



ARBORICULTURAL IMPLICATIONS ASSESSMENT AND METHOD STATEMENT

PROPOSED DEVELOPMENT

AT

LAND OFF OAK ROAD
WREXHAM INDUSTRIAL ESTATE
WREXHAM

April 2021

PM/AIA/AMS/21/04/21

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1.0 ARBORICULTURAL IMPLICATIONS ASSESSMENT

1.1 The purpose of this report is to: -

- a) Assess the implications, if any, the proposed development will have on the trees identified in the Tree Survey of 6th March 2018 (PM/BS/20/03/18) carried out by Murray Tree Consultancy. The tree schedule and constraints plan from the survey are included within Appendix One of this report.
- b) Advise on arboricultural measures, which would be likely to mitigate any damage resulting from the proposed development

1.2 All background information from which this report is based has been taken from the initial survey, as stated in point 4.1 (a), by Murray Tree Consultancy and a provided development layout plan for the construction of one residential dwelling.

2.0 ASSESSMENT

2.1 The Site Layout Plan within Appendix Four identifies the trees in relation to the proposed development.

2.2 In order to fully assess the impact of the proposals an Implications Table has been created, which gives details of the proximity of the associated works to the trees.

2.3 The below Implications Table details the Root Protection Area (RPA) in accordance with the British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. This is an area that should be left undisturbed in order to provide adequate rooting area for retained trees. This is also illustrated on the Site Plan of Appendix Four.

2.4 This information can then be used in accordance with BS 5837:2012 to determine whether the development will have a detrimental impact on the health of the trees. Once this has been determined remedial measures can be detailed to reduce the impact the proposals will have.

2.5 Implications Table: -

Tree No.	Species	Root Protection Area (m ²)	Circle Radius (m)	Distance to any proposed construction or surfacing (m)	Can the Tree be Successfully Retained
Site	Mixed	<72.38	<4.80	Remove approx. 30-40% for development	
T1	Oak	68.81	4.68	n/a	Yes
T2	Oak	104.23	5.76	n/a	Yes
T3	Oak	629.91	14.16	n/a	Yes

Tree No.	Species	Root Protection Area (m ²)	Circle Radius (m)	Distance to any proposed construction or surfacing (m)	Can the Tree be Successfully Retained
T4	Oak	173.90	7.44	11.0	Yes
T5	Oak	113.10	6.00	Remove for development	
T6	Oak	113.10	6.00	Remove for development	
T7	Oak	261.30	9.12	Remove for development	
T8	Oak	350.33	10.56	4.0	Yes see 4.0
T9	Oak	282.34	9.48	n/a	Yes
T10	Oak	326.85	10.20	n/a	Yes
T11	Oak	254.47	9.00	n/a	Yes
T12	Oak	382.90	11.04	n/a	Yes
T13	Oak	452.39	12.00	n/a	Yes
T14	Oak	157.48	7.08	n/a	Yes
T15	Oak	640.63	14.28	n/a	Yes
T16	Oak	289.53	9.60	n/a	Yes
T17	Oak	289.53	9.60	n/a	Yes

3.0 IMPACT ASSESSMENT

- 3.1 To assess the implications of the proposed development each tree can be categorised in the following way: -

	Trees to be Retained		Trees to be removed	
	With No Impact	With Impact within RPA	Due to Condition	Due to Development
Tree No.	T1, T2, T3, T4, T9, T10, T11, T12, T13, T14 & T15	T8	n/a	Site (30-40%), T5, T6 & T7

4.0 MITIGATING PROPOSALS

4.1 Tree Losses and Replacement Planting

- 4.1.1 The loss of any tree is always regrettable although in this instance the majority of trees to be removed for development are self-sown scrub. However, there are three reasonable quality Oak trees to be removed for the proposed development (T5, T6 & T7). Unfortunately, this is necessary to make the site commercially viable for development, without their removal the proposal would become unworkable.
- 4.1.2 According to the TPO document that was included within PM/BS/20/03/18 only T6 & T7 are currently protected by the Order. Therefore, out of the ten Oak trees that are protected by the Order only two are to be removed for development. A total of seventeen Oak trees were included within the original tree survey.
- 4.1.3 In mitigation the loss of visual amenity due to the removal of these three Oaks trees is minimal as they are not readily visible from the public road or any public footpath, mainly due to the surrounding scrub.
- 4.1.4 Part of the scrub area is to be left on the northern side of the development adjacent to the road, providing a green natural buffer to the development. The site is also to be left intact on the western, eastern and southern sides creating an ecology and heritage zone.
- 4.1.5 The Local Authorities UPD Policy EC4 states: *Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.* It could be argued that T5, T6 & T7 are not considered 'valuable' due to the lack of visual amenity afforded by them and that just two of them are included within the TPO. Further, most tree valuation methods are based on the size and visual presence of trees to the wider community.
- 4.1.6 Within Section 5.5 of the UDP it goes on to state: *A development may be acceptable if mitigating measures can be provided for within the control of the developer which would reinstate the integrity or continuity of these features.* As part of the new overall landscaping scheme forty-eight avenue Oak trees are to be planted along the main access road. The planting of these trees should more than compensate for the loss of these three Oaks.
- 4.1.7 The Local Authorities LPG Note 17 states: *3.1 General A) Development which would result in damage and/or inappropriate felling of significant trees (i.e. BS 5837 Category A & B trees) and hedgerows will not normally be permitted. Planning conditions and Tree Preservation Orders will be used to safeguard trees in appropriate cases.*

- 4.1.8 The above statement discusses ‘inappropriate felling’ and ‘not normally permitted’. However, in this instance this is a carefully considered, designed and controlled development application. The loss of these three trees is considered to be appropriate in the context of what they are to be replaced within and the benefits to the local economy. The use of the words ‘not normally’ also implies that with the correct mitigation this general principle can be reviewed if the circumstances are appropriate.

4.2 Development

- 4.2.1 As shown above, the Implications Table identifies the potential for the proposed development to have an impact on T8 due to the proximity of hard surfacing being within its RPA as shown on the plan of Appendix Four.
- 4.2.2 It is felt that an attempt to retain this tree should be made therefore, some special surfacing is recommended in order to protect roots. Geo-textile materials, such as ‘Geoweb’ and ‘Cellweb’ can be used to construct a permanent ‘no dig’ surfacing within the RPA’s of trees. The below picture is an example of how the product can be used:



- 4.2.3 A clear tree works specification and details of all tree protective measures can be found in the following Arboricultural Method Statement (Section 6.0).

5.0 DISCUSSION

- 5.1 The majority of the root system, of a tree, is in the surface 600mm of the soil, extending radically for distances frequently in excess of the trees height. Beyond the main structural roots (close to the base of the trunk), the root system rapidly sub-divides into smaller diameter roots: off this main system, a mass of fine roots develops.
- 5.2 The shape of the main structural roots develops in response to the need for the tree to have physical stability. Beyond these major roots, root growth and development is influenced by the availability of water and nutrients. Unless conditions are uniform around the tree, which would be unusual, the extent of the root system will be very irregular and difficult to predict. It will not generally show the symmetry seen in the branch system.
- 5.3 The parts of the root system, which are active in water and nutrient uptake, are very fine, typically less than 0.5mm diameter. They are short lived, developing in response to the needs of the tree, with the majority dying each winter. It is *essential* that conditions in the soil remain conducive to the healthy growth of these fine roots so that the water and nutrients necessary for healthy tree growth can be absorbed.
- 5.4 All parts of the root system, but especially the fine roots, are vulnerable to damage. Once they are damaged, water and nutrient uptake will be restricted until new roots have regenerated. Vigorous young trees will be capable of rapid regeneration but over mature trees will respond slowly, *if at all*.
- 5.5 In order to live and grow, roots need oxygen from the soil. Respiration by the roots and other soil organisms depletes this oxygen and increases carbon dioxide levels in the soil; a correct balance of these gases is normally maintained by diffusion between the soil and the atmosphere. Anything, which disturbs this balance, will affect the condition of the root system.
- 5.6 The factors that most commonly affect this diffusion adversely, and therefore damage roots, are the following: -
- a) Compaction of the ground, which reduces the space between soil particles. This is particularly important on clay soils. A single passage by heavy equipment on clay soils or storage of heavy materials can cause significant damage.
 - b) Changing soil levels, even for a few weeks.
 - c) Covering the root area with impervious surfaces.
 - d) A rise in the level of the water table. Roots can tolerate submersion for short periods. But a permanent rise will deplete the soil of oxygen.
- 5.7 Serious damage is often caused during preliminary site works by stripping the topsoil. For this reason, such works should be avoided until protective fencing has been erected.
- 5.8 Excavations in the rooting area can sever roots. As the majority of roots are in the surface 600mm, even shallow excavations can cause damage.

- 5.9 Excavations for foundations, landscaping or service trenches are usually sufficiently deep to sever most of the roots, and it should therefore be assumed that all parts of the root system beyond the excavation would no longer serve the tree.
- 5.10 Excavation or soil stripping which sever or damage the roots may impair the stability of the tree and make it dangerous.

6.0 METHOD STATEMENT

Before any form of development commences on the site the following works should be undertaken: -

6.1 Tree Works

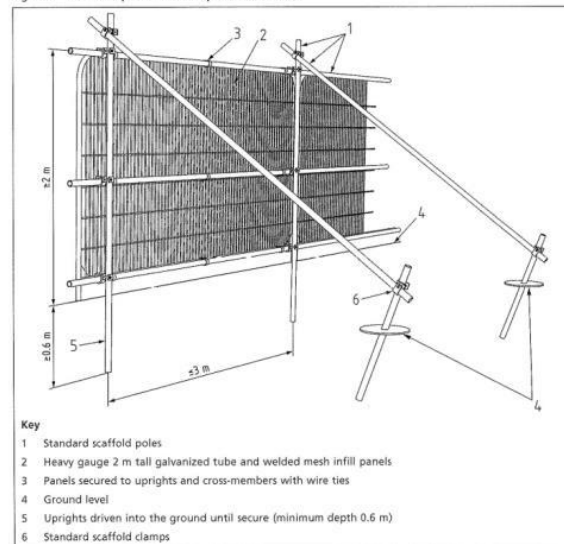
Tree No.	Proposed Works
Site (30-40%), T5, T6 & T7	Fell to ground level and remove stumps.
T16	Sever Ivy at base.

Recommended works should be carried out to the *British Standard Recommendations for Tree Work, BS 3998:2010*

6.2 Protective Fencing

- 6.2.1 Fencing for all retained trees may not be required if protected by existing scrub but in case the scrub is removed then the following shall apply:
- 6.2.2 All fencing used on the site should fully comply with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.
- 6.2.3 The fencing should be strong and suitable for local conditions. It should also take into account the degree of construction activity on the site.
- 6.2.4 In this circumstance the location for the protective fencing should be as shown on the Tree Protection Plan of Appendix Four and of the following specification:

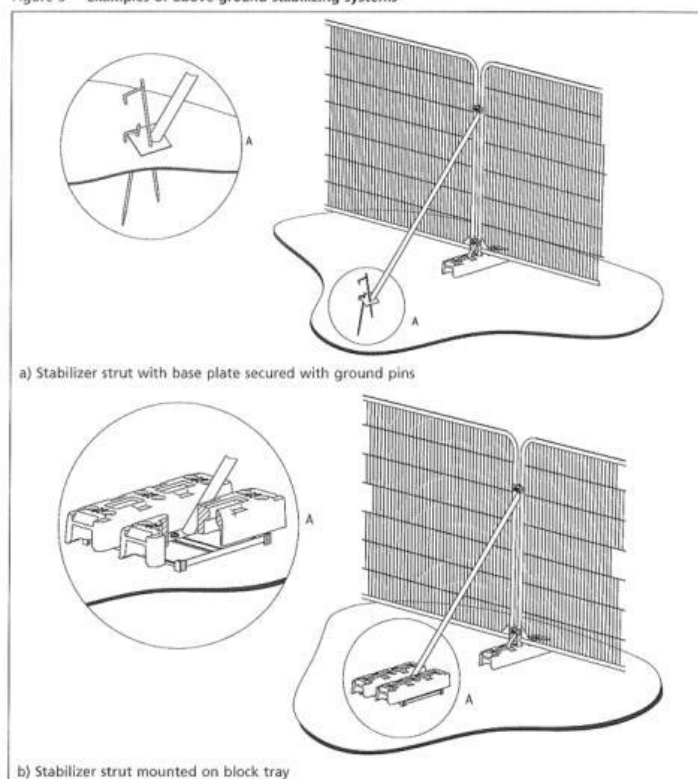
Figure 2 Default specification for protective barrier



Or

Heras type temporary fencing can sometimes be acceptable with the bases pinned to the ground securely. This needs to be checked with the Local Planning Authority.

Figure 3 Examples of above-ground stabilizing systems



6.2.5 No storage of materials or any construction operations should occur within the fenced area. Additionally, when designing the site layout, account should be taken of the route/installation method of underground services/drains and, the route/construction method of new access roads/driveways in relation to the retained trees. It would be advisable to mark out the optimum position of the protective fencing on the ground prior to finalisation of any design proposal.

- 6.2.6 Notices should also be erected on the fencing stating 'Protected Area - No operations within fenced area'. An example can be found in Appendix Three, which should be laminated and attached to the fencing at regular intervals.
- 6.2.7 The positioning of the protective fencing is also very important and should be erected in the proposed location identified on the site plan of Appendix Four. Once the fence has been erected it should never be crossed and particular care should be taken not to store any materials or soil within the protected area.

6.3 Additional Precautions Outside Fenced Areas

- 6.3.1 Oil, bitumen, cement or other material likely to cause damage to the tree will not be stacked or discharged within 10m of the trees stem or within the protective area. Also, materials in general will not be stacked or discharged within the exclusion zone.
- 6.3.2 Concrete mixing and washing will not be carried out within 10m of any retained trees.
- 6.3.3 Fires will not be lit beneath the foliage or in a position where the flames could extend to within 5m of the foliage, branches or trunk. If the fire is large, then this may necessitate a distance of at least 20m.
- 6.3.4 Trees that are to be retained will not be used as anchorage for equipment.
- 6.3.5 Notice boards, telephone cables, or other services will not be attached to any part of the retained tree.
- 6.3.6 Care should be taken when using cranes or other equipment near the canopy of the retained trees. Also any trees to be felled in proximity to the retained trees should be done so with particular care.

6.4 Site Buildings

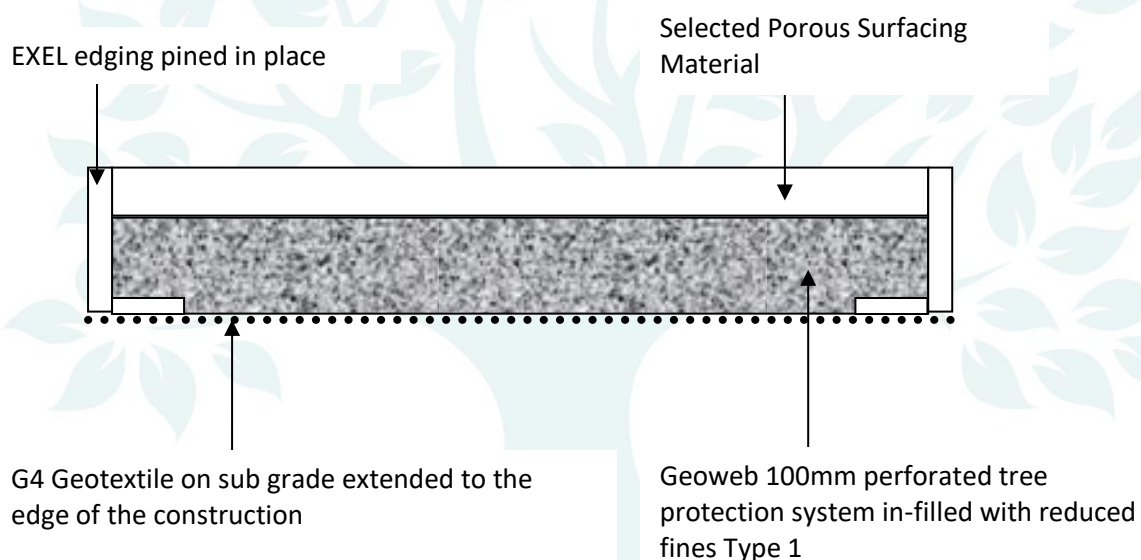
- 6.4.1 Site cabins, compounds and welfare should all be placed outside of the protection areas of retained trees.
- 6.4.2 Where this is not possible further advice should be sought from the appointed arborist and in some circumstances, it may be possible to construct temporary ground protection and adjust fencing but this is only to be considered as a last resort.
- 6.4.3 On larger sites of more intensive development where there is little open space for site buildings then alternative arrangements off site should be considered or part of the site should remain undeveloped until the final stages when less site storage is needed.

6.5 Methodology for the Construction of Permanent and Temporary Hard Surfaces within Root Protection Area's

The following methodology supports the below drawing indicating the construction of the proposed 'no dig' surfaced area as mentioned in section 4.2.2 above with regard to T8. The methodology is prepared on the basis of the sequence of operations necessary to complete the construction of the hard surfaces with the minimum damage to the trees proposed for retention.

- Surface layer to be scrapped off by no more than 50-100mm. This can be done either by hand or by very small machinery but may not be needed at all in this instance.
- Spread a sub grade material over the areas to fill any small ruts.
- Lay G4 Geotextile over area to be surfaced.
- Position EXEL metal edging pinned in place.
- Extend the Geoweb 100mm perforated tree root protection system over the area to be surfaced.
- Fill the voids within the Geoweb with reduced fines Type 1 material working into the site over the top of the Geoweb.
- Surface over the Geoweb such that the construction binds itself together.

GEOWEB BASED SPECIAL SURFACE CONSTRUCTION – (INDICATIVE ONLY)



6.6 Services

- 6.5.1 Where possible all service trenches should be dug outside of the Root Protection Area.
- 6.5.2 Should this not be possible then the guidelines within 'NJUG 10' *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees* should be adopted, in particular Section 4.0, which is included within Appendix Two of this report.

6.7 Summary of Methodology for the Protection Trees

1. Remedial tree works carried out in accordance with this report and by a competent and fully insured arboricultural contractor and in accordance with BS 3998:2010.
2. Erection of Protective Fencing in accordance with this Method Statement and plans of Appendix Four and to be checked by the appointed arboriculturalist before commencement of works.
3. The construction of the 'no dig, surfacing adjacent T8 as outlined above and to be supervised by the appointed arborist.
4. The removal of Protective Fencing is only to be done with the agreement of a competent arborist or the LPA.
5. Replacement tree planting within the new landscaping scheme.

6.8 Conclusion

The loss of the three Oaks trees is unfortunate but as stated above they are not prominent specimens within the locality and their loss can easily be mitigated by the extensive planting of the tree lined avenue within the development. The removal of these three trees and the scrub is considered necessary and appropriate for a commercially viable development.

Signed



Peter Murray (HND. ARB, M, Arbor A)
Consulting Arborist

21st April 2021

APPENDIX ONE

Tree Schedule & Tree Constraints Plans

APPENDIX B – Arboricultural Data

Arboricultural Data Sheet: Land off Oak Road, Wrexham Industrial Estate, Wrexham										Date of Survey: 06/03/18		Surveyor: PM			
Crown C = Crown Clearance; Cond R = Condition Rating; ERC (Yrs) = Estimated Remaining Contribution; TQRA = Tree Quality Category Rating; RPA (m ²) = Root Protection Area (m ²) Recommended works should be carried out to the <i>British Standard Recommendations for Tree Work, BS 3998:2010</i>															
Tree No.	Species	Dbh (mm)	Height (m)	Age	Crown Spread				Crown C	Cond R	Comments and Preliminary Management Recommendations	ERC (Yrs)	TQCR	RPA (m ²)	RPA Circle Radius (m)
					N	E	S	W							
Site	Scrub – Hawthorn, Field Maple, Ash, Elderberry, Birch & Goat Willow	<180 <400	<6 <12	Y-EM	3	3	3	3	0	B	Varied scrub becoming thicker and larger towards the south of the site. All adventitious vegetation due to lack of activity.	10+	C2	<72.38	<4.80
T1	Oak	390	8	EM	6	6	5	6	1.8	B	Located on the edge of a closely spaced group with minor crown asymmetry as a result. Minor deadwood present.	20+	B2	68.81	4.68
T2	Oak	480	9	EM	5	6	5	5	2	B	Located within a closely spaced group with minor crown asymmetry as a result. Minor deadwood present.	20+	B2	104.23	5.76
T3	Oak	1180	12	FM	6	7	5	5	1.8	B	A larger specimen within the group exhibiting reasonable but stunted form. Potential veteran tree. Minor deadwood present and decline within the crown.	20+	B2	629.91	14.16
T4	Oak	620	12	M	7	7	6	6	1.8	B	An individual specimen exhibiting reasonable symmetry with minor deadwood throughout the crown.	20+	B2	173.90	7.44
T5	Oak	500	11	M	7	7	5	6	1.8	B	An individual specimen exhibiting reasonable symmetry with minor deadwood throughout the crown.	20+	B2	113.10	6.00
T6	Oak	500	10	M	5	6	6	6	1.5	B	An individual specimen exhibiting reasonable symmetry with minor deadwood throughout the crown. Not prominent outside of site.	20+	B2	113.10	6.00
T7	Oak	760	12	M	5	7	7	6	1.8	B	An individual specimen exhibiting reasonable symmetry with minor deadwood throughout the crown. Large wounds on scaffold limbs and broken branch stubs present. Not prominent outside of site.	20+	B2	261.30	9.12
T8	Oak	880	12	M	6	7	5	6	1	B	An individual specimen exhibiting good symmetry and good vigour. Minor deadwood within the crown. Minor scars & cavities.	20+	B2	350.33	10.56
T9	Oak	790	13	M	7	7	6	7	1.8	B	A co-dominant specimen exhibiting minor asymmetry. Major deadwood and minor cavities present	20+	B2	282.34	9.48
T10	Oak	850	12	M	8	8	9.5	5.5	2	B	A co-dominant specimen exhibiting minor asymmetry. Major deadwood and minor cavities present	20+	B2	326.85	10.20

Arboricultural Data Sheet: Land off Oak Road, Wrexham Industrial Estate, Wrexham

Date of Survey: 06/03/18

Surveyor: PM

Crown C = Crown Clearance; Cond R = Condition Rating; ERC (Yrs) = Estimated Remaining Contribution; TQRA = Tree Quality Category Rating; RPA (m²) = Root Protection Area (m²)

Recommended works should be carried out to the *British Standard Recommendations for Tree Work, BS 3998:2010*

Tree No.	Species	Dbh (mm)	Height (m)	Age	Crown Spread				Crown C	Cond R	Comments and Preliminary Management Recommendations	ERC (Yrs)	TQCR	RPA (m ²)	RPA Circle Radius (m)
					N	E	S	W							
T11	Oak	750	12	M	5	5.5	4.5	5	2	C	An individual specimen in decline with major cavity on west side of the stem. Heavy compaction over primary roots and soil erosion.	10+	C2	254.47	9.00
T12	Oak	920	17	OM	3	6	5	7.5	2	C	An individual specimen with large tear out wound on north-east of stem at 10m. Major deadwood within the crown. Low potential due to condition limited visual amenity not being prominent outside of site.	20+	B2/3	382.90	11.04
T13	Oak	1000	15	FM	5	5	7.5	7	3	C	An individual specimen with basal decay and exposed roots due to erosion on steep embankment. Major deadwood within the crown. Low potential due to condition limited visual amenity not being prominent outside of site.	20+	B2/3	452.39	12.00
T14	Oak	590	13	M	5	5	7	4.5	2	C	A co-dominant specimen located on boundary with reasonable symmetry but has a large longitudinal decayed seam on stem to the west side. Minor deadwood present.	20+	B2/3	157.48	7.08
T15	Oak	1190	12	S	7.5	6	8	8	1	C	A large stem diameter tree with a potential for veteranisation. Declining outer crown with low vigour.	20+	B2/3	640.63	14.28
T16	Oak	800	9	M	4	4	4	8.5	1	B/C	A co-dominant specimen previously topped out resulting in a new crown on poor attachments. Swamped in Ivy. Poor tree. - Sever Ivy at base.	10-20	C2/B 2	289.53	9.60
T17	Oak	800	6	FM	3	4.5	3	3	1	C	Ivy clad stump with very low potential and no visual amenity.	10+	C2	289.53	9.60



T1
T2
T3

T4

T5

T6

T7

Scattered
Scrub

Scattered
Scrub

Scattered
Scrub

KEY

-  TREE LOCATION AND CONDITION
-  GROUP/ HEDGE LOCATION AND CONDITION
-  ROOT PROTECTION AREA (RPA)
-  CROWN SPREADS

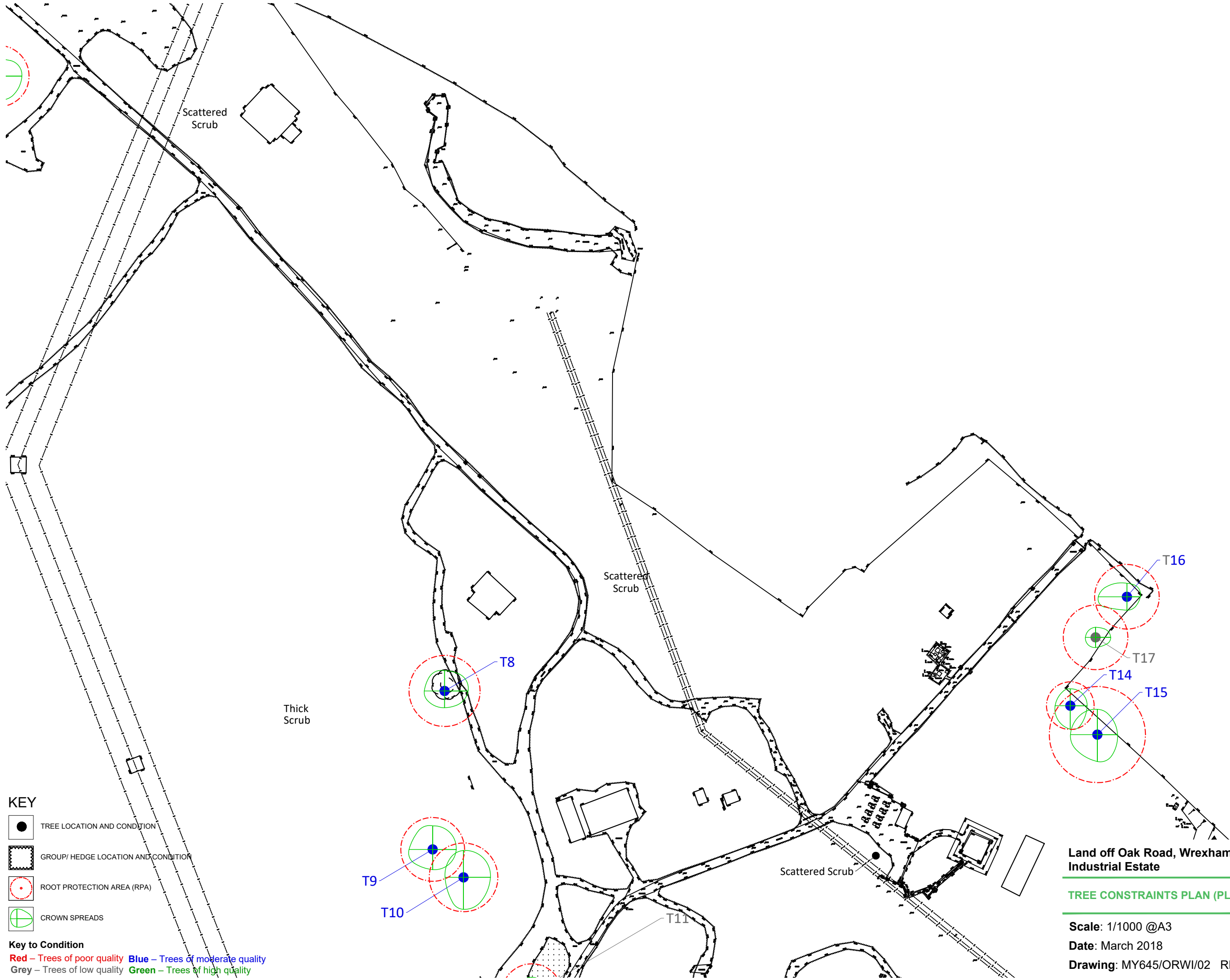
Key to Condition
Red – Trees of poor quality **Blue** – Trees of moderate quality
Grey – Trees of low quality **Green** – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE CONSTRAINTS PLAN (PLAN 1/4)

Scale: 1/1000 @A3
Date: March 2018
Drawing: MY645/ORWI/01 REV -





KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS

Key to Condition

Red – Trees of poor quality Blue – Trees of moderate quality
Grey – Trees of low quality Green – Trees of high quality

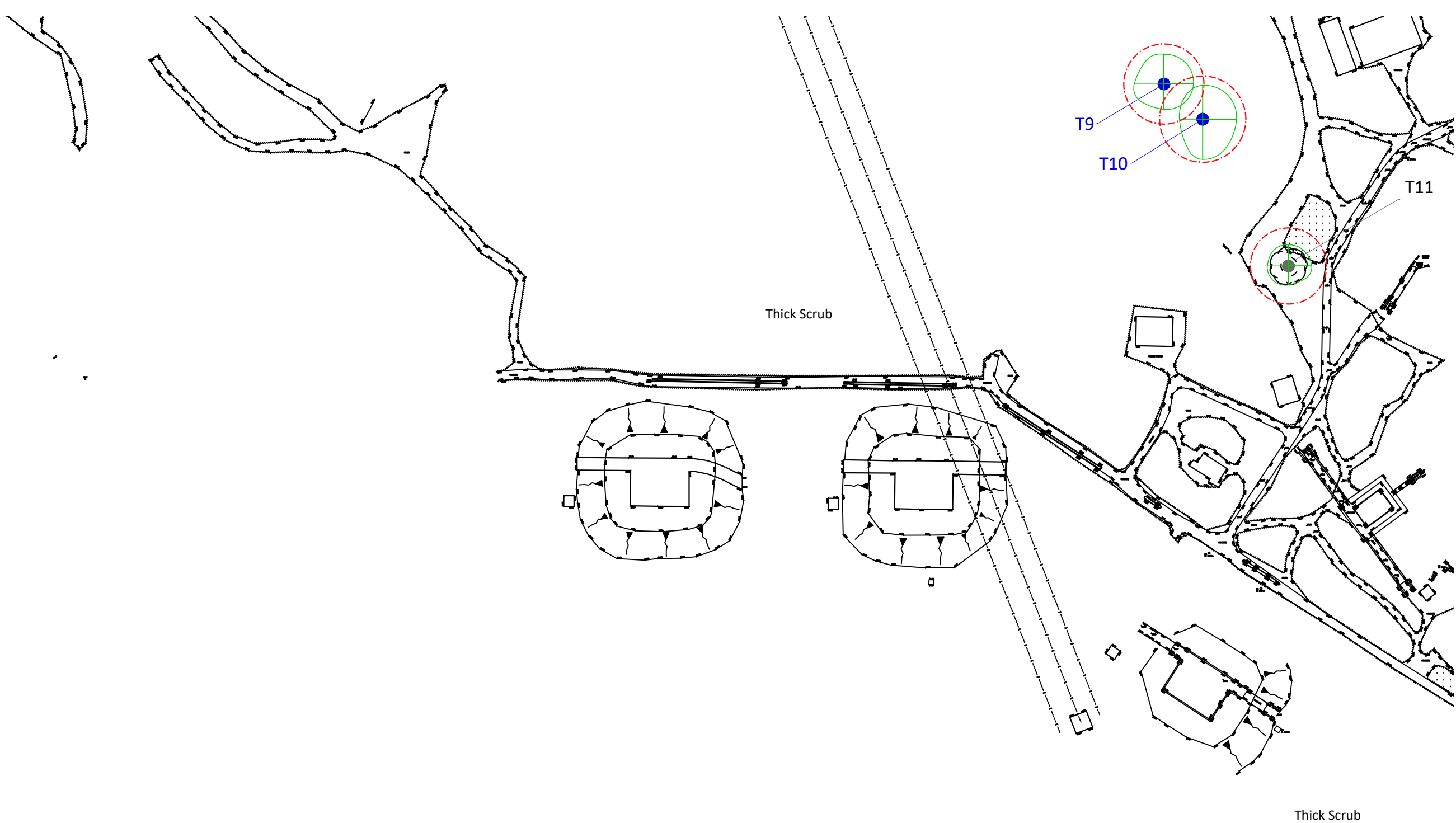
Land off Oak Road, Wrexham Road Industrial Estate

TREE CONSTRAINTS PLAN (PLAN 2/4)

Scale: 1/1000 @A3
Date: March 2018
Drawing: MY645/ORWI/02 REV -




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Thick Scrub

KEY

-  TREE LOCATION AND CONDITION
-  GROUP/ HEDGE LOCATION AND CONDITION
-  ROOT PROTECTION AREA (RPA)
-  CROWN SPREADS

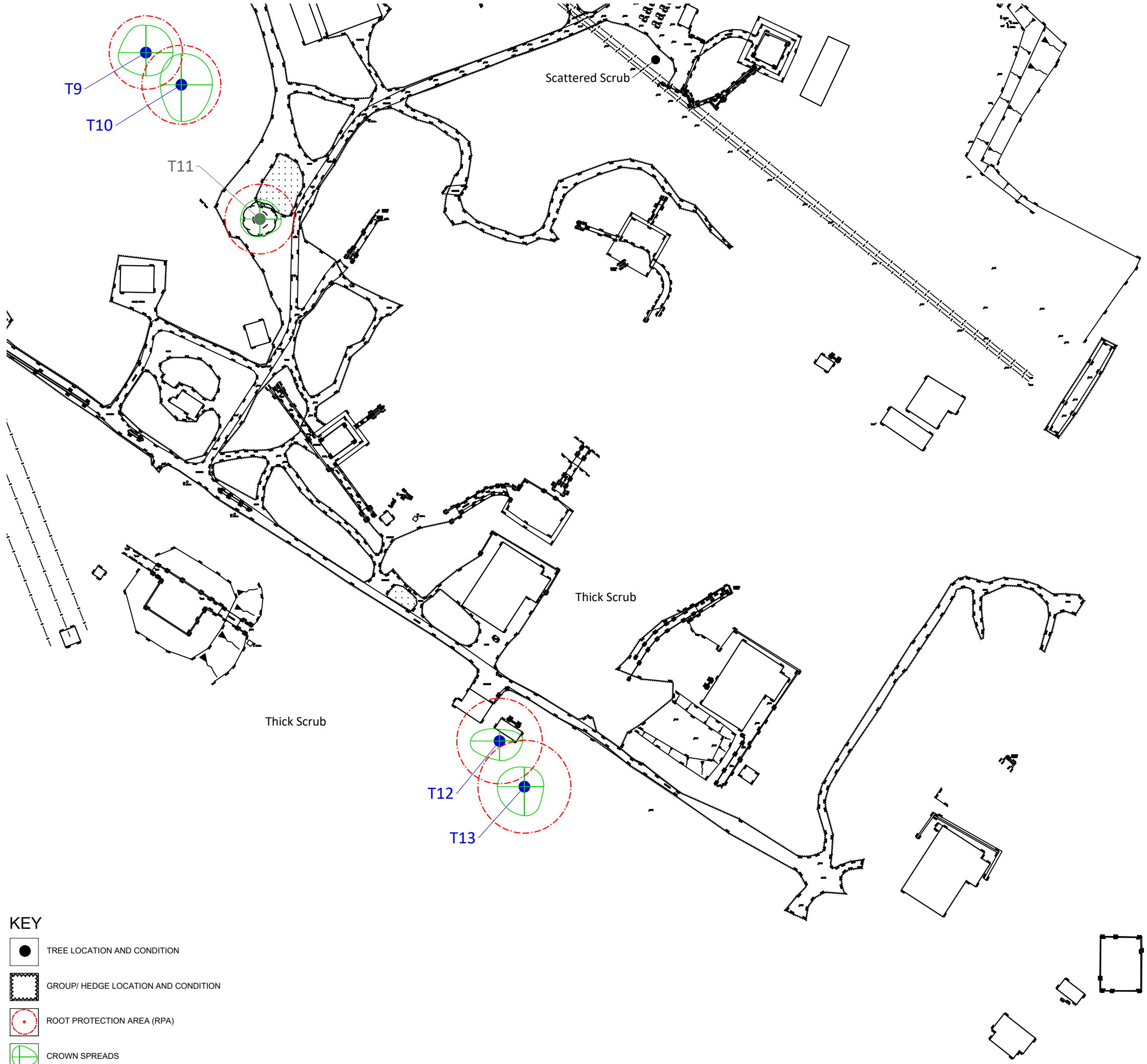
Key to Condition
Red – Trees of poor quality **Blue** – Trees of moderate quality
Grey – Trees of low quality **Green** – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE CONSTRAINTS PLAN (PLAN 3/4)

Scale: 1/1000 @A3
Date: March 2018
Drawing: MY645/ORWI/03 REV -





KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS

Key to Condition
Red – Trees of poor quality **Blue** – Trees of moderate quality
Grey – Trees of low quality **Green** – Trees of high quality



Land off Oak Road, Wrexham Road
Industrial Estate

TREE CONSTRAINTS PLAN (PLAN 4/4)

Scale: 1/1000 @A3
Date: March 2018
Drawing: MY645/ORWI/04 REV -



APPENDIX TWO

NJUG 10 Section 4.0

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

Telecommunications Code (Schedule 2). Paragraph 19 of the Telecommunications Code enables operators to require the lopping of trees which overhang the street and obstruct or interfere with the working of their lines.

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 Fine Roots

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 Precautions

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – ‘Tree Protection Zone’.

4.1.3 Realignment

Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones. In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug

This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

c) Continuous Trench - Hand-dug

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 Backfilling

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – ‘Legislation and Bibliography’**). In England this relates to the requirements of the code of practice – ‘Specification for the Reinstatement of Openings in Highways’ approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.
- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder’s sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.
- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly “tamped” and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

4.1.6 Additional Precautions near Trees

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.
- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –‘Prevention of Damage to Trees Below Ground’ below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

APPENDIX THREE

Site Notice for Protective Fencing



TREE PROTECTION AREA KEEP OUT!

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND ARE SUBJECTS OF A
TREE PRESERVATION ORDER
(TOWN & COUNTRY PLANNING ACT 1990)

CONTRAVENTION OF TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION

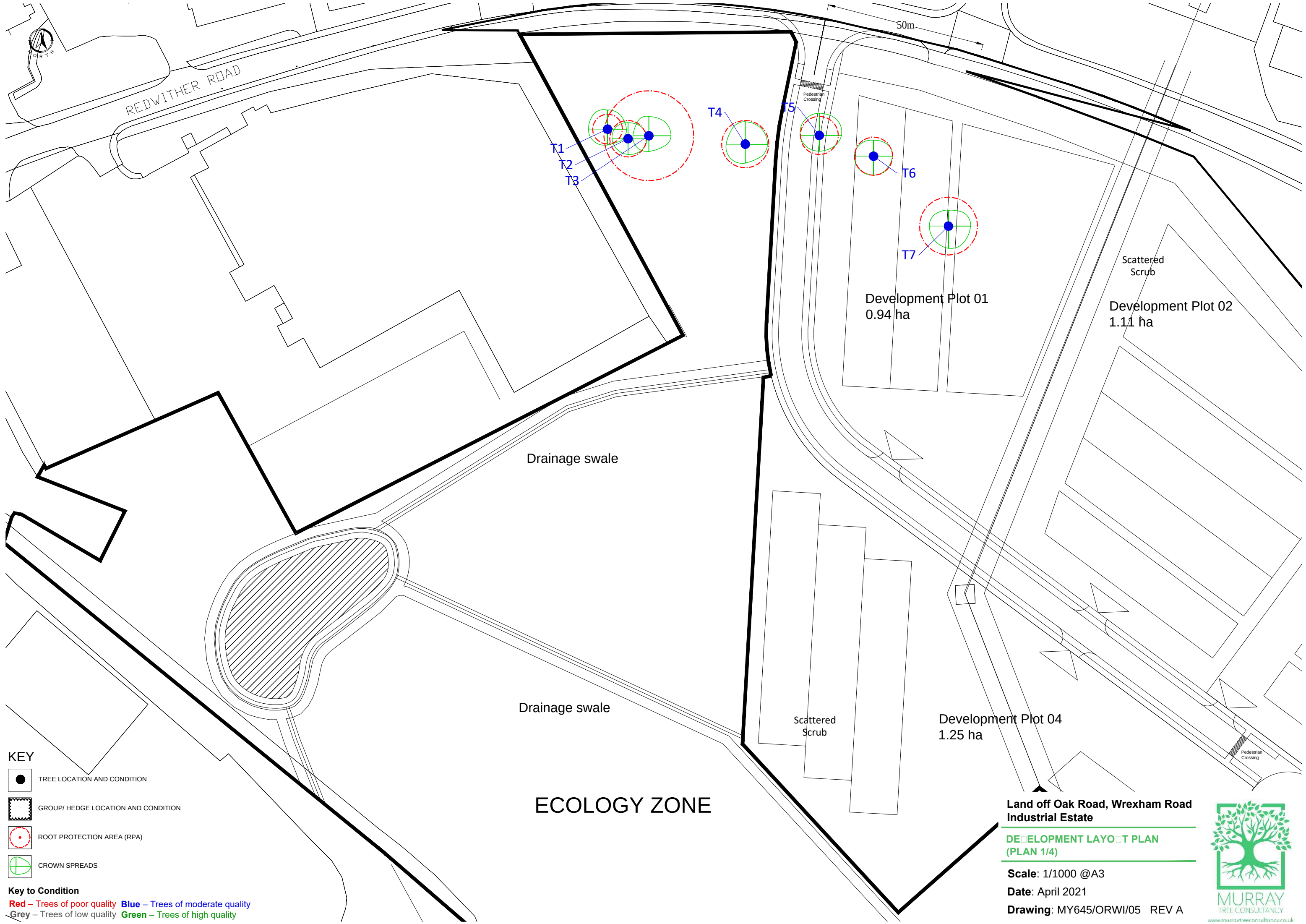
THE FOLLOWING **MUST** BE OBSERVED BY ALL PERSONS:-

- THE PROTECTIVE FENCING MUST NOT BE REMOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE STORED IN THE PROTECTED AREA
- NO SPOIL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

**ANY INCURSION INTO THE PROTECTED AREA MUST BE
WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY**

APPENDIX FOUR

Development Layout Plans Tree Protection Plans



KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS

Key to Condition
Red – Trees of poor quality **Blue** – Trees of moderate quality
Grey – Trees of low quality **Green** – Trees of high quality

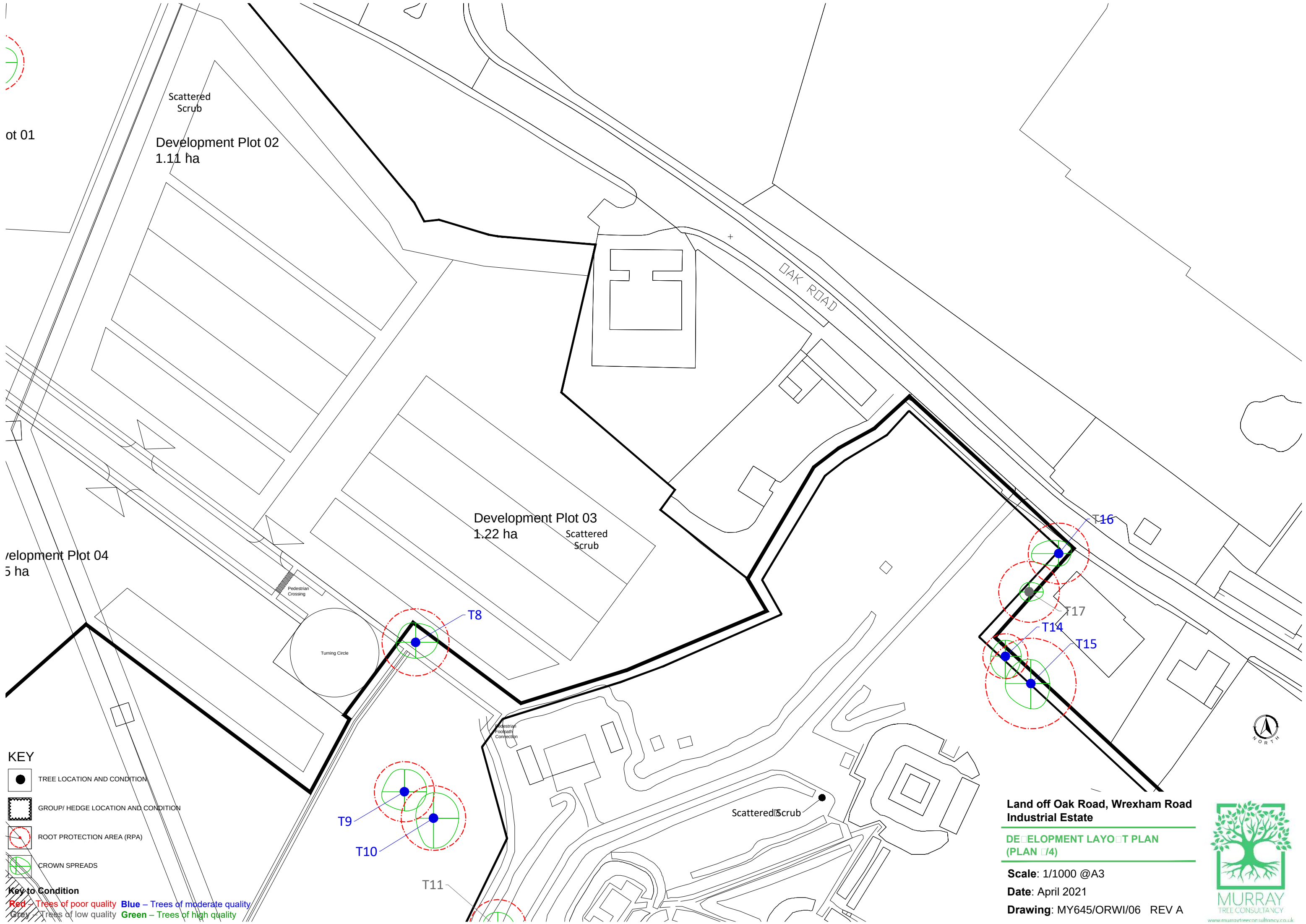
ECOLOGY ZONE

Land off Oak Road, Wrexham Road
Industrial Estate

DEVELOPMENT LAYOUT PLAN
(PLAN 1/4)

Scale: 1/1000 @A3
Date: April 2021
Drawing: MY645/ORWI/05 REV A





Land off Oak Road, Wrexham Road Industrial Estate

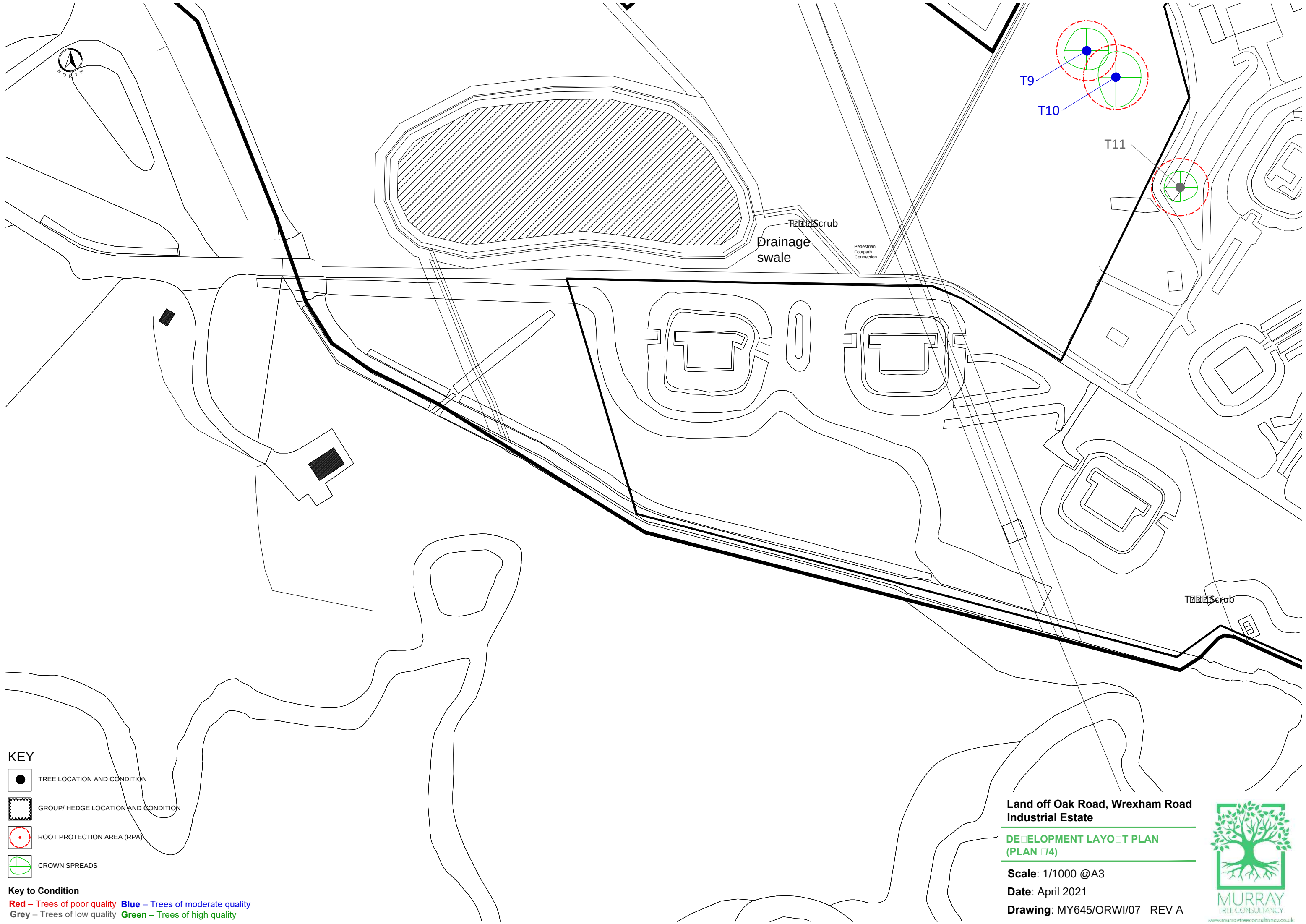
DEVELOPMENT LAYOUT PLAN (PLAN 04)

Scale: 1/1000 @A3

Date: April 2021

Drawing: MY645/ORWI/06 REV A





KEY

-  TREE LOCATION AND CONDITION
-  GROUP/ HEDGE LOCATION AND CONDITION
-  ROOT PROTECTION AREA (RPA)
-  CROWN SPREADS

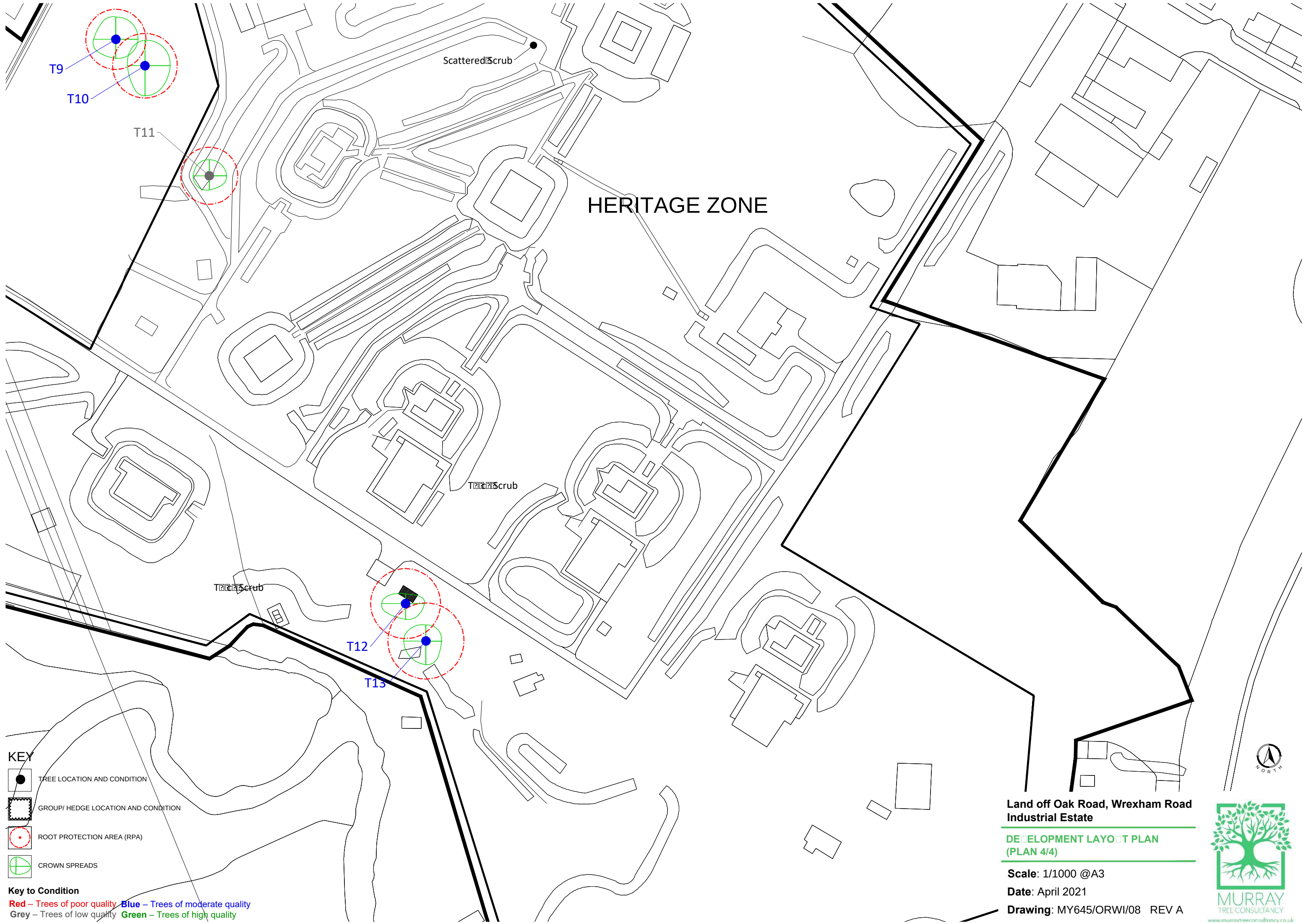
Key to Condition
Red – Trees of poor quality **Blue** – Trees of moderate quality
Grey – Trees of low quality **Green** – Trees of high quality

**Land off Oak Road, Wrexham Road
Industrial Estate**

**DEVELOPMENT LAYOUT PLAN
(PLAN 1/4)**

Scale: 1/1000 @A3
Date: April 2021
Drawing: MY645/ORWI/07 REV A





KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS

Key to Condition

Red – Trees of poor quality Blue – Trees of moderate quality

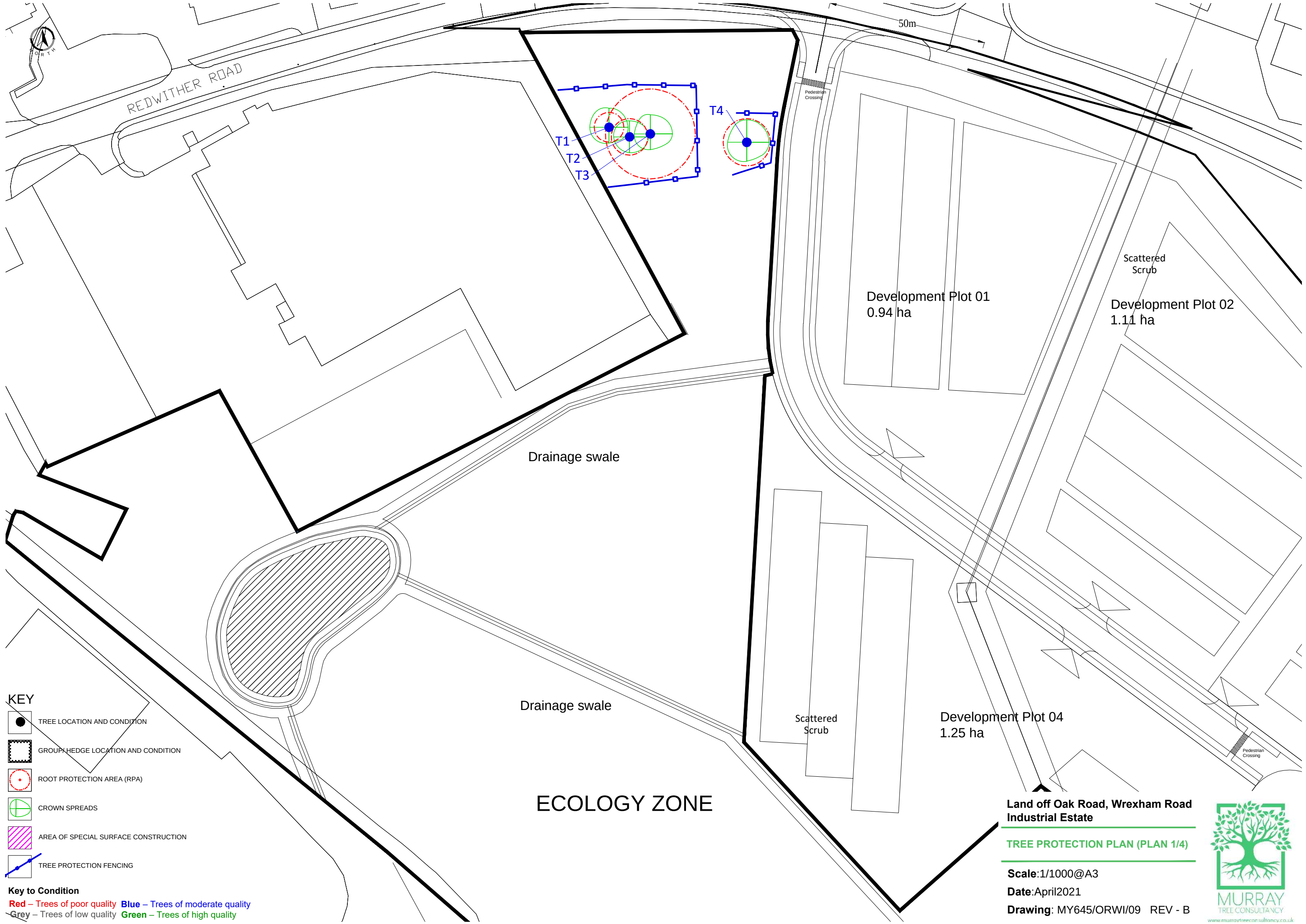
Grey – Trees of low quality Green – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

**DEVELOPMENT LAYOUT PLAN
(PLAN 4/4)**

Scale: 1/1000 @A3
Date: April 2021
Drawing: MY645/ORWI/08 REV A





KEY

- TREE LOCATION AND CONDITION
- GROUP/HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS
- AREA OF SPECIAL SURFACE CONSTRUCTION
- TREE PROTECTION FENCING

Key to Condition

Red – Trees of poor quality Blue – Trees of moderate quality

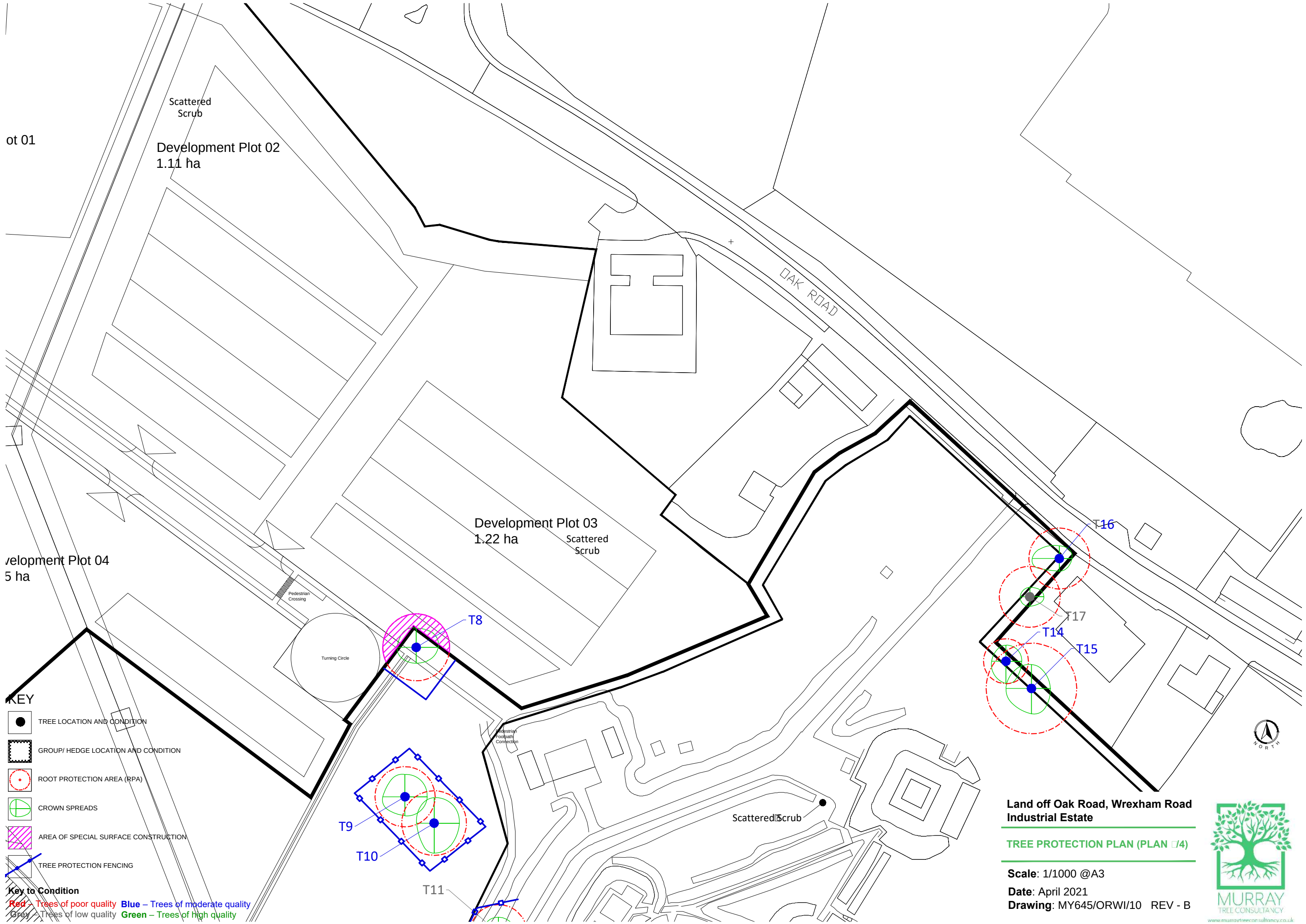
Grey – Trees of low quality Green – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE PROTECTION PLAN (PLAN 1/4)

Scale:1/1000@A3
Date:April2021
Drawing: MY645/ORWI/09 REV - B





KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS
- AREA OF SPECIAL SURFACE CONSTRUCTION
- TREE PROTECTION FENCING

Key to Condition

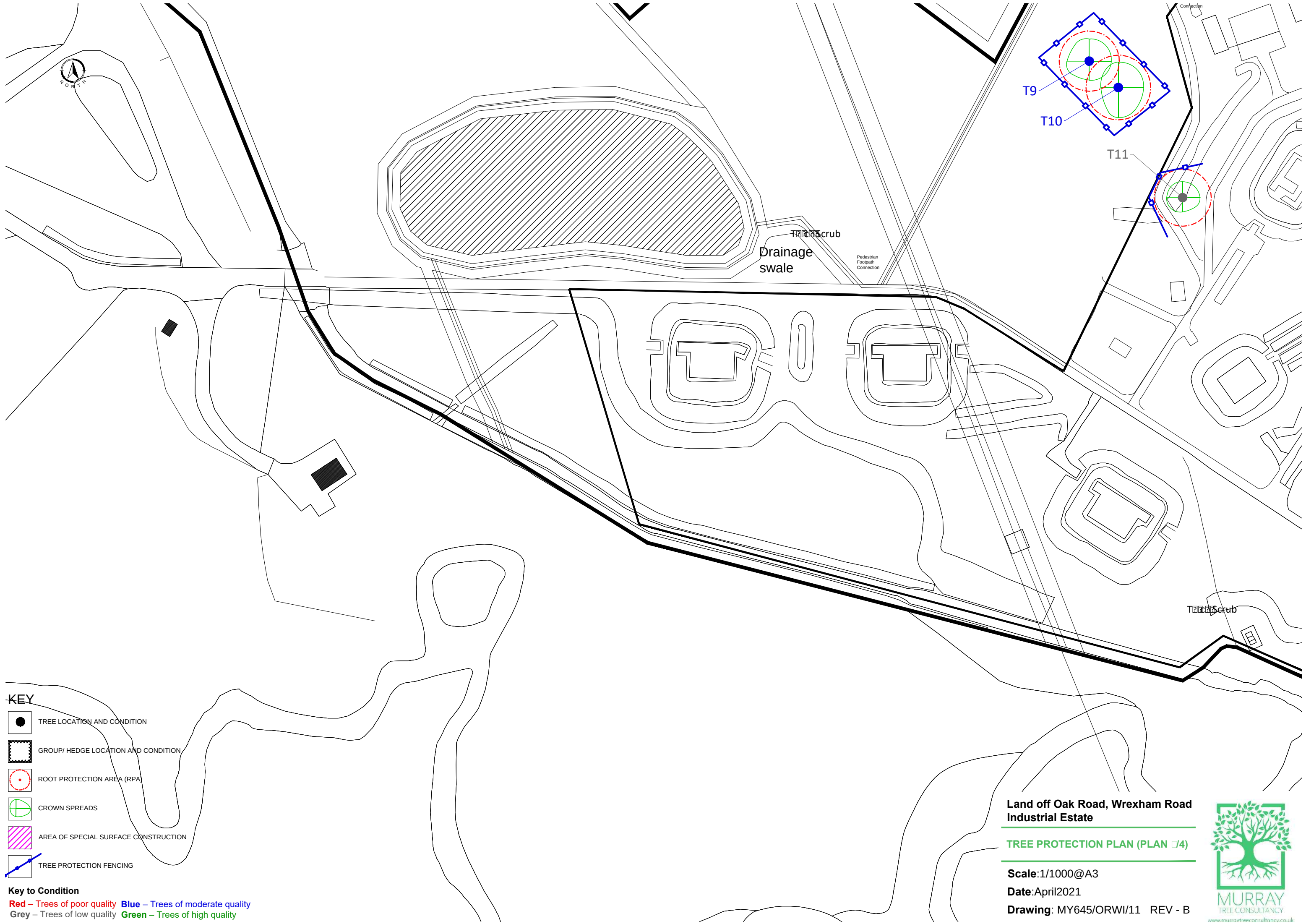
Red - Trees of poor quality Blue - Trees of moderate quality
Grey - Trees of low quality Green - Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE PROTECTION PLAN (PLAN 4)

Scale: 1/1000 @A3
Date: April 2021
Drawing: MY645/ORWI/10 REV - B





KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS
- AREA OF SPECIAL SURFACE CONSTRUCTION
- TREE PROTECTION FENCING

Key to Condition

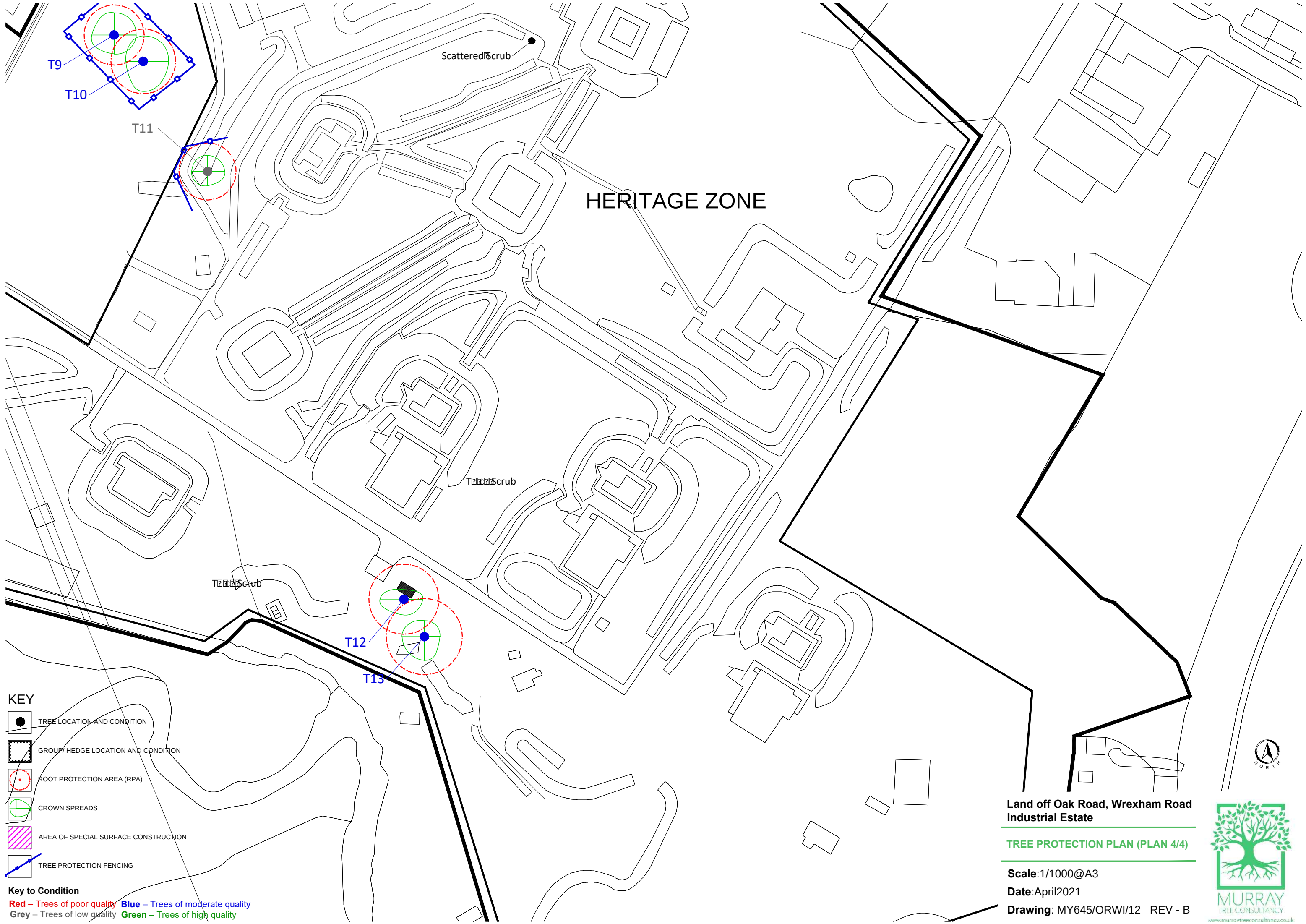
Red – Trees of poor quality Blue – Trees of moderate quality
Grey – Trees of low quality Green – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE PROTECTION PLAN (PLAN 1/4)

Scale:1/1000@A3
Date:April2021
Drawing: MY645/ORWI/11 REV - B





KEY

- TREE LOCATION AND CONDITION
- GROUP / HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS
- AREA OF SPECIAL SURFACE CONSTRUCTION
- TREE PROTECTION FENCING

Key to Condition

Red – Trees of poor quality Blue – Trees of moderate quality

Grey – Trees of low quality Green – Trees of high quality

Land off Oak Road, Wrexham Road
Industrial Estate

TREE PROTECTION PLAN (PLAN 4/4)

Scale: 1/1000@A3
Date: April 2021
Drawing: MY645/ORWI/12 REV - B



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