

Arboricultural Method Statement & Tree Protection Plans

Deal Ground and May Gurney, Norwich
Serruys Property Company Ltd

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Arboricultural Method Statement and Tree Protection Plans

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1 Introduction

1.1 Appointment

- 1.1.1 Lanpro Services Ltd. was appointed by Serruys Property Company Ltd. to produce Tree Protection Plans and an Arboricultural Method Statement in accordance with British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'.
- 1.1.2 These documents relate to a proposed development ('the Development') at May Gurney and Deal Ground to the north of Bracondale, Norwich, NR1 2EG, National Grid reference: TG 2454 0723. Outline consent for the Development was granted on 12th July 2013. The Development consists of a maximum of 670 new dwellings, a local centre comprising commercial uses and a restaurant/dining quarter, demolition of buildings on the May Gurney site, an access bridge over the River Yare as well as a new access road and landscaping.
- 1.1.3 Planning conditions 7 and 10 of the outline consent require an Arboricultural Impact Assessment, Tree Protection Plan and an Arboricultural Method Statement to be submitted with the reserved matters planning application. Lanpro has already provided an Arboricultural Impact Assessment¹. This report therefore seeks to provide an Arboricultural Method Statement and Tree Protection Plans to fulfil these conditions.
- 1.1.4 The following schedule and drawings are to be read in conjunction within this report and are included as appendices:
- Tree Survey Schedule (Appendix 1) provides guidance as to the nature and quality of the existing tree stock within and adjacent to the Site;
 - Definitions for Tree Survey Schedule (Appendix 2);
 - Tree Preservation Order Map (Appendix 3); and
 - Tree Protection Plans (Appendix 4).

1.2 Objectives

- 1.2.1 This report provides Tree Protection Plans and an Arboricultural Method Statement that must be followed by all contractors undertaking construction activities on the Site. This includes tree removal, pruning, vegetation clearance, ground works, construction works and landscaping works.
- 1.2.2 The methods and protections detailed in this document aim to ensure that the development proceeds in accordance with the Arboricultural Impact Assessment and that all retained trees are safeguarded during construction.
- 1.2.3 A copy of this Method Statement and Tree Protection Plans must be provided to all contractors.

1.3 Arboricultural Features Within the Site

- 1.3.1 The Site contains 31 individual trees, 11 groups of trees and four woodlands across the two areas of the Site: the May Gurney site to the south of the River Yare and the larger Deal Ground site to the north of the River Yare and to the south of the River Wensum. No trees have been identified as ancient or veteran. These trees were surveyed by Lanpro in 2022 and 2023 and the tree numbers cited account for the tree felling that took place in early 2023 prior

¹ Lanpro (June 2023). Arboricultural Impact Assessment – Deal Ground and May Gurney, Norwich.

to the submission of a reserved matters application. A full schedule of existing trees is provided in Appendix 1.

- 1.3.2 An area Tree Preservation Order (reference: TPO 423, made February 2008) by Norwich City Council protects all trees of whatever species that were present on the date the Order was made in the area defined by the map shown in Appendix 3. Protected trees are shown on the Tree Protection Plans and referred to within this report with an asterisk symbol (i.e. W1*). Protected trees on the Site are: T18* sycamore, T22* goat willow, T32* white willow, T33* sycamore, W1*, W2*, W3*, G4*, G12* and G13*.
- 1.3.3 Advice on the legal restrictions that apply to trees protected by a TPO is provided in sections 2.1 and 3.3.7.

2 Relevant Legislation and Policy

2.1 Tree Preservation Order (TPO)

- 2.1.1 A Tree Preservation Order (TPO) is a legal Order applied to an individual tree, group of trees, area or woodland. It makes it a legal offence to cut down, top, lop, uproot, wilfully damage or destroy a tree (including roots) specified in the Order.
- 2.1.2 All species of tree can be protected by a TPO. Area orders protect all trees of whatever size and species that are present within the defined area in the year that the Order was made. Prior to undertaking works to a tree protected by a TPO, consent must first be gained from the local planning authority through a tree works application. Exceptions to the need to apply for consent do apply, advice from an Arboriculturist must be sought on the extent and relevance of any exceptions.

2.2 Birds and Bats

- 2.2.1 Birds often nest in trees and can be affected by tree removal or pruning works. All bird species are protected under the Wildlife and Countryside Act 1981 (as amended). This legislation prevents the killing or injuring of any bird or damaging or destroying nests and eggs. Some species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). For Schedule 1 species, the intentional or reckless disturbance of the species on or near an active nest is prohibited.
- 2.2.2 Bats roost in trees and must be considered when undertaking tree work. All bat species are listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Bats and their roosts also receive protection from disturbance from by the Wildlife and Countryside Act 1981 (as amended). This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

3 Arboricultural Method Statement

3.1 How To Use This Document

- 3.1.1 The following Method Statement and attached Tree Protection Plans must be provided to all contractors involved with the Development activities such as vegetation clearance, ground works, service installation, construction and landscaping.
- 3.1.2 This Method Statement identifies key activities which have the potential to harm trees. Activities are considered in the expected chronological order of the Development. Measures to avoid or mitigate the potential impacts to trees have been provided and will be followed on Site in collaboration with the project Arboriculturist.
- 3.1.3 It is the responsibility of the Site Manager to communicate the contents of this Method Statement to contractors undertaking the relevant activity.

3.2 Sequence of Events

- 3.2.1 In relation to trees, the following sequence of works will be undertaken as shown in Table 1 below.

Construction Stage	Arboricultural Operation
Pre-Construction Vegetation Clearance	Tree removals and pruning.
Pre-Construction	Installation of temporary tree protection fencing and ground protection.
Site Check by Arboriculturist to Sign Off Tree Protection Prior to Construction Commencing and Provide Toolbox Talk on Method Statement	
Construction Phase	Siting of site office and compounds
Construction Phase	Ground works.
Construction Phase	Installation of underground services.
Construction Phase	Arboriculturist supervision of installation of a no-dig permeable footpath in the north of the Site parallel to the River Wensum.
Construction Phase	Installation of play equipment and hard surfacing near retained trees, managing root impacts via root pruning under Arboriculturist supervision.
Landscaping Phase	Installation of fencing and landscaping within the gardens in the north-east corner of Deal Ground near white willows T1-3.
Landscaping Phase	Tree planting.
Post Construction Phase	Removal of temporary tree protection fencing and ground protection.
Site Check by Arboriculturist to Inspect Retained Trees and Specify Any Remedial Works Necessary	

3.3 Tree Removals and Pruning

- 3.3.1 The Arboricultural Impact Assessment and Tree Impact Plans require the following trees to be removed prior to the commencement of construction activities and installation of tree protection measures on Site:

- Category B trees: W1* (removal of a further 1,930m²), W2* (removal of a further 4,250m²), W3* (removal of 798m²), W4, G1 (one remaining silver birch to be felled), G2, G11, G12* (partial removal), G13* (partial removal), G14, G15, T9 white willow, T16 sycamore, T18* sycamore, T19 sycamore, T22* goat willow, T23 beech, T24 purple beech, T25 beech, T28 goat willow, T29 silver birch, T32* white willow, T33* sycamore,
- Category C trees: G5, T8 white willow, T21 goat willow

3.3.2 Trees to be removed are shown in the enclosed Tree Protection Plans in Appendix 4. Groups and woodlands (or sections of groups and woodlands) to be removed are shaded red. Individual trees to be removed are also shaded red and have a red cross at the stem position.

3.3.3 Given that many of the trees to be removed are part of woodlands or groups, it may be difficult to assess on Site which exact trees require removal. Prior to a tree surgery contractor attending Site, an engineer will attend the Site with the project Arboriculturist to mark out the tree removals based on the Tree Protection Plans. The engineer will have a GPS device with the coordinates of the tree removal areas which will then be clearly marked on Site with tape between flag posts or equivalent. An Arboriculturist will then mark the trees to be removed with tree paint on their stems to ensure the correct trees are removed.

3.3.4 The following trees will need to be pruned prior to the commencement of construction activities and installation of tree protection measures on Site:

- Canopy lift the southern canopy spreads of T10 weeping willow and T14 weeping willow to achieve a vertical clearance height of 2.5m;
- Shortening of all deadwood over 100mm in diameter to one third of branch length or removal of deadwood above this size for trees near the proposed River Wensum footpath: T1, T2, T3, T4, T5, T6, T7, T10, T11, T12, T13 and T14. Deadwood will be retained wherever possible if it can be shortened (usually to one third of its length) and made safe. If deadwood cannot be shortened and/or retained safely, then it will be removed.

3.3.5 All tree work will be undertaken by a suitably qualified, insured and experienced Arborist working in accordance with British Standard 3998: 2010 Tree Work – Recommendations. No tree works will be undertaken by construction workers.

3.3.6 All tree work will be timed to avoid illegal impacts to nesting birds in accordance with ecological advice and section 2.2 of this report. Ecological advice must also be sought on any bat roost potential within trees prior to felling or pruning works to avoid illegal impacts to bats or their roosts.

3.3.7 No additional works to trees, other than those listed in section 3.3 will take place without prior consultation with the project Arboriculturist and an update to this Arboricultural Method Statement being carried out. Any necessary consents for additional work to trees protected by a Tree Preservation Order will be applied for and granted by the local planning authority where necessary.

3.4 Installation of Tree Protection Fencing

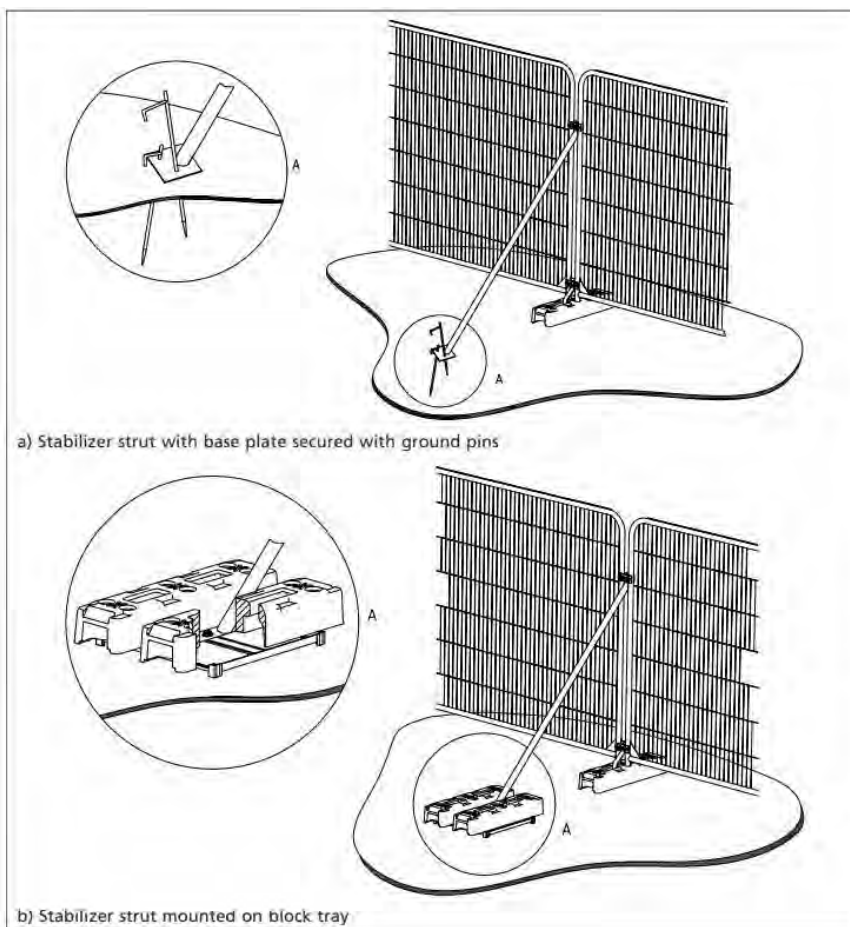
3.4.1 Tree protection fencing and ground protection will need to be installed in the locations shown on the Tree Protection Plans prior to any construction activities or materials entering the Site.

3.4.2 The locations of these measures are designed to protect the Root Protection Areas (RPAs) of all retained trees and exclude all construction activities from RPAs. The column entitled 'Radius of RPA (m)' in Appendix 1 gives the horizontal distance that the RPA stretches from each tree.

For trees in groups or woodlands, the RPA will be measured from the stem of the outermost tree at any given location.

- 3.4.3 The RPA is the minimum area of roots required for a tree to survive. As such the RPA must be considered sacrosanct and a Construction Exclusion Zone as delineated by tree protection fencing and ground protection.
- 3.4.4 Tree protection fencing and ground protection will be installed once all tree works specified in section 3.3 have been completed but before any materials enter the Site or construction activities begin such as setting up a site compound, ground works, installation of services or other buildings works.
- 3.4.5 Tree protection fencing locations will be marked on Site by an engineer working with GPS coordinates based off the Tree Protection Plans in Appendix 4.
- 3.4.6 Tree protection fencing will consist of a vertical scaffold framework made of posts, well braced to resist impacts. The framework must be driven into the ground, taking care to avoid any large structural roots (>25mm in diameter) and underground services. Onto this framework, Heras fencing will be securely fixed with anti-tamper couplers between fence panels. An alternative acceptable specification that avoids driving posts into the ground would be bracing Heras fencing with bracing poles and ground pins or bracing poles with block trays as shown in Figure 1 below.
- 3.4.7 Signage will be attached on every second fence panel that reads ‘Tree Protection Zone –Keep Out’.

Figure 1. Temporary Tree Protection Fencing Specification as per BS5837: 2012



- 3.4.8 Once fencing has been installed and before construction activities begin, a site check by an Arboriculturist will be conducted to check the locations and suitability of the tree protection measures. **Construction must only proceed once sign-off from the Arboriculturist has been received.**
- 3.4.9 A toolbox talk with the Site Manager will also take place at the tree protection check to ensure that a copy of this Method Statement and the Tree Protection Plans has been received and to discuss the arboricultural methods specified.
- 3.4.10 Once installed, tree protection fencing and ground protection will not be moved or altered in anyway without prior consultation and sign off from an Arboriculturist. If fencing does need to be moved back to create construction space, appropriate ground protection (see 3.5 below) must be used to cover the exposed RPA during works until such time as tree protection fencing can be reinstated in its original position.
- 3.4.11 It is the responsibility of all persons working on the Site to ensure that the fencing remains intact and in the correct locations throughout construction. It is also the responsibility of all persons working on the Site to respect the Construction Exclusion Zones created by the tree protection fencing. In the event that any fence panels are damaged, this must be rectified immediately to restore the Construction Exclusion Zone.
- 3.4.12 Tree protection fencing will only be removed once all construction and landscaping work is complete.

3.5 Installation of Ground Protection

- 3.5.1 Ground protection is specified for the trees adjacent to the River Wensum. The total amount of ground protection specified in the Tree Protection Plans is just under 750m².
- 3.5.2 Ground protection is specified here so that tree protection fencing can be set back to allow construction working space. **The exposed RPA must be covered by either fencing or ground protection at all times.**
- 3.5.3 Ground protection must be suitable for the weight of the traffic using the area to ensure that underlying soils are not compacted. Ground protection specifications will meet the recommendations set out in paragraph 6.2.3.3 of British Standard 5837: 2012:
- “for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*
- for pedestrian-operated plant up to a gross weight of 2 t, 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 t 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.”*
- 3.5.4 For construction traffic exceeding 2 tonnes, appropriate ground protection will constitute a 150mm woodchip or sharp sand layer topped with heavy duty ground protection mats (multiple providers are available for rent or purchase) that are suitable for the weight of the heaviest vehicle requiring access to the area.
- 3.5.5 In all cases the objective must be to avoid soil compaction within RPAs. A single pass of a heavy vehicle, especially in wet ground conditions, can cause compaction.

3.6 Site Office and Compounds

- 3.6.1 The site office and compounds must be located outside of the RPAs and canopy spreads of all retained trees. Access to the site office and construction compounds must avoid low tree canopies to avoid the need for pruning to allow taller construction vehicles to gain entry to the compound.
- 3.6.2 No materials or machinery must be stored within RPAs at any point.
- 3.6.3 The storage of oils, fuels and chemicals within the compound will be confined to areas with impervious bases and surrounded by impervious bunds. All materials storage facilities and areas must consider the effects of sloping ground on the movement of potentially harmful liquids towards retained trees.

3.7 Ground Works

- 3.7.1 This Method Statement will be provided to ground works contractors in advance of ground works commencing.
- 3.7.2 No ground works will take place within the RPAs of trees to be retained as shown on the Tree Protection Plans. Ground levels will not be raised or lowered within RPAs. No heavy machinery or soil storage will enter RPAs. No mechanical excavation will take place within RPAs.

3.8 Underground Services

- 3.8.1 Underground services must avoid the RPAs of all retained trees. At the time of writing, no details of the locations of underground services have been provided therefore provisional advice is provided below if services do intersect with RPAs.
- 3.8.2 Prior to installation of services within RPAs, the project Arboriculturist will be consulted.
- 3.8.3 The distance between the service run and the tree stems must be maximised to minimise the size and amount of root that may be impacted.
- 3.8.4 Impact moling will be used wherever possible to install underground services within RPAs. Entry and exit pits must be located outside of RPAs and when passing underneath RPAs, the depth of moling must exceed 600mm.
- 3.8.5 Where impact moling is not practical, hand digging with hand tools and an airspade will take place within the RPA under the supervision of an Arboriculturist to create the trench. Roots larger than 25mm will be assessed by the Arboriculturist and then pruned back cleanly to the side of the trench on the stem side by construction personnel.
- 3.8.6 If roots need to be retained they will be wrapped in damp hessian and worked around. Services will then be thread underneath roots. Advice from the service engineer will be sought regarding the need for installing a root protection barrier around the service to protect the service from potential future root ingress.

3.9 Footpaths

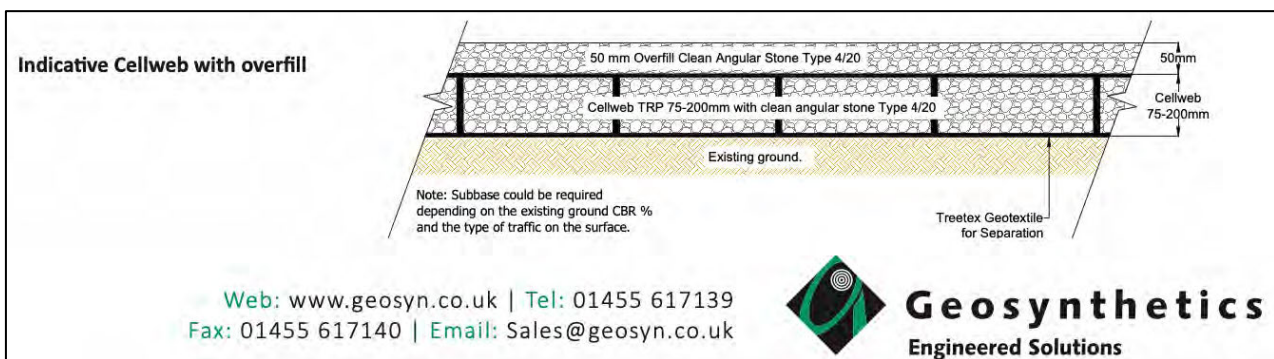
- 3.9.1 One footpath requires specialist construction methods and materials.
- 3.9.2 It is located on the northern edge of the Deal Ground beside the River Wensum and within the RPAs of T1-T14.
- 3.9.3 The footpath needs to be of a construction which requires no excavation into the ground ('no-dig'), this prevents root severance. In addition, the footpath and all its constituent layers, need be permeable to allow retained roots underneath to continue to access air and water.

3.9.4 To achieve this, a cellular confinement system will be used to construct the footpath. These products can provide an above ground subbase with high load bearing capacity. There are a number of manufacturers which provide cellular confinement systems. The following systems would be appropriate:

- Geosynthetics Cellweb Tree Root Protection System²
- Wrekin’s Protectaweb³
- Core Landscape Products’ Core TRP⁴

3.9.5 An example detail for the Geosynthetic’s Cellweb is shown below in Figure 2.

Figure 2. Indicative Geosynthetic’s Cellweb Footpath Detail



3.9.6 The chosen cellular confinement system must have the following specifications:

- No required excavation into the ground;
- A permeable geotextile laid at ground level to prevent soil migrating into the cellular matrix reducing permeability of the system over time;
- A cellular matrix that is suitable for the weight of the intended loads (i.e. pedestrians/cyclists). This will inform the depth of the cellular grid layer which can range from 75mm to 200mm as shown in Figure 2 above. A depth of 75mm is usually sufficient for footpaths;
- The cellular matrix must be filled with a no-fines stone aggregate, ideally 20/40mm stones however, where not available, 4/20 stone can be used. Type 1 aggregate must not be used;
- A permeable finishing layer such as porous asphalt or blocks; and
- Edge supports which require no excavation. Kerb stones set into concrete haunching are not appropriate as this would require excessive digging into RPAs. Instead, timber edging will be used where it is set above ground level with regular pegs into the ground pinning it into position.

² <http://www.geosyn.co.uk/product/cellweb-tree-root-protection>

³ <https://www.wrekinproducts.com/geosynthetics/geocells-geocellular-paving/protectaweb>

⁴ https://www.corelp.co.uk/core-tree-root-protection/?utm_term=protecting%20trees%20during%20construction&utm_campaign=AP+%7C+Search+%7C+Tree+Root+Protect

or&utm_source=adwords&utm_medium=ppc&hsa_acc=3393753656&hsa_cam=9567872581&hsa_grp=95517313662&hsa_ad=423203799057&hsa_src=g&hsa_tgt=kwd-6304883325&hsa_kw=protecting%20trees%20during%20construction&hsa_mt=b&hsa_net=adwords&hsa_ver=3&gclid=EAlaIQobChMI0ujQzfCu_wIVTu7tCh3zOgXwEAAyASAAEgKEYvD_BwE

- 3.9.7 The following methodology will be used to install the no-dig footpath in conjunction with any specific methodology provided by the product manufacturer:
1. **No digging will occur at any time within RPAs. No hard surfacing will be within 0.5m of a tree stem to avoid future stem growth causing hard surfaces to heave.**
 2. Prior to installation of the footpath, the ground will have been protected from soil compaction by suitable ground protection over RPAs (see Tree Protection Plans and section 3.5 of this report). No soil compaction must be present prior to installing the footpath. If compaction is present, an Arboriculturist must be consulted and decompaction with an airspade may be required prior to footpath installation.
 3. An Arboriculturist will attend site to supervise the removal of any existing vegetation along the route using hand tools. No machinery will be used to clear vegetation. Any surface roots encountered will be worked around and hollows can be filled with sharp sand (not builder's sand). No excavation will take place to level the area.
 4. Once the surface has been prepared, the permeable geotextile will be laid.
 5. Edging will be installed comprised of softwood edging boards placed above ground level. These will be held in place with pegs spaced a minimum of 500mm apart and driven into the ground, avoiding any large (>25mm diameter) roots.
 6. The cellular layer will then be laid on top of the geotextile and pinned into position as per the manufacturer's instructions to achieve the specified cell diameter. Cells will be filled with a minimum of 100mm depth no-fines angular fill (20/40mm, or if not available then 4/20 may be appropriate). The infill material will be placed at the end of the footpath and then pushed over the expanded cells. Machinery can then work from the filled cells or from adjacent ground protection.
 7. Once the cells are filled to capacity, a second layer of geotextile will be laid over the in-filled cells and a permeable surface installed on top.

3.10 Root Pruning

- 3.10.1 Play equipment is proposed for installation within the RPAs of T4 Lombardy poplar, T5 weeping willow, T6 Lombardy poplar, T31 false acacia, W2* and W3*. A footpath is also proposed within the RPAs of W1*.
- 3.10.2 Root pruning along the black lines shown in the Tree Protection Plans will be undertaken.
- 3.10.3 A shallow trench will be hand dug along the root pruning line using hand tools only with an Arboriculturist present. The trench will be to the depth of the excavation required to install the relevant play equipment/hard surfacing.
- 3.10.4 Any roots larger than 25mm in diameter that are encountered during works will be assessed by the Arboriculturist and where necessary pruned back cleanly to the side of the excavation on the stem side by construction personnel. Roots smaller than 25mm will be cut back with secateurs to the side of the excavation closest to the tree stem.

3.11 Fencing and Soft Landscaping

- 3.11.1 Garden fencing will be installed within the RPAs of T1-3 white willow.
- 3.11.2 Fence post installation will require excavation within RPAs which may sever or damage roots.
- 3.11.3 To minimise potential root damage, all excavation for fence posts will be undertaken by hand or using a handheld mechanical auger. Where large roots (>25mm in diameter) are encountered, fence post holes will be moved to avoid the root. Where roots smaller than

25mm in diameter are encountered, these will be pruned back cleanly to the side of the hole with secateurs.

- 3.11.4 It is advised that concrete bases for fence posts are avoided as toxic leachates within concrete can be taken up by nearby trees, particularly where roots are severed, negatively impacting tree health. Should concrete bases be required, then fence post holes will first be lined with an impermeable membrane. Concrete will then be poured into the lined post holes.
- 3.11.5 Gardens are proposed within the RPAs of T1-3 white willow. The soils within gardens will not be cut and/or filled. Ground levels must not be changed within RPAs. If ground levels do require amendment, then advice from an Arboriculturist must be sought.

3.12 Tree Planting

- 3.12.1 All tree planting will be in accordance with British Standard 8545:2014 Trees from Nursery to Independence in the Landscape – Recommendations.
- 3.12.2 New trees must be checked carefully upon arrival to the Site for quality and any damage during transportation.
- 3.12.3 Bareroot trees must be stored securely on the Site and not left unplanted for more than 48 hours. If bareroot trees are being stored, they will be kept in a shady secure location with their roots within bags to maintain humidity. Roots will be sprayed with water regularly so they are kept moist during storage.
- 3.12.4 Containerised and rootballed trees must also be stored securely and their soil kept moist through regular watering until planting.
- 3.12.5 Tree planting will take place during the winter months from November – March. This will prevent desiccation of any new trees and allow trees to establish roots ready for the next growing season.
- 3.12.6 Tree pits will be dug to the depth of the rootball/container and 75mm wider in diameter than the rootball taking care not to glaze or smear the sides of the tree pit. Soil removed will be separated into two piles: top soil and subsoil. The tree will be placed carefully in the pit, ensuring that the natural root flare at the base of the stem is visible above ground level.
- 3.12.7 The removed subsoil will then be backfilled into the tree pit in 150-230mm layers, ensuring the tree remains vertical at all times. Layers of backfill will be firmed in to remove air pockets but without overly compacting the soil.
- 3.12.8 The final layer of backfill will not be consolidated but be of sufficient depth for soil settlement.
- 3.12.9 A support system can then be installed as necessary and the tree watered to field capacity.
- 3.12.10 Where trees are planted within soft landscaping, a 1m radius circle of woodchip mulch, applied to an even depth of 50-100mm will be placed around each tree's stem, taking care not to allow the mulch to touch the tree stem.

3.13 Post Construction

- 3.13.1 When all construction and landscaping works are complete, tree protection fencing and ground protection measures can be removed.
- 3.13.2 An Arboriculturist will attend the Site to undertake a health and safety inspection of the trees and to specify any required remedial works.

3.14 General Precautions

- 3.14.1 It is important that all workers on site are aware of the tree constraints and presence of the Tree Preservation Order on the Deal Ground site.
- 3.14.2 A copy of this report and the attached Tree Protection Plans must be available in the Site Office at all times and provided to relevant contractors ahead of time.
- 3.14.3 Planning of construction activities will take account of the canopies of existing trees to ensure that no movements of materials impact on the trees, potentially causing physical damage.
- 3.14.4 Movement of machinery or equipment with a hydraulic lifting arm will be carried out under the supervision of a banksman to ensure that adequate clearance distances are always maintained.
- 3.14.5 No spoil, oils, chemicals or building materials are to be stored within the RPA, particularly those whose accidental spillage could potentially cause contamination and damage to a tree. No fires will be sited near tree canopies.
- 3.14.6 RPAs should be considered as a Construction Exclusion Zone.

Appendix 1 Tree Survey Schedule

Tree Reference No.	Common Name	Scientific Name	Tree Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height (m) and Direction of Lowest Branch	Canopy Clearance Height (m)	Life Stage	Observations	Structural Condition	Physiological Condition	Estimated Remaining Contribution (Years)	Root Protection Area (RPA, m ²)	Radius of RPA (m)	BS5837:2012 Quality Category
					North	East	South	West										
T1	White willow	<i>Salix alba</i>	12	1400	#3	#3	#7	#1	S1.5	1	Mature	Old willow pollard, significant decay in main stem, evidence of past lost limbs, good deadwood habitat in stem	Poor	Fair	20-40	887	16.8	B3
T2	White willow	<i>Salix alba</i>	29.5	1490	9	12	10	14	W1.5	1	Mature	Two large mature willows with twin stems arising at base. Good form, evidence of past limb loss, deadwood in canopy.	Fair	Good	20-40	1004	17.9	B2
T3	White willow	<i>Salix alba</i>	24.5	920	7.5	4.5	10	8.5	N1.2	4	Mature	Suppressed by T2, evidence of past branch loss, decay in stem.	Poor	Fair	10-20	383	11.0	C1
T4	Lombardy poplar	<i>Populus nigra 'Italica'</i>	30	700	2.5	2	1.5	2	S8	6	Mature		Good	Good	20-40	222	8.4	B2
T5	Weeping willow	<i>Salix babylonica</i>	15	800	#10	#5	3	10	N5	1	Mature	Well formed tree, evidence of past crown reduction with good regrowth present. Stem leaning north.	Fair	Good	20-40	290	9.6	B2
T6	Lombardy poplar	<i>Populus nigra 'Italica'</i>	28	850	2	4.5	2	1	W3	2	Mature	Twin stem tree at ground level, minor deadwood in crown	Fair	Good	10-20	327	10.2	C2
T7	Lombardy poplar	<i>Populus nigra 'Italica'</i>	28	780	2	2	2	2	W2.5	3	Mature	Minor deadwood in crown	Good	Good	20-40	275	9.4	B2
T8	White willow	<i>Salix alba</i>	19	700	5	9	9	2	S1.5	1	Mature	Canopy suppressed by neighbours, canopy supporting large branch from T9	Fair	Good	10-20	222	8.4	C2
T9	White willow	<i>Salix alba</i>	32	1500	16	10	13	14	W4	1.5	Mature	Large willow with multiple stems, one fallen to east onto T8, deadwood in canopy	Fair	Good	20-40	1018	18.0	B3
T10	Weeping willow	<i>Salix babylonica</i>	16	750	7	6	8	11	S3	1	Mature	Canopy slightly suppressed by T9, deadwood in canopy, tree potentially pollarded historically at 4m, good regrowth present	Good	Fair	20-40	254	9.0	B2
T11	Lombardy poplar	<i>Populus nigra 'Italica'</i>	32	1100	3	6	6	1	S2.5	1.5	Mature	Tree in good condition, pair with T12, minor deadwood in canopy	Good	Good	20-40	547	13.2	B2
T12	Lombardy poplar	<i>Populus nigra 'Italica'</i>	31	1100	3	1	5.5	4.5	S1.5	2	Mature	Tree in good condition, pair with T11, minor deadwood in canopy	Good	Good	20-40	547	13.2	B2
T13	Lombardy poplar	<i>Populus nigra 'Italica'</i>	25.5	900	#3	4	4	2	S1	1.8	Mature	Well formed tree in good condition, minor deadwood	Good	Good	20-40	366	10.8	B2
T14	Weeping willow	<i>Salix babylonica</i>	13	1010	#3	8	9.5	11	S2	0	Mature	Significant lost limb to north, deadwood in canopy	Good	Fair	20-40	461	12.1	B2
T15	Sycamore	<i>Acer pseudoplatanus</i>	12	#200	3	3	3	3	N2	1.7	Semi mature	No access to stem due to vegetation	N/A	Good	10-20	18	2.4	C1
T16	Sycamore	<i>Acer pseudoplatanus</i>	15	#300	#4	#4	#4	#4	0N	1	Semi mature	Twin stem, minor deadwood, no access to stem	N/A	Good	10-20	41	3.6	B2

Tree Reference No.	Common Name	Scientific Name	Tree Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height (m) and Direction of Lowest Branch	Canopy Clearance Height (m)	Life Stage	Observations	Structural Condition	Physiological Condition	Estimated Remaining Contribution (Years)	Root Protection Area (RPA, m ²)	Radius of RPA (m)	BS5837:2012 Quality Category
					North	East	South	West										
T17	Sycamore	<i>Acer pseudoplatanus</i>	11.5	460	#6	6	6.5	#6	N1.5	1.5	Semi mature	No access to stem due to vegetation	Good	Good	40+	96	5.5	B2
T18*	Sycamore	<i>Acer pseudoplatanus</i>	14.5	500	8	7	8	7.5	SE1.8	1.2	Semi mature	Good form, minor deadwood, suckering at base	Good	Good	40+	113	6.0	B2
T19	Sycamore	<i>Acer pseudoplatanus</i>	14	#300	#4	#4	#4	#4	N1.5	1	Semi mature	No access to stem due to vegetation	Good	Good	40+	41	3.6	B2
T20	Sycamore	<i>Acer pseudoplatanus</i>	10	300	6	6	5	6	W2	1.5	Semi mature	Growing from earth bank	Fair	Good	20-40	41	3.6	C2
T21	Goat willow	<i>Salix caprea</i>	4	#80	#2	#2	#2	#2	0	0	Young	Young tree in good condition, multistem	Good	Good	40+	3	1.0	C1
T22*	Goat willow	<i>Salix caprea</i>	13	700	6	6	6	6	N1.5	1.5	Mature	Large mature tree, deadwood in canopy	Good	Good	20-40	222	8.4	B3
T23	Beech	<i>Fagus sylvatica</i>	6	140	3	2	2	2	E2	1.5	Young	Young tree planted in hard standing, good form, tree guard present. Thin crown	Good	Fair	40+	9	1.7	B2
T24	Purple beech	<i>Fagus sylvatica</i> 'Purpurea'	6	120	3	2	2	2	N1.8	0.5	Young	Young tree planted in hard standing, good form, tree guard present	Good	Good	40+	7	1.4	B2
T25	Beech	<i>Fagus sylvatica</i>	6	140	2	1.5	1	2.5	E1.8	1	Young	Young tree planted in hard standing, good form, no guard but small unattached stake	Good	Good	40+	9	1.7	B2
T28	Goat willow	<i>Salix caprea</i>	10	#500	7	#6	5	4.5	-	1.5	Mature	Multistem at 1.5m, overhanging footpath	Fair	Good	20-40	113	6.0	B3
T29	Silver birch	<i>Betula pendula</i>	11	#300	#3	#3	#3	#3	-	-	Early mature	No access to stem due to vegetation	N/A	Good	40+	41	3.6	B2
T30	Goat willow	<i>Salix caprea</i>	13.5	#630	7	6.5	#7	7	-	0	Mature	Minor ivy, pruned to south, multistem	Fair	Good	40+	180	7.6	B3
T31	False acacia	<i>Robinia pseudoacacia</i>	22	780	4	6	8	5.5	S2	1.5	Mature		Good	Good	20-40	275	9.4	B2
T32*	White willow	<i>Salix alba</i>	15	1030	#10	#10	#10	#10	-	0	Mature	Triple stem, low old limb breakout	Fair	Good	40+	480	12.4	B3
T33*	Sycamore	<i>Acer pseudoplatanus</i>	19.5	850	8.5	8	#8	8.5	S2	1	Mature	Triple stem at base with tight forks	Fair	Good	40+	327	10.2	B2
W1*	Silver birch, sycamore, white willow	<i>Betula pendula</i> , <i>Acer pseudoplatanus</i> , <i>Salix alba</i> , <i>Quercus robur</i>	24 max	#500	-	-	-	-	-	-	Mostly semi and early mature. Mature willows to north	Drier woodland on raised ground. Dominated by semi- to early-mature silver birch with some larger mature white willows on the northern boundary. Occasional sycamore and only one oak south of old brick structure	Mix	Mostly Good	40+	-	6.0	B3
W2*	Alder, silver birch, goat willow,	<i>Alnus glutinosa</i> , <i>Betula pendula</i> , <i>Salix caprea</i> , <i>Acer pseudoplatanus</i> , <i>Salix alba</i>	24 max	#500	-	-	-	-	-	-	Mostly mature	Large significant group of trees on lower ground dominated by willows and alder. Majority of trees not accessible due to inundated ground.	Mix	Good	40+	-	6.0	B3

Tree Reference No.	Common Name	Scientific Name	Tree Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height (m) and Direction of Lowest Branch	Canopy Clearance Height (m)	Life Stage	Observations	Structural Condition	Physiological Condition	Estimated Remaining Contribution (Years)	Root Protection Area (RPA, m ²)	Radius of RPA (m)	BS5837:2012 Quality Category
					North	East	South	West										
	sycamore, white willow																	
W3*	Sycamore, white willow, goat willow, crack willow, blackthorn, ash, false acacia, elder	<i>Acer pseudoplatanus</i> , <i>Salix alba</i> , <i>Salix caprea</i> , <i>Salix fragilis</i> , <i>Fraxinus excelsior</i> , <i>Robinia pseudoacacia</i> , <i>Sambucus nigra</i>	15	#700	-	-	-	-	-	-	Mostly Semi Mature with a couple of Mature Willow to east	Woodland with a couple of mature willow on eastern edge. Otherwise made up of semi mature sycamore and ash with scrubby edges. Grades into bramble scrub to north.	Mostly Good	Mostly Good	40+	-	8.4	B3
W4	Aspen, sycamore, goat willow, ash	<i>Populus tremula</i> , <i>Acer pseudoplatanus</i> , <i>Salix caprea</i> , <i>Fraxinus excelsior</i>	23.5	#500	-	-	-	-	-	-	Mostly Mature	Large group of mature trees dominated by aspen. Two fallen in the west, ivy on some trees, phone wire present in south-west corner of group. Semi mature sycamore trees.	Fair	Good	40+	-	6.0	B3
G1	Silver birch, elder, sycamore, goat willow	<i>Betula pendula</i> , <i>Sambucus nigra</i> , <i>Acer pseudoplatanus</i> and <i>Salix caprea</i>	18.5	#400	-	-	-	-	1	0	Semi mature with one mature silver birch	Average to well formed group of trees, self-set. Six sycamores, one silver birch and 1 goat willow with scattered elder. Silver birch is mature, rest are semi mature.	Good	Good	40+	-	4.8	B3
G2	Sycamore, goat willow	<i>Acer pseudoplatanus</i> , <i>Salix caprea</i>	11	400	-	-	-	-	0	0	Mature and Young	Two mature goat willow surrounded by young goat willow and rarely sycamore	Good	Good	40+	-	4.8	B3
G3	Sycamore, hawthorn	<i>Acer pseudoplatanus</i> , <i>Crataegus monogyna</i>	9	#250	-	-	-	-	1.5	1.8	Semi mature	Five sycamore and one hawthorn, self-set	Fair	Good	40+	-	3.0	C2
G4*	White willow, downy birch	<i>Salix alba</i> , <i>Betula pubescens</i>	14	#450	-	-	-	-	0	0	Mature	Group of trees set in marsh with multistem form. No access to stems	N/A	Good	20-40	-	5.4	C2
G5	Sycamore	<i>Acer pseudoplatanus</i>	8	#150	-	-	-	-	3	0	Semi mature	Group of seven trees with multiple stems arising from ground level. Average form, some deer damage evident to stems	Good		40+	-	1.8	C2
G11	Sycamore	<i>Acer pseudoplatanus</i>	11	#250	#4	#4	#4	#4	-	-	Semi mature	No access due to vegetation	Good	Good	40+	-	3	B2
G12*	Hawthorn and goat willow	<i>Crataegus monogyna</i> and <i>Salix caprea</i>	9	#400	-	-	-	-	-	-	Mature	Layered willow in marsh with some mature hawthorn	Fair	Good	40+	-	4.8	B3
G13*	White willow, sycamore, goat willow, ash	<i>Salix alba</i> , <i>Acer pseudoplatanus</i> , <i>Salix</i>	13	700	-	-	-	-	-	-	Mature	Group of mostly goat willow, one large white willow, young sycamore many in low lying inundated ground	Good	Good	40+	-	8.4	B3

Tree Reference No.	Common Name	Scientific Name	Tree Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height (m) and Direction of Lowest Branch	Canopy Clearance Height (m)	Life Stage	Observations	Structural Condition	Physiological Condition	Estimated Remaining Contribution (Years)	Root Protection Area (RPA, m2)	Radius of RPA (m)	BS5837:2012 Quality Category
					North	East	South	West										
		<i>caprea, Fraxinus excelsior</i>																
G14	Sycamore	<i>Acer pseudoplatanus</i>	21.5	890	9.5	#8	#8	9.5	N3.5	1	Mature	Two sycamore as a pair. Both have tight forks with natural bracing, good physiological condition	Fair	Good	40+	-	10.6 8	B2
G15	Willow	<i>Salix sp.</i>	23	440	10.5	10	5.8	8	-	5	Mature	Minor deadwood throughout, ten stems	Fair	Good	40+	-	5.28	B3
G16	Sycamore	<i>Acer pseudoplatanus</i>	12	#400	-	-	5	-	-	1	Semi mature and young	Around six trees, only one is semi-mature, the rest are young	Good	Good	40+	-	4.8	C2

Appendix 2 Definitions for Tree Survey Schedule

Term	Definition	
Ref No.	Unique identification number given to each tree or group. Corresponding number on plan – T = Tree / H = Hedge / G = Group / W = Woodland (*symbol indicates a tree thought to be protected by TPO)	
Common Name/ <i>Scientific Name</i>	Common name followed by italicised scientific name using binomial nomenclature.	
Tree Height	Height of the tree, measured in metres and recorded to the nearest half metre dimensions up to 10 m and the nearest whole metre for dimensions over 10 m.	
Stem diameter	Diameter of stem measured in millimetres at 1.5 metres above ground level (MS = Multi-stem tree measured in accordance with BS5837)	
Canopy Spread	Extent of the tree canopy spread, measured in metres at the four compass points (north, east, south and west) and recorded to the nearest half metre for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m.	
Height of First Significant Branch and Direction	The height of the first significant branch in metres and its direction of growth (north, south east or west).	
Canopy Clearance Height	The height to the lowest part of the crown, measured in metres and recorded to the nearest half metre for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m.	
Life Stage	Classification given in relation to the life expectancy of the specific species.	
	Young (Y)	A recently planted or self seeded tree with a stem diameter less than 150mm at 1.5m height.
	Semi Mature (SM)	Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size).
	Early Mature (EM)	Tree in the second third of its normal life expectancy for the species (some potential for future growth in size).
	Mature(M)	Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size).
	Ancient (A)	Tree that has survived beyond the typical age range for the species and may have acquired rare qualities such as a large stem diameter, hollowing and significant habitat features.
Observations	General observations, particularly of structural and/or physiological condition. (E.g., the presence of any decay and physical defect).	
Physiological Condition	The condition of the canopy and photosynthetic parts of the tree. Good – good health and vitality with sufficient leaf cover and size appropriate to the species and age. Tree will likely have minor deadwood. Fair – tree showing some signs of stress such as minor thinning, dieback of branches, discolouration of leaves, smaller leaves than usual or typical leaf pests or diseases. Tree may recover in time or with remedial work.	

Term	Definition
	Poor – tree showing strong signs physiological stress. This can include extensive crown dieback, stag heading, sparse foliage and pest infestation. Tree is unlikely to recover.
Structural Condition	<p>The biomechanical integrity of the stem and woody parts of the tree.</p> <p>Good = no or few minor defects of little significance or easily rectifiable such as damaged or suppressed branches. No adverse risk of failure.</p> <p>Fair = presence of one or more moderate defects. This could include large deadwood, bark included unions, weak branch attachments, storm damaged limbs, cavities and decay. Work may self-optimize over time or work may be required to remedy the defect.</p> <p>Poor = a tree with major structural defects such as advanced decay or root damage. Works to the tree can be expected.</p>
Estimated remaining contribution	In years based on the condition and species of the tree. <10 years, 10-20 years, 20-40 years and 40+ years.
Root Protection Area (RPA)	An area which defines the theoretical minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability and where the protection of the roots and soil structure is treated as a priority. Measured as the radius of a circle in metres, and total area in square metres.
Root Protection Area radius	In metres, the radius of the circle around the tree defining the Root Protection Area.
BS5837:2012 Quality Category	<p>As per Table 1 in BS5837:2012.</p> <p>Category A = trees of high quality with at least 40 years life expectancy</p> <p>Category B = trees of moderate quality with at least 20 years life expectancy</p> <p>Category C = trees of low quality with at least 10 years life expectancy OR young trees with a stem diameter of less than 150mm at 1.5 height.</p> <p>Category U = trees of very low quality with less than 10 years life expectancy.</p> <p>1 = Mainly arboricultural qualities</p> <p>2 = Mainly landscape qualities</p> <p>3 = Mainly cultural values including conservation</p>
#	Dimension estimated due to tree(s), hedgerow(s) etc. not being accessible and preventing accurate measuring.
Veteran tree	A tree that shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Appendix 3 Tree Preservation Order 423 (Area Order, made February 2008)

All trees present in 2008 of whatever size and species and within the black dashed line are protected.



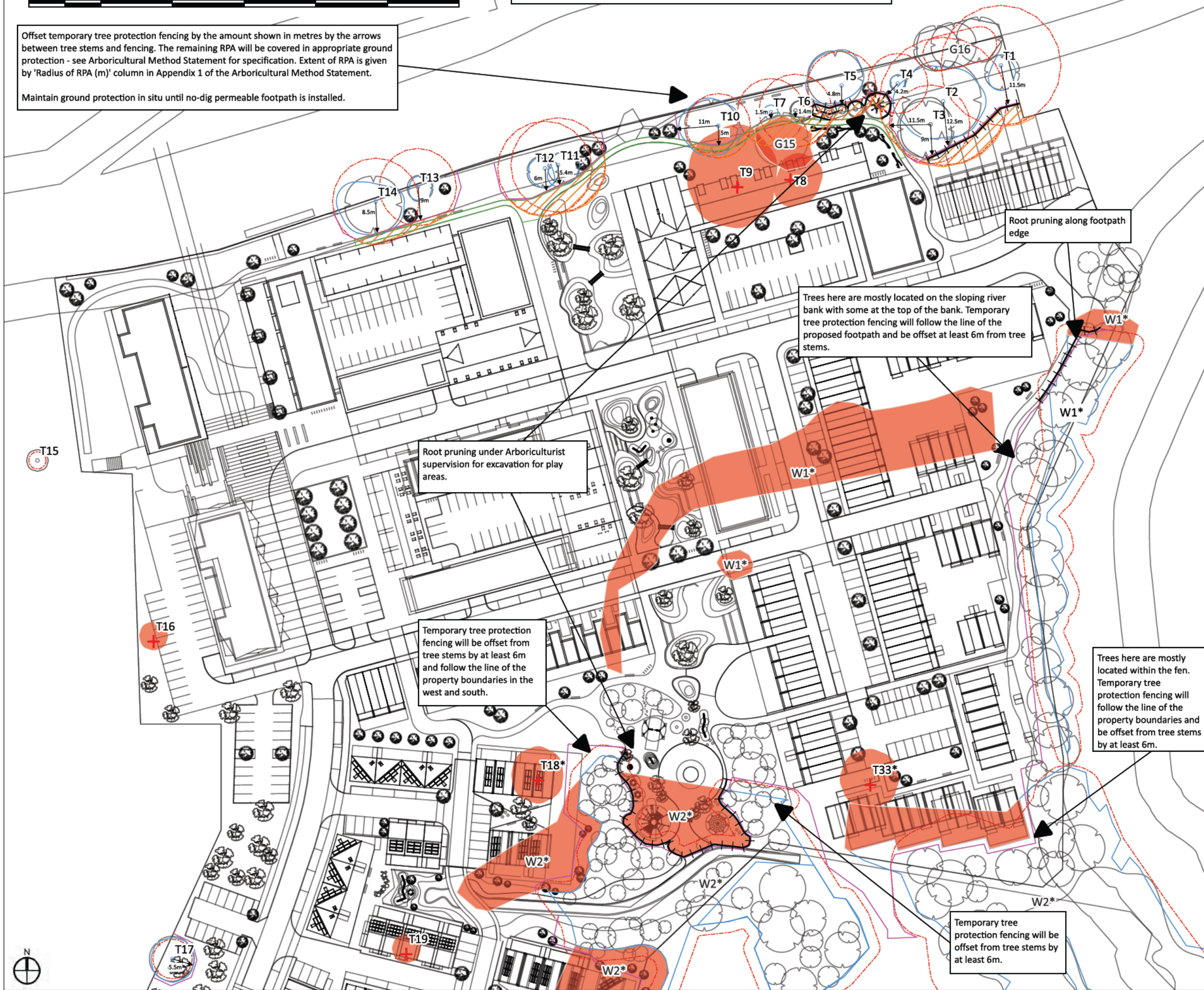
⁵ Norwich City Council. Available at: <https://maps.norwich.gov.uk/mynorwich/index.html>

20 0 20 40 60 80 100 m

This Tree Protection Plan must be read in conjunction with the Arboricultural Method Statement produced by Lanpro dated 20th June 2023.

Offset temporary tree protection fencing by the amount shown in metres by the arrows between tree stems and fencing. The remaining RPA will be covered in appropriate ground protection - see Arboricultural Method Statement for specification. Extent of RPA is given by 'Radius of RPA (m)' column in Appendix 1 of the Arboricultural Method Statement.

Maintain ground protection in situ until no-dig permeable footpath is installed.



NOTES

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Canopy Spread and Retention Category

Category B tree as defined by BS5837:2012 : MODERATE Quality/ value

Category C tree as defined by BS5837:2012 : LOW Quality/ value

RPA (Root Protection Area)

ree/group to be removed

emporary tree protection fencing

Ground protection

Root pruning

No dig permeable footpath using a cellular confinement system

Please note that trees marked with a * symbol (e.g. W1*) are protected by TPO 423 (protects all trees of whatever species that were present in 2008).

Revised by:	Date:	Checked by:	Date:
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PURPOSE OF ISSUE
PL - PLANNING SUBMISSION

DRAWING STATUS
S2 - Fit For Information

PROJECT TITLE
Deal Ground, Norwich

CLIENT
SPC Ltd

DRAWING TITLE Tree Protection Plan 1 of 3	SCALE 1:1000 at A3
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DATE: 20.06.2023	DRAWN BY: AL	CHECKED BY: RG	APPROVED BY: MT
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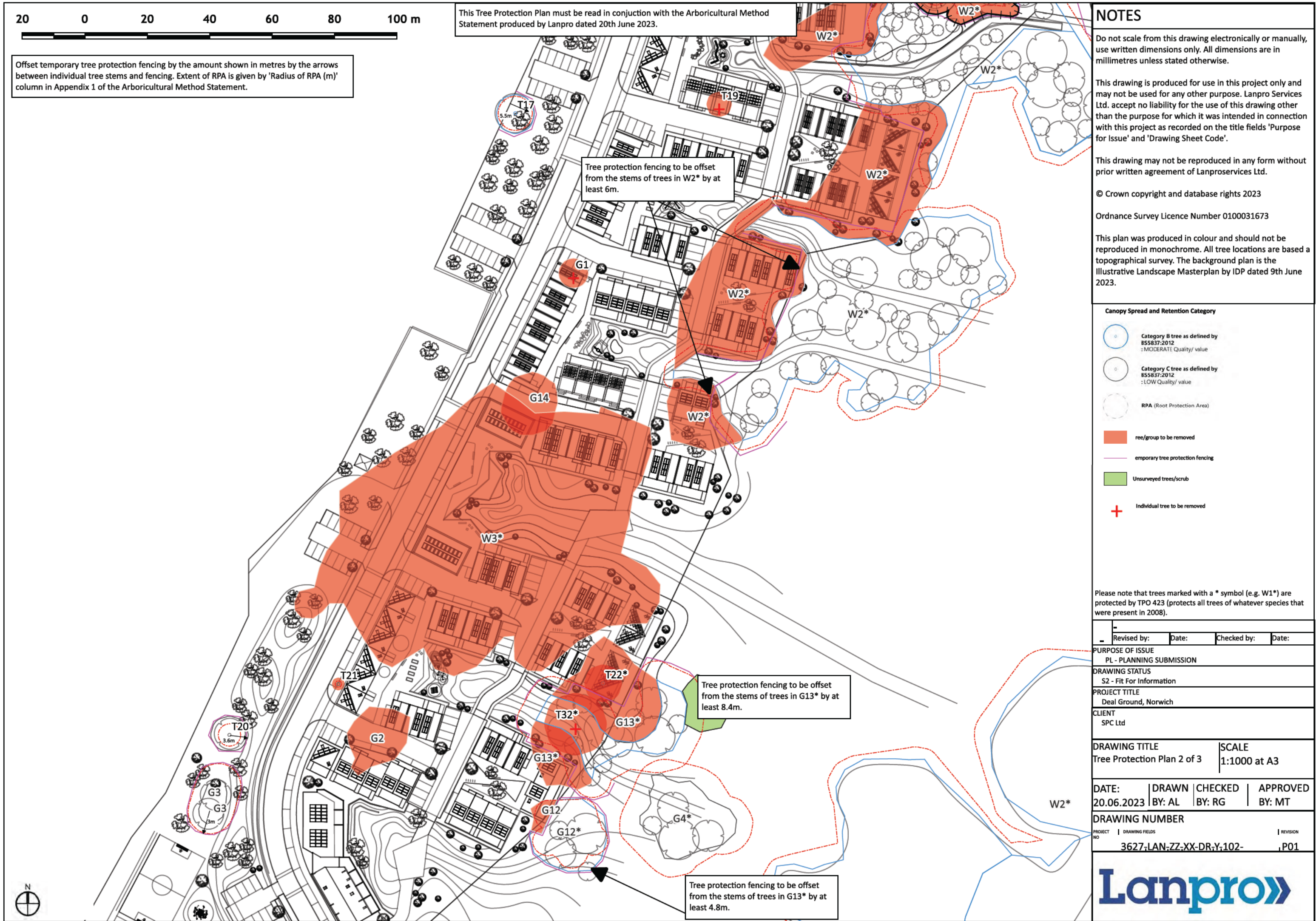
DRAWING NUMBER PROJECT NO 3627;LAN;ZZ;XX-DR;Y-102-	REVISION P01
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20 0 20 40 60 80 100 m

This Tree Protection Plan must be read in conjunction with the Arboricultural Method Statement produced by Lanpro dated 20th June 2023.

Offset temporary tree protection fencing by the amount shown in metres by the arrows between individual tree stems and fencing. Extent of RPA is given by 'Radius of RPA (m)' column in Appendix 1 of the Arboricultural Method Statement.



NOTES

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Canopy Spread and Retention Category

-  Category B tree as defined by BS5837:2012 : MODERATE Quality/ value
-  Category C tree as defined by BS5837:2012 : LOW Quality/ value
-  RPA (Root Protection Area)
-  tree/group to be removed
-  temporary tree protection fencing
-  Unsurveyed trees/scrub
-  Individual tree to be removed

Please note that trees marked with a * symbol (e.g. W1*) are protected by TPO 423 (protects all trees of whatever species that were present in 2008).

Revised by:	Date:	Checked by:	Date:
PURPOSE OF ISSUE PL - PLANNING SUBMISSION			
DRAWING STATUS S2 - Fit For Information			
PROJECT TITLE Deal Ground, Norwich			
CLIENT SPC Ltd			
DRAWING TITLE Tree Protection Plan 2 of 3		SCALE 1:1000 at A3	
DATE: 20.06.2023	DRAWN BY: AL	CHECKED BY: RG	APPROVED BY: MT
DRAWING NUMBER PROJECT DRAWING FIELDS REVISION 3627;LAN;ZZ;XX-DR;Y-102- P01			



20 0 20 40 60 80 100 m

This Tree Protection Plan must be read in conjunction with the Arboricultural Method Statement produced by Lanpro dated 20th June 2023.

Offset temporary tree protection fencing by the amount shown in metres by the arrows between individual tree stems and fencing. Extent of RPA is given by 'Radius of RPA (m)' column in Appendix 1 of the Arboricultural Method Statement.

Temporary tree protection fencing to be offset from W3* by at least 8.4m from tree stems. Fencing to be moved back when play area is installed so protection fencing is in line with the proposed hard surfacing. Root pruning under supervision from an Arboriculturist will take place in accordance with the Arboricultural Method Statement.

NOTES

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Canopy Spread and Retention Category

-  Category B tree as defined by BS5837:2012 : MODERATE Quality/ value
-  Category C tree as defined by BS5837:2012 : LOW Quality/ value
-  RPA (Root Protection Area)
-  tree/group to be removed
-  temporary tree protection fencing
-  Root pruning
-  Unsurveyed trees/scrub to be removed
-  Unsurveyed trees/scrub
-  Individual tree to be removed

Please note that trees marked with a * symbol (e.g. W1*) are protected by TPO 423 (protects all trees of whatever species that were present in 2008).

Revised by:	Date:	Checked by:	Date:
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PURPOSE OF ISSUE
PL - PLANNING SUBMISSION

DRAWING STATUS
S2 - Fit For Information

PROJECT TITLE
Deal Ground, Norwich

CLIENT
SPC Ltd

DRAWING TITLE Tree Protection Plan 3 of 3	SCALE 1:1000 at A3
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DATE: 20.06.2023	DRAWN BY: BY: AL	CHECKED BY: BY: RG	APPROVED BY: BY: MT
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DRAWING NUMBER PROJECT NO DRAWING FIELDS REVISION 3627;LAN;ZZ;XX-DR;Y-102- P01
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