

11. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

11.1 Introduction

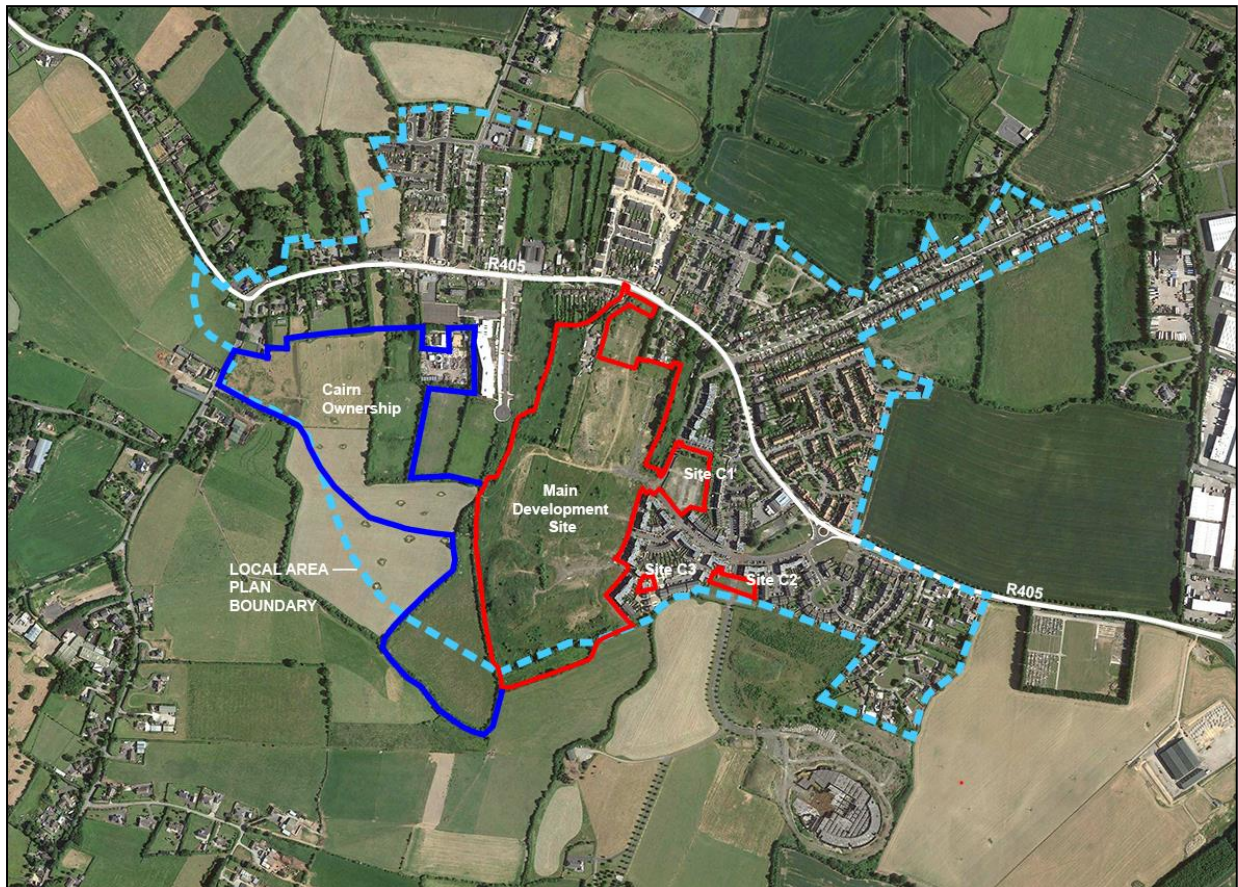
Murray and Associates were engaged to complete a Landscape and Visual Impact Assessment for the proposed residential development, and associated infrastructural works, on lands located to the south of Main Street at Newcastle South and Ballynakelly, Newcastle-Lyons, County Dublin. The report was completed by Jim Bloxam (MLArch, MILI), an Associate and Senior Landscape Architect. He holds a master's degree in Landscape Architecture from University College Dublin and is a full corporate member of The Irish Landscape Institute.

The landscape and visual impact assessment of the proposed development is a means of appraising the affect the proposed development would have on the receiving environment in terms of quality of landscape – both physically and visually. The assessment aims to indicate the layout and design of the proposed development which would present the least overall landscape and visual impact.

11.2 Characteristics of the Proposed Development

The preliminary design provides for 406 no. residential dwellings, representing Phase 1 of lands located to the south of Main Street at Newcastle South and Ballynakelly, Newcastle-Lyons, County Dublin.

Figure 11.1 Site Location Map



The total area of the proposed development lands is approx. 16 hectares and covers four separate areas. The Main Development Site, to the south of Main St is 15 hectares in area, and then there are three infill sites. The infill sites comprise of a 0.80ha site at Ballynakelly (Site C1) a 0.05ha site at Ballynakelly Edge (Site C3) and a 0.18ha site at Ballynakelly Rise (Site C2).

Figure 11.2 Development sites within application



Open spaces are proposed within the residential development, along with a larger open space to the south (Taobh Chnoic Park). A proposed pedestrian and cycle greenway connects Main Street to the north with this proposed park. Total open space within the proposed development areas amounts to 3.80 hectares. Further proposals include a Childcare facility and 1 no retail unit. The proposed development provides for the first phase of a new east-west link street, a continuation of Newcastle Boulevard, in addition to a new north-south street linkage to Main Street and a number of future potential pedestrian and cycle links to existing and proposed adjoining developments. Access to the proposed development is via the proposed north-south link street with a new entrance onto Main Street and via the existing road network from Newcastle Boulevard.

This application represents Phase 1 of the overall development with future development of Phase 2 lands to the west on zoned residential development lands.

11.3 Receiving Environment

11.3.1 Site Setting and Character

Newcastle itself sits in the Newcastle Lowlands Landscape Character Area, as defined by the 2015 Landscape Character Assessment of South Dublin County.

Figure 11.3 Landscape Character Areas (Fig 21, pg 54, Landscape Character Assessment, 2015)



The LCA continues further, and calls Newcastle a 'Historic Urban' character area - towns and villages that have developed historically, surrounded by primarily 20th Century residential development, and with significant recent development in the past two decades. The bulk of Newcastle is designated as an area of Archaeological Potential due to the large range of recorded archaeological sites within the environs of the village.

The village of Newcastle underwent significant change with extensive new development over the early 2000's and particularly to the east of the village. In this respect, the Newcastle Local Area Plan (2012) notes that Newcastle has transformed the area from a rural village to a development village with suburban characteristics. Residential development to the west of the village is predominantly low density, one-off dwellings cantered on Main Street while development to the east is characterised by medium density, suburban type housing estates to the north and south of main street. The application lands generally comprise of greenfield backlands located to the south of Main Street and west of established residential development at Ballynakelly, a mid-noughties development of houses, duplexes and apartments. The proposed development site (comprising of 4 no separate locations within close proximity) comprise of approximately 16 hectares and are zoned RES-N (to provide for new residential communities in accordance with approved planning schemes), RES (to protect and/or improve residential amenity), OS (To preserve and provide for open space and recreational amenities) and RU (to protect/improve rural amenity and provide for development of agriculture).

Previous pre-development works are visible within the larger Main Development Site. This gives the Main Development Site a brownfield character, although the boundaries are reinforced by the existing hedgerow network, providing a rural backdrop and a sense of enclosure, with views extending to the south. As such, the site that compromises of the main larger area will extend the suburban character of the Ballynakelly development to the west of the site, further east into the backlands of Newcastle village, where development is solely located along Main Street. The other infill sites are located within the Ballynakelly development and have an existing suburban character.

11.3.2 Description of Sites

See Fig 11.2 for Location of Development Sites

Main Development Site: The Main Development Site is currently disturbed open ground, with traces of previous site development works apparent from the already permitted development (Reg. Ref. SD05A/0344 (PL06S.217096). The bulk of the area within the Main Development Site has been left fallow for a period of years, with the resulting colonisation of the lands by pioneer plant species. Some previously existing hedgerows within the site were removed by the previous site works, leaving an open aspect to the site, although there are still existing hedgerows mainly around the edge extent of the site. Occasional spoil heaps are also present across the site. A disused agricultural field is present to the west of the site. The north of the Main Development Site is bounded by existing development extending south from Main Street, while the eastern boundary of the Main Development Site is contained by the newer developments of Burgage Crescent and Lyons Avenue. To the southern and eastern boundary are existing agricultural lands, that seem to be in regular use.

Ballynakelly (Site C1): This site is currently hoarded, with the interior being disturbed ground, showing signs of previous site development works associated with the existing Ballynakelly housing development but never completed. The western edge of Site C1 faces onto Burgage Crescent with views of the Main Development Site beyond. The remaining boundaries comprise of existing development (commercial and residential) of Newcastle Boulevard, Burgage Green and the rear of Parson's Court. The surrounding properties are generally three storeys in height.

Ballynakelly Edge (Site C3): The site is located to the south-east of the Main Development. The site measures approximately 0.03ha and includes a community building which was never completed together with open space to the rear (west) and carparking to the front (east). The site is surrounded by existing residential development.

Ballynakelly Rise (Site C2): The site is located to the south-east of the Main Development Site and immediately adjacent existing properties onto Ballynakelly Rise. The site consists of part of an undeveloped land parcel which has been grassed over. The infill site is bound to the north by 3 storey properties fronting onto Ballynakelly Rise, to the east by rear gardens of residential properties fronting onto Ballynakelly Court, to the south by the balance of the infill site and associated road infrastructure and to the west by 3 storey residential properties fronting onto Ballynakelly Edge. The site is bisected by Ballynakelly Rise, which also provide access to lands to the south.

11.3.3 Existing Hedgerows

The overriding feature within this landscape are the existing elements of the original burgage plot field system, dating from the Anglo-Norman manorial system. These are long rectangular field boundaries extending perpendicularly from properties fronting onto Main Street. This landholding system and pattern has been identified as of regional importance.

The portions of hedgerows that remain are associated with this historic land use. The majority of the trees within the remaining hedgerows are Ash, with the occasional Sycamore, Wych Elm, Cherry and Poplar evident. The hedgerow themselves are mature and have not had any significant maintenance in recent years. The hedgerow species are dominated by Blackthorn, with large portions being colonised by bramble and ivy. Elsewhere there are areas of discontinuity within the hedgerow lines, while there are portion of encroachment by Blackthorn into the existing fields.

11.3.4 Topography

Overall, the site slopes gradually from a high point to the south of 107m A.O.D. down to 88.90 A.O.D. by Main Street. The southern point of the site continues to slope up to form Athgoe Hill (177m A.O.D.), approximately 1km from the southern edge of the site.

11.3.5 Existing Visual Context and Views

Main Development Site: Although the centre of the Main Development Site has an open character, visibility is limited by the built edge of Newcastle Main Street to the north. This allows partial and glimpsed views from a few locations, as well as from the rear, mainly upper windows of residential properties. There are open views into the site from the newer developments along the eastern boundary. The pattern of agricultural hedgerows forms a visual boundary from the agricultural lands to the west. Partial and glimpsed, elevated views into the site (mainly the northern portion) are available from properties on the northern slope of Athgoe Hill due to the interceding hedgerows and the topography of the slope.

Ballynakelly (Site C1), Ballynakelly Edge (Site C3) and Ballynakelly Rise (Site C2) are situated within the existing Ballynakelly development and as such, all have immediately adjacent views from neighbouring properties.

11.3.6 Planning Context

The overall landholding is subject to four zoning objectives in the South Dublin County Development Plan 2016-2022:

The majority of the lands, including the Ballynakelly Site, are zoned Objective RES-N *'to provide for new residential communities in accordance with approved area plans'* and Objective RES *'to protect and/or improve residential amenity'*.

An area to the south of the site, together with a smaller area located centrally, is zoned Objective OS *'to preserve and provide for open space and residential amenities'*.

Lands to the south (outside the LAP Boundary) are zoned Objective RU *'to protect and improve rural amenity and provide for the development of agriculture'*.

The entire site (and including the wider village) is identified as a Recorded Monument under Ref. 020-003. The subject site is also located with an Area of Archaeological Potential.

The site also appears to be located within an area designated as a Geological Site for Protection. Table 9.6 of the Development Plan refers to Newcastle Buried Channel as a Geological Site for Protection. The site is described as *'a deep buried channel in the Carboniferous Limestone bedrock, representing the site of a former Vauclisian Spring type cave (a large resurgence of groundwater from a cave)'* located at the townlands of Newcastle Farm, Newcastle Demesne, Glebe, Athgoe North, Newcastle South, Ballynakelly, Newcastle North, Cornerpark and Commons Little.

The site is not within the Newcastle Architectural Conservation Area.

11.3.6.1 Views and Prospects

The South Dublin County Development Plan 2016-2022 lists Athgoe Hill as a prospect to be protected from prominent public places. The only listed view within the vicinity of the site is from Hazelhatch Road, some 550 metres to the west of the Main Development Site.

11.3.6.2 Green Infrastructure

Within the County Development Plan Policy 6 (New Development in Urban Areas) has specific objectives with regards to hedgerows and associated ecological features (G6 Objective 1). Also included are objectives dealing with connections to wider green infrastructure network (G6 Objective 2) and open space provision within new developments (G6 Objective 3).

11.3.6.3 Protected Trees

There are no tree protection orders on trees within the site

11.3.6.4 Newcastle Local Area Plan (Dec 2012 – extended to 2022)

Within the LAP a substantial part is devoted to the implementation of Green Infrastructure within Newcastle. Of particular note, in regard to the main subject site are the Planning Objectives for the retention, incorporation and reinstatement of the burgage plot field system. (Objectives GI7, GI8, GI9, GI10 and GI11).

11.3.6.5 Landscape Character Assessment

The character of South Dublin's landscape has been assessed in 2015 as a separate document from the existing County Development Plan. The assessment breaks the varied existing landscape typologies into distinct Character Areas and Types, highlighting the value and sensitivity of the landscape and its ability to accommodate change.

Newcastle lies within the Newcastle Lowlands Character Area (LCA2), while the historic core of Newcastle is within the 'Historic Urban' Character Type, mainly associated with the ACA boundary. However, the site itself, which is within the Local Area Plan boundary, also lies within the Historic Urban' Character Type according to Table 6a of the Landscape Character Assessment.

Figure 11.4 Table 6a of the Landscape Character Assessment (extract). Relevant LCT name in red.

LCT name and description	Forces for change	Recommendations
The following character areas are indicative only and would be better addressed through further assessment of townscape character as part of Local Area Plans or other relevant studies.		
Urban: Includes built land and historic settlements within the larger urban areas. Primarily composed of established nucleated villages and towns that have developed historically- many of which saw significant improvements in the 19th century in terms of streetscapes. These are surrounded by residential development of various origins but primarily 20th century with significant recent development in the past two decades.	Loss of greenspace and poor ecological connectivity Increase soil sealing Overreliance on private transport Challenge of providing sufficient and appropriate green space within the urban environment. Poor reference to built heritage of historic core.	<ul style="list-style-type: none"> Siting and boundary treatments of new residential developments. Demonstrate through design statement /masterplan/planting plan how it relates to historic core where present. Stronger use of hedgerows as a visual screening.
Historic urban: settlements that originated from ecclesiastical (early Christian) or medieval origins. Clondalkin Village Lucan Village Palmerstown Lower (Mill Complex) Rathfarnham Village including Willbrook Tallaght Village Saggart Then also the core of Newcastle village – Local Area Plan boundary	<i>Loss of integrity</i> <i>Renovation/ restoration challenges</i> <i>Maintaining function for contemporary uses</i>	<ul style="list-style-type: none"> enhancement when feasible the historic fabric of these villages through the village initiative programme and use of appropriate building forms and materials village design statements ACA designation Compliance with the above in new developments and public realm projects.

Key characteristics of the Newcastle Lowlands character area include:

- Low-lying and gently undulating agricultural lands over limestone
- Agricultural land use primarily pasture and tillage
- Increasing influence of urban activities closer to the motorways, national roads and regional roads
- Long history of historic settlement and human activity with medieval landscape complex associated with Newcastle village and surrounds.

The Landscape Character Assessment goes further to say, *'The field pattern in this LCA is traditionally composed of blocky dense hedgerows and the field pattern is of predominately medium to large geometric field boundaries. In many places this pattern has been modified through boundary removal and land rationalisation to facilitate modern agricultural methods including machinery associated with tillage.'*

With regards to Landscape Character Type the LCA states that the forces for change in these areas are, *'Loss of integrity, Renovation/restoration challenges, Maintaining function for contemporary uses.'*

11.3.6.6 Sensitivity

Landscape sensitivity refers to the inherent sensitivity to change of the landscape resource, and its overall ability to sustain its character in the face of change, as well as the visual sensitivity in terms of views, visibility, number and nature of viewers, and scope to mitigate visual impact. For example, a highly sensitive landscape is likely to be vulnerable to change whereas a landscape with a low sensitivity is likely to be less at risk from change.

The LCA identifies the Newcastle Lowlands overall landscape character sensitivity as medium, with overall visual and landscape sensitivity as being medium. Landscape values within the Newcastle Lowlands Character Area are noted as being medium/high.

However, while the classification provides a generalised picture of the County's landscape, it should be noted that within each classification level there may be varying natural / environmental or cultural / social reasons why distinctly different lands fall within the same category.

Although officially within the Newcastle Lowlands character area, and within the 'Historic Urban' character type, the site is brownfield and disused in nature. Furthermore, as set out in the South Dublin Development Plan, the lands in question have been zoned for substantial residential development, with previous residential development planning applications on the subject lands. Therefore, despite the presence of the burgage plot system, the sensitivity of the immediate landscape within and adjacent to the site can still be seen as medium where hedges exist and low where existing hedges are not impacted.

11.4 Assessment Methodology

11.4.1 Terminology

Landscape impacts are defined as changes in the fabric, character and quality of the landscape as a result of the development. This includes direct impacts to landscape receptors and greater effects that can alter the wider distinctiveness of the landscape. Landscape receptors are the physical or natural resource, special interest or viewer group that will experience an impact. The sensitivity (of a landscape receptor) is the vulnerability to

change. The extent of the landscape impacts have been assessed by professional evaluation using the terminology defined as per Tables 11.1, 11.3 and 11.4. The terminology is based on the criteria set down in the Guidelines for Landscape and Visual Impact Assessment (3rd Edition, by The Landscape Institute / Institute of Environmental Assessment published by E&FN Spon, 2013). Landscape impacts are assumed to be permanent.

Table 11.1 Extent of Landscape Impact

Imperceptible Effects	An effect capable of measurement but without noticeable consequences.
	There are no noticeable changes to landscape context, character or features.
Not significant	An effect which causes noticeable changes in the character of the landscape but without noticeable consequences.
	There are no appreciable changes to landscape context, character or features.
Slight Effects	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities.
	There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.
Moderate Effects	An effect that alters the character of the landscape in a manner that is consistent with existing and emerging trends.
	There are minor changes over some of the area (up to 30%) or moderate changes in a localised area.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape.
	There are notable changes in landscape characteristics over a substantial area (30-50%) or an intensive change over a more limited area
Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	There are notable changes in landscape characteristics over a substantial area (50-70%) or a very intensive change over a more limited area
Profound Effects	An effect which obliterates sensitive characteristics.
	There are notable changes in landscape characteristics over an extensive area (70-100%) or a very intensive change over a more limited area

Visual impacts relate solely to changes in available views of the landscape and the effects of those changes on people viewing the landscape. They include the direct impact of the development on views, the potential reaction of viewers, their location and number and the impact on visual amenity. The intensity of the visual impacts is assessed by professional evaluation using the terminology defined as per Tables 11.2, 11.3 and 11.4.

Table 11.2 **Extent of Visual Impact**

Imperceptible Effects	There are no changes to views in the visual landscape.
Not significant	An effect which causes noticeable changes in the character of the visual environment but without noticeable consequences. The proposal is adequately screened due to the existing landform, vegetation or constructed features.
Slight Effects	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition, or changes the view in a marginal manner.
Moderate Effects	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the visual environment. The proposal affects the majority of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Profound Effects	An effect which obliterates sensitive characteristics. The view is entirely altered, obscured or affected.

Table 11.3 **Quality of the Landscape and Visual Impact**

Neutral Impact	Neither detracts from nor enhances the landscape of the receiving environment or view
Positive Impact	Improves or enhances the landscape of the receiving environment or a particular view
Negative Impact	Detracts from the quality of the landscape or view

Table 11.4 The Duration of Visual Impact

Temporary	Impacts lasting one year or less
Short-term	Impacts lasting one to seven years
Medium-term	Impacts lasting seven to twenty years
Long-term	Impacts lasting twenty to fifty years
Permanent	Impacts lasting over fifty years

The landscape and visual assessment methodology will be utilised in conjunction with a professional evaluation of the proposed development to determine the degree of impact.

The term 'study area' as used in this report refers to the site itself and its wider landscape context in the study of the physical landscape and landscape character. This may extend for approximately 1km in all directions from the site in order to achieve an understanding of the overall landscape. In terms of the visual assessment, the study of visual amenity may extend outside the study area, from areas where views of the site are available, but the majority of visual impacts for a development of this nature would be most significant within 500m.

11.4.2 Methodology

The methodology employed in the landscape and visual impact assessment is as follows:

1. Desktop survey of detailed maps, aerial photography and other information relevant to the study area, including the South Dublin Development Plan 2016 - 2022 and the Newcastle Local Area Plan 2012.
2. Site survey and photographic survey to determine landscape character of the general study area and specific landscape of the site.
3. Assessment of the potential significant impacts of the proposed scheme utilising the plan and elevation drawings of the scheme to determine the main impacting features and the degree to which these elements would be visible in relation to observations made during the field survey. In determining visibility, the views to and from the proposed development areas are considered based on the heights, finishes, design and other visual characteristics of the proposed structures and setting.
4. The proposal of a scheme of mitigation measures, where relevant. These will be defined as measures which will be generally implemented and specific landscape measures which would be site-specific and address particular landscape or visual issues identified.
5. An evaluation of the impacts of the scheme with and without amelioration. For the purposes of assessment the predicted visual effects of the scheme are assumed at 10 years following the completion of the proposed development.

The assessment follows prescribed methodologies, as set down in the following publications:

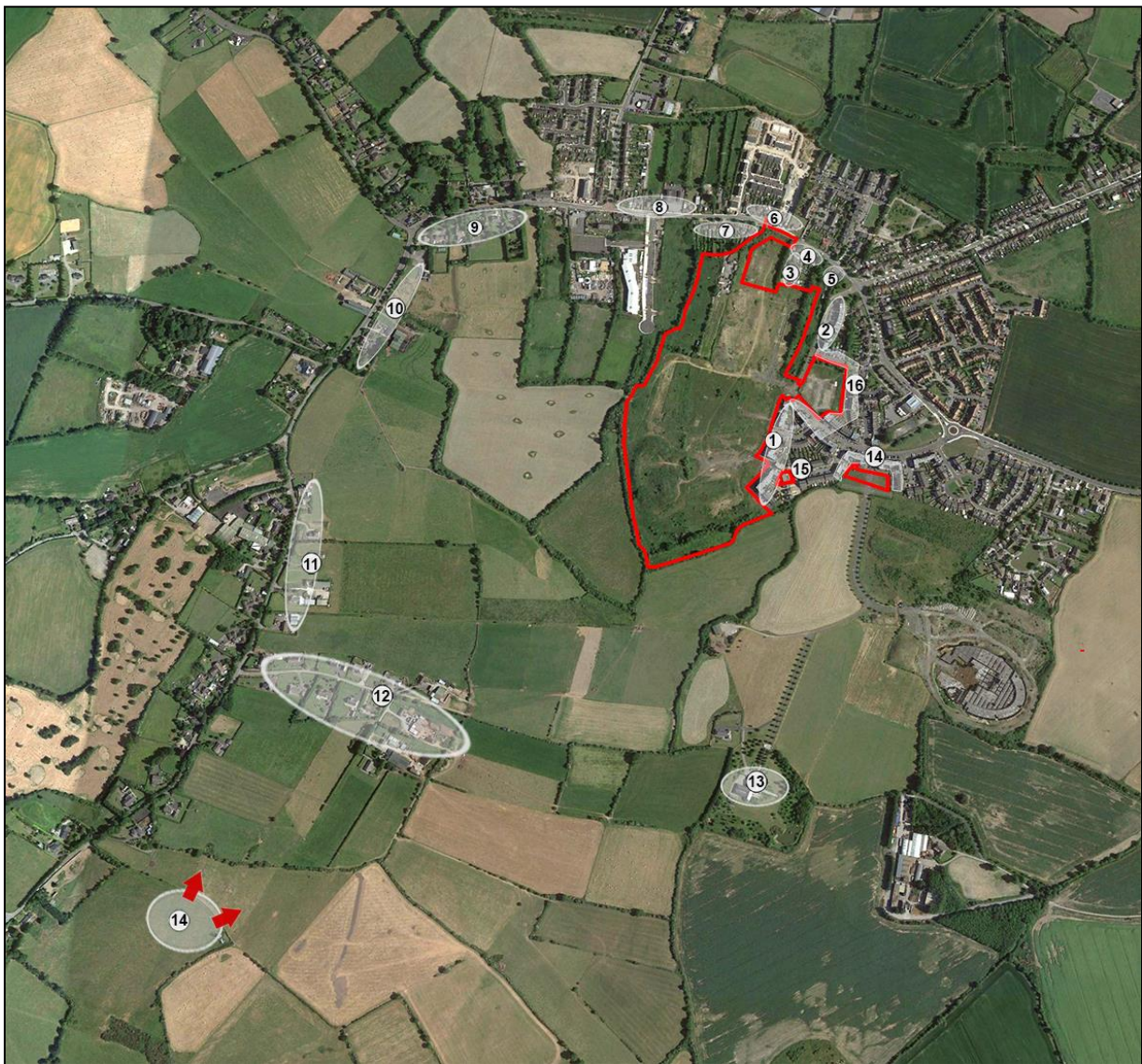
- a) Guidelines for Landscape and Visual Impact Assessment 3rd Edition, by The Landscape Institute / Institute of Environmental Assessment published by E&FN Spon (2013),
- b) Advice notes on Current Practice in the Preparation of Environmental Impact Statements, published by the Environmental Protection Agency (EPA) (2003), and
- c) Guidelines on the information to be contained in environmental impact statements, published by the EPA (2002).

The Draft EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) EPA, 2017 was also consulted.

11.5 Sensitivity of the Identified Receptors

In landscape and visual assessment, one of the key factors is the sensitivity of a landscape to change, where the proposed development will inevitably result in adding a new element to the landscape. The publication *Guidelines for Landscape and Visual Impact Assessment* (2013) defines sensitivity as: "A term applied to specific receptors, combining judgments of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor."

Figure 11.5 Map of Potentially Sensitive Receptors



In landscape terms, the site is considered to have medium sensitivity due to the presence of the existing burgage hedgerows coupled with the brownfield/fallow nature of the majority of the site. In this context, the focus of views is generally the ridgeline of Athgoe Hill to the south, but the existing internal vegetation growing within the surrounding hedgerows contributes somewhat to the amenity value of the views.

Visual receptors have greater potential sensitivity to change in the landscape, however this is reduced by the following existing adverse factors:

- There are visual barriers for many potential receptors, including walls, trees, existing boundary hedgerows to the west, south and portions of the north-east of the site which limit views into the development area
- The site is zoned and planned for large scale development.

11.5.1 Magnitude and Quality of Change in the Landscape and Visual Environment

The proposed development will result in a change to the landscape, which will give rise to landscape and visual effects. The likely extent of the change within the landscape context is considered to be very significant as there will be intensive changes to landscape character within this localised area, which will be visible from several surrounding areas. The magnitude of change will vary depending on the viewpoint from which it is viewed and how visible the proposed buildings are in that view.

The proposed buildings will contrast with the existing landscape resulting in a permanent change in character. As there has been extensive change to the site in the last 10 years (removal of hedgerows, enabling site-works for a previously permitted development, etc.) the magnitude of change is somewhat ameliorated.

With regard to quality of change, the proposed development is generally considered an improvement to the existing degraded, low quality brownfield/fallow landscape, as described earlier, although it does require the removal of two portions of high sensitivity burgage hedgerow. It will also be an improvement in the landscape amenity value of the site for users. However, some of the proposed buildings will block views of the wider landscape from some receptors and in these cases, this would be considered a localised negative impact. Construction stage impacts, where they occur, are considered to be of negative quality and short term, as the construction stage is expected to last less than seven years.

11.5.2 Potential Impact of Proposed Development without Mitigation

The potential impacts are the effects that the development could have without consideration of landscape mitigation or amelioration – i.e. without landscape works. For the sake of clarity these shall be considered under the following headings: Landscape Impacts and Visual Impacts.

These impacts are considered under the following headings:

- temporary effects (construction phase up to one year);
- short-term impacts (construction phase up to two years);
- short-term impacts (operation phase up to seven years);
- medium-term impacts (operation phase, seven to fifteen years) and
- long-term impacts (operation phase up to fifteen years and beyond).

These effects have been compiled to identify any areas where the proposed development may be injurious to the scenic and visual character of the area and represent the potential impact rather than the eventual long-term effect. For this section, it is assumed that no specific landscape works are carried out with the construction of the development and that the open spaces are simply grass areas. This enables recognition of potential, rather than actual, effects which facilitates the identification of suitable landscape mitigation measures.

11.5.3 Construction Phase – Potential Landscape and Visual Impact

11.5.3.1 Temporary and Short-Term Effects

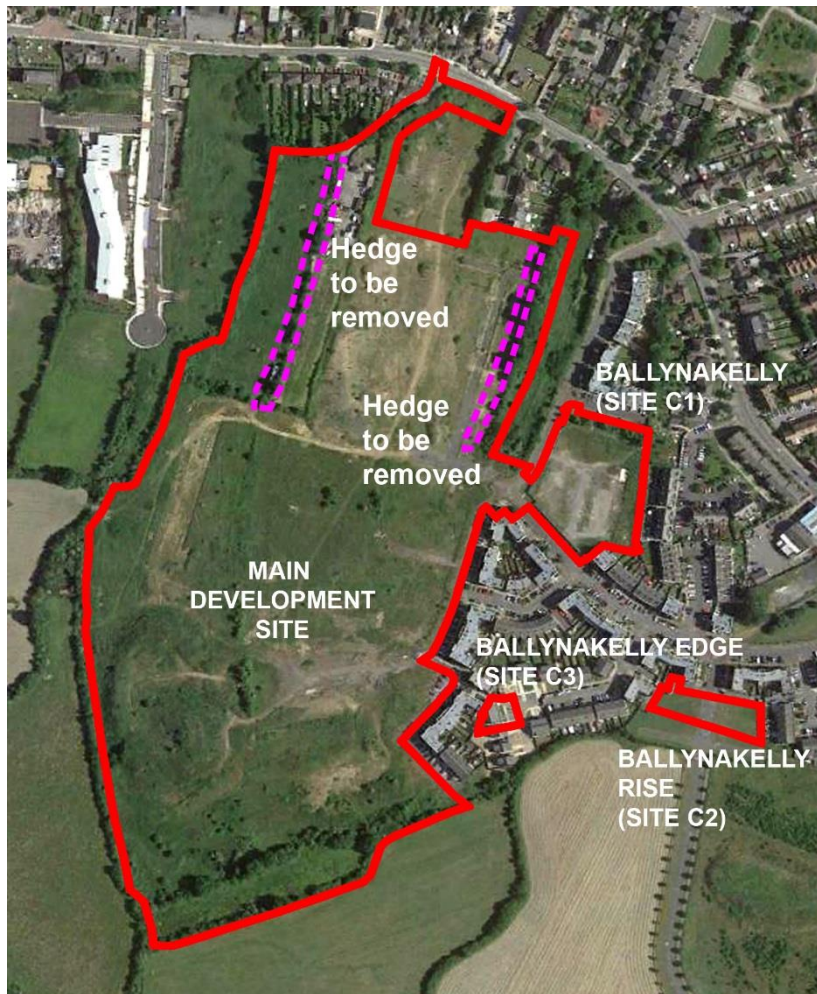
During this process the site will undergo a change from that of an area of previously disused pre-development and open fallow land to a large construction site. Any impacts generated at this stage will be short term in duration, save for some landscape effects which will be permanent.

There will be significantly negative effects on the existing landscape associated historic burgage hedgerows due to the construction works of this development. This will be due to the site clearance, the proposed linking in of the proposed road network with the existing road network, the building processes required to build the proposed development and associated distributor roadworks. Elsewhere, landscape impacts will be slightly negative due to the quality of the brownfield/fallow areas within the site.

The removal of 2 no. burgage hedgerows will have a significantly negative impact on the landscape. These hedges are of minimal arboricultural value due to the existing vegetation being highly sporadic and variable in condition. Portions have been highly modified over time.

There are large amounts of Bramble (*Rubus fruticosus*) and Ivy (*Hedera helix*) that are dominating the underlying hedge structure. There are some Wych Elms showing evidence of Dutch Elm disease, while the majority of the existing fabric of the hedges contain Hawthorn, (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) The hedges may offer some degree of ecological worth. However, the real value in these hedges lies with their historical importance as burgage plot boundaries.

Figure 11.6 Hedges to be removed due to construction



Visual impacts will be more acute than in the operational phase, but short term in duration. This is due to the construction traffic, site hoarding, cranes, etc. Cranes will be taller than the proposed buildings and therefore more visible in the landscape. There will also be vehicular and crane movement and changes to the configuration of the site, typical of building sites, resulting in visual impacts to local viewpoints.

The most substantive visual effects during construction will be experienced by varying adjacent residential receptors on all four sites within the proposals. Viewpoint 3, adjacent to the Main Development Site (Orchard Grove), Viewpoint 14 (Newcastle Boulevard), Viewpoint 15 (Ballynakelly Edge) and Viewpoint 16 (various around Site C1) will be most affected, the proposed development works having a moderately negative visual impact at construction stage.

Other residents in these areas with oblique but no direct views from their properties will experience slightly negative visual effects from the public realm as they come and go from their dwellings and potentially from their rear, upper floor windows or gardens.

11.5.4 Operational Phase – Potential Landscape Impact

11.5.4.1 Short-Term Impacts (up to seven years)

Following construction, the main landscape effects of the proposed development are associated with the change in land use from previously disused lands and open space to a more intensified, residential use, as specified in the South Dublin Development Plan zoning designation. This will result in a slightly negative effect on the landscape.

This is due to the fact that the site is of moderate sensitivity and the development proposed will have a higher landscape quality than the current brownfield nature of most of the site.

11.5.4.2 Medium-term Landscape Impacts (seven to fifteen years)

As the existing planting matures on site there will be a slight positive impact upon the subject site.

11.5.4.3 Long-term Landscape Impacts (over fifteen years)

The existing maturing planting will further integrate the proposed development into the existing landscape, resulting in a long term slightly positive effect on the landscape.

11.5.5 Operational Phase – Potential Visual Impact

Potential visual impacts of the proposed development are assessed by examining potential views to the site of the proposed development that have the likelihood of being significantly affected. Photographs of relevant viewpoints from public land are at Appendix 11.A. Photographs of other viewpoints are not included due to the impact of the development being on privately owned land and the potentially ensuing access issues. The impact from these viewpoints have been assessed by professional evaluation according to the relevant prescribed methodologies as stated in Section 11.4.2.

The lands have been zoned for significant residential development within the South Dublin Development Plan 2016 - 2022. This designation has been taken into consideration within the assessment of sensitivity of the all viewpoints.

Viewpoint 1) Burgage Crescent/Lyons Avenue: 15m east of site

There will be a moderately negative effect of views into the site from properties on Burgage Crescent and Lyons Avenue; these properties have direct views into the site from across the existing roadway to the front. This is due to a loss of perceived open space, although current views are over the fallow/brownfield portion of the site.

Viewpoint 2) Burgage Crescent: 50m east of site

There will be a slightly negative visual effect on views from properties fronting onto Burgage Crescent in this location. The existing hedgerow along the roadway provides this viewpoint with some screening from the proposed development, although glimpsed views will be available from upper floor windows, especially during winter months.

Viewpoint 3) Orchard Grove: Immediately adjacent to south: 0 – 25m north-east of site

There will be a slightly negative effect on views from the southern portion of housing along Orchard Crescent due to the adjacency of the proposed development and the loss of perceived open space. The most affected views would be from upper floor windows. Views from the northern portion of housing will be slightly negatively affected due to the existing mature hedgerow to the other side of the road.

Viewpoint 4) Main Street: 75m north-east of site

There will be no significant effect on views from the row of semi-detached housing fronting onto Main Street. The views are from the rear of the properties and would be potentially from upper floor windows, due to existing garden boundaries and vegetation.

Viewpoint 5) Main Street: 50m north-east of site

As Viewpoint 4, there will be no significant effect on views from these properties facing Main Street as the potential views into the site are screened by adjacent properties and associated garden vegetation and boundaries.

Viewpoint 6) Main Street: 25 – 50m north of site

These properties are located on the northern side of Main Street and have open views to the site and across to Athgoe Hill. The obstruction of this existing view will have a moderately negative short-term impact due to the loss of perceived open space and the change in character. However, this would be reduced to a slightly negative effect on views as the proposed development forms a part of the urban fabric of the village core.

Viewpoint 7) Main Street: rear boundaries adjacent to north of site

This row of semi-detached housing faces Main Street and backs obliquely onto the proposed development. There will be a slightly negative impact on glimpsed views from upper floor rear windows of these properties due to the perceived loss of a rural edge to the south. Ground floor views will not be significantly affected due to existing garden and boundary vegetation.

Viewpoint 8) Main Street: 100 – 140m north of site

Existing views into the site are glimpsed from the front of two single-storey properties on the northern side of Main Street. The main portion of the existing development along this viewpoint is taken up with the Newcastle Shopping Centre and its car park adjacent to the road from which views are not significant. However, existing views are screened by existing vegetation to the southern side of Main Street, which leads to a not significant effect on existing views from this viewpoint.

Viewpoint 9) Main Street: 320 – 400m north-west of site

This viewpoint consists of a group of detached properties fronting onto the southern side of Main Street. Views towards the site are oblique and glimpsed, and would primarily be from upper rear windows. These views towards the proposed development are partially screened by existing rear garden boundaries and vegetation,

and existing field boundaries consisting of trees and hedgerows. Therefore there will not be a significant visual effect from the proposed development in the short-term. In the medium to long-term the impact of Phase 1 development will be imperceptible as Phase 2 lands are developed.

Viewpoint 10) Athgoe Road: 450 – 500m west of site

Properties within this viewpoint consist of detached properties either side of Athgoe Road. There may be glimpsed views towards the proposed development from upper windows which will not have any significant effect on existing views due to existing rear garden vegetation and the intervening field boundary vegetation.

Viewpoints 11 and 12) Athgoe Road/Cul-de-sac: 450 – 700m south west of site

Viewpoint 11 comprises of detached properties on the eastern side of Athgoe Road, while Viewpoint 12 is accessed via a cul-de-sac off Athgoe Road. Both viewpoints have elevated distant views of the proposed development across existing field boundaries. The development would have a slightly negative effect on existing views. This is due to the interceding topography of the slope; the nearest housing elements to the viewpoints would be less visible than parts of the proposed development towards the north of the site. The existing field boundary vegetation also contributes towards a mitigation of the severity of impact on the existing views.

Viewpoint 13) Off Newcastle Boulevard: 350 – 425m south of site

This consists of a detached house and a bungalow situated on slightly elevated lands to the south of the proposed development. The predicted effect on views would be slightly negative, due to the distance to the site and the small portion of the viewshed occupied by the proposed development. Intervening boundary vegetation and field boundary vegetation also contributed towards mitigating the visual impact of the proposed development.

Viewpoint 14) Newcastle Boulevard: 10m from existing development

This is adjacent to Site C2 (Ballynakelly Rise) and includes views from the rear of some properties on Ballynakelly Edge and Newcastle Boulevard. There are views from the rear of some properties facing onto the west side of Ballynakelly Court. The views are generally oblique and from upper floor windows. There will be a moderately negative impact on views from these locations due to a loss of perceived open space.

Viewpoint 15) Ballynakelly Edge: 5-10m from existing development

The views in this area (Site C3) are totally enclosed by existing development; 3 storeys to the west and two-storey detached and semi-detached properties to the east. There is an existing unused structure on the subject site surrounded by site hoarding. The proposed development within this portion of the site will have a significantly positive effect on views due to the cohesive design elements supplied the completion of the street frontages.

Viewpoint 16) Newcastle Boulevard, Burgage Green, Parson's Court: 15 – 30m from existing development

This portion of the proposed development (Site C1 – Ballynakelly) is currently hoarded off from the existing developments on Newcastle Boulevard, Burgage Green and the rear of Parson's Court. The site itself is

brownfield in nature, with remnant of previous site works evident. Existing vegetation is colonising low scrub to the edges of the site. The effect on views in the medium to long-term will not be significant. This is due to the loss of perceived open space tempered with the addition of a significant area of new streetscape, urban fabric and associated planting that will contribute towards creating a sense of place for the community.

11.6 Mitigation Measures

The following recommendations are put forward to mitigate against the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the subject site.

11.6.1 Construction Phase

During the construction phase, site hoarding will be erected to restrict views of the site during construction. Hours of construction activity will also be restricted in accordance with local authority guidance.

11.6.2 Operational Stage

The existing boundary hedges around the site to the west are to be retained. In areas where these existing boundaries need rehabilitation and filling in, semi-mature native tree planting, bare-root tree planting and native shrub planting is proposed. This will create a landscape buffer space that will reduce the views into the site from adjacent properties to the west and south-west. The southern portion of the site contains a large park that will have semi-mature tree planting that will contribute to screening the development from properties to the south.

Internal streets within the development will also contain a substantial amount street tree planting that will continue to soften and screen the development over the medium to long-term as the trees and planting mature.

At time of planting, the proposed trees in the landscaped buffer zones will be at least 3.0m in height. The trees will reach a mature height of at least 7 to 12 metres, dependant on species and environmental factors within the medium term (seven to fifteen years).

If necessary, and subsequent to appropriate soil analysis, topsoil may be imported where necessary to ensure that mitigation measures establish and grow appropriately.

Table 11.5 Visual Impacts

Note: The assessment takes into account relevant mitigation measures for construction and residual stages.

Ref.	Viewpoint / Approx. Elevation	Level of Sensitivity	Magnitude of Change to View – Construction	Construction Impact (all negative)	Magnitude of Change to View – Operational/ Residual	Operational Impact	Residual Impact (with mitigation)
1	Burgage Crescent/Lyons Avenue; 102m OD	Medium	High	High	High	Slight Neg.	Slight Neg.
2	Burgage Crescent; 92-95m OD	Medium	Medium	Significant	Significant	Slight Neg.	Slight Neg.
3	Orchard Grove, 93m OD	Medium	High	Significant	Significant	Moderate Neg.	Moderate Neg.
4	Main St; 89m OD	Low	Low	Not Significant	Low	Not significant	Not significant.
5	Main St; 89m OD	Low	Low	Not Significant	Low	Not significant	Not significant.
6	Main St; 89m OD	Low	Low	High	High	Moderate Neg.	Slight Neg.
7	Main St; 89m OD	Medium	Medium	Significant	Significant	Slight Neg.	Not significant.
8	Main St; 89m OD	Low	Low	Low	Low	Not significant	Not significant.
9	Main St; 90m OD	Low	Low	Low	Low	Not significant	Not significant.
10	Athgoe Rd; 95m OD	Low	Low	Low	Low	Not significant	Not significant
11	Athgoe Rd; 110-130m OD	Low	Low	Low	Low	Slight Neg.	Not significant
12	Cul-de-sac off Athgoe Rd; 140m OD	Low	Low	Low	Low	Slight Neg.	Not significant..
13	Off Newcastle Boulevard; 105m OD	Low	Low	Low	Low	Slight Neg.	Not significant.
14	Newcastle Boulevard; 99m OD	Medium	High	High	High	Moderate Neg.	Moderate Neg.
15	Ballynakelly Edge; 100m OD	Medium	High	High	Low	Significant Pos.	Significant Pos.
16	Newcastle Boulevard, Burgage Green, Parson's Court; 95-99m OD	Medium	High	High	High	Not significant	Slight Pos.

Note re. abbreviations - Quality of Impact: Neg. = Negative; Pos. = Positive

11.7 Residual Impacts

The predicted impacts are the impacts that the development is most likely to have on the receiving environment **having regard to the remedial and reductive measures outlined in the previous section.**

Residual impacts are largely as per the Operational impacts due to the nature and scale of the development, although the mitigation measures proposed in section 11.6 will help to further enhance the scheme.

11.7.1 Construction Phase – Residual Landscape and Visual Impact

Residual landscape impacts at construction stage are likely to be as per the potential impacts – see Section 11.5.2. However, the proposed hoarding will slightly improve the negative effect on visual impact from adjacent properties as the majority of construction traffic and activity will be screened. However, as the proposed development will be higher than the hoarding, the predicted visual effects will remain largely unchanged.

The construction phase will have a significantly negative impact for the receptors at Viewpoints 1, 3, 14, 15 and 16 due to the proximity of the development. This, however, is temporary and over a short-term duration.

11.7.2 Operational Phase – Residual Landscape Impact

The landscape effects of the proposed development would overall be slightly negative in the short term, particularly considering the moderate sensitivity of the site, and the existing residential zoning designation within the South Dublin Development Plan 2016 - 2022.

The main impact on the landscape is the removal of some of the historical burgage hedgerows to facilitate development, but the overall quantity of hedgerow planting is increased.

These predicted effects are mitigated by the potential quality of the public realm, the cohesive land use and pattern that would result; and the new spaces, landscape features and distinctiveness introduced by the proposed development with its associated landscape spaces and planting interventions.

Landscape impacts will be further enhanced positively by the proposed planting, particularly due to the high proportion of native and pollinator-friendly plant species. Landscape amenity value of the proposed scheme is particularly high due to the quality of the proposed spaces, with quality materials and soft landscape elements contributing to the sense of place and wayfinding along the newly created linkages and Greenway.

Existing boundary planting is retained to the western boundary of the site to protect the privacy and visual amenity of the existing residents. Elsewhere internal hedgerows have been retained where possible, with the inclusion of additional hedgerow planting that reinstates some of the previously removed burgage hedgerows.

Boundary and native screen planting species mixes, that include trees and shrubs, will be selected from the native Irish palette to encourage wildlife in the area and enhance biodiversity.

Within the site there will be approximately 900 new standard trees planted with the residential development, with approximately 7,000 sq.m. of native shrub planting.

These mitigation measures contribute towards improving the positive impact of the development upon the landscape, resulting in a slightly positive impact. The proposed planting would substantially increase the tree resource and quality in the area overall.

11.7.3 Residual Visual Impact

The predicted residual visual impacts are those that will persist following implementation and establishment of the proposed landscape measures (medium term). The residential zoning designation of these lands within the South Dublin Development Plan 2016-2022 have been taken into consideration when assessing the impacts on the following receptors.

The proposed planting and mitigation measures will help in further softening and increasing the visual value of the development over time, particularly from the south and west of the site, mitigating some visual impacts from slightly negative to not significant.

Views from the north of the site and east of the site, and from the properties adjacent to Sites 2, 3 and 4 will largely be unaltered by the proposed mitigation measures due to the lack of space for additional planting. Therefore, the permanent slight to moderately negative visual impact will persist from viewpoints 1, 2, 3, 6 and 14. See Table 11.1 for a full assessment of likely visual impacts to all receptors.

11.8 Do Nothing Scenario

The do-nothing impact refers to the non-implementation of the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant.

The current land use of the subject site is not a land use which is likely to persist in the longer term due to the current zoning within the South Dublin Development Plan. This envisages a considerable development for the land in the proposed development area.

In the event that the development does not proceed it is likely that the subject site would be developed in the future for some residential and open space use in line with its zoning. If the site is left in its current state, the management, or lack thereof, will be likely to continue in its current manner and hence a neutral impact will persist on the existing landscape.

11.9 Interactions Arising

The assessment of the landscape impacts associated with the proposed development has a number of interactions with other parameters of the assessment. In summary, these are as follows:

- Population and Human Health
- Biodiversity

The interactions of landscape with these parameters were as follows:

Population and Human Health

The landscape and visual impact associated with human beings focuses on the effects to dwellings. The proposed development generates visual effects; the effects and associated amelioration of these effects is discussed in the impact section of the report.

Biodiversity

The long-term effects of the proposed development will have a positive effect on the tree cover associated with the development and the inclusion of native species of shrub planting.

11.10 Monitoring

Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

Operational Phase

Monitoring of the mitigation measures forms part of the landscape maintenance plan. Replacement trees, replacement planting and pruning measures are captured in landscape maintenance plans, and are intrinsically linked to the proposed mitigation measures. All landscape works will be in an establishment phase for the initial three years from planting. A landscape maintenance (?) plan accompanies the planning application (see Appendix 11.B for copy of Landscape Masterplan dan Appendix 11.3 for Landscape Maintenance Plan). Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

11.11 Potential Cumulative Impacts

Any further development within the vicinity of the proposed lands could have the possibility of impacting on the same sensitive receptors as identified above. This could lead to potential impacts of a slightly higher level of significance on the identified receptors when assessed cumulatively. These future developments will have further impact on the named receptors above that cannot, at this stage, be fully quantified. The most likely of these potential impacts will be loss of vegetation and an impact on views. This may happen in particular to Viewpoint 3 and Viewpoint 2, where adjacent land has been zoned for development and in some cases granted permission (Viewpoint 8), and also where the potential Phase 2 of the proposed development will be situated.

11.12 References

South Dublin County Development Plan 2016-2022, published by South Dublin County Council

Newcastle Local Area Plan, December 2012 (extended to 2022), published by South Dublin County Council

Landscape Character Assessment of South County Dublin, 2015 (updated June 2016) Minogue & Associates for South Dublin County Council

Guidelines for Landscape and Visual Impact Assessment 3rd Edition, by The Landscape Institute / Institute of Environmental Assessment, published by E&FN Spon (2013)

Advice notes on Current Practice in the Preparation of Environmental Impact Statements, published by the Environmental Protection Agency (EPA) (2003)

Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA (2017)

Advice Notes for preparing Environmental Impact Statements (Draft), published by the EPA, 2015

APPENDIX 11.A Viewpoints

Photographs from Viewpoints (photographs are to identify locations and are approximate to specific viewpoints identified. Only viewpoints with likely effects are included.)

Viewpoint 1 – Burgage Crescent. View to south-west



Viewpoint 2 – Burgage Crescent. View to north-west



Viewpoint 3 – Orchard Grove. View to south



Viewpoint 6 – View to south-west from R405



Viewpoint 12 – View north from Athgoe Hill



Viewpoint 14 – Site C2, Ballynakelly Rise. View to north



Viewpoint 15 – Site C3, Ballynakelly Edge. View to west.



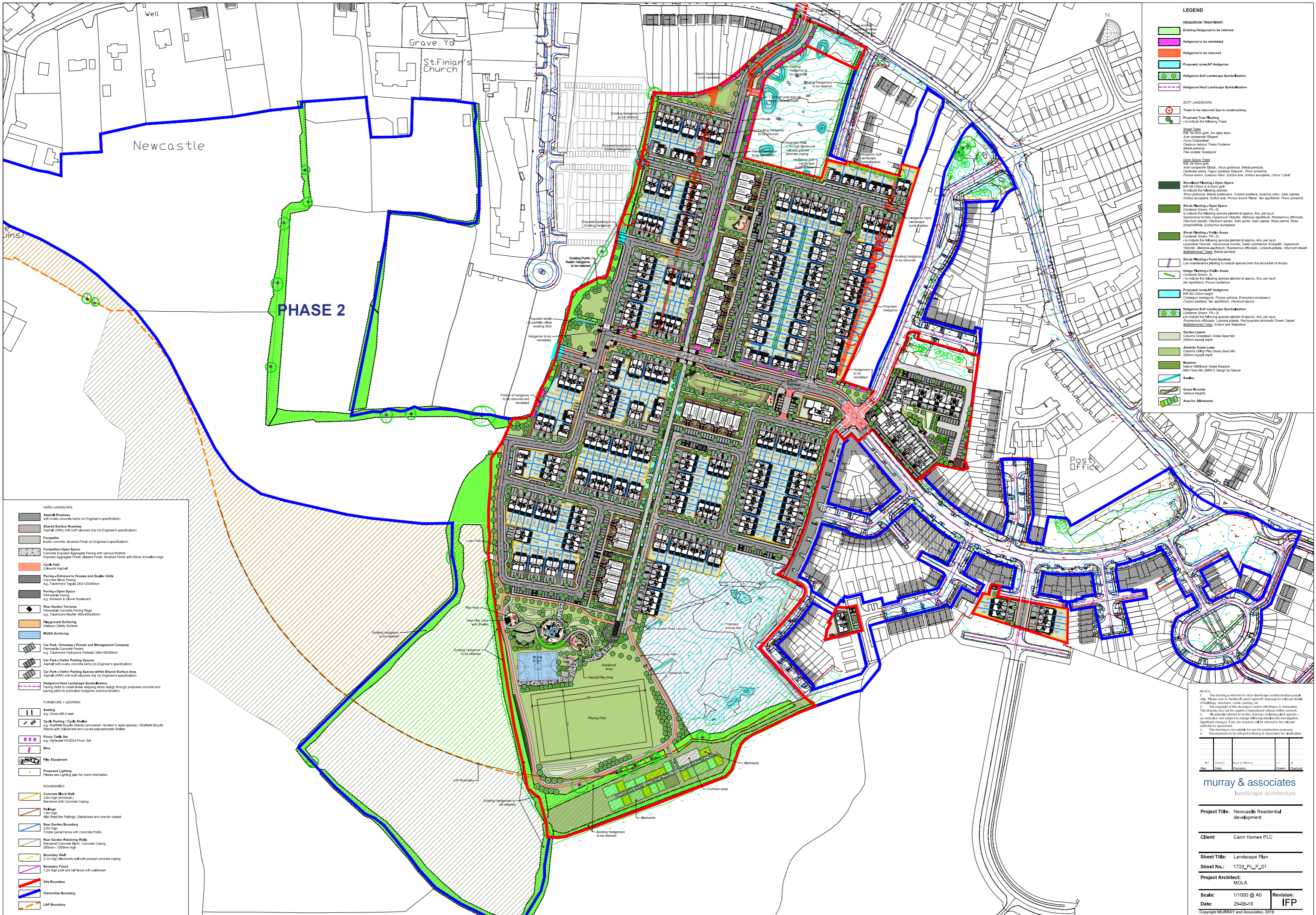
Viewpoint 16 – Ballynakelly. View to east



Viewpoint 16 – Burgage Green. View to east



APPENDIX 11.B Landscape Masterplan



LEGEND

HEDGEROW TREATMENT:

- Existing Hedgerow to be retained
- Hedgerow to be reinstated
- Hedgerow to be removed
- Proposed non-LAP Hedgerow
- Hedgerow Soft Landscape Symbolisation
- Hedgerow Hard Landscape Symbolisation

SOFT LANDSCAPE

- Trees to be removed due to construction.
- Proposed Tree Planting - to include the following Trees:
 - Street Trees: 10-15m girth, 2m clear stem: Acer campestre 'Spartan', Picea canadensis 'Franklin's Mill', Salix caprea, Picea canadensis 'Millar's Seedling'
 - Open Space Trees: 15-18m girth: Acer campestre 'Spartan', Alnus glutinosa, Betula pendula, Castanea sativa, Fagus sylvatica 'Dawyck', Pinus sylvestris, Prunus avium, Quercus robur, Sorbus aria, Sorbus aucuparia, Ulmus 'Lodell'
 - Woodland Planting - Open Space: 10-12m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Shrub Planting - Open Space: 2-3m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Shrub Planting - Public Areas: 2-3m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Shrub Planting - Front Gardens: 2-3m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Hedge Planting - Public Areas: 2m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Proposed non-LAP Hedgerow: 10-12m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Hedgerow Soft Landscape Symbolisation: 2-3m girth: Alnus glutinosa, Betula pubescens, Corylus avellana, Quercus robur, Salix caprea, Sorbus aucuparia, Tilia cordata, Ulmus 'Lodell', Pteris aquilina, Pteris caudata
 - Garden Lawns: 200mm topsoil depth
 - Amenity Grass Lawn: 200mm topsoil depth
 - Meadow: Native Wildflower Grass Meadow
 - Grass Mounds: 200mm topsoil depth
 - Area for Absements

HARD LANDSCAPE

- Asphalt Roadway with in situ concrete kerbs (to Engineer's specification)
- Shared Surface Roadway Asphalt (HMA) with buff coloured chip (to Engineer's specification)
- Footpaths 150mm concrete, brushed finish (to Engineer's specification)
- Footpaths - Open Space Concrete (Exposed Aggregate) Paving with various finishes: Exposed Aggregate Finish, Blasted Finish, Brushed Finish with 50mm trowelled edge
- Cycle Path Coloured Asphalt
- Paving - Entrance to Houses and Duplex Units Concrete Block Paving e.g. Tolomere Tegula 240x120x60mm
- Paving - Open Space Permeable Paving e.g. Adhesion & Clover Boulevard
- Rear Garden Terraces Permeable Concrete Paving e.g. Tolomere Myster 400x400x40mm
- Playground Surfacing Resilient Safety Surface
- MUGA Surfacing
- Car Park / Driveway - Private and Management Company Permeable Concrete Paving e.g. Tolomere Hydriqare Pedests 200x100x80mm
- Car Park - Visitor Parking Spaces Asphalt with in situ concrete kerbs (to Engineer's specification)
- Car Park - Visitor Parking Spaces with Shared Surface Area Asphalt (HMA) with buff coloured chip (to Engineer's specification)
- Hedgerow Hard Landscape Symbolisation Paving paths to create linear stepping stone design through proposed concrete and paving paths to reinforce hedgerow previous location

FURNITURE + LIGHTING

- Seating e.g. Onea 400 x 2 seat
- Cycle Parking / Cycle Shelter e.g. Sheffield Bicycle Stands (uncovered - located in open spaces) / Sheffield Bicycle Stands with Geknessed and powder coated
- Picnic Table Set e.g. Hecobal HC2024 Picnic Set
- Bins
- Play Equipment
- Proposed Lighting Please see Lighting plan for more information

BOUNDARIES

- Concrete Block Wall 2.0m high (minimum) Reinforced with Concrete Capping
- Aluminum 1.2m high
- M60 Steel Bar Railings, Geknessed and powder coated
- Rear Garden Boundary 2.0m high Timber panel Fence with Concrete Posts
- Rear Garden Retaining Walls Reinforced Concrete Block, Concrete Capping 500mm - 1000mm high
- Boundary Wall 2.0m high Blockwork wall with precast concrete coping
- Boundary Fence 1.2m high post and rail fence with widthmesh
- Site Boundary
- Ownership Boundary
- LAP Boundary

NOTES:

- This drawing is intended to show landscape architectural proposals. Please refer to Architectural and Civil Engineering drawings for relevant details of buildings, structures, roads, parking, etc.
- The copyright of this drawing is owned by Murray & Associates. This drawing may not be copied or reproduced without written consent.
- All materials referred to in this drawing, including plant species, are indicative and subject to change following detailed site investigation. Significant changes, if any are required, will be referred to the relevant authority for agreement.
- This drawing is not suitable for use for construction purposes.
- Discrepancies to be referred to Murray & Associates for clarification.

Rev	Date	Revision	By	Check

murray & associates
landscape architecture

Project Title: Newcastle Residential development

Client: Cain Homes PLC

Sheet Title: Landscape Plan
Sheet No.: 1723_PL_P_01

Project Architect: MOLLA

Scale: 1/1000 @ A0
Date: 29-06-19
Revision: IFP
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APPENDIX 11.C Landscape Maintenance Plan

**RESIDENTIAL DEVELOPMENT ON LANDS AT NEWCASTLE
CO. DUBLIN**

LANDSCAPE MAINTENANCE PLAN

**Client:
CAIRN HOMES PROPERTIES LTD.**

**Date:
*JULY 2019***

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DRAWINGS

These Specifications are to be read in conjunction with the Landscape Architect's drawings, as per drawing issue sheets.

PREAMBLE TO SPECIFICATIONS FOR LANDSCAPE WORKS

Contractors should note that landscape works must be carried out by a competent and experienced Landscape Subcontractor from the list of approved landscape subcontractors provided in the accompanying documentation.

NATURE OF WORKS

The works consist of landscape works including supply of nursery stock & various landscape materials, grassing, tree planting, at the Lidl Regional Distribution Centre.

The Works also involve maintenance of all planted and grassed areas for one year after the planting has been completed.

Prior to setting out of works a site visit with the Landscape Architect and the Main Contractor will be arranged to determine precise lines prior to setting out of works, and the Landscape Subcontractor will follow precisely the exact lines laid down at that meeting.

The Landscape Contractor shall liaise with the Main Contractor, as the appointed Project Supervisor for the Construction Stage regarding available working space, access, health and safety, available site areas for planting and all other things insofar as they may have connection with the works. Quality control is under the auspices of the Landscape Architect.

1. Period

The Contractor shall be responsible for aftercare of the completed works for 1 year from the date of completion of planting. Aftercare is deemed to include adequate watering of standard trees and shrubs during dry periods of weather.

2. Organisation

The aftercare program will be organised as follows:

- (a) Scheduled operations, in who's timing the Contractor will be permitted some flexibility, and which will be the basis of payment to the Contractor.
- (b) Performance standards, which the Contractor is required to meet at all times, and on which his performance will be assessed.
- (c) Critical dates, by which time scheduled operations shall have been completed, and at which performance will be assessed.

3. Performance Standards – General

The following maintenance standards shall be upheld for the duration of the maintenance period:

3.1 **Replacement planting under defect:**

The Employer's representative shall inspect the planting in July following planting. Any tree 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 aspects with this Specification, including all specified excavation, provision and incorporation of all fertilizers and ameliorants, and weed killer treatments.

Failures will not be charged to the contractor in the following cases:

- (a) Damage by hares or rabbits, where protection has not been provided for in the contract.
- (b) Losses due to theft, vandalism or disturbance by other contractors.
- (c) Failures of whips and transplants due solely to prolonged dry weather, provided that the specified planting procedures have been employed and watering has been carried out in accordance with the contract specifications.

3.2 **Plant Health:**

- (a) All plants shall show signs of healthy growth throughout the growth season after planting. E.g. bud break, leaf extension, branch extension, normal for such species.
- (b) All plants shall not show signs of drought for any period exceeding five days. Such signs include change in leaf colour, withering leaves or leaves dropping.
- (c) For all trees and shrubs pruning shall be carried out to ensure removal of dead or damaged branches and the retention of a healthy crown shape throughout the growing season.
- (d) The trees shall not show signs of bark damage as a result of failure to loosen tree ties.

3.3 **Note Re. Pesticides / Herbicides**

All pesticides and herbicides to be used on-site must be approved as fit for purpose by a qualified Pesticide Advisor, registered with the Department of Agriculture, Food and Marine. Evidence of such approval will be required by the Contract Administrator, along with evidence of compliance with recommended application rates and safety protocols.

3.4 **Unforeseen Plant Infestations / Infections / Disease / etc.**

In the event that an unforeseen event occurs during the maintenance period, such as an infestation of insects, fungal infection or plant disease that affects one or more species of the plants on site, treatment of same will be agreed by all parties and costs for same are not deemed to be included in the contract for regular maintenance. This does not apply to normal levels of insect pests such as aphids on susceptible plants, or any infestation, infection or disease introduced to the site through importation of plants onto the site.

4. Specifications for Landscape Maintenance Operations

4.1 Grass and Lawn Areas

(i) General

At all times grass to look lush, vigorous and of fine quality with a minimum weed content, and a minimum variation in height of the sward during the growing season. Cutting should take place on a regular basis. Grass cutting areas shall be cleared of dead leaves, litter and rubbish prior to grass-cutting taking place.

No ruts are to be caused due to poor ground conditions. During periods of poor weather, no grass is to remain lodged following cutting. In periods of prolonged wet weather or where ground is waterlogged, consult with Landscape Architect prior to engaging in grass cutting operations.

Noxious and competitive weeds such as Ragwort, Gorse, Thistle, Dock, Nettle, Briar, Horsetail and Dandelion shall not be allowed to establish in any grass areas.

(ii) Amenity Lawn Areas

Criterion	Performance Standards
Aesthetic / functional requirements	Amenity lawn areas are those grass areas which will be maintained for general access and amenity purposes, to create a lawn which is neat, healthy, close-cut and with minimal weed content.
Permitted mower type	Cylinder mower, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; hand-mowing required in designated areas and/or where ground is soft).
Litter Pick	Weekly and prior to each grass cut, all litter and debris (including stones or other potential hazards to the mowing operation) shall be removed from the grass. All litter, debris and waste materials collected shall be delivered to a licensed waste transfer site.
Height of Cut	Minimum 20mm; maximum permissible height 50mm. At the commencement of the contract, following flowering cycle of seasonal bulbs or if grass cutting has been forestalled due to poor ground conditions resulting in the grass growing above the maximum permissible height, it shall be cut to 50mm on the initial cut, then to 25mm on the subsequent cut. Such initial long grass shall be collected and removed off site.
Frequency	28no. Cuts Mow weekly during May, June, July, August and September; Fortnightly March, April, October, November; only when necessary in winter. Mowing is not permitted when ground conditions are very soft, waterlogged or frozen, or during spells of cold, drying winds or when the grass is frosty or wet.

Finish	Even finish. Vary direction/pattern of cutting every 3 months. Grass shall be trimmed from around the bases of walls and fences, back of footpaths and kerbs, litter bins, sluice valves and hydrant markers, trees, poles, signage and public lighting columns, etc., and this interface between grass and walls, fences, etc., as noted above, kept in a neat and tidy condition. This trimming shall be deemed to be included for at every grass-cutting. The Landscape Contractor is bound to comply with this instruction and herbicide application is not permitted to achieve this.
Clippings	To be gathered at every cut and disposed of in designated area or off-site. Box to be emptied regularly during cutting to avoid clumps being left on the grass.
Fertiliser	In mid-spring (late March to April), use a proprietary lawn fertiliser at the manufacturer's recommended rates, to be approved by the Landscape Architect. Apply fertilisers when the soil is moist, or when rain is expected. If grass loses vigour and freshness between late spring and late summer (often May to August), repeat the application of lawn fertiliser.
Weed Control	Minimum weed content permitted i.e.: (1) <5% of species content; (2) <10% of total grass area. When necessary and approved by Landscape Architect, use an approved selective herbicide, to control broad-leaved weeds in the sward. Weeds resistant to herbicide to be dug out by hand in autumn.
Scarifying	Scarifying to be carried out to keep levels of thatch (old grass stems, dead moss and other debris) at an acceptable level (i.e. less than 1cm deep). To remove thatch, rake vigorously but carefully with a power-scarifier. Recommended to be carried out in autumn only.
Aeration	Spiking with holes 10-15cm (4-6in) apart and deep to be carried out once per annum.
Rolling	Amenity grass areas should be reasonably even, with no variations greater than 25mm over a 1m straight edge. In September, to repair any uneven areas of the lawn, use an edging iron to slice through the turf and roll it back. Fork over the underlying ground and add or remove soil as needed. Replace the turf, pressing the edges together, roll with lawn roller (nominally 100kg, subject to site conditions) and water thoroughly.
Edging	Lawn to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm.
Over-seeding	After moss or weeds have been removed, or where grass is growing sparsely, over-seeding may be necessary. (Early autumn or mid-spring). Break up the surface with a fork and rake to leave a fine, even tilth; Sow grass seed at half the recommended rate (usually 10-15g/sq.m); lightly rake to incorporate the seed into the surface; water if weather remains dry for 2-3 days following seeding.
Watering	Watering to be carried out when required. Ensure that the water reaches a depth of 10cm (4in) after each watering. Rate: max. 20 litres per square metre.

Indicators of under-performance:

Excessive weeds or weeds such as clover or moss indicate poor sward health; bare patches may indicate scalping or lack of vigour; yellowing or browning of sward may indicate drying out, under-feeding, herbicide drift or inappropriate use of herbicide; thatch build-up greater than 1cm depth; rutting of the surface, wheel marks or poor drainage may indicate compaction of soil caused by mowing in wet weather or use of unsuitable mower type.

(iii) Rough Cut Grass Areas

Criterion	Performance Standards
Aesthetic / functional requirements	Rough cut grass areas are those grass areas which will not usually be accessed by users and will usually be in low priority areas, or in the background. These areas are to be maintained to create a grass area which is healthy and with minimal weed content, with grass allowed to grow relatively long between infrequent and regular cuts.
Permitted mower type	Strimmer, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; strimming required in designated areas, areas of slope gradient greater than 1:3 and/or where ground is soft)
Litter Pick	Minimum of 8no. litter picks per annum and prior to each grass cut, all litter and debris (including stones or other potential hazards to the mowing operation) shall be removed from the grass. All litter, debris and waste materials collected shall be delivered to a licensed waste transfer site.
Height of Cut	Grass areas shall be cut to a height of c. 75mm
Frequency	5no. times during the growing season, at regular intervals of approximately 6 weeks
Finish	Rough cut shall mean grass of minimum height 75mm, with informal appearance
Clippings	To be gathered at every cut and disposed of in designated area or off-site.
Fertiliser	In mid-spring (late March to April), use a proprietary lawn fertiliser at the manufacturer's recommended rates, to be approved by the Landscape Architect. Apply fertilisers when the soil is moist, or when rain is expected.
Weed Control	Minimum weed content permitted i.e.: (1) <5% of species content; (2) <15% of total grass area. When necessary and agreed with Landscape Architect, use an approved selective herbicide to control broad-leaved weeds in the sward. Noxious or invasive weeds to be spot treated by controlled droplet applicator or glove with approved herbicide in May, June and August and prevented from flowering.
Edging	Rough-cut grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm

Indicators of under-performance:

Excessive weeds or occurrence of noxious or invasive weeds unacceptable; rutting of the surface, wheel marks or poor drainage may indicate compaction of soil caused by mowing in wet weather or use of unsuitable mower type.

(iv) Meadow Grass / Wildflower Areas

Criterion	Performance Standards
Aesthetic / functional requirements	Meadow grass or wildflower areas are those areas which will not usually be accessed by users and will usually be in low priority areas, or kept for biodiversity reasons. These areas are to be maintained to create a meadow area which is healthy and with minimal noxious or invasive weed content, with grass allowed to grow relatively long between infrequent and regular cuts.
Permitted mower type	Strimmer, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; strimming required in designated areas, areas of slope gradient greater than 1:3 and/or where ground is soft)
Litter Pick	Minimum of 8no. picks per annum and prior to each grass cut, all litter and debris (including stones or other potential hazards to the mowing operation) shall be removed from the grass. All litter, debris and waste materials collected shall be delivered to a licensed waste transfer site.
Height of Cut	Meadow grass areas shall be cut to a height of c. 75mm
Frequency	3no. times during the growing season, in May, July and September
Finish	Meadow
Clippings	To be gathered at every cut and disposed of in designated area or off-site
Weed Control	Noxious or invasive weeds to be spot treated by controlled droplet applicator or glove with approved herbicide in May, June and August and prevented from flowering
Edging	Meadow grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm

Indicators of under-performance:

Occurrence of noxious or invasive weeds unacceptable.

4.2 Shrub & Hedgerow

(i) General

At all times shrubs and hedges are to look healthy, vigorous and of fine quality with a minimum weed content. Cutting should take place on a regular basis. Shrub areas shall be cleared of dead leaves, litter and rubbish regularly, at least once per week.

Noxious and competitive weeds such as Ragwort, Gorse, Thistle, Dock, Nettle, Briar, Horsetail and Dandelion shall not be allowed to establish in any shrub areas.

(ii) Groundcover / Mixed Borders / Mass Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Shrub planting areas shall be kept clean at all times, with an even finish. Plants to have a healthy, lush appearance, typical for plant species and time of year.
Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Residual herbicide permitted for established shrub areas, subject to approval by Pesticide Advisor.
Bark Mulch	Required – min. 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Pruning once per annum to maintain the typical size and form of the plant, for sightlines and for plant health; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Edging	Beds to be edged by hand or edging machine twice per annum to leave an even, straight edge. Shrubs or soil not to protrude past the edge by more than 50mm.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)
Dead-heading	Not required.

(iii) Specimen Shrubs

Criterion	Performance Standards
Aesthetic / functional requirements	Specimen shrub planting areas shall be kept clean at all times, with an even finish. Shrubs to have a healthy, lush appearance at all times, typical for plant species and time of year.
Weed Control	No weeds permitted in the shrub area. Established shrub areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Required – 75mm deep; to be kept topped up at all times.

Fertiliser	Annual feeding with 50-100g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the typical size, habit and form of the plant, for health and to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required to ensure consistent availability of water to plant during periods of drought (i.e. after more than 5 days) - minimum

(iv) Hedge – Free Growing (Existing Hedgerows)

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	No weeds permitted in the hedge area. Established hedge areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Required – 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Pruning once per annum as necessary to maintain the required height and width, and prevent “leggy” growth; all clippings to be gathered at every pruning and disposed of in designated area or off-site. Laying may be required for Hawthorn and Blackthorn hedges if hedge growth becomes thin at the base.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(v) Hedge – Pruned (including topiary)

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Formal habit to be maintained throughout year. Formal habit of hedge to be defined and maintained at all times.
Weed Control	No weeds permitted in the hedge area. Established hedge areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	None required
Fertiliser	Annual feeding with 50-100g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the required height and width of the plant, to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(vi) Native Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Approved residual herbicide permitted for established areas.
Bark Mulch	Required for high prominence areas; recommended for medium areas – 50mm deep; to be kept topped up at all times.
Fertiliser	Not required.
Pruning / Clipping	Pruning once per annum for shrubs such as Dogwood and Guelder Rose or to control height and spread when necessary.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(vii) Scrub - naturally occurring

No maintenance operations required, except to ensure that any edge plants are kept cut back at least 1m from road edges and tidy where visible or prominent. Such scrub areas shall not be allowed to spread, except in natural areas, and must be trimmed or mown back at regular intervals.

4.3 Trees & Woodlands**(i) General:**

- Canopies overhanging a pedestrian path to be maintained to 2.2m and canopies overhanging vehicular access to 4m.
- Limb damage caused by wind, passing traffic, etc. to be pruned resulting in a clean even wound.
- No signs, security boxes, etc. to be attached to trees.
- Surface tree roots not to cause a trip or mowing hazard. In grass areas, top up soil over roots and re-seed.
- Raised paviers or cracked/bulging walls due to root growth are to be reported to the Contract Administrator.
- Exposed roots from construction works to be kept moist by wrapping damp hessian around roots until soil is backfilled and then apply a one off generous application of water. Root damage to be pruned resulting in a clean even wound prior to backfilling / topsoiling.
- Control of ivy and suckering on the trunks of trees within falling distance of activity
- Informal monitoring of trees for change of condition or evidence of a fungal fruiting body.

(ii) Specimen, Solitary, Avenue Trees

All trees to be maintained in accordance with requirements for species and habit to be maintained in accordance typical form for tree, to include pruning where necessary. Tree trunk will be kept visible for defect inspection with control of ivy and removal

of suckering. Mulch 1m diameter will be maintained around all individual trees within grassed areas. Stakes and ties to be retained for a maximum period of 3 years, with tie loosened annually and both stake and tie to be removed after 3-year period. All nursery marking, bamboo and labels to be removed off all trees. Tree grilles in hard surface areas to be maintained weed free.

Provision to be made for watering of all trees as necessary throughout the maintenance period. Costs related to this to be included in rates.

Any visible change in condition to be reported.

(iii) Tree Groups, Woodland, Grid, Hedgerow Trees

Such areas shall be kept free of noxious and pernicious weeds at all times. Mulch or spray rings 1m diameter will be maintained along group perimeter and around all plants in recently or newly planted woodland areas where canopy cover has not been achieved. Established woodland areas or tree groups shall not be treated with herbicide except where necessary for the removal of noxious and invasive weeds including Ragwort, Gorse, Thistle, and Dock, hogweed, bramble and any others. Invasive weeds shall not be allowed to establish in any woodland areas. Scrub (including Bramble, Ivy or any other spontaneous vegetation) shall be controlled and shall not be allowed to establish in newly planted areas. Ivy shall not be allowed to establish on trees along the perimeter and within falling distance of activity within existing woodland areas or tree groups. Understorey (excluding saplings) not to exceed 1m in height in order to retain visibility for user safety in areas of activity. Tree numbers not to exceed 4 per sq.m of trees with a girth of less than 250mm and numbers not to exceed 2 per sq.m for trees with a girth of over 300mm. Fallen or felled trees in woodland areas to be maintained on-site where permissible, for reasons of biodiversity and ecology which contribute to the overall health of the woodland.

4.4 Herbaceous Perennial Planting (including Ferns and Ivy)

(i) Bulbs

Performance standards as per the following table:

Criterion	Performance Standards
Aesthetic / functional requirements	Bulbs to have a healthy, lush appearance, typical for plant species and time of year.
Weed Control	Following planting, all annual beds to be kept free of weeds through mulching or hand-weeding only. Targeted herbicide use permitted only in exceptional circumstances.
Cutting Back	Cut back dead foliage to ground level six weeks after the end of flowering (or earlier if foliage is yellow and straw-like). Do not tie or knot the leaves.
Fertiliser	Apply approved general purpose fertiliser to all bulb areas at nominal rate of 35g/sq.m in late February.
Watering	Ensure that bulbs have adequate water throughout growth period, up until cutting back occurs (see above).

Note: Herbicides may not be used in or around bulb areas.

(ii) Herbaceous Perennials, Ornamental Grasses, Ferns

Performance standards as per the following table:

Criterion	Performance Standards
Aesthetic / functional requirements	Planting areas shall be kept clean at all times, with an even finish. Plants to have a healthy, lush appearance, typical for plant species and time of year.
Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Mechanical means and mulching only acceptable means of weed control. In exceptional circumstances, targeted use of approved herbicide may be permitted.
Bark Mulch	Required – min. 50mm deep; to be kept topped up at all times. Bark mulch to be wetted during periods of dry weather.
Fertiliser	Annual feeding with nom. 35g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Trimming	Perennials to be trimmed back in Spring – remove all dead or unhealthy material and old growth, taking care not to damage new growth
Edging	Beds to be edged by hand or edging machine twice per annum to leave an even, straight edge. Plants or soil not to protrude past the edge by more than 50mm.
Watering	Watering required to ensure consistent availability of water to plants during periods of drought (i.e. after more than 7 days)
Division of perennials	Perennials to be divided once every 5 years. Division operation to be appropriate to species type and flowering period.

4.5 Paved Surfaces & Signage

Hard Standing including paved areas, pavements, and kerb-lines - shall be kept clean at all times, with no growth of weeds and without moss infestation. Roads and kerb lines shall be kept free of litter and build up of grit and debris through the implementation of a regular sweeping program.

(i) Weed Control

All paved areas such as footpaths, kerb lines, feature paving, gravel areas, etc., throughout the site are to be maintained weed free at all times. The application of an approved suitable broad-spectrum herbicide shall be applied 3no. times per annum to achieve this. Once per annum a suitable chemical to treat moss shall be applied where it has established on hard surfaces. An initial physical treatment, such as scraping using a spade, will be required to remove any existing moss growth prior to spraying.

(ii) Sweeping

Sweeping shall mean sweeping of feature paving areas, footpaths and kerb lines along all public roads (edge of road) and removal of all grit, rubbish and leaves from these areas. Soil wash from beds on to paved areas should also be swept. This work to be executed fortnightly.

Note: Particular attention is required during the period of October/ November to deal with leaf fall.

(iii) Cleaning

- Fine cut grass areas, all paved and hard standing areas, footpaths and kerb lines: This work to be executed prior to grass cutting on each grass cutting visit. Cleaning shall be carried out 36no. times per annum, including winter.
- Rough cut grass areas: prior to each scheduled grass cut, minimum 8no. times per annum.
- Tree groups, boundary tree areas, shrub maintenance areas, all other areas: 8no. times per annum.

Cleaning shall mean the removal of paper, plastic bags and all other rubbish. Cleaning of all paved and hard standing areas, footpaths and kerb lines shall be carried out weekly, including winter. Cleaning shall also include the removal of grit and rubbish from road gullies, drains, Aco drains and collapsible bollards twice per year.

(iv) Signage

All signs are to be cleaned to a high standard 4 times per year.

(v) Gullies

All gullies are to be inspected monthly and if full or blocked, must be cleared out as appropriate.

4.6 Natural Areas

No maintenance operations are permitted within areas designated as natural zones. Neither is dumping of any arisings, storage of materials or any other related activity.

4.7 Weed Control**(i) General**

Minimal amount of herbicidal chemicals are to be utilised on the site, with non-chemical means of weed control to be preferred (mulching, mechanical control, hand weeding, etc. where feasible). Biodegradable herbicides are to be preferred where herbicide use is required. Prior to executing weed control involving the use of herbicides, details of the products to be used including approval by registered Pesticide Advisor, proof of compliance with recommended application rates, Material Safety Data Sheet (MSDS) for each product is to be provided to the Contract Administrator for each of the herbicides proposed.

Where translocated herbicides are applied, spray drift should be avoided and spray guards fitted to apparatus. Where feasible, spot treatment using CDA (Controlled Droplet Applicator), weed wiper or glove preferred. Use of residual herbicides shall not be used in areas of herbaceous planting, in the initial year following planting of new shrubs or over areas of bare ground within shrub beds where replacement planting is to be carried out. Hand weeding in planting beds will be required where there is a large component of herbaceous material, bulbs or prostrate groundcover plants.

Weed control performance standards are given above in sections 4.1-4.6.

(ii) Invasive Weeds

Invasive weeds of any kind, most particularly Japanese Knotweed, Winter Heliotrope, Giant Hogweed and Himalayan Balsam (all identified on this site) shall not be allowed to establish in any area of the site. It will be the responsibility of the contractor to be able to identify same and treat at first sign of emergence. Treatment for all except Japanese Knotweed to consist of removal of weed by mechanical means, treating any remaining plant parts with an approved translocating herbicide.

Recommended Treatment for Giant Hogweed

Giant Hogweed is known to be present in adjacent sites, but has not been identified on-site to date. A survey of the site should be carried out in spring and summer each year to identify if Giant Hogweed is present. When identified, Giant Hogweed should immediately be treated with an approved herbicide. The herbicide is to be sprayed onto the plant or liberally applied using a glove. The plant should be left in-situ until completely dead and rotted down. If the first treatment does not work, a second treatment should be applied. Following treatment, the infected site must be monitored on a weekly basis for signs of re-emergence. Re-emergent plants should be treated in the same way, no later than October in any given year.

4.8 Litter

All litter, debris and waste materials collected shall be delivered to a licensed waste transfer site for onward recovery or disposal. Any leaves removed under this contract shall be kept separate from other wastes and transferred on separately for composting at a licenced facility. The selection of the waste facility or facilities to be used in this regard will be subject to approval by the Contract Administrator. The records of receipt of this material at the waste facility (the weighbridge receipts) shall be retained by the contractor for review at the discretion of the Contract Administrator.

5. Duties of Maintenance Contractor; Evaluation & Payment Procedures

The contractor shall be required to complete a site specific maintenance programme and attend site in accordance with the program agreed with the Contract Administrator. During the course of the contract the contractor shall supply after each visit to site a record of attendance using site attendance record sheets. These should be signed by the contractor's site foreman and manager and retained in a file for use as an appendix to the payment application. Failure to complete works on the prescribed date, may result in determination of the contract, except where an adjustment to program has been agreed in advance with the Contract Administrator.

At the end of every month the contract manager shall complete the monthly report sheets to clarify the completion of works for the particular month. Items of work not completed shall be noted and a timeframe for their completion indicated. The forestalled works must be attended to at the first opportunity in the month following the submission of the monthly report sheet, unless exceptional circumstances or bad weather prevent the work from being completed. In this case the work shall be attended to, as soon as is practicable, and by agreement with the Contract Administrator.

Monthly program sheets, based on the maintenance schedules, shall be signed by the contractor's manager and forwarded to the Contract Administrator for verification. Upon verification the document will be returned to the contractor and shall be attached at the time of payment application. If necessary, a site visit will be undertaken with the contractor to verify completion of works. The completed monthly report sheets shall be used as the basis for payment. Items of work not completed to the required standards shall be excluded from payment for that particular month. Should the Contract Administrator / Landscape Architect be dissatisfied with the quality of work within a particular month then a reasonable sum of money shall be withheld in proportion to the amount of incomplete work or work that is not up to standard. A minimum of 80% of work must be complete or satisfactory in order for payment to be made for a particular month.

In relation to Health and Safety, the safety file must be maintained by the contractor and be made available for inspection upon request. All possible precautions and risk management strategies must be in place in relation to safety of employees, personal protective equipment, use and maintenance of equipment/vehicles, signage when works are underway, procedures for closing off areas while works are in progress, traffic management, etc. as required. Any incident or accident must be reported to the Contract Administrator and recorded in the safety file.

6. Inspections by Employer

As part of the management of this contract, twelve critical inspections per annum (i.e. one per month, or as agreed) shall be arranged with the Contract Administrator in attendance. These may not be notified to the landscape contractor. The Contract Administrator will produce a report of the site visit, commenting on the appearance of the site and examining each aspect of work in detail. The Landscape Architect may also direct resources to a certain area of work, if deemed necessary. It is at such dates that standards will be reviewed, problems arising rectified and issues of dispute arising from the concerned parties will be settled.

7. Monthly Maintenance Operations Schedule

The following tables give an indicative outline of the required monthly maintenance operations, based on the specification outlined above.

Maintenance Program - January

Item	Description
1.1	Yearly maintenance Shrub and tree planting Tree pruning Hedge cutting
1.2	Weed free circles around trees/whips Check tree stakes and ties
1.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - February

Item	Description
2.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
2.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - March

Item	Description
3.1	Yearly maintenance Shrub and tree planting Shrub Pruning Tree pruning Hedge cutting Hedgerow cutting Hand Weeding in shrub areas Weed free circles around trees/whips
3.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Grass trimming Grass edging Weed control to rough cut/rough ground areas
3.3	Grass reinstatement
3.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Clean all signs

Maintenance Program - April

Item	Description
4.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hedgerow cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser
4.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming Grass edging Weed/Moss Control Fertiliser Application
4.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
4.4	Grass reinstatement
4.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas

Maintenance Program - May

Item	Description
5.1	Yearly maintenance Shrub and tree planting Hedge cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Apply fertiliser Watering
5.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming 1 Grass trimming 2 Weed/Moss Control Fertiliser Application
5.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
5.4	Grass reinstatement
5.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1
5.6	Watering

Maintenance Program - June

Item	Description
6.1	Yearly maintenance Shrub and tree planting Tree pruning Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser Watering
6.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming Weed/Moss Control
6.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
6.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Clean all signs
6.5	Watering of all trees & shrubs

Maintenance Program - July

Item	Description
7.1	Yearly maintenance - Shrub and tree planting Hand Weeding in shrub areas Watering
7.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming 1 Grass trimming 2 Grass edging
7.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3
7.4	Watering of all trees & shrubs

Maintenance Program - August

Item	Description
8.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hand Weeding in shrub areas Weed free circles around trees/whips Watering
8.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming
8.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1
8.4	Watering of all trees & shrubs

Maintenance Program - September

Item	Description
9.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hedge cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser Watering
9.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming 1 as per clause 3.3 (c) Grass trimming 2 as per clause 3.3 (c) Weed/Moss Control Fertiliser Application
9.2	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
9.4	Grass reinstatement
9.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Road Gulley cleaning Clean all signs
9.6	Watering of all trees & shrubs
9.7	Attenuation Pond - cleaning, removal of detritus

Maintenance Program - October

Item	Description
10.1	Yearly maintenance Shrub and tree planting Tree pruning Hedge cutting Hedgerow cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser
10.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Grass trimming Grass edging
10.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
10.4	Grass reinstatement
10.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Road/Paved area sweep 2

Maintenance Program - November

Item	Description
11.1	Yearly maintenance Shrub and tree planting Hedgerow cutting Check tree stakes and ties
11.2	Grassed areas – Fine Cutting Cut 1 Cut 2
11.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road/Paved area sweep 2 Road/Paved area sweep 3

Maintenance Program - December

Item	Description
12.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
12.2	Grassed areas – Fine Cutting Cut 1 Grass trimming as per clause 3.3 (c)
12.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Clean all signs