

Appendix A

Street-works noticing copy of online forms

Works Durations and Notice Periods

The notice period required for works in the highway is dependent upon these factors;

The duration of the works.

Whether the works form part of a forward programme of other works.

Whether the works subject to a Temporary Traffic Regulatory Order (T.R.O) i.e. a temporary road closure.

Whether the proposed Works are Urgent or Emergency (as prescribed in the New Roads and Street Works Act 1991).

Whether the Works are on a 'Traffic Sensitive' Street.

Notice period requirements are:-

Immediate - Urgent or Immediate - Emergency; 2 hours after actual start

Minor works – 1 to 3 working days duration, 3 working days' notice period is required.

Standard works – 4 to 10 working days duration, 10 working days' notice period is required.

Major works – i.e. works that are 11 working days or greater, are on a 'Traffic Sensitive' street, require a T.R.O.

or is part of a forward programme of works, then 3 months minimum notice period is required.

All works noticing must follow the sequence set out below for each category of notice; these are:-

Immediate - Emergency, Immediate - Urgent; In progress, works stop and reinstatement registration.

Minor works; 3 day proposed, In progress, works stop and reinstatement registration.

Standard works; 10 day proposed, In progress, works stop and reinstatement registration.

Major works; 3 month proposed (PAA), 10 day proposed, In progress, works stop and reinstatement registration.

Template notices are attached in 'tabs' at the bottom of this page.

The notice periods are the minimum required.

The works start notice must be submitted within 24 hours of commencing work on site.

The works end notice must be submitted within 24 hours of completing work on site.

The reinstatement registration must be submitted within 10 working days of works completion - please note NYC are not required to register their own works.

This noticing requirement is legislated under The New Roads and Street Works Act 1991.

Failure to comply may result in the issue of a Fixed Penalty Notice (£120), or the issue of court proceedings which, upon conviction, may be subject to a fine of up to £2500.

Please note that when a notice is submitted, the NYC Area Office need to know the exact location of the works as this is required to be plotted on the electronic Street Works Register map.

Providing only the name of the road you are working on is not enough information to satisfy the noticing requirements of NRSWA;

house names / numbers, grid references and approximate length of works are essential to meet the legal noticing requirements.

Please ensure that you complete all sections of the notice in full, including details of any traffic management, contractor contact details etc.

**NYC - Street Works Notice Form
Three Months - Proposed**

From:	Company Name:							
	Address:							
					Postcode	:		
	Telephone Number:					Mobile:		
Works Ref.	JB500 - 123456654321				Licence Number / NYC Reference:			
Location of Works	Doncaster Road, Selby, North Yorkshire							
Specific Location (e.g. adjacent to)	Near to Stainton Turn B6270							
NSG Ref.	319/03009							
Easting/Northing co-ordinates	Start Point:	123456	by	123456	End Point:	123456	by	123456
Description of Works	Replace gully currently topped with stone - tarmac from road to new gully approx. 1m x 1m							
Date for works	Start Date:				End Date:			
Position on Highway	Carriageway / Footway / Verge / Cycleway (delete as appropriate)							
Works Type	Major							
Traffic Management	No c/w Incursion / Some c/w Incursion / Stop & Go / Give & Take / Priority / Two-way Lights / Multi-way Lights / Lane Closure / Road Closure (delete as appropriate)							
Excavation Type	Excavation works - other / No Excavation works - other / Open cut - Machine cut / Pole Testing / Replacement of Manhole - Chamber cover / Replacing Pole - Column (same location) / Road Breaker / Slab Working / Thrust Boring - Minimum Dig / Tunnel - Culvert - Ditch work (No Excavation) (delete as appropriate)							
Works carried out by?	Company Name:							
	Address:							
					Postcode	:		

	Telephone Number:		Mobile:	
Works carried out on behalf of?	Name:			
	Address:			
			Postcode:	
	Telephone Number:		Mobile:	

If you have any queries regarding completing these forms please contact the Area Office by calling 0300 131 2 131 or email to the relevant area office.

Key: 'greyed out' is an example of information required.

Easting and Northings: We need co-ordinates for the start and for the end of the trench.

PLEASE ENSURE THAT A MAP IS PROVIDED TO SHOW THE LOCATION OF THE WORKS

Appendix B

Product Certification Schemes

MARKED SCHEMES

KITEMARK

Certification body BSI Quality Assurance
 PO Box 375
 Milton Keynes
 MK14 6LL

Section Title	Reference	Material	Usage checked
01	Preliminaries		
02	Site Clearance		
05	Drainage and Service Ducts		
	BS EN 295-1:2013 BS EN 295-2:2013	Vitrified Clay	Surface Water Drainage
	BS EN 295-1:2013 BS EN 295-2:2013	Vitrified Clay	Filter Drains
	BS 5911-1:2021 BS EN 1916:2002	Concrete	Surface Water
	BS EN 13598-1:2020 BS EN 1401-1:2019	PVC-U	Surface Water
	BS EN 13598-1:2020 BS EN 1401-1:2019	PVC-U	Filter Drains
	BS EN 1852-1:2018+A1:2022 HAPAS approved or BBA	Plastic	Surface Water
	BS EN 1852-1:2018+A1:2022 HAPAS approved or BBA	Plastic	Filter Drains
	BS 4962:1989	Plastic	Field Drains
	BS EN 13242:2002 +A1:2007 Clause 5.2 table 9	Natural or recycled Coarse Aggregate	Pipe Bedding
	BS EN 1916:2002	Concrete	Pipe Beds and Surrounds
	SHW Series 500		Backfill Material
	BS EN 13285:2018		
	BS EN 5911-3:2022	Concrete	Manholes and Chambers
	BS EN 124(1-6):2015		Gully Frames
	BS 5911-6:2021		Road Gullies and Gully Cover Slabs
	BS EN 10255:2004 BS EN 10025:2004 BS EN ISO 1461:2022 BS 4211:2005 +A1:2008		Hand Rails and Ladders
	BS EN 771-1:2011+A1:2015	Masonry	Brick Manholes
06	Earthworks		

07	Road Pavements		
	SHW Series 600		Capping Layer
	SHW Series 700		
	BS 812	Material Testing	Capping Layer
	BS EN 1097-5:2008	Material Testing	Water Content
	BS EN 13285:2018	Material Testing	Unbound Granular Material
	SHW Series 800		
	BS 1377-2:2022	Material Testing	Sieve Tests
	BS EN 1097-2:2020	Material Testing	Los Angeles Coefficient
	BS EN 1367-2:2009	Material Testing	Magnesium Sulphate
	BS EN 1744-1:2009 +A1:2012		
	BS 812-124:2009	Material Testing	Heave Value
	DMRB CD 226	Pavement Design	
	DMRB CD 236	Material Testing	Skid Resistance
	DMRB CS 228	Material Testing	Skid Resistance
	BS EN 13108-4:2016	Material	Hot Rolled Asphalt Surface Coat
	SHW Series 900		
	BS 594987:2015+A1:2017	Delivery, laying and Compaction	
	BS EN 12591:2009	Material	Binder
	BS EN 13924-1:2015		
	BS EN 13108-4:2016	Material	Binder coat to Chippings
	BS EN 13108-1:2016	Material	Asphalt Concrete Dense Base and Binder Course
	BS EN 13108-21:2016	Production Control	All Bituminous Materials
	BS EN 13808:2013	Material	Hot Applied Bond Coat
	BS EN 15322:2013		
	BS EN 14023:2010		
	BS EN 12272-1:2002	Application	Spread Rates
	BS 594987:2015+A1:2017	Application	Recommendations for laying
	BS 434-1:2011+A1:2016	Application	Bitumen Road Emulsions
	BS EN 13036-1	Material Testing	Texture depths
	BS EN 1338:2003	Material	Concrete Block Paving
	BS 7533-3:2005+A1:2009		
	BS EN 16236:2018	Material	Kiln Dried Sand
	BS EN 933-1:2012		
11	Kerbs Footways and Paved Areas		
	BS EN 1340:2003	Material	Pre Cast Concrete Kerbs, Channels & Paving
	BS EN 1341:2012	Material	Natural Stone Kerbs
	BS EN 771-1:2011 +A1:2015	Material	Blue Brick Channels
	BS EN 1433:2002	Material	Combined Kerb and Drainage Systems

	BS 1881-108	Testing	Compressive Strength
	BS EN 13108	Material	Foot/Cycle way Surfacing
	BS 594987:2015+A1:2017	Application	Compaction Flexible Surfacing
	BS EN 16236:2018	Material	Kiln Dried Sand
	BS EN 933-1:2012		
12	Road Markings and Traffic Signs		
	BS EN 12899-1:2007	Material	Sign Plates
	BS EN 12899-3:2007	Material	Sign Plate Reflectorisation
	BS EN ISO 1461:2022	Material	Posts Hot Dip Galvanised
	BS EN 12767:2019	Material	Posts Passively Safe
	BS EN 12899-1:2007	Design / Material	Post Foundations
	BS EN 1463-1:2021	Material	Road Markings Thermoplastic
	BS 3262-3:1989	Application	Road Marking Laying
	BS 1436 : 2018 BS 4800:2011	Material Colour	Yellow Lines Lemon - general Primrose – Conservation Areas
	BS EN 1463-1:2021	Material	Thermoplastic Tape
	BS EN 1436:2018	Material	Reflective Road Studs Crossing Studs
	BS 8442:2022	Material	Bitumen Grout
13	Road Lighting		
17	Concrete and Mortar		
	BRE Special Digest 363 (2005)	Material	Concrete Grades
	BS 8500:2015+A2:2019	Material	Concrete
	BS EN 206:2013+A2:2022	Material	Aggregate
	BS EN 12390-1:2021 BS EN 12390-2:2019	Testing	Concrete
	BS EN 206:2013+A2:2021	Material	Air Entrained Concrete
	BS 4449:2005+A3:2016	Material	Reinforcement round bar
	BS 4483:2005	Material	Mesh Reinforcement
	BS 1881-131:1998	Testing	Compressive Strength of Standard or Prescribed mixes.
	BS EN197-1:2011	Material	Portland Cement
	BS EN 998-2:2016	Material	Mortar
22	Bridges		
26	Miscellaneous Items		
30	Landscape		
	BS 3882:2015	Material	Topsoil
	BS 3969:1998+A1:2013	Material	Turf

APPENDIX C

BRITISH BOARD OF Agrément ROADS AND BRIDGES CERTIFICATES

British Board of Agrément
Bucknalls Lane,
Watford,
Herts WD25 9BA

British Board of Agrément
1 Mann Island,
3rd floor,
Liverpool, L3 1BP 9BA

Types of work, goods or materials for which proprietary product are required to have a British Board of Agrément Roads and Bridges Certificate are as follows.

Description	Specification Clause
Pipes for drainage and or service ducts other than listed in section 2.01	2
Permanent shuttering for road gullies	2
Fin drains and constituent materials for edge of pavement drainage	2

Details of products conforming to the above requirements are listed in the index of current BBA Publications which may be obtained from their web site.

APPENDIX D

Road Lighting Equipment

Contact the Road Lighting Department on Tel: 01609 780780 or email RoadLighting@northyorks.gov.uk for the latest information regarding the Specification for Street Lighting equipment.

APPENDIX E

APPROVED PLANTING

SCHEDULE OF SHRUBS FOR GROUND COVER PLANTING IN VERGES

BOTANICAL NAME	COMMON NAME	HEIGHT (m)
<i>Berberis candidula</i>	Barberry Family	0.5
<i>Berberis thundergii</i> (atropurpurea Nana)		0.5
<i>Calluna</i> (in variety)	Ling	0.5
<i>Ceanothus prostratus</i>		0.5
<i>Cornus canadensis</i>	Creeping Dogwood	0.3
<i>Cotoneaster dammeri</i>	Cotoneaster family	0.5
<i>Cotoneaster horizontalis</i>		0.5
<i>Cotoneaster microphyllus</i>		0.5
<i>Cotoneaster salicifolius</i> (Repens)		0.5
<i>Cotoneaster</i> (Skogholm)		0.5
<i>Cytisus x beanii</i>	Broom Family	0.3
<i>Cytisus x kewensis</i>		0.5
<i>Erica</i> (in variety)	Heather	0.5
<i>Euonymus fortunei</i> (Radicans in variety)		0.5
<i>Gaultheria procumbens</i>	Checkerberry	0.3
<i>Genista sylvatica</i>		0.5
<i>Genista hispanica</i>	Spanish Gorse	0.5
<i>Hebe albicans</i>	Shrubby Veronica Family	0.5
<i>Hebe armstrongii</i>		0.5
<i>Hebe</i> (Carl Teschner)		0.5
<i>Hebe pinguifolia</i> (Pagei)		0.3
<i>Hedera canariensis</i> (in variety)	Canary Island Ivy	0.3
<i>Hypericum calycinum</i>	Rose of Sharon	0.5
<i>Juniperus communis</i> (Honbrookii)	Juniper Family	0.5
<i>Juniperus horizontalis</i>		0.5
<i>Lavandula spica</i> (Hidcote)	Lavender	0.5
<i>Pachysandra terminalis</i>		0.5
<i>Roas</i> (Max Graf)		0.5
<i>Vinca major</i> (in variety)	Greater Periwinkle	0.3
<i>Vinca minor</i> (in variety)		0.3

FOR TREES SEE NYC Guide

Trees within New Developments in the Highway 2015

APPENDIX F

Trees within New Developments in the Highway

Guidance for developers wishing to plant trees in the highway within North Yorkshire

Document Control	Date	Version	Comment
Final Document	Jan 2015	1.0	Approved

Title	Trees within New Development in the Highway
Document Type	Protocol
Author	Neil Leighton
Approved By (including date)	D Bowe & BES Exec Members (30/1/15)
Approval Date	30 January 2015
Issue Date	1 February 2015
Review Date	February 2018
Reviewing Officer	Network Strategy Manager
Links to other NYC documents	Management of Existing Trees in the Highway

Introduction

Trees within the highway setting will cause various specific maintenance issues throughout the life of the tree. This guidance therefore is intended to help ensure that only suitable species of trees are planted, appropriate consideration is given towards their protection within the highway setting when highway works are programmed, and that trees are located within appropriate locations. In addition guidance is included for the management of existing trees located within new development sites.

Scope

This guidance is designed for use by anyone who wishes to plant trees within the highway (and prospectively maintainable highway) as part of new developments. For clarity this document uses the term 'developer' to include designer, agent, developer, contractor or sub-contractor etc. The Council has a separate related document for the '*Management of existing Trees in the highway*'. In addition, it will be used by those officers who examine applications which include trees in the highway (and prospectively maintainable highway). Not applicable for Principal Roads where Design Manual for Roads and Bridges will apply.

Legislation and Standards

No specific legislation exists regarding the planting of trees within the highway other than the general powers to plant, covered by the Highways Act 1980 sections 64, 96, 141 & 142. A list of related standards is provided within this document at section 21 '*References*'.

Policy Statement

This document has been developed with the primary aim of providing guidance to those developers who design prospectively maintainable highways, in order to ensure a consistent councilwide approach to tree selection and planting, ground work considerations within close proximity to trees, and tree aftercare procedures.

Equality Impact Assessment

Equality Impact Assessment not required. This decision will be re-visited at document review.

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Appendix a: Example Commuted Sum calculation for 100 highway trees

1. General

- 1.1 If the Council is to adopt areas of soft landscaping, it is essential that developers follow industry recognised standards of practice so that soft landscape schemes become well established. The design of any soft landscape area should ensure that long-term maintenance requirements are appropriate and practical as well as being a sensible investment. Developers can achieve this by providing sufficient space for new planting to enable the plants develop to full maturity without the need for too much intervention. Providing adequate space between the planting area and adjoining buildings (both existing and proposed) is also important to ensure that both can exist together.
- 1.2 It is essential that developers engage the services of a chartered landscape architect for professional advice on all landscape design (both hard and soft area) matters relating to new developments.
- 1.3 All planting needs to be carefully selected taking into consideration the size it will grow to. This applies particularly to trees and includes both the canopy spread of the tree and the root system. As well as providing adequate space for trees to grow, developers need to consider the effect trees will have on the existing surroundings such as nearby buildings or walls. A tree's demand for water can have a direct impact on the existing soil conditions dependent upon soil profile, water demand categorisation of the tree itself, and a trees access to soil moisture in other areas. Developers should not underestimate the effects of soil heave and shrinkage - there are guidelines on tree planting and recommended appropriate foundation depths within NHBC Standards Chapter 4.2 *Building near trees*.
- 1.4 If shallow rooting trees are the preferred species choice, then consideration should be given to the inclusion of root deflectors within the tree pit design and construction. Without the inclusion of appropriate consideration of root impacts at the design stage then it is likely that future issues with roots disturbing tarmac and other hard surfaces may arise. In most cases trees must not be planted within 1.5m of any footway and 2.5m of any road which is intended to become highway maintainable at public expense.
- 1.5 With careful planning and the inclusion of appropriate engineering solutions at the design stage, developers should be able to include well-designed and effective soft landscape areas in the layout of a new development without significantly affecting the space available and the potential for developing the site. Areas of open space, grass verges and public gardens are all potential sites for a wide range of planting. However, in the design and construction of soft landscape areas the following points should be taken into consideration. These landscape areas may not necessarily preclude tree planting but may require consideration of engineering solutions or appropriate species to suit the site constraints:
- Classification of roads - dual carriageway, main road, estate road, country lane etc.
 - Visibility - on the inside of bends, from junctions, from house driveways, to road signs etc.
 - Existence of service runs - overhead cables, streetlights, underground cables and pipes, drains etc must not be adversely affected by trees, their roots and future growth.
 - Aerial space - how close the trees and shrubs are, above ground, to roads, accesses, neighbouring houses etc.
 - Subterranean space - how much root-sustaining soil is available and how close hostile ground conditions (such as concrete and compacted aggregate) are.
 - How great the risk of damage to footways, boundary walls, kerbs etc.
 - Soil quality - fertility, pH, compaction, plasticity, drainage and possible waterlogging etc.
 - Plant characteristics - tall, bushy, compact, columnar, spreading, prostrate, evergreen or deciduous etc.
 - Tree and shrub habit - mature height and spread, growth characteristics of roots and crown, suckering etc.

Seasonal features - seed production, shade density, leaf fall, flowering etc.

Aesthetic qualities - leaf colour, flowering, bark, shape etc.

Light levels - daylight, aspect, obstruction of street lights etc.

- 1.6 The type of planting that can be used in landscape schemes will depend on the available space. Open spaces at the centre of a development may be considered for tree planting where trees may become a focal point (for example, village greens or public squares).
- 1.7 Large open spaces are ideal for planting larger groups of trees (the design and species mix can be provided by the consultant landscape architect), whereas wide verges on either side of a road provide an opportunity for planting avenue trees. Shrub planting can provide low-level screening, particularly where there is a need to restrict visibility (for example, for traffic calming). With the planting of trees and shrubs in a new development, the design should include features which will allow for their successful establishment and potential growth characteristics such as the typical form and habit of the plant species.
- 1.8 Informal areas of open space such as screen bunds provide an opportunity to establish areas of structure planting which can provide effective screening and, eventually, mature shrub and woodland areas. In more restricted spaces, there is an opportunity to consider planting small to medium sized trees or shrubs. The design of this type of planting can utilise native species and this can ensure that long-term maintenance requirements are kept to a minimum. The use of shrub beds with ornamental species is not permitted due to the future maintenance costs usually being high and this type of planting often acts as a litter trap.
- 1.9 The Council will normally adopt well-designed and planted soft landscape on verges and other highway-related land providing that developers pay a commuted sum derived using the North Yorkshire Council Highways Commuted Sums procedure to cover long-term maintenance. (A sample Commuted Sum for 100 trees is included as appendix).
- 1.10 The Council will not adopt new planting within a development if plants are either dead, dying, stressed or failing to establish due to poor design and planting establishment methods.
- 1.11 The Council will not permit the planting of any tree species which has the potential to grow to a girth of 250mm (measured 0.3m above ground level) within 4.5m of any road which may be categorised as an A or B road. Reference must be made to the Council's Passive Safety Protocol (available on the Council website at www.northyorks.gov.uk).

2. Trees and Street Lighting

- 2.1 Developers should be aware that the presence of trees can affect the performance of any Street Lighting installation in the highway. The root system of trees can also potentially have a damaging effect on underground cabling networks. Therefore, great care should be taken when siting trees in lit Highways.
- 2.2 In general terms, the developer will need to address the number of trees relative to the lighting units and the potential adverse effects on the performance of the lighting system. For example, large trees can reduce the effectiveness of a lighting system. Where lighting units are located, trees should be planted as far away as possible from street lighting locations and in all cases no closer than 10 metres from any lighting unit. It is important to ensure the lighting system is designed alongside selecting the location for any trees (including trees outside the highway where canopy or roots may also affect the street lighting) to ensure no conflicts arise.
- 2.3 The planting of trees can cast areas of shading across the highway and as a consequence may result in the increase in the number of lighting units to mitigate against these areas of shadow. Developers should note that a commuted sum will be payable for any extra over lighting units required as a consequence of trees, this will also apply for trees which may be planted outside the highway but where the canopy affects the lighting design.

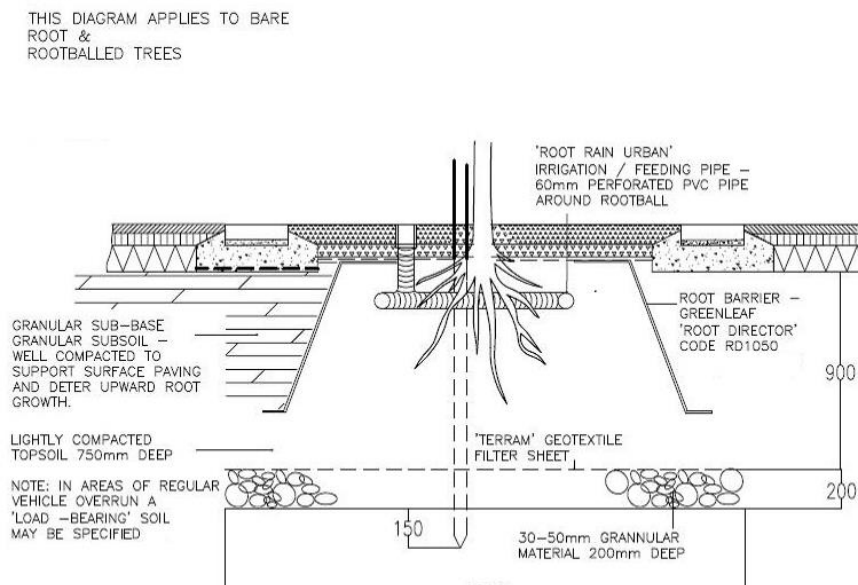
3. Trees and Drainage Systems

- 3.1 Developers must be aware that the presence of trees may affect the performance of any Sustainable Drainage System (SuDS). The root system of trees tends to grow along the path of least resistance and will tend to grow more vigorously in disturbed soil. Tree root systems have the potential to enter a SuDS project and extend their roots throughout the system
- 3.2 Tree root infestation into SuDS can be prevented to a large degree by the use of root barrier membranes which should be provided when the tree pits are constructed prior to the new trees being planted.
- 3.1 Existing trees cannot usually cope with the retro-fitting of a root barrier membrane. The root spread of existing trees (usually accepted as a circle of radius at least equivalent to the height of the full grown tree) must be kept outside the permeable area around any SuDS features (about five metres) eg any SuDS should be placed outside the Root Protection Area (RPA) of any existing trees. This is likely to be up to 25metres for trees which when fully grown could reach a height of 20 metres.

4. Site preparation

- 4.1 As well as considering the amount of space available for new planting above the ground, it is equally important to assess the condition and extent of the soil or other planting medium. During the construction period, existing top soils and sub soil can become damaged by compaction and contamination. It is essential that the handling of soils should comply with the *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* published by DEFRA. Compacted soil can become starved of oxygen (anaerobic), which is essential to the survival of plant roots. Oxygen if removed from the soil cannot be reversed and the soil structure becomes permanently damaged. The quality of the soil should be investigated in accordance with the DEFRA guidance and BS4428: 1989 and where it is contaminated, it should be removed from the site. Where the topsoil falls below the quality criteria it should be ameliorated in accordance with the standard. The use of imported top soil should be avoided since this is costly and not sustainable. The application of organic surface mulch such as pulverised bark to a planting area is always required as this will help retain soil moisture, suppress weed growth and encourage the colonisation of soil organisms (mycorrhizae) which are beneficial to plant roots.
- 4.2 A soil analysis in accordance with BS4428 will be required before planning or designing any new soft landscape areas and amelioration to remedy inadequate soil content and structure is essential. The planting of trees and shrubs into poor quality sub soil and top soil- will result in lack of plant establishment
- 4.3 Developers should ensure that any hard surfaces in close proximity to the planting areas are designed and constructed to provide a robust edge with appropriate foundations design with bedding and haunch details. The sub-base construction should be constructed to suit the potential load bearing capacity of the paved area (i.e. vehicle or pedestrian). The use of root deflectors can minimise the risk of root migration and potential damage to adjoining paved areas as a precautionary measure, but the design and construction of the paved area should meet the loading bearing capacity and have a suitably designed edge restraint to British and European Standards BS EN 1338 to 1344 and the Building Regulations. Root barriers consist of an artificial barrier placed round the tree, which then deflects root development downwards and away from vulnerable surfaces. Hard surfaces should be permeable to allow drainage and oxygen penetration to the soil below. Alternatively, the use of enclosed cellular root containing systems can be incorporated into schemes to ensure roots are contained without interference with utility apparatus etc.

Figure 3 Planting in hard-surfaced areas



Selecting species to plant

- 4.4 This is a complicated process with many aspects to consider. To ensure that new planting survives and forms a beneficial co-existence within the new development, it is essential that the correct species are selected for the site. This will normally require the submission of a landscape scheme and/or input from a chartered Landscape Architect and Arboriculturist. It is important that the developer takes into account the potential mature size of the selected plant species to ensure there is sufficient space and the planting is not likely to unnecessarily encroach into other areas of the development (for example, roads, accesses, houses etc.)
- 4.5 With tree planting, in particular, the potential size, shape, growth habit and leaf and flower qualities of the tree species must be appropriate for the site and soil conditions. A qualified Landscape Architect must provide the Landscaping scheme details.
- 4.6 In rural areas, developers should use native plant species to integrate the development into the surrounding countryside and reflect the landscape character of the area. The landscape character of the area is set out in three tiers of landscape character assessment, which exists at National level, council level and district level.
- 4.7 The list of tree and shrub species in Table 1 is a guide and suggests a range of appropriate uses. Table 2 provides a list of tree species that must be avoided.
- 4.8 Developers should seek professional advice from a chartered landscape architect when selecting species. This will ensure that new planting is suitable for the site and soil conditions and is appropriate to the particular location.

Figure 1 Poor tree selection. Tree already interfering with highway space and property eaves.



5 Planting

- 5.1 To ensure plants can become properly established, the planting area should be suitable and well prepared, and the plants should be carefully handled so they arrive at the site in the best condition. The *Code of Practice for Plant Handling* published by the Joint Council for Landscape Industries (JCLI) should be used. It is also important that plants are well planted in accordance with BS 4428: *Code of practice for general landscape operations*. As a general guidance trees should be planted in a prepared pit, which is 50% larger than root-ball of the tree. The sides of the planting pit should be forked over to help alleviate compaction and allow for the tree roots to become established. Trees should be planted with the root collar at the same level as the surrounding soil levels, with the tree pit backfilled with approved topsoil clean of building contaminants. Trees should be staked, tied and mulched at the time of planting. Trees should be anchored with a single stake angled at 45 degrees and attached the trunk of the tree with a tie at circa 1 metre above ground level. The stake shall be driven into the ground clear of the root-ball. The stake and tie should be removed no sooner than following a minimum of 2 growing seasons. In all cases tree procurement and planting should be in line with the recommendations of BS 8545 *Trees: from nursery to independence in the landscape; Recommendations*.
- 5.2 Any trees to be planted within the highway will be not of less than 'heavy standard' specification (120-140mm girth at 1m above ground level). Tree planting pits must be a minimum of 1m³ in size, with topsoil retained for backfilling around the roots incorporating 50:50 tree planting medium. A proprietary root barrier (or containment) system must be incorporated within the planting pit to remove the risk of future root disruption to surrounding surfaces and structures. The use of a tree guard to protect the tree from accidental damage and vandalism is advised in urban areas. Trees must be mulched at the base to a depth of 75mm and topped up each year during the establishment period to suppress weed growth and retain moisture.
- 5.3 Any trees which fail to establish during the first three years shall be replaced by the developer by a species of equivalent specification at the time of planting and replacement shall take place during the next available planting season (November to March) during suitable weather conditions.
- 5.4 Tree species selection should take into account aesthetic interest, biodiversity opportunities and the need to reduce the potential impact of bacterial and fungal infections.
- 5.5 In avenue planting, trees must not be planted in opposite locations across the highway and must be planted alternately to allow for sufficient establishment space. This will also enhance sunlight penetration and provide dappled light rather than full shade.

6 Maintenance and Aftercare

- 6.1 Soft landscape works must be successfully established before they are adopted by the local authority and schemes must be designed to ensure that long-term maintenance is kept to a minimum. Developers will be required to pay a commuted sum as a contribution towards the future maintenance costs.
- 6.2 After planting, developers should ensure a full maintenance specification to include the removal of weeds, adjustment of tree ties and guards, pruning and when necessary, watering of plants to ensure satisfactory establishment. This should be a minimum of three years. The development should include a full landscape specification that includes a maintenance programme covering the three year period to ensure that new landscaping reaches its potential and fully complements the new development. This programme should include any making good trees associated with any vandalism, theft or other damage which may be evident.
- 6.3 Maintenance works must meet the relevant British Standards and should always relate to a specific scheme. For example, establishing an avenue of heavy standard trees planted in a grass verge is very different to establishing a forestry plantation.

7 Nursery stock – Standards and quality

7.1 All nursery stock used in the landscape scheme should be sourced from appropriate suppliers and should meet the requirements of the National Plant Specification and the following British Standard (BS) specifications.

BS 3936: Part 1 *Nursery stock (Specification for trees and shrubs)*

BS 3936: Part 4 *Nursery stock (Specification for forest trees, poplars and willows)*

BS 3936: Part 9 *Nursery stock (Specification for bulbs, corms and tubers)*

BS 3936: Part 100 *Nursery stock (Specification for ground cover plants)*

BS 8545: *Trees: from nursery through to independence in the landscape - Recommendations*

7.2 All plant stock should be suitably protected when being handled at the supplying nursery, during transport and while being stored on the site. As well as protecting the stock against any physical damage while being handled, it is essential that the roots of all bare-rooted stock are covered, kept moist and not allowed to dry out. If roots dry out the fine root hairs, which absorb moisture from the soil, are destroyed and this can quickly lead to the decline and death of the plant.

8 Materials for landscaping

8.1 All materials used in the landscape scheme and all associated construction practices and workmanship should comply with the appropriate British Standard specification or Code of Practice issued by the British Standards Institution or European Code of Practice.

8.2 Other British Standards relevant to landscaping works include:

BS 3882: *Specification for topsoil and requirements for use.*

BS 4428: *Code of practice for general landscape operations (excluding hard surfaces)*

BS 7370: part1: *Grounds maintenance part 1. Recommendations for establishing and managing grounds maintenance organisations and design considerations*

BS 7370: part2: *Grounds maintenance part 2. Recommendations for the maintenance of hard areas (excluding sports surfaces)*

BS 7370: part3: *Grounds maintenance part 3. Recommendations for maintenance of amenity and functional turf (other than sports turf)*

BS 7370: part4: *Grounds maintenance part 4. Recommendations for maintenance of soft landscape (other than amenity turf)*

BS 8545: *Trees: from nursery through to independence in the landscape - Recommendations*

9 Suggested Tree Species

Species	Common name	Crown shape	Mature crown spread/m (ie space reqd)	Characteristics and uses
Acer campestre: 'Elsrijk' 'Queen Elizabeth'	Field Maple	Spreading	10	Medium Tree - suitable for open spaces and verges wider than 4 metres - good autumn colour
Acer platanoides Cleveland'	Norway Maple	Spreading	18	Large Tree - suitable for open spaces - prone to shedding branches - good autumn colour
Acer rubrum 'Scanlon'	Red Maple	Fastigiate	6	Medium Tree - erect cultivar suitable for verges wider than 2 metres - excellent autumn colour
Aesculus hippocastanum 'Baumanii'	Horse Chestnut	Spreading	20	Large Tree - suitable for open spaces - 'Baumanii' - does not produce conkers
Alnus cordata	Italian Alder	Conical	14	Medium Tree - suitable for open spaces and verges wider than 3 metres - long period in leaf
Alnus glutinosa 'Imperialis'	Common Alder	Conical	14	Medium Tree - suitable for open spaces and poor soils
Alnus incana 'Aurea'	Grey Alder	Conical	14	Medium Tree - suitable for open spaces and poor soils
Amelanchier laevis	Snowy Mespilus	Spreading	8	Small Tree - suitable for gardens and open spaces. - spring flowering and excellent autumn colour
Betula pendula 'Dalecarlica' 'Tristis'	Swedish Birch	Conical	14	Medium Tree - suitable for gardens, open spaces and verges wider than 3 metres
Betula utilis 'Jjaquemontii'	Himalayan Birch	Conical	14	Medium Tree - suitable for gardens, open spaces and verges wider than 3 metres
Carpinus betulus	Hornbeam	Spreading	16	Large Tree - suitable for open spaces Recommended cultivar Carpinus betulus

				'Fastigiata Frans Fontaine' - suitable for verges wider than 3 metres
Carpinus betulus fastigiata 'Frans Fontaine'	Fastigate Hornbeam	Columnar	12	Tight form suitable for area with limited available space as well as open space sites
Castanea sativa	Sweet Chestnut	Spreading	20	Large Tree - suitable for open spaces
Corylus colurna	Turkish Hazel	Columnar	12	Large Tree - suitable for open spaces and verges wider than 5 metres
Cotoneaster cornubia	Tree Cotoneaster	Spreading	8	Small Tree - semi evergreen - suitable for verges wider than 4 metres
Crataegus crus-galli	Cockspur Thorn	Spreading	8	Small Tree - suitable for gardens, open spaces and verges wider than 4 metres - good autumn colour
Crataegus monogyna	Hawthorn	Spreading	8	Small Tree - suitable for open spaces and verges wider than 4 metres
Crataegus prunifolia	Broad Leafed Cockspur Thorn	Spreading	8	Small Tree - suitable for gardens, open spaces and verges wider than 4 metres - good autumn colour - produces large thorns
Fagus sylvatica	Beech	Spreading	20	Large Tree - suitable for open spaces - casts heavy shade Recommended cultivar - Fagus sylvatica Dawyck' suitable for verges wider than 5 metres
Ginkgo biloba	Maidenhair Tree	Conical	14	Medium tree - suitable for open spaces and verges wider than 3 metres
Juglans regia	Walnut	Spreading	18	Medium to Large Tree - suitable for open spaces
Larix decidua	European Larch	Conical	8	Large Deciduous Conifer - suitable for open spaces
Malus species 'Golden Hornet' 'Floribunda' 'John Downie'	Crab Apple	Spreading	8	Small tree - suitable for open spaces and verges wider than 3 metres -

Malus trilobata	Erect Crab	Columnar	6	Medium Tree - suitable for open spaces, gardens and verges wider than 2 metres
Pinus sylvestris 'Argentea'	Scots Pine	Conical	10	Large Tree - suitable for open spaces
Pinus nigra 'Austriaca'	Austrian Pine	Conical	12	Large Tree - suitable for open spaces
Platanus x hispanica	London Plane	Spreading	20	Large Tree - suitable for open spaces
Prunus x hillieri 'Spire'	Erect Cherry	Columnar	8	Medium Tree - suitable for verges wider than 2 metres - ensure it is produced on a non-suckering rootstock
Prunus padus 'Albertii'	Bird Cherry	Spreading	14	Medium tree - suitable for open spaces and verges wider than 3 metres
Prunus subhirtella 'Autumnalis'	Autumn Cherry	Spreading	8	Small to Medium Tree - suitable for open spaces and large gardens
Prunus sargentii 'Rancho'	Sargents Cherry	Columnar	6	Small to Medium Tree - suitable for verges wider than 2 metres
Prunus 'Snowgoose'	Flowering Cherry	Columnar	8	Medium Tree - suitable for verges wider than 2 metres - ensure it is produced on a non-suckering rootstock
Pyrus calleryana 'Chanticleer'	Callery Pear	Spreading	10	Large Tree - suitable for open spaces and verges wider than 3 metres
Pyrus communis 'Beech Hill'	Erect Common Pear	Columnar	6	Medium Tree - suitable for open spaces and verges wider than 2 metres
Pyrus salicifolia 'Pendula'	Willow Leafed Pear	Weeping	5	Small Tree - suitable for gardens
Quercus robur	English Oak	Spreading	20	Large Tree - suitable for open spaces Recommended cultivar - Quercus robur 'Fastigiata' - suitable for verges wider than 3 metres
Quercus robur 'Koster'	Fastigate oak	Columnar	12	Tight form suitable for area with limited available space as well as open space sites
Quercus rubra	Red Oak	Spreading	18	Large Tree - suitable for open spaces

Sorbus aria 'Lutescens'	Whitebeam	Spreading	10	Medium Tree - suitable for open spaces and large gardens
Sorbus aucuparia 'Sheerwater Seedling' 'Cardinal Royal' 'Asplenifolia'	Rowan	Spreading	8	Small to Medium Tree - suitable for open spaces, gardens and verges wider than 2 metres
Sorbus intermedia	Swedish Whitebeam	Spreading	10	Medium Tree - suitable for open spaces
Sorbus thurungiaca 'Fastigiata'	Rowan/ Whitebeam Hybrid	Broad Columnar	8	Medium Tree - suitable for open spaces and verges wider than 3 metres
Tilia x euchlora	Caucasian Lime	Spreading	18	Large Tree - suitable for open spaces - does not secrete honeydew
Thuja plicata	Western Red Cedar	Columnar	10	Large Evergreen Conifer - suitable for open spaces

Table 1

10 Specifically excluded Tree Species

Common Name	Species	Problems/Characteristics
Silver Maple	<i>Acer saccharinum</i>	Weak branch unions - prone to wind damage
Raywoods Ash	<i>Fraxinus angustifolia</i> Raywood'	Weak branch unions - prone to wind damage
False Acacia	<i>Robinia pseudoacacia</i>	Weak branch unions - tends to sucker
Poplars	All species	Vigorous invasive root growth - brittle wood - tends to sucker
Willow	All species	Vigorous invasive root growth - brittle wood
Laburnum	<i>Laburnum anagyroides</i>	Produces poisonous seeds
Yew	<i>Taxus baccata</i>	Produces poisonous seeds
Sumach	<i>Rhus typhina</i>	Tends to sucker
Common Ash	<i>Fraxinus excelsior</i>	Weak branch unions - prone to wind damage
Manna Ash	<i>Fraxinus ornus</i>	Weak branch unions - prone to wind damage
Sycamore	<i>Acer pseudoplatanus</i>	Not suitable near parking areas.
Wild Cherry	<i>Prunus avium</i>	Not suitable close to gardens and hard surfaces.
Small Leaved Lime	<i>Tilia cordata</i>	Not suitable close to buildings or parking areas.
Broad Leaved Lime	<i>Tilia platyphyllos</i>	Not suitable close to buildings or parking areas.

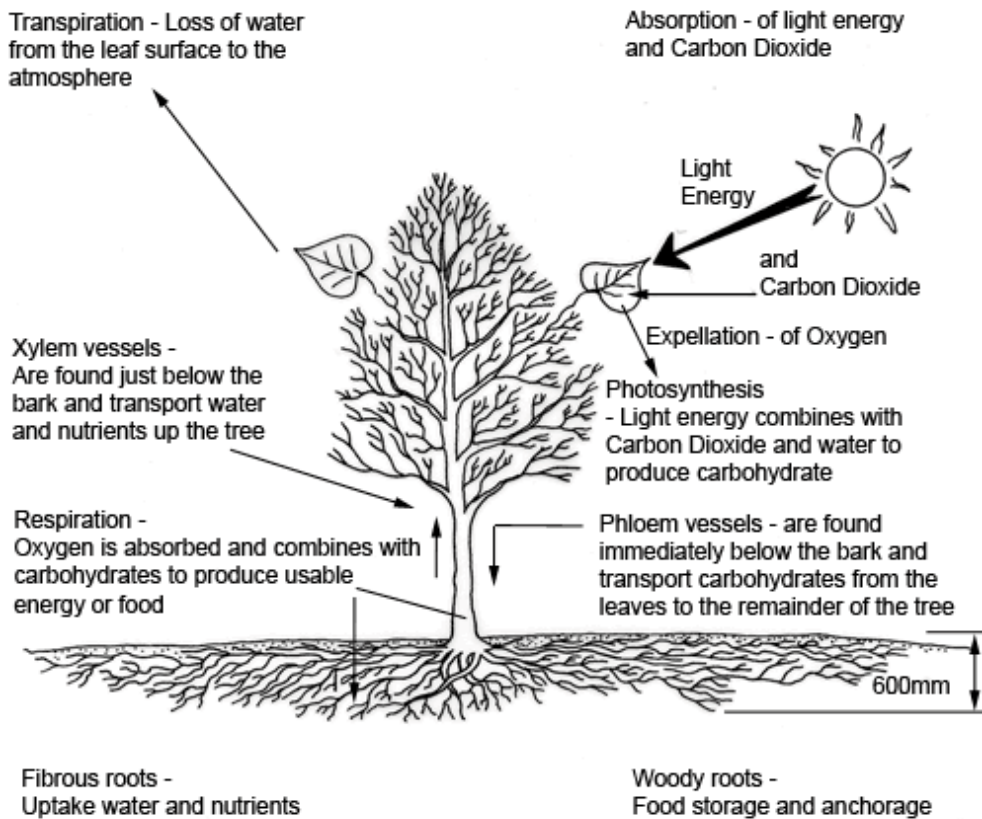
Table 2

- 11 Preservation of existing site trees during development.
- 11.1 Trees are an important feature in our urban and rural landscapes and make a significant contribution to the character and landscape quality of our area. They play an important role in providing screening, filtering traffic noise and absorbing dust and other pollutants. Trees on or next to the highway can be severely damaged by construction and maintenance work to roads and footways. However, damage can be limited, and in many cases prevented, by following the guidelines contained in this document. The guidelines cover design principles and site practices, which, if followed, protect existing trees within new projects.
- 11.2 Wherever possible, our policy is to retain, preserve and protect existing healthy trees when carrying out road construction and maintenance work. A large number of trees are lost each year due to a wide range of development and so it is important that existing trees are retained.
- 11.3 It is good practice to retain healthy, semi-mature and mature specimens with significant life potential rather than struggle to retain over-mature specimens with limited life expectancy (apart from oak, which in a dying state as veteran trees are invaluable). Protection measures must always follow best practice guidance. Developers should ensure that contractors put them in place before the construction work commences and maintain them until the works are complete. Inadequate or half-hearted protection measures are not cost effective and can lead to significant damage to trees, which may only become apparent months or years after the works are complete. A damaged or deteriorating tree can present a significant danger to users of the highway.

12 Tree form and function

- 12.1 Trees are complex living organisms which can be adversely affected by direct or indirect damage caused during construction work. Even minor changes to their living environment can affect growth and establishment. As the tree forms a trunk and crown above the ground it also produces a root system below ground which supports the crown. Tree roots need to absorb oxygen to survive, so most of a tree's root system is found in the aerobic (oxygen-rich) soil within the 600mm immediately below the surface. The tree's roots absorb nutrients and moisture from the soil and can extend well beyond the area taken up by its crown.
- 12.2 Water and nutrients are transported from the roots, up the trunk and into the crown of the tree through tissues called xylem vessels which lie just below the tree's bark. Similarly, carbohydrate produced by the tree's leaves is transported through phloem vessels down the tree to its trunk and roots, where it combines with absorbed oxygen to produce food energy which, in turn, supports future growth. Water lost through the tree's leaves is also replaced by moisture absorbed through its root system and transported through the tree.
- 12.3 Consequently the tree's roots and its trunk and crown above ground are interdependent and even minor damage to one can badly affect the other.

Figure 6: Tree form and function



- 13 Planning and design
- 13.1 Highway construction projects should allow for all healthy existing trees and where appropriate, the planting of new trees. Developers should involve a consultant Arboriculturalist or chartered landscape architect who can advise at the planning, design and construction phases on the protection of the existing trees and the planting of new species. The potential growth of retained trees must be considered, their future compatibility with new and existing highway works and how near new and existing service runs will be placed. An appropriate root protection area (RPA) should be identified around the retained trees, and the scheme should exclude this area from the construction site. British Standard BS 5837 sets out the requirements for tree protection and implications for trees. All necessary tree maintenance work, both before and after construction, should be carried out by trained operatives to British Standards BS 3998.
- 13.2 When planting new trees, developers should consider their future growth and habit and the development should include design features which allow for their growth.
- 13.3 Developers must carry out a survey of the construction site at the planning stage before the design of the development or improvement works have commenced. The survey must include details of both the site levels and individual trees and may require all or some of the following information in line with BS 5837:
- British Standard Tree Survey
 - Arboricultural Implication Assessment (AIA)
 - Tree Protection Plan (TPP)
 - Arboricultural Method Statement (AMS)
- Site survey
- A scaled plan showing the location and identification of all trees, shrubs and hedges on site. Any existing Tree Preservation Orders or conservation area status.
- Other relevant site features such as watercourses, street lighting and CCTV poles, adjacent walls and fences, hard surfaces and so on.
- Details of ground levels as a basis for avoiding changes to soil levels around retained trees.
- Locations of trees on adjoining land which might be affected by the works.
- Details of site drainage which may be altered or interrupted by the proposed works and which may, as a result, affect retained trees.
- Site features with a high nature-conservation value.
- Details of other site features such as service runs (for ducts, utility apparatus and drainage) and how close they are to the trees.
- 13.4 Detailed information on the species, health, condition and status of each tree should be collected and assessed by an appropriately qualified and experienced Arboriculturalist.

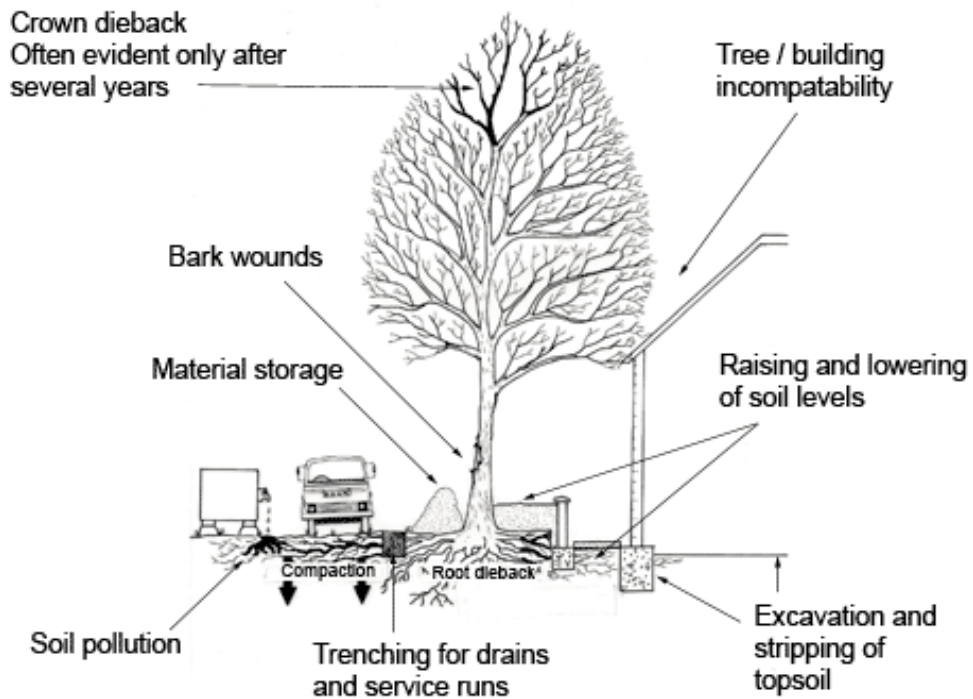
- 14 Retaining existing trees
- 14.1 When designing a new development, wherever it is safe and practical, the design should incorporate existing trees worth retaining into the overall layout to provide a mature and established character. For the most part, important trees within such sites may have already been made the subject of a Tree Preservation Order.
- 14.2 Trees within the development site should be assessed in accordance with the recommendations included in British Standard (BS) 5837: '*Trees in relation to design, demolition and construction - Recommendations*'. The assessment should cover their condition, significance and landscape and environmental value and potential. The tree survey should classify each tree into one of the retention categories below.
- 14.3 Where there is a conflict between retaining a category A or B tree and ensuring road safety, the first option should be to amend the proposed design to avoid the conflict and retain the tree. The Council will consider situations where it is not reasonable or practical to do this on a site-by-site basis.
- A) Trees to be retained – high category
- Trees in this category:
- Are prominent, healthy trees of good form and habit;
 - Have high historical and commemorative value;
 - Are botanically valuable (because of their species) or rare; or
 - Are older trees with high nature-conservation value and long life potential which pose little or no danger to users of the highway and the surrounding locality.
- B) Trees where retention is desirable moderate category
- Trees in this category are:
- Healthy young trees of good form with substantial life potential; or
 - Healthy mature trees of reasonable form with moderate life potential.
- C) Trees which could be retained – low category
- Trees in this category are:
- Mature trees in reasonable condition with some life potential; or
 - Less prominent young trees in reasonable condition.
- D) Trees which should be removed – fell category
- Trees in this category are:
- Dangerous or unstable;
 - Dead;
 - Likely to become unstable after others are removed; or
 - Less prominent, over-mature trees with limited life potential.
- 14.4 Developers should plan or design the roadwork's or new development to ensure all category A and B trees are retained and, where possible, category C trees. However, developers should not impair road safety or access to the development.

15 Causes of damage to trees during construction works

15.1 The following activities are common causes of damage to trees when construction is carried out within the trees' natural rooting area.

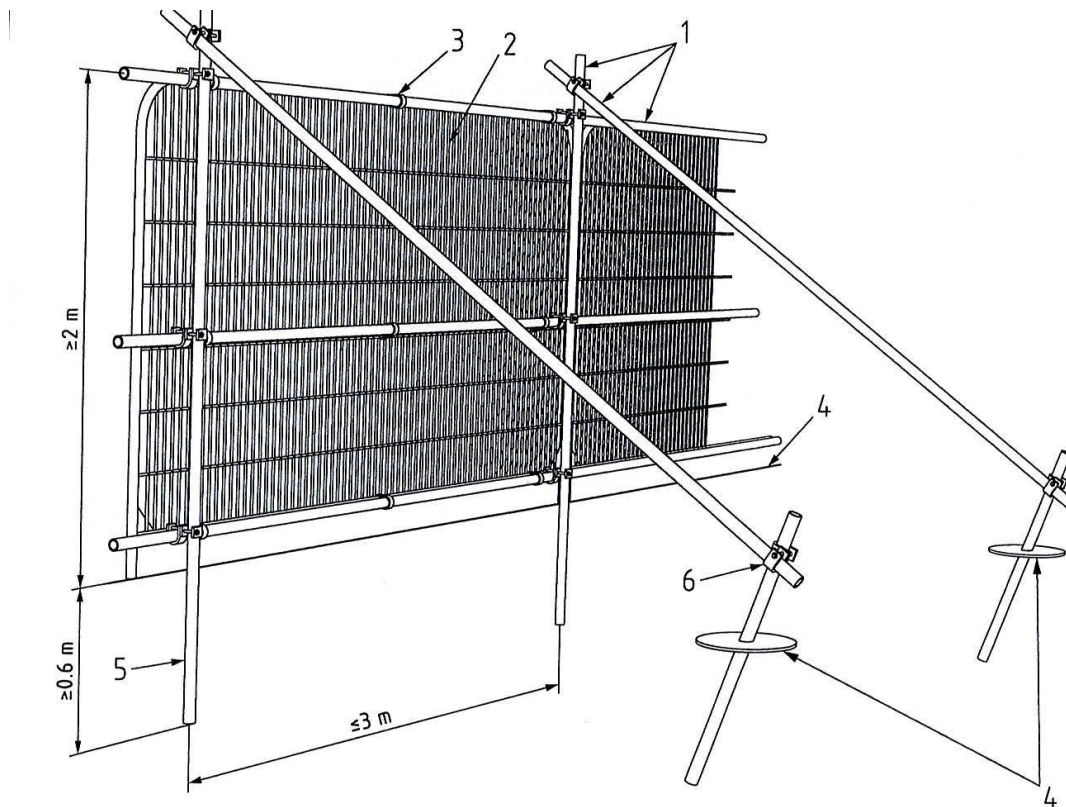
Activity	Damage caused
Excavating trenches	To install and maintain services, for foundations, kerbing and so on. Root severance.
Alterations in soil level	Raising or lowering the soil level can alter the nutrient and oxygen context of the soil.
Installing non-porous surfaces	Affects soil aeration and drainage.
Compacting the surface	By plant, vehicles and storing material. One run across the root-plate of a tree by a vehicle can be detrimental to its long term viability and health
Soil pollution and direct salt damage	Storing toxic material (for example, diesel oil and road salt) within the root protection area (RPA), but runs and spills may also migrate from surrounding areas.
Physical damage	By plant and machinery to a tree's roots, trunk and branches.
Changes to soil hydrology	Caused by changes to drainage or alteration of soil gradients, which accelerates water run-off or compacts the soil which causes waterlogging.
Fires	Burning unwanted material within the tree's root spread can cause significant damage to the tree's roots, trunk and branches.
Exposure	Damage or whole tree failure caused by increased levels of sunlight and wind when neighbouring trees are removed.

Figure 7: Damage to trees during construction works



- 15.2 A tree's root system can extend radially (outwards) to a distance much greater than the tree's height. The trees RPA can be calculated by using BS 5837: 2012. The whole of this area should be protected and remain undisturbed during construction work. If works are necessary within the tree's potential rooting area then reference should be given to the recommendations of BS 5837 and should be underpinned by an Arboricultural Method Statement (AMS) and agreed by the relevant Local Planning Authority Arboriculturalist. The RPA should be protected with substantial fencing (see below) and be excluded from the construction site. If works are necessary within the protection zone, developers must consult a qualified Arboriculturalist at the design and implementation stages to identify specific measures to minimise damage. This will normally require submission of an AMS to be prior agreed by the LPA. At this stage developers should also consider the potential effects of the works on privately-owned trees next to the site.

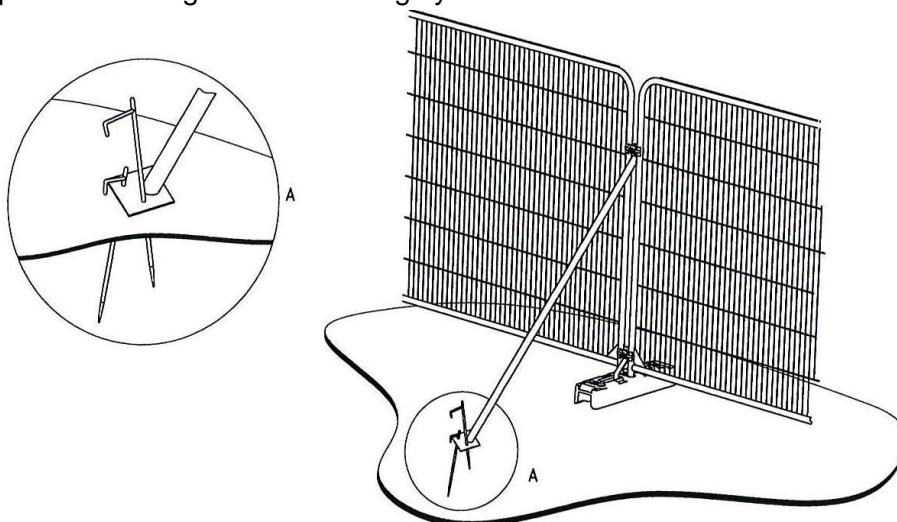
Figure 8: Protective fencing to be employed in all circumstances as BS5837 Fencing is to be erected as shown below.



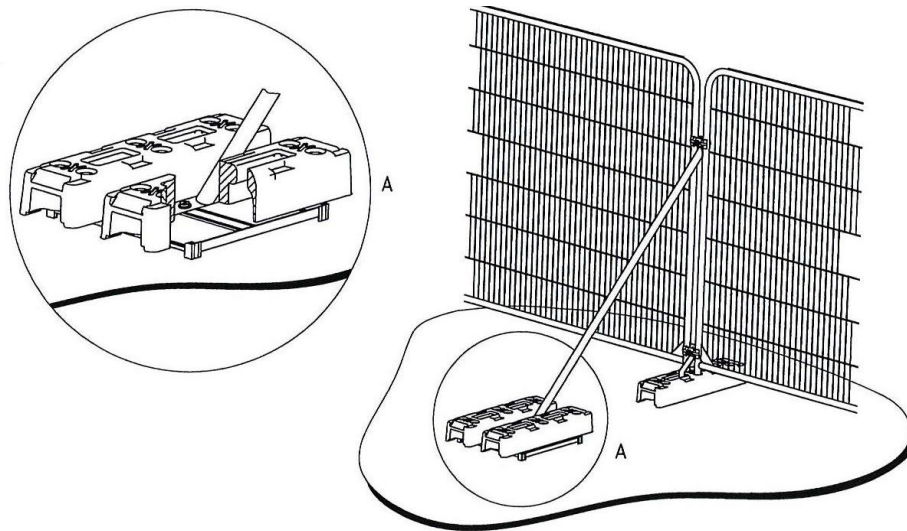
Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

Examples of above-ground stabilizing systems



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

- 15.3 On larger schemes where trees are retained within the site area, protective fencing must be erected, as specified in Figure 8, before the works begin. This fencing should stay up until all the work is complete and all materials, plant, vehicles and spoil have been removed from site. It is essential that the tree protection zone is excluded from the construction site and all associated activities including excavations and changes of soil level. Areas where machinery, materials, chemicals and waste material are stored should also be excluded from the protection zone.
- 15.4 However, due to the linear nature of many highway maintenance operations (for example, kerbing) and the fact that most highway corridors are narrow, it is not always possible to exclude a tree's protection zone from the work area. In such cases developers should adopt the following specific measures to minimise the effects of the works:
 Adhere to the recommendations of British Standards BS 5837
 Adhere to the guidelines of NJUG 10
 Before starting the work a survey team should identify the protection zone with marker paint or pegs. This will ensure that the construction operatives are fully familiar with the protected area where special precautions are required to avoid or minimise damage.
 The trunk of each tree shall be protected with industry hoarding, supported on scaffolding, to a height of at least two metres, to protect its bark from mechanical damage. This protection should be reusable so that as work progresses, it can be transferred from tree to tree.
- 15.5 If the work needs surfaces to be removed or excavated, this should be carried out as follows:
 Footways – Slabs or paving should be removed manually, but initial layers of concrete or tarmac should be removed using a hand-held breaker. All sub-base material should then be removed using hand tools only.
 Carriageways – Tree roots do not usually penetrate the road base, binder course or surface course and may only be present in the sub-base material below the carriageway. This means the road base, binder course and surface course can be removed by machine. The compacted sub-base material below may initially be broken using a hand-held breaker but all material, once broken, should be excavated carefully using hand tools only.
- 15.6 All excavations using hand tools need to be carried out with great care to minimise tree damaging activity. There needs to be close supervision during hand-digging operations and all site staff should understand what is required. All tree roots over 25mm in diameter should ideally be protected and retained. If, however, it is necessary to remove these roots, developers should seek a recognised consultant for Arboriculturalist advice. Any root cutting should be done with a sharp handsaw or secateurs and the size of the wound should be kept to a minimum. Individual roots of less than 25mm may be severed, but mats of smaller roots

(including fibrous roots) should be retained. Smaller roots can easily dry out and die when exposed, particularly in warm or windy conditions. These should be covered and protected with damp hessian until the excavation is back filled.

- 15.7 Where kerbs are being installed or refitted through a root protection area and roots with a diameter of more than 25mm obstruct the work, developers should consult a consultant a recognised Arboriculturalist before agreeing on potentially severing the roots. If the root cannot be severed without putting the stability of the tree in danger, developers should consider:
- Reducing the section of kerb;
 - Creating a gap in the kerb to allow for the root;
 - Bridging the kerb over the root; or
 - Constructing a kerbside build-out.
- 15.8 Developers should take particular care when backfilling excavations within the root protection area. Tree roots are particularly affected when soil is compacted and they can also be damaged by the mechanical action of tamping down. Backfill material around exposed roots should consist of a fine granular material which provides a high proportion of air space. Developers must not use 'general' sand which may be toxic to tree roots. The material should be compacted using hand-tamping methods which maintain a degree of aeration and enable tree roots to survive. This method will allow the backfill material to be compacted to the required level for footway construction. Compacting a road base close to tree roots is more complex due to the load-bearing requirements of a road. If a road carriageway is to be constructed within a tree's root protection area and tree roots more than 25mm are present, developers should consult a recognised arboriculturalist to identify the special measures required to protect tree roots during construction. Non-paved areas should be backfilled using the previously excavated soil which should be only lightly firmed and left proud to allow for natural settlement.
- 15.9 To survive, tree roots require water and oxygen to be present within the soil. Surface material should also be flexible to allow for future soil heave and root growth. Granular surfacing, such as gravel chippings or other permeable materials, laid on to a geo-textile membrane may be appropriate, but maintenance considerations should be taken into account.
- 15.10 Any service runs or street furniture within a tree's protection area should adopt hand-dig methods to ensure that all roots with a diameter of more than 25mm are retained. Developers should follow the recommendations contained in NJUG 10: '*Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees*'. Developers should contact a consultant Arboriculturalist for specific advice.
- 15.11 Where development is being carried out during winter months care must be taken to avoid any tree root contact with rock salt as this can be especially harmful.
- 15.12 Residual chemical herbicides should not be present in construction materials to be used within a tree's root protection area as these may be potentially absorbed by the tree roots and have a significant toxic effect.

16 Tree surgery and site aftercare

- 16.1 In some instances, it may be necessary to carry out tree surgery in the first stage of the works to accommodate access to the site and prevent physical damage occurring to nearby trees.
- 16.2 Tree surgery may also be necessary after the work is complete to repair any minor damage which has occurred. Tree surgery should always be carried out in accordance with BS 3998: Tree work-Recommendations. A qualified and appropriately insured tree-work contractor who is skilled in modern Arboricultural techniques should only be used. If damage has occurred to the site during the construction works, techniques such as soil aeration and surface mulching with an organic material (for example, pulverised bark) could be beneficial to improve the soil and allow the tree to recover from any disturbance.

17 Installing highway equipment

- 17.1 When designing and planning highway equipment, developers should consider the location of nearby trees, whether they are on the highway or on nearby property. Care should be taken to avoid installing any equipment within the tree's root protection area and within its crown or potential growing space. Developers must site equipment such as road signs, street lights, CCTV camera poles, walls, fences and so on to avoid damage to trees during installation and to avoid the need for regular pruning to maintain visibility.
- 17.2 Developers must take particular care when siting SuDS systems in the vicinity of trees (see 3).

18 Carrying out the works

- 18.1 When carrying out development work near to trees, it is essential that staff working on the site adopt all measures identified to retain trees and minimise damage. All site personnel must establish good communication and identify the project requirements for retaining trees. It is important that all recognised practices and tree protection methods as set out in accordance with the relevant, current British and European Standards are followed.

19 Adopting trees

- 19.1 The Council will only adopt trees that have been successfully retained on verges and other highway land providing developers pay a commuted sum to cover their long-term maintenance. The Council will not adopt any tree retained within a development if the Council is aware that it has been damaged by poor practice during construction and the appropriate protection measures have not been adopted.
- 19.2 Trees which will not be adopted must be identified by developers and their maintenance arranged with adjacent property owners to ensure future clarity of maintenance responsibility.

Tree survey complete (include identify TPO trees)	<input type="checkbox"/>
Existing high-category and moderate-category trees (and, where possible, low-category trees) have been retained in the scheme.	<input type="checkbox"/>
Root Protection Areas (RPA) excluded from the construction area using approved protective fencing.	<input type="checkbox"/>
No excavations or alterations to soil levels within the tree's root protection area.	<input type="checkbox"/>
Arboriculturalist consulted if works need to take place in a root protection area.	<input type="checkbox"/>
Arboricultural contractor to carry out tree surgery in the first phase of the project.	<input type="checkbox"/>
Recognised Codes of Practice and specific recommendations followed when working within root protection areas.	<input type="checkbox"/>
Reinstate and improve the site (for example, soil aeration and mulching) after works completion, where appropriate.	<input type="checkbox"/>
No storage of construction materials or toxic substances (including road salt) or light fires within a tree root protection area.	<input type="checkbox"/>
No operation of vehicles or plant within a tree root protection area.	<input type="checkbox"/>
Permeable surfaces installed over disturbed ground within a tree root protection area.	<input type="checkbox"/>
No houses built within close proximity to root protection area.	<input type="checkbox"/>

21 References

BS 3936: *Nursery stock*

BS 3882: *Specification for topsoil and requirements for use.*

BS 4428: *Code of practice for general landscape operations*

BS 5837: *Trees in relation to design, demolition and construction - Recommendations*

BS 7370: *Grounds maintenance*

BS 3998: *Recommendations for tree work*

BS 5837: *Trees in relation to construction*

BS 8545 *Trees: from nursery through to independence in the landscape.*

National Joint Utilities Group – NJUG 10 – *Guidelines for the planning, installation and maintenance of utility services in proximity to trees*

Arboricultural Practice Note 1 – *Driveways close to trees*

22 Acknowledgements

This guidance is based upon 'The 6Cs Design Guide' which deals with highways and transportation infrastructure for new developments in Derbyshire, Leicestershire and Nottingham.

The Council recognises the contribution made by Harrogate Borough Council is its consultation feedback.

Calculation for Commuted Sum									
Type of Maintenance activity (and costs)									
Year	Water Trees	Top up mulch	Remove Tree guards and Stakes	Inspection	Remedial Works	Selectively Remove and Replace dead & diseased	Option 1		
							Total of Treatment Costs (at todays prices)	Present Value (discounted)	
1							£0	£0	
2	Years 1 - 3 will be included in Developers Initial maintenance costs							£0	£0
3							£0	£0	
4	3000	750		500	1000		£5,250	£4,812	
5	3000	750	1000	500	1000		£6,250	£5,606	
6				500	1000		£1,500	£1,316	
7				500	1000		£1,500	£1,288	
8				500	1000		£1,500	£1,260	
9				500	1000		£1,500	£1,233	
10				500	1000		£1,500	£1,207	
11				500	1000		£1,500	£1,181	
12				500	1000		£1,500	£1,155	
13				500	1000		£1,500	£1,130	
14				500	1000		£1,500	£1,106	
15				500	1000		£1,500	£1,082	
16				500	1000		£1,500	£1,059	
17				500	1000		£1,500	£1,036	
18				500	1000		£1,500	£1,014	
19				500	1000		£1,500	£992	
20				500	1000		£1,500	£971	
21				500	1000		£1,500	£950	
22				500	1000		£1,500	£929	
23				500	1000		£1,500	£909	
24				500	1000		£1,500	£890	
25				500	1000		£1,500	£871	
26				500	1000		£1,500	£852	
27				500	1000		£1,500	£834	
28				500	1000		£1,500	£816	
29				500	1000		£1,500	£798	
30				500	1000	10000	£11,500	£5,986	
31				500	1000		£1,500	£764	
32				500	1000		£1,500	£748	
33				500	1000		£1,500	£731	
34				500	1000		£1,500	£716	
35				500	1000	10000	£11,500	£5,369	
36				500	1000		£1,500	£685	
37				500	1000		£1,500	£671	
38				500	1000		£1,500	£656	
39				500	1000		£1,500	£642	
40				500	1000	10000	£11,500	£4,816	
41				500	1000		£1,500	£615	
42				500	1000		£1,500	£601	
43				500	1000		£1,500	£588	
44				500	1000		£1,500	£576	
45				500	1000	10000	£11,500	£4,319	
46				500	1000		£1,500	£551	
47				500	1000		£1,500	£539	
48				500	1000		£1,500	£528	
49				500	1000		£1,500	£516	
50				500	1000	10000	£11,500	£3,874	
51				500	1000		£1,500	£494	
52				500	1000		£1,500	£484	
53				500	1000		£1,500	£473	
54				500	1000		£1,500	£463	
55				500	1000	10000	£11,500	£3,475	
56				500	1000		£1,500	£443	
57				500	1000		£1,500	£434	
58				500	1000		£1,500	£425	
59				500	1000		£1,500	£415	
60				500	1000	10000	£11,500	£3,116	
Sum before Discount							£164,000	£80,012	
								Final Commuted Sum	

Appendix G

Please note: Form to be completed and returned to development.inspections@northyorks.gov.uk no later than 10am the preceding Friday.

W/C	Proposed Weekly Work Schedule		
Site Info	Developer:		Location Inc. Post Code:
	Contractor:		
Contact/s			
	Proposed Works		Drawing Ref/Specification Clauses
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			
Any other info			Signature [on behalf of Developer]
	Failure to submit notification will result in Highways Authority being unable to undertake site inspections. If there is any changes to the schedule the Highways Authority should be notified.		

Site Works - Notifiable items (All of the below should be included on your weekly site diary when undertaken) Please note Red items must be inspected prior to covering/backfill and need to be left open for the min 48 hr. period after notice has been given (See NYC Specification for more detail on standards and notice)

Work item	Works Code	NYC Specification for Housing & Industrial Estate Roads & Private Street Works	
		Section/s	Standard detail Dwg No/s
FORMATION	FO	4.01 (2), 4.02 3.06	
BULK FILL	BF	3.04	
HIGHWAY DRAINAGE	HD	2.0 - 2.21	C1-C7
GULLY CONNECTIONS	GC	2.15	
GULLIES	GU	2.13	C5,C6
BRICK WORK (TO IRONWORK)	BW	2.19	C1 – C6
IRON WORK	IW	2.14 & 2.11	C1 – C6
DUCTS	DU	2.01 / 1	
CAPPING	CA	4.01 (2), 4.03, 4.05, 4.06, 3.06	A1,A2
SUB-BASE (Type 1)	SB	4.04, 4.05,4.06 4.07	A1, A2
KERB & CHANNEL	KCF	5.06	A1, A2
KERBS (inc temp edge restraint)	KE	5.01- 5.04 5.07 & 5.08	B1 – B4
CHANNELS	CH	5.01, 5.02, 5.06, 5.07	B1 – B4
UTILITY SERVICES (Backfill)	US	2.11 5.08	D1
EDGINGS	ED	5.12	B5
FOOTWAY SUBBASE	FSB	5.08, 5.09	A1, A2
FW BINDER LAYER	FBL	5.10	A1, A2
FOOTWAY SURFACING	FS	5.10	A1, A2
VISIBILITY SPLAYS	VS	To approved plans	
ROAD, BASE	RB	4.01,4.09 & 4.14-	A1,A2
ROAD, BINDER LAYER	RBL	4.01,4.09 & 4.14-	A1, A2
ROAD, SURFACING (including surfacing preparation)	RS (SP)	4.01,4.09 & 4.14- 4.17	A1,A2
BLOCK PAVING PREP	BPP	4.18	A3
BLOCK PAVING	BP	4.18	A3
TACTILE SURFACES	TS	To current NYC requirements/details	
LINING	LI	6.05	
SIGNING	SI	6.01 - 6.04	G1,G2
LIGHTING	LG	7.0 (& Highway Lighting Dept. req)	F1
LANDSCAPING	LA	9.0	

Appendix H

Development Management Recycled materials - advice note

Recycled Aggregates: compliance requirements for any recycled materials to be used within the adoptable works on all S278 & S38 works within North Yorkshire.

This briefing note relates to the recycled aggregate aspect only and is in addition to the standard material performance certs required to meet the specific clause for each material

Type 1 Sub-base to Specification for Highway Works (SHW) Clause 801 & 803

Recycled coarse aggregate and recycled concrete aggregate used in unbound mixtures in accordance with Clause 803 shall also comply with the additional requirements of Table 8/3 below

Table 8/3

Unbound Mixture	Type 1
Component Identified by Clause 710 (See below)	Maximum Permitted Content (% by mass)
Asphalt (Class Ra)	50
Glass (Class Rg)	25
Other materials (Class X), including wood, plastic and metal	1

Capping Material to SHW series 600, Table 6/1- Class 6F5

Where 'recycled aggregate' is used in Series 600, the material shall be aggregate resulting from the processing of inorganic or mineral material previously used in construction and shall have been tested in accordance with Clause 710. It shall not contain more than 1% other materials (Class X), not more than 50% in Class Ra (bituminous materials) and not more than 25% in Class Rg (crushed glass). Where 'recycled aggregate' is imported onto the site, it shall be aggregate complying with BS EN 13242 from source code A (construction and demolition recycling industries).

Where 'recycled aggregate except recycled asphalt' is used in Series 600, the aggregate shall have been tested in accordance with Clause 710. It shall not contain more than 1% other materials (Class X), not more than 1% in Class Ra (bituminous materials) and not more than 5% in Class Rg (crushed glass). Where 'recycled aggregate except recycled asphalt' is imported onto the site, it shall be aggregate complying with BS EN 13242 from source codes A2 (crushed concrete) and/or A3 (crushed bricks, masonry).

Pipe Bedding Material to Clause 503 (SHW)

Where recycled coarse aggregate or recycled concrete aggregate is used in this Clause, it shall have been tested in accordance with Clause 710 and shall not contain more than 1% other materials (Class X).

710 Testing for Constituent Materials in Recycled Aggregate and Recycled Concrete Aggregate

1 This Clause specifies the basic procedure and test methods for the examination of recycled aggregate

And recycled concrete aggregate for the purpose of identifying and quantifying constituent materials.

Quality Control Procedure

2 The quality control procedure shall be in accordance with the 'Quality Protocol for the production of

Aggregates from inert waste' and the 'Producers' compliance checklist' published by Waste and Resources Action Programme (WRAP). The results of all quality control checks carried out by the Contractor shall be compiled in accordance with the procedure set down in the above document and with those in this Clause. These shall be delivered promptly to the Overseeing Organisation on request.

Test Method

3 The constituents of a sample of recycled aggregate shall be classified by hand-sorting the coarse

Aggregate particles in accordance with BS EN 933-11. The test shall be carried out by a suitably trained laboratory technician who has demonstrated competence in classifying the constituent classes in accordance with the test method.

Note – All recycled materials brought onto site for intended use within the adoptable works shall be supported fully by the documentation requirements referred to in this advice note, the material shall be stockpiled ready for further visual inspection before use, at this time the Authority may request further testing before use from the stockpile should there be any concerns regarding the material quality,

NYC – Development Management
July 2019

Appendix I

Your ref: Development & Flood Management
Highways & Transportation
County Hall,
Northallerton,
North Yorkshire

Our ref: DL7 8AH

Tel: 01609 780 780

Contact: e-mail:
Date: development.control@northyorks.gov.uk
www.northyorks.gov.uk

Dear Sirs

DEVELOPMENT AT -

Developer – All sites

North Yorkshire Council (NYC) as Local Highway Authority (LHA) is committed to working closely with your company to deliver the road works at the above site and achieve:

- The highest quality development possible;
- Efficient and effective delivery of projects for the benefit of all parties;
- Development that is not a financial burden or maintenance liability to NYC
- The delivery of adoptable highway works constructed to the required standards;

To achieve this communication is key. Your company is fully responsible for the day-to-day supervision of the road works construction on the site. The LHA will only inspect the works to check that they are being constructed in accordance with the approved drawings and the LHA's other requirements and specification. These LHA visits do not free you from your responsibility for supervising the work and making sure that it is carried out in a proper and safe manner, and in line with the specification.

Before you start you should ensure you have all the necessary permissions for works associated with road construction and a full set of approved drawings and specification on site. The permissions may include the following as site conditions dictate:

.....Continued

- A valid planning permission
- A signed Section 278 or Section 38 Agreement as appropriate
- The necessary Streetworks permits and notices
- Approval for any traffic management to be used
- A programme for delivering the roadwork's
- A provision for receiving deliveries and storing materials clear of the highway
- Parking provision for operatives
- Measures to control the spread of mud onto the highway
- Agreed HGV delivery routes.

Your road works must be constructed by a contractor/ground-worker who has relevant experience and capabilities. However, you need to demonstrate to the LHA how you intend to:

- Make yourself fully aware of the engineering quality and standards of workmanship required by the LHA; and
- Quality control and manage the works being delivered on your site.

NYC does not expect your contractor/ground-worker to operate unsupervised by your company on site.

Pre-start meetings will be required to establish and emphasise the LHA's position and your responsibilities on a number of issues including those identified in this letter. Initially this will be between the LHA and your company to discuss issues including:

- Personnel and responsibilities;
- Construction site management and traffic control;
- Streetworks Authorisations;
- Communications
- Agreed start date.

A formal agenda is available on request and will be issued prior to the meeting.

A further meeting will take place between the LHA's Highways Officer, yourself and your contractor to discuss day to day issues including:

- Communications
- Workmanship and standards;
- Materials and Testing;
- Setting Out.

The Highways Officer will also advise which elements of work will require prior notice to enable inspection to be carried out. You should note that without prior notification of your need for the Highways Officer to inspect key items resources may not permit a site visit on your required date. This may result in additional destructive testing to prove the acceptability of the works in question. You should consequently ensure you give adequate notice for all inspections required.

.....Continued

To assist with programming inspections the Developer's site manager will be required to submit a weekly report indicating the following week's programme of adoptable highway works, prior to noon on the preceding Friday. Please note if a sheet is not submitted, visits to the site will not be scheduled by the LHA. Scheduled visits will always be given priority and consequently the LHA may not be able to visit your site when you wish. Where you undertake works without inspection, you work at risk. You will be required to uncover or open up any uninspected part of the works to prove acceptability and permit necessary testing and remove and make good any materials or parts of the works which are, in the opinion of the LHA, defective.

It is of paramount importance that existing roads and accesses to adjacent houses, buildings etc. adjacent to the site are kept clear of obstruction, clean and clear of mud and material dropped from vehicles. Mud, slurry or material brought onto the road as a result of carrying out the works shall be removed immediately by brushing or other approved means. If required by NYC to ensure the Cleanliness of the highway wheel washers shall be installed and used by every vehicle leaving the site.

If we work together on these matters adoptable roadwork's can swiftly progress to formal maintenance periods with a minimum of hassle for all. We appreciate your co-operation in these matters.

Yours faithfully

Team Leader Transport and Development

Appendix J

DEVELOPERS CHECK LIST FOR A NEW ACCESS, ENTRANCE OR PUBLIC HIGHWAY JOINING THE PUBLIC HIGHWAY

Requirements check list. (Please note, the verge between the carriageway edge and the site boundary generally forms part of the Highway, and makes this applicable)

Item	Required unless otherwise agreed	Date/approved/agreed
1 Planning consent		
2 Section 38/278 agreement		
3 Pre-agreement (Form6PA)		
Section 184 licence needed if no 2 or 3		
Approved Drawing		
Approved construction details		
Approval of materials		
Site pre-start meeting with D M O or Engineer		
Street works notices completed and on the system		
Approval of Traffic management		
Signage for site access & 24 hour contact telephone number		
Advance notice of works for public.		
Details of contractors street works accreditation		
Proof of public liability insurance		
Details of wheel washing/ sweeping measures		

It is an offence under Section 131 of the Highways Act 1980 to work in the Public Highway without the Authorities Permission.

APPENDIX K

Your ref:

Our ref: 101004
Contact: 01609 780780

North Yorkshire Council
Customer Resolution Centre
East Block
County Hall
Northallerton
DL7 8AD
Tel: 01609 780780

15 May 2017

Dear Sir/Madam,

Highways Act 1980 – Section 154
OVERHANGING VEGETATION –

We understand that you may be the owner or occupier of the above property. It has come to the attention of the Highway Authority that a tree along this route is growing in such a way as to overhang the public highway and cause an obstruction to the passage of large vehicles.

Please arrange to trim the tree in question within the next 14 days so as to remove the overhanging vegetation. For your information, a minimum clearance of 5.2 metres (17'0") above the carriageway and 2.3 metres (7'6") above any footpath or highway verge is required. If you fail to carry out this work within the period of fourteen days the Council may carry out the work itself and recover from you the expenses reasonable incurred in doing so, in accordance with Section 154 of the Highways Act 1980.

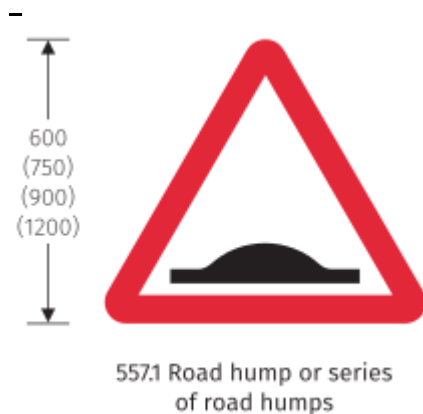
Your attention is also drawn to the provisions of the Wildlife and Countryside Act 1981 for protecting birds, their young and nests. Please ensure that you take reasonable steps to avoid destroying the nest of any wild bird which is in use or being built.

Should you have any queries regarding the work required, please contact this office via the above contact details.

I thank you in anticipation of your assistance.

APPENDIX L

13 ROAD HUMPS



May be used only in combination with diagram 557.2, 557.3 or 557.4, and with the marking to diagram 7062



File:Traffic signs manual-chapter-4-diagram 557x4 (2008).svg]]

These plates may be used only in combination with diagram 557. 7. The distance may be varied (see Appendix C) and on diagrams 557.3 and 557.4 may be omitted. The legend on diagram 557.4 may be on two lines. On diagrams 557.3 and 557.4 the arrow may be reversed, or a second arrow pointing in the opposite direction may be added. The arrow on diagram 557.4 may be omitted; the appropriate x-height will then be 50mm

13.1 Diagram 557.1 is used to warn of the presence of a road hump or a series of humps. It must be accompanied by one of the plates shown. The plates must not be used alone.

However, no signs are required to warn of humps in a 20 mph zone signed with traffic signs to diagram 674 (Highways (Road Humps) Regulations 1999). Road hump signs will usually benefit from the relaxation from the direct lighting requirement described in para 1.37.

13.2 Figure 13-1 illustrates the range of signing that might be used where road humps are installed on adjacent roads within an area. Signs are needed at each entrance to the area, other than at short culs-de-sac with no humps and fewer than about 100 dwellings. If the humps are spaced more than 150 metres apart, each individual hump should be signed. Similar signing should be used where humps are installed on one road only.

13.3 Individual circumstances will determine whether signs for road humps should be provided on both sides of the road. Where a gateway is to be used as a speed-reducing feature in advance of humps, it is recommended that signs should be erected on both sides

of the carriageway and incorporated into the gateway. Further advice on siting can be found in Appendix A.

13.4 Where several adjoining roads have humps, the distance on the sign plates should relate to the humps on the road on which the sign is erected. Separate signing for adjoining roads should not be necessary, provided the first hump in the adjoining road, whether it is the major or the minor one, is within 40 metres of the junction of the two roads.

13.5 As humps may be installed only on roads with speed control features, a 50 mm x-height is sufficient for the supplementary plate, 557.2. Diagrams 557.3 and 557.4 when incorporating an arrow indicate the presence of humps on side roads, and may themselves be used on roads where speeds are higher. A wider range of x-heights is therefore prescribed for these signs (see Annex B for details).

13.6 Signing of a humped Zebra or signaled crossing in a series of road humps will generally be necessary only if the spacing between it and adjacent humps is greater than 100 metres (see also para 9.13 for details of sign plates).