

Oxpens River Bridge and Connecting Paths

Canopy Cover Assessment



On behalf of **Oxford City Council**

Document Control Sheet

Project Name: Oxpens River Bridge

Project Ref: OXPEN-STN-GEN-ALL-RP-J-3003

Report Title: Canopy Cover Assessment

Date: 14/10/2022

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For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
P01	13/10/2023	Planning	CS	MC	JS
P02	19/10/2023	Planning	CS	MC	JS

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1 Introduction

- 1.1.1 This report has been prepared by Stantec on instruction from Oxford City Council to provide a tree canopy cover assessment in relation to the Oxpens River Bridge project proposals at Oxpens Meadow, Oxford. The planning application boundary for the Proposed Development is presented in Appendix A and Appendix B as the redline boundary.
- 1.1.2 The purpose of this report is to present an assessment on how the implementation of the Proposed Development may impact the area of tree canopy present within the Site. This report is provided in response to requirements in the Oxford Local Plan 2036 (adopted 08 June 2020) Policy G7: 'Protection of existing Green Infrastructure features.'
- 1.1.3 Policy G7 recognises the potential merits of trees in terms of ecological function and public amenity and seeks to encourage the retention of established trees and the planting of new trees where this is appropriate. Policy G7 confirms the Council will not grant planning permission where development results in the loss of trees except in instances where it can be demonstrated that the retention of trees is not feasible; and the loss of tree canopy cover is mitigated through the planting of new trees or introduction of additional tree cover (considering future tree canopy growth); and, where tree planting within the site is unachievable, then alternative proposals for mitigation are provided.
- 1.1.4 A tree survey compliant with BS5837: Trees in Relation to Design, Demolition and Construction (2012) was carried out on 13th and 14th October 2021. A further tree survey was carried out on 15th July 2022 and the results of these surveys have been used to formulate the results of this assessment.
- 1.1.5 An assessment outlining the retention and removal of trees at the time of construction is provided within *Oxpens River Bridge and Connecting Paths Arboricultural Impact Assessment* (Stantec, 2022). Proposals for new tree planting are provided in Soft Landscape Design Plan OXPENS-STN-GEN-ALL-DR-L-3001-P01 (Stantec, 2023). These documents are used as the basis for the calculation of tree canopy cover with implementation of the Proposed Development.

1.2 Scope of the report

- 1.2.1 The methodology adopted for this survey is based on the Oxford City Council Technical Advice Note 9 (TAN 9). TAN 9 states that for Detailed Tree Canopy Cover Assessments, the process is as follows:
1. Calculate total area of existing baseline tree canopy cover within the application site.
 2. Calculate existing baseline tree canopy cover as % of total application site area.
 3. Taking account of key site specific tree canopy cover dynamics (e.g. tree growth, tree age, tree life expectancy/ potential to contribute etc.) project forward over time to predict total tree canopy cover within the application site at baseline + 10, +20 and + 30 years for the following scenarios:
 - a) No development.
 - b) With development.
 4. Calculate impact on existing tree canopy cover by subtracting the area of tree canopy cover for 'no development scenario' from the area of tree canopy for 'with development scenario', both at baseline +25 years.

1.3 Limitations

- 1.3.1 The assessment is made in consideration of the proposed site layout and landscape proposals shown on the 'Canopy Cover with Development' plan shown in Appendix B. If the proposed layout or landscaping plan changes this may invalidate the findings of the Canopy Cover Assessment.
- 1.3.2 Trees are living organisms and as such their condition will vary over time. This report and recommendations are limited to observations made on the date of inspection. The report and survey information are valid for a maximum period of two years.
- 1.3.3 Due to the absence of scientific data on canopy growth rates within the United Kingdom, and the wide range of factors that can influence canopy growth over long periods of time, the predicted canopy sizes given are an estimation based on the consultant's knowledge, experience, and best available data.

2 Canopy Cover Assessment Methodology

- 2.1.1 A tree survey encompassing the site was carried out by Stantec on 13th and 14th October 2021. A further tree survey was carried out on 15th July 2022. The surveys were carried out in accordance with BS 5837:2012. As part of this survey the canopy spread for all individual trees and groups within the application boundary was recorded and the trees were plotted using a combination of topographical survey data and GPS where topographical survey data was unavailable.
- 2.1.2 A calculation was developed by Stantec to predict future shoot growth based on species, growth rates, ultimate size, age and current condition of the trees. Limitations to canopy growth presented by site features and current tree management methods have been considered.
- 2.1.3 Using the information from the original survey, and predicted shoot extension growth, existing and future predicted canopy areas were plotted and measured on AutoCAD to quantify total canopy cover area within the red line boundary.
- 2.1.4 The assessment considers trees within the red line boundary as well as canopies extending into the red line boundary from outside the site. This allows any facilitation pruning such as canopy reductions to be taken into account when assessing the development impact. Canopy cover outside the red line boundary has not been included in the assessment.

2.2 Specific limitations to future canopy growth

- 2.2.1 Category U trees have a life expectancy of less than 10 years and have not been included in the calculation for future canopy growth. Trees with a life expectancy of 10 years+ have been excluded from the calculation for canopy growth at 20 years and above.
- 2.2.2 White willows T1-T6, T8, T9, T11 and T13-T15 have been maintained as pollards. If they had been retained, it is assumed that these trees would continue to be maintained as pollards and therefore their canopy spread will not exceed 5m on all sides.
- 2.2.3 New canopy growth can only fill the space available between existing tree canopies. This is particularly relevant to the woodland area to the south side of the bridge. The amount of space available for competing canopies in this location is limited. Trees planted at closer spacings will therefore have lower canopy expansion areas than open grown trees.

3 Summary of Results

- 3.1.1 Table 1 below shows a comparison of site canopy cover as the baseline, with development and without development at +10, +20, +25 and +30 year periods. Canopy cover of proposed planting is added to the area of retained canopy cover with development to calculate the total area for comparison with canopy cover without development which is given as a % change.
- 3.1.2 Canopy cover from baseline to +25 years will increase by 55% if no development takes place.
- 3.1.3 Excluding proposed tree planting the development will result in a loss of 5.2% canopy cover over 25 years compared to predicted canopy cover without development over the same time period. Existing tree canopies will grow to fill the space left by those trees proposed for removal. Additional tree planting within the site boundary will result in an increase in canopy cover of 13.6% over 25 years.
- 3.1.4 The canopy cover area has a lower percentage increase compared to the baseline at 30 years because trees to the south can only fill the space available between canopies. The amount of space available for competing canopies in this location is limited.

Table 1: Comparison of canopy cover at baseline, 10 years, 20 years, 25 years and 30 years with and without development

	Baseline	+ 10 years	+ 20 years	+ 25 years	+ 30 years
Canopy cover without development (m ²)	3983	4580	5620	5720	6177
Area of retained canopy cover with development (m ²)	2125	3630	5114	5406	5639
Area of new canopy cover with development (m ²)	278	604	891	1093	1270
Total canopy area with development (m ²)	2403	4234	6005	6499	6909
Impact of development on existing tree canopy cover (% change)	-39.7%	-7.1%	+6.9%	+13.6%	+11.9%

4 Conclusions

- 4.1.1 A BS 5837:2012 compliant survey of the site was carried out on 13th and 14th October 2021. A further tree survey was carried out on 15th July 2022 and the results of these surveys have been used to formulate the results of this assessment.
- 4.1.1 Canopy cover from baseline to +25 years will increase by 43% if no development takes place.
- 4.1.2 Excluding proposed tree planting the development will result in a loss of 5.2% canopy cover over 25 years compared to predicted canopy cover without development over the same time period. Existing tree canopies will grow to fill the space left by those trees proposed for removal. Additional tree planting within the site boundary will result in an increase in canopy cover of 7.2%.

5 References

British Standard Institute (BSI) (2012). *BS 5837:2012 Trees in Relation to Design Demolition and Construction-Recommendations*. BSI, London.

British Standard Institute (BSI) (2010). *BS 3998:2010 Recommendation for Tree Works*. BSI, London.

British Standard Institute (BSI) (2014). *BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations*. BSI, London.

Department for Communities and Local Government (2014). *Planning Practice Guidance on Tree Preservation Orders and trees in conservation areas*.

Department for Environment, Food and Rural Affairs (DEFRA). *Multi-Agency Geographic Information for the Countryside (MAGIC)*. Available at: <https://magic.defra.gov.uk/magicmap.aspx>

HMG Ministry of Housing, Communities & Local Government 2019. Policy Paper: The National Planning Policy Framework (NPPF), updated 19 February 2019.

Lonsdale, D. (1999). *Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management*. HMSO

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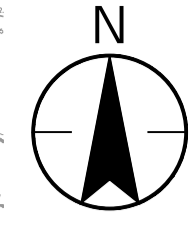
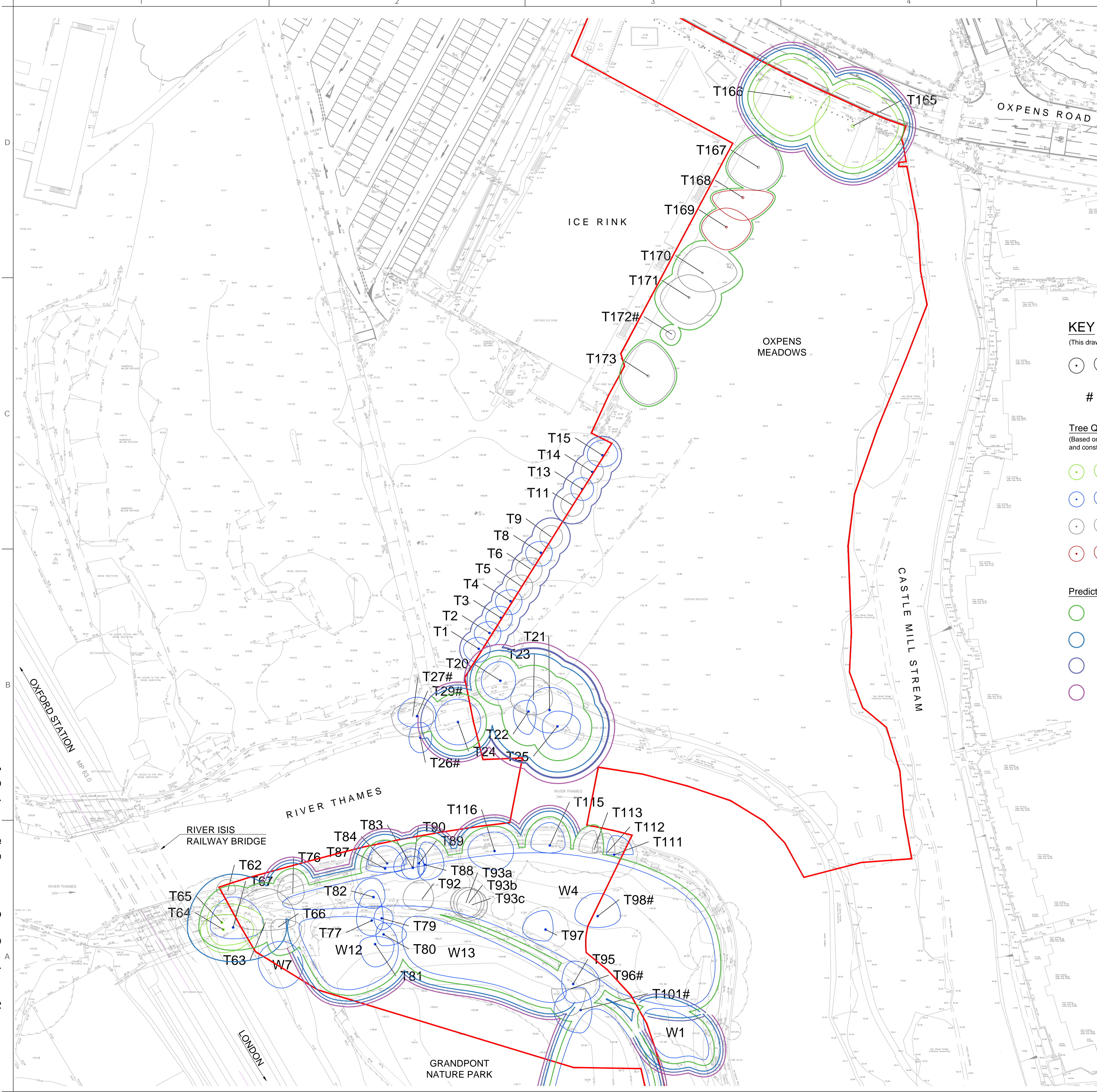
Town and Country Planning Act 1990 (as amended).

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

Woodland Trust. *Ancient Tree Inventory*. Available at: <https://ati.woodlandtrust.org.uk/tree-search/>

Woodland Trust (2008). *Ancient tree guide 4: What are ancient, veteran and other trees of special interest?*

Appendix A Canopy Cover Without Development



KEY

(This drawing must be reproduced in colour)

○ ○ T1/G1/W1 Trees & Groups

Approximate location (Feature not shown on supplied topographical survey)

Tree Quality Categorisation
 (Based on BS5837:2012 Trees in relation to design, demolition and construction - Recommendations)

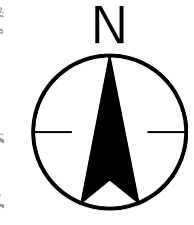
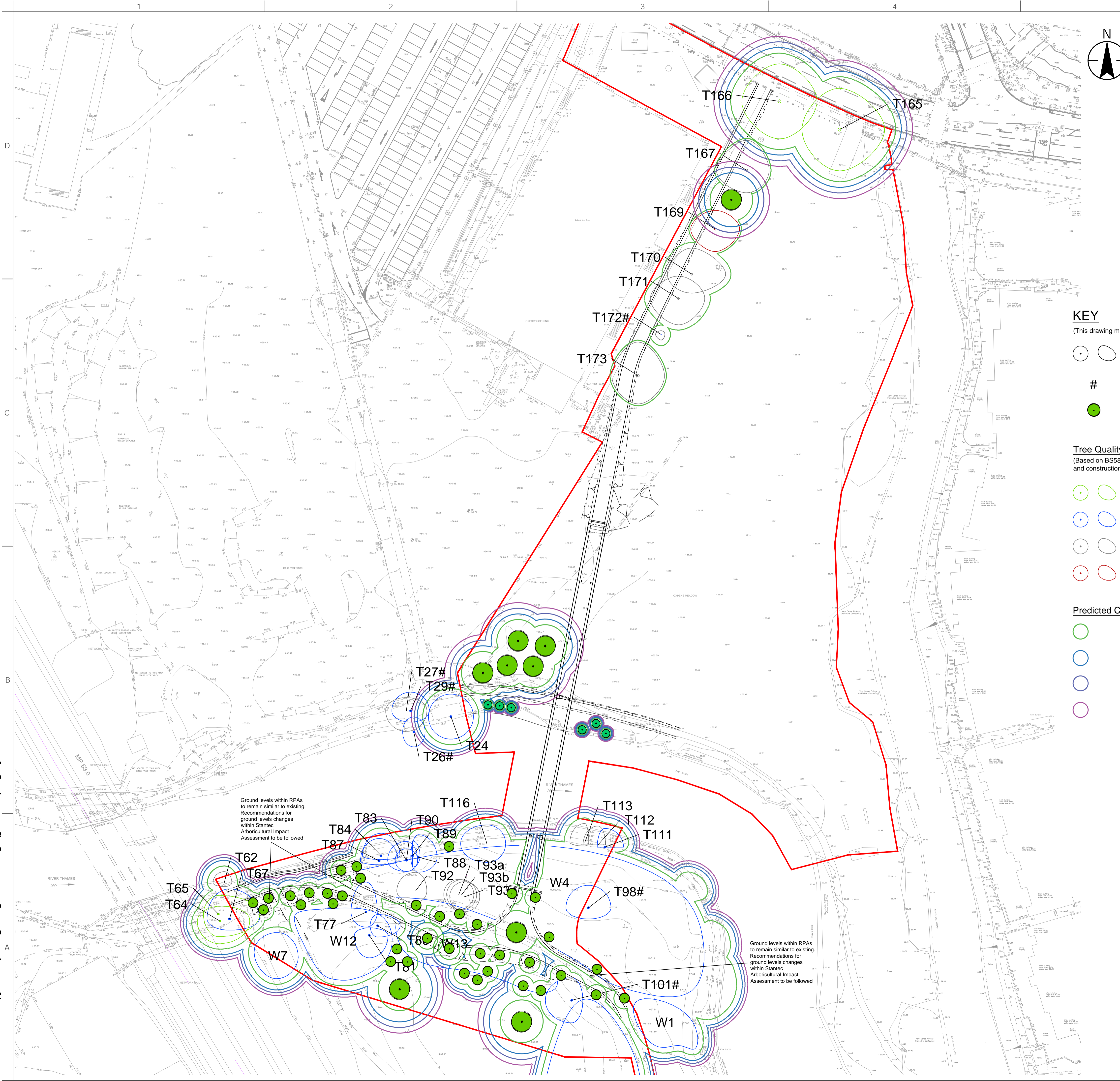
- ○ Category A (High quality)
- ○ Category B (Moderate quality)
- ○ Category C (Low quality)
- ○ Category U (Remaining life span of less than 10 years)

Predicted Canopy Growth

- +10 years
- +20 years
- +25 years
- +30 years

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Appendix B Canopy Cover with Development



KEY

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- T1/G1/W1 Trees & Groups
- # Approximate location (Feature not shown on supplied topographical survey)
- New tree planting

Tree Quality Categorisation
(Based on BS5837:2012 Trees in relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Remaining life span of less than 10 years)

Predicted Canopy Growth

- +10 years
- +20 years
- +25 years
- +30 years

Ground levels within RPAs to remain similar to existing. Recommendations for ground levels changes within Stantec Arboricultural Impact Assessment to be followed

Ground levels within RPAs to remain similar to existing. Recommendations for ground levels changes within Stantec Arboricultural Impact Assessment to be followed



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Notes
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

TREE CATEGORIES
Tree canopies are coloured in accordance with their quality category as set out in Table 1 of BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations' and shown in the Legend below. Category 'A' - Trees of high quality with an estimated remaining life expectancy of at least 40 years. Category 'B' - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. Category 'C' - Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. Category 'U' - Trees in such condition that they cannot realistically be retained as living trees in context of the current land use for longer than 10 years.

ROOT PROTECTION AREAS
This is a minimum area in m² which should be left undisturbed around each retained tree. The RPA is calculated using the British Standard BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'.

ACCURACY OF TREE LOCATIONS
Tree locations based on topographical survey. Those trees not included in the topographical survey are marked T#. Accuracy of these tree locations cannot be guaranteed. Their locations and RPA extents must be confirmed on site prior to works taking place

REFERENCES
OXPEN-STN-GEN-ALL-M2-G-0004_CombinedSurvey Topographical Survey
OXPEN-STN-GEN-ALL-M2-J-3001 BS5837 Tree Survey carried out 13/10/2021, 14/10/2021, and 23/11/2021

P02 COMMENTS INCORPORATED	GCP	JWS	2023.10.19
P01 FIRST ISSUE	GCP	JWS	2023.10.16
Issued/Revision		By	Appd YYYY.MM.DD

	GCP	CS	JWS	2023.10.16
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Issue Status
SUITABLE FOR INFORMATION

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Client/Project
OXFORD CITY COUNCIL

OXPENS RIVER BRIDGE AND CONNECTING PATHS

Title
CANOPY COVER ASSESSMENT - WITH DEVELOPMENT

Project No. 332610335	Scale 1:500
Revision P02	Drawing No. OXPEN-STN-GEN-ALL-DR-J-3012