



Arboricultural Impact Assessment with Arboricultural Method Statement

- Blackley Fire Station, Rochdale Road, Manchester -

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- Blackley Fire Station, Rochdale Road, Manchester -

A report for

Greater Manchester Combined Authorities
Greater Manchester Fire and Rescue Service

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SUMMARY

Twelve individual trees and five groups of trees were recorded. In accordance with *BS5837:2012 Trees in relation to design, demolition and construction* two individual trees and one group of trees were recorded as retention category 'B'; and a mixture of ten individual trees and four groups of trees were recorded as retention category 'C'.

The trees were generally found to be in a good to fair condition and no trees were classified as retention category 'U' (unsuitable for retention).

The proposed development directly impacts upon several trees. These trees shall require removal due to their close proximity to construction activity.

The retained trees will be protected to British Standard *BS5837:2012 Trees in relation to design, demolition and construction* to ensure that they remain in a healthy condition during and post development. The *Tree Protection Plan* to the rear of this report highlights the recommended tree protection measures.

Any arboricultural work undertaken should be done so by a competent arborist in line with British Standard *BS3998:2010 Tree Work*, and after permission has been granted to do so by the local planning authority.

It is recommended that a detailed tree risk assessment is undertaken post development to identify any potential hazards obscured during the initial tree survey and is used to inform an arboricultural management strategy.

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1. Introduction

1.1. Project outline

- 1.1.1. This report has been produced in accordance with *British Standard BS5837: 2012 Trees in relation to design, demolition and construction* to achieve a harmonious and sustainable relationship where tree retention or planting is proposed in conjunction with nearby construction (site-based operations with the potential to affect existing trees).

1.2. Scope of this report

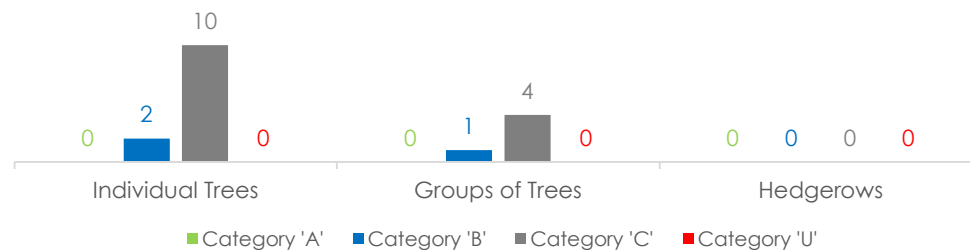
- 1.2.1. This report has been produced to comply with planning requirements where trees are to be considered as part of a proposed development. To achieve this, arboricultural constraints have been identified and a detailed plan (*Tree Constraints Plan*) has been produced showing the location, root protection areas and retention category of trees within the site.
- 1.2.2. In addition, this report provides an *Arboricultural Impact Assessment* that evaluates the direct and indirect effects of the proposed development, and where necessary makes recommendations for mitigation measures. This report also includes *Tree Protection Measures* and a *Tree Protection Plan* as part of an outline *Arboricultural Method Statement*, which demonstrate how the retained trees will be protected during construction, and where tree protection measures are to be implemented.
- 1.2.3. Recommendations for tree works within this report are specific to the construction of the proposed development. This report does not form part of a tree safety inspection or tree management strategy, and general arboricultural management works may be required post development. To manage the safety and risk from trees it is advised that trees are inspected in detail for this purpose by an arboriculturist using a suitable risk management strategy.

1.3. Data collection

- 1.3.1. A ground level inspection was undertaken by Robert Godwin on 18th November 2022. As recommended by *BS5837*, the position of all trees within the site with a stem diameter of 75 mm or more, measured at 1.5 m above highest adjacent ground level are recorded. The position of trees with an estimated stem diameter of 75 mm or more that overhang the site or are located beyond the site boundaries within a distance of up to 12 times their estimated stem diameter were also recorded. For individual trees the crown spread taken at four cardinal points; for tree groups the overall extent of the canopy was recorded.
- 1.3.2. Tree positions were plotted using a topographical plan supplied by the client, which is the basis for which the *Tree Constraints Plan* has been prepared.

2. Arboricultural Constraints

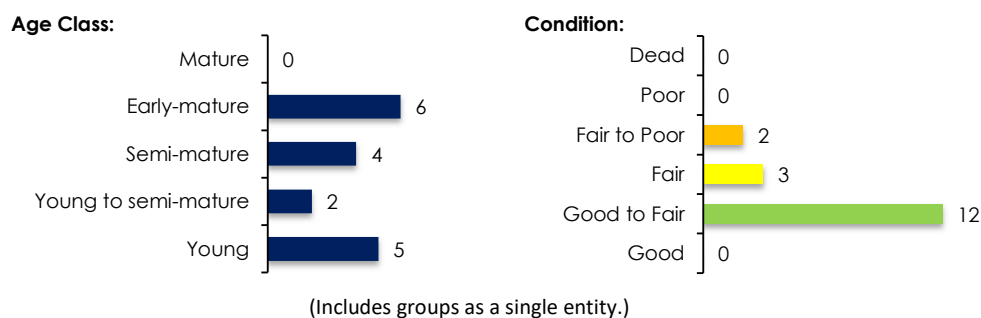
2.1. Tree retention categories



2.1.1. Twelve individual trees and five groups of trees were recorded. In accordance with *BS5837:2012 Trees in relation to design, demolition and construction* two individual trees and one group of trees were recorded as retention category 'B'; and a mixture of ten individual trees and four groups of trees were recorded as retention category 'C'.

2.1.2. The trees were generally found to be in a good to fair condition and no trees were classified as retention category 'U' (unsuitable for retention).

2.2. Tree age class and condition



2.2.1. Please see *Appendix 1* for the detailed list on existing species, age class, dimensions and condition of trees within the site, and *Appendix 2* for an explanation of retention category criteria. Tree locations can be seen on the *Tree Constraints Plan* at the rear of this report (*Drawing 1*).

2.2.2. The inspection of several trees and groups was restricted as detailed at *Appendix 1*. The inspection of these trees was limited to a cursory observation of the parts of the trees that could be clearly observed, without obstruction, from the available vantage point. However, sufficient tree related data was collected to fulfil the requirements detailed within the scope of this report.

- 2.2.3. Where inspections are limited by restrictions such as stem ivy, understory vegetation, limited access, epicormic growth or being located on adjacent land, any form of tree condition hazard assessment was restricted. A full assessment of the levels of risk posed by trees can only be informed by considering site use together with assessing any hazards present within a tree. Trees are dynamic structures that continue to develop and decline; in addition, changes in site use are likely to occur during and as a result from the proposed development. On this basis, it is recommended that a suitably timed, detailed tree risk assessment is undertaken post development to identify any potential hazards obscured during the initial tree survey, particularly to trees **G10** and **G11**, and is used to inform an arboricultural management strategy.

2.3. Root Protection Areas

- 2.3.1. The tree Root Protection Area (RPA) is a layout design tool indicating the area around a tree that, along with the tree stem and branches, must be considered during development. The protection of the roots and soil structure within the RPA should be treated as a priority. The RPA of each tree or group is marked on the *Tree Constraints Plan* at the rear of this report.

2.4. Tree protection status

- 2.4.1. A statutory tree protection enquiry was made with Manchester City Council on 28th November 2022. We are still awaiting the results of the enquiry and will forward them once they are available.
- 2.4.2. **In the meantime it is essential that no tree works (including works to category 'U' trees), and no construction works that may affect retained trees, are undertaken within the site prior to consideration and consent of the proposed works under FULL planning approval only by the local planning authority, regardless of whether the trees are currently protected or not.**

3. Arboricultural Impact Assessment

3.1. The proposed development

- 3.1.1. The demolition of the existing fire station and the construction of a new fire station with associated car parking and training tower is proposed. The proposed layout drawing can be seen within the *Tree Protection Plan* to the rear of this report. This drawing has been used to assess the potential direct and indirect arboricultural impacts.

3.2. Proposed tree works

- 3.2.1. The proposed development directly impacts upon several trees. These trees shall require removal due to their close proximity to construction activity. Please see the table below for the proposed tree removal details.

	Category 'A'	Category 'B'	Category 'C'
Trees to be removed to enable the construction of the proposed development	None	T5	T1, T2, G3, T4, T6, T13 & T14

- 3.2.2. The majority of trees proposed for removal are considered to be low quality ('C' category) specimens. In addition, one tree is considered to be of a moderate quality. This tree has developed into an established specimen, but still offers limited amenity value to the wider area and could be replaced as part of a post development tree planting scheme.
- 3.2.3. The formative pruning of trees **G8**, **G10**, **G11**, **T15** and **T16** will be required to ensure sufficient clearance between the proposed development structures and adjacent branches. The proposed pruning works relate to the crown lifting/pruning of small tertiary branches. The overall shape of the trees from the proposed pruning works would not be affected, and therefore the proposed pruning works would not have a negative impact on the visual amenity of the trees and would maintain all the positive aspects the trees bring to the area. In addition, the proposed pruning works will have no adverse impacts on tree health and longevity.
- 3.2.4. Several trees may benefit from general arboricultural works as part of a practical post-development arboricultural management strategy; however, these works are not covered within the scope of this report. Within *Appendix 1* the term 'No action required' relates specifically to those tree works required to enable the proposed development and does not mean that general post development arboricultural management works are not required.

- 3.2.5. However, general remedial pruning works have been recommended in this instance, please see *Appendix 1* for full details. The proposed works involve the removal of deadwood/the removal of poor/dead specimens within groups **G10** and **G11**.

3.3. Proposed mitigation measures

- 3.3.1. It is recommended that, where space allows, the proposed tree removal be mitigated as part of a post development planting scheme of well-structured new trees that will add to the quality of the area and help integrate the proposed development into the surrounding landscape.

3.4. Site construction traffic and demolition works

- 3.4.1. Generally, to protect the trees from construction site traffic (including demolition works) the remaining trees should be protected by a temporary protective barrier, put in place prior to any construction activity. However, in this instance all the trees proposed for retention are situated on adjacent land.

3.5. Foundations within the RPA

- 3.5.1. A minor section of RPA from tree **T15** lies within the foundation area of a proposed building. It should be noted that this section of RPA currently lies beneath an existing building foundation. On this basis, the proposed foundations are not expected to cause any long-term harm to the adjacent tree. However, as a precautionary measure, it is recommended that construction within the RPA is undertaken using techniques sympathetic to tree roots.

3.6. Hard surfaces within the RPA

- 3.6.1. Minor sections of RPA from trees **G10** potentially extend beyond the existing boundary fence and into the area where the existing hard surface may be replaced. It should be noted that these RPAs are currently located beneath an existing hard surface, and that its replacement with a new similar hard surface would not cause any harm to the adjacent trees. However, given the potential area of RPA disturbance, it is recommended that should the existing hard surface be replaced, the removal and re-instatement of any hard surface is undertaken using techniques sympathetic to tree roots.
- 3.6.2. In addition, a minor section of RPA from tree **T15** extends into an area proposed for a hard surface footpath. As a precautionary measure, it is recommended that any proposed hard surface within the RPA is constructed using a '*Minimum-Dig*' technique.

3.7. Post development impacts

- 3.7.1. No soil samples were taken during the site visit. It is recommended that soil assessment is undertaken by a competent person to determine whether the soil is shrinkable, and that foundation design is undertaken in line with detailed guidance given in the National House Building Council (NHBC) publication *Building near trees, Chapter 4.2*.
- 3.7.2. It is essential that consideration is also given by a suitably qualified professional to how the proposed tree removal may affect soil conditions and the stability of any future foundations.

4. Arboricultural Method Statement

4.1. Tree works prior to development

- 4.1.1. Care should be taken to ensure during tree removal or remedial work that damage to the retained trees and disturbance to the RPA is avoided. All tree works, as described in *Appendix 1*, should be carried out in accordance with *BS 3998: 2010 Recommendations for tree work*, and after permission has been granted to do so by the local planning authority. It is essential that those appointed to undertake any tree works carry out adequate checks to ensure that no statutory laws are contravened during tree work operations.

4.2. Foundations within the RPA

- 4.2.1. The removal of the existing building foundations and the installation of proposed foundations within the RPA of **T15** *must only* be undertaken by hand, to establish the presence of roots. Any tree roots exposed within the RPA must be left as intact as careful digging with hand tools will allow, avoiding the use of heavy machinery within the RPA.
- 4.2.2. No more than 100mm of soil should be removed before the ground is inspected for roots. Depending on the presence of roots it may then be acceptable to remove a further 50mm of soil down to the required depth.
- 4.2.3. During excavations roots smaller than 25mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25mm diameter and over should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.
- 4.2.4. Any roots exposed during excavations should immediately be wrapped or covered in damp hessian to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible. Prior to backfilling, retained roots should be surrounded with topsoil or un-compacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced.

4.3. Removal of existing hard surfaces

- 4.3.1. The removal of the existing hard surface within the RPA of **G10** *must only* be undertaken by hand. The underlying existing soil sub-base ground level **must** be retained, avoiding the use of heavy machinery within the exposed RPA. Once existing ground level has been reached, the exposed ground level must be protected by temporary ground protection system until on-site construction activity has been completed.

4.4. Temporary ground protection

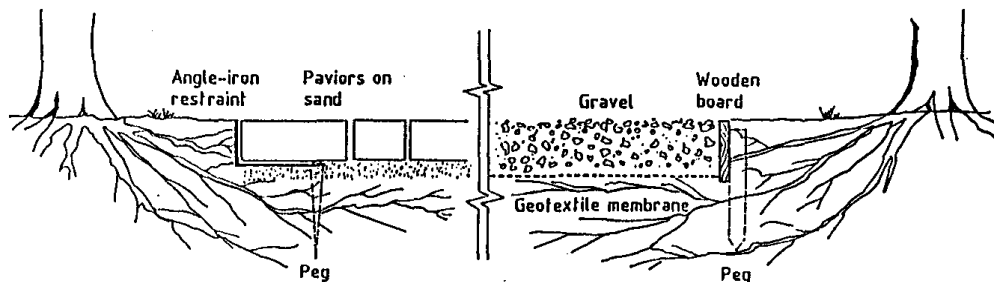
- 4.4.1. Ground protection in the form of ridged material, suitable to distribute the weight of any potential traffic, should be installed over exposed areas of RPA from **G10**. British Standard BS5837 recommends that:

The ground protection might comprise one of the following:

- a) 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. 100mm depth of woodchip), laid onto a geotextile membrane;*
- b) for pedestrian-operated plant up to a gross weight of 2t, 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;*
- c) for wheeled or tracked construction traffic exceeding 2t 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.*

4.5. Hard surfaces within the RPA – Minimum-Dig

- 4.5.1. It is recommended that any surface replacement within **G10**, and for the proposed footpath within the RPA of **T15** that construction is undertaken in a manner that would not cause the adjacent trees any long-term harm. In this instance, it is recommended that a 'Minimum-Dig' method is used.
- 4.5.2. Excavations within the RPA must only be undertaken by hand to establish the presence of roots. Any tree roots exposed within the RPA must be left as intact as careful digging with hand tools will allow, avoiding the use of heavy machinery within the RPA.
- 4.5.3. No more than 100mm of soil should be removed before the ground is inspected for roots. Depending on the presence of roots it may then be acceptable to remove a further 50mm of soil down to the required depth. Excavations must be undertaken using the technique detailed in *Section 4.2* above.



Example of a light duty drive constructed using the **Minimum Dig Method**.

4.6. Services within the RPA

- 4.6.1. Wherever possible, under-ground services should be routed outside of the RPA of retained trees, and plans showing the proposed routeing should be drawn up. Where excavations may be required hand-held tools might be acceptable for shallow service runs, using the hand-dig technique detailed in *Section 4.2 above*.

4.7. Fencing within the RPA

- 4.7.1. Where any proposed boundary fencing lies within the RPAs of retained trees it is essential that the post holes are excavated by hand. It is recommended that initial trial holes are dug using a hand-held auger to establish the presence and size of any adjacent tree roots.
- 4.7.2. On this basis, for fixed length fencing it is recommended that all footing locations are identified before committing to their final locations. All post locations must be as narrow as possible, with a suggested maximum diameter of 300mm. Excavations must only be undertaken as detailed in *Section 4.2 above*.

Drawing 1. Tree Constraints Plan



T	G	H	W	S
INDIVIDUAL TREE	GROUP OF TREES	HEDGEROW	WOODLAND GROUP	SHRUB

	EXISTING LAYOUT
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TREE QUALITY ASSESSMENT CATEGORY	
	CATEGORY 'A' HIGH QUALITY
	CATEGORY 'B' MODERATE QUALITY
	CATEGORY 'C' LOW QUALITY
	CATEGORY 'U' UNSUITABLE FOR RETENTION

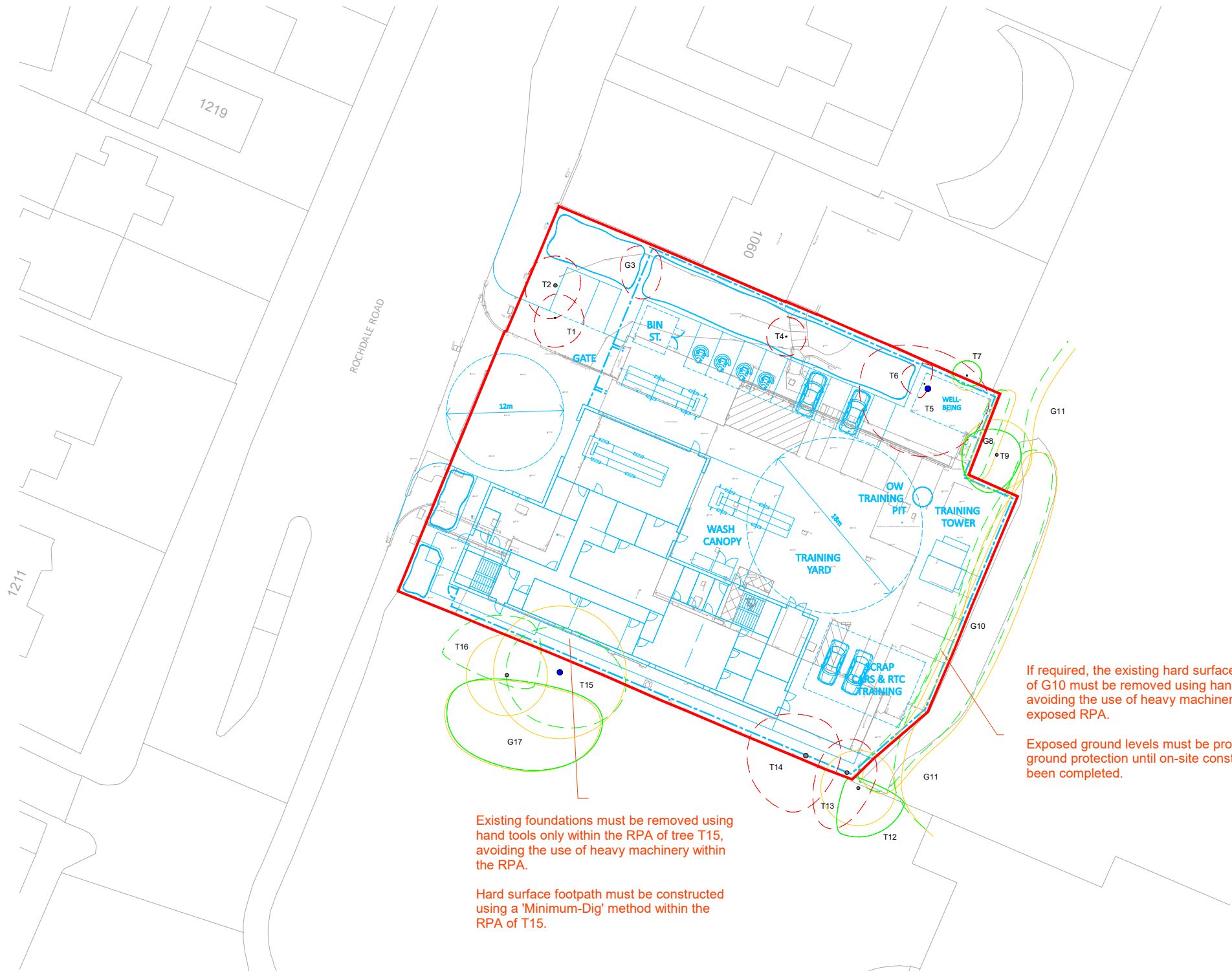
Based on British Standard 5837:2012 Table 1.
Please refer to Appendix 2 of the arboricultural report for more detailed category definitions.

	ROOT PROTECTION AREA (RPA)
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The Root Protection Area (RPA) is a layout design tool highlighting the underground tree constraints.
Along with the tree stem and branches the RPA must be considered prior to and during development.

PROJECT TITLE: Blackley Fire Station, Rochdale Road, Manchester		
DRAWING TITLE: TREE CONSTRAINTS PLAN	SCALE: 1:500 @ A3	ISSUE DATE: 21.11.22
DRAWING NUMBER: TCP.13557	REVISION: .01	DRAWN BY: RG

Drawing 2. Tree Protection Plan



T	G	H	W	S
INDIVIDUAL TREE	GROUP OF TREES	HEDGEROW	WOODLAND GROUP	SHRUB

	EXISTING LAYOUT
	PROPOSED LAYOUT

PROPOSED TREE WORKS

	TREE PROPOSED FOR RETENTION
	TREE PROPOSED FOR PRUNING
	G8, G10, G11, T15 & T16
	TREE PROPOSED FOR REMOVAL (ARBORICULTURAL REASONS)
	None
	TREE PROPOSED FOR REMOVAL (TO ENABLE DEVELOPMENT)
	T1, T2, G3, T4, T5, T6, T13 & T14

Please refer to Appendix 1 of the Arboricultural Impact Assessment for details on tree condition and proposed works.

	ROOT PROTECTION AREA (RPA)
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The Root Protection Area (RPA) is a layout design tool highlighting the underground tree constraints. Along with the tree stem and branches the RPA must be considered prior to and during development.

TREE PROTECTION MEASURES

	TEMPORARY PROTECTIVE BARRIER Refer to Appendix 4 of the Arboricultural Impact Assessment for specification details.
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If required, the existing hard surface within the RPAs of G10 must be removed using hand tools only, avoiding the use of heavy machinery within the exposed RPA.

Exposed ground levels must be protected by temporary ground protection until on-site construction activity has been completed.

Existing foundations must be removed using hand tools only within the RPA of tree T15, avoiding the use of heavy machinery within the RPA.

Hard surface footpath must be constructed using a 'Minimum-Dig' method within the RPA of T15.

PROJECT TITLE: Blackley Fire Station, Rochdale Road, Manchester		
DRAWING TITLE: TREE PROTECTION PLAN	SCALE: 1:500 @ A3	ISSUE DATE: 21.11.22
DRAWING NUMBER: TPP.13557	REVISION: .01	DRAWN BY: RG

Appendix 1. Tree Schedule

Tree No.	Species	Age	Stems at 1.5m	Stem Dia (mm)	Height (Crown Hgt) (m)	FSB (D) (m)	Branch Spread (m)				Observations	Cond	Life Exp	Tree Works Required to Enable Development	Root Protection Area (RPA)		Retention Category
							N	E	S	W					Radius (m)	Area (m ²)	
T 1	Prunus sp. (Cherry)	Semi-mature	1	120	4(2)	2(S)	2.5	3	3	2	Asymmetrical crown. Limited inspection - restricted access. Limited inspection - dense undergrowth.	Good to Fair	40+	Remove to enable the construction of the proposed development.	1.4	6.5	C
T 2	Prunus sp. (Cherry)	Early-mature	1	350	6(2.5)	2.5(S)	3	2.5	3.5	3	Asymmetrical crown. Limited inspection - restricted access. Limited inspection - dense undergrowth. Limited inspection - dense ivy on stem/base. Previously pollarded.	Good to Fair	40+	Remove to enable the construction of the proposed development.	4.2	55.4	C
G 3	Corylus avellana (Hazel), Salix fragilis (Crack Willow)	Young	12	15	2.5(0)	0(S)	1.5	1.5	1.5	1.5	Multi-stemmed from ground level. Re-growth from stump. Limited inspection - restricted access.	Fair to Poor	10+	Remove to enable the construction of the proposed development.	0.6	1.2	C
T 4	Acer pseudoplatanus (Sycamore)	Young	6	50	5(0.5)	0.5(S)	2	2	2	2	Multi-stemmed from ground level. Re-growth from stump. Limited inspection - restricted access.	Fair to Poor	10+	Remove to enable the construction of the proposed development.	1.5	6.7	C
T 5	Acer pseudoplatanus (Sycamore)	Early-mature	1	600	16(7)	7(S)	4	6.5	7	7	Asymmetrical crown. Occasional pruning wounds. Limited inspection - restricted access. Limited inspection - dense ivy on stem/base.	Good to Fair	40+	Remove to enable the construction of the proposed development.	7.2	162.9	B
T 6	Prunus domestica (Damson)	Young	1	70	5.5(0.5)	0.5(S)	2	0.5	1.5	2.5	Limited inspection - restricted access. Crown suppressed by adjacent tree.	Good to Fair	40+	Remove to enable the construction of the proposed development.	0.8	2.2	C
T 7	Cupressus sp. (Cypress)	Young	2	90	5(1)	1(S)	1.5	1.5	1	1.5	Twin-stemmed below 1.5m. Limited inspection - situated on adjacent land.	Good to Fair	40+	No action required.	1.5	7.3	C
G 8	Sambucus nigra (Elder), Acer pseudoplatanus (Sycamore), Acer campestre (Field Maple), Corylus avellana (Hazel)	Young	3	50	4(0.5)	0.5(W)	1	0.5	1	1.5	Occasional pruning wounds. Multi-stemmed from ground level. Limited inspection - situated on adjacent land.	Fair	40+	Crown lift those branches that overhang the development site to create an even boundary.	1.0	3.4	C
T 9	Prunus sp. (Cherry)	Semi-mature	1	300	9.5(3)	3(W)	2.5	2.5	4	3.5	Asymmetrical crown. Limited inspection - dense ivy on stem/base. Limited inspection - situated on adjacent land.	Good to Fair	40+	No action required.	3.6	40.7	C
G 10	Prunus spinosa (Blackthorn), Corylus avellana (Hazel), Acer campestre (Field Maple), Alnus glutinosa (Common Alder)	Young to semi-mature	1	200	11(0.5)	1.5(W)	2.5	2.5	2.5	2.5	Limited inspection - restricted access. Limited inspection - dense undergrowth. Individuals crowns restricted by group. Occasional poor/dead specimens.	Fair	40+	Crown lift those branches that overhang the proposed training tower to ensure 1.5m clearance. Remove poor/dead specimens from within group.	2.4	18.1	C

Tree No.	Species	Age	Stems at 1.5m	Stem Dia (mm)	Height (Crown Hgt) (m)	FSB (D) (m)	Branch Spread (m)				Observations	Cond	Life Exp	Tree Works Required to Enable Development	Root Protection Area (RPA)		Retention Category
							N	E	S	W					Radius (m)	Area (m ²)	
G 11	Populus alba (White Poplar)	Early-mature	1	400	18(9)	9(W)	6	6	6	6	Not inspected - situated on adjacent land with restricted access. Occasional poor/dead specimens.	Good to Fair	40+	Crown lift those branches that overhang the proposed training tower to ensure 1.5m clearance. Remove poor/dead specimens from within group.	4.8	72.4	B
T 12	Acer platanoides (Norway Maple)	Semi-mature	1	320	10(3)	5(N)	1	5	5	1.5	Unbalanced crown. Limited inspection - situated on adjacent land.	Good to Fair	40+	No action required.	3.8	46.3	C
T 13	Sorbus aria (Whitebeam)	Early-mature	1	400	11(3)	5(N)	3.5	3	6	3	Unbalanced crown. Multiple pruning wounds.	Good to Fair	40+	Remove to enable the construction of the proposed development.	4.8	72.4	C
T 14	Sorbus aria (Whitebeam)	Early-mature	1	480	12(3)	5(N)	4	3.5	6	6	Unbalanced crown. Multiple pruning wounds.	Good to Fair	40+	Remove to enable the construction of the proposed development.	5.8	104.2	C
T 15	Quercus robur (Common Oak)	Early-mature	2	400	14(2)	8(N)	4.5	7	5.5	5.5	Asymmetrical crown. Occasional pruning wounds. Twin-stemmed from ground level. Limited inspection - situated on adjacent land.	Good to Fair	40+	Crown lift those branches that overhang the proposed building to ensure 1.5m clearance.	6.8	144.9	B
T 16	Salix fragilis (Crack Willow)	Semi-mature	3	200	8(0.5)	2(N)	6	3	1	7	Unbalanced crown. Multi-stemmed from ground level. Limited inspection - dense ivy on stem/base. Limited inspection - situated on adjacent land.	Fair	20+	Crown lift those branches that overhang the proposed building to ensure 1.5m clearance.	4.2	54.1	C
G 17	Quercus robur (Common Oak), Betula pendula (Silver Birch), Prunus sp. (Cherry)	Young to semi-mature	1	200	11(0.5)	0.5(N)	2.5	2.5	2.5	2.5	Not inspected - located away from the proposed development area. Individuals crowns restricted by group. Occasional self-seeded saplings.	Good to Fair	40+	No action required.	2.4	18.1	C

Appendix 2. Explanatory Notes

A2.1. Tree statistics and measurements

Survey record	Description
<i>Tree No.</i>	Unique tree reference number. (T) = Individual tree, (G) = Group of trees or woodland that form cohesive arboricultural features, (H) = Hedgerows and substantial internal or boundary hedges.
<i>Species</i>	Species listed by scientific name, with (common name).
<i>Age</i>	Life stage – Young, Semi-mature, Early-mature, Mature, Over-mature and Veteran.
<i>Stem Count</i>	Number of stems recorded at 1.5m above ground level.
<i>Stem Diameter</i>	Stem diameter recorded in millimetres at 1.5 meters above ground. Where the tree is multiple stemmed, each stem has been recorded.
<i>Height (Crown Height)</i>	Height of the tree in metres – to the closest 0.5m. Average canopy height in brackets, e.g. 10(3).
<i>First Significant Branch</i>	Existing height above ground level of first significant branch and direction of growth, e.g. 3(N)
<i>Branch Spread</i>	Branch spread, taken as a minimum at the four cardinal points – North, East, South and West.
<i>Observations</i>	General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay, physical defect or historic pruning).
<i>Cond</i>	Condition of the tree recorded as Good, Good to Fair, Fair, Fair to Poor, Poor or Dead.
<i>Life Exp</i>	Life Expectancy - classed as less than 10 years, 10 plus years, 20 plus years, or more than 40 years.
<i>Tree Works Required to Enable Development</i>	Tree works specifically required to enable the proposed development, or to reduce significant risk of harm. The term 'No action required' does not mean that general post development arboricultural management works are not required.
<i>RPA Radius</i>	Radius of the root protection area, when plotted as a circle centred on the base of the stem.
<i>RPA Area</i>	Total area of RPA in metres squared, e.g. 100m ² .
<i>Retention Category</i>	See below – A2.2.

A2.2. Tree retention categories

Retention category and definition	Criteria
<i>U (marked in red on the Tree Constraints Plan) = trees for removal.</i>	Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.
<i>A (marked green on the Tree Constraints Plan) = Trees of high quality</i>	Trees of high quality with an estimated remaining life expectancy of at least 40 years.
<i>B (marked in blue on the Tree Constraints Plan) = Trees of moderate quality</i>	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
<i>C (marked in grey on the Tree Constraints Plan) = Trees of low quality</i>	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

Appendix 3. Report Limitations & General Guidelines

- A3.1 Where the inspection of trees was limited (*see Appendix 1*), the 'Tree statistics and measurements' (*Appendix 2.1*) are estimated, and observations, condition and life expectancy are based on an inspection from the available vantage point.
- A3.2 It is recommended that qualified and experienced companies are sought when appointing tree work contractors and they should be approved under the Arboricultural Association Approved Contractors scheme. It is essential that all appointed tree work contractors have adequate Public Liability, Products Liability and Employers Liability Insurance. All tree works must conform to the current BS 3998 "*Recommendations for Tree Work*".
- A3.3 PENNINE *Ecological* will not accept liability for works undertaken by third party companies. All necessary checks must be made by the appointed tree work contractor prior to undertaking any works to ensure that no statutory tree protection measures or relevant laws are contravened.
- A3.4 The validity, accuracy and findings of this report are directly related to the accuracy of the information made available prior to and during the inspection process. No checking of independent third-party data will be undertaken. PENNINE *Ecological* will not be responsible for the recommendations within this report where essential data are not made available, or are inaccurate.
- A3.5 The assessment and works recommendations relate to conditions found at the time of our inspection. Any significant alteration to the site post our site inspection but pre submission for planning that may affect the trees present, or have a bearing on the planning implications (including level changes, hydrological changes, storms, extreme climatic events or site works) will necessitate a re-assessment of the trees and the site.
- A3.6 This report has been carried out in order to inform the planning process, and not to assess the potential hazards and risks posed by trees. Where clear and obvious hazards have been observed to accessible trees, these have been addressed in the works recommendations. Where inspections were limited by restrictions such as stem ivy, understory vegetation, limited access, epicormic growth or being located on adjacent land, any form of tree condition assessment was restricted. A full assessment of the levels of risk posed by trees can only be informed by considering site use together with assessing any hazards present within a tree.
- A3.7 Trees are dynamic structures that continue to develop and decline; in addition, changes in site use are likely to occur during and as a result from the proposed development. On this basis, regular tree risk assessments are advised.
- A3.8 PENNINE *Ecological* plans are to scale whenever possible but care should be taken when measuring from a plan without first checking the original data.

Appendix 4. Protective Barrier Construction

- A4.1 The default specification for protective barriers should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated below. The vertical tubes should be spaced at a *maximum* interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots.

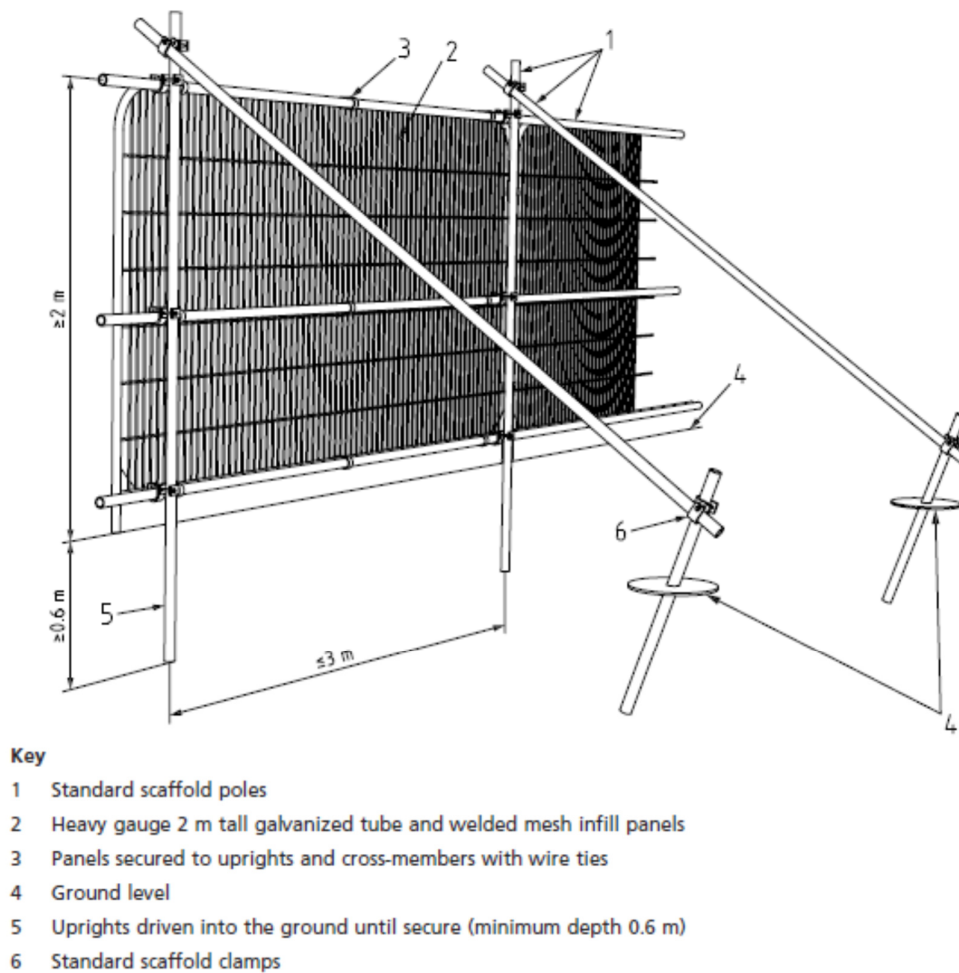


Figure 1. Default protective fencing barrier as detailed in BS 5837: 2012.

- A4.2 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification may be adopted. This system includes 2 m tall welded mesh panels on rubber or concrete feet, secure enough to provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 2a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 2b).

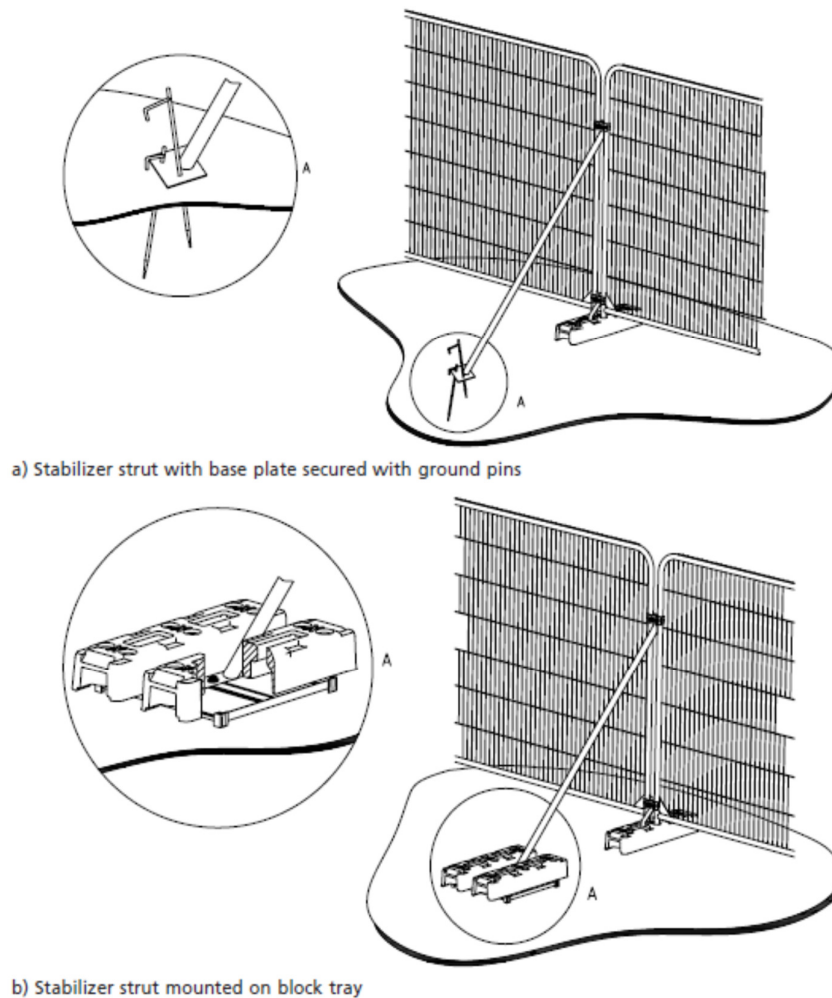


Figure 2. Examples of above-ground stabilizing systems