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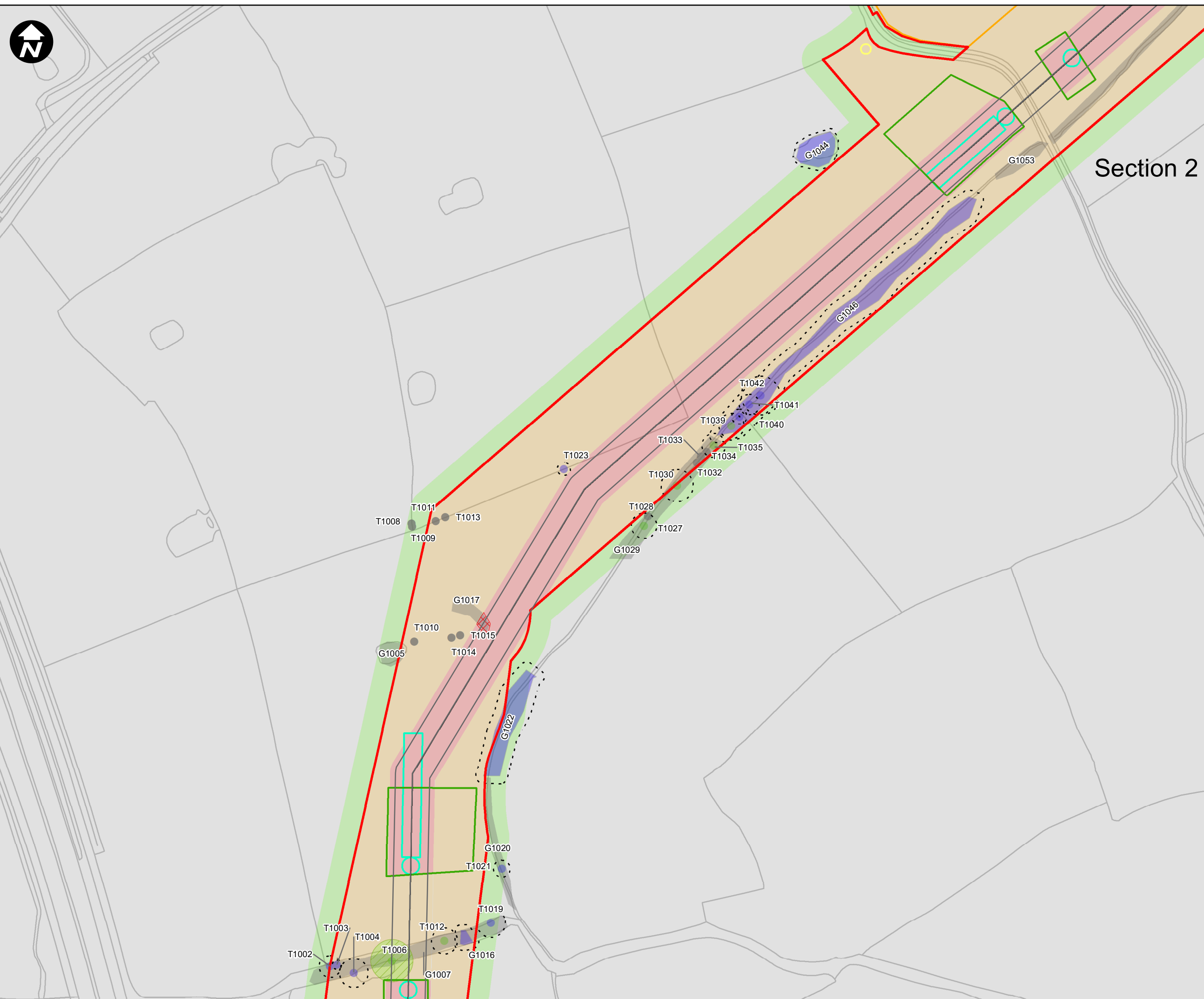
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Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound

SCALE: 1:2,500

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HyNet Carbon Dioxide Pipeline DCO

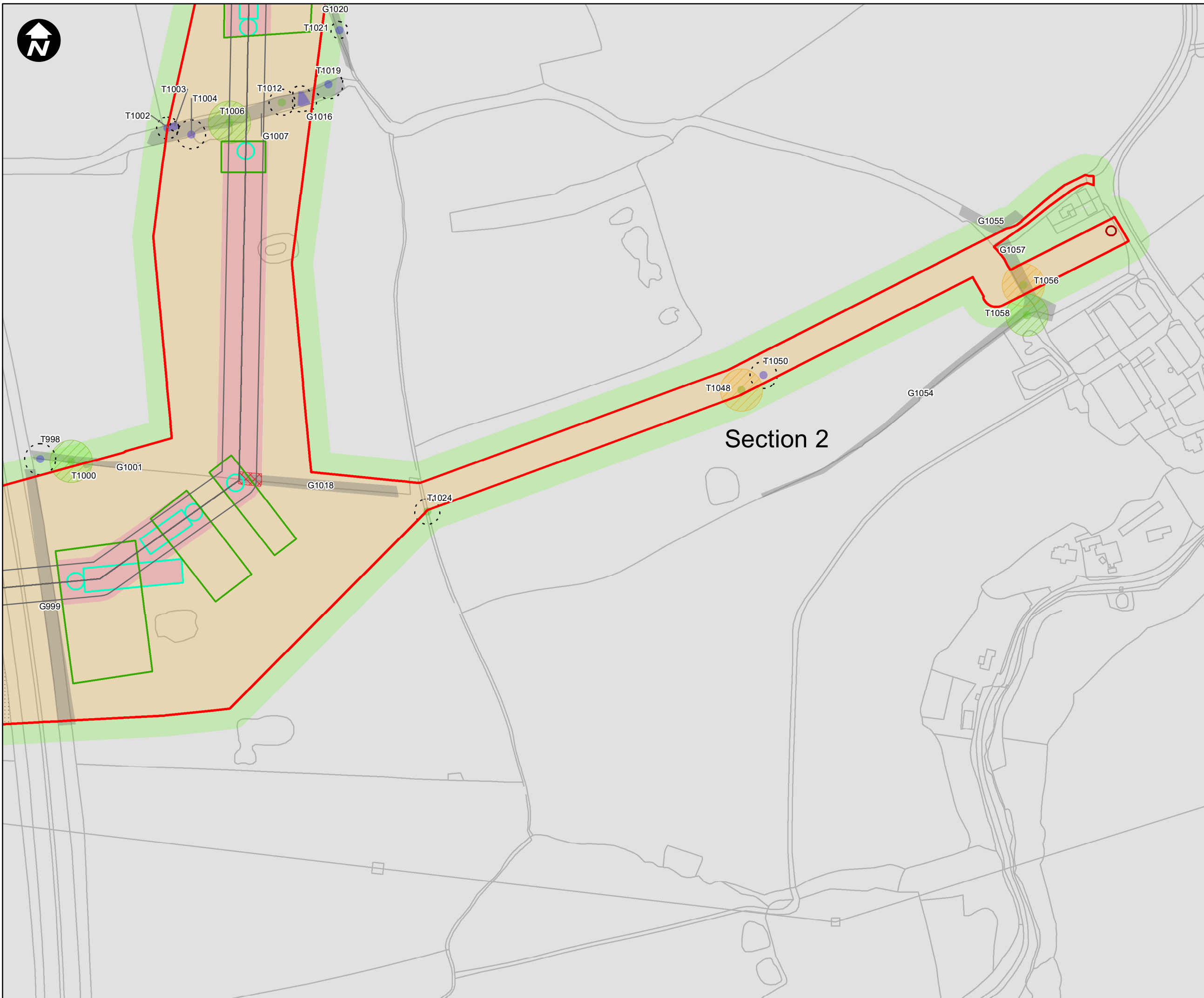
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EN070007-PA-PEI-3.1-Sheet 12



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	 A
● B	 B
● C	 C
● U	 U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

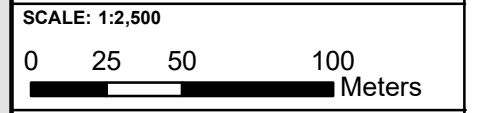
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Root Protection Areas (RPA)

- Preliminary Removals
- Root Protection Areas (RPA)

Veteran Trees - RPA's

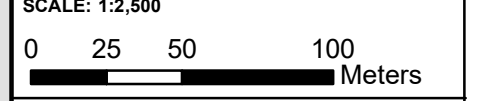
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

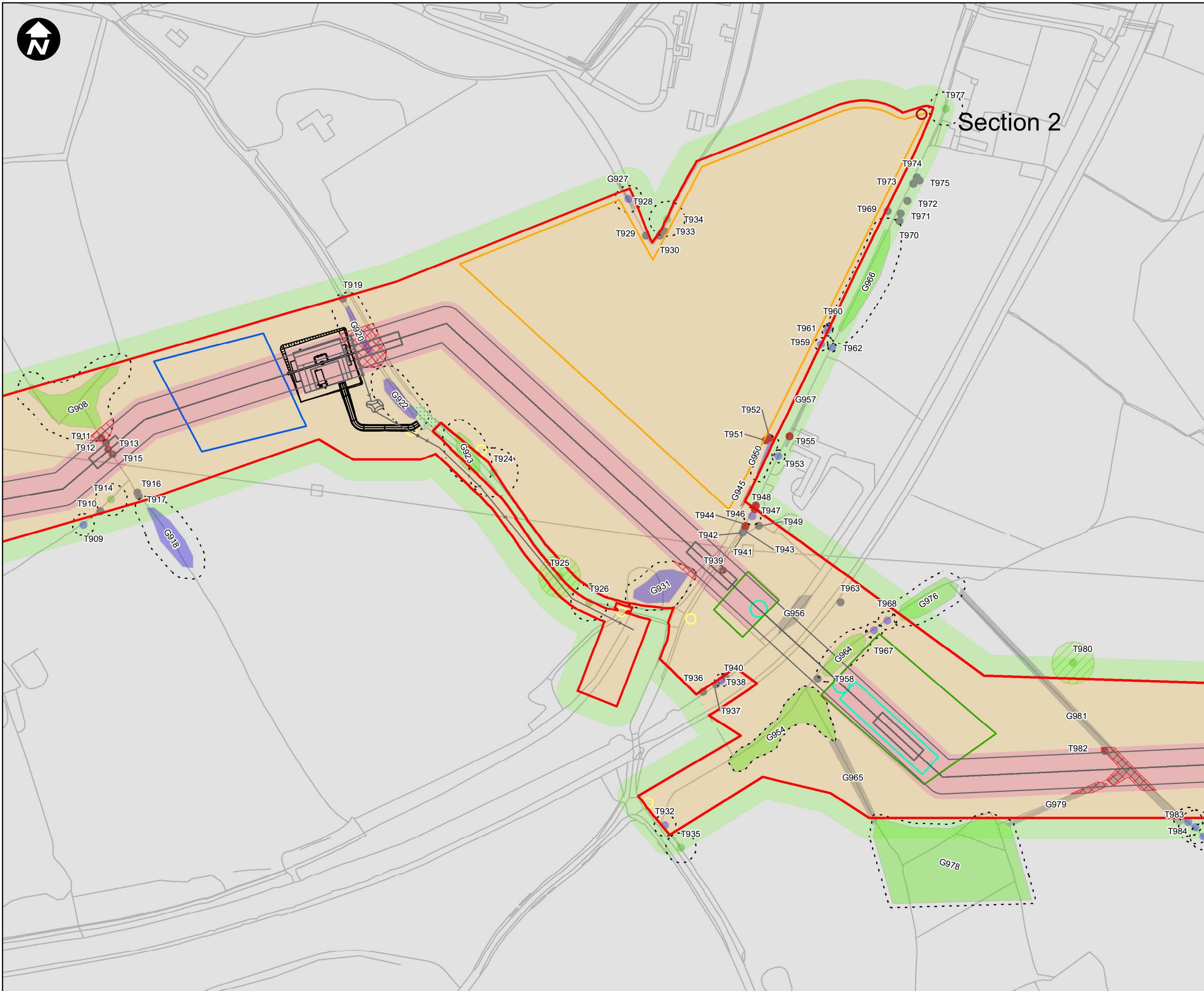
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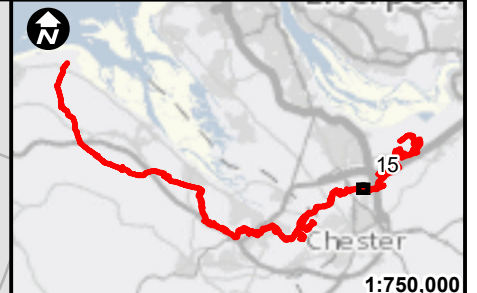
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Section 2



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removes

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

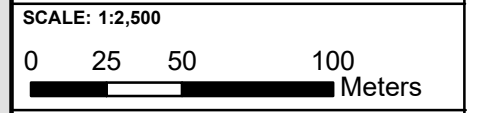
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- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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Section 2

Key:

- New Infrastructure Development Boundary
 - Areas Not Surveyed
 - Proposed Sections
- BS 5837 Tree Category Grading**
- A
 - B
 - C
 - U

Preliminary Removes

- Preliminary Removes

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

SCALE: 1:2,500



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

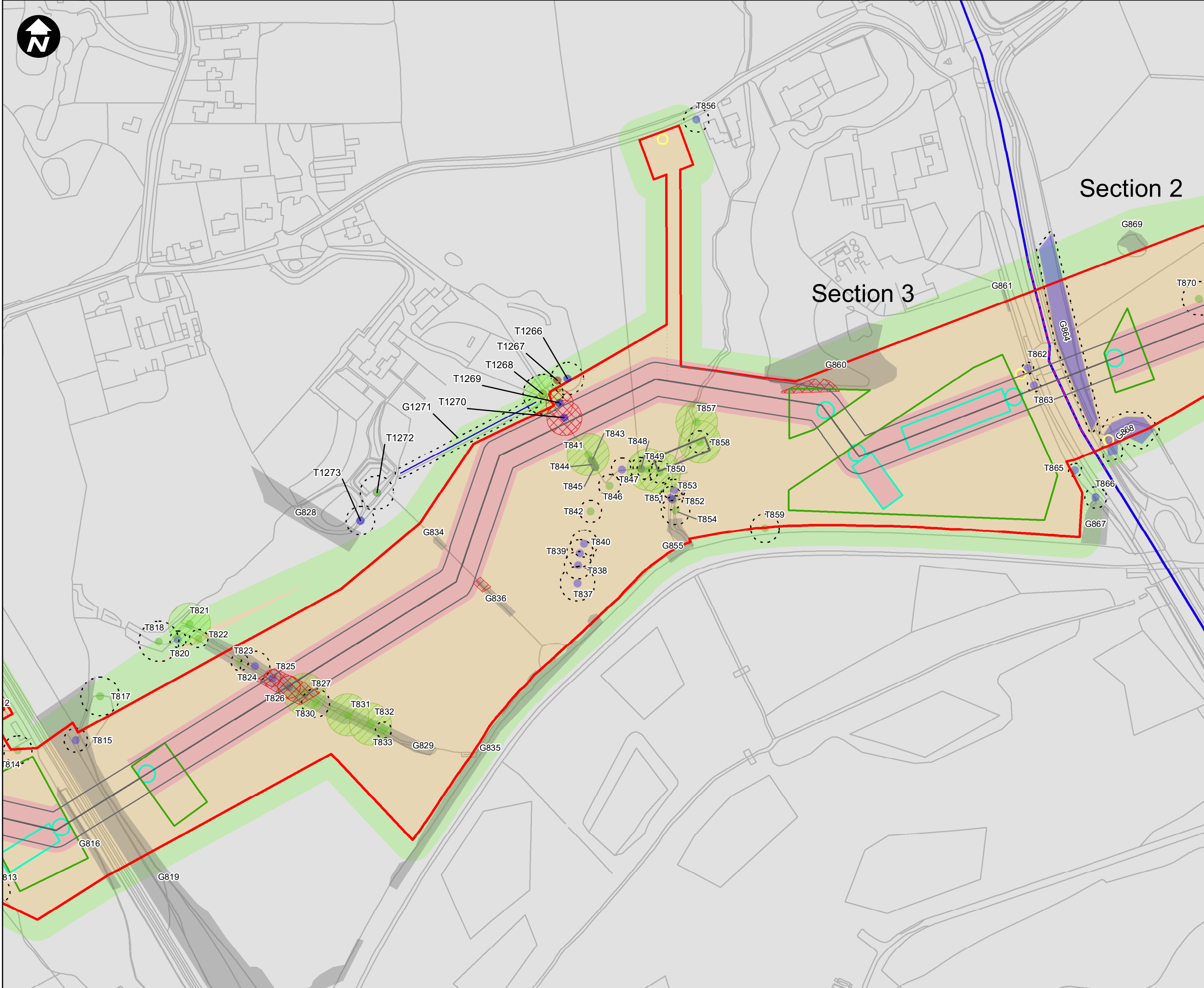
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Page 16 of 46**

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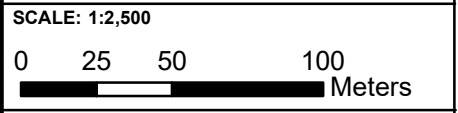
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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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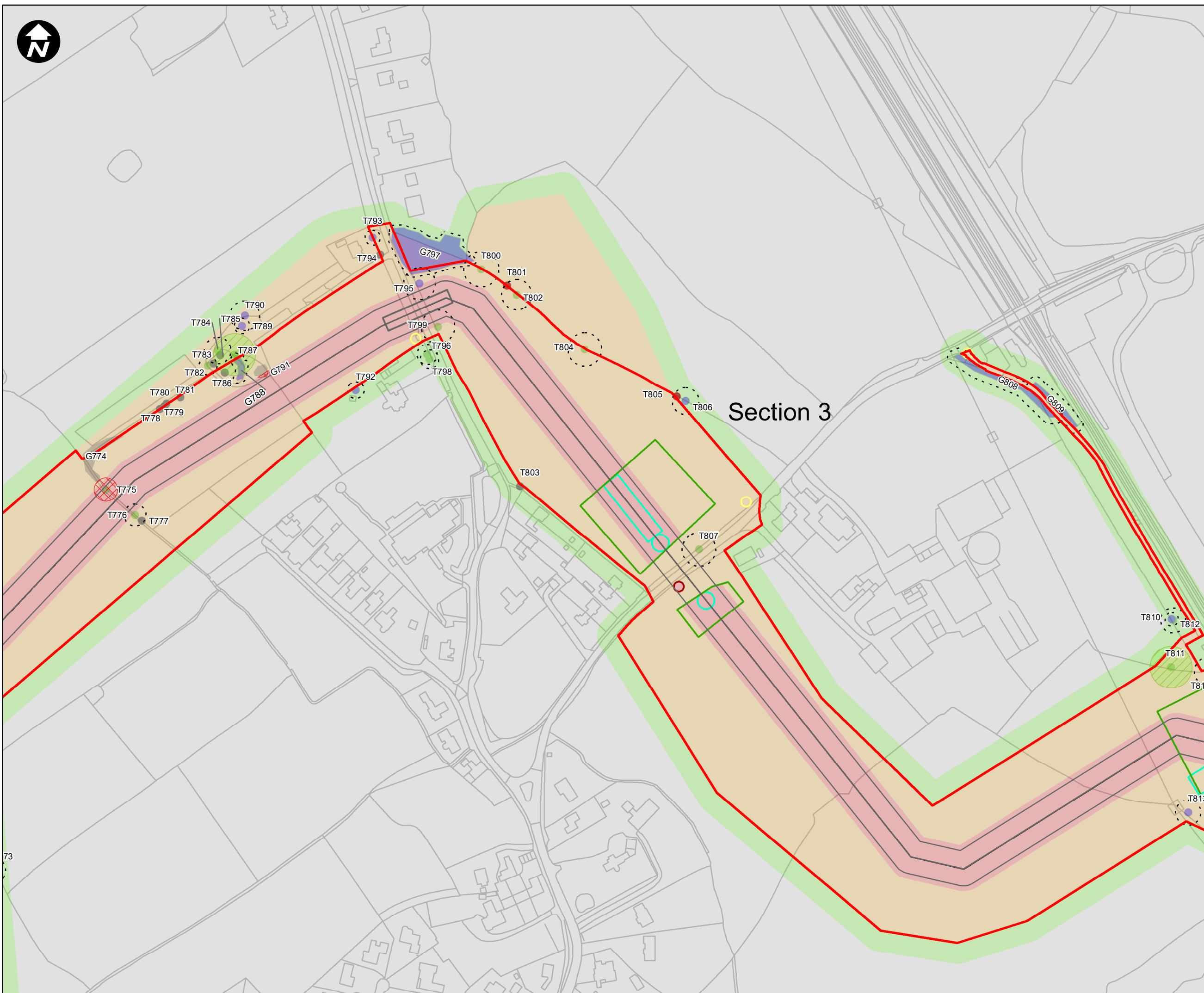
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HyNet Carbon Dioxide Pipeline DCO

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SCALE @ A3 SIZE 1:2,500	DATE 14/03/2023	REVISION B	

DRAWING NUMBER
EN070007-PA-PEI-3.1-Sheet 17



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

Section 3

SCALE: 1:2,500



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

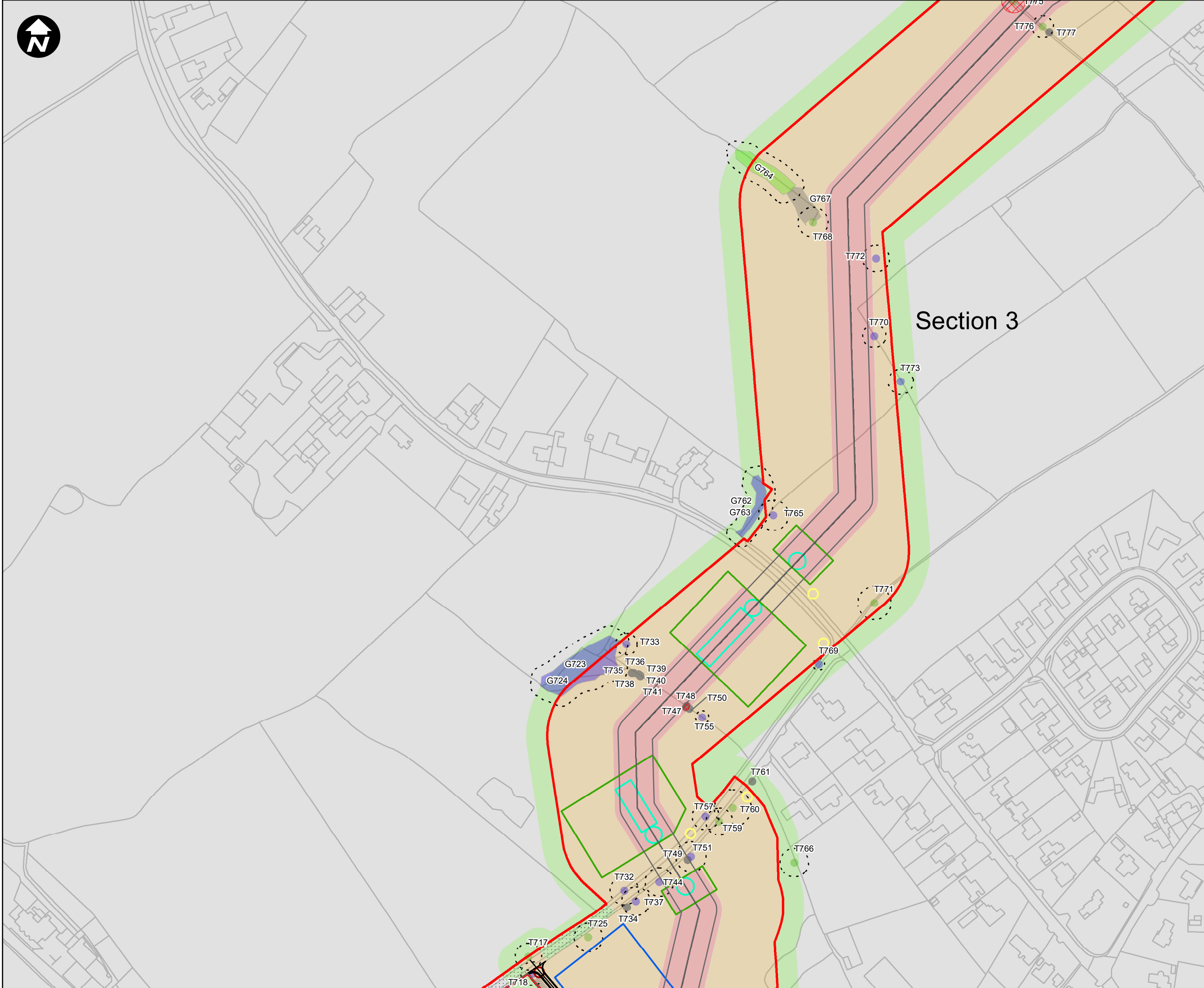
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1:2,500	14/03/2023	B

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EN070007-PA-PEI-3.1-Sheet 18



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

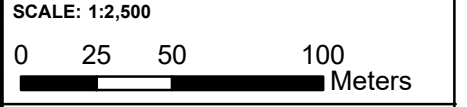
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- Root Protection Areas (RPA)
- Root Protection Areas (RPA)
- Veteran Trees - RPA's
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
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- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
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- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

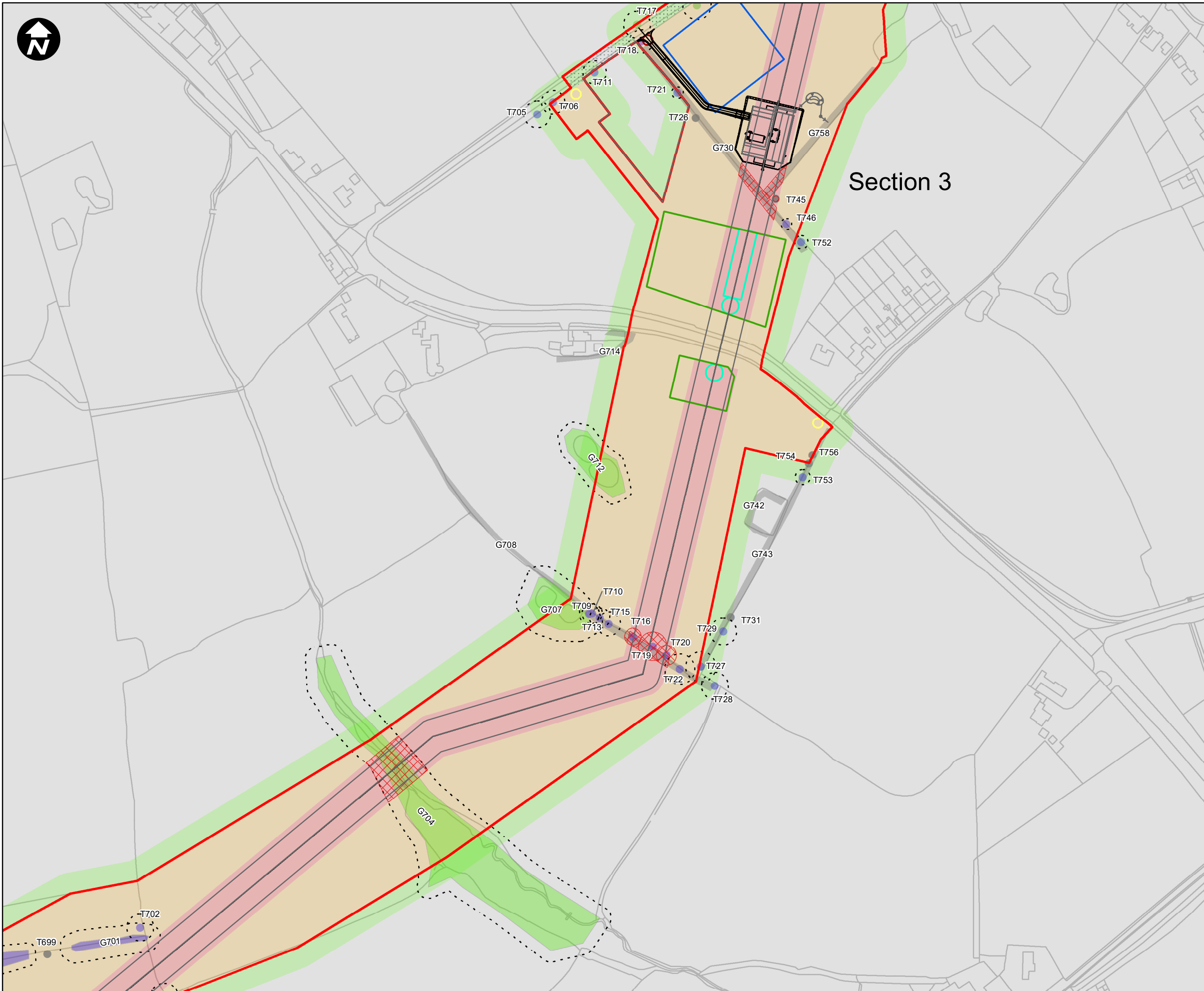
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Page 19 of 46

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EN070007-PA-PEI-3.1-Sheet 19



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

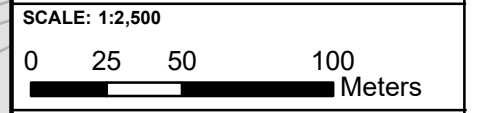
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- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

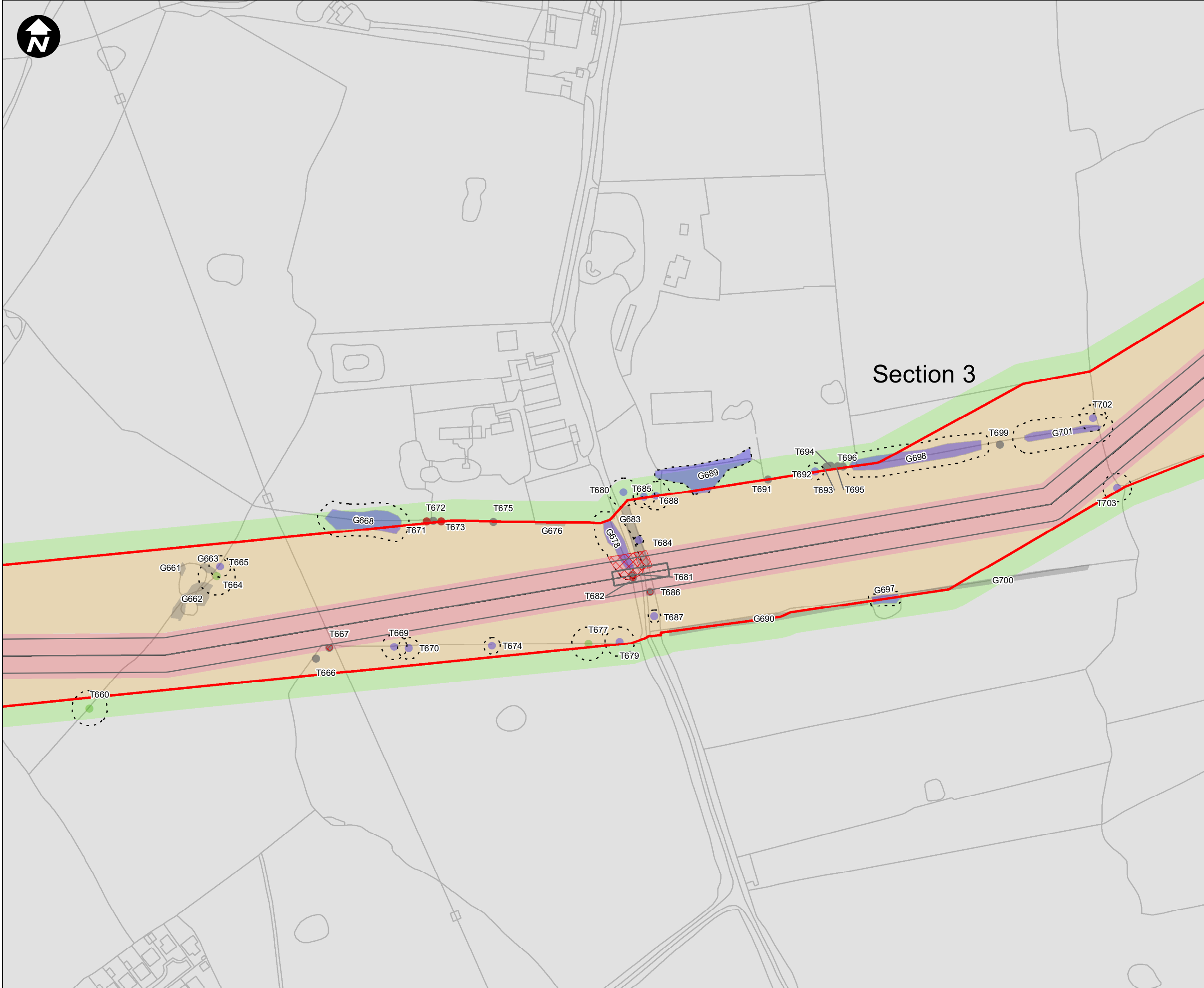
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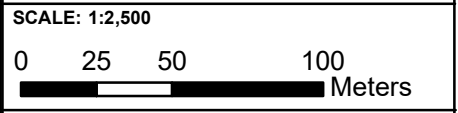
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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
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- Red - Removed
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- Constructions Layers**
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- Trenchless Crossing
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- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

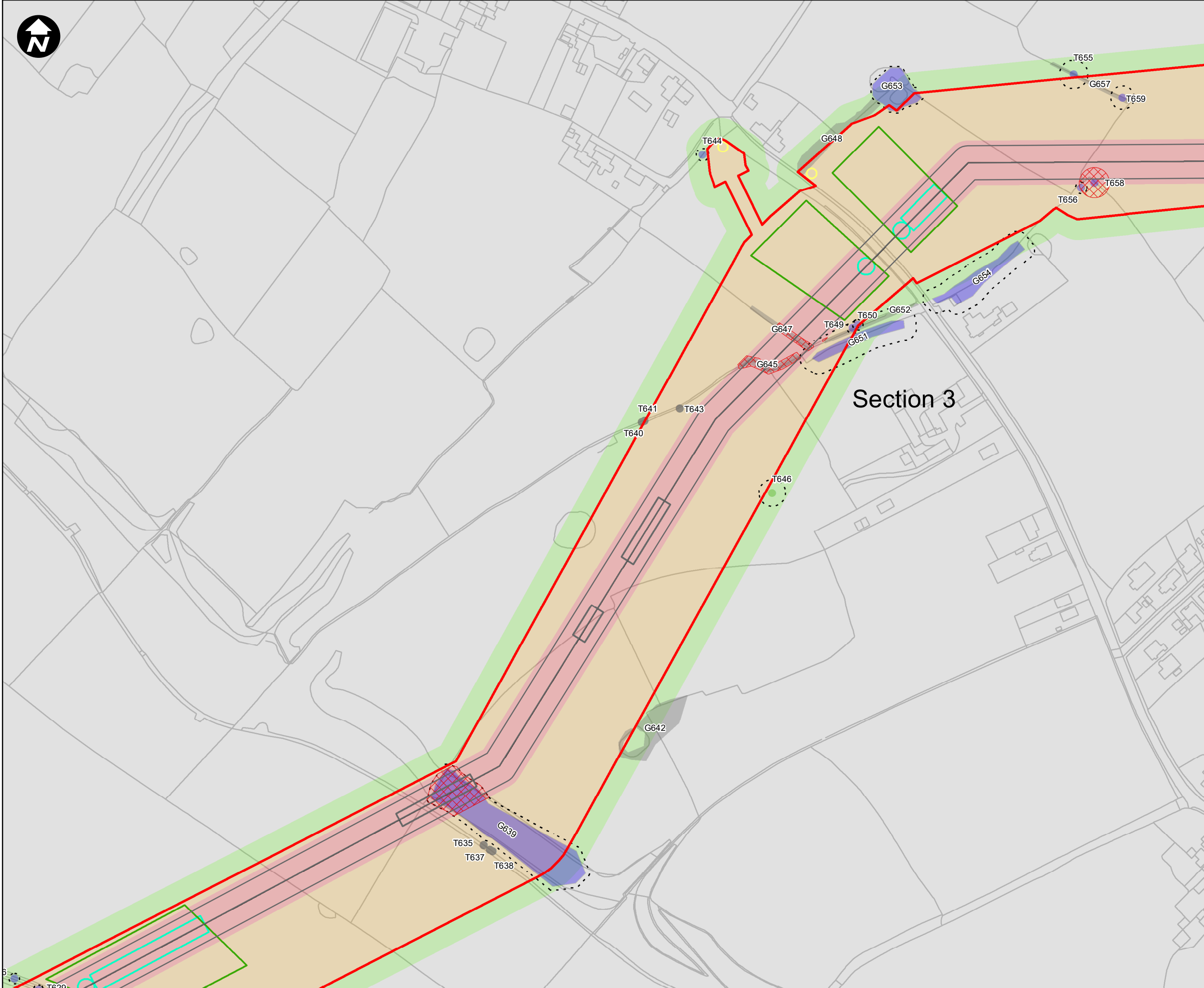
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EN070007-PA-PEI-3.1-Sheet 21



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

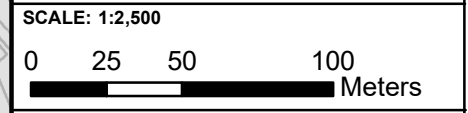
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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PROJECT TITLE
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DRAWING NUMBER
EN070007-PA-PEI-3.1-Sheet 22



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment
 - Red - Removed
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- Constructions Layers
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 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access - Existing Access Point
 - Construction Access - New Access Point
 - Localised Compound



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Page 23 of 46**

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Section 3

Section 4



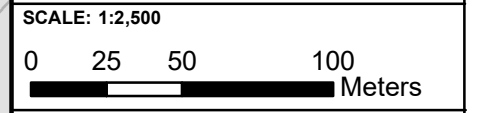
Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
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 - Construction Access – New Access Point
 - Localised Compound



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EN070007-PA-PEI-3.1-Sheet 24



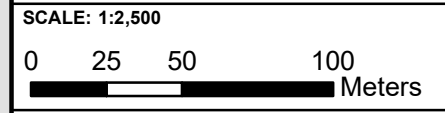


Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
 - A
 - B
 - C
 - U
- Preliminary Removals
- Root Protection Areas (RPA)**
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's**
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
 - Red - Removed
 - Amber - At Risk
 - Green - Retained
- Constructions Layers**
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access – Existing Access Point
 - Construction Access – New Access Point
 - Localised Compound



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Preliminary Constraints and Impacts Plan
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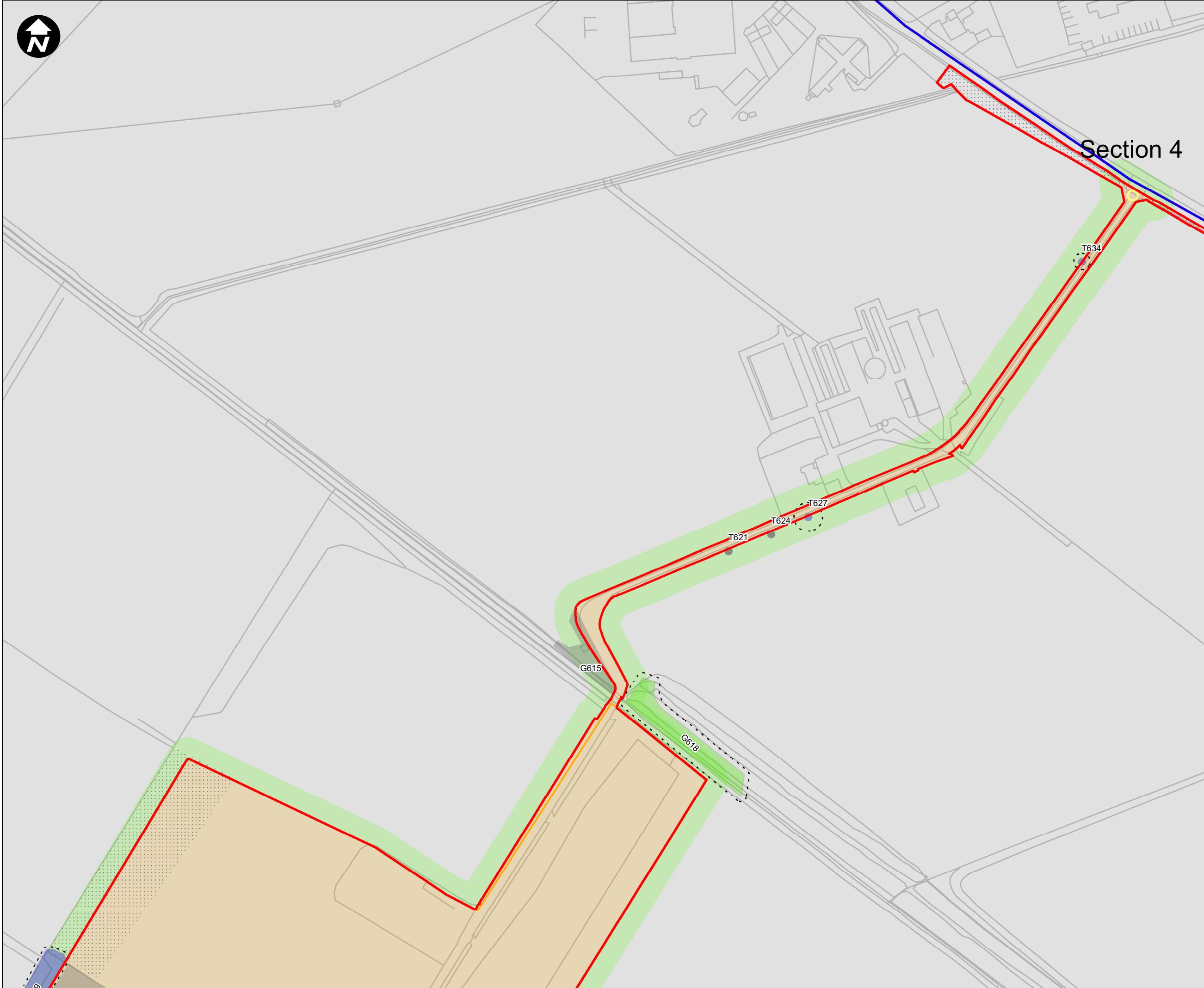
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Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

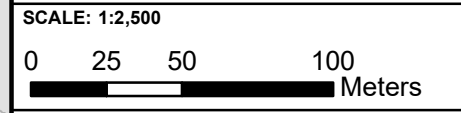
Preliminary Removals
 Root Protection Areas (RPA)
 Root Protection Areas (RPA)
Veteran Trees - RPA's
 Veteran Tree to be Retained
 Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

■ Red	Red - Removed
■ Amber	Amber - At Risk
■ Green	Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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PROJECT TITLE
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EN070007-PA-PEI-3.1-Sheet 26



Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

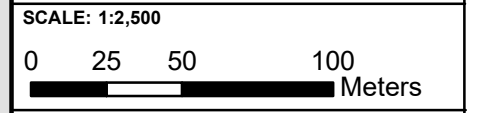
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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PROJECT TITLE
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 Preliminary Constraints and Impacts Plan
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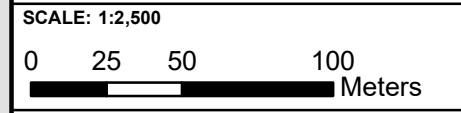
Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment
 - Red - Removed
 - Amber - At Risk
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- Constructions Layers
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access – Existing Access Point
 - Construction Access – New Access Point
 - Localised Compound



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PROJECT TITLE
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Page 28 of 46**

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1:2,500	14/03/2023	B

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Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Root Protection Areas (RPA)

- Preliminary Removals
- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

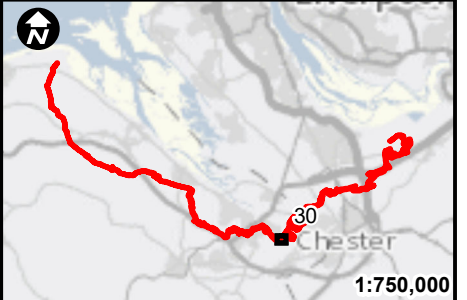
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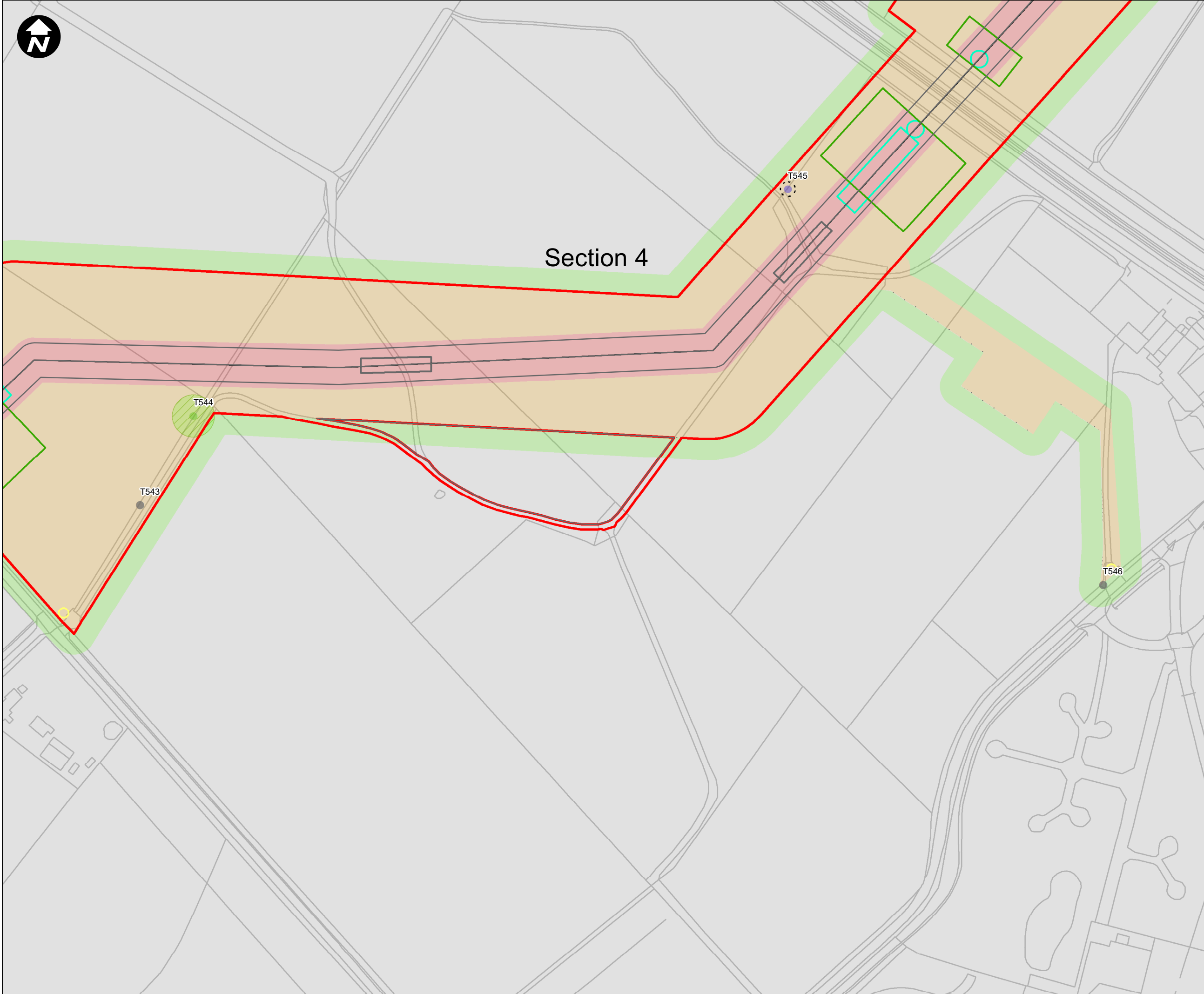
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EN070007-PA-PEI-3.1-Sheet 29



Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Root Protection Areas (RPA)

- Preliminary Removals
- Root Protection Areas (RPA)

Veteran Trees - RPA's

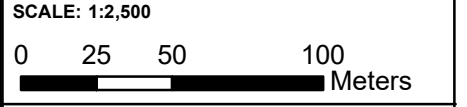
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

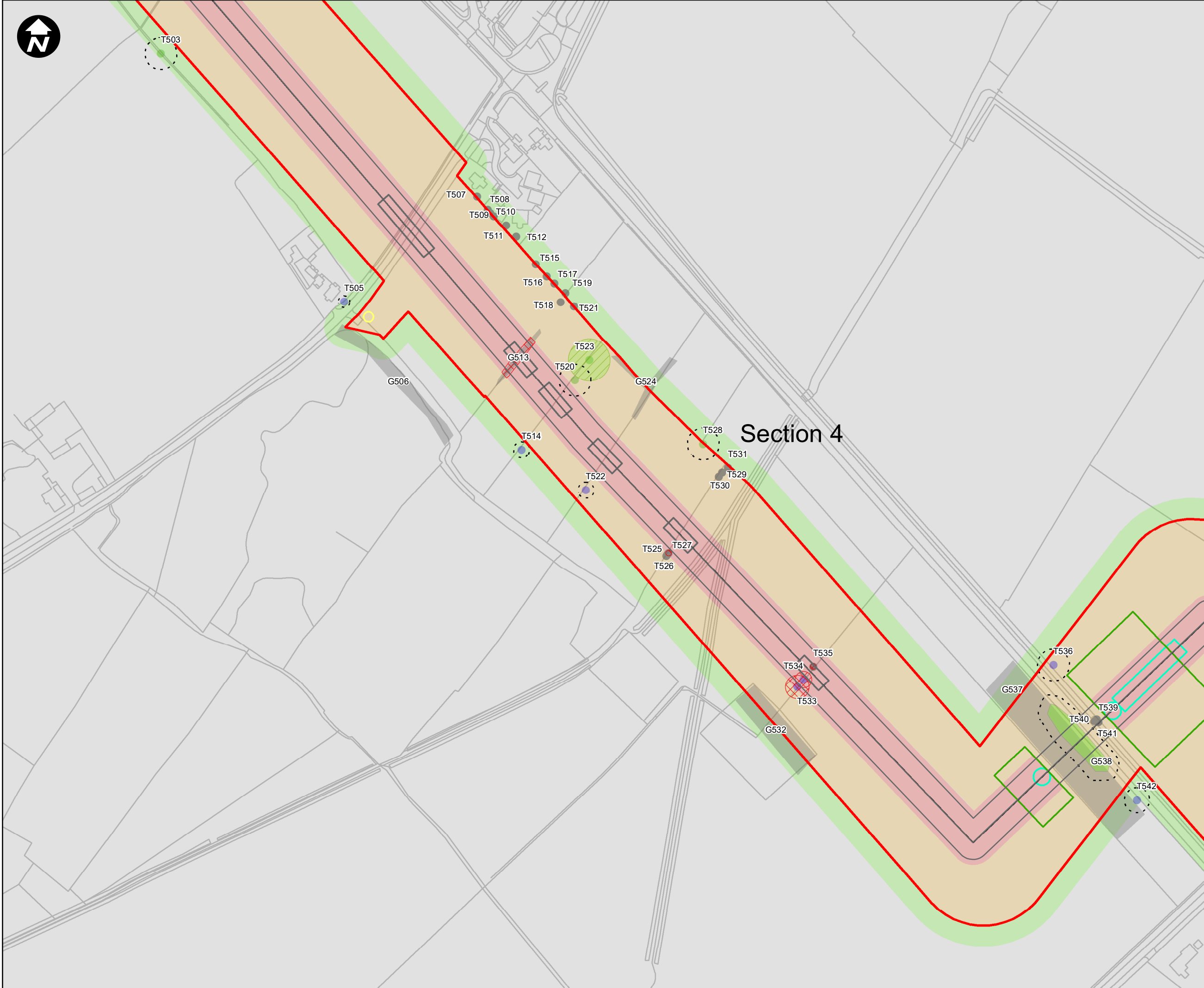
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Page 30 of 46

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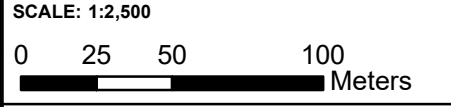
Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's
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 - Centralised Compound
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 - Trenchless Crossing Compound
 - Construction Access – Existing Access Point
 - Construction Access – New Access Point
 - Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

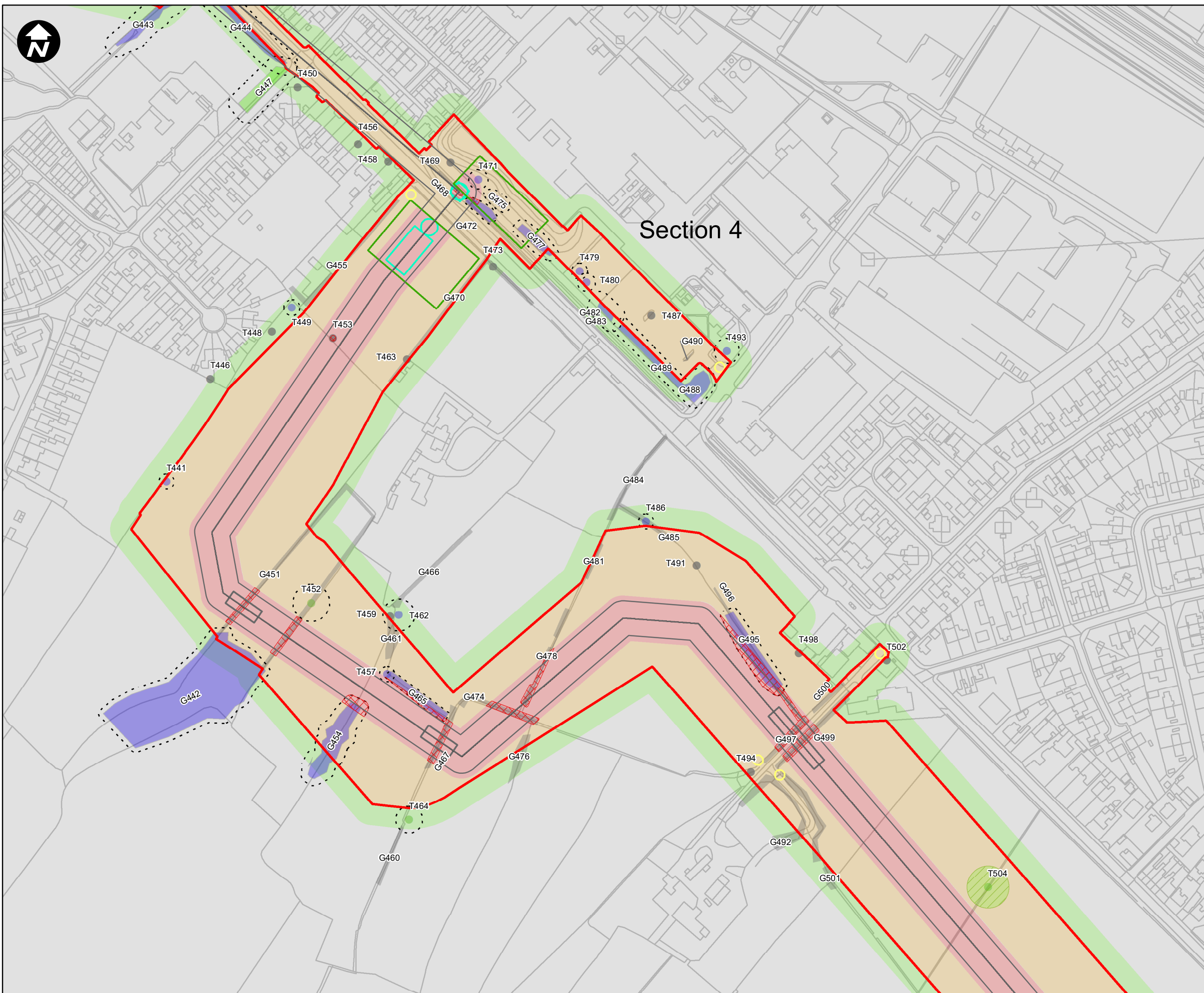
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Page 31 of 46**

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SCALE @ A3 SIZE	DATE	REVISION
1:2,500	14/03/2023	B

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Section 4



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

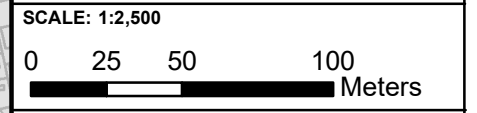
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
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- Construction Access – New Access Point
- Localised Compound



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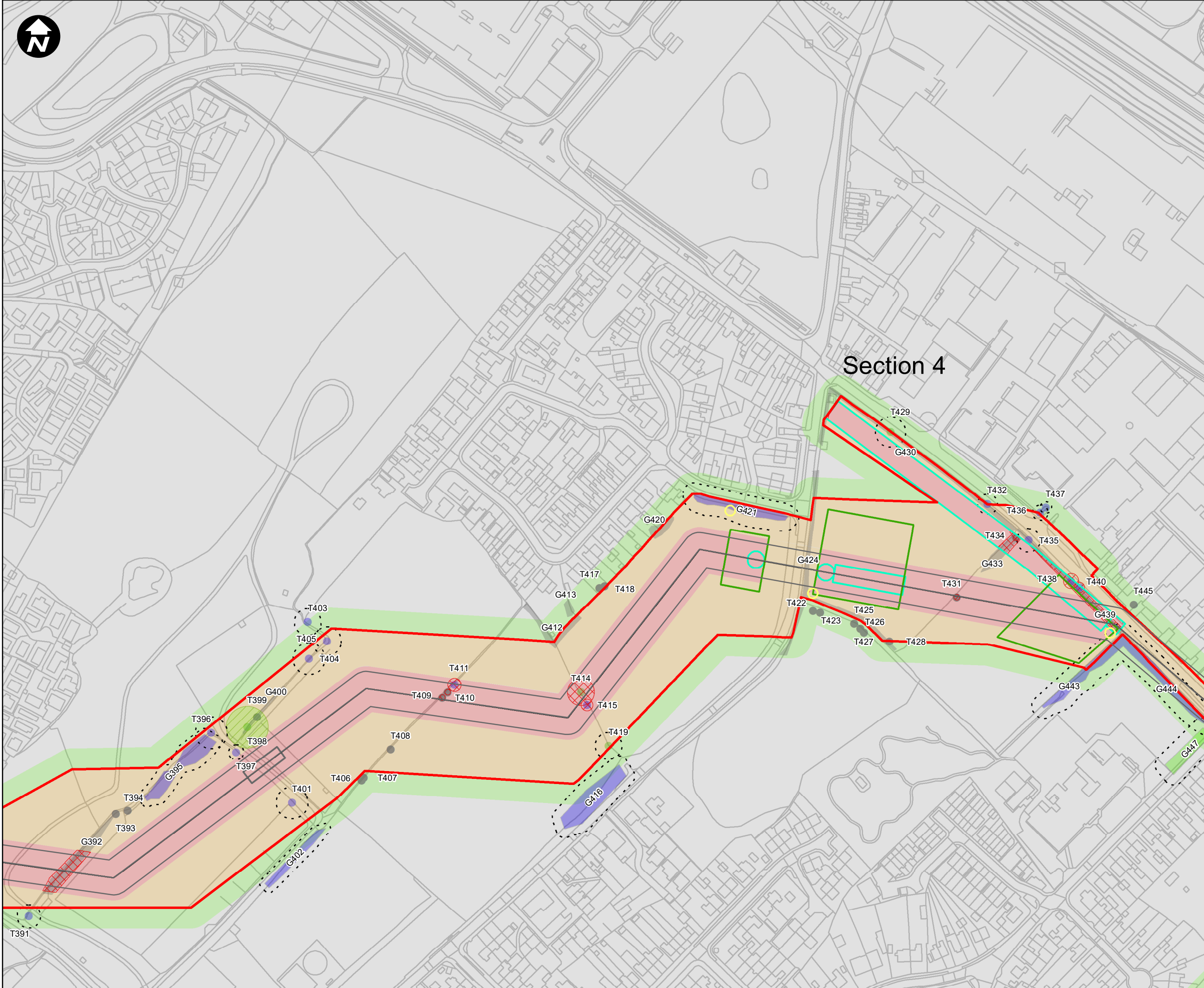
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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
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- Veteran Tree to be Retained
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- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

Section 4



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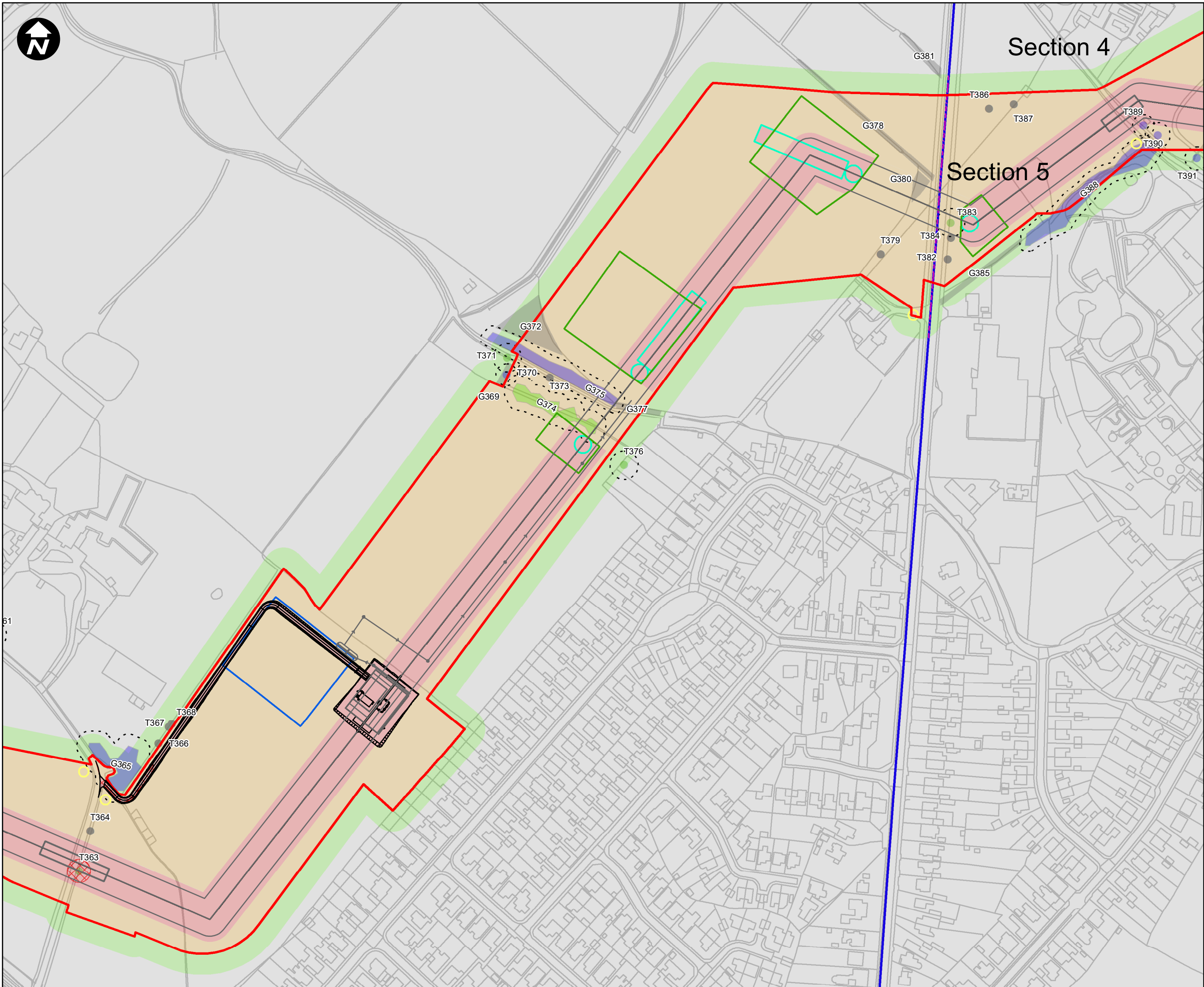
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Page 33 of 46**

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DRAWING NUMBER
EN070007-PA-PEI-3.1-Sheet 33



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	 A
● B	 B
● C	 C
● U	 U

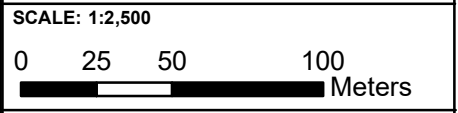
- Preliminary Removals
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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HyNet Carbon Dioxide Pipeline DCO

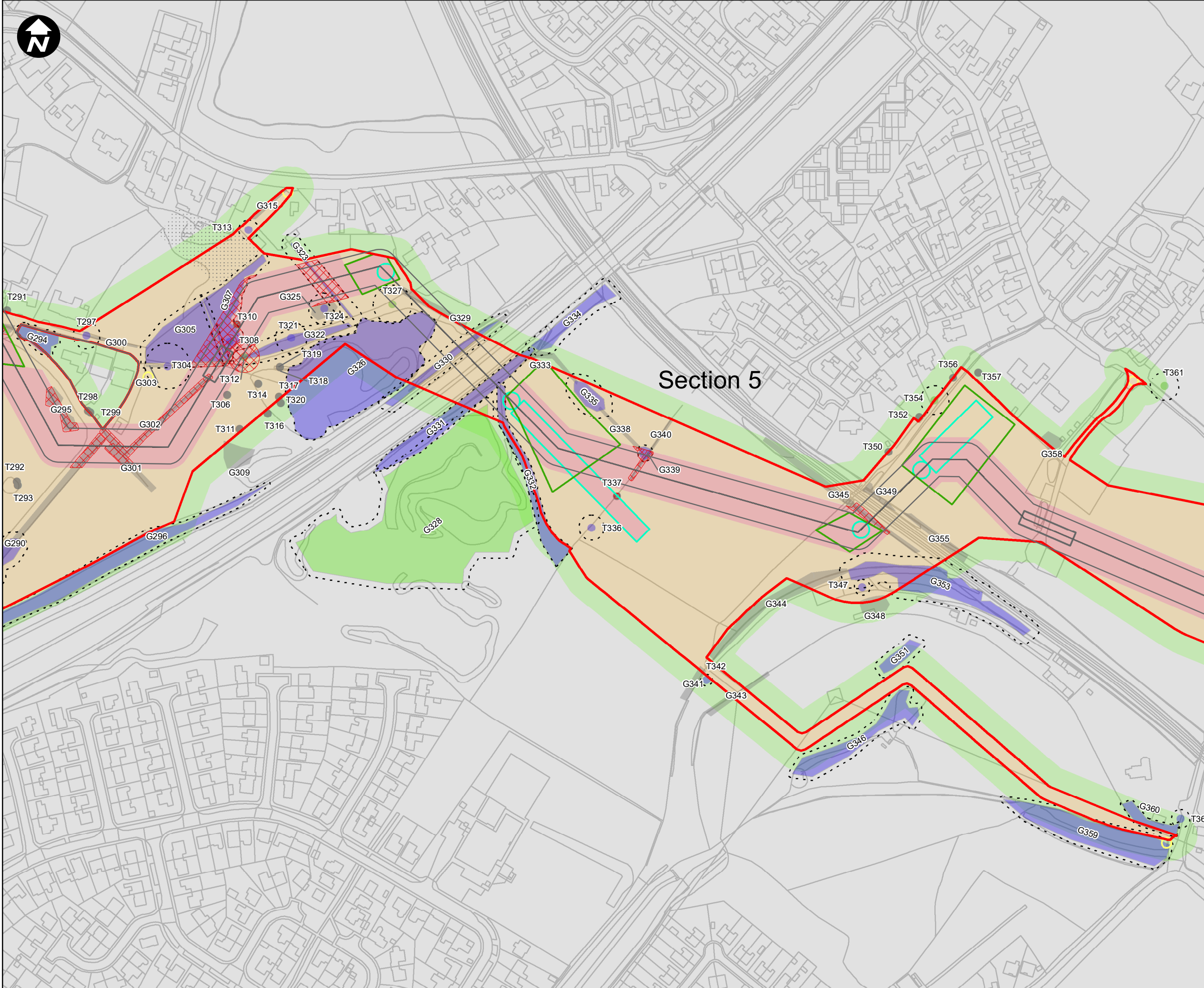
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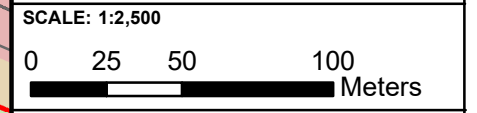
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Section 5

Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A
- B
- C
- U
- A
- B
- C
- U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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**Preliminary Constraints and Impacts Plan
Page 35 of 46**

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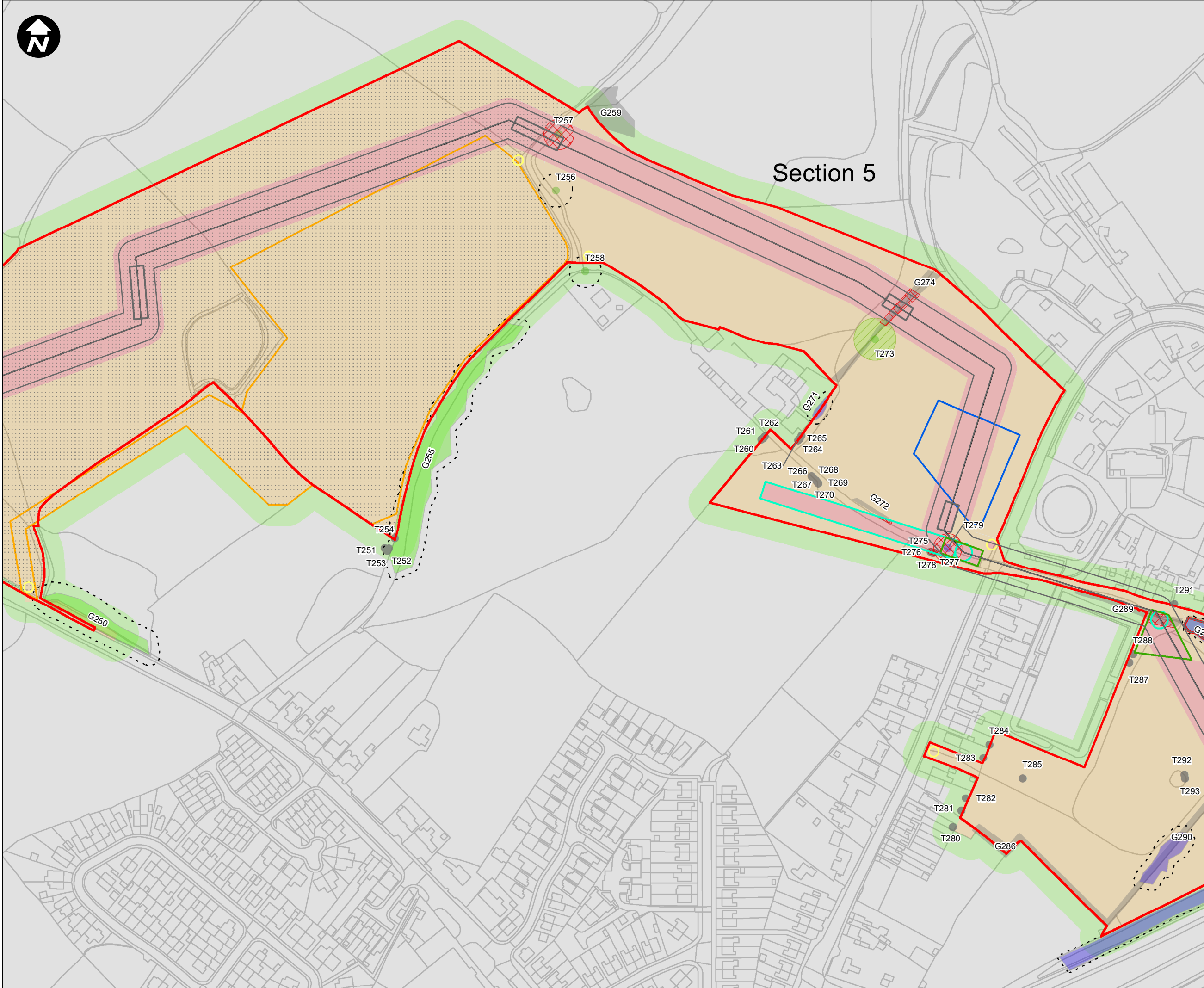
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EN070007-PA-PEI-3.1-Sheet 35



Section 5



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

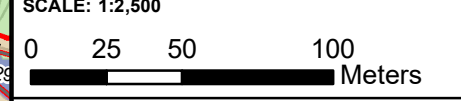
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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EN070007-PA-PEI-3.1-Sheet 36



Option PS02b

Section 5

1:750,000

Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- Option PS02b

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removals

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

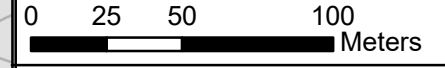
Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound

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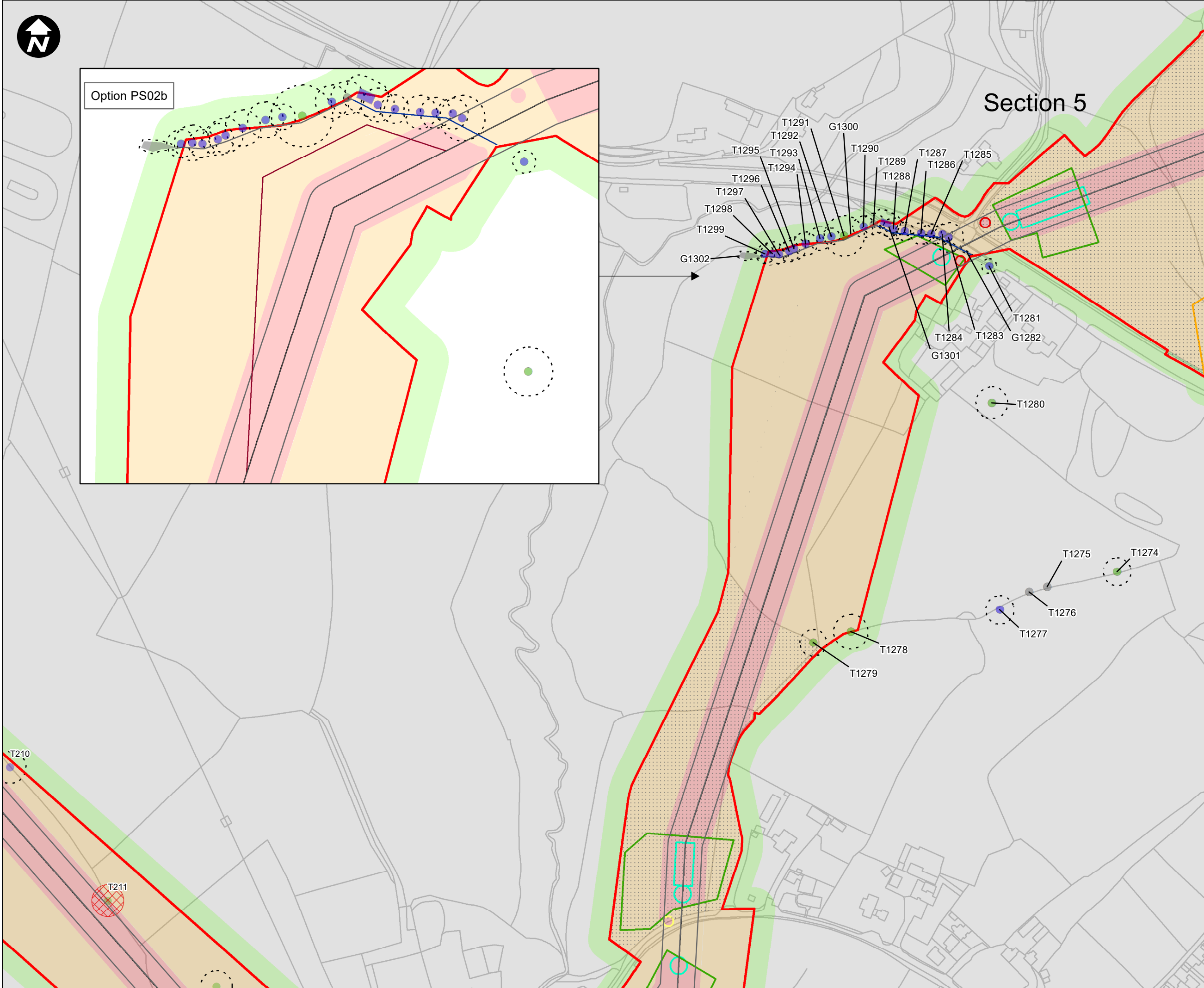
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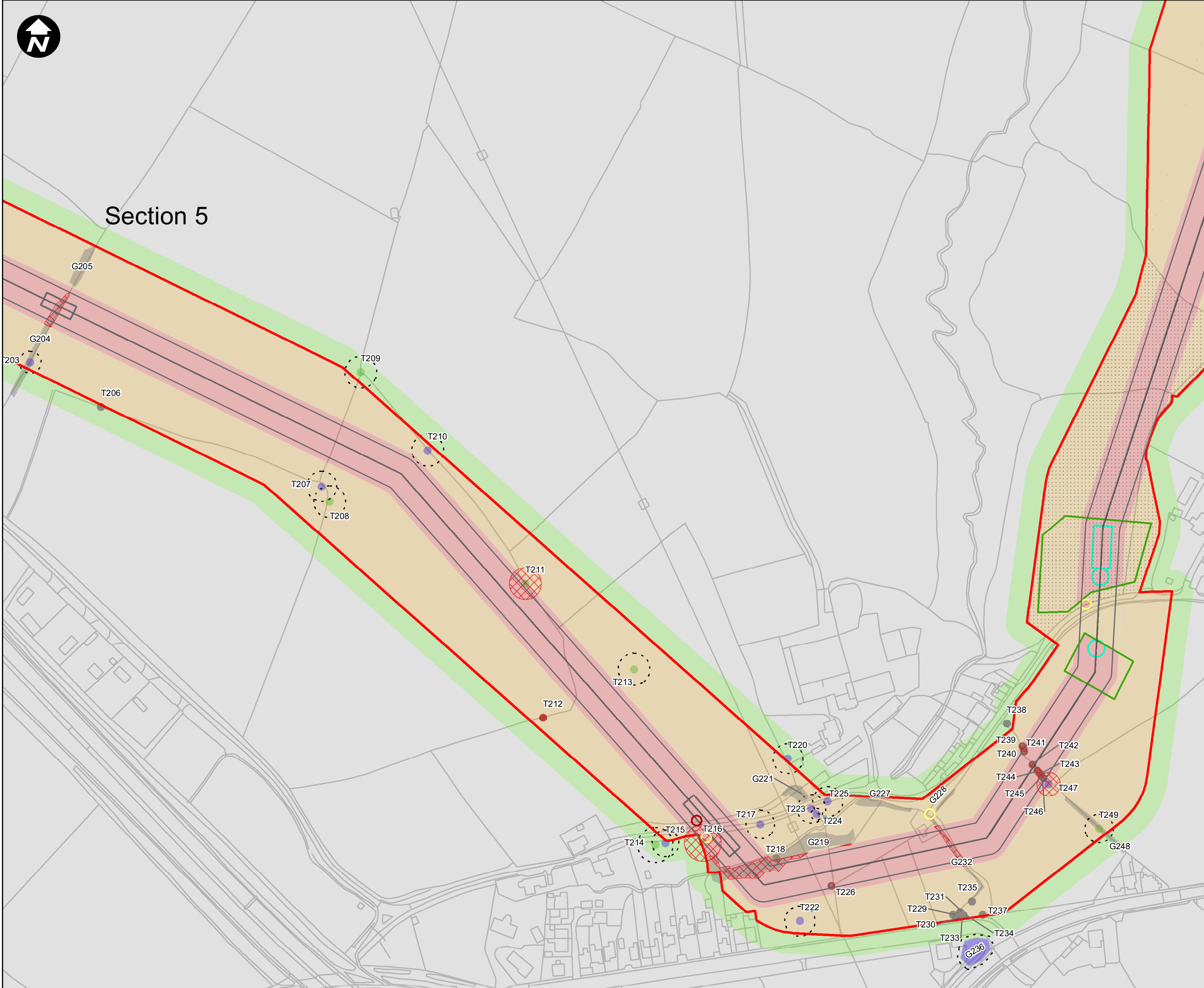
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EN070007-PA-PEI-3.1- Sheet 37





Section 5



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

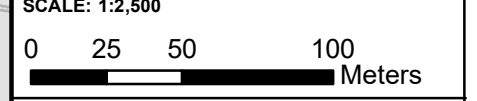
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- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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Page 38 of 46**

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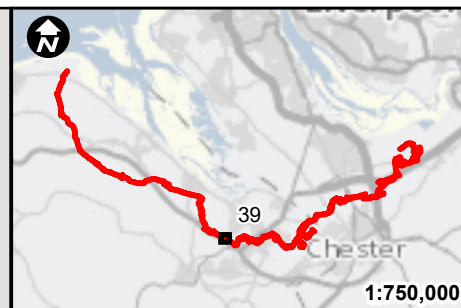
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EN070007-PA-PEI-3.1-Sheet 38



Section 5



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	 A
● B	 B
● C	 C
● U	 U

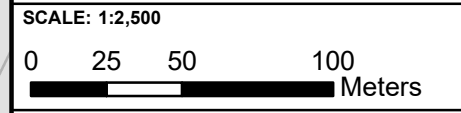
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- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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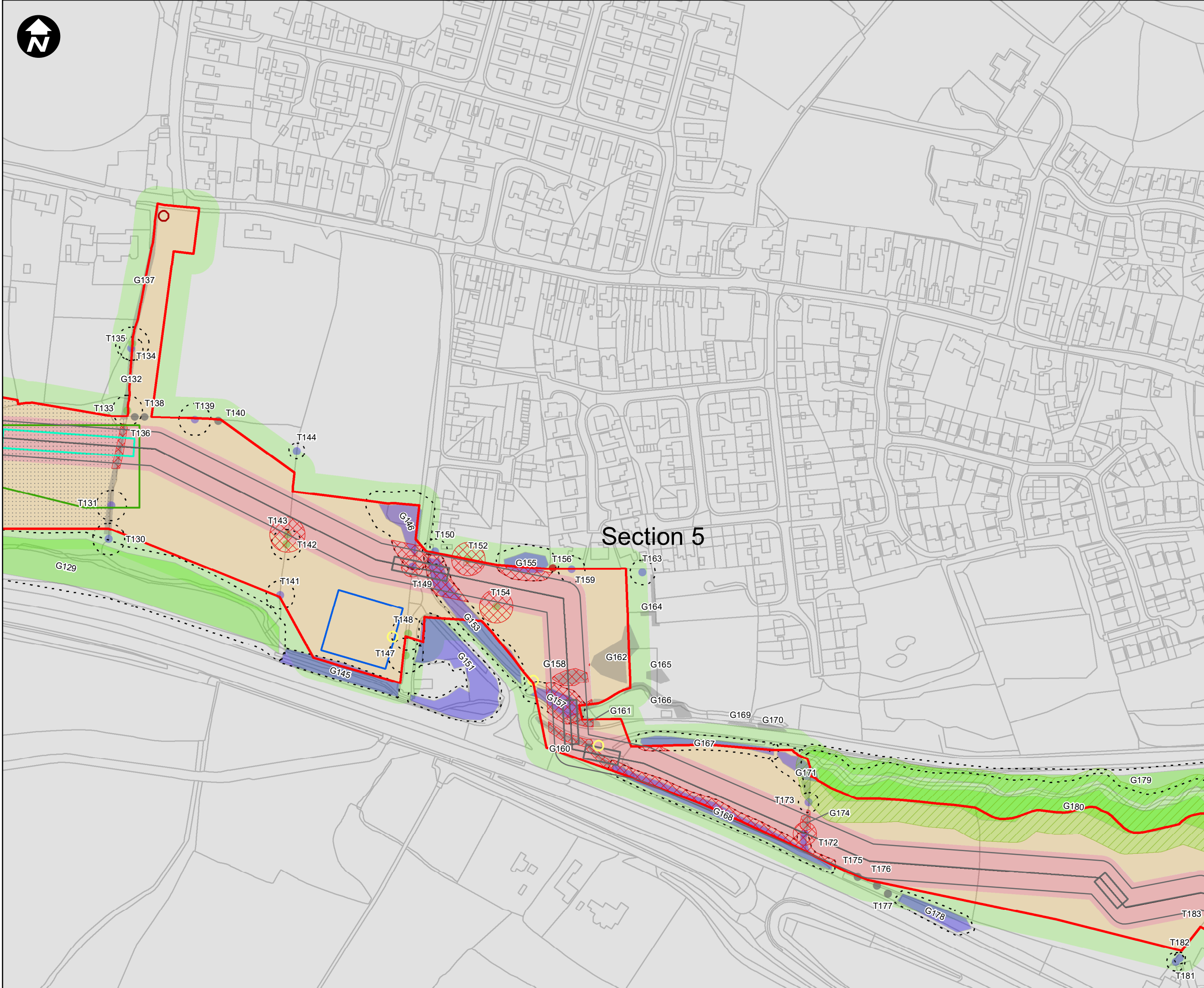
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Page 39 of 46**

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EN070007-PA-PEI-3.1-Sheet 39



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A A
- B B
- C C
- U U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound

Section 5

SCALE: 1:2,500



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HyNet Carbon Dioxide Pipeline DCO

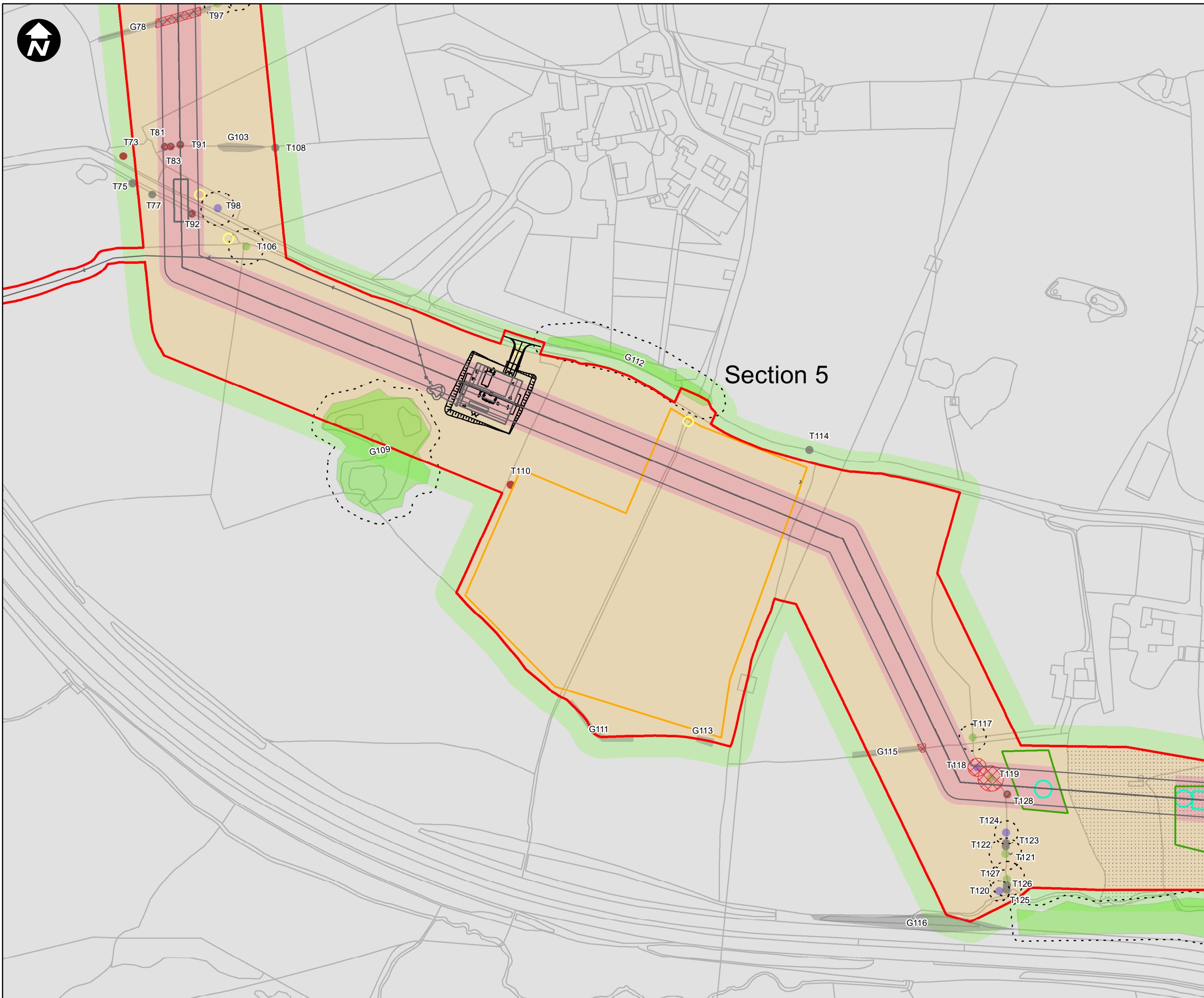
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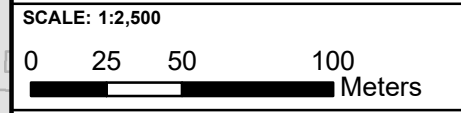
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EN070007-PA-PEI-3.1-Sheet 40



1:750,000

- Key:**
- New Infrastructure Development Boundary
 - Areas Not Surveyed
 - Proposed Sections
- BS 5837 Tree Category Grading**
- A
 - B
 - C
 - U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
 - Amber - At Risk
 - Green - Retained
- Constructions Layers**
- Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access - Existing Access Point
 - Construction Access - New Access Point
 - Localised Compound



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Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

- A
- B
- C
- U

Preliminary Removes

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

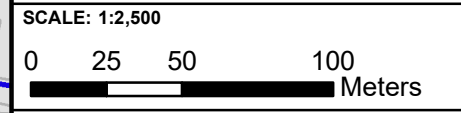
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access - Existing Access Point
- Construction Access - New Access Point
- Localised Compound



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PROJECT TITLE
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Preliminary Constraints and Impacts Plan
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SCALE @ A3 SIZE	DATE	REVISION
1:2,500	14/03/2023	B

DRAWING NUMBER
EN070007-PA-PEI-3.1-Sheet 42



Section 6

Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
 - A
 - B
 - C
 - U
- Preliminary Removals
- Root Protection Areas (RPA)**
 - Root Protection Areas (RPA)
- Veteran Trees - RPA's**
 - Veteran Tree to be Retained
 - Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
 - Red - Removed
 - Amber - At Risk
 - Green - Retained
- Constructions Layers**
 - Proposed Development Design
 - Trenchless Crossing
 - Centralised Compound
 - Open-cut trench Crossings
 - Trenchless Crossing Compound
 - Construction Access – Existing Access Point
 - Construction Access – New Access Point
 - Localised Compound

SCALE: 1:2,500



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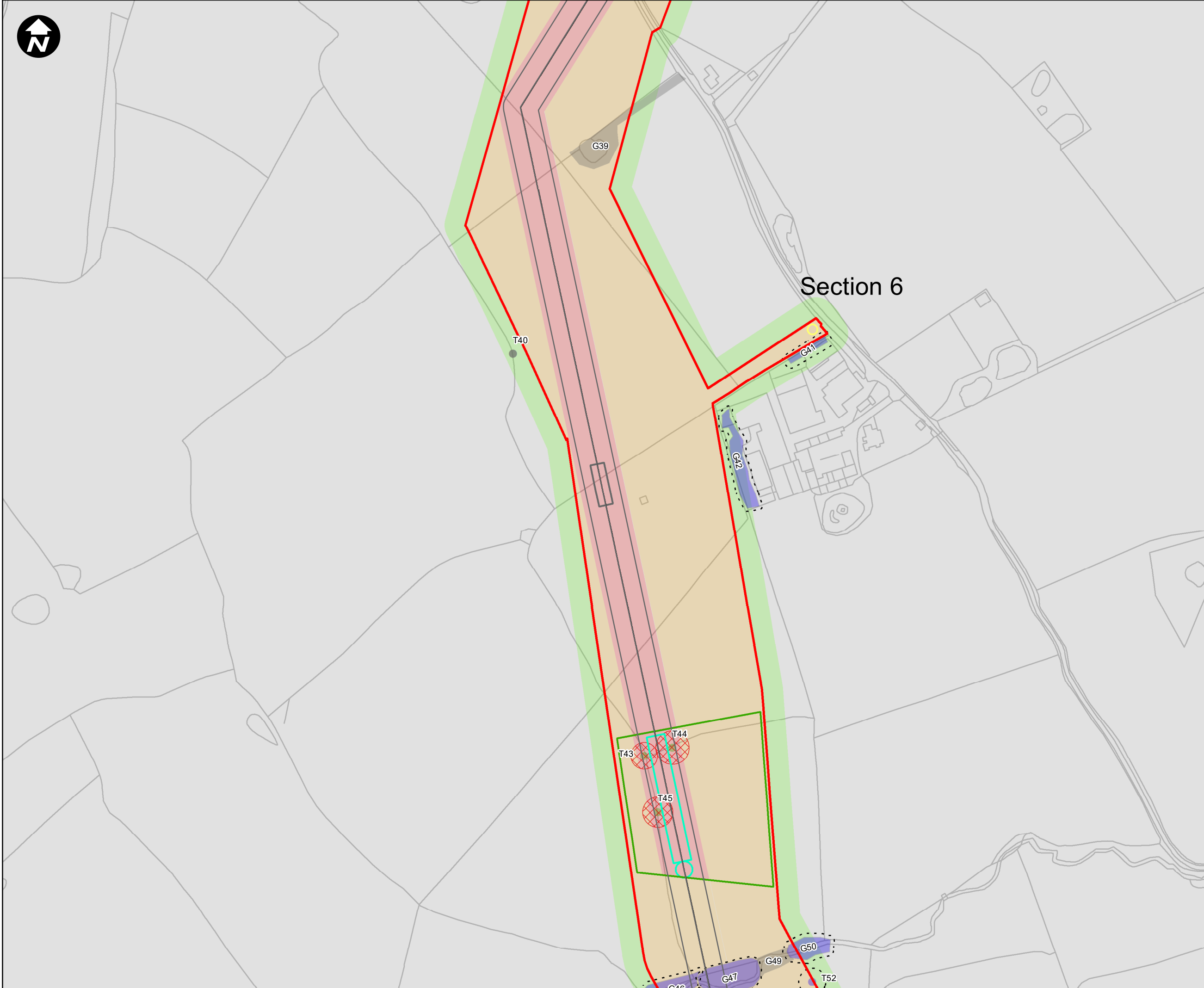
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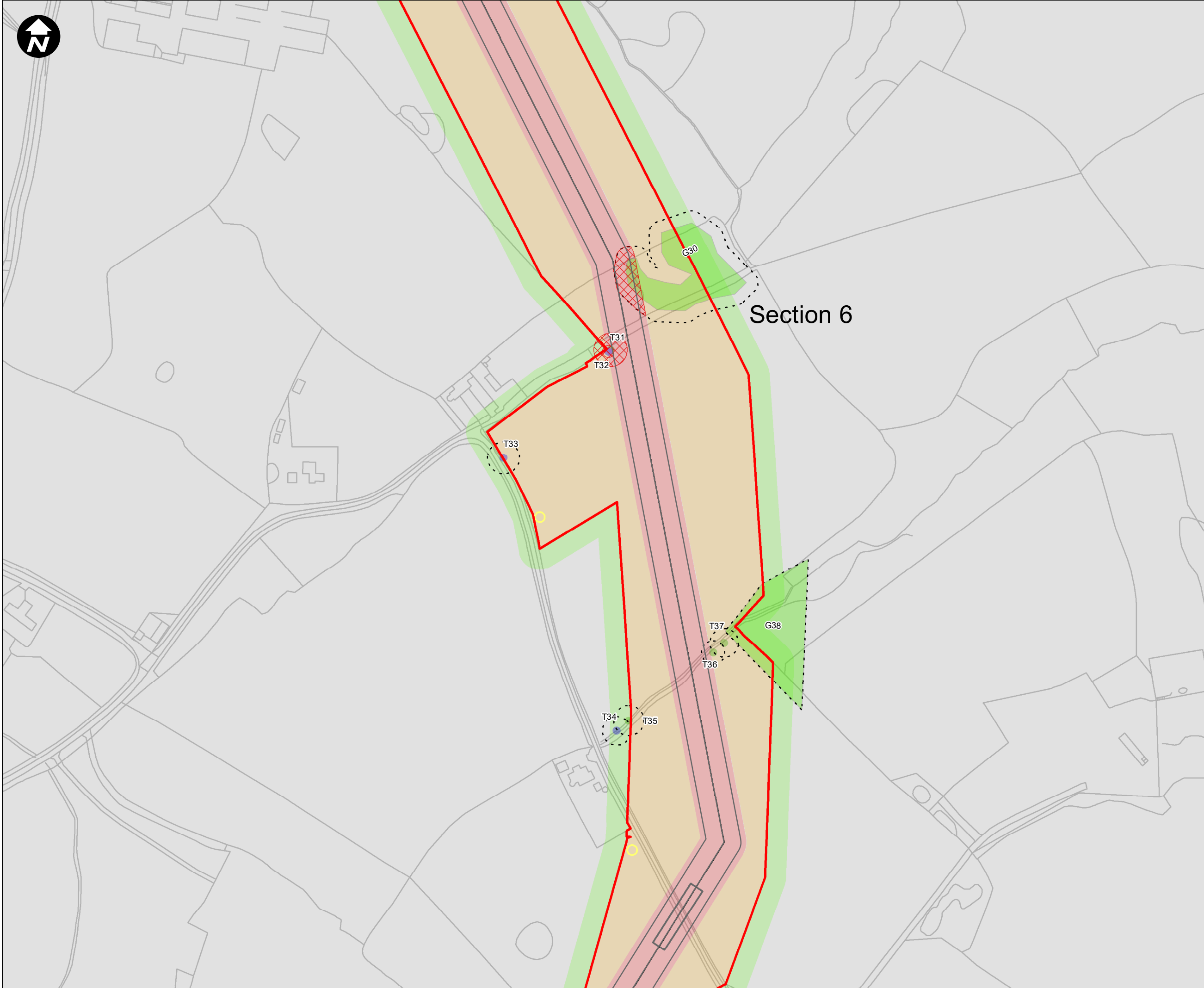
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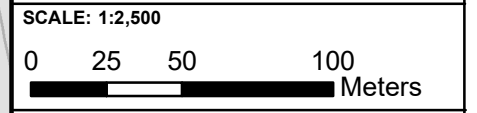
Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

● A	■ A
● B	■ B
● C	■ C
● U	■ U

- Preliminary Removals
- Root Protection Areas (RPA)
- Veteran Trees - RPA's
- Preliminary RAG Impact Assessment
- Constructions Layers



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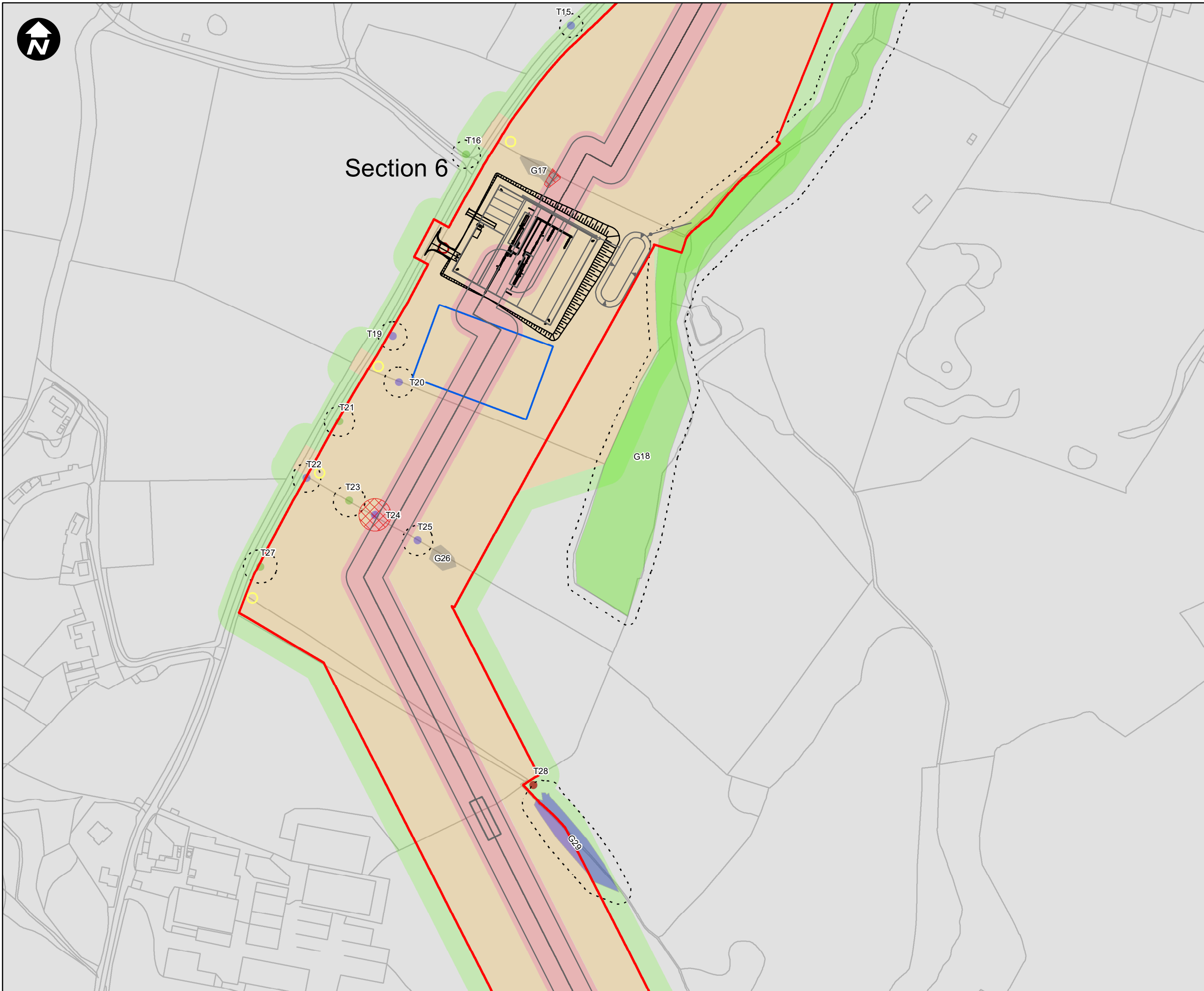
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EN070007-PA-PEI-3.1-Sheet 44



Section 6



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections

BS 5837 Tree Category Grading

A	A
B	B
C	C
U	U

- Preliminary Removals

Root Protection Areas (RPA)

- Root Protection Areas (RPA)

Veteran Trees - RPA's

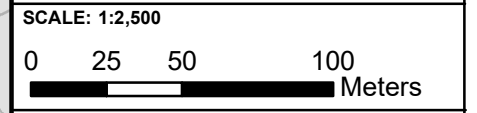
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain

Preliminary RAG Impact Assessment

- Red - Removed
- Amber - At Risk
- Green - Retained

Constructions Layers

- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound



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EN070007-PA-PEI-3.1-Sheet 45



Key:

- New Infrastructure Development Boundary
- Areas Not Surveyed
- Proposed Sections
- BS 5837 Tree Category Grading**
- A A
- B B
- C C
- U U
- Preliminary Removals
- Root Protection Areas (RPA)**
- Root Protection Areas (RPA)
- Veteran Trees - RPA's**
- Veteran Tree to be Retained
- Veteran Tree at Risk, aiming to Retain
- Preliminary RAG Impact Assessment**
- Red - Removed
- Amber - At Risk
- Green - Retained
- Constructions Layers**
- Proposed Development Design
- Trenchless Crossing
- Centralised Compound
- Open-cut trench Crossings
- Trenchless Crossing Compound
- Construction Access – Existing Access Point
- Construction Access – New Access Point
- Localised Compound

SCALE: 1:2,500



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Page 46 of 46**

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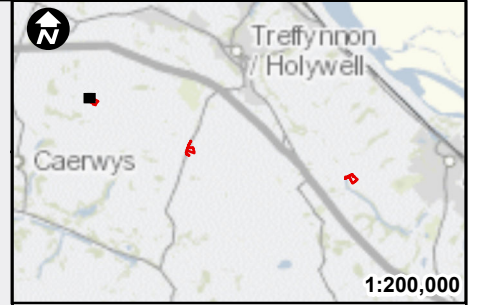
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Section 6

ANNEX E – TREE REMOVAL AND PROTECTION PLAN (SECTION 7 OF THE DCO PROPOSED DEVELOPMENT)



Key:

- Newbuild Infrastructure Boundary
- Arboricultural Study Area
- Tree Canopies
- Babell BVS
- Special Measures Area
- Root Protection Area (RPA)
- Indicative Protective Fencing
- Indicative Tree Removals

BS5837 2012 Tree Category

A	A
B	B
C	C
U	U

SCALE: 1:500

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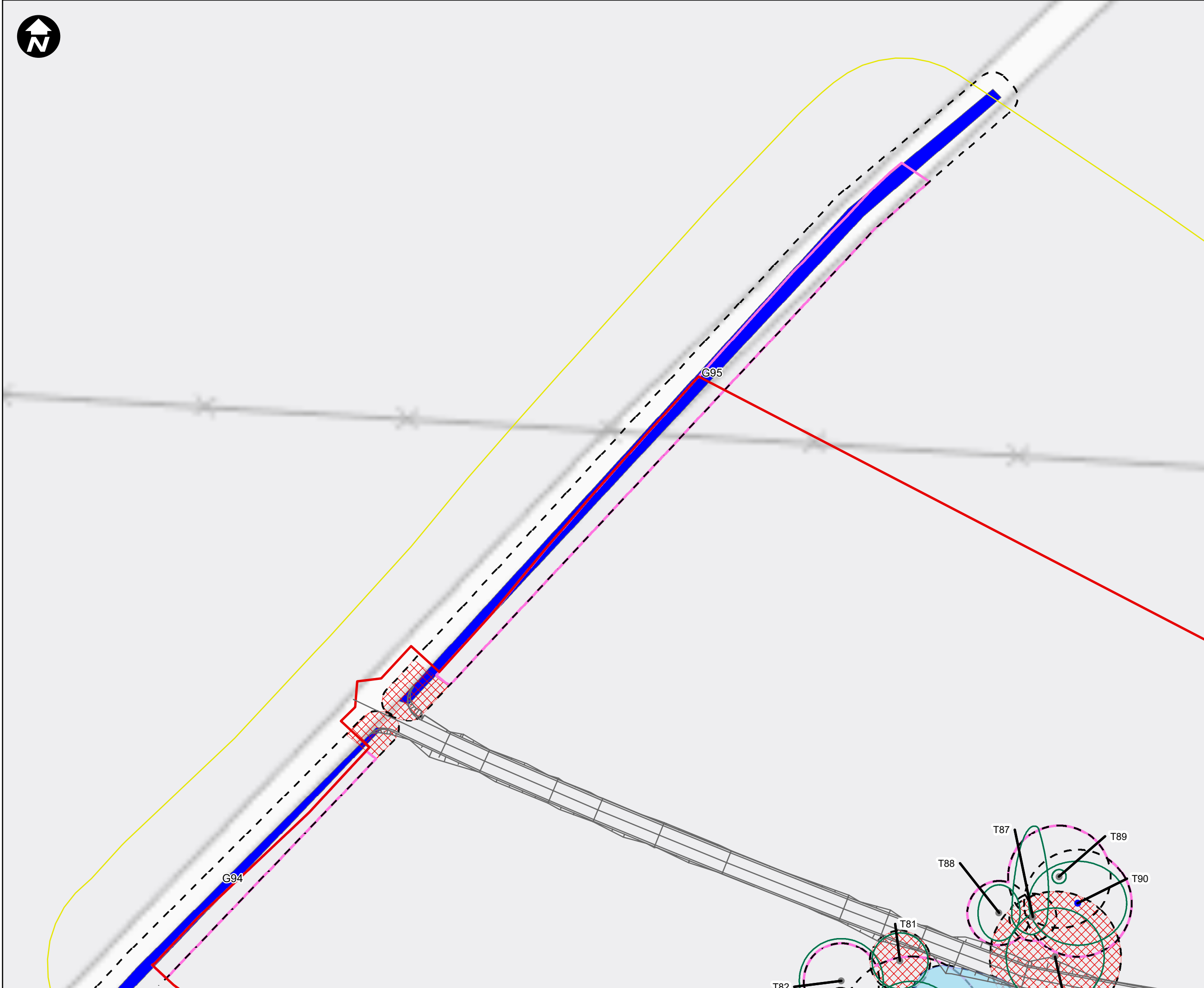
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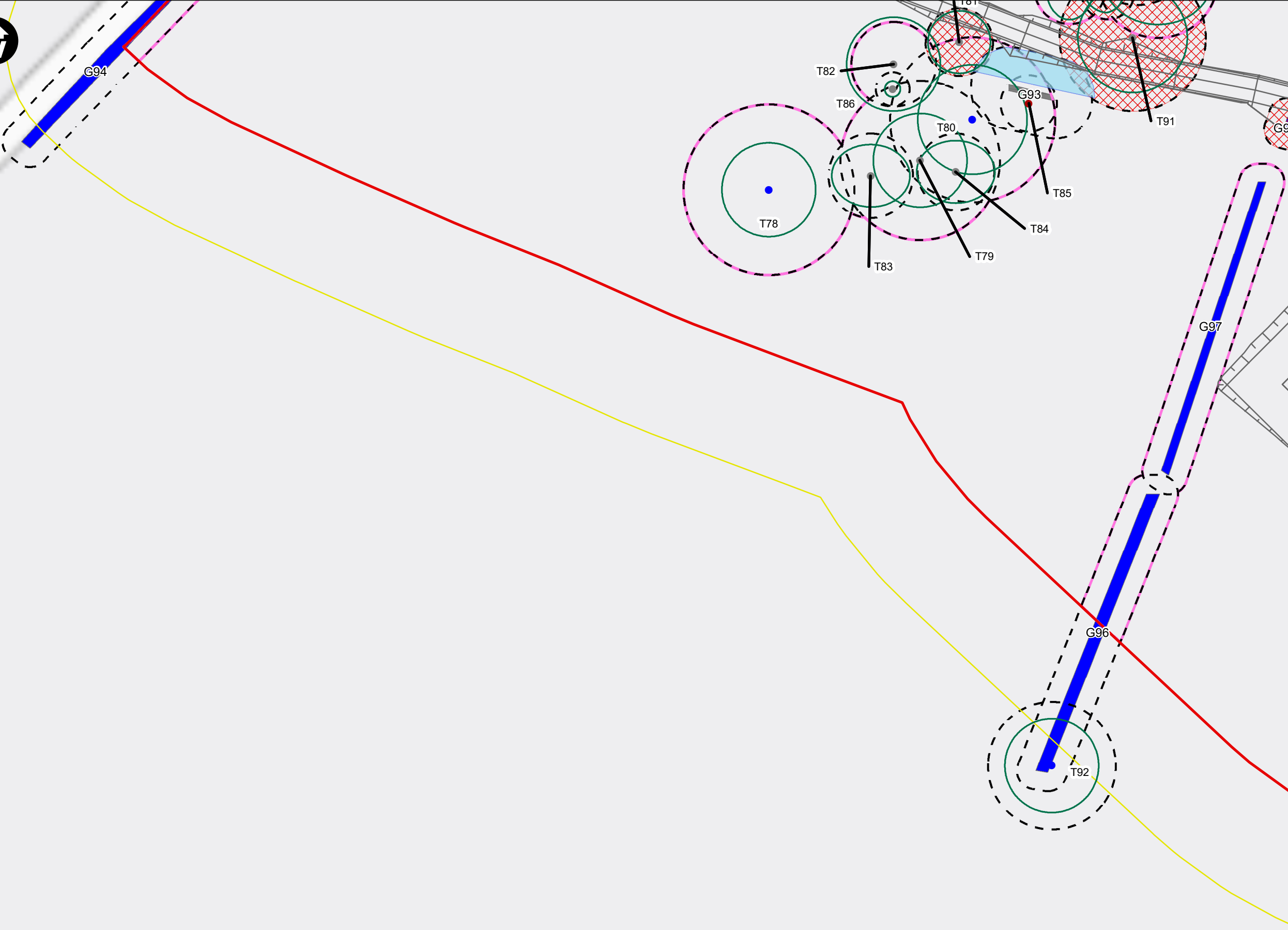
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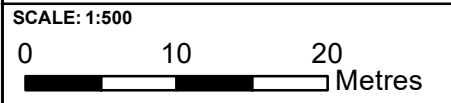


Key:

- Newbuild Infrastructure Boundary
- Arboricultural Study Area
- Tree Canopies
- Babell BVS
- Special Measures Area
- Root Protection Area (RPA)
- Indicative Protective Fencing
- Indicative Tree Removals

BS5837 2012 Tree Category

- | | |
|---|---|
| A | A |
| B | B |
| C | C |
| U | U |



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PROJECT TITLE
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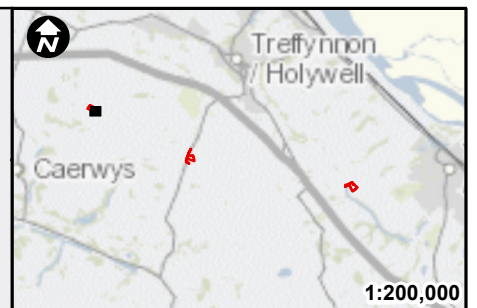
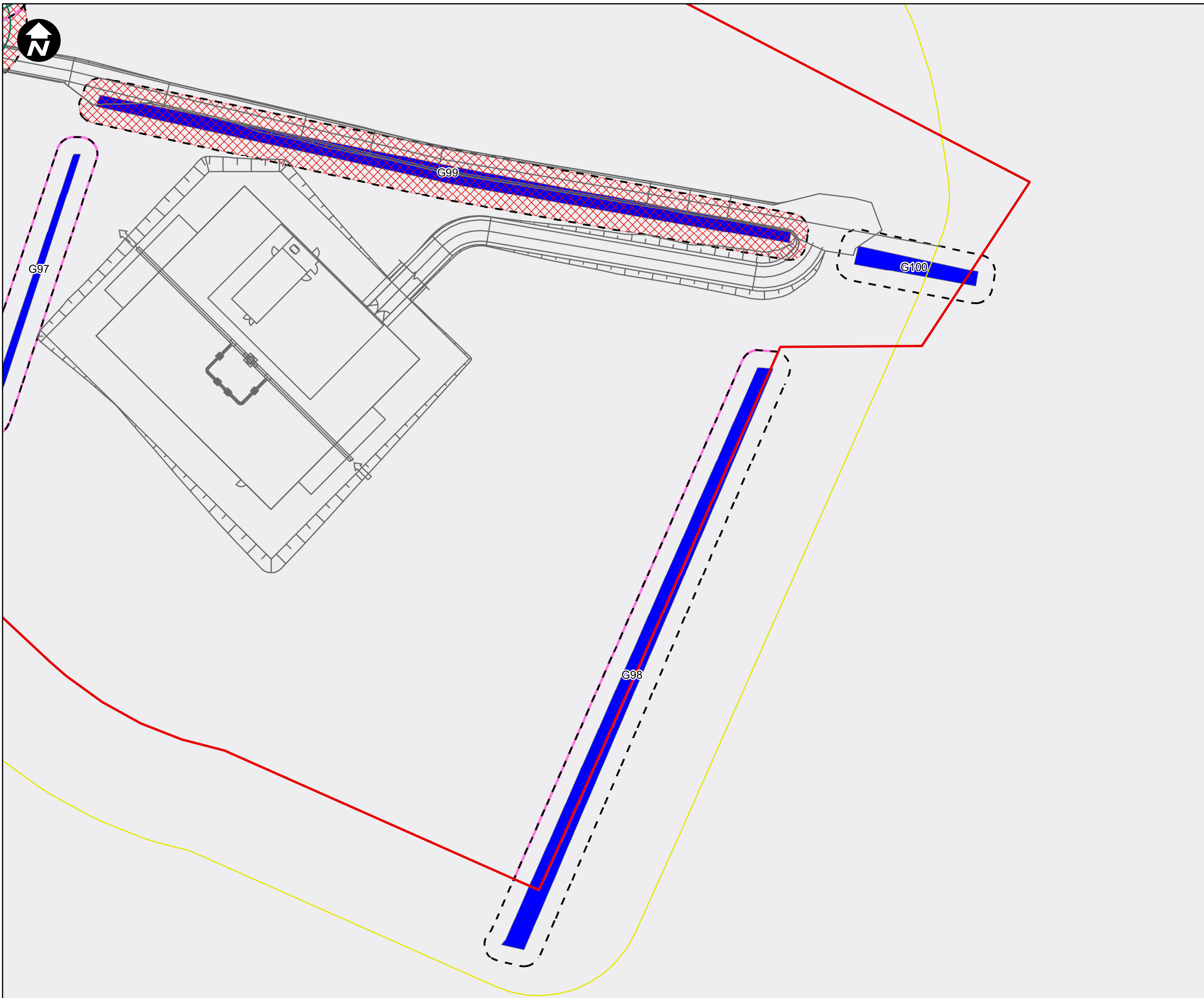
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 SHEET 2 OF 11

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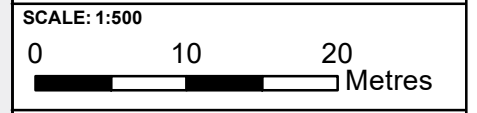


Key:

- Newbuild Infrastructure Boundary
- Arboricultural Study Area
- Tree Canopies
- Babell BVS
- Root Protection Area (RPA)
- Indicative Protective Fencing
- Indicative Tree Removals

BS5837 2012 Tree Category

● A		■ A
● B		■ B
● C		■ C
● U		■ U



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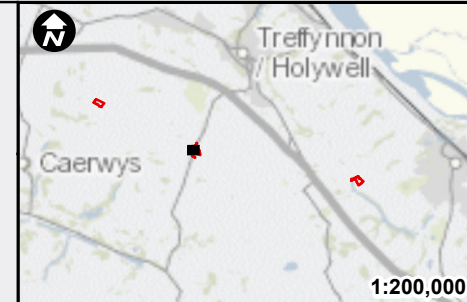
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DRAWING STATUS
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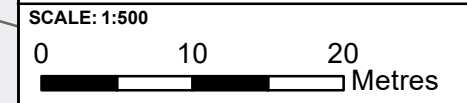
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- Key:**
- Newbuild Infrastructure Boundary
 - Arboricultural Study Area
 - Pentre Halkyn BVS
 - Root Protection Area (RPA)
 - Indicative Protective Fencing
 - Indicative Tree Removals

BS5837 2012 Tree Category

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| ● | B | | ■ | B |
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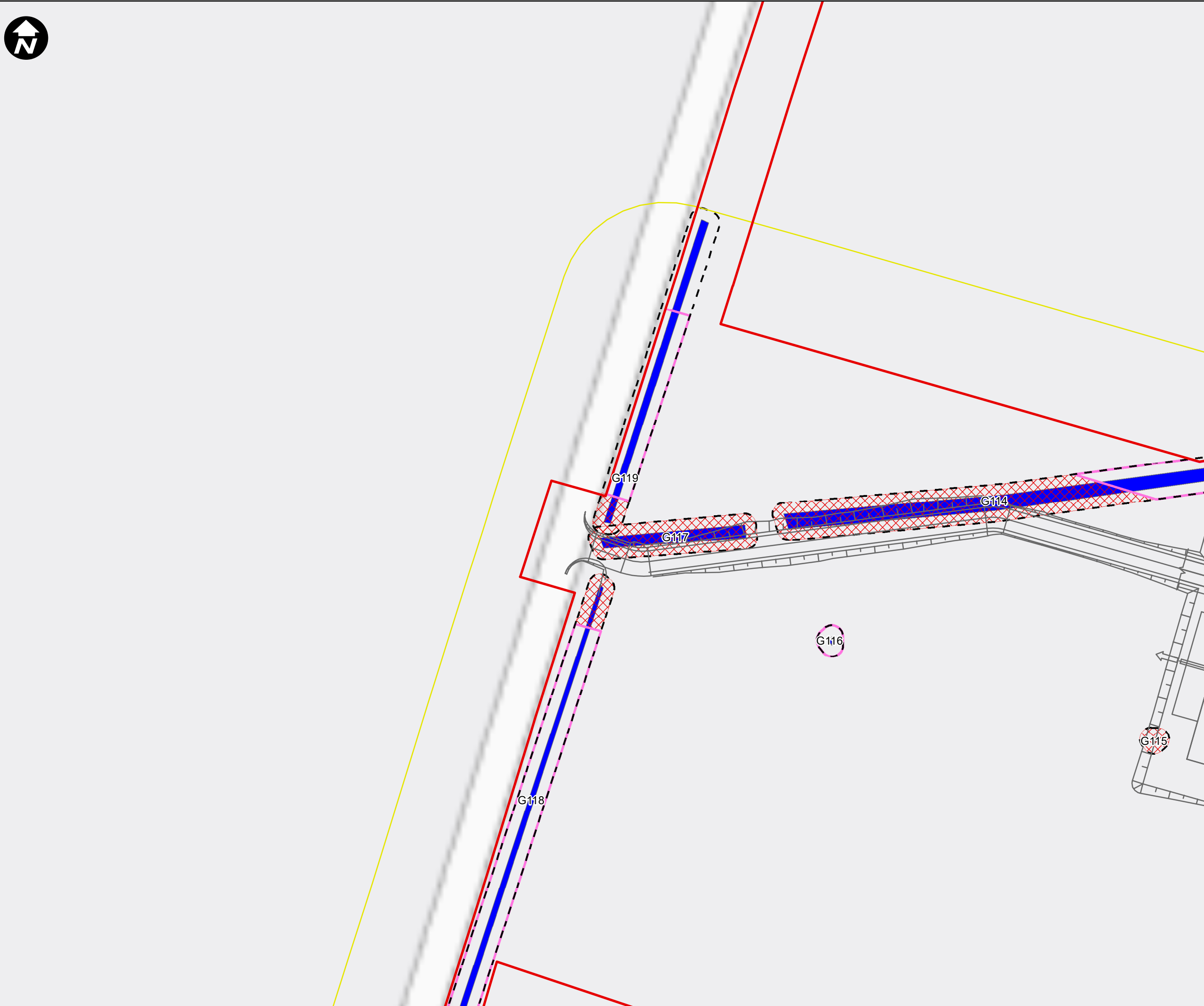
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 SHEET 4 OF 11

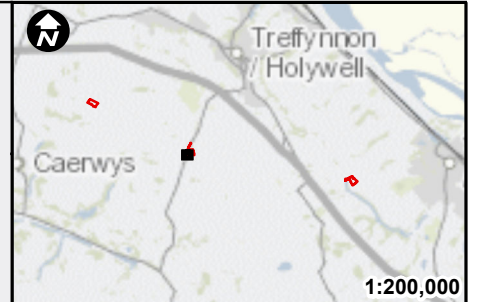
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

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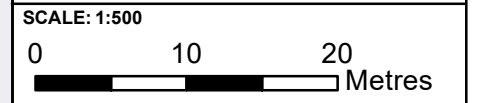




- Key:**
-  Newbuild Infrastructure Boundary
 -  Arboricultural Study Area
 -  Tree Canopies
 -  Root Protection Area (RPA)
 -  Indicative Protective Fencing

BS5837 2012 Tree Category

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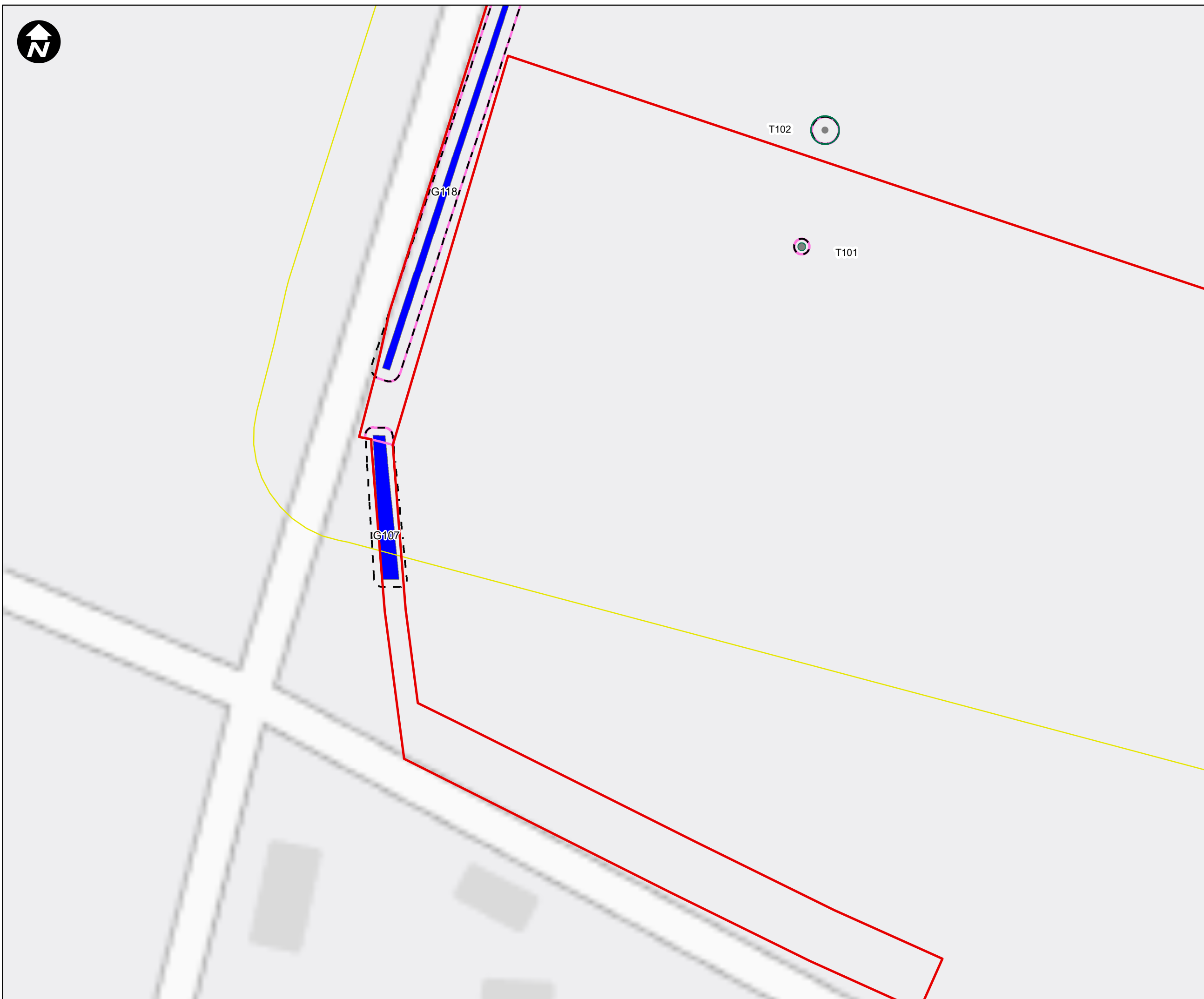
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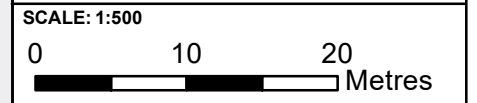
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- Key:**
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 - Arboricultural Study Area
 - Tree Canopies
 - Pentre Halkyn BVS
 - Root Protection Area (RPA)
 - Indicative Protective Fencing
 - Indicative Tree Removals

- BS5837 2012 Tree Category**
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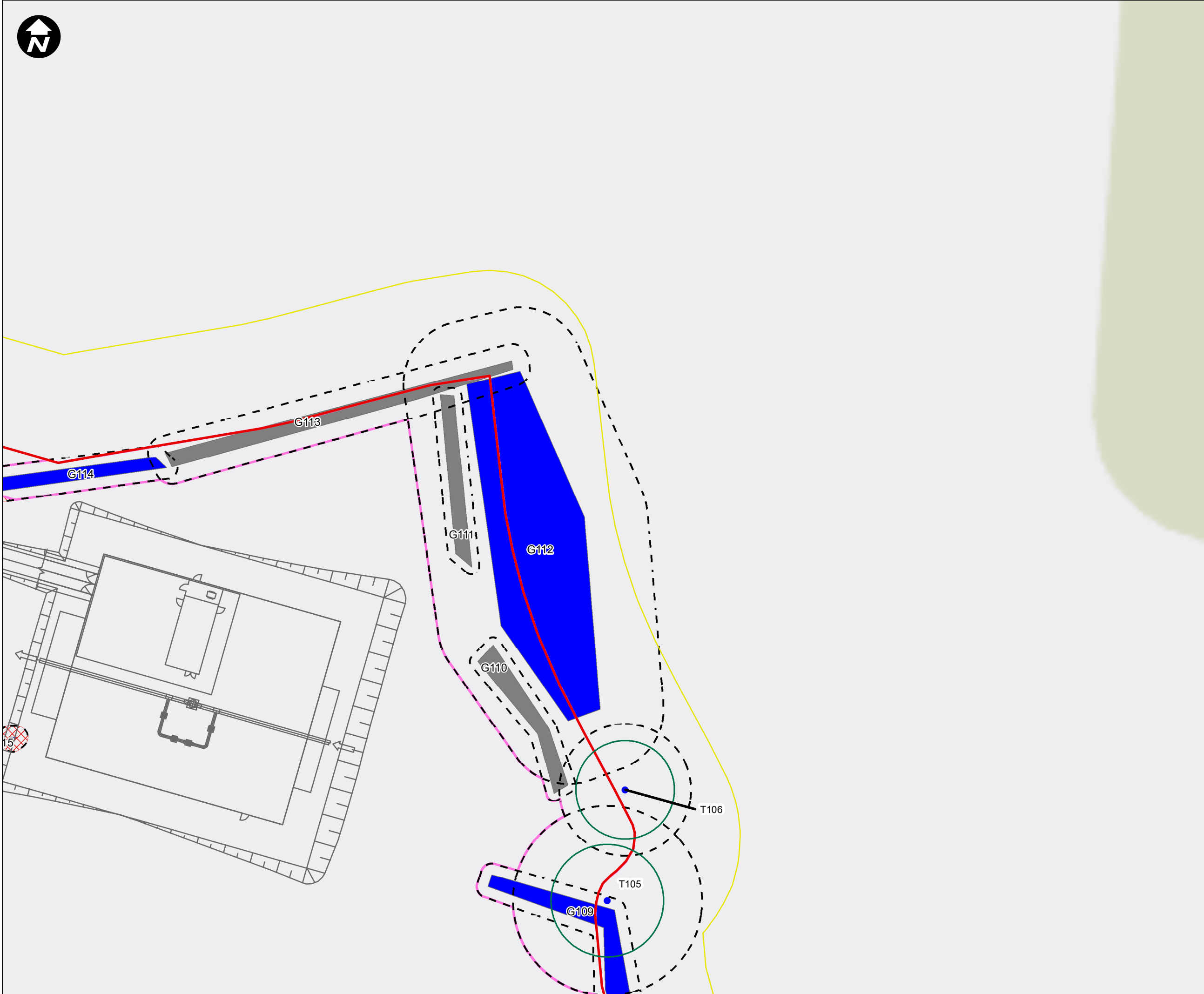
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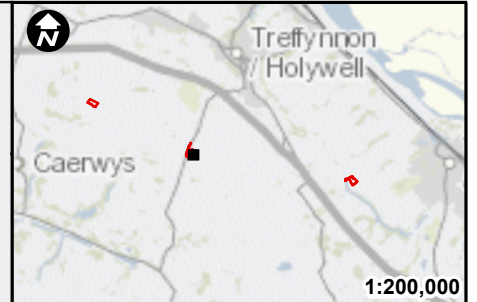
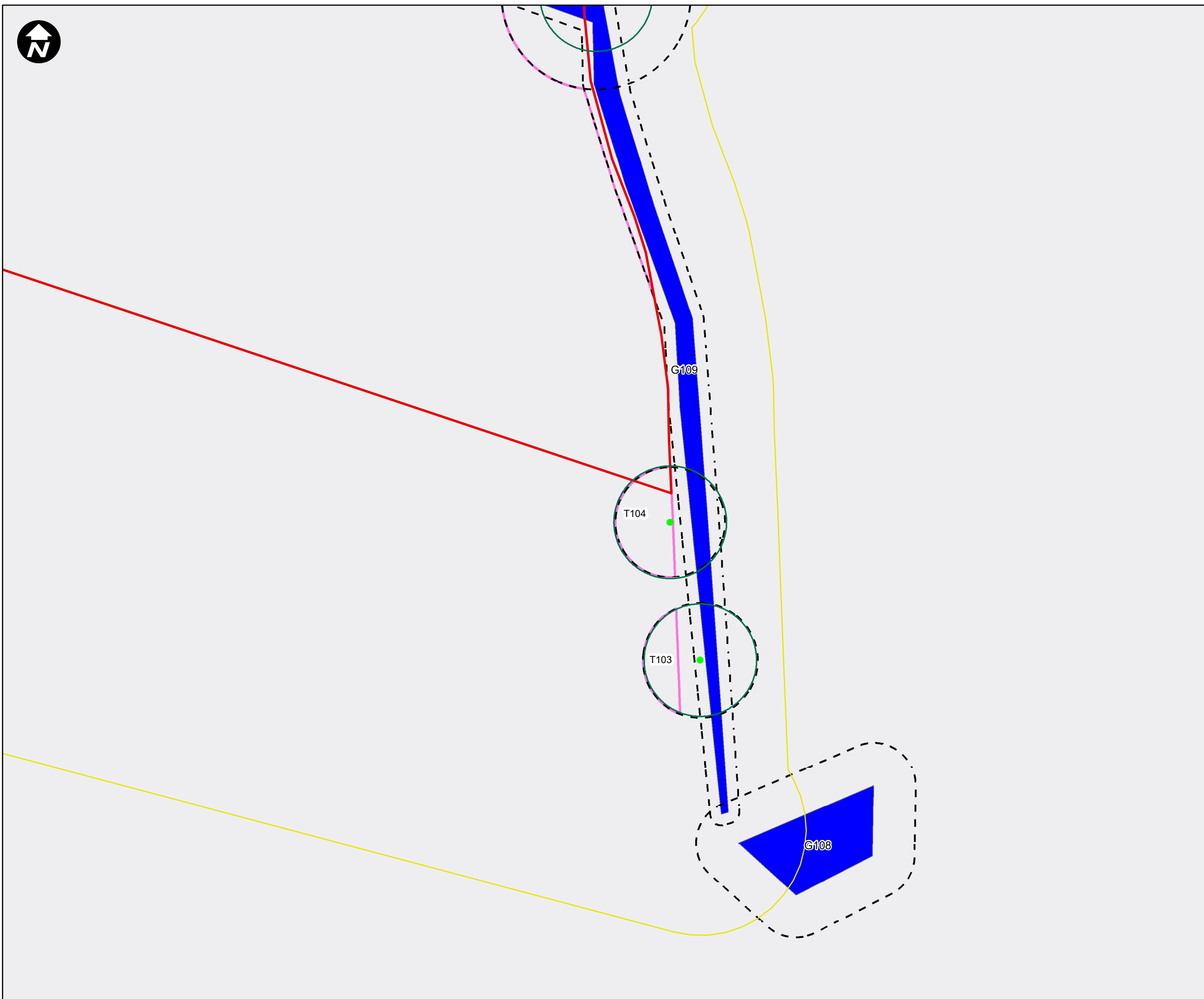
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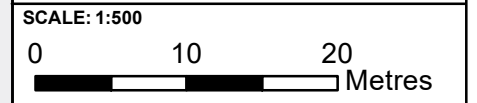


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	Indicative Protective Fencing

BS5837 2012 Tree Category

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HyNet North West

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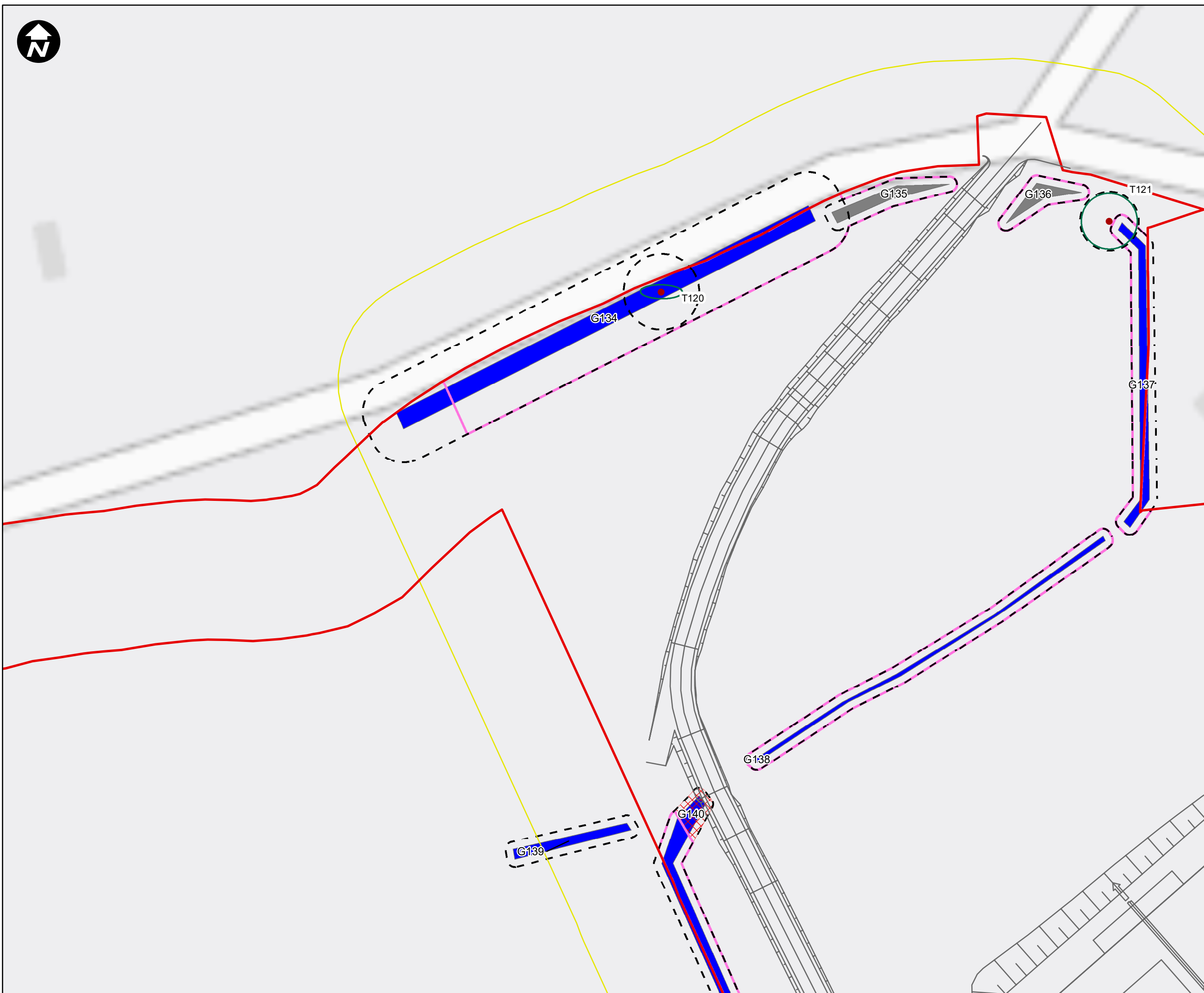
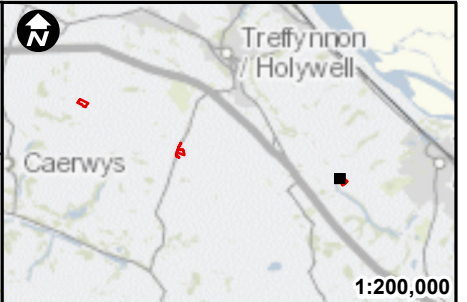
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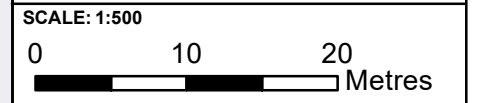


Key:

- Newbuild Infrastructure Boundary
- Arboricultural Study Area
- Tree Canopies
- Cornist Lane BVS
- Root Protection Area (RPA)
- Indicative Protective Fencing
- Indicative Tree Removals

BS5837 2012 Tree Category

A	A
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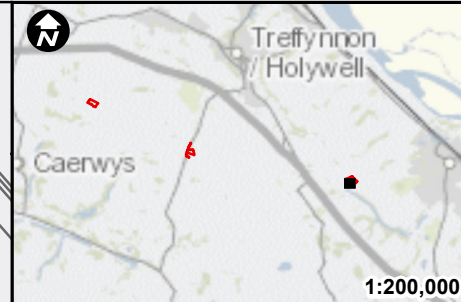
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

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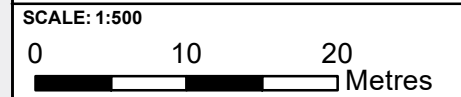
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- Key:**
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 -  Cornist Lane BVS
 -  Root Protection Area (RPA)
 -  Indicative Protective Fencing

BS5837 2012 Tree Category

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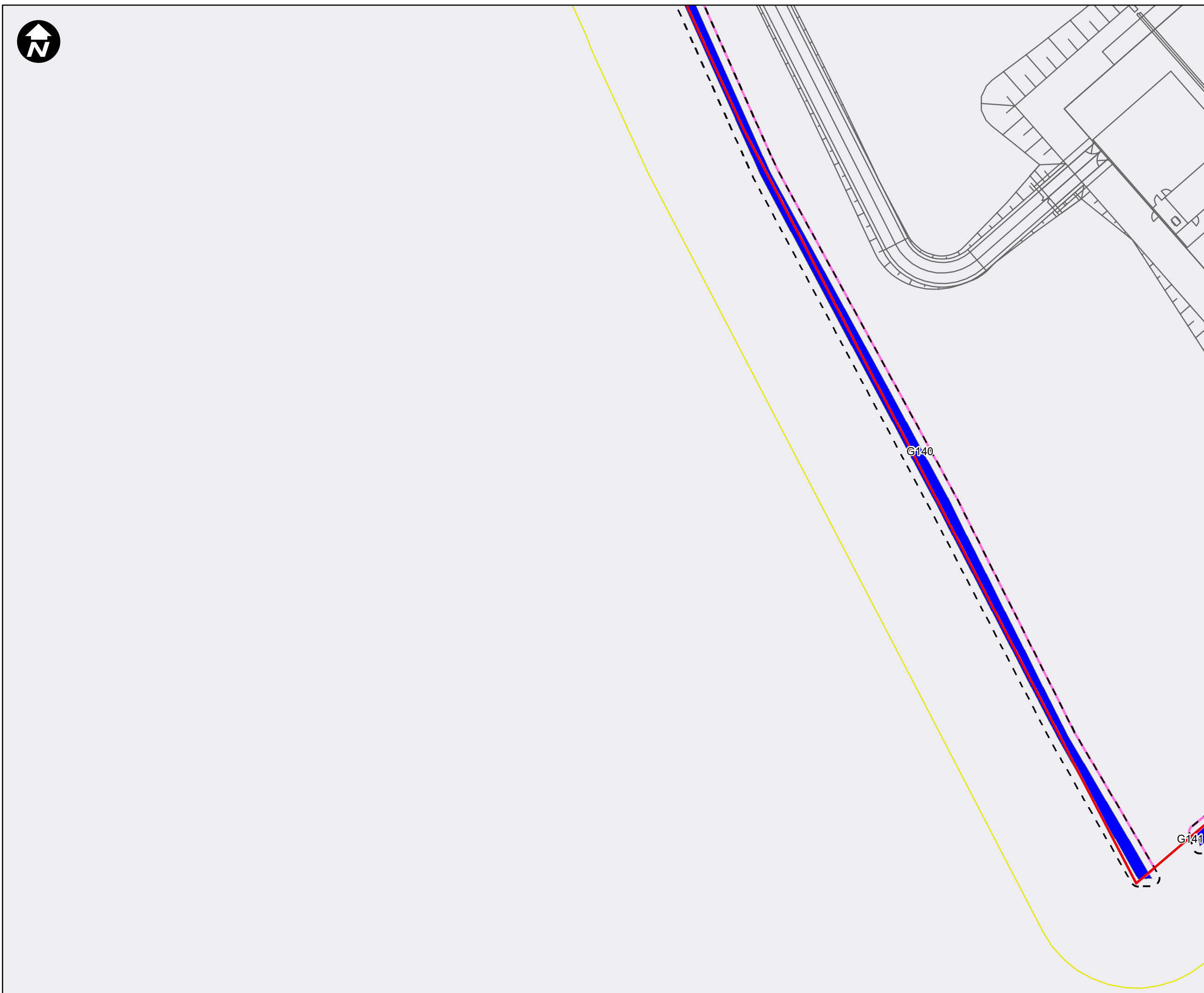
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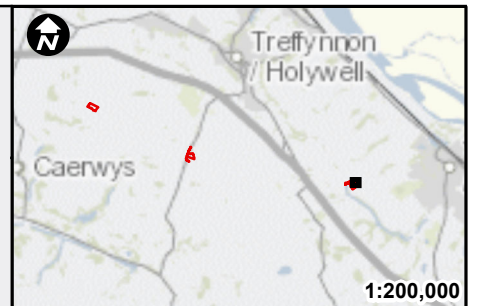
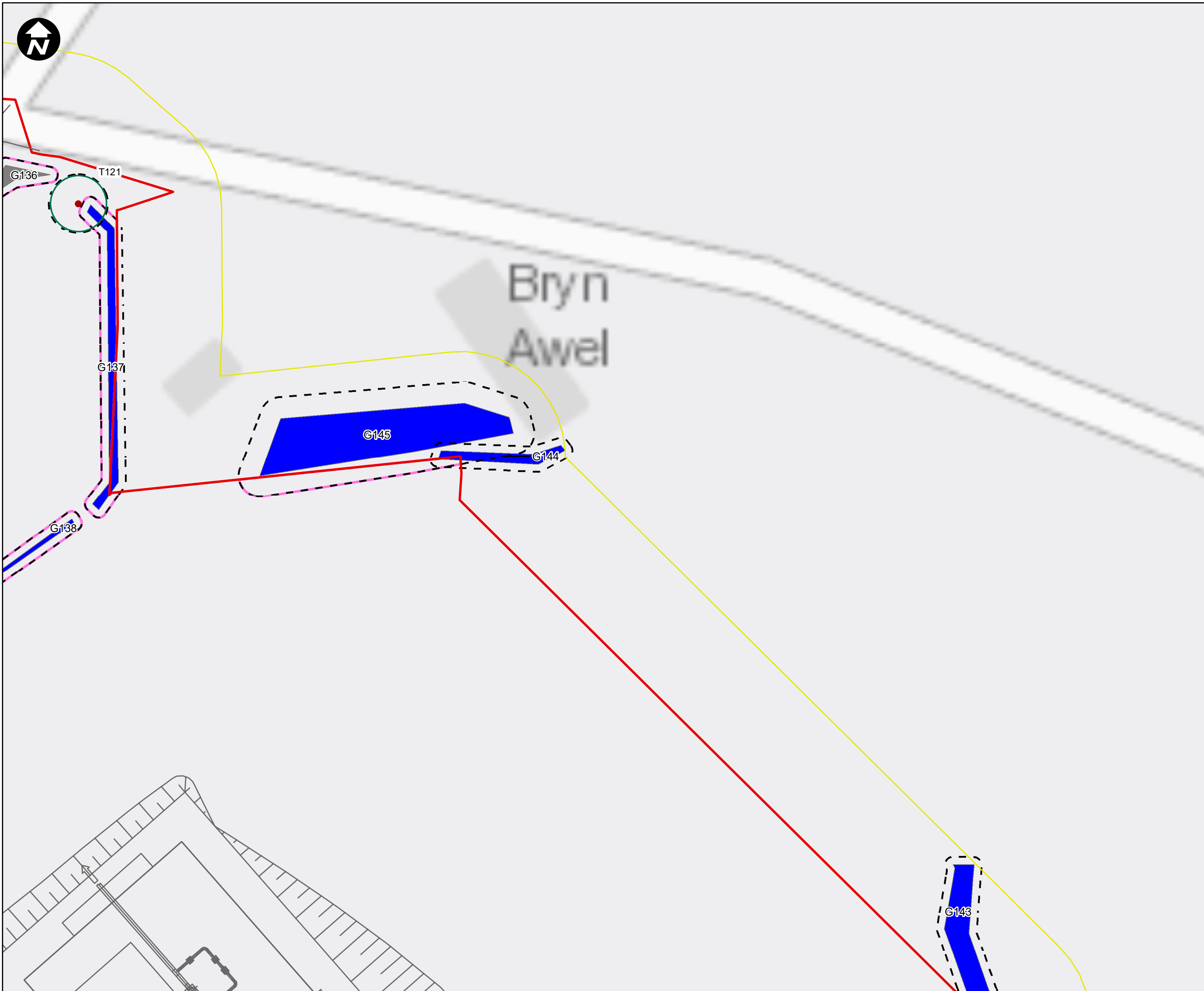
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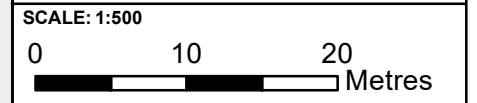


Key:

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BS5837 2012 Tree Category

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● B	■ B
● C	■ C
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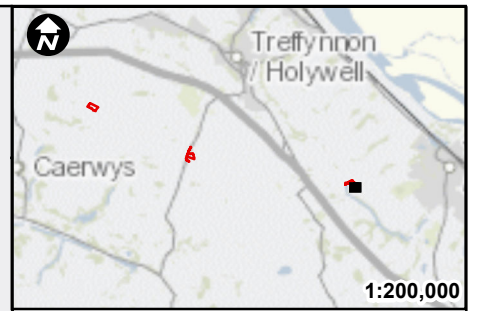
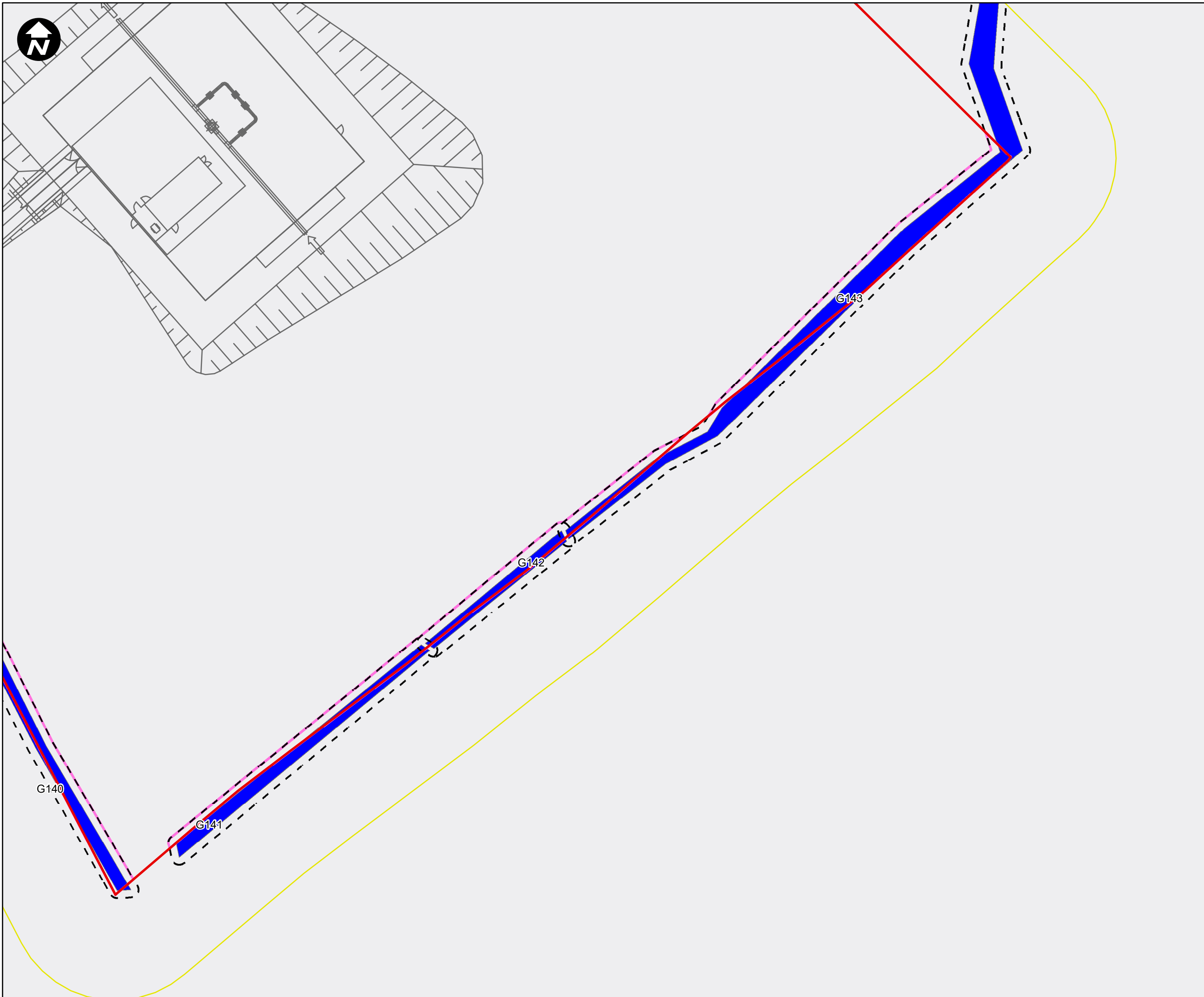
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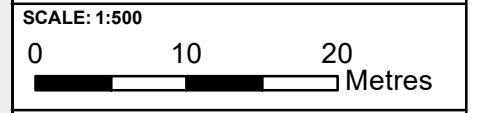
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ANNEX F – OUTLINE ARBORICULTURAL METHOD STATEMENT

INTRODUCTION

The outline Arboricultural Method Statement (AMS) is designed to provide guidance to the Main Contractor to ensure appropriate protection is given to retained trees during the construction stage of the DCO Proposed Development.

The AMS will be a working document and be further developed at the Detailed Design stage with input from the appointed project arboriculturist(s) acting as an Arboricultural Clerk of Works (ACoW). At the Detailed Design stage, a Tree Protection Plan will be developed and will identify the location of mitigation measures to be applied, in conjunction with a specific AMS.

PHASING

Detailed below is the phasing programme which will be followed by the Main Contractor throughout all stages of the DCO Proposed Development to ensure that trees are protected in accordance with the Arboricultural Method Statement.

Phase 1 – Pre-construction

- Pre-construction site meeting(s) with client, Main Contractor, Local Planning Authorities, engineer and ACoW;
- With reference to design plans and in consultation with client, Main Contractor, LPA and ACoW, confirm the trees to be removed and trees to be retained;
- Install protective fencing for retained trees; and
- Carry out tree removal in line with current best practice and BS3998: 2010 Tree Work – Recommendations.

Phase 2 – Construction stage

- Undertake routine checks to ensure tree protection measures remain fit for purpose; and
- ACoW to undertake monitoring and auditing at intervals agreed at the pre-construction meeting.

Phase 3 – Post construction stage

- Carry out soft landscaping;
- Remove protective fencing; and
- Remove ground protection.

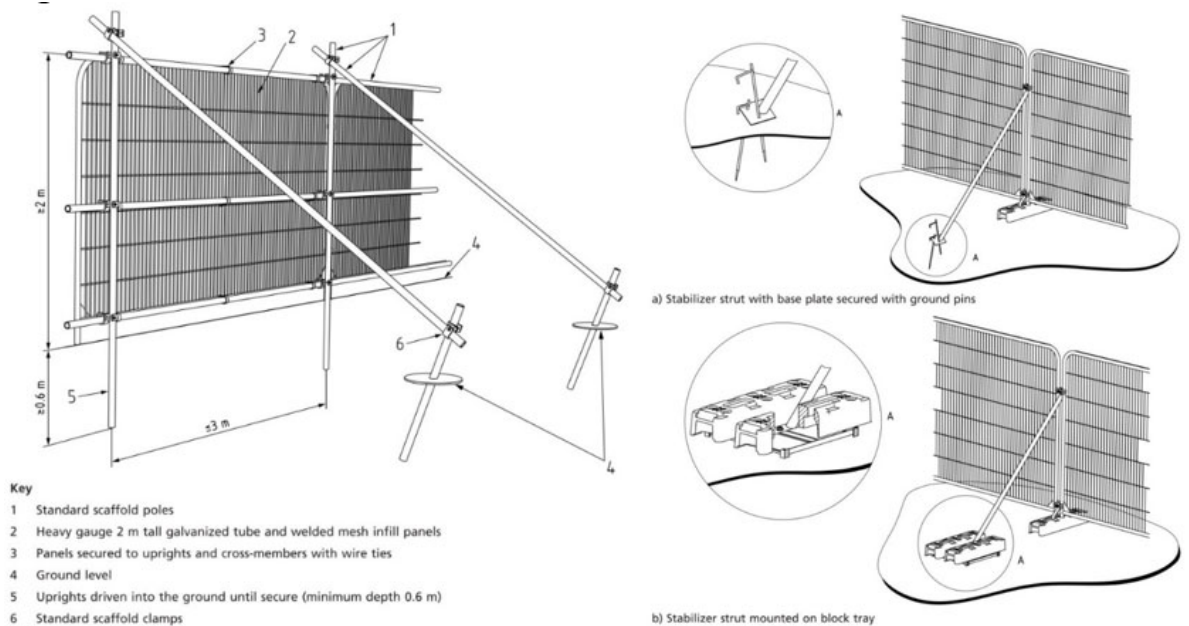
TREE PROTECTION

Effective tree protection can only be achieved by adherence to a logical sequence of works combined with effective arboricultural monitoring. Tree protection fencing in accordance with BS5837:2012 (or similar and approved) shall be erected for retained trees prior to the commencement of any of the following activities:

- The delivery of any plant or materials;
- Demolition;
- Soil stripping;
- Construction works;
- Installation of utilities; and
- Landscape works.

The protective fencing will be erected to protect retained trees with positioning agreed on site with the ACoW. Typical examples of the type of tree protection fencing are included in **Insert 2**.

Insert 2 - Examples of tree protection fencing



Extracts taken from BS 5837:2012 - Trees in relation to design, demolition and construction – Recommendations.

All weather notices will be attached to the tree protection fencing at suitable intervals and positioned at eye level. These notices will include suitably sized informative text containing the following statement:

“TREE PROTECTION FENCING

CONSTRUCTION EXCLUSION ZONE – NO ACCESS”

Once erected these areas will be regarded as sacrosanct, and, once installed, barriers will not be removed or altered without prior recommendation by the ACoW and, where necessary, approval from the Local Planning Authority (LPA).

This fencing is to remain in place until completion of all construction works in a given area are complete.

The areas covered by the tree protection fencing are known as the Construction Exclusion Zones (CEZ) and will not be compromised. The following shall apply within these areas:

- No mechanical excavations;
- No excavations by other means without the agreement of the ACoW;
- No change in levels (except removal of grass sward using hand tools);
- No storage of plant or materials;
- No storage or handling of any chemicals including cement washings; and
- No vehicular access.

Where the Root Protection Areas (RPAs) for retained trees exceeds the perimeter of the tree protection fencing then temporary ground protection will be installed in areas of soft landscaping. This will be in accordance with BS5837:2012.

Suitable ground protection with the objective of avoiding soil compaction and therefore leaving the tree roots to function unimpaired shall consist of the following:

- For pedestrian access only: single thickness scaffold boards laid butt jointed on a 100mm compression-resistant layer of woodchip, laid on a geo-textile membrane. Or a single thickness of scaffold boards laid on top of a driven scaffold frame to form a suspended walkway.
- For pedestrian-operated machinery up to 2 tonnes gross weight: proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane.
- For wheeled or tracked construction traffic exceeding 2 tonnes gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with

arboricultural advice, to accommodate the likely loading to which it will be subjected.

On completion of all construction works the above systems shall be removed only with the consent of the LPA. Surface de-compaction and root zone enhancement measures will then be undertaken. This may include spiking, aeration and/or injection of rhizobium inoculants.

ADDITIONAL PRECAUTIONS OUTSIDE THE CONSTRUCTION EXCLUSION ZONE

Care will be taken when planning construction works to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to retained trees will be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning in consultation with the ACoW. Notice boards, telephone cables or any other services shall not be attached to any part of a tree to be retained.

CONSTRUCTION COMPOUNDS, STORAGE OF MATERIALS AND SPOIL

Temporary site compounds, including mobile WCs and any service connections, will be positioned clear of the CEZs of retained trees.

The delivery, storage, mixing and discharge of concrete and all other cement-based materials shall be carried out so that there is no run-off and spillage near the RPAs of retained trees. No substances that are potentially injurious to plant tissue (including diesel, bitumen, concrete, mortar and other phyto-toxic materials) shall be stored, discharged, prepared or used, where direct contact, infiltration or run-off might reasonably be considered liable to harmfully affect existing root growth or other parts of retained trees. Where chemicals are stored emergency spillage kits will be made available to construction staff to minimise the impacts of any accidental spillages. All cement mixing, vehicle washing or any other activity where toxic chemicals are used shall have the provision to contain any accidental spillage. This can be achieved using suitable soil bunding or using a supporting timber framework sealed with heavy duty plastic sheeting.

No construction materials shall be stored within CEZs of retained trees. Spoil from any construction activity and any materials designated for re-use, shall either be removed from site; or, if kept on site, shall be stored or piled clear of CEZs of retained trees.

INSTALLATION OF UNDERGROUND SERVICES

All underground services should be routed outside the RPAs of all retained trees. . Where this is not feasible then it is preferable to keep all apparatus in common ducts to minimise disturbance.

Provided that roots can be retained and suitably protected (i.e. exposed roots are immediately wrapped or covered to prevent desiccation and rapid temperature change and all wrappings removed prior to backfilling) excavation with hand tools may be acceptable for shallow service runs under the supervision of the ACoW.

Where services are to pass within the RPA then plans showing the proposed route should be drawn up with input from the project arboriculturist. Trenchless insertion methods should be used with the entry and exit pits situated outside the RPAs.

REMOVAL OF FOUNDATIONS AND HARD SURFACING WITHIN THE CONSTRUCTION EXCLUSION ZONE

Temporary pedestrian access shall be allowed within the CEZ to carry out the removal of foundations and hard surfacing within the CEZ. . A suitable gap in the fencing shall be created just wide enough to allow pedestrian and wheelbarrow access only. On completion of the works the breach shall be closed to prevent further access.

The foundations and any hard surfacing to be removed from within the RPA will be broken up using low impact pneumatic tools only not breakers attached to excavators, unless absolutely necessary due to the nature of the materials. If this is the only option, then this must first be agreed with the ACoW.

Work to remove the existing hard surfacing will begin at the furthest point from the edge of the CEZ and continue back towards the protective fencing. Removal of the existing hard surfacing will be carried out in 2m strips working from the undisturbed surface. This will allow any exposed roots to be suitably covered to prevent desiccation in a timely manner. The exposed surface can then be made good as the work proceeds to avoid unnecessary travel over the newly uncovered ground. The existing hard surfacing prior to its removal will be used as the working platform. Sections of existing path/foundation shall be broken out separately and debris carefully lifted clear and exported outside the protective fencing using wheelbarrows.

As each section of existing surfacing is removed it shall immediately be replaced with topsoil. The topsoil shall be imported using wheelbarrows and loose tipped. Grading shall be undertaken using hand tools only to avoid compaction.

No reduction of levels of the underlying soil surface shall be carried out.

Topsoil shall conform to BS3882:2007 Specification for Topsoil and Requirements for Use and shall be stored in convenient piles adjacent to the working area just outside the CEZ.

SOFT LANDSCAPING WITHIN THE CONSTRUCTION EXCLUSION ZONE

For all soft landscape works, excavations and ground preparation within these areas is to be carried out using hand tools only in a sensitive manner to ensure root damage is kept to a minimum. At no time shall a rotavator be used within any of the protected areas to prepare the soil.

Removal of existing vegetation and turf will be carried out by hand only. Any herbicide used during the development works shall be appropriate for the type of vegetation to be killed and all instructions, warnings and other relevant information from manufacturers will be strictly observed and followed. Care will be taken to avoid any damaging effects on existing plants and trees to be retained.

Care will be taken to avoid changes in ground levels within the RPAs and no changes in ground levels shall occur within 1m of the trunks of all retained trees.

No works shall be carried out within the RPAs if the soil moisture levels are high enough to allow compaction to occur following assessment by the ACoW. If compaction of the ground has occurred then decompaction measures will be undertaken, these may include forking, spiking, soil augering and tilled radial trenching.

Final grading to marry in new levels with existing ground will be achieved by importing good quality topsoil and spreading it using hand tools only. Areas of proposed grass shall then be raked to a fine tilth and will be grass seeded or turfed as necessary by hand.

All new tree planting will be undertaken in accordance with BS8545:2014 Trees: from nursery to independence in the landscape - Recommendations. Planting pits for shrubs or trees must be hand excavated taking care to avoid damage to existing tree roots. If substantial roots are discovered then the planting pit will be relocated if possible in order to retain them. Hedging plants if bare root shall be notch planted and no trench planting shall take place within the RPAs. If fertiliser is to be incorporated into the planting pits it will be a slow release type such as 'Enmag' or other similar approved and will be applied in accordance with the manufacturer's recommendations.

Roots shall be retained and carefully worked around, wherever practicable. No root greater than 25mm dia. shall be cut without confirmation from the project ACoW. If damage does occur to a root greater than 25mm dia, then advice must be sought from the project ACoW. Where it is essential to sever roots they shall be cleanly cut, using an appropriate, sharp bladed hand-tool.

If in the course of operations, roots, that are to be retained, are unearthed, they shall not be left unduly exposed, but shall be covered with hessian, or similar, to protect from desiccation. Prior to backfilling, any hessian wrapping will be removed and retained roots will be surrounded with sharp sand, or other loose granular fill before soil or other material is replaced.

Where materials or plants are to be brought into or removed from the RPAs they will be transported in wheelbarrows and must be moved across existing hard surfacing or temporary ground protection in accordance with BS5837:2012 in a way that prevents compaction of the soil.

Mulch will be applied to open soils and shrub planting areas to inhibit weed growth, reduce groundwater evaporation, resist and mitigate soil compaction and reduce maintenance requirements. Material that may be used shall include well composted wood chip, pulverised bark, leaf mould or green waste conforming to PAS 100. The depth of mulch will not exceed 100mm, taking particular care not to lay excessive mulch around new plants and will be avoided in areas of established tree growth.

MONITORING

Once the protective fencing and ground protection measures have been installed but prior to operation of the Proposed Development, a site inspection will be undertaken by the ACoW. This is to confirm that all protection measures have been installed in accordance with the Tree Protection Plans and method statement.

Regular monitoring visits will be carried out as necessary during the development.

On completion of the construction works a walkover survey of the trees will be undertaken to identify any remedial action necessary as a result of the construction stage. Should any further consents or permissions be required for remedial tree works, these will be obtained by the ACoW as necessary.