

Streets Ahead Project

Five Year Tree Management Strategy

2018 to 2023



Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

RECORD OF REVISIONS

Date	Topic of change	Sections changed	Revision no.	Agreed (Operations manager)	Approved (Operations director)
Feb 2013	Authority comments and track changes	All	01		
March 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		
July 2013	Minor changes	Page 9 & 10	04		
Nov 2013	Annual submission	Page 5	05		
Nov 2014	Annual submission	Front cover, page 11	06		
Nov 2015	Annual Submission	All	07		
Nov 2016	Annual Submission	None	08		
Nov 2017	Annual Submission	All	09		

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.

REGISTER OF CONTROLLED COPIES Company/ Revision and Date First

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 Operations 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.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

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.

Copy no.	Holder	Company/Organisation	Location	Revision and date first issued to holder
001	[REDACTED]	Amey	Olive Grove Depot	18.11.14
002	[REDACTED]	Sheffield City Council	Sheffield	18.11.14

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Introduction

The following Tree Management Strategy applies to the trees located within the boundaries of Sheffield highway network, our aim to ensure the tree population is maintained throughout the project period (25 years) to create a legacy of a healthy, diverse tree stock in terms of age profile and species, reducing the risk of monocultures whilst ensuring the safety of the highway user and adjacent properties.

The strategy aims to meet the outcomes of the 2007 Independent tree survey commissioned by Sheffield City Council, the aspirations to maintain Sheffield as the Greenest City, the contractual obligations set out in the Project Agreement and Performance Requirements.

Streets Ahead Project offers Sheffield a unique opportunity over the next 25 years to invest in the landscape of our streets for future generations, similar to the Victorians who originally planted the iconic tree lined streets we have today. Our strategy outlines how trees will be preserved, maintained and the replacement programme to achieve the below outcomes.

Our Five Year Strategy 2012 to 2017 is reviewed annually, providing an opportunity to measure success against our strategic and contractual outcomes.

Strategic Outcomes

- **Sustainable tree population** through appropriate species selection, appropriate management whilst considering environmental / climatic changes.
- **Maintain Sheffield's tree heritage** by protecting and conserving where appropriate.
- **Increase biodiversity** through applicable species selection for the location 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 Education, Community Engagement, communications and events.
- **Embrace inclusive mobility** in creating a modern highway environment that fit for the purpose of all.

Process: Deliver Service
Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Background

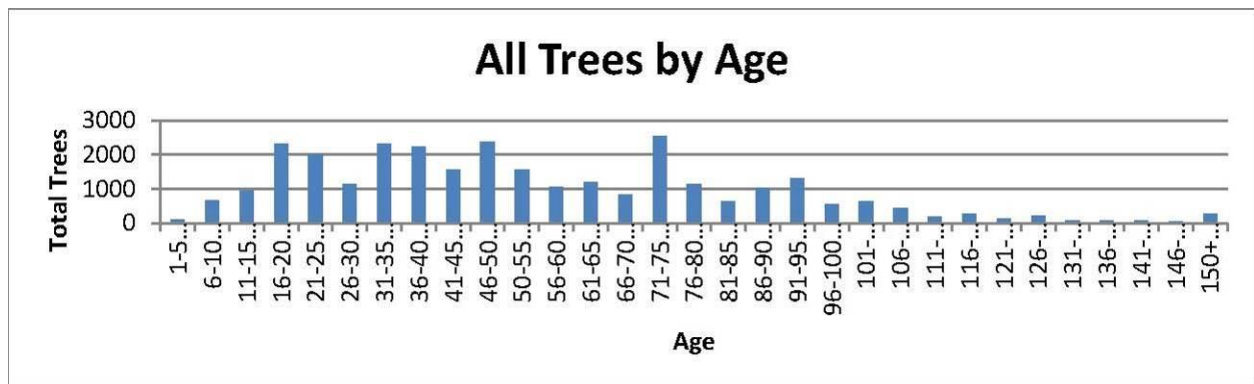
History & Context

A survey of the highway tree population was undertaken in 2007 by an independent consultancy commissioned by Sheffield City Council which identify 75% of the trees were assessed to be mature or over mature with the potential of a catastrophic decline highly likely if a sustainable programme of the replacement wasn't considered.

The data gathered from the initial asset survey (2012) undertaken by an independent tree surveyor on behalf of Amey 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.

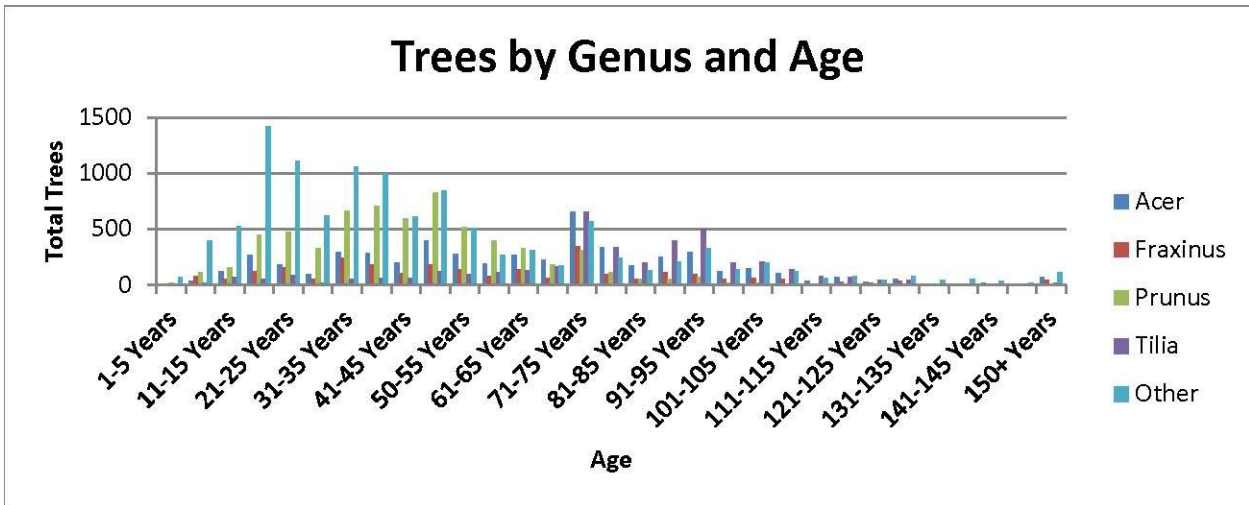
The age spread graph shown below shows a fairly even age range across the highway tree stock with notable peaks coinciding with times of extensive urban housing development such as the post war period . The majority of highway trees will require replacement after 70-80 years, so with an average of 1,000-1,500 trees in each 5 year age bracket then the projected replant rate to maintain the current tree numbers will be in the range of 200 to 400 trees per



annum.

Process: Deliver Service
Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	



The species mix graph above 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 has 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 Core Investment Period zonal works programme.

Tree Management

Asset survey & Risk Management

General

The surveying of trees will be undertaken by suitably trained and qualified inspectors, typically qualified to degree level with proven industry experience and competencies. 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 threat 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 (2012/13) was undertaken for the whole tree stock, which include GIS data, inventory and measurement data, condition assessment and threat assessment for the first phase of individual Highway Tree assets. For Highway Woodland Groups and Other Designated Land, separate asset models were created to reflect the unique management requirements of these areas and enable specific management plans to be developed. Once completed the data was 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 on a rolling cyclical programme where valuation and other management data may be gathered in addition to the update of condition and validation of the threat assessment. The order of resurvey for each defined area is 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.

Process: Deliver Service
Title: 5 Year Tree Management Strategy

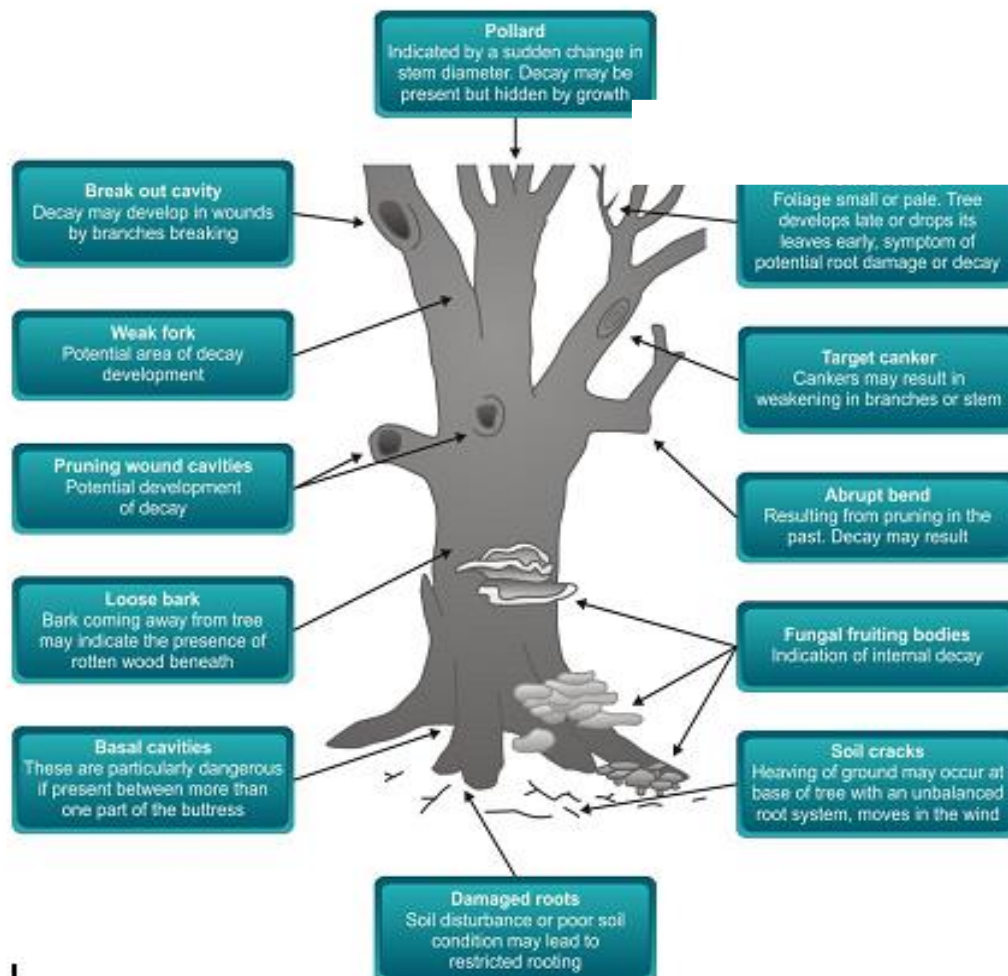
Mandatory	Process
Guidance	
Contract Specific	

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.

The following information was captured in the initial inventory survey:

- Coordinates, Site, Location and Species
- Measurements. DBH, Height, Spread
- Age Class & Condition Rating
- Condition Assessment. 5 point assessment (Root, Stem, Scaffold, Canopy, Pathogen)
- Individual Tree Hazard Assessment. 3 point assessment (Target, Likelihood, Impact)
- Tree work recommendations with priority



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

Mandatory	Process
Guidance	
Contract Specific	

The following additional data will be captured on resurvey:

- Tree Valuation Assessment to BS 5837
- 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 design 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
- Inclusive mobility (Equalities Act) implications

Sheffield City Council have chosen to capture the sentiment of the above survey considerations using more generic terminology, which has been branded as being the “6D” criteria (Dead, Dangerous, Dying, Diseased, Damaging and

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Discriminatory).

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 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

As highlighted in the Forestry Commission publication “Hazards from Trees”, pollards can become excessively crowded and heavy if regular pollarding regimes are not maintained.

Sadly, historical under-investment in Sheffield’s tree stock prior to contract commencement in 2012 has meant that there are a significant number of previously pollarded trees on the highway network which have been neglected from a lack of regular re-cutting of the pollards.

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

Mandatory	Process
Guidance	
Contract Specific	

Failure in pollards often involves snap of top-heavy new branches, rather than splitting at the pollard point.

Crown removal in older trees (sometimes called topping, rather than pollarding) can also cause problems as the new branches are likely to fail either under excessive branch weight, or wind loading upon weakened unions.

Given the risk associated with managing trees with neglected historical pollards, pollarding will only be considered for use in Sheffield 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.

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 Horse chestnut where growth is identified. Trees in grass areas and shrub beds will only be visited on the annual maintenance programmes or as need arises.

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

Mandatory	Process
Guidance	
Contract Specific	

Removals

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. Removals 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.

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. 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

There are often instances where trees cannot be replanted in the same location as the original tree once stood, for example when the presence of statutory undertakers' equipment (gas and water pipes, electricity or fibre optic cables) at a shallow depth within the footway prevent a new tree pit from being formed.

In these situations, trees will typically be relocated within the same road section length in order to ensure no reduction in highway tree numbers along a particular street.

Where this is not practicable, priority will firstly be given to planting within the same neighbourhood, and then failing this, deferring to additional planting requests made by customers within the same area of the city, as this provides the best possible chance that the new tree will be nurtured and protected by proactive and community minded residents.

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

Mandatory	Process
Guidance	
Contract Specific	

This may include creation of new avenues or sections of tree planting where site conditions are favourable.

Where significant new avenues or planting schemes are to be established in locations where there have not previously been trees, to avoid conflict with members of the public, localised discussions will be considered with affected residents will be considered in order to reduce the likelihood of deliberate vandalism or malicious removal of newly planted trees.

Other designated land

Amey will identify areas of other designated land (ODL) as per the confirm layers and then carry out a walk through survey of these areas collecting the following information to ensure that these trees do not cause damage or detriment and the land is managed to correct Arboricultural or forestry practices:

- Main tree species
- Measure of significant trees
- Condition of significant tree
- Works required

Woodland plots

Amey will identify areas of woodland on the network and inspect these woodland plots and record the findings on the confirm system and then recommend woodland management to be carried out to ensure these areas are managed in line with good silvicultural practices.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

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. 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. The approved list of species is provided below:

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	

Process: Deliver Service

Mandatory

Process

Title: 5 Year Tree Management Strategy

Guidance

Contract Specific

Crataegus monogyna	
Betula pendula	
Acer campestre	
Arboretum/Specimen Species . As native species but in prominent position	
Quercus cerris	
Liriodendron tulipifera	
Cedrus atlantica 'Glauca'	
Catalpa bignonioides	
Sequoiadendron giganteum	
Ulmus 'New Horizon'	
Parrotia persica	
Gymnocladus dioica	
Pterocarya fraxinifolia	

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 suitable 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 1.) 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

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

specifications used are consistent with current best practice and latest research.

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

Mandatory	Process
Guidance	
Contract Specific	

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.

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.

Process: Deliver Service

Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

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 2 weeks before works to inform the wider community of the proposals.

Consultation

Where a significant impact on the landscape is likely through the replacement programme, 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

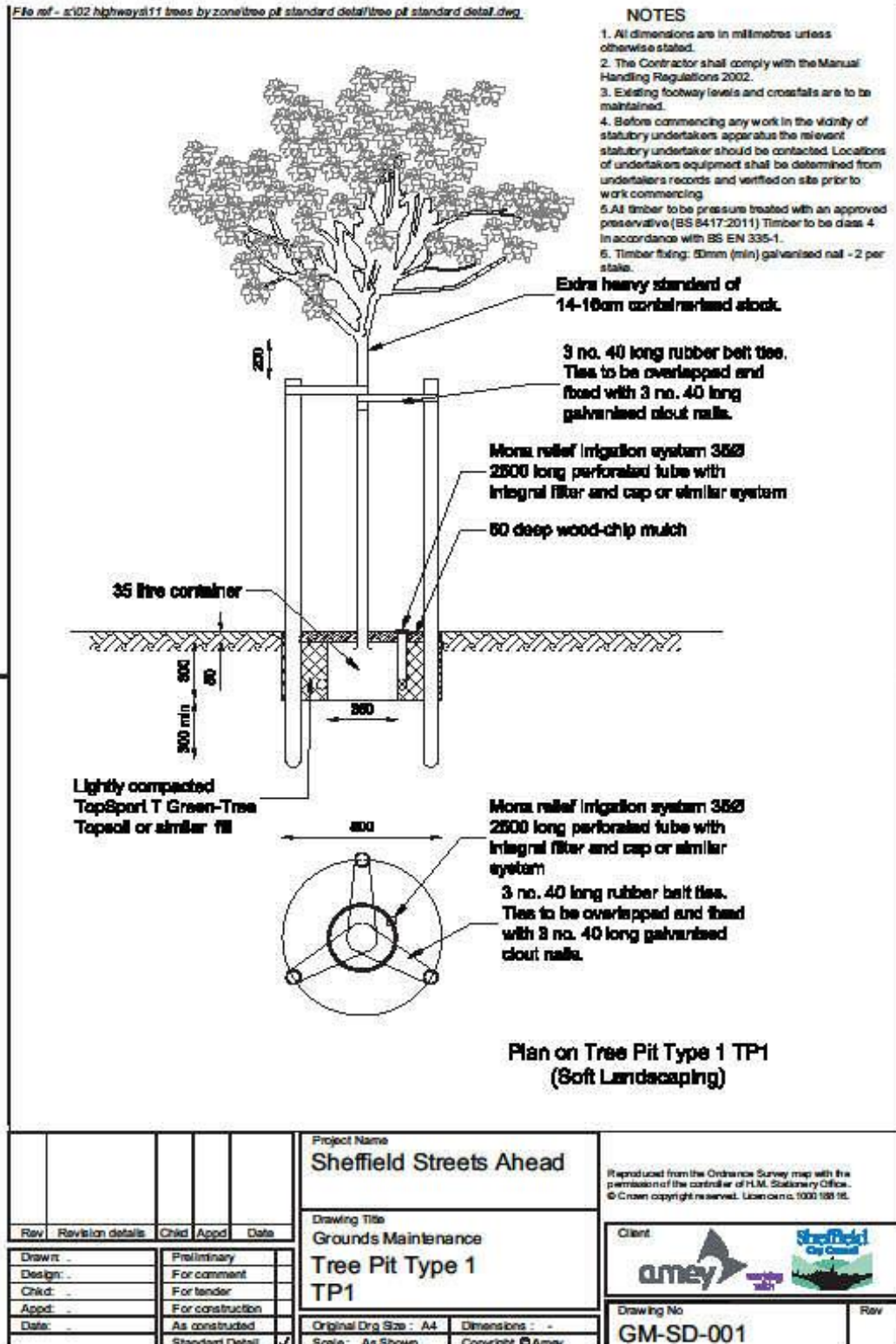
Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

Process: Deliver Service
 Title: 5 Year Tree Management Strategy

Mandatory	Process
Guidance	
Contract Specific	

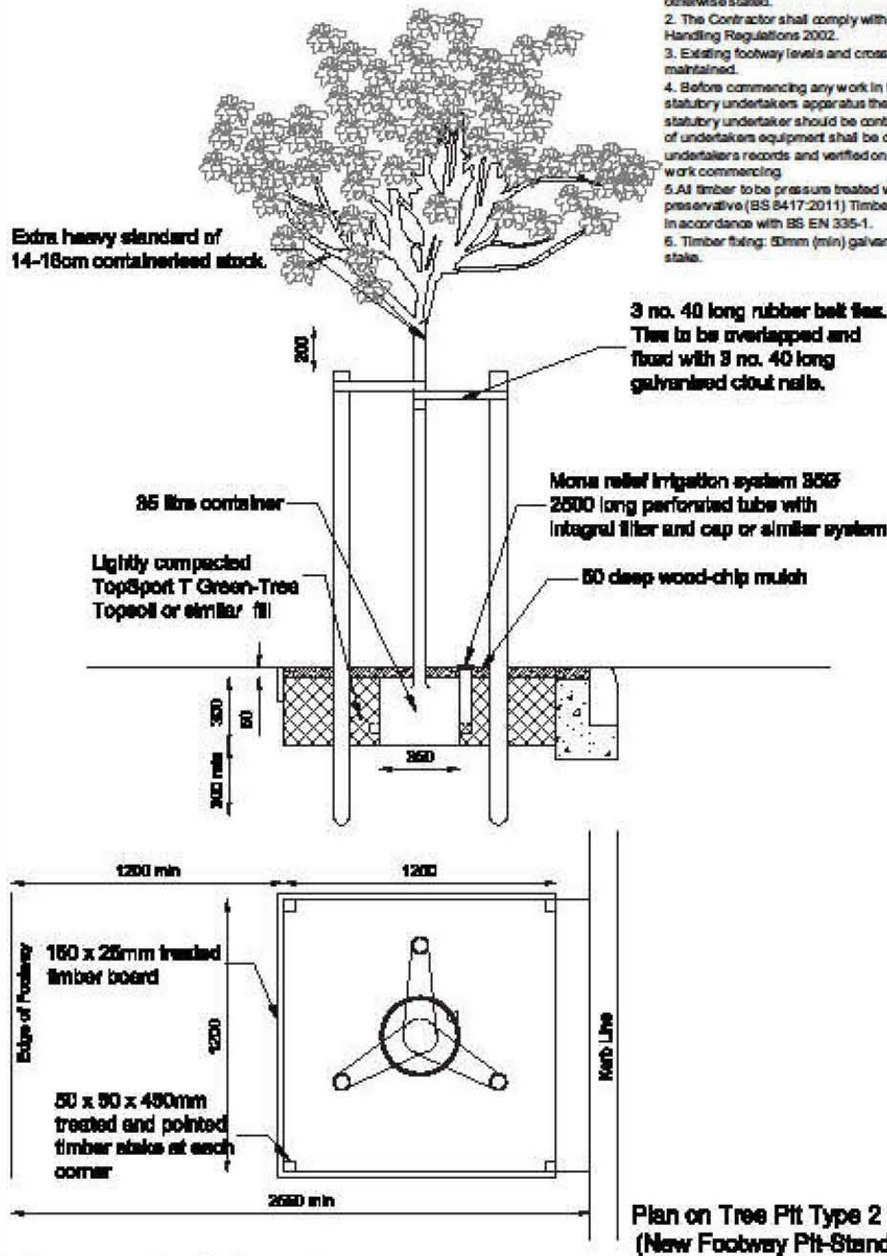
Appendix 1.



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



Mandatory	Process
Guidance	
Contract Specific	

File ref - x102 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.

				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 18.	
Rev	Revision details	Chkd	Appd	Date	Drawing Title Grounds Maintenance Tree Pit Type 2 TP2		Client  
Drawn	-	Preliminary	-	-	Original Dwg Size : A4 Dimensions : -		Drawing No GM-SD-002
Design	-	For comment	-	-	Scale: As Shown Copyright © Amey		Rev
Chkd	-	For tender	-	-			
Appd	-	For construction	-	-			
Date	-	As constructed	-	-			
				Standard Detail			