

A guide to works near our water mains

Information for tree planting near water mains



1 Introduction

This information is produced for your guidance and is drawn up in light of research into the effects of planting of new trees, including conifers and shrubs, either side of a water main.

New water mains located outside public highways are usually protected by legal agreements referred to here as “easements” to prevent future access difficulties or buildings being built where they may cause damage to our water mains.

The easements typically extend 3.0 metres either side of the main, although this can be increased in some circumstances.

This guidance note takes account of opinions expressed in the National House Building Council (NHBC) Standards Chapter 4.2 – Building Near Trees and the draft National Joint Utilities Group (NJUG) guidelines on Trees and Services.

1.1 Water demand and soil conditions

The water demands of trees vary considerably; they generally reflect the size of the tree although species of tree differ in their water requirements. If the soil is a shrinkable clay* or a deep peat, the drying effect of tree roots may amplify any seasonal shrinkage, especially in drought years. A possible “heave” situation may occur following re-wetting of such soil, the sudden removal of the trees, or the severing of tree roots by trenching.

Although the majority of the root system of a tree is usually within 600mm of the surface, the roots may extend radially in any direction for distances frequently in excess of the tree’s height. Underground services are often cooler than the surrounding soil, causing moisture within the soil to condense on the outer surface of the main, thereby encouraging roots to grow close to the service.

Damage to water mains can occur either by:

- 1 **Direct damage** where the root penetrates an existing flaw and as it grows, its increasing diameter causes damage
- 2 **By fibrous roots** blocking the flow
- 3 **By the movement of the whole root** bowl when the tree sways in high winds

Such damage is not inevitable, much will depend on the species of tree planted, the depth of the water main and its method of construction and/or protection. Advice should be sought at an early stage on the positioning

of trees near new water mains, and reference to the NHBC and NJUG publications is advised.

* Clay containing more than 35 per cent fine particles (silt & clay) and having a plasticity index greater than 10 per cent.

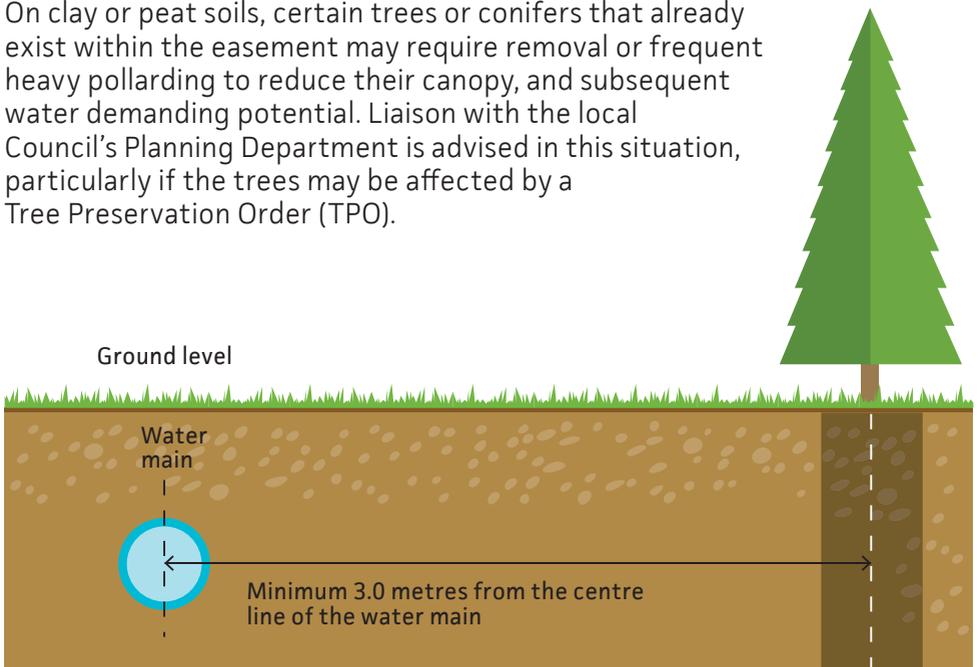
2 Planting of trees and shrubs

The following schedule has been prepared of commonly available trees which by reason of their large size in ultimate growth under certain soil conditions, combined with their high water demanding potential, **should be excluded** from the pipeline easement area (ie. planted at a distance greater than 3.0 metres from the centre line of the water main).

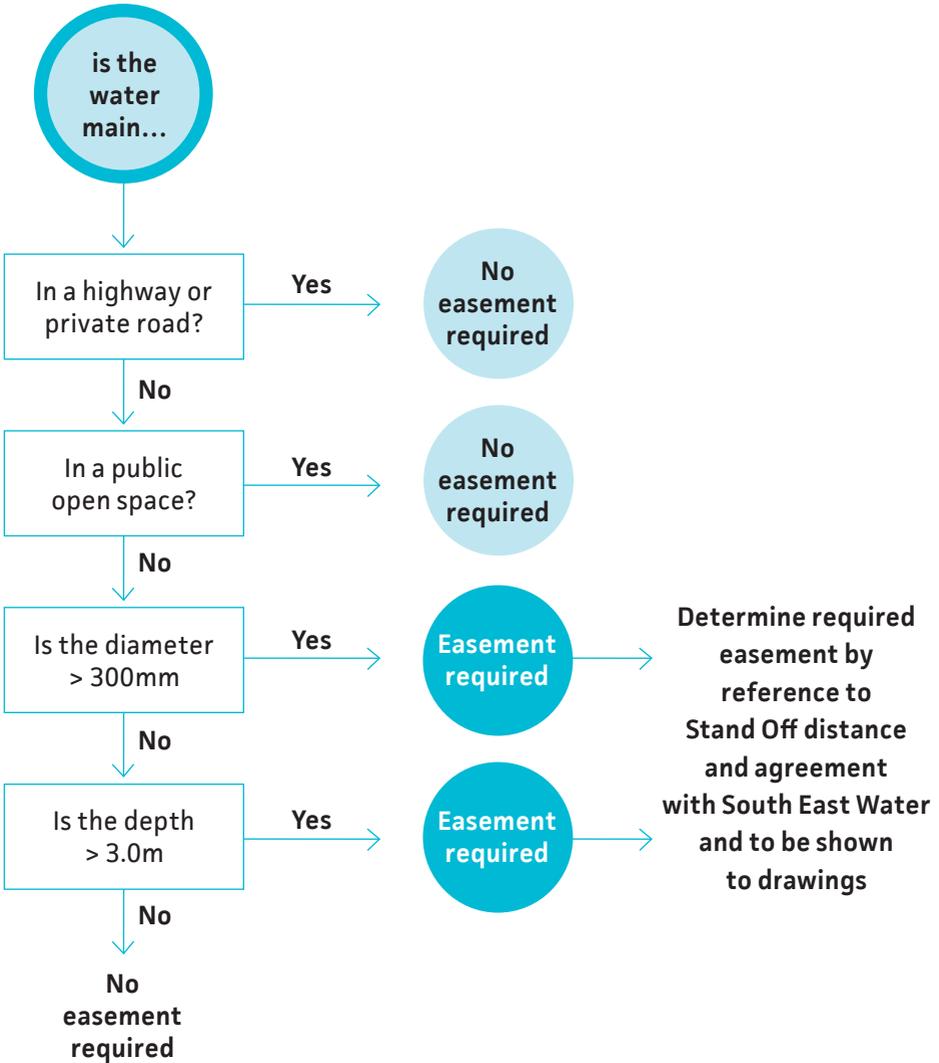
Trees and conifers not included in this exclusion list would usually be permissible, (see “Guidelines for Planting in Easement Areas”) but it is recommended that approval is sought for any trees, shrubs or conifers, whose nature or water demand is unknown, particularly if on peat or clay soils.

Outside the easement area trees should not be planted so thickly as to form a dense copse-like situation, which could impede access to the water pipe in an emergency.

On clay or peat soils, certain trees or conifers that already exist within the easement may require removal or frequent heavy pollarding to reduce their canopy, and subsequent water demanding potential. Liaison with the local Council’s Planning Department is advised in this situation, particularly if the trees may be affected by a Tree Preservation Order (TPO).



Easements



2.1 Trees and conifers not to be planted within pipeline easements

Schedule of commonly available trees and conifers, which should be excluded from planting within the pipeline easement because of their large size, and/or heavy canopy in ultimate growth and moderate/high water demand. Refer to 4.1 “Hedges” below for use of trees as hedge plants.

Definitions:

(H) – High Water Demand

(M) – Moderate Water Demand

CVS – Cultivars or garden varieties

Acers	(“Maples”) – particularly: negundo (“Box Elder”) and cvs. platanoides (“Norway Maple”) and cvs. pseudoplatanus (“Sycamore”) and cvs. rubrum (“Red Maple”) and cvs.	(M)
Aesculus	(“Horse Chestnut”) – particularly: carnea (“Red Horse Chestnut”) carnea “Briottii” hippocastanum (“Common Horse Chestnut”) and cvs.	(M)
Ailanthus	altissima (glandulosa) (“Tree of Heaven”)	(M)
Alnus	(“Alder”) cordata (“Italian Alder”) glutinosa (“Common Alder”) incana (“Grey Alder”)	(M)
Carpinus	betulus and cvs. (“Hornbeam”)	(M)
Catalpa	bignonioides (“Indian Bean Tree”) *	
Cupressocyparis	leylandii (“Leyland Cypress”) and cvs.	(M)

* No information currently available regarding water demand on these genera. Generally they fall into the moderate water demand category.

2.1 Trees and conifers not to be planted within pipeline easements *continued*

Cupressus	("True Cypress") – particularly: macrocarpa ("Monterey Cypress") and cvs. glabra ("Pyramidaus") (C. arizona "Conica")	(M)
Fraxinus	("Ash") – most species and cvs. particularly excelsior ("Common Ash") oxycarpa "Raywood"	(M)
Juglans	("Walnut") – species and cvs. * nigra ("Black Walnut") regia ("Common Walnut")	
Liquidambar	styraciflua ("Sweet Gum") and cvs. *	
Liriodendron	tulipifera ("Tulip Tree") and cvs. *	
Paulownia	fargesii * tomentosa	
Picea	("Spruce") – particularly: * abies ("Christmas Tree") (Norway Spruce) pungens ("Colorado Spruce") sitchensis ("Sitka Spruce")	
Pinus	("Pine") – particularly: * contorta "Latifolia" ("Lodgepole Pine") nigra ("Austrian Pine") nigra "Maritima" ("Corsican Pine") pinaster ("The Maritime" or "Bournemouth Pine") ponderosa ("Western Yellow Pine") radiata ("Monterey Pine") strobus ("Weymouth Pine") sylvestris ("Scots Pine") wallichiana ("Bhutan Pine")	

* No information currently available regarding water demand on these genera. Generally they fall into the moderate water demand category.

2.1 Trees and conifers not to be planted within pipeline easements *continued*

Plantanus	("Plane") x hispanicus ("London Plane") and cvs. orientalis ("Oriental Plane") and cvs.	(M)
Populus	("Poplars") of which there are many.	(H)
Pseudotsuga	menziesii ("Douglas Fir")	(M)
Pterocarya	("Wing Nut") * fraxinifolia x rehderana	
Quercus	("Oak") – all species and cvs. of which there are many	(H)
Robinia	("False Acadia") x ambigua "Decaisneana" pseudoacacia and some cvs.	(M)
Salix	("Willows") – most species and cvs.	(H)
Thuja	occidentalis ("American Arborvitae") * plicata ("Western Red Cedar") and cvs. notably p. "Fastigiata" and "Zebrina"	
Tilia	("Lime" or "Linden") all species and cvs.	(M)
Ulmus	("Elm") – most species and cvs.	(M)
Zelkova	("Water Elm") carpinifolia serrata	(H)

* No information currently available regarding water demand on these genera. Generally they fall into the moderate water demand category.

3 Guidelines for planting in easement areas

- 3.1** Approval must be obtained from South East Water before any planting is carried out within the permanent easement. The company retains the right to remove any trees which might become a danger to the water main, providing this does not conflict with any Tree Preservation Orders present.
- 3.2** Blackthorn/quickthorn, elder, hazel, privet are the only hardwood plants that should be planted directly across the pipeline. These may only be planted where a hedge is necessary either for screening purposes or to indicate a field boundary. These should be planted out and maintained as detailed in 4.1. Elsewhere within the easement area hedge may be planted with species listed in 4.1.
- 3.3** Apple trees grafted onto dwarf root stocks may be planted to within 3.0 metres of the pipeline.
- 3.4** Christmas trees may also be planted to within 3.0 metres of the pipeline provided that they will be clear felled at intervals not exceeding seven years.
- 3.5** Ash, beech, elm, horse chestnut, lime, oak, sycamore, fruit trees and most conifers may only be planted as individual specimens, or a single row, in an area at least 6.0 metres clear of the pipe. Woodland planting may only be carried out at distances greater than 10.0 metres from the pipe.
- 3.6** Poplar and willow may not be planted within 10.0 metres of the pipeline.

4 Suggested trees and shrubs within the easement area

Cornus Alba	Red Barked Dogwood
Viburnum Opulus	Guelder Rose
Rosa Canina	Dog Rose
Corylus Avellana	Hazel
Crataegus Monogyna	Common Hawthorn
Amelanchier Canadensis	Shrub
Rosa Rugosa Bamanas Rose	Shrub
Ligustrum Vulgare	Privet
Prunus Spinosa	Quickthorn
Ulex Europaeus	Gorse
Sambucus Nigra	Elder

4.1 Hedges

Trees, shrubs and conifers used as hedge plants, close planted in a line up to 1 metre apart will, if left untrimmed as free-standing specimens, grow to large trees, and then exhibit all the disadvantages of water demand and large size. Such trees and conifers frequently used as hedge plants include:

Cupressus macrocarpa (“Monterey Cypress”)

Cupressocyparis leylandii (“Leyland Cypress”)

Quercus ilex (“Holm” or “Holly Oak”)

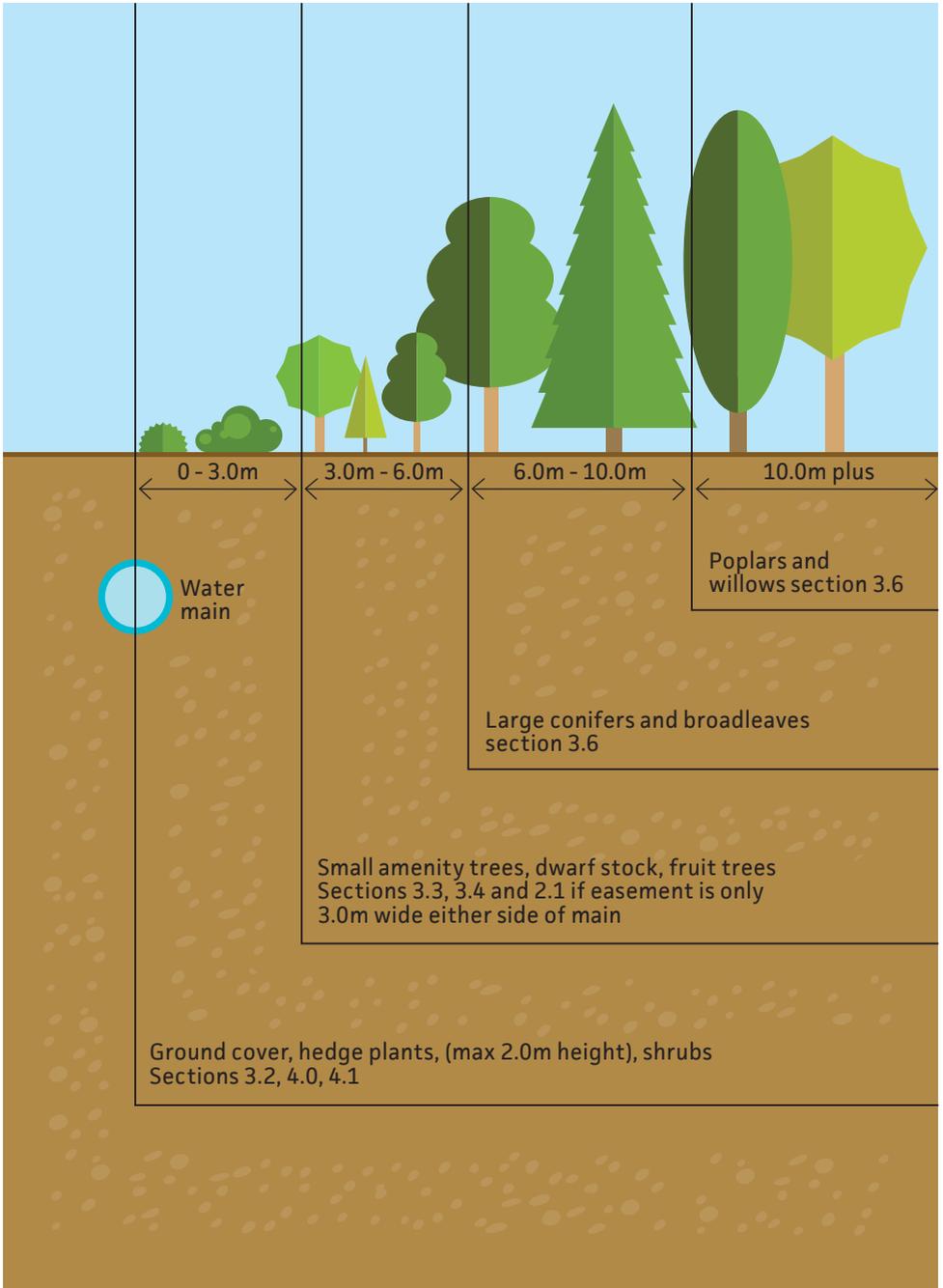
Chamaecyparis lawsoniana (“Lawsons Cypress”) and cvs.

Thuja plicata (“Western Red Cedar”) and cvs.

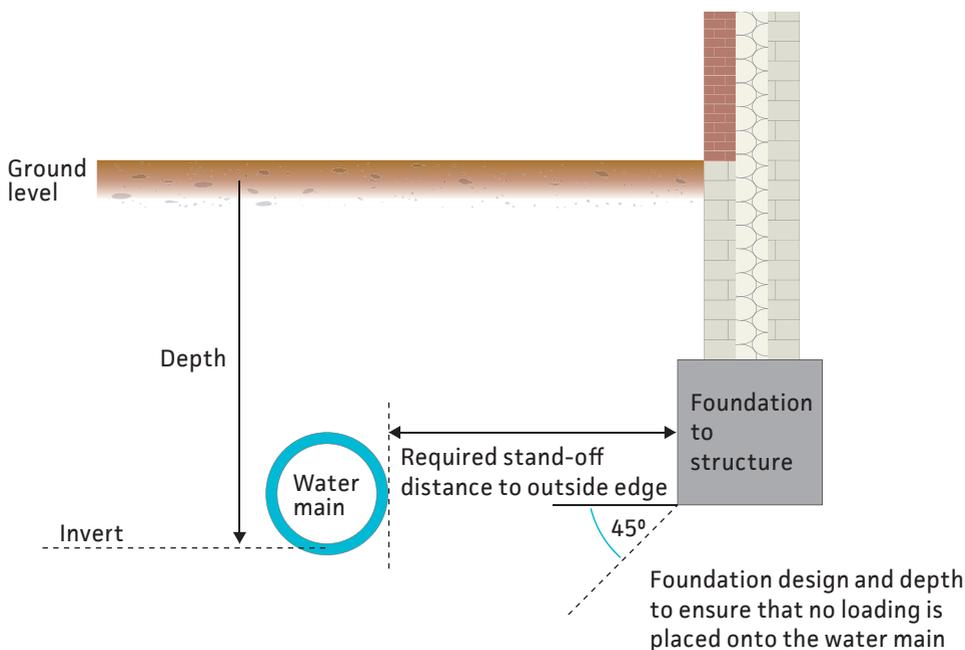
Ulmus species and cvs. (“Elm”)

These species, as long as they are grown in hedge form, remaining clipped to a low height (no more than 2.0 metres) and closely planted (no more than 1.0 metre apart) are usually permissible within the easement area, but should be avoided directly over the actual pipe and particularly on deep clay or deep peat soils.

5 Planting distances from centre line of water main



Stand-off distance diagram



Depth to crown (m)	Internal diameter (mm)									
	<250	250-299	300-399	400-449	450-499	500-599	600-799	800-999	1000-1199	1200+
1.50	6	6	6	6	6	6	7	8	9	10
2.50	6	7	7	8	8	8	9	10	11	12
3.50	6	9	9	10	10	10	11	12	12	12
4.50	8	11	11	12	12	12	12	12	12	12

Notes

- 1 The above applies to water mains outside of the adoptable highway
- 2 The above table also applies to raw water mains
- 3 For mains of less than 250mm internal diameter, stand-off distances can be agreed on a case by case basis but standard stand-off distance is 6m
- 4 The above distance are for either side of the water main from the edge of the main
- 5 The above applies to the protection of existing South East Water assets and to proposed assets

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