REPORT: LANDSCAPE DESIGN REPORT

PROJECT: Dunshaughlin East SHD

DATE: December 2018

Landscape design report

Design development.

1.0 Vision for the Landscape

The layout and design of the streetscape, landscape amenity areas, landscape mitigation and the protection and enhancement of the peripheral hedgerows is central to the long term successful establishment of this Strategic Housing Development (SHD) at Dunshaughlin East. This SHD scheme forms part of the wider '(The) Willows' development which is largely currently under construction to the southern portion of the SHD lands.

As part of the master planning exercise as developed at initial concept stage, the open spaces (totalling some 18.3% of the development) were established and sited at appropriate locations throughout the scheme. The open spaces, as now developed, are woven into the scheme to provide regular breaks to the built form providing a complimentary aspect and a strong sense of cohesion to the 'landscape'. The landscape design development has been guided and influenced by both the Ecological and Arboricultural appraisal of the site, both of which have been enclosed as part of this application and have been referenced further below.

The design and layout of the open space is essential in the creation of a built environment for this scheme, the adjoining '(The) Willows' and future surrounding developments. The landscape design associated with the adjoining '(The) Willows' scheme has been developed to offer its own character and sense of place. It has also established precedence for the landscape design for this current SHD Development which will encourage cohesiveness across the scheme. Refer below to a series of images referencing the establishing landscape at 'The Willows'.

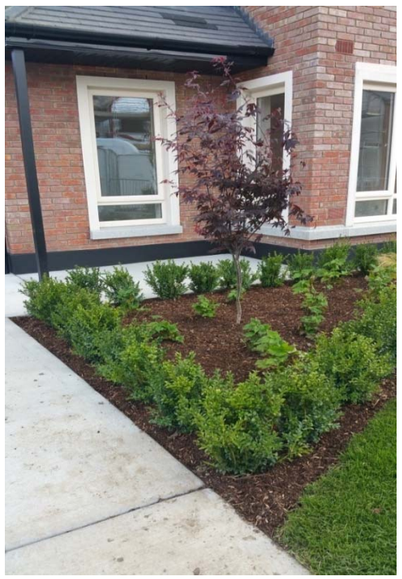

Fig. 1. Private and public 'green spaces' being developed at 'The Willows', Dunshaughlin.

The use and mix of trees, shrubs and herbaceous plants have been considered in detail in order to be robust enough to establish, while still offering seasonal interest, movement and a focussed expression. Native plant material, where appropriate, has been considered for the scheme to improve the overall biodiversity of the site. Much of the herbaceous perennials shall be under-planted with bulb species to offer 'flurries' of colour from early to late spring. Leaf colour, bark tone and berries have all been considered for the scheme which allows for good contrast and again, seasonal variation.

The designed landscape must be comfortable, passively supervised, accessible, welcoming, sheltered and safe. The open space areas must provide a high level of visual amenity and must provide a seamless connection between this development and the future surrounding developments and amenity lands, including the town of Dunshaughlin as detailed in the submitted masterplan. This provision of 'connection' was one of the core principals of the design.

The designed landscape amenity areas offer comfort, passive supervision, ease of access and a safe space for all end users.

Second to the core principal of amenity was the development of a palette of materials for both hard and soft landscaping to both the amenity lands and the streetscape. To aid us during the process to select materials we have developed a simple check list of both hard and soft landscape materials.

Hard works materials must;

- Allow for ease of movement for all users
- Enhance the space and not conflict with the building materials
- Work and look attractive in both wet and dry conditions
- Have a long timeline appeal

Soft works plant materials must;

- Be suitable for the Irish climate
- Be non-invasive
- Collectively provide visual interest all year round
- Enhance bio-diversity and habitat creation
- Be disease resistant

By approaching the overall landscape design of the scheme at both macro and micro levels, the scheme delivered will provide a high level of amenity. Consideration will be strongly considered to provide a workable, aesthetically appealing, and robust scheme to work both within the surrounding development. It is proposed that both the streetscapes and landscape amenity areas proposed will receive a landscape treatment of a high standard in terms of materials and specification; both for hard and soft landscape elements.

Fig. 2. Trees with year round interest

Fig. 3. Shrub planting with form, colour and texture

2.0 Landscape Proposals and Green Infrastructure

The site has been assessed holistically from the outset at the concept masterplan stage in terms of the existing site features and retaining elements. The existing trees and hedgerows, drainage ditches, archaeological and ecological aspects have been considered. This process has been important in determining an end masterplan layout whilst being respectful of the landscape fabric.

The existing trees and hedgerows pertaining to the said lands have been reviewed by the Consulting Arborist (Independent Tree Surveys), the Consulting Ecologist (Open Field) and the Consulting landscape architect (doyle + o'troithigh landscape architecture ltd.) The initial findings of the tree survey and associated Arboricultural Impact Assessment have been included within this SHD application.

It has been collectively considered that the tree and hedgerow species throughout the core of the site lands will be removed to facilitate development. The hedgerows as part of the tree survey have generally been categorised as fair or fair/poor; given that they have been unmanaged over time. As well as the condition assessment, the 'visual appeal' has been considered also and the hedgerows potential to transition well from an open agricultural setting to a formalised residential scheme would not be considered successful. Given the poor overall visual appeal, as referenced in figure 4 and 5 below, it is recommended that the hedgerows are removed from the central core of the scheme. Refer to supporting Tree and Hedgerow Survey Report (including the Arboricultural Impact Assessment) prepared by Independent Tree Surveys for further detail with regard to condition of existing vegetation, recommendations and associated arboricultural impacts.

Fig. 4. View of typical hedgerows on site.

Fig. 5. Presence of unmanaged hedgerows on site.

The Ecological Assessment of the said lands has been carried out by Openfield Ecological Consultants. A collaborative approach has been adopted with regard to the development of the scheme including the protection and reinforcement of the site's 'Green Infrastructure'. It is proposed that the western and northern hedgerows (many of which are present on adjoining) lands are retained and enhanced as part of the overall scheme. This will create a strong and reinforced boundary to the scheme, will mitigate in part against the loss of a series of hedgerows throughout the scheme, will provide opportunity to increase the site's biodiversity and will improve linkages in terms of green infrastructure and the wildlife corridor to connect with the hedgerows of the adjoining hinterland. It will ensure connectivity of habitats with the surrounding countryside – something which will benefit birds, invertebrates, flora and mammals (including bats). There are no significant water courses on the site and drainage ditches are not suitable for migratory or salmonid fish. The site is connected to the Broadmeadow River, which is of salmonid quality, and water quality is to be protected through the use of SUDS.

In terms of drainage ditches present on the lands (and in association with existing hedgerows), these are difficult to translate to formal open spaces given their visual appearance in a neatly maintained landscape, concerns over impact on inter-visibility, health and safety concerns for users given their potential to hold water and sharp side slopes and many do not simply align with future design lines within the schemes open space.

Along the western boundary, the existing drainage ditch is to be retained and shall be widened (with side slopes in the order of 1.4) to accommodate for attenuation for the existing industrial lands to the west of the scheme. The side slopes are relaxed along the eastern edge in the order of 1:4 to alleviate any health and safety concerns. This widened drain shall be allowed to regenerate naturally as advised by OpenField Ecological Consultants. This will create a feature in the landscape and offer an experience for the greenway user to view this zone at varying stages depending on the season; either as open water, a dry ditch with naturally occurring hedgerow and herbaceous species or a mid-way ground between the two.

In order to ameliorate against the potential loss of green infrastructure, further ecological compensatory measures are proposed as part of the scheme which include the provision of bat boxes at appropriate locations, the planting of native hedgerows (linking to boundary hedgerows where possible), developing new compensatory woodlands, planting of flowering trees which are beneficial for pollinators, planting diverse meadow mixes and managing key grass areas zones as meadows.

The key objectives of the landscape proposals specific to this development are:

- To provide a landscape scheme which delivers a high level of visual amenity and passive recreation for the residents all year round;
- To create an attractive, high quality landscape for the residents and their lifestyles. Well-designed landscapes, especially in neighbourhoods contribute to an overall sense of well-being by providing places for people to meet up for a walk, for collaboration or just to chat. People places are successful places.
- To ensure that the plant materials proposed are suitable in terms of scale, species selection, on-going maintenance and overall longevity;
- To adopt a repetition and rhythm of plant species to ensure a cohesive style and an overall consistency.
- To adopt ecological compensatory measures for the scheme, including the objective to retain and reinforce the western and northern boundaries of the scheme which will provide a positive aspect to the landscape and offer significant ecological mitigation measures. To establish a landscape which enhances and offers cohesiveness with the adjoining '(The) Willows' development
- To sensitively incorporate a dedicated greenway along the western and northern edge of the offering a positive element to the scheme in terms of its visual appeal, health benefits, and promotion of connectivity both within and surrounding the scheme (including connections to the town centre of Dunshaughlin).
- To include a landscape strategy around creation of safe and pleasant pedestrian and cycle routes through the scheme. All cycle/pedestrian routes throughout the scheme have been developed to ensure a supporting lighting scheme is proposed, passive surveillance is achievable and that a quality landscape is developed offering a variety of experiences.

Fig. 6. Colour and variety to open space planting

Fig. 7. Sustainable trees which are suited to the the scale of the open space area

The proposed landscape design relates to the following key areas:

2.1 Open Space

The location and positioning of open spaces have been considered in detail as part design development stage. They have been considered in terms of proximity to end users as well as being positioned to provide passive surveillance. Uniting the built form to the landscape, where it can provide passive and active recreation will benefit the health and lifestyle of the end user. The open space arrangements are varied in size and form, aspect and function and will to provide a range of opportunities for the future users of the scheme. These spaces have the ability with the surround-built elements to create a localised character offering an opportunity for living and play.

Some of the spaces are large and open offering opportunity for active recreation (kickabout zones, walking, jogging) and greater opportunity for statement artwork, compensatory woodland blocks, large meadow areas and natural play); more intimate and enclosed spaces are also proposed with seating zones with good aspect offering opportunity for local gathering, grass mounding for interest and play, interconnecting pedestrian links to pre-empt desire lines and feature tree planting with an element of native planting species.

'Linear' open spaces are also provided which promote active recreation in the form of walking and cycling with appropriate rest stops. To the west of the scheme, a combined cycle/walking route, partly within the woodland arrangement is proposed which forms part of a wider circuitous linking route of the scheme and outwards towards adjoining developments and the town centre of Dunshaughlin. A further 'linking' linear park is proposed in an east-west arrangement which is further enhanced by a mixed woodland understorey planting with a native element, and a mix of tree planting with blocks of grass areas managed as a meadow.

As a general note, the following key elements have been considered as part of the open space design and the protection and overall reinforcement of the sites 'Green Infrastructure': (refer to supporting Landscape Plan prepared)

- Pathways (and in some cases cycleways) which link to surrounding pedestrian routes. Consideration of potential desire lines within and beyond the site have been assessed
- Structural tree planting and meadow grass mixes with diverse seed range
- Naturalised bulb planting and largely native hedgerows.
- Grass mounding to provide form and visual interest; and offer a sense of enclosure
- Focussed formalised orchard with a species rich meadow to improve overall biodiversity
- Informal kick-about space
- A variety of seating zones with good aspect.
- Attenuation will feature below ground; avoiding impact with tree planting to aid future maintenance
- Formalised playgrounds (including opportunity for natural play)
- Opportunity for installation of art to aid place-making
- Opportunity for active and passive recreation

Fig. 8. Feature elements of designed open space (concept images)

Fig. 8. Feature elements of designed open space (concept images) – continued.

The open spaces within the SHD lands vary in size and form and the **quantum and quality of the Public Open Space** has been defined below. The designed open spaces have been developed on the basis of linkages and connectivity throughout the scheme; pre-empting desire lines has been critical. People places are successful places and it is envisaged that these spaces will be actively used and enjoyed by future residents which will bring about a great sense of ownership and overall pride.

(a) Large Formal Open Spaces:

- The largest proposed open space on the F1 zoned lands is located to the east of the site. (The F1 zoning is *'to provide for and improve open spaces for active and passive recreational amenities'* as per the Meath County Development Plan 2013-2019) This large space (some 2.0 Ha) includes the following key elements:

  - A large formal playground with play facilities to account for a range of age groups; from 1- 15 years. The play facility is proposed to the south-western edge of this open space where there will be an intensity of activity from the commercial centre and adjoining residential units. Whilst this space will be overlooked, it will be edged with suitable tree and shrub planting to provide comfort and an amenity value for the end use. The play facility will be finished in a wetpour safety surface and will be edged with a fence in line with industry standards.

  - Pathway links throughout the space are proposed to account for intended desire lines and linkages through to the proposed scheme and to future developments beyond; and in particular to the playing pitch facility and associated bus stops on the outer relief road.

  - Native woodland block offering a feature within the open space to provide amenity interest, as well as providing a compensatory woodland as part of environmental mitigation measures.

  - Open green areas offering multi-functional zones for kickabout and play and associated grass mounding (of a suitable scale to address future maintenance operations) to offer visual appeal

    Meadow grass areas – part of this open space shall be managed as a meadow grass area which essentially means it will cut 2-3 times per annum. This management principle reduces maintenance, encourages more species diversity, improves the sites biodiversity, and offers a variation within the ground plane of the parkland.

  - Semi-matures trees, of a mixed variety, which will establish well in an open parkland. Many of the species will be grouped together in order to give greater appeal and impact.

  - Naturalised bulb planting throughout the grass sward to offer visual appeal and seasonal interest.

  - Opportunity for site specific artwork within this space

- A further large open space is proposed to the west of the site. This space covers an area of 0.9Ha and contrasts with the aforementioned open space as it is more formal in nature. Suitable fastigiate trees are proposed around the perimeter to reinforce its formal arrangement.

  Similar to the F1 zoned lands, this space will include formal pathways considering local desire lines, open green areas for active recreation, meadow grass managed zones and formal tree planting. It will also provide the following elements:

  - A gridline arrangement of semi-mature trees to provide a formal landscape element and added interest.

  - A formal playground, catering for young age groups with play elements more 'natural' in style. This play facility will be fully fenced but it is proposed that the finish will be of a resin bound bark mulch which will have a more organic appeal.

  - Potential opportunity for gym equipment at key locations.

  - Seating with good aspect, offering rest stops along all pedestrian routes

(b) Pocket Parks

- There are a number of pocket parks proposed throughout the scheme which will individually offer a variation in character and amenity value. The pocket parks proposed throughout the scheme will be reflective and complimentary of the varying 'character zones' which will be visible throughout the built elements of the scheme. The colour palette of hardscape external elements in conjunction with the built finishes will be considered in detail. The 'key' pocket parks proposed can be noted as follows:

- The proposed formal pocket parks (2no.) to the west of the scheme refer. Both (some 555sq.m. each) offer a similar approach in terms of design; however the plant material proposed offers sufficient variation to ensure these spaces have their own identity. It is proposed that these pocket parks will offer the following key features:

  - Seating space set beneath a grid line of formal specimen trees. The ground plane shall receive a bound gravel arrangement to soften the hardscape elements within that zone.
  - Pathway linkages connecting the western 'greenway' to a large formal open space
  - Perimeter planting of hedging and ornamental sedges to provide vegetation with movement and strong seasonal appeal.

- The formal pocket park to the north of the scheme refers, which accounts for an area of

some 860 sq.m. It is proposed that this pocket park will offer the following key features:

- Formal playground catering for young ages. This playground will be finished with wetpour arrangement and will be fenced in accordance with industry standards.
- Formal specimen tree planting, grass mounding, and pathway linkages will also be provided within this space.

- A further pocket park is proposed to the west of the main boulevard; located between the duplex blocks, which accounts for an area of some 802sq.m. It is proposed that this pocket park, which is open in nature, will offer the following key features:

  - Formal playground catering for young ages.
  - A pedestrian linkage connecting the user to the main open space at the F1 open space lands.
  - Buffer planting along the eastern edge from the main boulevard.
  - Good aspect for users

- A pocket park also is proposed to the south of the scheme; where is adjoins the east-west linear park with the associated cyclelane/footpath linkage. This park is some 0.2Ha in size and included the following key features:

  - South-facing aspect
  - Formal playground facility
  - Edge planting to the north to offer a buffer from built units whilst still allowing for passive surveillance

- Added advantage of being connected to the east-west linear park; which offers ease of access to and from the core commercial development and to Dunshaughlin Town Centre.

There are three no. further pocket park/open space areas which include:

- A peripheral open space to the north east (0.18 Ha.) and south-east (0.12 Ha.) of the scheme.
- Small pocket park within the confines of the built development to the south-east of the scheme. (500 sq.m.)

(c) Linear open space

The following linear open spaces are proposed within the scheme; namely that to the west (in a north-south arrangement) and to the south (in an east-west arrangement).

- The western linear edge includes a combined cycle footpath, in the order of 3.5m in width. It is proposed that this pathway link will meander close to the edge of the western hedgerow which is scheduled for retention. The protection of this tree line will therefore maintain some connectivity and continuity to the vegetation; and will allow a continuance of the existing wildlife corridor and habitat services provided by the trees and hedges. This will particularly benefit bats, certain species of which are known to rely on these routes for foraging. Where possible, the western edge will receive blocks of woodland planting to further reinforce the edge.

  To the southern portion of the linear space, the existing open drain shall be widened (to accommodate attenuation requirements for the existing industrial lands). The widened drain (along its eastern edge) and where it adjoins the proposed cycle/footpath link will receive a side slope of 1:4 to avoid any health and safety risks. This widened drain will be allowed to regenerate naturally.

  The linear open space will offer access through to the existing residential development to the north. The linear open space connects to a more open public space to the north which accommodates stormtech attenuation.

- The southern linear space (orientated in an east west direction) includes a formal designated cycle lane and footpath arrangement. It is proposed that the aforementioned route will meander through this space where it will connect with the formal central plaza and a network of pedestrian linkages to the adjoining proposed residential units.

  Swales and a stormtech attenuation arrangement are proposed along this route and the landscape scheme has developed sensitively to accommodate the same.

  Mixed tree planting, open grass zones, meandering pathways, site specific planting and outer ‘seamless’ connections to the adjoining residential units will make this space.

2.2 Front Gardens / Internal Access Roads

It is proposed that the internal access roads will receive specimen trees, suited to streetscape development; where possible. Size, seasonal interest, colour and variation have all been considered in choosing specific trees for these locations. Supporting shrub planting will be included along these routes to ensure an overall unified approach is adopted. Tree planting will be coordinated with site lighting in accordance with requirements set out by Meath County Council. For the purposes of this planning application, finishes to front gardens have been shown in grass. However, it is considered that as the scheme materialises, hedging and further shrub and herbaceous planting shall be added to provide seasonal interest and colour.

2.3 Boundary Treatment (including Greenway) – northern and western edge

It is proposed that the existing vegetation (tree and hedgerows) to the north and west of the site, some of which are actually located outside of the site boundary, shall be retained and receive amelioration works where applicable. Furthermore, it is proposed that a woodland mix of planting is proposed along the western and northern edge, where space allows to reinforce the boundary, aid screening and improve the overall biodiversity of the site.

As part of the land use zoning objectives, and as noted above, a greenway is proposed along the western edge. A combined cycle footpath, with a consistent surface treatment, likely to be a buff bitmac finish, is proposed along the western and northern route where it will link with Willows Phase 1C to the south and the existing residential development of Coledrick's Pass to the north. It is envisaged that the route will weave through a newly proposed light canopied woodland inpart with a diverse and rich understorey which will aim to mitigate against potential ecological loss throughout the site. The greenway will link to a series of pathway routes throughout the site offering permeability and connectivity throughout the scheme. As noted the above, the greenway will also be edged by a widened open drain along the western edge. The widening of the drain is proposed to accommodate attenuation for the adjoining industrial lands to the west. The eastern side slopes of this drain shall be relaxed to 1:4 to any potential safety concerns and it will be allowed to regenerate naturally forming a new 'green' feature within the proposed development.

2.4 Open Space for Apartments/Duplexes

The apartments and duplex blocks are served by a mix of defensible, communal and plaza type spaces, depending on location, however all units are located in close proximity to a substantial provision of public open space across the site ensuring a high quality residential environment with generous open spaces for future residents. The apartments shall receive a landscape treatment which will include the following key features:

- Edge treatment in the form of evergreen shrub planting along the building facade to ensure a consistent edge treatment. Where recesses are proposed within the building alignment and wider planting blocks are possible, it is proposed that these areas will receive a block of herbaceous planting with an under planting of spring bulbs to provide some seasonal interest.

- Formal specimen tree planting is proposed along the eastern edge of the apartment blocks to provide a 'buffer' to the outer relief road. Proposed tree planting is fully coordinated with proposed lighting.

- The external space to the apartment block includes a proposed landscape space over a podium arrangement. These zones have been developed to include formal pedestrian access to building, seating zones with good aspect, screening of ventilation, ornamental planting and formal hedge planting to edge the space. The finished planting scheme has been developed in accordance with restricted soil zones over the proposed podium arrangement.

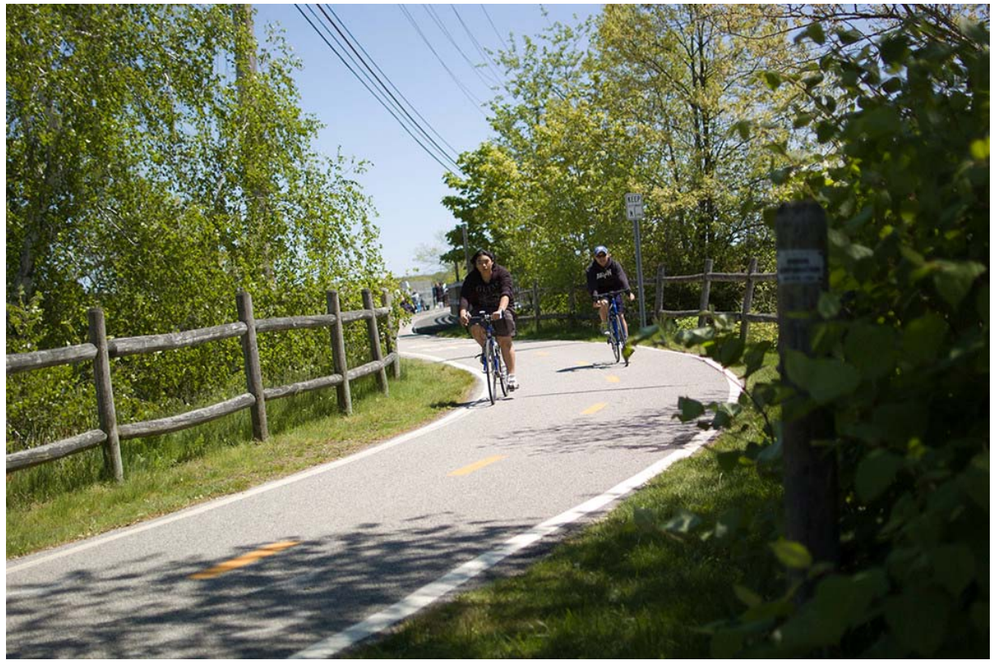

Fig. 9. Proposed 'Greenway' along the western and northern edge of the development lands

3.0 Planting Programme

Planting on site will commence with the completion of each stage of the works and as a result the programme is closely tied to construction operations.

Fig. 10. Quercus rubra

Fig. 11. Bulb Planting (Narcissus 'Dutch Master')

Ground preparation will precede planting and will include weed clearance and soil amelioration where necessary.

Fig. 12. Fagus sylvatica (Hedge)

Fig. 13. Crocus

Planting will largely be carried out during the dormant period from November – March, with grass seeding carried out from April – September. A 12 months defects liability and landscape maintenance period will be set in place for all plant material with plant failures being replaced in the following planting season.

Plant materials selected for this residential scheme will largely follow the planting plans provided within the application. The following landscape specification as outlined below shall be adopted in accordance with best practice.

1.0 Standards of Workmanship and Materials

The Contractor shall satisfy the Employer's Representative that all works have been carried out to comply with BS 4428:1989 (General Landscape Operations) and BS 3936-1:1992 (Nursery Stock).

It is essential that the site is tidy at all times and that the planting appears healthy. The Contractor should be prepared, at all times, to ensure that such conditions are met, and should include for this in his rates.

Any material not meeting the specifications or qualifying for the approval of the Employer's Representative, for whatever cause, shall be rejected.

The Contractor shall familiarize himself with the layout of services and the positions of all structures on the site and shall be liable for any damage to the above.

1.2 Work by Machine or Hand

All operations hereinafter described will be carried out by suitable approved machines or by hand. Any work around the bases of existing trees, saplings, footpath edges, manhole covers, underground services etc. which cannot be carried out by machine for any reason shall be executed by hand and the Contractor must include for this in his rates.

1.3 Unsuitable Weather

Excavation, filling, cultivation, planting and other works will be suspended in wet weather and when conditions are unsuitable and the Contractor shall allow in his prices for such eventualities.

1.4 Planting

"Suitable weather conditions" for planting will mean open weather (i.e. mild, dull and moist even in winter). Planting operations will be suspended in periods of drought, when soil is frost-bound or water-logged and in periods of persistent drying cold winds. The Employer's Representative reserves the right to halt the works should the Employer's Representative consider the working conditions or the weather unsuitable.

1.5 Planting Season

The planting season has been addressed as part of the program of works scheduled in item 4.0. Containerised plants may be planted throughout the year provided the weather is considered suitable, the soil is sufficiently moist and each plant is watered following planting.

Planting outside the specified planting period will only be permitted in exceptional circumstances at the discretion of the Employer's Representative; such exceptional circumstance shall include unsuitable weather and no penalty shall be incurred under the heading of liquidated damages provided that any delay is formally accepted by the Employer's Representative as attributable to this cause. In the event that works are delayed by inclement weather, the Contractor shall complete them at the earliest opportunity afforded by suitable weather conditions.

1.6 Approved Chemicals

All chemicals used will be non-toxic to human beings, birds and animals under normal use. No chemicals will be used for any purpose without the prior approval of the Employer's Representative. The Contractor will submit a list of all chemicals to be used to carry out the contract prior to commencement.

1.7 Planting Generally

The Contractor shall be responsible for setting out all areas of planting to the satisfaction of the Employer's Representative.

1.8 Notice of Intentions

The Contractor will give 48 hours notice to the Employer's Representative of his intention to commence any of the following operations: tree and shrub removal, setting out, planting, fertilising, herbicide application and maintenance visits. Alternative notification requirements may be stated relating to specific items and these over-rule this general requirement.

PREPARATORY WORKS

1.9 Litter, Debris Removal

All litter, debris and clippings, are to be removed from the entire area of the site before planting operations begin. No burning shall be allowed on site.

1.10 Planting Areas

The Contractor shall clearly mark boundaries of all planting areas and obtain approval of setting out by the Employer's Representative before commencing work.

1.11 Weed Removal

In areas to be ripped all aggressive perennial weeds, dock, thistles and nettles are to be eliminated from the site.

In areas where existing grass is to be removed and the soil cultivated a combined contact/ translocated herbicide is to be applied to remove all grass and weeds.

1.12 Surface cultivation

Surface cultivation will consist of rotovating the topsoil to a minimum depth of 450 mm over shrub areas, care to be taken to ensure that the subsoil is not brought to the surface. It shall then be worked to reduce the topsoil to a fine tilth. Works within the planting beds will require hand working and the contractor shall include this in his price.

After cultivation, all debris, perennial weeds and stones over 25mm in any dimension are to be removed off site.

Final grading is to be carried out to ensure the true specified level and slope and to avoid minor ridges, dishing or other depressions where water may collect.

Unless otherwise stated, finished levels of shrub planting areas will be 50mm above adjoining paving or kerbs, retaining wall copings, manhole covers etc. and levels will be arranged to give gentle falls for drainage and to avoid ponding hollows.

Any area unduly compacted during the work of grading will be loosened by forking. The use of heavy rollers to roll out mounds will not be permitted.

Landscape Specification Softworks

2.1 Plants generally

All trees, hedging, specimen shrubs, shrubs, ground cover planting and bulbs, shall conform fully to the specification in respect of species, size and quality. The Contractor shall name the supplier in his tender for approval by the Employer's Representative . All plants shall be well grown, sturdy and bushy according to type and free from all diseases and defects. Shrubs shall be container grown, rootballed or bare rooted as stated in the plant schedules. If container grown, root growth shall not have been restricted by the containers. The Employer's Representative reserves the right to reject any plant material (not previously approved) before or after planting if it does not conform to the specification. All plant material which does not conform to the specification will be automatically rejected and must be removed from site and replaced at the Contractors' expense.

2.2 Materials

All plant material shall be good quality nursery stock, free from fungal, bacterial or viral infection. Aphids, Red Spider or other insect pest, and physical damage. It shall comply with the requirements of the following sections of B.S. 3936-1, Specification for Nursery Stock, where applicable:

Part 1:	1992:	Trees and Shrubs.
Part 2:	1990:	Roses.
Part 10:	1981:	Groundcover plants.
Part 9:	1992:	Bulbs, corms and Tubers

All plants shall have been nursery grown in accordance with good practice and shall be supplied through the normal channels of the wholesale nursery trade. They shall have the habit of growth that is normal for the species.

Except for any cultivated varieties or exotic species which do not set viable seed in Ireland, all plants shall have been grown from seed.

The Contractor will be deemed to have advised his suppliers of the relevant sections of this specification, including all protection required, at the time of enquiry and shall in all cases be liable to replace materials brought on site which are not in accordance with this specification.

2.3 Species

All plants supplied shall be exactly true to name as shown in the plant schedules. Unless stipulated, varieties with variegated or otherwise coloured leaves will not be accepted, and any plant found to be of this type upon leafing out shall be replaced by the Contractor at his own expense.

Bundles of plants shall be marked in conformity with the relevant part of B.S. 3936-1. The Contractor shall replace any plants which are found not to conform to the labels.

2.4 Plants/Trees - General

Condition: Materially undamaged, sturdy, healthy and vigorous.

Appearance: Of good shape without elongated shoots.

Hardiness: Grown in a suitable environment and hardened off.

Health: Free from pests, diseases, discoloration, weeds and physiological disorders.

Budded or grafted plants: Bottom worked.

Root system and condition: Balanced with branch system.

BS Standard: The relevant sections of BS 3936.

Species: True to name.

2.5 Container Grown Trees/Rootballed Trees/Shrubs

Growing medium: With adequate nutrients for plants to thrive until permanently planted.
Plants: Centered in containers, firmed and well watered.
Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
Hardiness: Grown in the open for at least two months before being supplied.
Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

2.6 Certification

The Contractor will provide a certificate to the effect that all plant materials are fully in accordance with the specification and with BS 3936. All trees shall have a Certificate of Provenance Declaration Form and the number of times a tree has been transplanted shall be certified.

All plants will be inspected by the Employer's Representative at time of planting for variety and size, but approval from this inspection will not preclude rejection of plant material for defects which may appear later during the progress of the works.

2.7 Identification

One plant of each group, bundle or batch of plants will bear a permanent label of metal or other indestructible material, securely attached, having the full botanical name thereon.

2.8 Plant/Tree Substitution

Upon submission of substantial evidence that certain plant materials are not available at the time of contract, the Contractor will be permitted to substitute other plants with the approval of the Employer's Representative with an adjustment of price if necessary, to that originally specified. Submit alternative stating price and difference from specified plants/trees.

2.9 Damage

All plants are to be adequately and carefully packed and protected to survive transport, by whatever means, to the site, without damage in loading, transit or unloading. If, in spite of these precautions, roots, branches or shoots suffer slight damage they are to be carefully pruned. If major damage has occurred the plants will be rejected and replaced at the Contractor's own expense.

2.10 Heeling In

Non-Applicable

2.11 Planting Generally

All planting to be carried out during planting season October - March; unless otherwise detailed by the project programme.

2.12 Herbicides

Glyphosate - 'Roundup' by Monsanto Chemicals Ltd. Do not apply when rain is forecast within six hours. Do not apply when wind is likely to cause spray drift (over 24 kph/15 mph). Allow leaf symptoms to develop before carrying out any cultivations.

Basta - by Hoechst Ltd. Do not spray when wind is likely to cause drift (over 24 kph/15 mph). Protect all foliage of transplants or shrubs.

Propyzamide - 'Kerb 50W'. Apply between 1st October and 20th December only, when ground is damp. Ensure complete cover of the ground.

Pistol - Contains: 250g/L glyphosate & 40g/L diflufenican. Apply Pistol post-emergence of weeds at any time from March until the end of October, provided that the weeds are actively growing. Annual broad-leaved weeds should have at least two fully exposed leaves, and annual grasses should be at the one leaf growth stage or beyond. Some perennial weeds, including Docks, Perennial Sow Thistle and Willowherb are best treated just before flowering or the setting of seed.

The Contractor may use alternative formulations of the above herbicides, by other manufacturers, with the prior approval of the Employer's Representative. Such alternative formulations shall be applied to give the same degree of control as the application provided for in the Schedules of Quantity.

2.13 Weedkiller Application

All weedkiller shall be applied to manufacturer's recommendations with properly designed equipment, maintained in good working order and calibrated to deliver the specified volume, evenly and without local over-dosing.

The Contractor may, with the Employer's Representative s prior agreement, apply foliar acting weedkillers with an ultralow-volume applicator. The rate of application shall be such as to achieve the same control as the general rate specified. Such application shall not be used post-planting, nor with fosamine ammonium.

2.14 Fertilisers – General Fertiliser

Fertiliser to be agreed with Employer's Representative in advance of fertilizing operations.

Apply evenly over all planted areas at manufacturers specified rate g/sq m prior to the application of mulch.

Soil Conditioner/Ameliorant

Manure: Spread well-rotted horse or farmyard manure or farmyard dung over all planted areas @ 1cubic metre per 10 Sq.m. prior to cultivation. (Poultry or pig manure will not be permitted on this site.)

2.15 Cultivation to Shrub Beds

The Contractor shall cultivate planting areas to break up the imported soil to a depth of 300-400 mm by the use of suitable machinery or by hand as necessary. After cultivation the areas is to be graded, stone picked and all stones, debris and the like in excess of 25mm in any dimension shall be removed from site. Spread the following over the planted area:

Manure: 25mm depth

General Fertiliser: To manufacturer's instructions

2.16 Planting rootballed Semi-mature trees:

Excavate pit to dimensions as noted in above clause or to a diameter 400 mm greater than rootball/container. Stockpile topsoil for re-use. Remove excavated subsoil, weeds, roots, stones and rubbish over 50 mm diameter to tip, and make up with topsoil. Fork over the base of the pit to decompact thoroughly.

Supply and incorporate the following ameliorants evenly into the backfill beside the pit:-

Moist manure: 0.047cu.m

Slow Release Fertilizer 'Osmo Pro 2' Apply to manufacturers recommendations

(Note: Osmo Pro 2 is available from White's Agri, Ballough, Lusk, Co. Dublin.

Place spring-ringed or container grown tree upright in centre of pit, and orientate to best effect. Partially backfill the pit, to hold rootball steady. Probe the rootball on the west side of the tree for the stake. Drive 2 no. 1950 x 100 mm diameter stakes to leave 650mm over the ground.

Backfill pit in layers 150 - 225 mm deep, to set rootball at same depth as in nursery, allowing 50 mm for settlement. Firm backfill.

Secure tree to cross bar (for double-staking) using rubber flat back block and rubber tie.

Unless the soil is already wet, water thoroughly before placing the last layer of soil and allow to drain.

2.17 Stakes for Trees.

Stakes: Softwood (preserved), peeled chestnut, larch or oak, free from projections and large or edge knots and with pointed lower end.

Nails: To BS 1202: Part 1, galvanized, minimum 25 mm long and with 10 mm diameter heads.

The stakes shall be set vertically into the ground, and shall be set on the windward side of the tree as agreed with the Employer's Representative. Drive stakes before planting with a drive-all, wooden maul or cast iron headed maul, not with a sledge hammer. Refer to landscape drawings enclosed.

2.18 Tree Ties

Ties are to be approved by the Employer's Representative prior to their use. Tree ties shall be of rubber, PVC or proprietary fabric laminate composition, and shall be strong and durable enough to hold the tree securely in all weather conditions for a period of three years. They shall be flexible enough to allow proper tightening of the tie.

Ties shall be min. 45 mm wide. They shall be fitted with a simple collar spacer to prevent chafing, and with a buckle for adjustment. Nail each tie to the stake with one galvanized nail immediately behind the buckle, leaving the tie end free for adjustment. Non-adjustable, buck-less types will not be permitted.

2.19 Tip Pruning

Include for tip pruning of all standard trees. Pruning will be undertaken to reduce the crown volume, while retaining a proportion of live buds on each branch. The extent of pruning for each species will be instructed on site. Leading shoots shall not be pruned.

2.20 Shrub & Herbaceous Planting

Remove pots, wrappings or containers. Excavate for rootball. Insert plant into ground with minimum disturbance of its roots so that the soil level of the pot matches the surrounding soil level. Do not cover or damage dormant resting buds or shoots.

2.21 Cutting Back

Plants scheduled for cutting back shall be cut back after inspection. They may be cut back before or after planting. Cut back to approx. 200 mm above ground level, making a sloping cut slightly above a live bud. Cuts shall be made with a sharp pruning knife.

2.22 Watering

All root balled and pot grown plants shall be well soaked before planting. All planting shall be watered after planting, to consolidate soil around the roots, unless ground is so wet as to make additional water unnecessary.

2.23 Replacements

The planting will be inspected in Spring and again in the September following planting. Any tree or shrub found to have died from any cause except as provided below or the work of other contractors shall be replaced by the Contractor at his own expense. Replacement planting shall conform in all respects with this Specification, including all specified excavation, provision and incorporation of all fertilizers and ameliorants, and weedkiller treatments.

Failures will not be charged to the Contractor in the following cases:-

- Damage by hares or rabbits, where not protected by fencing or shelters.
- Damage by livestock, where not protected by fencing.
- Failure solely due to prolonged dry weather, except where the Contractor will be responsible for watering.
- Losses due to theft, vandalism or disturbance by other contractors.

Persistence of weed in planted areas will be regarded as a contributory cause of failure due to drought. Prolonged dry weather will not exonerate the Contractor if the scheduled aftercare operations have not been carried out as programmed.

2.24 Setting Out

Setting out shall be from figured dimensions where indicated, and otherwise by scaling. All planting areas shall be set out and agreed with the Employer's Representative prior to any planting.

Shrubs and ground covers planted in mass shall be at the spacing indicated on the drawings. Shrubs shall not generally be planted closer to a kerb or to the edge of a planting area than a distance equal to half the spacing indicated for that species.

2.25 Workmanship

A high quality of finish will be expected at all times.

Shrubs and Mixed Transplants/Shrubs: Leave surface reasonably even, free of all stones and debris over 50 mm diameter, free of weeds.

Shrubs and Ground Covers: Rake off surface, to leave even, free of all stones over 30 mm diameter, and free of weeds, before mulching.

2.26 Mulching & Hand-edging

The contractor shall allow for edging around all existing trees; i.e. by providing a clean edge with a hand edger to a depth of 100mm. All excess topsoil derived from the edging process to be removed from site. Allow for topping up of all 'edged' areas (i.e. 500mm radius around trunk of tree) with medium grade bark mulch to a depth of 50mm.

Allow for mulching on all formal shrub planting and hedging areas, as well as a 1.0m diameter circle around all existing and proposed trees; to a depth of 50mm.

Contractor shall allow for edging around all existing light posts, site structures (should as mini-pillars, postboxes) within the context of the contract area. Mulching in accordance with the above shall also be carried out.

2.27 Grass Seeding

GENERAL INFORMATION/REQUIREMENTS

2.28 Seeded Areas

Growth and development: Healthy, vigorous grass sward, free from the visible effects of pests, weeds and disease.

Appearance: A close knit, continuous ground cover of even density, height and colour.

2.29 Topsoil

Allow for topping up to allow for an even grass sward to be prepared post contract works.

2.30 Climatic Conditions

Carry out the work while soil and weather conditions are suitable. Grass seeding to be carried out during the first available opportunity, depending on weather conditions.

2.31 Machines and Tools

Use only machinery and tools suitable for the site conditions and the work to be carried out. Use hand tools around trees, plants and in confined spaces where it is impracticable to use machinery.

2.32 Watering Generally

Ensure the full depth of topsoil is thoroughly wetted.

Use a fine sprinkler or oscillating spray.

Frequency: As necessary to ensure the establishment and continued thriving of seeding.

2.33 Water Restrictions

If water supply is or is likely to be restricted by emergency legislation do not carry out seeding until instructed. If seeding has been carried out, obtain instructions on watering.

2.34 Setting Out

Clearly mark boundaries of seeding areas and obtain approval before starting work.

2.35 Preparation Materials Generally

Do not use materials containing concentrations of toxins, pathogens or other extraneous substances harmful to plant, animal or human life.

Submit to the Employer the seed supplier's certificate for the following materials and obtain approval before ordering or using the materials:

Source of supply

Analysis of content

Confirmation of suitability for proposed purpose

Confirmation of absence of harmful substances.

2.36 Herbicide

Weeds shall receive a herbicide suitable for suppressing perennial weeds. During the fallow period before cultivations.

2.37 Cultivation

Break up any compacted topsoil to full depth.

Reduce top 100 mm of all topsoil to a tilth suitable for blade grading (10 mm down particles).

Remove undesirable material brought to the surface including stones and clay balls larger than 50 mm in any dimension, roots, tufts of grass and foreign matter.

2.38 Grading

When topsoil is reasonably dry and workable grade to smooth, flowing contours, with falls for adequate drainage, removing all minor hollows and ridges.

Unless otherwise stated, finished levels after settlement to be 25 mm above adjoining paving, kerbs, manholes etc.

Soil levels may be adjusted by blade grading ensuring that there is nowhere less than 150 mm of topsoil. If the required levels cannot be achieved by movement of the existing soil, obtain instructions.

2.39 Fertilizer

Fertilise grass during seeding with Contractors choice of fertilizer. Fertiliser to be applied to manufacturer’s instructions.

2.40 Final Cultivation

After grading carry out further cultivation to reduce top 25 mm to a fine firm seed bed with good crumb structure.

Rake with chain harrow, drag mat or hand rake to a true, even surface, lightly firmed but not over compacted, removing all stones and earth clods more than 50 mm in any dimension on general areas.

Extend cultivation into any adjacent existing grass areas to ensure full marrying in of levels.

Obtain approval of appearance of prepared soil areas before seeding.

2.41 Quality of Seed

Purchase fresh seed for each growing season. Do not use seed purchased for previous seasons.

Use blue label certified seed varieties complying with EC regulations for purity and germination and also complying with the Ministry of Agriculture Fisheries and Food Higher Voluntary Standard.

Samples of mixture: supply when requested

2.42 Sowing

Sow seed in calm weather during early autumn in accordance with B.S. 4428

Spread seed evenly at the specified rate(s) applied in two equal sowings in transverse directions.

Lightly harrow or rake.

On light soils roll and cross roll after seeding using a lightweight roller.

2.43 Seeding for general grass amenity areas:

Mixture: 40% Perennial Ryegrass

40% Creeping Red Fescue

20% Chewings Fescue

- Supplier and reference: n/a
- Rate of application: Seed @ 35g/Sq.m.
- Increase rate of application by 50% for slopes exceeding 1 in 3

2.44 Edges to Seeded Areas

Locations: Planting beds and around newly planted trees.

Timing: After seeded areas are well established.

Arisings: Remove.

PROTECTING/WATERING/CUTTING

2.45 Watering

During establishment of grass areas ensure that sufficient water is applied using a fine sprinkler or oscillating spray to maintain healthy growth.

Planting sites: Form level, stepped or gently sloping areas as scheduled and/ or appropriate to planting water depths and container/ bag sizes and shapes.

2.46 First Cut of General Grass Areas

When grass is 100 mm high, remove debris, litter and all stones and earth clods larger than 25mm in any dimension, and when grass is reasonably dry, cut to approximately 25 mm high using appropriate machinery.

Arisings: to be collected and removed off site.

2.47 Cleanliness

Remove soil and arisings from hard surfaces and leave the works in a clean, tidy condition at Practical Completion and after any maintenance operations.

4.0 General Landscape Performance Standards

The regular care and maintenance of any area of landscape has a profound effect on its appearance, its value as an amenity and, even in the longer term, its plant structure and overall nature. The right levels of maintenance, and the methods to be used, will vary considerably from site to site and as well as being influenced by the layout and use, will also be a reflection of the soil types, topography, exposure to the elements and local climatic variations.

Matching the maintenance regimes to the needs of a site is a major part of landscape management and it is not possible to give any absolute prescription or standard specification that can be applied for a particular type of landscape. However, this chapter attempts to describe and define the main operations that go into routine maintenance. Under the heading of each main type of landscape feature there are performance specifications and objectives for the various operations.

Type	Description	Maintenance Objective	Maintenance Operations
Amenity Grass Areas	Amenity grassland describes all natural and semi-natural grassland used for recreation purposes as distinct from that used for productive agriculture. It forms the major part of the landscape and its maintenance requires more time during the summer growing season than any other activity.	To provide an even stand of vegetation of uniform height and colour comprising predominantly grass species, although a small percentage of dichotyledenous plants - no more than 5 per cent - will be accepted.	• Mowing shall be carried out using a cylinder mower to maintain the vegetation length within the limits of 30 mm and 35mm during April to August inclusive and between 35 mm and 50 mm during the rest of the year. (This will normally require mowing at up to once a week in the peak of the season and up to, 20 times per year). • The 'arisings' shall be collected and discarded appropriately off site by the Landscape Contractor. At no stage must arisings come to rest on paved or planted areas. • All edges of grass areas, against buildings, footpaths, roadways, trees, posts and any other obstruction shall be kept neat, trimmed and tidy. • Mowing strips against walls, etc. shall be 100 mm wide and may be maintained by the use of an appropriate approved herbicide. • Border edges shall be clipped and not be allowed to exceed 75mm length. • Grass areas may be sprayed overall with a suitable approved selective herbicide in accordance with the manufacturer's instructions. Alternatively, spot weeding of isolated weed infestation may be carried out. • Fertilisers to be applied in the period of March to April and in period September to October as noted above. • Provisional item Reinstatement by re-turfing or re-seeding of worn areas may be undertaken as necessary.
Type	**Description**	**Maintenance Objective**	**Maintenance Operations**
Planting Areas (Shrubs/Herbaceous)	The borders must be kept weed free, particularly of perennial weeds, to allow planting to give early cover. However, the plants may be required to be thinned so that the shrubs that are retained are able to achieve an attractive form. This may involve removing the intermediate plants soon after shoots are touching.	Maintain shrub growth to cover as much as possible of the border area and allowing the individual plants to achieve as nearly as possible their natural form. Maintain the borders free of visible weeds and shape and prune the shrubs to avoid obstructing pathways or blocking light to, or adhering to windows.	• After planting, if appropriate and in season for the species involved, prune shrubs to develop their desirable ornamental characteristics. At the same time remove intermediate plants that are restricting the natural and attractive development of their neighbours. Remove all arisings from site. If plants have become over mature, rejuvenation by a once over complete coppice is recommended; however this should be reviewed with the Employer in the first instance. • Lightly cultivate the surface soil, to a depth of approximately 50 mm, remove or bury all annual weed or natural litter and break any surface capping. • Take special care to avoid unnecessary damage to the shrub plants and ensure that all the shrubs are firmly bedded in the soil. Leave the surface with a fine and even tilth with soil crumbs of less than 50 mm in diameter. Once a year operation (in early winter). **Note**: This operation is only essential where the soil is compacted or as a means of incorporating mulch. Not required where the areas are mulched. • Maintain the soil surface substantially free of weeds (less than 10 per cent weed cover) by hand removal and spot treating with Glyphosate, or approved equivalent. Spot treatment at approximately four-weekly intervals in the main growing season, to a total of five times per season. **Note**: As an alternative the borders can be regularly hand-hoed at up to two-weekly

			intervals in the main growing season, to 6 times per year. This procedure is recommended for the first year after planting when the plants may be more sensitive to contact herbicide damage and residual herbicides may not be used. • Immediately after planting or, as required and where subsequently directed, mulch the surface of the border with a 50 mm layer of pulverised bark (maximum particle size 40 mm), or other approved equivalent. Thereafter, top dress the mulch as necessary and at least once a year to maintain effective cover. Spot treat or remove any emergent weeds as specified in c) above but do not cultivate or incorporate the mulch into the soil.
Type	**Description**	**Maintenance Objective**	**Maintenance Operations**
Newly Planted Trees	Young trees will need regular attention to ensure establishment. Either guards or fencing have been used to protect the plant against rabbits, etc. The most important operation is to keep the soil around the base of the tree free from weeds or grass and to ensure secure and correct staking.	Establish a stable and healthily growing tree with a well-shaped framework for future growth.	• Maintain a 1 m diameter circle of plant-free soil around the base of each isolated tree by hoeing or the use of approved herbicide other than a residual. Avoid strimming around the base of standard trees which readily damages young bark. Allow for hoeing up of soil once every 4 weeks in the growing season (5 times per year). Allow for herbicide treatment once in the winter or spring and 3 additional treatments. **Note**: In some areas this operation may be replaced by the application of bark mulch as ground cover. • Cut back any tall vegetation that is threatening to shade or smother the young tree (i.e. taller vegetation growing from outside the 1 m weed free area). Allow for cutting back regularly (3/4 times a year). • If required, water the newly planted trees throughout the summer months (May to August) as required after any period of 4 weeks without significant rainfall (less than 5 mm). Apply sufficient water to thoroughly wet the top 150 mm of soil around the tree roots. This will normally require approximately 10 litres for a seedling or whip and 20 litres for a standard tree. Supply/transport of water to be the responsibility of the Landscape Contractor. • Check stakes and ties for firmness and support and adjust as necessary. Allow for checking twice a year, preferably in late spring and late summer. • Firm the soil around the roots to ensure that the plant is securely planted in the ground and upright. Allow for firming once in the spring after planting. • Formative prune to remove any dead, diseased or damaged shoots and create a balanced form for future growth. Allow for pruning once in the season after planting. • Where tree guards, stakes, ties, strimmer guards, rabbit guards and temporary fencing is no longer deemed necessary, the contractor shall allow for removing and discarding of these elements appropriately off site.
Hedging		Regularly clip hedges to maintain a uniform and tidy appearance (according to the type of hedge and situation) and a well-developed cover of vegetation over the whole of the hedge surface. Control any weed or grass growth at the base of the hedge so that it does not detract from the overall appearance or adversely compete with the hedge.	• Clip the top and sides of the hedge to maintain true and even levels and using suitable mechanical cutters to maintain the shape and height. Remove any cuttings lodged in the surface of the hedge and rake up and remove all arisings. • Allow for the operation to be carried out to suit the species and position of the hedge. • Maintain weedfree 750mm wide band at the base of the hedge (weeds at a maximum height of 100mm and a maximum ground cover of 10%) by regular hand removal, hoeing or by the use of approved herbicide. Allow for control once every 6 weeks in the main growing season (4 times per year).

Type	Description	Maintenance Objective	Maintenance Operations
Litter Clearance		Collect and remove from the site, all extraneous litter and rubbish on a regular basis so that its presence is not detrimental to the appearance of the site. (This means that the site should be free from litter after each visit to site).	• Collect and remove and dispose appropriately off sit all extraneous rubbish, not arising from maintenance works, which is detrimental to the appearance of the site. This rubbish to include stones (over 50mm dia. which may be buried), bricks, debris, paper, confectionery and other wrappings, bottles, cans and plastic containers. Allow for this operation to be carried out at regular intervals based in conjunction with other maintenance visits and operations. • Collect and removed and disposed of appropriately off site all extraneous matter which has deliberately been deposited on the site by persons known or unknown (fly-tipping). Such matter to include bricks, rubble, garden and household refuse, discarded domestic appliances, furniture and scrap metal. Priced per occasion based on an estimate of the volume of material to be collected.
Paved Areas		Regularly sweep or clean paved surfaces to keep it clear of litter or other debris that will detract from the appearance of the site. Keep the surface free from weed (including moss) growth and all associated drainage gullies in working order.	• Sweep all paved areas at regular intervals and remove all arisings from the site. Frequency may vary according to time of year or other maintenance operations. Hand or mechanical - sweeping may be used. • Control all annual weed (moss) growth by the application of residual weed killer. A single application in March/April should normally be sufficient but follow-up spot treatment may be necessary in late summer. • Clear silt and extraneous matter from the drainage gullies, including the lifting and replacement of the drain cover. Programme for once every six months but more frequently where silting up is a particular problem. • Inspect and clear any leaves and other litter from drain gulley covers. Programme at up to once a week in the autumn when the where there is likely to be heavy leaf fall.