

TREE SURVEY AND ARBORICULTURAL ASSESSMENT

Chadwicks Depot and Yard,
Heiton Steel,
Ashfield,
Naas Road,
Clondalkin,
Dublin.

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Prepared for Chadwicks Group,
c/o Pierce Kelly,
RDF Architects and Planning Ltd.

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STATEMENT OF AUTHORITY

The author, Mark Donnelly, holds a BSc. Hons in Forestry from Bangor University, Wales, and is a member of the Institute of Chartered Foresters. He worked as an arboricultural consultant for the National Trust in Wales for 22 years and has worked as a lecturer in Forest Ecology at Bangor University. In Ireland, he has undertaken a range of arboricultural and ecological surveys for projects including wind farms, quarries, local authorities, housing developments, roads and pipelines.

REPORT LIMITATIONS

The statements, findings and recommendations made within the report do not take into account any effects of extreme climate and weather incidences, vandalism, changes in natural and built environment around the trees after the date of this report nor any damage whether physical, chemical, or otherwise. Mark Donnelly cannot accept any liability in connection with the above factors, nor where recommended tree management is not carried out in accordance with modern tree care techniques.

INTRODUCTION

The report was prepared for RDF Architects and Planning Ltd. on behalf of their client, Chadwicks Group. It covers the development site and surrounding trees within 'falling distance' of the proposed works.

The aims of the survey are:

- 1) To establish a baseline tree survey schedule
- 2) To provide an arboricultural Impact Assessment
- 3) To provide a tree constraints Plan
- 4) To provide an arboricultural Methods Statement.

SITE DESCRIPTION

GPS Grid Ref. 53.3122 – 6.37559. The site is located in the townland of Ashfield south of the Naas Road (N7) Clondalkin, Dublin. It is 800m south west of the N7/M50 interchange.

Extending to approximately 0.87 ha the site comprises an industrial yard and modern fabricated shed used for the storage and processing of steel. The southern and eastern boundaries are fenced with 140 meters of steel paling fence, it bounds onto Newlands Crematorium land where a belt of trees have been planted by the Crematorium owners to screen the industrial premises. There are no trees on the site itself.

The belt of trees planted on the boundary by the Crematorium owners is approximately 9m wide comprising a diverse species mix, broadleaved and conifer. Planted in 2001 at 1meter spacing the trees are on an earth bank 0.5 – 1m high with a shallow drain adjacent to the boundary fence. Their close proximity to the proposed swale, and extensions to the existing building is of particular concern.

The site is on flat ground with freely draining mineral soil. It is not unduly exposed to wind.

DESCRIPTION OF PROPOSED WORKS

The proposed works include:

1. An extension of the concreted yard will necessitate the construction of a surface water swale along the south and west site boundary. It is 3m wide and approximately 2m deep. 22m will be adjacent to existing planted boundary trees.
2. Extensions to both ends of the existing buildings which run parallel to and 2m from the boundary fence and planted neighbouring trees. The buildings length will be increased by approximately 40m.

METHODOLOGY

The site and adjacent Crematorium lands along its eastern and southern boundaries were surveyed on 21st April 2022. There are no trees within the fenced site itself however all trees on the neighbouring boundary land within 'falling distance' of the proposed development were individually recorded and tagged with a number (18658 - 18767) a total of 109 trees. Only the final three digits are referenced on the site maps. Their locations were not plotted by topographic survey consequently their positions should be regarded as approximate.

Assessment follows the standard in BS 837 (2012). Trees in relation to Design, Demolition and Construction. The tree diameter threshold has been reduced to > 100cm to ensure inclusion of the relatively young trees. Only trees showing disease or decay or within 0.5 m of the boundary fence have been recommended for removal on safety grounds. No attempt has been made to identify trees suitable for silvicultural thinning or the creation of a tree free corridor outside the boundary fence, as discussed later in the report.

It should be noted that the individual Root Protection Areas (RPA) are not recorded however an average RPA is marked on the tree protection plan.

Table 1. Survey Key

1.	Tree Numbers	Individual trees (prefixed by T) and Tree Groups (prefixed with G), have numbers to facilitate location on the site plan.		
2.	Species	Recorded with common name		
3.	Age	IM	An immature tree	greater than 100 mm diameter but regarded as a sapling
		SM	Semi mature	Semi mature a young tree but less than 50 % of its ultimate size
		M	Mature	Mature tree having attained dimensions typical of a fully-grown specimen of its species
		OM	Over Mature	An old specimen of a species showing signs of decline in health. Usual symptoms include crown starting to break up and decreasing in size.
4.	Girth	Stem diameter (at approximately 1.3 m above ground) in mm		
5.	Height	Approximate tree height in meters		
6.	Spread	Approximate horizontal extent of crown from tree centre, measured in m		
7.	Condition	Good	Full healthy canopy with good form and health	
		Fair	A specimen whose overall condition is typical of the site and may exhibit slightly reduced leaf cover/minor deadwood or may be predisposed to defects, e.g. Coppiced growth, but otherwise in good health.	
		Poor	A specimen which through defect or disease has a limited longevity or may be unsafe.	
8.	Root Protection Area (RPA)	<p>Root Protection Area as a radius measured from the tree centre in meters. RPA is the minimum radial range of tree protection necessary to safeguard trees roots and would normally be the same as the "Construction Exclusion Zone" enclosed by fencing during construction. The RPA is calculated as follows:</p> <p><u>Single stem tree:</u> RPA radius – stem diameter x .12 (See Root Protection Area Table). <u>Trees with more than one stem arising below 1.50m above ground level:</u> RPA radius – equivalent resultant combined stem diameter for multi-stemmed trees.</p>		
9.	Comments	Any information relating to trees condition not covered previously and recommendation for removal/retention.		
10.	Recommendation	General recommendations for retention, felling/removal and tree surgery.		

Table 2. Root Protection Area

Single stem diameter (mm)	Radius of nominal circle(m)	RPA (m ²)	Single stem diameter(mm)	Radius of nominal circle(m)	RPA (m ²)
75	0.9	3	675	8.1	206
100	1.2	5	700	8.4	222
125	1.5	7	725	8.7	238
150	1.8	10	750	9	255
175	2.1	14	775	9.3	272
200	2.4	18	800	9.6	290
225	2.7	23	825	9.9	308
250	3	28	850	10.2	327
275	3.3	34	875	10.5	346
300	3.6	41	900	10.8	366
325	3.9	48	925	11.1	387
350	4.2	55	950	11.4	408
375	4.5	64	975	11.7	430
400	4.8	72	1000	12	452
425	5.1	81	1025	12.3	475
450	5.4	92	1050	12.6	499
475	5.7	102	1075	12.9	519
500	6	113	1100	13.2	547
525	6.3	124	1125	13.5	573
550	6.6	137	1150	13.8	598
575	6.9	150	1175	14.1	625
600	7.2	163	1200	14.4	652
625	7.5	177	1225	14.7	679
650	7.8	191	1250	15	707

TABLE 3: INDIVIDUAL TREE DETAILS

No.	Species	Age Class	Girth (mm)	Height (m)	Spread (m)	Condition	Comments	Recommendation
18658	Ash	IM	120	8	2	Good		Retain
18659	Corsican Pine	IM	130	9	3	Good		Retain
18660	Corsican Pine	IM	110	8	3	Fair		Retain
18661	Corsican Pine	IM	140	9	3	Good		Retain
18662	Birch	IM	110	9	2	Fair	In drain	Fell
18663	Ash	IM	110	8	2	Good		Retain
18664	Ash	IM	110	8	2	Good		Retain
18665	Ash	IM	120	8	2	Fair	Forked	Fell
18666	Ash	IM	130	8	2	Good		Retain
18667	Corsican Pine	SM	200	10	3	Good		Retain
18668	Birch	IM	130	9	3	Good		Retain
18669	Corsican Pine	IM	120	9	2	Good		Retain
18670	Evergreen oak	SM	150	7	3	Good		Retain
18671	Corsican Pine	IM	110	8	2	Good		Retain
18672	Birch	IM	120	9	2	Good	Over drain	Fell
18673	Corsican Pine	IM	120	9	2	Good		Retain
18674	Corsican Pine	SM	220	9	3	Good		Retain
18675	Corsican Pine	IM	110	8	2	Fair		Fell
18676	Black Cherry	SM	220	7	4	Good		Retain
18677	Corsican Pine	SM	250	9	3	Good		Retain
18678	Scots Pine	IM	130	8	2	Good		Retain
18679	Ash	IM	100	8	2	Good		Retain
18680	Ash	SM	200	9	3	Good		Retain
18681	No tag	-	-	-	-	-	-	-
18682	Ash	IM	110	8	2	Good		Retain
18683	Ash	IM	120	7	2	Good		Retain
18684	Ash	IM	120	7	3	Fair	Multi-stemmed	Fell
18685	Ash	IM	120	7	2	Good		Retain
18686	Oak	IM	130	7	2	Good		Retain
18687	Oak	IM	120	7	2	Fair	Should be thinned out	Fell
18688	Birch	IM	130	7	3	Fair	Multi-stemmed	Fell
18689	Scots Pine	IM	120	8	3	Good		Retain
18690	Oak	SM	230	9	4	Good	Heavy branching	Retain
18691	Evergreen oak	SM	240	8	4	Good		Retain
18692	Scots Pine	IM	140	9	3	Good		Retain
18693	Oak	SM	170	9	3	Fair	Heavy branching	Fell
18694	Oak	IM	100	9	3	Good		Retain
18695	Birch	IM	130	8	4	Good	Multi-stemmed	Retain

No.	Species	Age Class	Girth (mm)	Height (m)	Spread (m)	Condition	Comments	Recommendation
18696	Scots Pine	SM	200	8	3	Good	Heavy branching	Retain
18697	Birch	IM	120	9	3	Fair	Multi-stemmed	Fell
18698	Evergreen oak	SM	150	8	4	Fair	Multi-stemmed	Fell
18699	Black Cherry	SM	150	8	5	Fair	Multi-stemmed	Fell
18700	Corsican Pine	IM	120	9	2	Good		Retain
18701	Black Cherry	IM	130	8	3	Good		Retain
18702	Corsican Pine	SM	150	9	2	Good		Retain
18703	Black Cherry	SM	150	9	4	Good		Retain
18704	Black Cherry	IM	130	9	5	Good		Retain
18705	Black Cherry	SM	150	10	5	Fair	Heavy branching	Fell
18706	Oak	IM	120	10	2	Good		Retain
18707	Oak	SM	240	10	4	Good		Retain
18708	Ash	SM	210	10	2	Fair	Too close to fence	Fell
18709	Evergreen oak	SM	260	9	5	Fair	Multi-stemmed	Fell
18710	Corsican Pine	SM	180	9	3	Good		Retain
18711	Ash	IM	140	9	3	Good		Retain
18712	Ash	IM	130	10	2	Fair		Fell
18713	Ash	IM	130	10	2	Good		Retain
18714	Ash	IM	130	10	2	Fair		Fell
18715	Ash	IM	140	10	2	Good		Retain
18716	Ash	IM	140	10	2	Fair		Fell
18717	Ash	IM	140	10	2	Good		Retain
18718	Corsican Pine	SM	220	11	3	Good		Retain
18719	Corsican Pine	SM	230	11	3	Good		Retain
18720	Beech	IM	120	8	2	Good		Retain
18721	Beech	SM	150	12	4	Fair	Multi-stemmed	Fell
18722	Corsican Pine	SM	180	9	3	Good		Retain
18723	Corsican Pine	IM	140	10	3	Good		Retain
18724	Beech	SM	180	10	4	Fair	Forked	Fell
18725	Alder	IM	130	11	3	Fair	2 stems	Fell
18726	Bird Cherry	IM	110	10	3	Good		Retain
18727	Alder	IM	130	10	3	Good		Retain
18728	Bird Cherry	IM	120	10	4	Good		Retain
18729	Alder	IM	140	11	3	Good		Retain
18730	Alder	IM	120	10	3	Good		Retain
18731	Bird Cherry	IM	160	10	4	Good		Retain
18732	Alder	IM	140	11	5	Good	2 stems	Fell
18733	Bird Cherry	IM	130	10	3	Good		Retain
18734	Alder	IM	130	11	3	Good		Retain
18735	Alder	IM	140	10	4	Fair	2 stems	Fell
18736	Alder	SM	150	10	4	Fair	2 stems	Fell

No.	Species	Age Class	Girth (mm)	Height (m)	Spread (m)	Condition	Comments	Recommendation
18737	Alder	IM	170	11	4	Good		Retain
18738	Alder	SM	200	11	4	Fair	2 stems	Fell
18739	Birch (No tag)	IM	130	10	3	Good		Retain
18740	Alder	IM	130	11	3	Good		Retain
18741	Alder	SM	200	11	4	Good		Retain
18742	Beech	IM	140	10	3	Good		Retain
18743	Beech	IM	140	11	3	Fair		Fell
18744	Beech	SM	160	11	4	Fair		Fell
18745	Alder	SM	180	10	3	Good		Retain
18746	Alder	SM	160	10	3	Fair	2 stems	Fell
18747	Alder	SM	180	10	3	Good		Retain
18748	Alder	IM	130	10	3	Good		Retain
18749	Alder	SM	220	10	4	Fair	2 stems	Fell
18750	Alder	IM	140	10	3	Good		Retain
18751	Alder	IM	140	10	3	Good		Retain
18752	Alder	SM	160	10	4	Fair	Fell to release oak	Fell
18753	Alder	SM	160	10	4	Fair	2 stems	Fell
18754	Oak	IM	130	9	3	Good		Retain
18755	Oak	IM	120	9	2	Fair	Suppressed	Fell
18756	Oak	SM	160	9	3	Good		Retain
18757	Alder	IM	120	9	4	Fair	Fell to release oak	Fell
18758	Alder	SM	160	9	3	Good		Retain
18759	Alder	IM	140	9	4	Good		Retain
18760	Alder	SM	150	9	4	Fair		Fell
18761	Oak	IM	140	9	2	Good		Retain
18762	Beech	IM	130	9	3	Good		Retain
18763	Beech	IM	120	10	3	Good		Retain
18764	Alder	SM	150	9	4	Good		Retain
18765	Alder	SM	170	9	4	Fair	2 stems	Retain
18766	Alder	SM	220	9	4	Fair	2 stems	Retain
18767	Alder	SM	120	9	4	Fair	2 stems	Retain

Photo 1 - Woodland screen looking east from Crematorium lands



Photo 2 –Raised bank with Corsican Pine, Birch and Ash



Phot 3 – Trees showing raised bank parallel to boundary fence



Photo 4 – Trees behind existing building and boundary fence



Photo 5 –Woodland screen behind south east elevation of existing building



RESULTS AND DISCUSSION

There are no trees within the development site and all trees surveyed are within a 10m wide belt along 140m of the south east and southern on the boundary with neighbouring land used as a Crematorium. (Photo 1). Consequently, implementation of any recommendations made in this report would need to be agreed with the neighbouring landowner.

The surveyed trees are part of landscape planting to screen the Chadwicks industrial site from Newlands Crematorium. (Photos 2 and 3) Planted in 2001 at 1meter spacing, the close proximity of individual trees is creating relatively tall trees with narrow crowns which are inherently unstable. (Photo 4). This will be a concern for tree safety as the trees mature and increase in height particularly where they are within 'falling distance' of the existing and proposed industrial buildings. The trees currently average 10.5 meters in height and to improve future stability individual trees would need to be selectively removed or 'thinned' out to create opportunities for the remaining trees to develop full, stronger crowns. Ideally thinning is carried out every 5-10 years with the objective to encourage and retain the stronger healthier trees whilst retaining species diversity, which fortunately in this instance is high.

Approximately 30% of the trees should be removed at each thinning. The retained trees should include 'high forest' species, eg oak, beech, alder, birch and Corsican pine, and an 'understorey' of black cherry, evergreen oak, yew and hazel.

In addition to thinning, the creation of a tree free corridor 3 meters wide (including the previous short term recommendation of 0.5 meters in table 4) immediately adjacent to the fence and building would reduce safety risks significantly in the medium term. 'Understory' species could be encouraged in this corridor. To retain an effective screen in the long term an extension of the planted area by 10 meters onto adjacent Crematorium owned should be considered.

Ash is a significant component of the trees surveyed (18%). With the endemic and usually fatal Ash Dieback Disease (*Hymenoscyphus fraxineus*) now present in the locality, ash removal should be prioritized during any felling operation to favor the remaining species.

RECOMMENDATIONS AND AGRICULTURAL IMPACT STATEMENT

This survey has recommended works to trees showing signs of disease and decay or structural weakness and trees growing within 0.5 m of the boundary fence (Table 4). These should be regarded as the minimum short term works for the welfare of the trees and maintain a status quo regardless of the proposed development.

The fact that the trees are too close together and too close to the boundary fence would be alleviated by an additional removal of trees from a 3-meter wide corridor behind the boundary fence. To encourage stability and to reduce the risk of trees falling on existing and proposed buildings the trees also need to be selectively thinned (a silvicultural thinning) as already outlined in the discussion section above. Whilst these recommendations will still leave the remaining trees within 'falling distance' it is a reasonable safety compromise that needs to be acknowledged by the owner of the trees and developer.

Impacts on specific proposed developments;

1. Proposed surface water swale

A swale 3m wide and approximately 2 m deep is proposed along 22m of the boundary with the adjacent trees. The site boundary fence would separate construction activity from these trees and 90% of them would be just outside the average RPA of 1.7 meters, providing the short term recommendations are carried out.

To conclude construction of the swale will have a minor negative impact on the RPA zone providing the recommendations in Table 4 are implemented. These impacts will be neutral if recommended additional thinning and felling along the boundary fence are carried out.

2. Proposed building extensions

Construction of the proposed extensions would be outside the average tree RPA of 1.7m. Extensions of the buildings will impact on the future development of adjacent tree canopies and they would be well within 'falling distance' and safety risks will increase as the trees mature.

Extensions to the existing building will have no impact on the RPA zone. Impacts on the development of the semi mature trees will be minor negative. However, if the mitigating thinning and felling is carried out along with new planting, medium to long term impacts will be neutral

MITIGATION

The works summarised below should be carried out regardless of the proposed developments. If they are implemented as a result of increased awareness arising from the development they could be regarded mitigation measures The schedule in table 4 provides recommendations for trees to be removed prior to development and should be regarded as a minimum requirement

The surveyed trees have received no maintenance to date and urgently need thinning and felling back from the site boundary to improve overall structure and resilience of the woodland to storm damage etc. and reduce safety risks. The maintenance of a long term screen by the remaining trees would be a long term benefit to Newlands Crematorium.

To mitigate the loss of trees from 3 meters adjacent to the boundary fence new tree planting is recommended. A 10meter extension of the existing woodland screen alongside the existing and proposed building, onto adjacent grassland would further improve resilience of the overall woodland and enable the development of mature trees outside the 'falling distance' from the building. Suitable trees for the new planting are Oak, Scots Pine, Birch, Hazel, Yew and Holly

ARBORICULTURAL METHOD STATEMENT

All works should be carried out to BS 3998 (2010). Recommendations by professional tree surgeons.

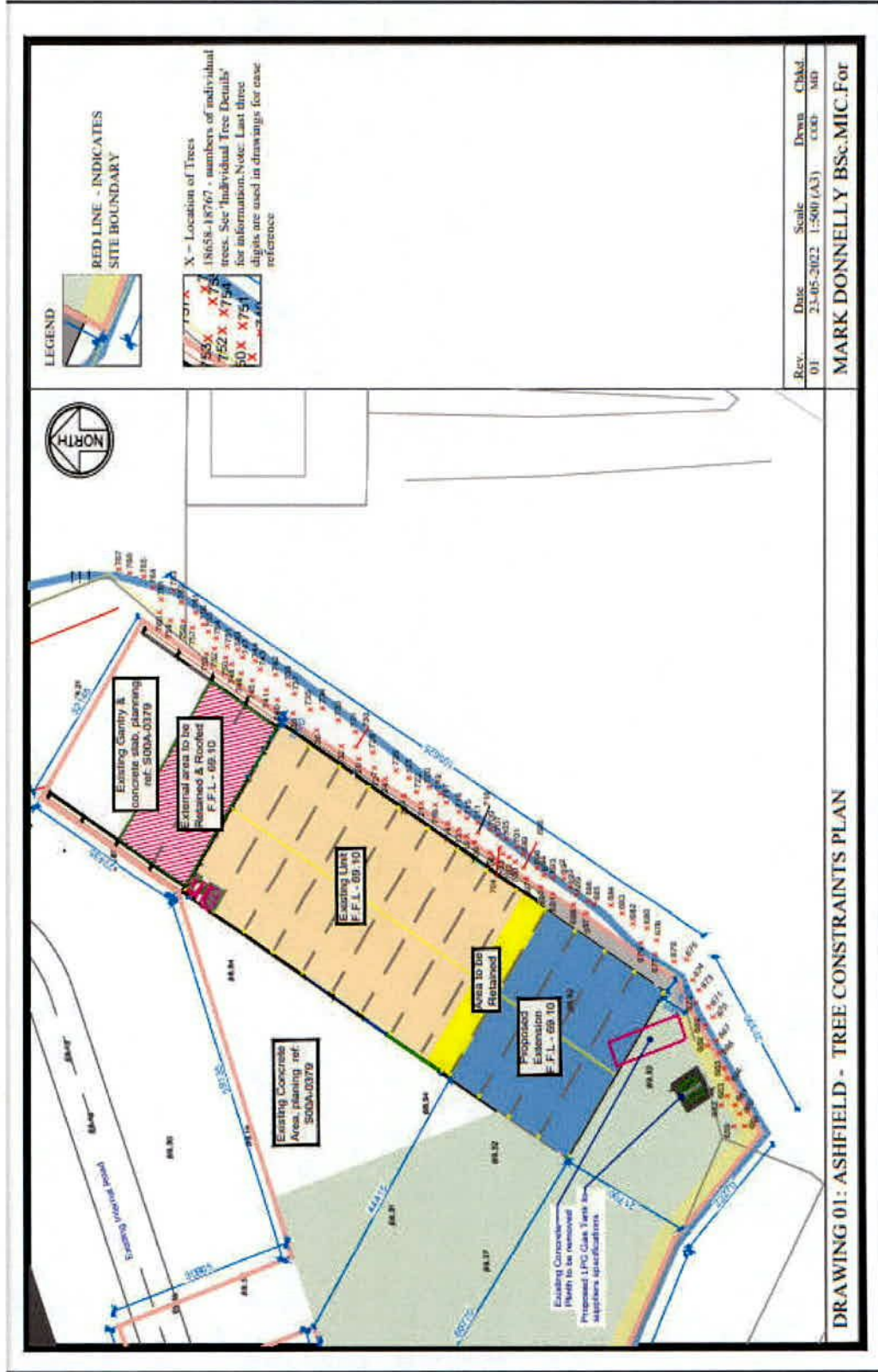
An arborist should be appointed to oversee site works.

The existing boundary fence will provide a tree protection barrier and temporary fencing will not be necessary. However if additional tree protection measures are required they are detailed in Appendix 2.

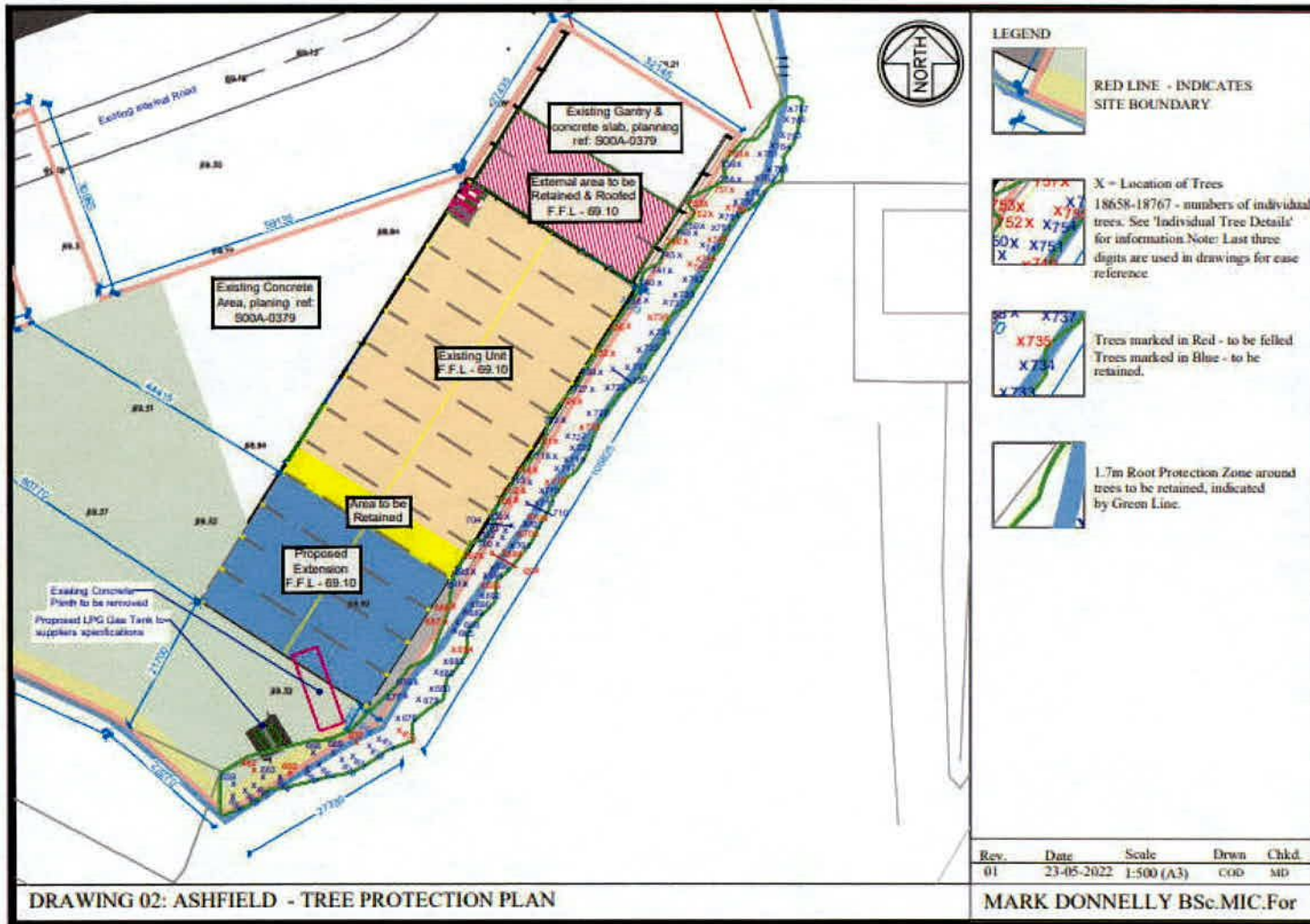
Table 4 SUMMARY OF FELLING RECOMMENDATIONS

Number	Species	Number	Species	Recommendations
18662	Birch	18721	Beech	Fell
18665	Ash	18724	Beech	
18672	Birch	18725	Alder	
18675	Corsican Pine	18732	Alder	
18684	Ash	18735	Alder	
18687	Oak	18736	Alder	
18688	Birch	18738	Alder	
18693	Oak	18743	Beech	
18697	Birch	18744	Beech	
18698	Evergreen oak	18746	Alder	
18699	Black Cherry	18749	Alder	
18705	Black Cherry	18752	Alder	
18708	Ash	18753	Alder	
18709	Evergreen oak	18755	Oak	
18712	Ash	18757	Alder	
18714	Ash	18760	Alder	
18716	Ash			

APPENDIX 1
Map 1 – Tree Constraints Plan



Map 2 – Tree Protection Plan



APPENDIX 2
TREE SPECIES LIST

Evergreen Oak	<i>Quercus ilex</i>
Black Cherry	<i>Prunus serotina</i>
Bird Cherry	<i>Prunus padus</i>
Alder	<i>Alnus glutinosa</i>
Beech	<i>Fagus sylvatica</i>
Birch	<i>Betula pendula</i>
Corsican Pine	<i>Pinus</i>
Scots Pine	<i>Pinus sylvestris</i>
Pedunculate oak	<i>Quercus robur</i>
Yew	<i>Taxus bacata</i>
Ash	<i>Fraxinus excelsior</i>

APPENDIX 3

TREE PROTECTION

Root Protection Area (R.P.A) and Tree Protection Measures

The Root Protection Area is defined as a layout design tool indicating the minimum area, usually defined as the radius in metres around a tree deemed to contain sufficient roots to maintain the trees viability. Protection of roots within the RPA is treated as a priority. When considering the consequences of development and construction activity in the vicinity of trees the R.P.A. which is calculated from the girth of the individual tree (12 x the girth at 1.5 metres above ground for a single stemmed tree) must be protected. The default position is that all structures must be located outside the R.P.A., however each tree should be assessed on a case by case basis and different trees species vary in their susceptibility to root disturbance. The R.P.A. for each tree retained on site needs to be protected by barriers before any materials or machines are brought on site, and before any demolition activity or stripping of top soil. British Standard Specifications are outlined in (Fig.1), below.

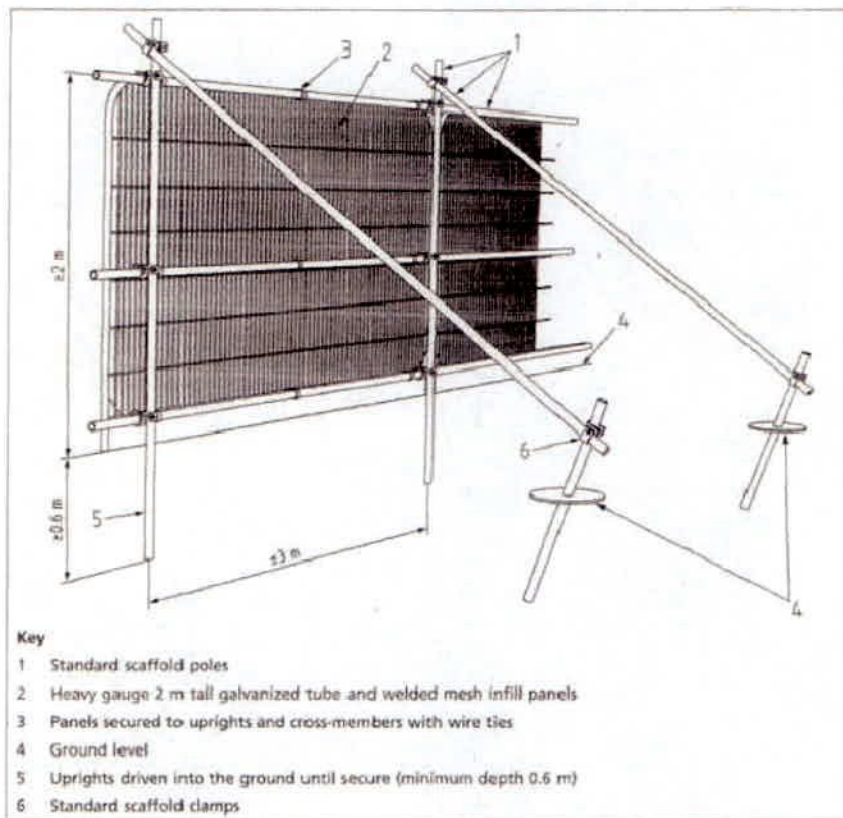


Fig.1 Default Specification for Protective Barrier

The area protected by barriers must be regarded as sacrosanct and the barriers must be fit for purpose. Where required, pre-construction tree work including crown reduction and thinning works should be carried out before protection measures are installed.

Where there is no alternative and construction work space or temporary access is justified within the R.P.A. new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site. The objective is to avoid any compaction of soil within the R.P.A., even from the single passage of a heavy vehicle, especially in wet conditions so that tree root functions remain unimpaired.

Permanent Hard Surfacing within the R.P.A.

Within the R.P.A. unavoidable permanent hard surfacing should not exceed 20% of the area. Where necessary, works will be designed to avoid localised compaction and where a permeable surface is to be used by vehicular traffic, for example a geotextile can be used.

Excavation within the R.P.A.

Excavation needed for placement of kerbs and edgings with linear foundations can be especially damaging to tree roots within the R.P.A. and should be avoided either by the use of alternative edge supports or by not using supports at all.

The use of traditional strip footings for buildings within the RPA can result in extensive root loss and should also be avoided. Root damage can be minimised and mitigated against by ensuring beams and slabs are laid over roots at or above ground level and do not exceed a total area greater than 20% of the existing unsurfaced ground within the R.P.A. There should be no changes in ground levels within the R.P.A.

Additional Precautions outside the R.P.A. exclusion zone

Planning of site operations needs to take account of machinery/plant, particularly machines with booms and jibs, from coming into contact with above ground branches etc. of retained trees. Also any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its R.P.A.