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Landscape Design Rationale, Specifications & Maintenance Plan

FOR

*PROPOSED 2NO. DWELLINGS AT
LYNBROOK, WHITECHURCH ROAD,
RATHFARNHAM, DUBLIN 14*

ON BEHALF OF

Ciara Lynch and Nicola Lynch

April 2022

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A. LONG TERM DESIGN OBJECTIVES

The proposed landscape scheme for the residential development of 2no. dwellings a Lynbrook is shown on Drawings No.:

- 22113_LP_01_B

The site comprises of 0.454 hectares and is a predominantly flat site comprised of a large lawn area surrounded by boundary trees. Bordered to the east by the Whitechurch Stream and the north by a vacant property, agricultural lands to the west and a vacant property to the south. The area is nestled at the foothills of the Dublin Mountains and in close proximity to the Grange and Edmonstown Golf Course, the Whitechurch and Graveyard, the M50 and Marley Park.

Inspired by the context and setting of the site, of soft woodlands and riparian vegetation, the proposed landscape design is gentle and unobtrusive and allows the proposed development to nestle into the surrounding landscape with ease. The tree planting scheme aims to wrap the site in an embrace of native tree planting contributing to and improving, the woodland setting that is already a strong feature of the site.

Soft boundaries of an estate railing coupled with hedge and tree planting allows greenery to be the prominent feature of the landscape, visually connecting the garden with the woodlands beyond. A look at the historical maps shows the wider area was used for gravel extraction and quarries, the proposed patio areas of exposed aggregate concrete aim to ground the landscape design in the historical context through the use of this material.

B. MANAGEMENT RESPONSIBILITIES

The end use as private gardens dictates that each resident will be responsible for the upkeep and maintenance of their own garden in keeping with the maintenance schedule and details outlined below for minimum of 18 months post implementation.

C. PHASING & TIMING OF LANDSCAPE WORKS

Grading and seeding works will be completed during dry weather in the summer months. The landscape works will be completed in the first planting season (November to March), following completion, in order to allow for the seasonal nature of the root-balled trees specified.

It is anticipated that the works will take approximately 2-3 weeks to complete and they will be carried out by a qualified and experienced landscape contractor.

A defects liability period of 18 shall apply to all planting and all defects must be replaced by the landscape contractor.

D. SPECIFICATION FOR LANDSCAPE & MAINTENANCE OPERATIONS

1. SUPPLY OF NURSERY STOCK:

1.1. Schedule of supply:

The nursery stock material will be delivered following consultation between the Landscape Architect, landscape contractor and the selected nursery. Delivery will be at all times by means of covered vehicles, and all plant material will be clearly labelled. The source of origin must be from the selected nursery as no other additional stock from other nurseries will be permitted without prior inspection and approval.

1.2 Nursery stock:

All plant material shall be good quality nursery stock, free from fungal, bacterial or viral infection, aphids, red spider or other insect pests and any physical damage. It shall comply with the requirements of B.S. 3936: Parts 1-10: 1965 Specification for Nursery Stock, where applicable.

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. Country of origin must be shown in all cases for species grown from seed.

Unless otherwise stated, the plant materials shall be supplied in accordance with the following codes where stated:

1+0	1 Year old seedling
1+1	1 Year old seedling lined out for 1 year
1+2	1 Year old seedling lined out for 2 years
1+1+1	1 Year old seedling lined out for 1 year, lifted and lined out for one further year
2X	Twice transplanted tree
3X	Three times transplanted tree
4X	Four times transplanted tree
P9	Containerised plant in 9cm pot
2Lt	Containerised plant in 2 litres pot
3Lt	Containerised plant in 3 litres pot
5Lt	Containerised plant in 5 litres pot
c/g.	Containerised plant
gth.	Girth
r/b	Rootball
b/r.	Bareroot
MS.	Multi-stemmed
Ftd.	Feathered trees

1.3 Species:

All plants supplied shall be exactly true to name as shown in the plant schedules. Unless stipulated, varieties with variegated and/or 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/her own expense.

Bundles of plants shall be marked in conformity with B.S. 3936: Part 1: 1965 and B.S. 3936: part 4: 1966. The nursery supplier shall replace any plants which, on leafing out, are found not to conform to the labels.

Definitions of all terms used are in accordance with the following British Standards: -

B.S. No. 3936: Part 1: 1965 entitled "Nursery Stock- Trees and Shrubs"

B.S. No. 3936: Part 4: 1966 entitled "Nursery Stock- Forest Trees"

B.S. No. 3936: 1967 entitled "Specification for Nursery Stock"

2. PLANT SPECIFICATIONS:

Trees shall have a sturdy, reasonably straight stem, and a well-defined straight and upright central leader, with branches growing out of the stem with reasonable symmetry. The crown and root systems shall be well formed. Roots shall be in reasonable balance with the crown and shall be conducive to successful transplantation.

2.1.1 Heavy Standard Trees

Heavy standard trees shall have a clear stem 1.80-1.90m in height from ground level to the lowest branch, a minimum girth of 14 cm. measured at 1.00.m. above ground level and a total height of 4.0 to 4.5 metres. All trees shall have been undercut a minimum of three times.

2.1.2 Heavy Standard Trees

Heavy standard trees shall have a clear stem 1.80-1.90m in height from ground level to the lowest branch, a minimum girth of 14 cm. measured at 1.00.m. above ground level and a total height of 4.0 to 4.5 metres. All trees shall have been undercut a minimum of three times.

2.1.3 Advanced Nursery Stock

Shall have a clear stem 2.0-2.2m in height from ground level to the lowest branch, a minimum girth of 18cm measured at 1.0m above ground level and a total height of not less than 6.0m. All trees shall have been undercut a minimum of three times and provided with a rootball of min. diameter 1200mm.

2.1.4 Bareroot Transplants

Transplants shall be not less than one year old. Trees of species not listed in B.S. 3936: Part 4: shall be sturdy, with a balanced root and shoot development. Size shall conform to the schedules. Trees

shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. Roots shall be of the habit normal for the species, without deformation. Transplants shall be wrapped in polythene in bundles of 50 no. and clearly labelled from the time of lifting until planting to conserve moisture.

2.1. Shrubs

(1) Containerised Shrubs shall be of the size specified in the schedules, with several stems originating from or near ground level and of reasonable bushiness, healthy, vigorous and with a sound root system. Pots or containers shall be appropriate to the size of shrub supplied and clearly labelled. Shrubs shall not be pot bound or with girdled or restricted roots.

(2) Bare Root Shrubs & Hedging shall be of size specified in the schedules, with several stems originating from or near ground level, with reasonable bushiness, healthy, and vigorous. They shall be well furnished with fibrous roots and shall be lifted without severance of major roots. All bare root shrubs shall be wrapped in polythene in bundles of 50 no. and clearly labelled from the time of lifting until planting to conserve moisture.

(3) Herbaceous Plants Shrubs shall be of the size specified in the schedules, with several stems originating from near ground level and of reasonable bushiness and health, with a well-grown root system. Pots shall be appropriate to the size of the plant supplied. Plants shall not be pot-bound, or with roots deformed or restricted.

2.2. Bulbs:

Bulbs should be firm, entire, should not be dried out or shrivelled, and should be visually free of pests, diseases and fungi. They should be removed from packaging immediately. If storage is necessary, they should be placed in a well ventilated, dark, covered location at 18-21 degrees C, for the minimum period of time, away from vehicle exhaust and fruit.

2.3. Protection:

The interval between the lifting of stock at the nursery and planting on site shall be kept to an absolute minimum. Plants shall be protected from drying out and from damage in transport. All stock awaiting transport shall be protected from the wind and frost and from drying out.

Protection shall include for the supply of stock to site to a suitable heeling-in/ storage area prior to planting. The landscape contractor shall allow for liaison with the site engineer to arrange the heeling-in area / storage. The contractor shall continue to be entirely responsible for the maintenance of this stock to ensure that at the time of planting the stock complies with the requirements for the supply of

nursery stock as per clause 1.0 thereof. No responsibility for the maintenance of the stock will attach to the site engineer whilst the stock is protected on site. No time limit shall attach to the period of protection.

In the event of the Landscape Architect being dissatisfied with the care and attention given to the stocks, following heeling-in, he shall notify the Landscape Contractor who shall take steps to ensure careful heeling-in procedures.

The preparation of the heeling-in area and its subsequent maintenance is the sole responsibility of the Landscape Contractor.

2.4. Damage

On completion of lifting of plants in the nursery, any broken shoots or severed roots shall be pruned, areas of damaged bark neatly pared back to sound tissue.

2.5. Inspections

The Landscape Architect will inspect the hardy nursery stock during the execution of the works. Only plants selected and approved in the landscape contractors selected nursery will be accepted on the site. Nursery stock selected will be reserved for the project, at lifting time in autumn, there will be another nursery visit to ensure such plants selected and reserved are the same plants being delivered.

2.6. Delivery and heeling in

All plants will be delivered on a phased basis as called up in advance in agreement with the Landscape Architect and the appointed Landscape Contractor. In the event of the Landscape Architect being dissatisfied with the care and attention given to the stocks, following heeling-in, he shall notify the Landscape Contractor who shall take steps to ensure careful heeling-in procedures.

The preparation of the heeling-in area and its subsequent maintenance is the sole responsibility of the Landscape Contractor.

SPECIFICATIONS FOR SITE OPERATIONS:

2.7. Setting out:

Setting out shall be in accordance with site meetings with the Landscape Architect, and the Landscape Drawings No. 22104_SLP_B; 22104_SL_B_W01; 22104_SLP_B_W02; 22104_SLP_B_E01; and 22104_HLP_B.. No planting or grading works shall take place when the soil / fill is in a waterlogged condition.

2.8. Subsoil

2.8.1. Supply of Subsoil

Subsoil should be good quality and be free of waste, chemicals, large stones, builder's rubble and any other detritus. Subsoil must not be excessively compacted as this will impede drainage. Any areas inadvertently compacted should be ripped prior to topsoiling.

2.8.2. Formation of Mounding

Subsoil should be utilised for formation of mounding. Grass mounds should be brought to 150mm lower than levels specified on landscape plan.

2.9. Topsoil

2.9.1. Supply of Topsoil

Topsoil should be good quality, friable soil conducive to plant growth. Soil shall be free of waste, chemicals, large stones, builder's rubble and any other detritus.

2.9.2. Weather and Soil Conditions

All work involving topsoil shall not be carried out, unless the Landscape Architect permits, otherwise:

- (i) Where areas have been exposed to a cumulative rainfall exceeding 60mm over the preceding 28 days measured at a point approved by the Landscape Architect; or
- (ii) Where soil moisture content is wetter than the Plastic Limit (PL) of the soil less 3%. The OL of the soil can be assessed in the field as the minimum moisture content at which the soil can be rolled and moulded into a thin thread approximately 3mm in diameter without breaking or cracking and in a laboratory according to BS 1377: Part 2.
- (iii) When heavy rain is falling.

2.9.3. Topsoil storage

Topsoil shall be stored in a single stockpile of dimensions no greater than 10x5x1.5m, such that a long, narrow and low berm is created to preserve the intrinsic qualities (structure and soil life) of the topsoil whilst in storage. The topsoil shall be loose tipped to create the berm and lightly compacted with the

back of a digger bucket to create a degree of compaction suitable for storage. No machinery shall be run over the soil berm.

2.9.4. Topsoil Spreading

Topsoil shall be moved and spread only in dry weather. Before topsoiling, remove all stones, rubble and rubbish over 50mm diameter from the surface of the subsoil formation. Dig out any areas polluted by oil or chemicals and make up with clean soil. Loaders shall load from the base of the soil storage berm only. Placement of soil should be carried out using a tracked vehicle to avoid subsoil compaction. Reinstated areas of topsoil shall not to be tracked over. The topsoil shall be allowed to settle to a thickness of 300mm and the contractor shall make full allowance for such settlement in applying the topsoil. Uneven areas shall be topped up as necessary.

2.9.5. Soil cultivation:

For all grass areas all topsoil to be cultivated to a depth of 150mm to produce a tilth up to 25mm suitable for seeding and turfing. For all shrub planting areas, topsoil to be cultivated to a depth of 300mm prior to planting. For all woodland areas, spray off existing grass/weeds prior to cultivating. Cultivate ground to a depth of 200mm prior to planting. All stones and debris 50mm, weeds and other deleterious materials shall be raked up and removed from site. When the topsoil is reasonably dry and workable grade to smooth flowing contours, with falls for adequate drainage, removing all minor ridges and hollows. Unless otherwise stated, finished levels of topsoil, after settlement. to be:

- 50mm above adjoining pavements and kerbs.
- Married in with adjoining soil areas.
- All stones above 50mm diameter to be removed off site by the landscape contractor,
- All planting areas shall be left in a very even state, with all soil clumps broken up.

2.10. Finished grading:

All planting pits and topsoiled areas disturbed by the landscape contractor shall be left in an even state, with all soil clumps broken up and stones of greater than 50mm diameter shall be removed. Where necessary additional high quality topsoil will be added as specified in Item 3.3.

3. SPECIFICATIONS FOR PLANTING AND PLANT MATERIALS

3.1. Stakes:

Round stakes shall be of peeled larch, pine or Douglas fir, preserved with a water-borne copper chrome arsenic composition in accordance with I.S. 131. For standard and select standards stakes shall be 1.8m long, 75mm in diameter. Stake all whips and transplants greater than 120cm in height. For all transplants exceeding 120cm height stakes shall be 1.2m long, 37mm x 37mm square. Stakes shall be pointed at the butt end. Set stakes vertically in the pit, to the western side of the tree station, and drive before planting. Drive stake with a wooden maul or cast-iron headed drive. Stakes shall be driven into the excavated planting pit to a depth of:

800mm for Standards/Light Standards/Feathered Trees

1000mm for Heavy Standards

500mm for Whips/Transplants

3.2. Canes:

Bamboo canes or similar approved shall be used to provide spot spraying location markers for small plants. The canes are not to be attached to the plants.

3.3. Tree ties:

For standard and select standards, 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. 25mm wide for 120cms height trees and min. 38mm for larger sizes. They shall be fitted with a simple collar spacer to prevent chafing. Two ties per tree shall be applied to standards; for staked transplants, one tie per tree is required.

Ties shall be nailed to the stake with one galvanised nail.

3.4. Damage:

On completion of planting any broken branches shall be pruned, areas of damaged bark neatly pared back to sound tissue.

3.5. Watering / Alginure / Fertilisers:

All bare rooted light standards and select standards shall be soaked in water overnight, on site, before planting in a liquid solution containing "Alginure" at the recommended dilution rate. Fertilisers shall conform to BS 5581: 1981. In the case of granular fertiliser being added to plantings, it must be mixed through and incorporated into the base of the planting hole and covered over in order to avoid roots of plants coming in direct contact.

3.6. Setting out:

Setting out shall be in accordance with site meetings with the Landscape Architect. Transplants in mixtures shall be planted in staggered rows. Species shall be planted in groups, as indicated in the planting drawings.

No planting shall take place until all planting holes (with ameliorants) have been inspected and approved by the Engineer, or a person appointed by him as a representative, to ensure accordance with the specifications. No planting shall take place when ground conditions are frozen or waterlogged. All planting holes shall be opened and closed on the same day.

3.7. Tree planting:

Before excavation the surface of the proposed planting area shall be cleared of grass and weed growth, physically and/or chemically with a contact or translocated herbicide. Trees shall be planted at the same depth as in the nursery, indicated by the soil mark on the stem of the tree. They shall be planted in the centre of the planting pit and planted upright. Stones or other rubbish over 75mm shall be removed. Supply and drive the stake 800mm into the ground for standards, 500mm for other transplants. Backfill planting hole with excavated topsoil and, if there is insufficient existing topsoil in this location, additional topsoil, and remove all stones and debris, firming plant into position.

3.7.1. Select Standards

Excavate tree pits to 800mm x 800mm x 600mm deep, or as approved. The base of the pit shall be broken up to a depth of 80mm and glazed sides roughened. F.Y.M. at the rate of 0.047 cu.m. (equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied to each tree pit prior to planting. Farm manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

3.7.2. Extra heavy standards / Heavy Standards

All heavy standard trees to be planted in accordance with BS5236(1975). Excavate tree pits to 1000mm x 1000mm x 1000mm deep. The base of the pit shall be broken up to a depth of 100mm and glazed sides roughened. Incorporate F.Y.M. into the base at a rate of 0.25 cu.m (250mm in base of pit). Incorporate 600 grms of 0:10:20 into the backfill. Trees shall be planted at the same depth as in the nursery, indicated by the soil mark on the stem of the tree. They shall be planted in the centre of the planting pit and planted upright. Stones or other rubbish over 75mm. shall be removed. Trees shall be anchored by means of platypus anchoring system using kit no.RF1. Backfill planting hole with excavated topsoil, and, if there is insufficient existing topsoil in this location, additional topsoil, and remove all stones and debris, firming plant into position.

3.7.1. Advanced Nursery Stock

Excavate tree pits to 1000mm x 1000mm x 1000mm deep. **Note that excavations to a 1.0m depth may encounter rock at this depth.** The base of the pit shall be broken up to a depth of 100mm and

glazed sides roughened. Incorporate F.Y.M. into the base at a rate of 0.25cu.m (250mm in base of pit). Incorporate 600gms of 0:10:20 into the backfill. Provide for 50mm wavin perforated pipe wrapped around rootball to ground level and backfilled with gravel- for ease of watering.

Trees shall be planted at the same depth as in the nursery, indicated by the soil mark on the stem of the tree. They shall be planted in the centre of the planting pit and planted upright. Stones or other rubbish over 75mm. shall be removed. Semi-mature trees shall be anchored by means of platypus anchoring system using kit no. RF1. Heavy standard trees shall be staked as clause 2.8.

3.7.1.Bareroot Transplants

Excavate planting hole to a depth of 400mm x 400mm x 400mm deep, the base to be broken to a depth of 50mm and glazed sides roughened. Apply 30gm 0.10.20.per planting pit. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

3.7.1.Hedging

Excavate trench 600 wide x 600 deep, the base to be broken to a depth of 50mm and glazed sides roughened. Fill with F.Y.M. at the rate of 0.047 cu.m. (equivalent to 60mm deep) and 100gms of 0.10.20 shall be applied. Backfill planting trench with excavated topsoil, and remove all stones and debris, plant and firming plant into position.

3.7.2.C.G. Shrubs:

Excavate planting hole to a depth of 300mm x 300mm x 300mm deep; the base to be broken to a depth of 50mm and glazed sides roughened. Apply 30gm 0.10.20.per planting pit. Backfill planting hole with excavated topsoil, and, if there is insufficient existing topsoil in this location, additional topsoil, and remove all stones and debris, firming plant into position.

3.7.3.Bulbs:

They should be planted so that the top of the bulbs/ Corms/Tubers is at a depth of approximately twice its height with the base in contact with the bottom of the hole. Backfill with finely broken soil and lightly firmed to the existing ground level. When planting in existing grassed areas neatly remove a plug of turf and replace after planting. Scatter naturalised bulbs/corms/tubers at random positions over the allocated area and plant where they fall.

3.8. Grassing

All grass areas shall be ripped with a tractor mounted tine prior to rotovating. The contractor shall grade off all areas to smooth flowing contours, removing all stones greater than 25mm diameter and tip off site. All hollows shall be filled in. Roll all areas with a roller as approved. Following the completion of final grading and raking, the area shall be left fallow for a period of 14 days. Spray with 'Basta' at recommended rates, and seed with fine grass mix at a rate of 35gr/Sq.m together with fertilizer 10:10:20 at a rate of 50gr/Sq.m use urban parks mixture or other as approved by the Landscape Architect.

3.1. Wildflower Meadow

All meadow areas shall be ripped with a tractor mounted tine prior to rotovating. The contractor shall grade off all areas to smooth flowing contours, removing all stones greater than 25mm diameter and tip off site. All hollows shall be filled in. Roll all areas with a roller as approved. Following the completion of final grading and raking, the area shall be left fallow for a period of 14 days. Spray with 'Basta' at recommended rates, and seed with Native Wildflower Seed Mixture: "Design by nature" 'Meadow Mixtures' at a rate of 2gr/Sq.m

3.2. Ground Finish

Upon completion of planting, all pits shall be raked over lightly to leave an even surface and neat appearance. All stones greater than 25mm dia. shall be removed.

3.1. Topsoil

Topsoil shall be of good quality free from large stones of max. size 50mm, weeds and other deleterious materials. All topsoiling shall comply with BS 3882 and shall be carried out in appropriate weather conditions. The finished level of the topsoil shall be married in with the adjoining soil area.

Mulching

The product shall consist of matured Conifer Bark with an even nominal particle size distribution of 5-75mm with less than 5% dust and fines and less than 15% wood content. The pH to be between 4.5 and 5.5. The product shall be pest, disease and weed free and not have been treated with Methyl Bromide or any additives. The product shall have been tested in accordance with the requirements of BS 4790:1987, for fire resistance. The natural heat treatment maturing process shall have been sufficient to ensure that excess volatile substances are driven from the product. During the process, temperatures within the product heaps must exceed 50°C for a minimum 14-day period, followed by a further period of stabilisation.

3.2. Spraying:

The contractor shall be responsible for keeping the ground around all planted material weed free by means of herbicidal application during the course of the contract. Such routine spraying shall be carried out during maintenance visits over the one-year period. No spraying shall take place during adverse weather conditions or at times not recommended by the manufacturer.

Herbicides.

Glyphosate "Round-up" by Mosanto Chemical Ltd. Do not apply when rain is forecast within six hours. Do not apply when wind is likely to cause drift of spray (over 32 kph/20mph). Allow leaf symptoms to develop before cultural operations.

Paraquat "Gramoxone" and 'Basta' by I.C.I.Plant Protection Ltd. Do not spray when wind is likely to cause drift over 32kph/20mph. Protect all foliage of plants from spray drift.

3.1. General

Upon completion of planting, all pits shall be raked over lightly to leave an even surface and neat appearance. All stones greater than 75mm dia. to be removed. Provision should be made for the watering of transplants, shrubs, select standards, extra heavy standards, advanced nursery stock and herbaceous plants during periods of prolonged drought in the first year following planting.

Planting undertaken in Year No. 1 shall be inspected in October of Year No. 1 to ascertain replacement planting. Any tree or shrub found to have died from any cause except as provided below, or the work of another contractor, 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 of shelters.
- Damage by livestock, where not protected by fencing.
- 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.

4. MAINTENANCE

4.1. General:

The Contractor shall be responsible for aftercare of the completed works for 3 years from the date of completion of planting, including adequate watering of standard trees during periods of dry weather, and grass cutting.

It is a requirement that all plants shall exhibit visible signs of growth, shoot or branch extension and increased height and spread at the end of each growing season which is typical for their respective species given the general climatic conditions of the locality.

All planted areas shall be inspected to identify dead, dying and unhealthy plant material which has fallen below the original specification and the establishment criteria listed below. Defective plants shall be replaced, once each year and until full establishment is achieved.

Plant replacements shall achieve a reasonable level of cover across all planted areas as follows:

1) Tree, Shrub and Ground Cover planting shall exhibit annual, healthy growth consistent with the species selection and the prevailing Site conditions. Trees, Shrubs and Ground Cover shall exhibit a firm attachment of the roots to the soil and the crown of the tree shall be visible greater than when planted and greater than any die-back.

2) Hedgerow planting shall exhibit annual, healthy growth consistent with the species selection and the prevailing Site conditions. The overall visual impact shall be greater than when planted, there shall be no gaps through hedge planting and collectively the hedge shall create a strong visual line of vegetation within the landscape.

3) The plants shall have knitted together and formed a closed canopy (the ends of branches and plant shoots of adjacent plants shall touch or overlap so as to provide a closed canopy which will increasingly and over time shade out plant competition from grasses and other weeds and so provide an acceptable level of sustainability and low maintenance). Tree planting within hedgerows shall be distinctly visible.

All planting shall exhibit signs of self-sustainability at the end of the Period of Maintenance and protective fencing, stakes, ties, wind fencing, tree shelters, tree mesh guards and rabbit proof fencing shall be assessed immediately prior to the end of this period and removed where no longer required.

4.2. Period:

The Contractor shall be responsible for aftercare of the completed works for 3 years from the date of completion of planting, including adequate watering of standard trees during periods of dry weather, and grass cutting.

4.3. Organisation:

The aftercare programme will be organised as follows: -

(1) Scheduled operations, in whose timing the contractor will be permitted some flexibility and which will be the basis of payment to the Contractor.

(2) Performance standards, which the Contractor is required to meet at all times, and on which his performance will be assessed.

(3) Critical dates, by which time scheduled operations shall have been completed, and at which performance will be assessed. Typically, 30th April, 30th June Mid-September and Mid December. Precise dates to be determined by Engineer at commencement of maintenance period

4.4. Performance standards:

Structural/Whips shall be maintained in accordance with specifications and in good health exhibiting signs of growth.

Replacement planting shall be included in the first year of the maintenance period in accordance with Defects Liability Period.

Weed control shall be ongoing as per specification clause 3.2 hereof

Noxious weeds (Dock, Thistle, Ragwort) shall not be allowed to flower and all weeds shall be killed or removed at each maintenance visit.

Grass cutting shall be undertaken as per specification clause 4.5 hereof

4.5. Grass cutting – Fine Cutting

Grass cutting shall be carried out during the three-year maintenance period. Grass cutting shall be deemed to include for:-

Removal and disposal of stones and other obstructions from the area of grass to be cut.

Removal and disposal of swaths of grass cuttings and grass cuttings from adjoining roads and paving.

Any ruts or ridges shall be levelled off, topped up as necessary with topsoil, re-cultivated and reseeded (see Spec. 4.6)

Grass shall be trimmed from around the bases of walls and fences, back of footpaths and timber kerbs, sluice valves and hydrant markers, trees etc., and this interface between grass and walls, fences, gates etc., as noted above, kept in a neat and tidy condition. This trimming shall be deemed to be included for a min. of 12 no. times per annum. The Landscape Contractor is bound to comply with this instruction and large patches of sprayed off ground around the above-mentioned objects/areas is prohibited.

The edging between grassed areas and the back of footpaths/ kerbs shall be trimmed back, as required to maintain a clean line between the grassed area and the respective line of footpath or kerbing. Typically, a gap of 25mm (1inch) should exist between the edge of the footpath / kerbing and the grassed area. This edging shall be deemed to be included for a min. 3 no. times per annum. Spraying to achieve this effect is prohibited.

*Once the grass has been trimmed at the beginning of the grass cutting season and at a time to be agreed with the Landscape Architect or his authorised representative, the Landscape Contractor shall apply a suitable broad spectrum selective weed killer to maintain broad-leaved weed control in the grassed areas during the growing season. A second application will be applied to selectively control clover infestation in grassed areas.

All grass cuttings shall be collected, removed from site and deposited at a green waste recycling facility (for composting), all in accordance with the local authority regulations for waste disposal.

Mowing shall be carried out with machines in good repair, sharp and evenly set, avoid lying flat or pulling of the grass.

Fertiliser applications to be made 2 no. times per annum, once in the spring and once in autumn. Fertilisers to be applied in the period March to April and in the period September to October to provide 30kg N, 15kg P and 30kg K, per hectare annually. Each application is to be applied in two equal passes in transverse directions, giving an even distribution across the site surface.

Reinstatement by re-turfing or re-seeding of worn areas or areas damaged by the landscape contractor to be undertaken as necessary and at the contractor's own expense.

The Landscape Contractor shall be held responsible for the reinstatement of any areas of damage arising from the use of inappropriate heavy mowing apparatus on waterlogged ground. Should prolonged wet weather conditions persist the Landscape Contractor shall advise the employer and make arrangements for use of appropriate machinery to achieve a fine cut sward.

Borders are to be defined between grass and shrub beds using an appropriate edge tool. This operation is to be carried out 3 no. times per annum

*The weed control and fertiliser application may be carried out in combination as a weed-and-feed application. The landscape contractor shall submit proposals for this operation to the landscape architect, for approval, prior to proceeding with this method on site.

Grass cutting is defined into two categories:

4.5.1. Standard Areas

Grass shall be cut to a height of 25mm. A minimum of 20 no. cuts per annum.

A sample schedule is as follows:

March: 1 cut
April: 2 cuts
May: 3 cuts
June: 3 cuts
July: 3 cuts
August: 3 cuts
September: 2 cuts
October: 2 cuts
November - February: 1 cut
Total 20 cuts

4.6. Grass Re-instatement

Where grass has been damaged and requires re-instatement, the contractor shall cultivate the ground to remove compaction at the surface (to 100mm depth), removing all stone, debris and any subsoil material, to 100mm depth, apply topsoil to dress the levels to achieve an even, apply grass seed, urban parks mixture, at a rate of 25 grams per m² with fertiliser, 10:15:10 ratio or equivalent at a rate of 25 grams per m². Seed shall be sown in the season March to April or September to October.

4.1. Wildflower Meadow Areas

Wildflower meadow cutting shall mean mowing to a height of 2" (50mm).

Year 1 - This operation is to be carried out after six weeks of growth and repeated every 2 months throughout the first summer. All clippings should be removed

Year 2 onwards – One spring cut no later than the end of April, one further cut following flowering between September and November.

It is the responsibility of the tenderer to be fully acquainted with the precise areas for wildflower meadow grass cutting as detailed on the landscape drawings and by site visit

All grass cuttings and waste, where deemed necessary, shall be deposited at a tip to be found by the Landscape Contractor off the Client's property

Mowing shall be carried out with machines in good repair, sharp and evenly set, avoiding laying or pulling of the grass. Mowing shall be carried out in dry conditions.

4.2. Spraying:

1) Following planting, weed free circles shall be formed around individual plants, as directed, using an approved broad-spectrum contact herbicide, as approved by the Engineer. In mid-spring following planting. Herbicide shall be applied using controlled drop applicator containing a dye to indicate areas sprayed. In areas where grass is excessively long, such grass will be trimmed off and collected prior to spraying. The contractor shall be responsible for keeping the ground weed free (1m dia. circle for standard trees, 500mm dia. circle for whips and transplants) around all planted material by means of herbicidal application, using approved sprays, during the course of the contract. Weeds to be removed include grasses, broad-leaved annuals and perennial weeds and all noxious weeds.

2) Selective spot spraying will be carried out to all grassed areas, whether planted or unplanted through the application of contact herbicide to control broad-leaved annual and perennial weeds, including thistle, dock and ragwort. Contact herbicide shall be approved by the Engineer prior to application. Herbicide shall be applied using controlled drop applicator containing a dye to indicate areas sprayed.

3) The boundary hedgerows shall be kept weed free by herbicidal application by forming a 300mm wide sprayed strip along the full length of each respective hedgerow. Approved herbicide (broad-spectrum contact herbicide) shall be applied using controlled drop applicator containing a dye to indicate areas sprayed. Spraying of planted areas on roundabouts is also included in this spraying application.

4) Such routine spraying (1, 2 and 3 above) shall be carried out during maintenance visits over the three-year period. No spraying shall take place during adverse weather conditions or at times not recommended by the manufacturer.

4.3. Particular maintenance specifications

4.3.1. Trees & Shrubs

- (a) All planted areas and shrubberies throughout the site shall be maintained weed, grass, litter and briar free all year round and maintained in a neat and tidy condition.
- (b) In order to keep all planting beds in a weed free condition, the contractor shall apply broad spectrum residual herbicide at the recommended rate in early February.
- (c) In the event of weeds developing, the contractor shall apply contact herbicide during the growing season on a regular and unspecified number of occasions in order to maintain beds weed free. No spraying shall take place during adverse weather conditions or at times not recommended by the manufacturer.

The contractor shall also carry out hand weeding in planting beds where necessary. Remove weeds by surface hoeing and pulling. Dig out all deeply rooted or noxious species. Remove all weeded material from site each day and dispose off site. Make good disturbance to mulch.

Weeds shall be controlled by a combination of hand weeding and herbicide application to the contractor's discretion ensuring there is no spray damage to shrub material. Any plants damaged by spray shall be replaced at the contractor's own expense.

Year 1 - Ring spray (3 sprays) x 12,500no. Plants

Year 2 - Ring spray (2 sprays) x 12,500no. Plants

Year 3 - Ring spray (1 sprays) x 12,500no. Plants

Tree care shall mean pruning deciduous trees when dormant to promote open frameworks in the crown. Remove all suckers and dead branches and branches that that are encroaching onto footpaths should be cut back to the point of branching. Firm any plants loosened as necessary

Tree ties and stakes are to be checked, adjusted and removed where the diameter of the trunk is greater than the stake.

Shrub care shall mean maintaining a neat and tidy growth habit. Prune dead, diseased branches back to growth point. Adjust timing of pruning to suit growth habits of individual shrubs.

The contractor shall apply Osmocote 16–18-month slow-release fertiliser at a rate of 100gms/sqm. In March of Year No. 1 to all planted areas. The contractor shall satisfy his Authorised representative with appropriate proof of this application. In year no. 2 and 3 the contractor shall apply standard release fertiliser 10:15:10 or similar approved around all plants @ 50 grams per m2.

The contractor shall apply Siera Flora 12–14-month slow-release fertiliser tablets according to label instructions in March of Year No. 1 to all trees planted as indicated in maintenance schedule. The contractor shall satisfy his Authorised representative with appropriate proof of this application.

Maintain 50mm of bark mulch to all planting areas throughout the year.

The contractor shall remove all litter, debris etc from planted and grassed areas a minimum of once per month.

Each woodland block should ideally be reviewed and a schedule for thinning prepared in each case. As a general rule all weak and dead trees should be removed and thinning should allow for a minimum 2.8m spacing between main woodland species.

During construction of buildings temporary fencing will protect all trees and hedgerows to be retained. The fencing should be placed approximately 6.0m to 10.0m from the trunk of the tree depending on the

age/height/spread/etc. of the tree. These fences will be positioned on-site under the supervision of the landscape architect and may not be breached during site development works.

Structures requiring excavation (building foundations underground services, road base construction) will not be closer than 8 metres to retained trees under 16 metres in height (12 metres for trees over 16 metres in height). The provisions of BS 5837: 1980 *Trees in Relation to Construction* will be followed.

Please note the Landscape Contractor should be requested to regularly clip hedges to maintain a uniform and tidy appearance and a well-developed cover over vegetation over the whole of the hedge surface. Control and 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 the side of the hedge to maintain true and even levels and using suitable mechanical cutters to maintain the shape and height. Prune hedges in the autumn. All such hedges are to be pruned in accordance with good horticultural practice using appropriate pruning tools. Remove any cuttings lodged in the hedge and rake up and remove all arisings

4.3.2.Hedge Maintenance

Hedge maintenance shall include those hedges planted to the outside of all mesh fences, along roadways and within communal areas. This shall also include for the cutting of existing hedgerows. Hedges shall be rotary cut and not flailed.

Hedge material shall be pruned back from footpaths, driveways, planted areas etc. Hedge shall be neatly shaped to maintain an overall height of 3.0m and an overall width of 0.6m and to encourage bushy growth from the base upwards. All pruned material shall be cleared and removed off site.

4.4. Cutting back:

Plants for cutting back/tip pruning shall be cut back after inspection by the Engineer. This work shall be carried out initially following planting for plants suffering from wind damage.

4.5. Watering:

The contractor is responsible for the survival of all plants during the maintenance period. Apply water to moisten full depth of root run using proprietary irrigation system. Avoid washing or compaction of the soil surface. The Landscape Contractor is responsible for informing the Landscape Architect if the plants require watering. A provisional number of 16 no. watering year1, 8 no. year 2, 4 no. year 3 shall be applied. Prior notification to the landscape architect and a record of attendance will be requested for each visit. Spot checks will be made to ensure full compliance with this condition.

4.6. Firming-Up:

Plants which have become loosened, lifted up or out of the ground shall be set upright and re-firmed by treading.

4.7. Removal of Litter:

All litter shall be removed from park once per month. All pavements and hard surfaces shall be kept free of debris via sweeping or other equivalent method.

4.1. Hard surfaces:

All paved and gravelled areas such as car parking areas and footpaths throughout the respective locations are to be maintained weed free at all times. The contractor shall apply *Round-Up* at recommended application rates, twice yearly, April and August - September. In addition to a residual herbicide.

4.1. Sweeping and Cleaning

Sweeping shall mean sweeping of cycle path and footpaths, and removal of all grit rubbish moss and leaves, keeping the paved areas of the respective centres in a neat and tidy manner.

Cleaning shall mean the removal of paper, plastic bags and all other rubbish from grassed areas, roads, car parks and other paved areas, shrubberies, water feature, etc., in the respective areas. This operation shall be carried out twice a month.

All areas shall be cleaned and swept once a month during the contract period, except in the case of Autumn leaves which shall be swept on a weekly basis from end of October to mid-November (three weeks). Any additional cleaning and sweeping deemed necessary, during the year, and requested by the company for any of the various locations will be paid for at a pro rata basis to the rates for the programmed maintenance schedule.

5. PROGRAMME

5.1. Schedule

The establishment schedule is shown in Table 1.

5.2. Presentation of certificates:

The Landscape Contractor shall present for the Engineer's inspection, all seed and fertiliser bags, together with their markings. If requested, the contractor shall furnish the Engineer with receipts of purchase for these respective materials.

5.3. Maintenance Payments

The Contractor shall submit a statement of account at the critical dates. Payment will be certified with the following provisions:

If any part of the schedule aftercare is outstanding, its value will be deducted from payment.

The following will not be regarded as failures of performance:

1. Failures of plants due solely to prolonged dry weather.

The creation of a residential area is not a matter of standardisation of buildings, details existing vegetation and planting. The realisation of a high-quality residential development will be better realised by considering the relation of each site in the development to the site as a whole. It is essential also that all aspects of the development are planned and designed to relate to each other and to the individual site. Neither a unified overall landscape, nor satisfactory treatment of individual sites, will be achieved by the addition of 'landscaping' to a layout based solely on consideration of the developer's programme.

It is hoped that this guide will be seen as a strategy document with the sole aim of ensuring that this housing development reaches its potential as a top-quality residential environment providing a comfortable, amenable landscape setting. Such a development will benefit the community as a whole, as well as future residents.

Table 1. Establishment Schedule Years 1, 2 and 3												
OPERATIONS	A	M	J	J	A	S	O	N	D	J	F	M
GENERAL OPERATIONS												
List of Visits	X											
Plant Replacement Inspection					X							
Plant Replacement							X	X	X			
Watering	X	X	X	X	X	X						
Reforming	X	X	X	X	X	X	X	X	X	X	X	X
Removal of Litter	X	X	X	X	X	X	X	X	X	X	X	X
Pest and Disease Control	X	X	X	X	X	X	X	X	X	X	X	X
Plant Support	X	X	X	X	X	X	X	X	X	X	X	X
General Pruning	X	X	X	X	X	X	X	X	X	X	X	X
OPERATION TO TRANSPLANTS AND SHRUBS												
Weed Control	X	X	X	X	X	X	X	X				X
Cut Down Vegetation between Circles			X			X						
Slow-Release Fertilizer								X	X			
OPERATIONS TO TREES												
Weed Control	X	X	X	X	X	X	X	X				X
Slow-Release Fertilizer									X	X		
Tree Inspection	X	X	X	X	X	X	X	X	X	X	X	X
OPERATIONS TO ORNAMENTAL BEDS												
Weed Control	X	X	X	X	X	X	X	X				X
Slow-Release Fertilizer												X
OPERATIONS IN GRASS AREAS												
Grass – Mowing	X	X	X	X	X	X	X	X				X
Grass – Control and Removal of Pernicious Weeds	X	X	X	X	X	X	X	X				

Schedule no. 1 - Preliminaries					
Item	Description	Quantity	unit	rate	TOTAL
1.1	Provide for Plant, tools, equipment, including stores and workshops as necessary	-----	Item	----- --	
1.2	To provide transport for workforce & all items necessary to carry out the specified works	-----	Item	----- --	
1.3	Provide for Safety, health and welfare of workforce, including Welfare Facilities as necessary	-----	Item	----- --	
1.4	The contractor shall enter hereunder any item from Contract Documents against which he requires to cover any special risks, liabilities and obligations, which are not included in his rates for items. The amount claimed shall be entered here.	-----	Item	----- --	
1.5	To provide all documentation & administration to comply with Health, Safety and Welfare at Work Act 2005, and 2013 Regulations including appointment and resourcing of Project Supervisor for the Construction Stage and Safety Officer.	-----	Item	----- --	
1.6	Provide insurances as per the Schedule in compliance with Conditions of Contract	-----	Item	----- --	
1.7	Provide for compliance with specification	-----	Item	----- --	
1.8	Provide for all necessary setting out of the works	-----	Item	----- --	
1.9	Provide for all attendances at meetings and inspections	-----	Item	----- --	
1.10	Provide for road sweeping and cleaning	-----	Item	----- --	
1.11	Provide for protection of retained trees and shrub vegetation as necessary to ensure that it remains undisturbed and undamaged during works	-----	Item	----- --	
1.12	Attendance at pre-start meeting with the client to agree the Method Statement, Site Access and Site Setup	-----	item	----- --	

Schedule no. 2 - Planting Bed Preparation					
See drawings: - 22113_LP_01					
Item	Description	Quantity	unit	rate	TOTAL
2.1	Topsoil to planting beds to be supplied and placed in position by the Main Contractor		NOTE		
	Provisional Sum				
2.2	Import additional Topsoil. Topsoil to be BS 3882 compliant				
	Provide topsoil to all areas of tree and shrub planting				
2.3	Spray off surface sward of grass and weeds from all planting beds and areas for grass seeding using a Dept. Of Agriculture approved systemic herbicide; Glyphosate or equivalent				
2.4	Decompact subsoil layer of all planting beds and areas for grass seeding to a depth of 150mm. Remove stones larger than 50 mm. Remove arisings, contaminants and debris and Builder's rubble				
2.5	Planting bed cultivation: (shrubs, ground cover, trees) work in a 150mm layer of General-Purpose Compost by Enrich				
2.6	Soil Renew by Soil Renew Ireland to be applied to areas of grass				
	Applied by hand or spreader at the rate of a small handful (about 50 gm) per m ² . A 1.5kg box will treat 30m ² and a 10kg bucket will treat up to 300m ² . For small bushes or medium sized plants 25g at the base is sufficient and 50gm for larger trees				
2.7	Cultivation generally				
	Rotavate or hand dig with fork all areas to be planted and grass seeded with a minimum of 2				

	passes of a rotivator. Second pass to be in a direction perpendicular to first				
2.9	DAYWORKS				
	Dayworks Rates to be all inclusive, including travel, employers PRSI, insurances, Pension, holiday pay, travel pay, fuel, motor tax, maintenance, overheads and profit etc.				
2.11	PERSONNEL				
2.11.1	General Operative		Hrs		
2.11.2	Landscaper		Hrs		
2.11.3	Machine Driver		Hrs		
2.12	PLANT				
2.12.4	3 Tonne Mini Digger		Hrs		
2.12.5	9-13 Tonne Track Machine		Hrs		
2.12.6	Other Plant Charged For		Hrs		

Schedule no. 3 - Supply of Soft Landscape Works					
See drawings: - 22113_LP_01					
Item	Description	Quantity	unit	rate	TOTAL
3.1	Supply & protect bare-rooted nursery stock trees				
	standard extra-heavy, 3X, 16-18cm girth, 4.5-5.0m height, min.200cm clear stem, R/B				
	<i>Betula pendula</i>	9	no.		
	<i>Corylus avellana</i>	4	no.		
	<i>Quercus patrea</i>	2	no.		
	<i>Quercus robur</i>	4	no.		
	<i>Salix spp.</i>	2	no.		
	multi-stem trees, 3X, 16-18cm girth, 4.0-4.5m height, b/r 1.5m 25L, R/B				
	<i>Acer griseum</i>	5	no.		
	<i>Arbutus unedo</i>	9	no.		
	<i>Betula utilis jaquemontii</i>	3	no.		
3.2	Supply & protect bare-rooted nursery stock hedging (103m.)				
	B/R, 1.0m height, 300mm ctrs				
	<i>Illex Aquifolium</i>	102	no.		
3.3	Supply & protect low maintenance grass seeding				
	<i>Coburns Greenlawn Grass Seed Mix (50 gr/m²)</i>	23.6	kg		
		475	sq.m.		
3.4	Supply & protect planting mix, c/g 2L 20-30cm ht.				
	<i>Veronicastrum virginicum 'Temptation'</i>	50	no.		
	<i>Eryngium yuccifolium</i>	50	no.		
	<i>Agastache 'Blue Fortune'</i>	70	no.		
	<i>Veronia crinita</i>	70	no.		
	<i>Eupatorium macalatum 'Atropurpureum'</i>	60	no.		
	<i>Echinacea 'sunset'</i>	60	no.		
	<i>Knautia macedonia</i>	50	no.		
	<i>Peroviskia 'Little spire'</i>	70	no.		
	<i>Festuca mairei</i>	50	no.		
	<i>Molinia transparent</i>	70	no.		
	<i>Stipa gigantea</i>	50	no.		
	<i>Deschampsia cespitosa 'Goldschlier'</i>	70	no.		
	<i>Tulipa spp.</i>	100	no.		
	<i>Allium sphaerocephalon</i>	100	no.		
	<i>Crocus spp.</i>	100	no.		

3.5	Supply & protect low maintenance wildflower meadow mix seeding, 3 gr/m²				
	<i>Wildflower Meadow Seed Mix</i>	1.7 542	kg sq.m.		
	SUBTOTAL 3.				

Schedule no. 4 - Landscape Operations					
See drawings: - 22113 LP 01					
Item	Description	Quantity	unit	rate	TOTAL
4.1	Planting operations of bare-rooted nursery stock trees				
	standard extra-heavy, 3X, 16-18cm girth, 4.0-4.5m height, min.200cm clear stem, R/B	21	no.		
	multi-stem trees, 3X, 16-18cm girth, 4.0-4.5m height, b/r 1.5m 25L, R/B	17	no.		
4.2	Planting operations of bare-rooted nursery stock hedging				
	B/R, 1.0m height, 300mm ctrs	102	no.		
	Planting operations of planting mix nursery stock herbaceous				
	C/G, 2L, 30-40cm high, 500mm ctrs	720	no.		
4.3	Grade & seed low maintenance grass seeding areas				
	Coburns Greenlawn Grass Seed Mix	477	m ²		
4.4	Grade & seed wildflower meadow mix seeding, (3 gr/m²)				
	Wildflower Meadow Seed Mix	542	m ²		

Schedule no. 5 - Aftercare					
Item	Description	Quantity	unit	rate	TOTAL
5.1	Aftercare				
	Aftercare to be commenced on a phased basis as each area of works becomes practically complete. Each phase is to be maintained by the Landscape contractor for 18 months post practical completion prior to hand over to a management company or other. The handover date for each phase will be agreed as an aggregate date to take account of phased commencement of aftercare works.				
	Aftercare period: 2 years (24 months) post practical completion of soft landscape works.		incl.		
	Provide written monthly report (via email) to Landscape architect describing; work carried and identifying damage to or loss of planting		incl.		
	Allow for a minimum of fortnightly inspections during May to September inclusive and monthly visits during October to April inclusive.		incl.		
	Maintain all tree, shrub and groundcover planting free of grass and weed by hand and/or contact herbicide. Minimum of 6 visits per year.		incl.		
	Trim and tidy plants as required to remove dead, damaged or diseased wood.		incl.		
	Irrigating Soft Landscape: Include for watering all planting areas as required by dry conditions; 2 weeks without rain (precipitation less than 20mm) during months April to September. Allow for - 10 watering year 01 and 6 watering year 02.		incl.		
	All hedging to be given min. 2 cuts during June to September. All arisings to be collected and removed off site.		incl.		
	Include for the adjustment of tree anchoring, tree guards and ties as required and replacement of all stakes, guards and ties, broken or loosened by wind etc.		incl.		

	Replace trees that have failed. Except those damaged by vandalism, trafficking, sports or by others. OR planting stolen.		incl.		
	Include for cleaning of hard surfaces soiled during maintenance operations.		incl.		
	Grass cutting. Minimum 20 cuts per annum		incl.		