

Construction

General

Trees and hedgerows can offer many benefits by providing visual amenity, complementing the effect of the built environment and adding maturity to new developments. Trees are also important elements of green infrastructure, contributing to urban cooling and providing micro-climatic effects that can reduce energy demands in buildings. Whether on or near working areas, existing trees and hedgerows are a material consideration in the UK planning system.

Construction work often exerts pressures on retained trees and hedgerows, as do changes in their immediate environment following construction. Therefore, early provision of physical protection from damage is critical.

Planning

As part of the local planning process, an arboriculturist may be required to conduct a survey and draft a tree and / or hedgerow protection plan. Recommendations outlined in the plan are determined by various factors including, health and safety concerns and the presence of tree preservation orders (TPOs), 'important' hedgerows and designated sites / areas.

The tree and / or hedgerow protection plan should be referred to during the design phase to ensure trees and hedgerows that require retention are protected throughout the works, e.g. the construction and demolition of new structures, roads, car parks and service runs. It is important designers consider the working space required by tracked and other vehicles when finalising their designs. Attention should also be paid to areas where the existing ground level is being altered as this may lead to roots being compacted, severed or waterlogged.

Where a tree and / or hedgerow protection plan has not been drafted by an arboriculturist, contact must be made with the local planning authority (LPA) tree officer. The LPA tree officer will determine which trees and hedgerows must be retained and protected.

Depending on the site, it may be necessary for specialist contractors to undertake intrusive site investigations, e.g. environmental and / or archaeological sampling. Before these works commence, it is important retained trees and hedgerows in effected areas are suitably protected (see requirements below).

All retained trees and hedgerows must be labelled on the Environmental Constraints Layout Plan. Specific protection measures and any agreed remedial works, e.g. crown-lifting to avoid impact damage to low hanging branches, must be recorded in the Project Environmental Management Plan.

The Kier project team must share relevant information with subcontractors during the tender process. Subcontractors must ensure relevant environmental constraints and associated controls are referenced in their risk assessments and method statements (RAMS). RAMS that do not address these items shall be rejected by the Kier project team.

Tree Protection

For those trees that are to be retained and protected, a Root Protection Area (RPA) must be established. For single stem trees, the RPA should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter taken at 1.5m from ground level. For multi stem trees the RPA should be calculated using the Kier [Root Protection Area Calculator](#). The required RPA for each tree should not exceed 707m².

Where all activity can be excluded from the RPA, barrier fencing should be erected to create a construction exclusion zone. Where activity in an RPA cannot be avoided, barrier fencing, root protection options and, where required, excavation techniques must be reviewed with the LPA tree officer. **All protection measures and works within RPAs must be agreed with the LPA tree officer before site investigations and main works commence, e.g. before any materials or machinery are delivered to the site.**

Barrier fencing and root protection measures must be installed in accordance with **BS5837:2012 Trees in Relation to Design, Demolition and Construction-Recommendations** ([Accessible via IHS](#)), or as agreed with the LPA tree officer. Fencing should be maintained to ensure it remains rigid and complete. The default specification should comprise a vertical and horizontal metal framework, well braced to resist impacts or include the attachment of panels to a free-standing scaffold support framework as shown in examples figures 1 and 2 below. RPA signage should be displayed on barrier fencing every 5 metres.

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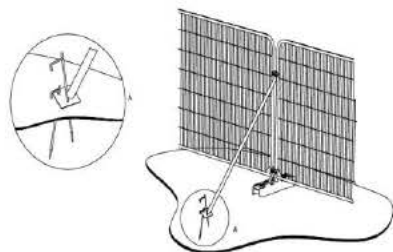


Fig 1. Stabilizer strut with base plate secured with ground pins

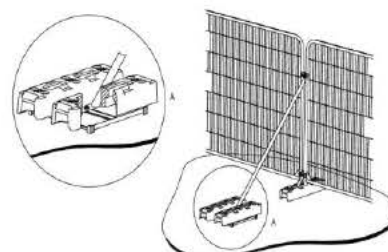


Fig 2. Stabiliser strut mounted on block tray

Root protection methods must be capable of supporting traffic entering or using the site without being distorted or causing compaction of underlying soil. Root protection may comprise one of the following:

- **Pedestrian movements only**
A single layer of scaffold boards placed on top of a driven scaffold frame to form a suspended walkway should be used, or on top of a compression-resistant layer, e.g. 100mm depth of woodchip, laid on to a geotextile membrane.
- **Pedestrian-operated plant (maximum gross weight of 2 tonnes)**
Proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer should be used, e.g. 150mm depth of woodchip laid on to a geotextile membrane.
- **Wheeled or tracked construction traffic (exceeding gross weight of 2 tonnes)**
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 should be used.

Protective barriers and root protection measures must not be moved or dismantled until soft landscaping works commence. Unless otherwise agreed with the LPA tree officer, barrier fencing and other protective measures must be reinstated immediately where work activities, not related to soft landscaping, continue or are scheduled to take place. Protective measures must also be reinstated where there is a risk of trees and hedgerows being damaged by people, vehicles, plant or materials accessing / exiting other areas of the site or neighbouring sites.

Hedgerow Protection

Measures to protect hedgerows must be implemented in accordance with recommendations contained within the tree and / or hedgerow protection plan, or as subsequently agreed by the LPA tree officer. Protective measures are likely to mirror requirements for trees (see above), e.g. RPAs and erection of barrier fencing. **All protection measures and works within RPAs must be agreed with the LPA tree officer before site investigations and main works commence, e.g. before any materials or machinery are delivered to the site.** RPA signage should be displayed on barrier fencing every 10-20 metres.


Monitoring & Record Retention

All RPAs must clearly display a Tree & Root Protection Enviro-tag. Enviro-tags must be completed by a Kier member of staff as part of the inspection regime prior to installation of protection measures. Subsequent inspections must be undertaken as a minimum on a weekly basis. During inspections, relevant guidance provided in this minimum standard should be referenced by scanning the QR code printed on the Enviro-tag. Please note, mobile devices may only be used within designated areas, e.g. in areas away from traffic and other hazards.

Where non-compliance is identified, the inspecting member of staff must complete the Enviro-tag, remove it from its holder and hand it to the Kier project environmental coordinator (PEC). Items requiring action must be recorded using Weekly Monitoring Report [SHEMS-FOR-GR-089](#). Where an Enviro-tag has been removed from its holder, the RPA should not be entered until the issue(s) have been resolved and the Enviro-tag has been reinstated by the Kier PEC or his / her nominee. Used / old Enviro-tags must be retained in the weekly SHE monitoring folder.


Weekly Monitoring Reports and Enviro-tags must be retained for a minimum of 3 years in accordance with the Record Retention Register [SHEMS-REG-GR-010](#). Electronic copies of these records are acceptable providing they are legible.

Further Guidance / Reference

Enviro-tags 
Inspection and Weekly Monitoring Standard [STD-GR-2004](#)

Avoiding Underground Services [SHEMS-MST-CON-0001](#)
[Kier Sign Schedule](#)
[Ecus Tree Protection & British Standard 5837:2012 Presentation](#)

For hard copies of documentation referenced in this minimum standard, please contact a Kier member of staff.

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TREE & HEDGEROW PROTECTION INSTALLATION AND ROUTINE MONITORING GUIDANCE

1	INITIAL ASSESSMENT (undertaken prior to installation of tree and hedgerow protection)
a	Contact has been made with the local planning authority (LPA) tree officer to discuss and agree tree and hedgerow protection and any necessary remedial works
b	Retained trees and hedgerows have been labelled on the Environmental Constraints Layout Plan
c	Tree and hedgerow protection requirements and, where applicable, excavation techniques within root protection areas (RPAs) have / are being communicated to relevant subcontractors before they start works
d	Specific tree and hedgerow protection measures and any agreed remedial works, e.g. crown-lifting to avoid impact damage to low hanging branches, has been recorded in the Project Environmental Management Plan
e	Where tree and hedgerow remedial works are required before construction or demolition activities commence, e.g. crown-lifting, the necessary works have been completed
f	Root protection area (RPA) is free from materials, plant, equipment and wastes
g	Tree and hedgerow protection measures have been installed as per BS 5837:2012, or as recommended by the LPA tree officer
h	RPA signage is clearly displayed on RPA fencing at intervals of 5m (trees) or 10-20m (hedgerows)
i	Provisions have been made to ensure washing, cleaning and maintenance of machinery, plant and vehicles will not take place within 10m of an RPA
j	Provisions have been made to ensure fuel, oil and other COSHH chemicals will not be stored or decanted within 10m of an RPA
k	Provisions have been made to ensure equipment used for managing concrete wash water will not be located or used within 10m of an RPA
l	Provisions have been made to ensure mortar silos will not be located or used within 10m of an RPA
2	ROUTINE MONITORING (undertaken as a minimum on a weekly basis)
a	Enviro-tag is missing or barrier fencing / root protection measures have been moved since the last inspection (complete section 1)
b	Root protection area (RPA) is free from materials, plant, equipment and wastes
c	RPA and associated trees and hedgerows are free from damage, e.g. no evidence of impact damage to low hanging branches and unauthorised access or excavation taking place
d	Barrier fencing and / or root protection measures are complete and undamaged
e	Barrier fencing is free from obstructions, e.g. materials are not stacked or leaning against fencing
f	RPA signage is clearly displayed on RPA fencing at intervals of 5m (trees) or 10-20m (hedgerows)
g	Subcontractors reference relevant environmental constraints and associated controls, e.g. those relating to trees and hedgerows, in their risk assessments and method statements (RAMS)
h	Washing, cleaning and maintenance of machinery, plant and vehicles is not taking place within 10m of the RPA
i	Fuel, oil and other COSHH chemicals are not be stored or decanted within 10m of the RPA
j	Equipment used for managing concrete wash water is not located or being used within 10m of the RPA
k	Mortar silos are not to be located or used within 10m of an RPA
l	Slewing machinery, e.g. telehandlers, excavators and cranes are not being used within 5m of retained trees and hedgerows without a banksman