

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

UNCONTROLLED IF COPIED or PRINTED

Amey plc and its associated companies are not liable for the contents of this document.

Sheffield Streets Ahead
5 Year Tree management Strategy

Contract: Sheffield Streets Ahead
Contract No: n/a

Purpose:
This Tree Management Strategy sets out Amey's approach to delivering the Tree Management Service. Amey shall use the Tree Management Strategy to effectively undertake its responsibilities under the Contract and deliver the Tree Management Service on the Project Network.

Written by: [REDACTED] **Date:** 28/11/2012
Tree Asset Manager

Approved: _____ **Date:**
Operations Director

Process: Deliver Service

Mandatory

Process

Title: 5 Year Tree Management Strategy

Guidance

Contract Specific

RECORD OF REVISIONS

Amey shall review the Tree Management Strategy at periods not exceeding one (1) year and shall update accordingly. Amey shall note reviews, including nil returns, in the table below.

Date	Topic of Change	Section/s Changed	Revision No.	Agreed (Highways Manager)	Approved (Operations Director)
Feb 2013	Authority comments and track changes	All	01		
Mar 2013	Incorporation of changes and further development	All	02		
May 2013	Incorporation of changes and further development	Front cover inc. Rev. Status. Page 7.	03		
Jul 2013	Minor changes	Page 9 & 10	04		
Nov 2013	Annual Submission	Page 5	05		

REGISTER OF CONTROLLED COPIES

Copy No.	Holder	Company/ Organisation	Location	Revision and Date First Issued to Holder
001			Olive Grove Depot	28/11/2012
002			SCC	28/11/2012

Amey shall retain copy number one (1) in a marked up condition showing changes and alterations between revisions and shall review this copy annually as part of its management review. The Tree Asset Manager shall incorporate amendments and comments into the Tree Management Strategy, where appropriate, and reissue under a new revision number. Amey notes that the frequency of revision will be determined by the importance and number of changes accumulated since the previous revision.

Amey shall ensure that unrestricted access to this document is available to Sheffield Highways Maintenance PFI staff via the Project's IT network, with a hard copy (controlled) held at the locations stated in the table above.

Process: Deliver Service

Mandatory

Process

Title: 5 Year Tree Management Strategy

Guidance

Contract Specific

Sheffield Streets Ahead

5 Year Tree Management Strategy

Strategic goals

- **Maximise potential canopy cover** through species selection, good establishment and good arboricultural management.
- **Establish a sustainable tree stock** through improved planting design and appropriate management.
- **Minimise future maintenance costs** through species selection and appropriate management.
- **Establish a resilient tree stock** through species diversity and species selection.
- **Maintain Sheffield’s tree heritage** by protecting and conserving where appropriate.
- **Increase biodiversity** through species selection and protection of habitats.
- **Ensure a safe tree stock** through good tree management and protection.
- **Improve compatibility with environment** through holistic highway design and management.
- **Improve public relationship with highway trees** through positive engagement and good management.
- **Improve understanding of benefits of urban trees** through communications and events.
- **Improve function of highway trees** through innovative design strategy.

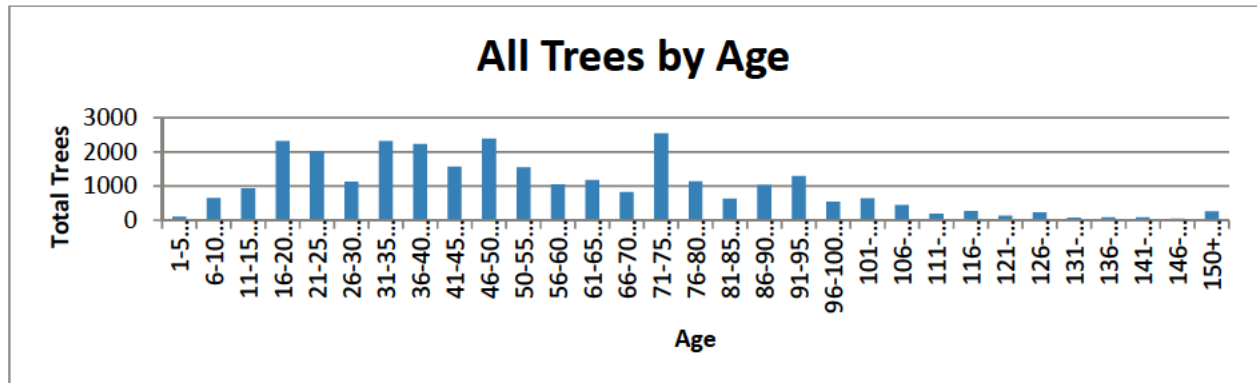
Process: **Deliver Service**
 Title: **5 Year Tree Management Strategy**

Mandatory	Process
Guidance	
Contract Specific	

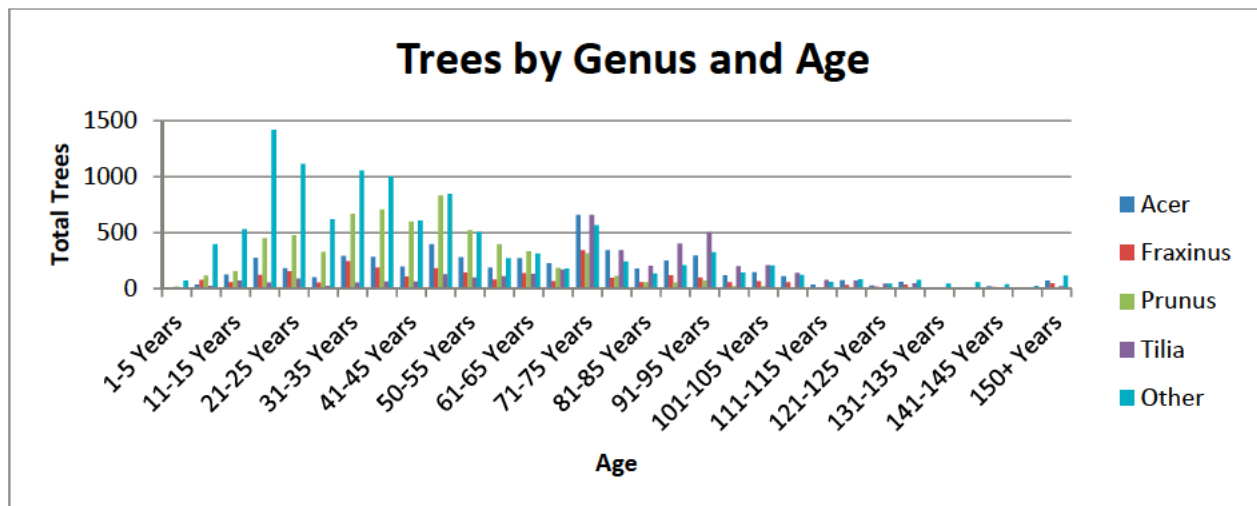
Background

History & Context

The data gathered from the initial asset survey has been analysed to obtain a broad overview of the highway tree stock with regard to age spread and species mix. As further data is gathered from re-surveys and historical information becomes available then this analysis will be expanded to provide a more detailed picture of the current tree assets.



The age spread graph shown above shows a fairly even age range across the highway tree stock with notable peaks coinciding with times of extensive urban housing development such as the post war period . The majority of highway trees will require replacement after 70-80 years, so with an average of 1000-1500 trees in each 5 year age bracket then the required replant rate to maintain the current tree numbers will be 200-400 trees per annum.



The species mix graph shows the four most significant genus of tree in the current stock with all other genus of tree incorporated together in to the 'Other' category. This clearly shows the pre-war popularity of larger species such as Ash, Lime and Sycamore and the later trend for planting Cherry species in large numbers. The recent peak in other more varied species is due to the increased availability of exotic species and more appropriate hybrids and cultivars that have a proven tolerance of highway conditions.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Policies

The principles set out in the SCC Tree Replacement Policy and Highway Tree Design Guide have been incorporated within this strategy. As other relevant SCC policies become available or existing policies are revised, the strategy will be reviewed to ensure consistency.

Management Areas

For the purposes of routine tree management and reactive maintenance the tree stock will be managed by ward and community assembly areas.

The initial 5 year Tree Replacement Programme will follow the CIP zonal works programme.

Tree Management

Asset survey & Risk Management

General

All tree surveying will be undertaken by suitably trained and qualified inspectors. Each inspector will only undertake surveys according to their level of experience and all inspectors will maintain Continued Professional Development through seminars, conferences and subscriptions to ensure their knowledge is up to date and they are aware of current and future threats to tree health.

Where condition and risk assessments are being updated, this work will only be undertaken by inspectors with a recognised arboricultural qualification to a minimum of level 3 on the National Qualifications Framework.

Timing

An initial inventory survey will be undertaken for the whole tree stock in the first twelve months of management. This will include GIS data, inventory and measurement data, condition assessment and risk assessment for the first phase of individual Highway Tree assets. For the second phase of Highway Woodland Groups and Other Designated Land, separate asset models will be created to reflect the unique management requirements of these areas and enable specific management plans to be developed. Once complete the data will be used to populate the first year's work programmes as well as informing future maintenance and replacement programmes.

Following this, an annual resurvey of 25% of the tree stock will be undertaken in years 2-5 where valuation and other management data may be gathered in addition to the update of condition and risk assessments. The order of resurvey for each defined area will be prioritised following analysis of tree condition data collected in the initial inventory survey. The work recommendations from these surveys will inform the following year's Annual Tree Management Programme. The detailed condition and valuation assessments will be used to review and modify future maintenance and replacement programmes where necessary.

From year 6 onward, once the tree stock has been brought to an improved standard, the resurvey will move to an annual 20% resurvey within a 5 year cycle.

Data collection & storage

All survey data will be recorded using Confirm survey software on handheld devices. This will ensure that there is minimum possibility of data transfer loss, the data collected is compatible with the main database configuration and accurate GIS data is available on site.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

The following information will be captured in the initial inventory survey:

- Coordinates, Site, Location and Species
- Measurements – DBH, Height, Spread
- Age Class & Condition Rating
- Condition Assessment – 4 point assessment (Root, Stem, Scaffold, Canopy)
- Individual Risk Assessment – 3 point assessment (Target, Likelihood, Impact)
- Tree work recommendations with priority

The following additional data will be captured on resurvey:

- Tree Valuation Assessment
- Site features
- Special attributes – Historic, Heritage, Habitat etc.
- Photographs (Where necessary) – Linked to the individual asset in Confirm

All data will be stored in the Confirm Asset Management system where dashboards will be available to monitor survey progress, risk profiles and work programme progress. Data will be analysed through reports to inform the future strategy for maintaining and improving the tree stock.

Review

The data collected and system configuration will be reviewed on an annual basis to ensure that the information available is in line with current best practice and changes in legislation.

Tree failure database

A tree failure database will be developed to record all significant tree failures on the highway. The data gathered will be used to analyse trends and inform proactive management plans. Failure figures will also be used to measure the performance of the risk management strategy and inform any necessary changes upon annual review.

Walk & Build surveys

Surveys undertaken in conjunction with highways surveyors ahead of the footway, carriageway and street lighting replacement works will inform the future Tree Replacement Programme. The following factors will be considered when making decisions on individual trees:

- Tree health/condition
- Species suitability
- Highway obstruction
- Damage to surrounding surfaces
- Third party damage
- Life expectancy
- Future management options
- Landscape impact
- Engineering solutions
- Heritage & habitat value

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Tree Maintenance

General

All pruning work will be specified and undertaken to the standards set out in BS3998:2010 Recommendations for Tree Work. Industry Best Practice will be used where specific guidance is not available or where standards have changed over a period of time.

When specifying pruning works the impact on long-term tree health and sustainability will always be considered in conjunction with highway safety, social impacts and legal requirements.

Crown lifting

Crown lifting will be undertaken primarily to maintain effective clearance over the highway for both vehicular traffic and pedestrians. This will normally involve pruning to between 5 & 6m over the carriageway and 3m over footways and pedestrian areas. Where trees are too young to achieve these clearances on minor roads then consideration will be given to a reduced clearance. Where trees are located over shrub beds or open grass areas then the need for crown lifting will be assessed with regard to the species and access needs; grass cutting etc.

Crowns will normally be lifted to an equal height all round except where this may have a negative impact on tree health and canopy volume.

Crown lifting operations will be undertaken on a regular basis throughout the life of the tree and at the earliest opportunity to minimise wound size and exposure to pathogens.

Crown lifting may also be considered to:

- Provide clearance over street furniture and third party structures.
- Improve general light levels to the immediate area and adjoining properties.

Crown thinning

Crown thinning will only be considered where a genuine arboricultural need can be given and long-term benefits can be seen.

Crown reduction

Crown reductions will be undertaken primarily to mitigate against structural defects and weaknesses that may otherwise lead to tree failure. The effect on each particular species of tree will be considered along with the long-term benefits and sustainability of management. In the case of trees in decline reductions may be specified to facilitate the safe management of the natural retrenchment process.

Reductions may also be considered individually, or for a whole avenue, where minimum clearances to adjacent structures cannot be maintained by any other means. This may involve whole crown reduction or side reduction after careful consideration of both the effect on visual amenity, tree stability and tree health. The future maintainability and long-term benefits of such management regimes will always be considered before such work is specified.

Pollarding

Pollarding will only be specified on previously pollarded trees where there are issues of clearance to adjacent structures and where no other management options are available. Generally this will only be considered for mature London Planes and to a lesser extent Common Lime, where the main stem is within 2m of an adjacent building.

Pollards will be managed on a short cycle programme of no more than 3 years to minimise the impact on tree health and ensure highway safety.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Previously pollarded trees which do not meet the above criteria will be allowed to re-form natural crowns where it is safe to do so and managed using crown reduction techniques when necessary. The long-term benefits and sustainability of this type of management should be carefully considered in each case. In all cases the preferred option will be removal and replacement with more appropriate species but it is recognised that this will not be suitable in some cases.

General pruning

General pruning will be undertaken as a regular maintenance requirement for all mature trees to ensure they meet the minimum standards expected on the highway.

This may include:

- Crown lifting
- Epicormic removal
- Crown cleaning
- Clearance of structures
- Clearance of highway assets
- Removal of attachments

Young tree maintenance

Young tree maintenance will be undertaken as a regular maintenance requirement for up to 5 years post planting. This will normally be undertaken on an annual basis to ensure good establishment and future structural integrity.

This may include:

- Formative pruning
- Crown lifting
- Tie replacement/removal
- Stake replacement/removal
- Mulching
- Weed control

Epicormic removal

Epicormic removal will be undertaken on an annual programme to prevent obstruction to the highway and the obscuring of sightlines.

In general the programme will include all Lime species adjacent to the highway or footway and certain other species such as Plane, Poplar and Horsechestnut where growth is identified.

Trees in grass areas and shrub beds will only be visited on the annual maintenance programmes or as need arises.

Felling

The removal of highway trees will only be considered as a last resort where there are no other management options available to ensure safety or prevent damage to surrounding structures. Fells will only be specified by suitably qualified and experienced surveyors and where necessary additional decay detection equipment will be used to confirm any recommendations. All trees removed will be replaced on a 1 for 1 basis the following planting season.

Highway safety

Where trees are identified as a hazard to the safe use of the highway and other management options are not appropriate then they will be removed and replaced as priority works.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Where 3rd Party trees are identified as an imminent threat to highway safety by an Arboricultural Surveyor then full details, including photographs, will be passed to the SCC Enforcement Team for noticing under Section 154 of the Highways Act.

Disease control

Where felling may be required to control outbreaks of disease and other pathogens then advice will be sought from industry and research bodies to ensure that the approach is consistent with current best practice and national strategies. Where there is a significant threat to the health of the highway tree stock, guidance documents will be produced and a joint approach will be discussed with SCC and other local tree managers.

The above approach is currently being taken in relation to Ash Dieback (*Chalara fraxinea*) which has the potential to have a significant impact on the tree stock. An environmental bulletin (Appendix 3.) has been circulated throughout the service and the situation is being closely monitored.

All nursery stock will be sourced from suppliers with suitable biological security procedures and a commitment to maximising the supply of locally grown species. All stock will undergo a three tier inspection regime consisting of a point of selection inspection, pre-delivery inspection and pre-planting inspection. This will ensure the supply of healthy stock and minimise the possibility diseases being spread to the wider tree population.

Replacement programmes

Where removals are proposed that will have a significant impact on the surrounding landscape, or tree stock as a whole, then individual reports will be produced for consultation with local stakeholders. In particular Sheffield has some significant mature avenues where a phased removal approach will be considered where highway safety is not compromised. The factors in deciding to instigate wider consultation will be varied and may be particular to local environments. Given the sensitivity of tree removal, an Arboricultural Surveyor will make all initial recommendations and these will be reviewed by the Arboricultural Asset Manager in consultation with SCC.

Tree Replacement

General

All trees programmed for removal in the Tree Replacement Programme or CIP Programme will be replaced within 12 months, in the planting season (October-March), on a one for one basis. Where trees are removed as part of unplanned reactive works then replacement may be delayed until the following planting season depending on the availability of required stock. The replacement species will be chosen primarily for their suitability to roadside conditions to minimise losses in early establishment and ensure future sustainability. Consideration will also be given to each individual species landscape and environmental suitability for the specific areas of planting.

Species

The primary species for planting in narrow verges and hard standing have been chosen following consultation with growers and review of older urban plantings. The early establishment of healthy trees that thrive to maturity is key to maximising environmental benefits such as carbon sequestration and pollution control. To this end, all species have been chosen with suitability and sustainability in mind and to minimise future pruning and conflict with both structures and people. (Approved species list – See appendix 1.)

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Location

Specific locations for individual replacements will be chosen to minimise conflict with surrounding structures both above and below ground. Where possible locations will be chosen that minimise negative impacts on adjacent properties and allow for future access requirements. All replacements will be located as near to the original location as possible but where necessary may be located elsewhere in adjacent roads.

Native & Arboretum/Specimen Trees

Where larger grass areas are available adjacent to the highway and there is adequate soil volume for unrestricted root development and space for full crown development then larger native and specimen species will be considered. The planting of larger native species will improve the habitat value of the tree stock and in prominent positions specimen trees will benefit the local amenity.

Standard Tree Pit Detail

The standard design (Appendix 2.) has been developed to promote early and successful establishment of trees in the often hostile highways environment. A triple stake system will be used wherever possible to provide all round protection from mechanical damage from planting through to establishment. All individual plantings will be Extra Heavy Standards (14-16cm) or larger to minimise losses from vandalism and provide instant impact in the landscape. Woodland and group planting specifications will be developed on an individual basis as required. City centre and town centre planting specifications will be developed after further consultation with planners and other interested parties.

The standard highway planting designs have been developed with regard to the principals set out in the SCC Highway Tree Design Guide. Where necessary the design details have been reviewed and updated to ensure that the specifications used are consistent with current best practice and latest research.

Tree Protection**General**

The tree stock will be protected from accidental and wilful damage through monitoring, inspections and physical strategies. The protection of trees and their root systems is key to establishing a healthy tree stock and ensuring development to maturity.

Capital Investment Programme

As part of the Walk & Build programme retained trees will be identified and tree protection methods will be specified where necessary. All construction work within tree canopies will be undertaken in line with the guidance given by the Arboricultural Team and specific guidance documents will be developed to be distributed to all construction teams.

Engineering solutions should always be considered before trees are recommended for removal and replacement.

Highway Projects

All other construction work in the proximity of trees will be monitored through the MAS process. This will normally include initial assessment of designs, attendance of pre-start meeting by an arboricultural inspector, monitoring during construction phase and inspection upon completion.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Utilities

All works undertaken by utility companies will be monitored by the NRSWA inspectors who will contact the Arboricultural team for specialist advice where necessary.

Vandalism/Unauthorised works

Where cases of vandalism or unauthorised work on highway trees are discovered and there is sufficient evidence available, compensation will be sought to make good any damage. Where possible these cases may be publicised to discourage future incidents.

Attachments

All unauthorised attachments to highway trees will be removed upon discovery and where possible compensation will be sought to make good any damage.

Communication**General**

All enquiries regarding trees will be responded to by the Arboricultural Team in a timely manner and in line with the strategies outlined in this document. This will ensure that the approach to tree management is consistent across all areas and the standard of service provided is the same for all residents and stakeholders.

Community Engagement

Information regarding planned tree management works will be disseminated to Community Assemblies and residents groups through the Assembly Steward for the area. Any local issues can also be raised with the stewards for feedback and consultation with the Arboricultural Team.

Notification

All planned tree replacement work and significant pruning work will be notified to councillors and residents prior to work commencing. Where tree removal is planned a notice will be fixed to the tree a week before to inform the wider community of the proposals.

Consultation

Where proposed tree removals may have a significant impact on the immediate landscape, close consultation with councillors and community groups will be undertaken and where possible communities will be included in the decision making process with regard to replacement species.

Education

The benefits of urban highway trees will be promoted to improve public awareness and as a balance to the often negative perceptions and impacts of highway trees. Promotional opportunities will be developed on an on-going basis but may include:

- Involvement in community events
- Website information
- Information leaflets
- Open days

Process: Deliver Service

Mandatory

Process

Title: 5 Year Tree Management Strategy

Guidance

Contract Specific

Appendix 1.

Sheffield Streets Ahead – Approved tree species(2012/2013)Primary Species – Narrow verges & tree pits

Acer campestre ‘Elegant’

Betula ermanii

Corylus colurna

Crataegus laevigata ‘Paul's Scarlet’

Ginkgo biloba

Gleditsia triacanthos ‘Sunburst’

Liquidambar styraciflua ‘Worplesdon’

Malus ‘Rudolph’

Platanus x hispanica

Prunus hillieri ‘Spire’

Pyrus calleryana ‘Chanticleer’

Sorbus x arnoldiana ‘Schouten’

Tilia cordata ‘Rancho’

Tilia ‘Winter Orange’

Tilia cordata x mongolica ‘Harvest Gold’

Sorbus intermedia ‘Brouwers’

Native Species – Wide grass verges where root & crown development are not restricted

Quercus robur

Carpinus betulus

Pinus sylvestris

Taxus bacatta

Fagus sylvatica

Crataegus monogyna

Betula pendula

Acer campestre

Arboretum/Specimen Species – As native species but in prominent position

Quercus cerris

Liriodendron tulipifera

Cedrus atlantica ‘Glauc’

Catalpa bignonioides

Sequoiadendron giganteum

Ulmus ‘New Horizon’

Parrotia persica

Gymnocladus dioica

Pterocarya fraxinifolia

Process: **Deliver Service**
 Title: **5 Year Tree Management Strategy**

Mandatory	Process
Guidance	
Contract Specific	

Appendix 2.

Environmental Bulletin

 Sheffield Streets Ahead


Title: Chalara dieback of ash (Chalara fraxinea)

Reason for Bulletin:

Description: Chalara dieback of ash is a serious disease of ash trees caused by a fungus called *Chalara fraxinea*. The disease causes leaf loss and crown dieback in affected trees, and usually leads to tree death.
Distribution: To date 135 confirmed cases of the disease have been found across Great Britain, mainly concentrated around the south east where nursery imports brought infected stock from Europe.
Control: A Plant Health Order prohibiting all imports of ash seeds, plants and trees into Great Britain, and all movement of ash seeds, plants and trees within Great Britain, was introduced by the UK Parliament on 30 October 2012 to prevent further spread of the disease.
Highway Trees: We manage and maintain over 2,000 Ash trees on the Sheffield highway network which could be affected by the spread of Chalara dieback. To date there have been no confirmed cases on the network or in the wider Sheffield area.



Action to be Taken:

Suppliers: Our suppliers have been rigorously tested by Defra inspections throughout the summer for incidence of Ash Dieback and fortunately they have come up clear. Due to the movement restrictions however, they will not be supplying and we will not be planting Ash species for the foreseeable future.
Monitoring: Our team of arboricultural surveyors have been monitoring the situation closely over the past 6 months and will continue to investigate all suspected cases and liaise with both Defra and the Forestry Commission on the latest national guidance.
Identification: A pictorial guide to the identification of infected trees is available on the Forestry Commission website: <http://www.forestry.gov.uk/chalara> or an App is available for smartphones: <http://ashtag.org/>
Reporting suspected cases: Any suspected cases of the disease found on the Sheffield highway network should be raised as an enquiry with the Arboricultural Team for further inspection by our qualified arboriculturalists. If reportable cases are found the details will be passed to the Forestry Commission for confirmation.
Management: Currently there is no intention to fell mature trees that are infected. Mature trees will only be removed if the infection has left them in a dangerous condition. Recently planted infected stock is likely to be destroyed as a control measure to limit the further spread of the disease.
Contact Information: Further advice can be obtained from [REDACTED] (Arboricultural Asset Manager) on [REDACTED] of Email: [REDACTED]



Pictures courtesy of Forestry Commission / Thomas Kirisits
 Source of Alert (if external):

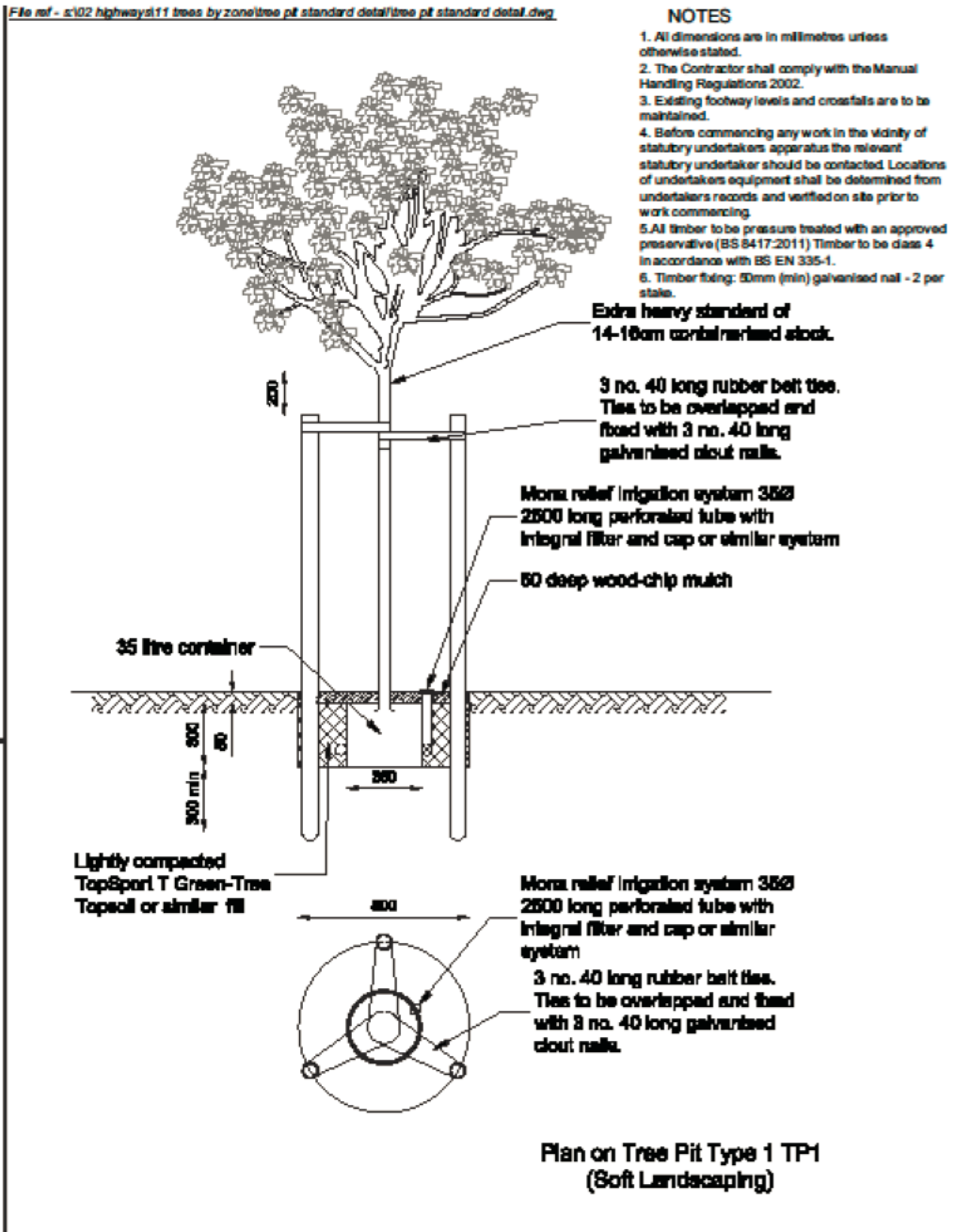
**Please Display on Noticeboards and
 Use the Information for Briefing and Workbox Talks**



Issued by: [REDACTED] Issue Date: 12/11/12 Number: SHEF / EB / 001

Process: **Deliver Service**
 Title: **5 Year Tree Management Strategy**

Mandatory	Process
Guidance	
Contract Specific	

Appendix 3.



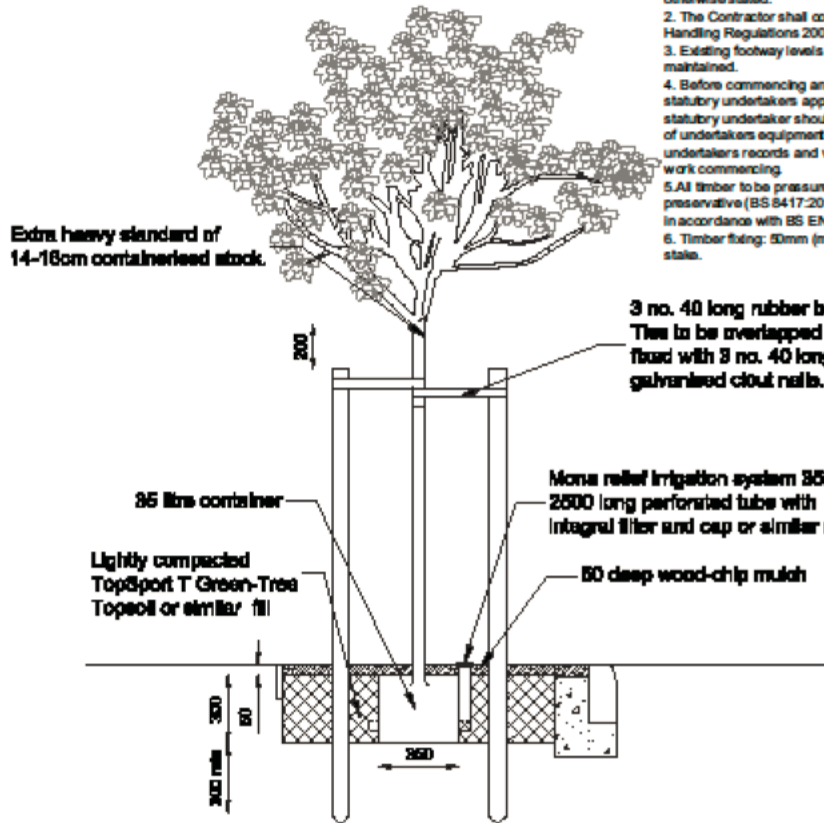
Project Name Sheffield Streets Ahead				Reproduced from the Ordnance Survey map with the permission of the controller of H.M. Stationery Office. © Crown copyright reserved. Licence no. 1000 188 16.	
Drawing Title Grounds Maintenance Tree Pit Type 1 TP1				Client  	
Rev	Revision details	Chkd	Appd	Date	Drawing No GM-SD-001
	Drawn: -		Preliminary		Rev
	Design: -		For comment		
	Chkd: -		For tender		
	Appd: -		For construction		
	Date: -		As constructed		
			Standard Detail	<input checked="" type="checkbox"/>	
Original Dwg Size: A4		Dimensions: -		Scale: As Shown	
				Copyright © Amey	

Process: **Deliver Service**

Title: **5 Year Tree Management Strategy**

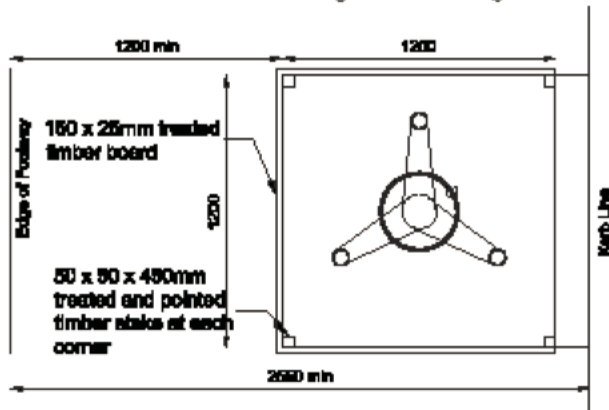
Mandatory	Process
Guidance	
Contract Specific	

File ref - s102 highways11 trees by zone/tree pit standard detail/tree pit standard detail.dwg




NOTES

1. All dimensions are in millimetres unless otherwise stated.
2. The Contractor shall comply with the Manual Handling Regulations 2002.
3. Existing footway levels and crossfalls are to be maintained.
4. Before commencing any work in the vicinity of statutory undertakers apparatus the relevant statutory undertaker should be contacted. Locations of undertakers equipment shall be determined from undertakers records and verified on site prior to work commencing.
5. All timber to be pressure treated with an approved preservative (BS 8417:2011) Timber to be class 4 in accordance with BS EN 335-1.
6. Timber fixing: 50mm (min) galvanised nail - 2 per stake.



Plan on Tree Pit Type 2 TP2 (New Footway Pit-Standard)

				Project Name Sheffield Streets Ahead		Reproduced from the Ordnance Survey map with the permission of the controller of H.M. Stationery Office. © Crown copyright reserved. Licence no. 1000 103 10.	
Rev	Revision details	Chkd	Appd	Date	Drawing Title Grounds Maintenance Tree Pit Type 2 TP2		Client  
Drawn	-	Preliminary			Original Dwg Size : A4		Drawing No GM-SD-002
Design	-	For comment			Dimensions : -		Rev
Chkd	-	For tender			Scale: As Shown		
Appd	-	For construction			Copyright © Amey		
Date	-	As constructed					
				Standard Detail			