11. LANDSCAPE & VISUAL IMPACT ASSESSMENT

11.1 Introduction

This Landscape and Visual Impact Assessment (LVIA) report describes the existing receiving environment, contiguous landscape and the methodology utilised to assess the impacts. It assesses the visual extent of the proposed development and its visual effects on key views throughout the study area. It describes the landscape character of the application site, together with the visibility of the site from significant viewpoints in the locality. The report summarises the impact of the proposed development on the visual and landscape amenity of the application site and contiguous area.

The following visual receptors are addressed in this assessment:

- Designated protected views and views/scenic routes protected through development objectives in the Kildare County Development Plan 2017-2023;
- Local Amenity and Heritage Features;
- Local community views to assess the landscape and visual impact of the proposals on those who live and work in proximity to the Proposed Development as well as those utilising local amenities;
- Relevant local settlement nodes; and
- Major routes adjacent to the site;

11.2 Assessment Methodology

Landscape and visual impact assessments are two separate but closely related topics. The assessment of visual impact focuses on the extent to which new developments can be seen. Visual analysis forms one part of a Visual Impact Assessment (VIA), the process by which the potential significant effects of a Proposed Development on the visual resource of an area are methodically assessed. In turn, VIA forms just one part of a Landscape and Visual Impact Assessment (LVIA) and the wider process of Environmental Impact Assessment (EIA). Landscape assessment focuses on the character of the landscape, examining responses which are felt towards the combined effects of the new development.

11.2.1 Desktop Study

A site assessment was undertaken in July 2018. Desktop studies were undertaken to evaluate the existing site conditions such as topography, vegetation, settlement patterns, contiguous land use, drainage, landscape character as well as overall visibility of the site from surrounding areas. Information was also collated on protected views, scenic routes, special and protected landscapes etc.

The following documents and web resources were consulted for the desktop study:

- Clane Local Area Plan 2017-2023;
- Kildare County Development Plan 2017-2023
- National Parks and Wildlife Service – Interactive Mapping and Aerial Photography - www.npws.ie;
- Ordnance Survey Ireland – Interactive Mapping and Aerial Photography – www.osi.ie;

- The National Monuments (Amendment) Act 1994, Section 12; and

This LVIA has been prepared utilising the following guidance documents:

- Guidelines on the Information to be contained in Environmental Impact Statements Environmental Protection Agency, Environmental Protection Agency, 2002;
- Revised Guidelines on the Information to be contained in Environmental Impact Statements. Draft 2015;
- Advice notes on current practices (in the preparation of an Environmental Impact Statement), Environmental Protection Agency, 2003;
- Advice notes for Preparing Environmental Impact Statements. Draft. Environmental Protection Agency, 2015;
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency, Draft August 2017
- Landscape and Landscape Assessment Draft Guidelines, Department of Environment, Heritage and Local Government (DoEHLG) 2000;
- Guidelines for Landscape and Visual Impact Assessment, The Institute of Environmental Assessment / Landscape Institute (2nd & 3rd Ed 2002, 2013); and
- A Handbook on Environmental Impact Assessment – Guidance on the Environmental Impact, Scottish Natural Heritage (SHN) - Assessment 2009. Appendix 1: Landscape and Visual Impact Assessment.

11.2.2 Impact Significance Criteria

The impact significance and rating criteria used are those outlined in the EPA guidelines.

11.2.3 Impact Significance Criteria

The following terminology, used in this visual assessment, is defined as follows:

Visual Intrusion: where a Proposed Development will feature in an existing view but without obstructing the view.

Visual Obstruction: where a Proposed Development will partly or completely obscure an existing view.

Sensitivity and Significance: The significance of impacts on the perceived environment will depend partly on the number of people affected, but also on value judgments about how much the changes will matter. In this respect it is important to identify actual visual and physical connections between the site, its adjacent occupiers/land owners and those who interact with it from further afield, in the context of the existing and the proposed situations.

While our visual sense is generally acknowledged to represent the dominant contribution to our perception of place and its context, other factors also contribute. Hearing/sound, smell and a variety of social/cultural factors relating to the land-use, function or business conducted on the land (or indeed, memory) can sometimes over-rule or outweigh the visual aspects and lead to individual perceptions which could be described as relatively subjective. The relevance of these non-visual aspects to our perception of our

environment and the impact made by proposed changes is considered in other sections of this assessment document. The purpose of this section is to objectively examine and assess the nature and extent of the visual impact created as a result of the development proposal.

11.2.4 Choice of Views

The views were chosen to accurately represent the likely visual impact from all directions. Views are from the public domain, particularly those from main roads and access routes. The views submitted are considered to be the most important and representative, having regard to the requirement to examine the greatest likely impacts.

11.2.5 Photomontage Methodology

11.2.5.1 Overview

This summarised methodology has been prepared by 3D Design Bureau Ltd (3DDB) to explain the production of Verified View Montages (VVM). The preparation and presentation of reliable verifiable visual information is a key component to the writing of Landscape Visual Impact Assessment reports. It should be noted that VVMs are technical images and should be produced and used in a technically appropriate manner. Note: A full version of this methodology is included as Appendix 11.A to this report.

11.2.5.2 What Is a Verified View Montage (VVM)?

Verified View Montages work by using the correct geospatial insertion of accurate 3d models in the existing landscape (photo) allowing for a photorealistic view of the planned model in its intended location.

11.2.5.3 Methodology

Project Planning

Following appointment, a full list of suggested views are drawn up for review prior to visiting site between 3DDB, the client and the planning consultant. After obtaining a full list, it is analysed and a plan for the taking of baseline photographs is put in place. Note: 3D modelling of the proposed scheme can, and usually is, commenced prior to the photographic site visit.

High Resolution Baseline Photography

Every baseline photograph is captured in raw settings using a high-resolution digital SLR camera. This allows for the maximum possible information to be retained in the digital file. It also avoids the file from being altered by any internal camera processing definitions, allowing us to retain the maximum control and fidelity on the end results.

The focal lengths used depend on the surrounding context and proximity to the desired area. High quality lenses with focal lengths are used that allow the capture of enough surrounding context without compromising quality and fidelity, by avoiding excessive barrelling, distortion or aberrations. All shots are taken horizontally with the use of a 50mm lens (where possible). Note: Although the 50mm focal length

represents the perceived scale of the human eye, it does NOT represent the human field of view and therefore should not necessarily be used to show the proposed development in its context.

On site and back in the studio, each photo location is correctly recorded and marked as follows

On-Site:

- The tripod location on site is paint marked and photographed in relation to existing elements.
- The location of each photo is manually marked on a printed map while on site.
- The camera height is recorded.

Upon completion of the baseline photo site visit all photographs go through post processing back in the studio. The full set of photos along with a viewpoint location map are issued to the client for review and to choose the best shots that will demonstrate the visual impact that the proposed scheme may/may not have.

Baseline Photo Surveying

When all baseline photos for the VVMs are chosen, each one is marked up in studio. The fixed reference points within each photo are coloured coded and all 'marked up' baseline photos are issued to our qualified topographical surveyor for surveying purposes.

The survey team records the camera/tripod position using GPS & Total Station to an accuracy of +-1cm Northing & Easting and to an accuracy of 2cm Elevation. The 'marked up' fixed reference points identified in each photo are then surveyed to establish exact orientation of the view and to verify the photomontage process.

11.2.5.4 3D Modelling & Visualisation

Modelling

An accurate digital 3D model of the 'proposed' development is produced in Revit. This is carried out from a combination of the 3rd Party architectural, engineering and landscape drawings. All proposed model information is contained in the one file and it is ALWAYS positioned relative to the existing survey information.

The 'marked up' fixed reference points which have been surveyed, are also modelled along with any other relevant survey information from the supplied topographical survey drawing/s. As stated above, the proposed model and survey model information are geospatially positioned relative to one another. This is imperative to ensure the accurate positioning / camera matching of the proposed digital 3D model within each chosen photo.

Visualisation

Once the digital 3D Revit model is complete, our 3D visualisation team take over the project for the visualisation process. This involves the matching of textures, lighting conditions and asset population. This ensures that the 3D model is visually as close as possible to the intended future 'As Built' development.

Software used for the visualisation process is called 3D Studio Max. This is accepted as the industry standard for architectural visualisation work and production of VVMs.

11.2.6 Camera Matching / Rendering / Post Production

Following the completion the 3D visualisation process (but in some instances prior to this) the following methodology is applied in order for views to be verifiable.

Camera Matching

All of the information recorded at the time of the baseline photographic site visit, that is, camera co-ordinates, angle of view, and direction of view, is programmed into the virtual camera within our 3D software package of choice - 3D studio Max. Insertion of digital cameras within the software with matching attributes of the physical camera is carried out. This careful method ensures that the size, position and height, of the proposed development in each VVM is correct to an accuracy of 0.33% i.e. +/- 1mm on an A3 print.

Rendering

Following the camera matching and visualisation process the view is 'rendered' at high resolution and is superimposed onto its matching baseline photograph using Adobe Photoshop software. The mathematical accuracy is then double checked and verified by ensuring that existing 'marked up' fixed reference point features which were also rendered line up exactly in the photo.

Post Production

Next, the VVM specialist establishes, which existing features, such as buildings, landscape and trees, are in the foreground of the proposed development and those that are in the background, i.e. which features will mask the development and which ones will appear behind the development. When it is found that the development is not visible due to foreground features, its extremities will be indicated with a red outline.

11.2.7 Results

The resulting VVM having gone through this extensive procedure is an accurate and verifiable representation of the proposed development as viewed from the selected camera positions. This shows as closely as possible any future impact the proposed development may have on the surrounding environment and existing buildings, presenting a truly valuable tool for planning purposes.

11.3 Existing Environment

11.3.1 Site Description and Context

The site is located in Co. Kildare, on the northern fringe of Clane town. Naas town lies approximately 8km to the south, and Celbridge town is situated approximately 10km to the northeast of the site. The site is located approximately 1km from the River Liffey, which runs along the eastern boundary of Clane town.

The R407 College Road, a regional road servicing Clane town runs to the west of the site, however is segregated from the site by several residential dwellings located to the east of the R407. The southern and western boundaries of the site are dominated by single residential dwellings and associated plots. The Capdoo residential development lies to the south of the site. The Mainham Woods residential development lies at the north eastern end of the site. The northern boundary is formed by a secondary road L5078 (Capdoo) and three residential dwellings scattered along the southern edge of this road. To the east, the boundary is made up of individual residential dwellings for the most part.

The site itself is predominately grassland at present. It is made up of former agricultural fields, bounded by hedgerows, used more recently as a pony stud / stables. The more open sections of the site are located towards the centre of the site, with larger, more open agricultural fields. The hedgerows cross the site in its entirety in many most locations, with a series of hedgerows running east west located towards the south of the site.

11.3.2 Architectural Conservation Areas

There are two Architectural Conservation Areas (ACA)s in the wider vicinity of the site. The Prosperous town ACA lies approximately 4.5km south west of the subject site. The Naas town ACA is located approximately 9km south of the subject site.

11.3.3 Protected Structures

There are several protected structures located in the centre of Clane town, approximately 0.5km south of the subject site including Clane Royal Irish Constabulary Barracks, Saints Patrick and Brigid's' Catholic Church, Saint Brigid's National School, and Clane Presbytery.

Clongowes Wood College lies approximately 1.3 km north of the subject site.

11.3.4 Topography and Drainage

The topography within the site slopes gently on a west east axis. The highest point of the site lies on the western boundary, immediately west of the Mainham Woods residential development.

The site level at the centre of the eastern boundary is approximately +79.00 OD. The land slopes consistently and evenly to the east where levels lie between +67.50 OD and +69.50 OD.

The River Liffey runs approximately 1km to the east of the site.

11.3.5 Vegetation

To the north the wider context is predominantly agricultural with field boundaries consisting of hedgerows and groups of both deciduous and coniferous tree plantings. To the west, east and south tree planting is located within gardens and the streetscape of residential developments.

Boundaries with adjoining private lands are mixed, but to the south, southwest and north are dominated by mixed native hedgerows and native deciduous trees.

The land within the site boundary is consistent with the wider context to the north and is comprised of a series of grassed fields, bounded by mixed hedgerows. The majority of these hedgerows run along an east west axis across the site. The majority of trees within the site are located within these hedgerows.

Fraxinus excelsior (Ash) is the predominant species on the site, with notable quantities of ornamental species included at boundaries. The *Fraxinus excelsior* (Ash) trees are located within the hedgerows with *Crataegus monogyna* (Hawthorn) the other predominant species.

A small forestry plantation is present on the southwestern corner of the site but appears to be un-managed at present.

A detailed Tree Survey and Arboricultural Assessment has been carried out by CMK Horticulture & Arboriculture and is included as Appendix 11.C.

11.3.6 Contiguous Land Uses

The contiguous lands uses adjacent to the subject site are dominated by road and infrastructure and private residential properties. The Capdoo Park residential development is located to the south.

The eastern boundary is almost completely composed of individual residential properties. To the north east, a portion of the boundary is formed by the secondary road L5078 (Capdoo).

To the west, a number of land uses are present. To the centre lie a number of residential properties. To the northwest the R407 College Road forms the boundary and the secondary (unnamed road) completes the boundary directly north, interrupted by a number of residential houses along this road.

11.3.7 Visual Analysis

The built fabric of the contiguous lands are contained to the south, east and west of the subject site. These built structures are predominantly single storey residential properties. The lands to the north are comprised of series of agricultural fields compartmentalised by tree and hedgerow plantings.

Generally, views into the site are restricted from the two regional roads running to the east and to the west of the site, the R407 College Road to the west and the R403 to the east. Views from the R407 are blocked for the most part due to the residential properties between the road and the site.

There are short distance views into the site from the Mainham Woods residential development and College Road east residential properties, both adjoining the western boundary of the site.

At the northwest corner views into the site are predominantly screened by the existing hedgerow and tree boundary. There are gaps between trees in the hedgerow and glimpse views are possible through the hedgerow looking southeast into the site.

Figure 11.1 Photograph taken at along northern road, looking south towards subject site, showing a gap in the hedgerow

A relatively thick hedgerow runs along the entirety of the road to the north. This, together with residential properties south of the road, screens views into the sight almost completely. There are a number of glimpse views into the site over the hedgerow at select locations only.

At present there are no views into the site looking north from the Capdoo Park residential development to the south. A hedgerow running along this boundary screens views completely up to a height of approximately three metres.

Figure 11.2 Photograph taken from Capdoo Park, looking north towards subject site

Along the eastern boundary the views into the site vary. To the north of this boundary the views from the road are screened by the roadside hedgerow and the residential properties along the western edge of the road. To the south of the eastern boundary, views open up between residential houses. Long views looking west into the subject site exist, as many of the residential plots in this area have open boundaries with the subject site to the west.

Figure 11.3 Photograph taken at road (unnamed), to north east of the subject site looking south, showing existing tree and hedgerow planting to roadside

Figure 11.4 Photograph taken at eastern road (unnamed), looking west towards the subject site

11.4 Planning Context

11.4.1 Landscape Planning Policy Context

Landscape Planning Policy for the subject site is laid out within the Kildare County Development Plan 2017-2023. Other relevant planning policy for the subject site is contained in the Clane Local Area Plan 2017-2023

11.4.2 Landscape Character

There are several Landscape Character Areas (LCA's) identified in the Kildare County Development Plan 2017-2023. The subject site is located between the Northern Lowlands LCA, and the Special LCA, a corridor running along both sides of the River Liffey. Clane town is shown on the western edge of the Special LCA.

11.4.3 Landscape Sensitivity

Each of the Landscape Character Areas has been assigned a landscape sensitivity rating. Landscape sensitivity is a measure of the ability of the landscape to accommodate change or intervention without undue effects to its character/values based on factors such as topography, slope, ridgeline, water bodies, land use and prior development.

The Northern Lowlands LCA is stated to have a Class 1 Low Sensitivity rating within the Kildare County Development Plan 2017-2023. Regarding landscapes with low sensitivity, the Kildare County Development

Plan 2017-2023 stage (p.311) *"Areas with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area"*.

The River Liffey is stated to have a Class 4 Special rating within the Kildare County Development Plan 2017-2023. Regarding landscapes with special statues, the Kildare County Development Plan 2017-2013 states (p.311) "*Areas with low capacity to accommodate uses without significant adverse effects on the appearance or character of the landscape having regard to special sensitivity factors."*

11.4.4 Local Settlements

11.4.4.1 Clane

Clane town is a settlement located on the crossroads of the R407 College Road and the R403, both regional roads. The town is located to the south of the subject site. Clane is bounded by the River Liffey to the east, and agricultural lands to the west and north. Clongowes Wood College is located on the northern fringes of the town. Clane is a town with a population of approximately 6,700 people.

11.4.4.2 Prosperous

Prosperous is a small town located approximately 4.5km west of Clane town and the subject site. The centre of Prosperous town is designated an Architectural Conservation Area.

11.4.4.3 Sallins

Sallins is a small town located approximately 5km south of Clane town and the subject site. Sallins merges with the larger town of Naas further south.

11.4.5 Environmental Designations

The site lies approximately 4.5km east of Ballynafagh Bog Special Area of Conservation (SAC) and Ballynafagh Lake Special Area of Conservation (SAC). The Poulaphouca Reservoir is the closest Special Area of Protection (SPA) to the subject site and is located approximately 20km south east of the site. The Hodgestown Bog Natural Heritage Area (NHA) is located approximately 7.5km northwest of the site.

11.4.6 Protected Views and Prospects

The Kildare County Development Plan 2017-2023 does not identify any views to be protected in the immediate vicinity of the site. The closest view to be protected is noted as RL 5 View of river Liffey from Alexandra Bridge in the Kildare County Development Plan 2017-2023. The view towards the subject site from Alexandra Bridge is blocked by existing trees and the topography associated with the river, and the distance from the bridge to the subject site (approximately 1.3km south of the site)

Figure 11.5 Photograph taken at Alexandra Bridge, looking north towards the subject site

11.5 Predicted Impacts

11.5.1 Impacts on Existing Vegetation

11.5.1.1 Construction Phase

Existing trees and hedgerows will be removed. CMK Horticulture + Arboriculture have assessed and produced a Tree Survey Report and Arboricultural Assessment included as Appendix 11.C to this report. 11 Category U trees (dead, dying or dangerous) are proposed for removal. 37 Category C trees, and 21 Category B trees are proposed for removal to facilitate the Proposed Development. Eight sections of hedgerow in full or in part are also to be removed to facilitate the development. The impact on existing trees and hedgerows will be *negative, moderate and permanent*.

The construction works will also require removal of grass and vegetation to facilitate the works.

11.5.1.2 Operational Phase

There are no predicted impacts on the existing vegetation in the operational phase.

11.5.2 Impact on Landscape Character

11.5.2.1 Construction Phase

The removal of existing trees and hedgerows will have a *negative, moderate and permanent impact* on existing landscape character.

Site hoarding, construction traffic, ground disturbance and temporary structures required for construction will have a *negative, moderate and short-term impact*.

11.5.2.2 Operational Phase

Where the landscape is not maintained appropriately in accordance with horticultural best practice there may be a *negative, moderate and permanent impact*.

Site hoarding, construction traffic, ground disturbance and temporary structures required for construction will have a *negative, moderate and short-term impact*.

11.5.3 Impact on Views

11.5.3.1 Construction Phase

Site hoarding and temporary structures required for construction will have a *negative, moderate and short-term impact* on views.

11.5.3.2 Operational Phase

Thirteen key views were chosen to illustrate the visual impact of the Proposed Development.

Each view is illustrated as existing and proposed and the views are numbered 1 to 13. The views include long, mid and short-distant views. Refer to the document by 3D Design Bureau included as Appendix 11.A to this report. A copy of the photomontages are included at Appendix 11.B.

The Proposed Development does not constitute a visual obstruction, but is a visual intrusion in some of the views.

View 1 *View from junction of R407 and R403, looking north*

The Proposed Development will not be visible due to the topography and built form of Capdoo town itself. The impact will be neutral.

View 2 *View from junction of R407 and College Road East, looking east*

The proposed development is largely screened by the existing tress and hedgerows, however the roofscape and gable ends of two proposed blocks are visible in the view above the line of the existing vegetation. The impact will be negative, slight and permanent.

View 3 *View from central lawn in Mainham Woods residential development, looking east*

The proposed development is almost screened entirely by the existing Mainham Woods residential development and due to the difference in topography from this viewpoint to the proposed development.

Glimpse views are possible of proposed trees along the proposed R403-R407 Link Distributor Road and a roof within the proposed development is partially visible. The impact is considered to be neutral, slight and permanent.

View 4 *View from R407 College Road, looking south east*

The proposed reconfiguration of the R407 College Road to include a roundabout and access to the R403-R407 Link Distributor Road within the proposed development is visible in the view. The removal of existing trees to facilitate the proposed development is evident as the existing boundary wall to the Mainham Woods residential development is now visible in the view (it was previously screened by existing trees). The impact will be negative, moderate and permanent.

View 5 *View from northern road L5078 (Capdoo), looking south west*

The existing dwellings, existing garden vegetation and the existing hedgerow running along the southern edge of the road all contribute to largely screen the proposed development. A number of proposed residential units are visible between gaps in the existing hedgerow and above the line of the existing hedgerow in places. The impact will be will be negative, moderate and permanent.

View 6 *View from junction of northern road L5078 (Capdoo) and eastern road (unnamed) looking south west*

The existing trees, hedgerows and dwellings almost completely screen the proposed development in full. There is a glimpse view of the proposed development down the road L5078 (Capdoo) that runs along the northern boundary of the subject site (seen on the left-hand side of the view), but this will be almost imperceptible. The impact will be will be negative, imperceptible and permanent.

View 7 *View from eastern road (unnamed) looking south*

The Proposed Development will not be visible. The impact will be neutral.

View 8 *View from eastern road (unnamed), looking north*

The Proposed Development will be substantially screened by the existing trees and hedgerows along the lane. Removal of small portion of hedgerow will be visible on the western side of the road. The impact will be negative, slight and permanent.

View 9 *View from junction of Capdoo Park road, looking north west*

The proposed development is almost screened entirely by the existing hedgerows. There are partial views of the roofs and top of blocks above the line of existing vegetation. The impact is considered to be negative, slight and permanent.

View 10 *View from Capdoo Park residential development, looking north*

The proposed development is screened to an extent by the existing Capdoo Park residential development and the existing trees and hedgerows. There is a view of the proposed development at the entrance to the

Capdoo Park residential development where it meets the proposed R403-R407 Link Distributor Road. The impact is considered to be negative, moderate and permanent.

View 11 *View from junction of R403, Brooklands and Capdoo Park road, looking north west*

The Proposed Development will not be visible. The impact will be neutral.

View 12 *View from junction R403 (at shopping centre) looking north*

The Proposed Development will not be visible. The impact will be neutral.

View 13 *View from Clongowes Wood College access road, looking south*

The Proposed Development will not be visible. The impact will be neutral.

11.6 Mitigation Measures

11.6.1 Existing Vegetation

11.6.1.1 Construction Phase

Existing vegetation was considered from the outset of the design process in order to minimise the impact of the development, particularly on existing trees. Site engineering, drainage, ducts and other infrastructure has been designed to minimise impact. Replacement planting is proposed as part of the landscape plans issued by Dermot Foley Landscape Architects and included as Appendix 11.D. The following mitigation measures are proposed:

- To protect trees to be retained, fell adjacent trees to be removed and grind out stumps in accordance with BS5837:2012;
- Implement tree protection measures for trees to be retained in accordance with BS5837:2012 before any demolition or construction works proceed;
- Where required strip and store topsoil in accordance with BS4428:1989 and BS3882:2007;
- Install proposed replacement and additional proposed planting and seeded areas in accordance with the Typical Soft Landscape Details issued by Dermot Foley Landscape Architects included as Appendix 11.E.

11.6.1.2 Operational Phase

The following mitigation measures are proposed:

- Maintain all vegetation in accordance with the Design Rationale by Dermot Foley Landscape Architect, included as Appendix 11.F.
- Install replacement planting for any plants that fail during the 18-month maintenance and defects liability period;
- Site will be monitored regularly for signs of invasive species

11.6.2 Landscape Character

11.6.2.1 Construction Phase

The following mitigation measures are proposed:

- Maintain the character of the site by installing proposed planting in accordance with the proposed landscape plans by Dermot Foley Landscape Architects, included as Appendix 11.D.
- Install approximately 4000sqm of new habitat along the proposed R403-R407 Link Distributor Road

11.6.2.2 Operational Phase

The following mitigation measures are proposed:

- Maintain and manage proposed specimen tree planting to ensure that it matures to match existing trees on site.
- Site will be monitored regularly for signs of invasive species.

11.6.3 Views

11.6.3.1 Construction Phase

Substantial tree planting is proposed, as illustrated in the proposed landscape plans issued by Dermot Foley Landscape Architects included as Appendix 11.D.

The following mitigation measures are proposed:

- Maintain restricted views of the site by installing proposed planting in accordance with the proposed landscape plans;

11.6.3.2 Operational Phase

The following mitigation measures are proposed:

- Maintain all existing and proposed vegetation to ensure that sight lines are retained across the site;
- Maintain and manage proposed specimen tree planting to ensure that it matures to match existing trees on site.

11.7 Residual Impacts

11.7.1 Construction Phase

No significant negative residual direct or indirect impacts are anticipated with the implementation of the construction mitigation measures as stated in Section 11.9.

11.7.2 Operational Phase

No significant negative residual direct or indirect impacts are anticipated from the operation of the proposed scheme. The increased area of trees and other vegetation, including proposed native species will have a *positive, moderate and permanent residual impact* as it matures.

11.8 Interactions

11.8.1 Biodiversity

Existing trees and hedgerows are to be removed to facilitate the Proposed Development. This impacts on habitats supported by this existing vegetation and the biodiversity value of the site at present. Proposed planting, including native species, is shown in the landscape plans by Dermot Foley Landscape Architects, included at Appendix 11.D. All mitigation measures are included in Section 11.9 of this document.

11.8.2 Land, Soils and Geology

There is a potential for importation of soil to the subject site to impact on the land in terms of quality of soil however suitable mitigation measures, i.e. working in accordance with the industry best practice BS4428:1989 and BS3882:2007, will avoid this impact.

11.8.3 Air, Dust and Climatic Factors

Proposed trees and vegetation, illustrated in the proposed Landscape Plans by Dermot Foley Landscape Architects, included as Appendix 11.D may have a positive impact on the air quality and climate in the Capdoo area.

11.8.4 Cultural Heritage & Archaeology

The development will not be visible from Clongowes wood College or Clane town, as outlined in section 11.5.3 of this document.

11.9 References

Clane Local Area Plan 2017-2023

Kildare County Development Plan 2017-2023;

National Parks and Wildlife Service – Interactive Mapping and Aerial Photography - www.npws.ie;

Ordnance Survey Ireland – Interactive Mapping and Aerial Photography – www.osi.ie;

The National Monuments (Amendment) Act 1994, Section 12

Guidelines on the information to be contained in Environmental Impact Statements Environmental Protection Agency, Environmental Protection Agency, 2002

Revised Guidelines on the Information to be contained in Environmental Impact Statements. Draft 2015;

Advice notes on current practices (in the preparation of an Environmental Impact Statement), Environmental Protection Agency, 2003

Advice notes for Preparing Environmental Impact Statements. Draft. Environmental Protection Agency, 2015

Landscape and Landscape Assessment Draft Guidelines, Department of Environment, Heritage and Local Government (DoEHLG) 2000

Guidelines for Landscape and Visual Impact Assessment, The Institute of Environmental Assessment / Landscape Institute (2nd& 3rd Ed 2002, 2013)

A Handbook on Environmental Impact Assessment – Guidance on the Environmental Impact, Scottish Natural Heritage (SHN) - Assessment' 2009 . Appendix 1: Landscape and Visual Impact Assessment.

Appendix 11.A 3D Design Bureau Ltd Photomontage Methodology

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

Verified View Montages (VVM), Methodology

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

Ref: 3DDB_VVM Methodology

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

TABLE OF CONTENTS

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

1. OVERVIEW

This document has been prepared by 3D Design Bureau Ltd (3DDB) to explain the methodology used for the production of Verified View Montages (VVM). The purpose of a VVM is to present a technically accurate visual representation of the proposed development and its potential impact on the skyline and its' surrounding environment (building & landscape).

Baseline photographs and photomontages are an important and integral part of MANY planning applications. The preparation and presentation of reliable verifiable visual information is a key component to the writing of Landscape Visual Impact Assessment reports. It should be noted that VVMs are technical images and should be produced and used in a technically appropriate manner.

2. WHAT IS A VERIFIED VIEW MONTAGE?

A Verified View Montage (VVM) is an accurate visual representation of the potential impact (or lack thereof) that a proposed development may have on its surrounding environment when constructed. VVMs are produced using technical scientific verification methods, through the use of photography, surveying, 3D modelling, rendering and post-production.

Verified View Montages work by using the correct geospatial insertion of accurate and detailed digital 3D models in the existing landscape allowing for a photorealistic view of the planned development in its intended location.

The correct combination of all these fields of expertise will deliver a result in which we believe and trust to be accurate for official usage by the client for their intended purposes (ex. Planning applications, impact studies,…).

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.1 Project Planning

The work for a VVM project begins by arranging with the client and their planning consultant a full list of the intended viewpoints to be captured. These suggested viewpoints are generally guided by the comments/observations from the local planning authority. However 3DDB often advise clients on the views required. Note: If a LVIA report is being written by a 3rd Party consultant, the medium to long range views will be guided by them. After obtaining a full list, it is analysed and a plan for the taking of baseline photographs is put in place. Viewpoint orientation, risk assessment, permissions that might be required, security procedures and predicted/intended weather are all considered prior to the site visit. Note: 3D modelling of the proposed scheme can, and usually is, commenced prior to the photographic site visit. 3DDB work along side design teams from the early stages of the project to ensure all areas of the VVM project are covered.

3.2 High Resolution Baseline Photography

The baseline photography is made with a high-resolution digital SLR camera, which nowadays is standard for photography. The high-resolution camera is needed not only for the capturing of as much detail as possible on the scene, but also to allow manoeuvrability in the post-processing stage of the project.

Every baseline photograph is captured in raw settings. This allows for the maximum possible information to be retained in the digital file. It also avoids the file from being altered by any internal camera processing definitions, allowing us to retain the maximum control and fidelity on the end results.

The focal lengths used depend on the surrounding context and proximity to the desired area. We use high quality lenses with focal lengths that allow us to capture enough surrounding context without compromising quality and fidelity, by avoiding excessive barrelling, distortion or aberrations. All shots are taken horizontally with the use of a 50mm lens (where possible). Note: Although the 50mm focal length represents the perceived scale of the human eye, it does NOT represent the human field of view and therefore should not necessarily be used to show the proposed development in its context. The use of a 50mm lens however is not always a realistic option particularly in an urban environment where viewpoints can be far closer to the subject and context needs to be seen in the resulting image. In these instances we use lower value focal lengths (wider angle) to show how the proposed development sits within its context. This does not affect the fidelity of the final image and is considered acceptable in VVM projects.

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.2 High Resolution Baseline Photography **(cont'd)**

On site and back in the studio, each photo location is correctly recorded and marked as follows

On-Site:

- The tripod location on site is paint marked and photographed in relation to existing elements. (Fig.1)
- The location of each photo is manually marked on a printed map while on site.
- The camera height is recorded.

Upon completion of the baseline photo site visit all photographs go through post processing back in the studio. They are slightly treated to retain a neutral look, retaining the lighting and conditions present at the time of the shoot. A viewpoint location map is created (Fig.2) showing the precise locations and directional view of each photo. The full set of photos along with the viewpoint location map are then issued to the client for review and to choose the best shots that will demonstrate the visual impact that the proposed scheme may/may not have.

Fig.1: Camera position marked and photographed.

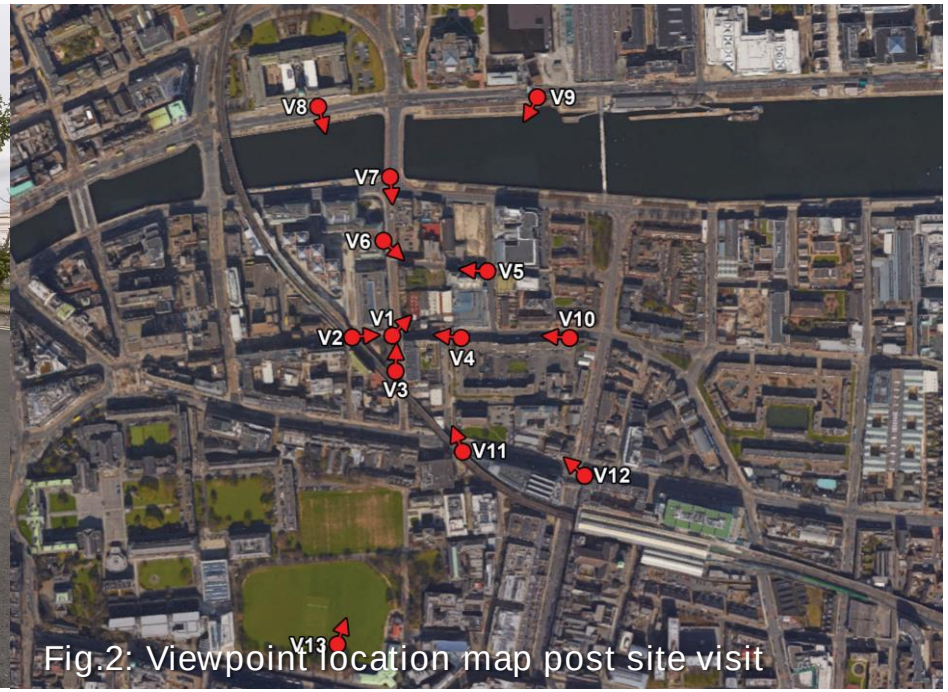


Fig.2: Viewpoint location map post site visit

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.2 High Resolution Baseline Photography **(cont'd)**

Sample baseline photographs prior to selection and prior to marking up for surveying.

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.3 Baseline Photo Surveying

When all baseline photos for the VVMs are chosen, each one is marked up in studio as per Fig.3 below. The fixed reference points within each photo are coloured coded and all ‘marked up’ baseline photos are issued to our qualified topographical surveyor for surveying purposes.

As stated in 3.2 High Resolution Baseline Photography (page 5), when each baseline photograph is taken the ground position of the tripod is marked and the direction of view is recorded by reference to fixed points in the view. The survey team records the camera/tripod position using GPS & Total Station to an accuracy of +-1cm Northing & Easting and to an accuracy of 2cm Elevation. The ‘marked up’ fixed reference points identified in each photo are then surveyed to establish exact orientation of the view and to verify the photomontage process. So for example, lamp posts, kerb lines and ridge/parapet heights are surveyed on a photo by photo basis.

The surveying team return the marked up photos to the production team (Fig.4) with all fixed reference points numbered which correspond to a supplied excel sheet. Note: ALL fixed reference points are 3D modelled and positioned in the digital model relative to the proposed digital 3D model AND the original topo survey of the existing site.

Fig.3 – Fixed ref points marked for surveyor

Fig.4: Fixed ref points surveyed and numbered by surveyor

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.4 3D Modelling & Visualisation

Modelling

An accurate digital 3D model of the 'proposed' development is produced in Revit. This is carried out from a combination of the 3rd Party architectural, engineering and landscape drawings. When 3rdParty 3D models are supplied, they go through an 'optimisation' process. In some instances 3DDB accurately model the landscape and survey information and use this in conjunction with the supplied 3rd Party model. All proposed model information is contained in the one file and it is ALWAYS positioned relative to the existing survey information.

The 'marked up' fixed reference points identified in each chosen photo, which have been surveyed, are also modelled along with any other relevant survey information from the supplied topo survey drawing/s. As stated above, the proposed model and survey model information are geospatially positioned relative to one another. This is imperative to ensure the accurate positioning / camera matching of the proposed digital 3D model within each chosen photo.

Visualisation

Once the digital 3D Revit model is complete, our 3D visualisation team take over the project for the visualisation process. This involves the matching of textures, lighting conditions and asset population. This ensures that the 3D model is visually as close as possible to the intended future 'As Built' development. Careful consideration is given to the direction of sunlight, time of day, weather conditions and distance of viewer, so that VVMs will match reality in terms of lighting, sharpness, density of colour etc.

Software used for the visualisation process is called 3D Studio Max. This is accepted as the industry standard for architectural visualisation work and production of VVMs.

Please see Fig 5. next page for an example of a proposed digital 3D Revit model. Fig 6 next page, shows the 'marked up' fixed reference points on the baseline photo which have been surveyed and assigned numerical values from which to the existing elements have been modelled from.

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

3. METHODOLOGY

3.4 3D Modelling & Visualisation

Fig.5: Digital 3D Model.

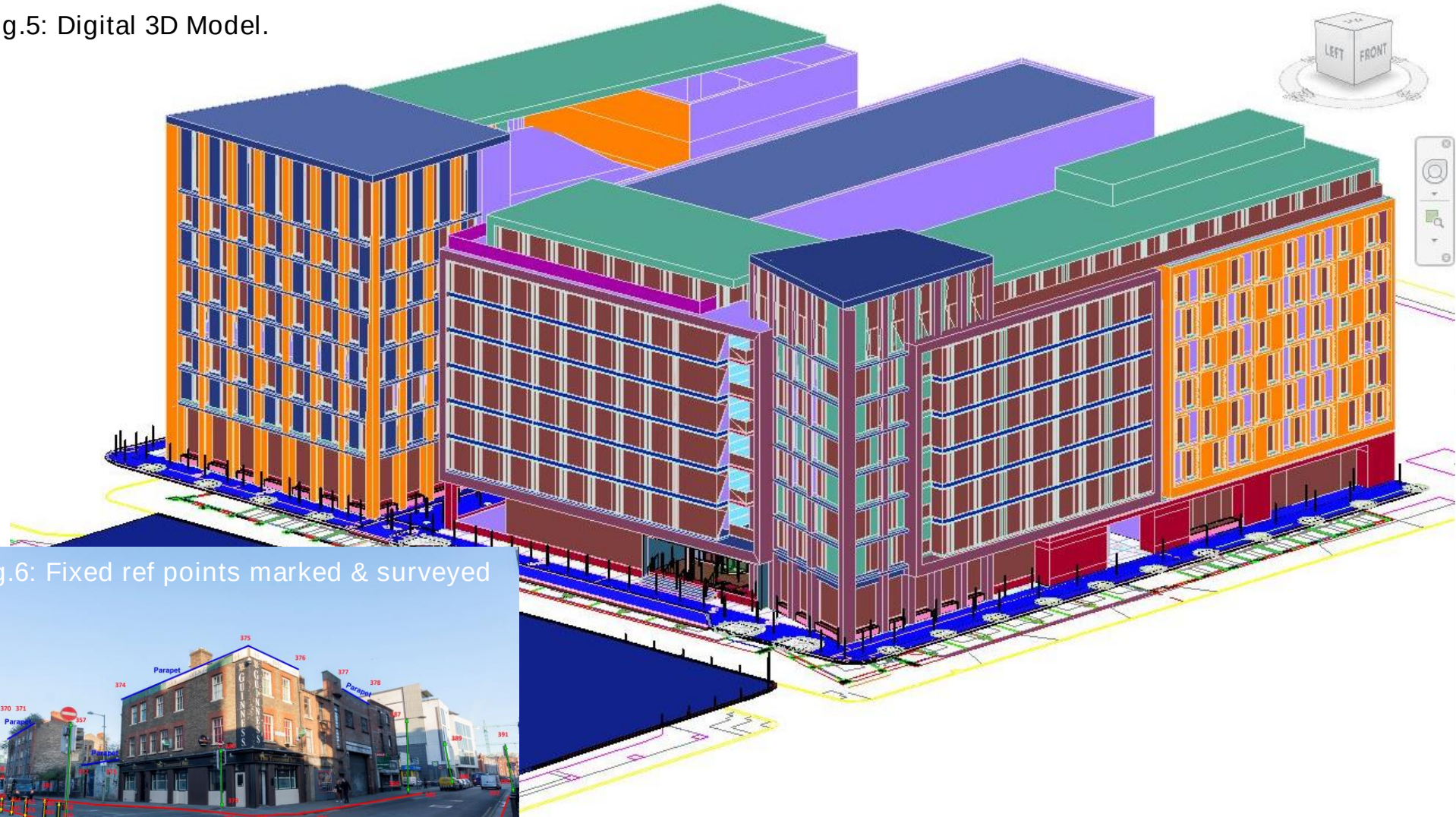


Fig.6: Fixed ref points marked & surveyed

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.5 Camera Matching / Rendering / Post Production

Following the completion the 3D visualisation process (but in some instances prior to this) the following methodology is applied in order for views to be verifiable.

Camera Matching

All of the information recorded at the time of the baseline photographic site visit, that is, camera co-ordinates, angle of view, and direction of view, is programmed into the virtual camera within our 3D software package of choice - 3D studio Max. Insertion of digital cameras within the software with matching attributes of the physical camera is carried out. This careful method ensures that the size, position and height, of the proposed development in each VVM is correct to an accuracy of 0.33% i.e. +/- 1mm on an A3 print. Note: For this part of the process it is vital for all of the survey information to be used to ensure accuracy. Virtual camera replication ALONG with the matching of all modelled fixed point references (Fig.7) ensures accurate positioning and representation of the development in each chosen view. See Fig.8 which shows the modelled and rendered ‘fixed reference points’ overlaid to confirm accurate positioning of the proposed model.

Rendering

Following the camera matching and visualisation process the view is ‘rendered’ at high resolution and is superimposed onto its matching baseline photograph using Adobe Photoshop software. The mathematical accuracy is then double checked and verified by ensuring that existing ‘marked up’ fixed reference point features which were also rendered line up exactly in the photo.

Post Production

Next, the VVM specialist establishes, which existing features, such as buildings, landscape and trees, are in the foreground of the proposed development and those that are in the background, i.e. which features will mask the development and which ones will appear behind the development. When it is found that the development is not visible due to foreground features, its extremities will be indicated with a red outline. Note: Colour grading and additional asset population of the final rendered model and final image is also carried out to ensure that a true representation of the scheme is produced.

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.5 Camera Matching / Rendering / Post Production

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

3. METHODOLOGY

3.5 Camera Matching / Rendering / Post Production

Fig.8: Fixed Ref points modelled, rendered and overlaid on baseline photo confirming accuracy.

3D DESIGN BUREAU

Creative & Technical 3D Solutions

Design | Planning | Marketing

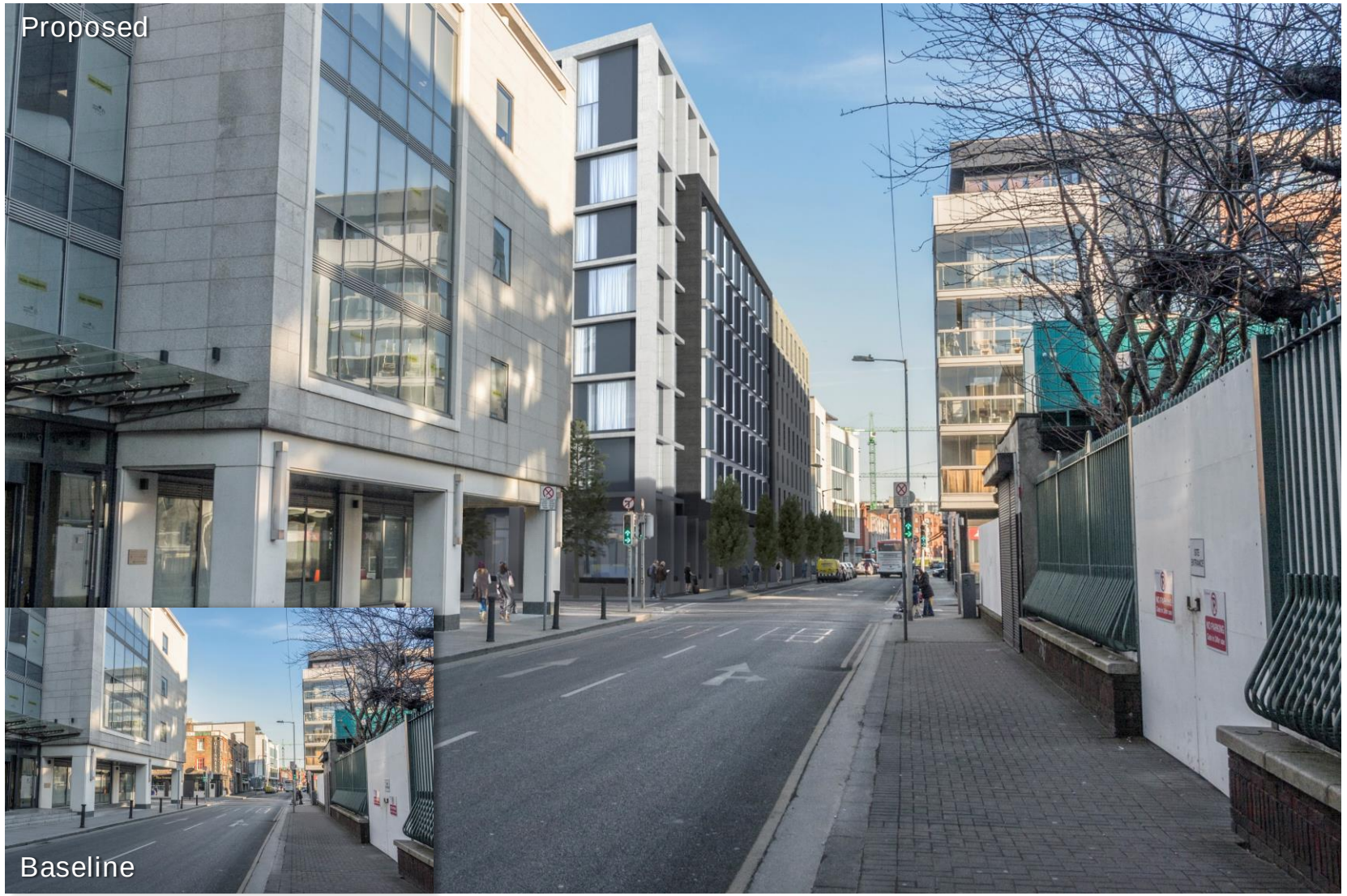
+353 1 2880186

info@3ddesignbureau.com

3ddesignbureau.com

4. RESULTS

The resulting VVM having gone through this extensive procedure is an accurate and verifiable representation of the proposed development as viewed from the selected camera positions. This shows as closely as possible any future impact the proposed development may have on the surrounding environment and existing buildings, presenting a truly valuable tool for planning purposes.



Appendix 11.B Copy of Photomontages

3D DESIGN BUREAU

Creative & Technical 3D Solutions
Design | Planning | Marketing

Capdoo, Clane Co. Kildare.

Project Deliverables

Applicant: Ardstone Homes Ltd.

May 2019

+353 (0) 1 2880186
info@3ddesignbureau.com
www.3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Viewpoint Location Map 1**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Viewpoint Location Map 2**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 1**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 1**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 2**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 2**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 3**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 3**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 4**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 4**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 5**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 5**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 6**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 6**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 7**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 7**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 8**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 8**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 9**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 9**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 10**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 10**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 11**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 11**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 12**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Outline of Proposed Development

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 12**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Baseline VVM 13**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: Proposed VVM 13**
	Planning Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Project Title: Capdoo, Clane, Co. Kildare.	**Applicant Name:** Ardstone Homes Ltd.	**Image Title: CGI 3**
	Presentation Imagery by 3D DESIGN BUREAU	Tel: 01 288 0186 www.3ddesignbureau.com info@3ddesignbureau.com

Appendix 11.C Arboricultural Assessment and Tree Survey

Arboricultural Assessment Report

Capdoo

Clane

Co. Kildare

Project No.	Project name	Date	Revision
TCAP001	Capdoo	26/03/19	A

Report Prepared by
Ciaran Keating
BSc Pl. Sci. & Ecol.
H.N.D. Hort
AA Tech Cert Arb,
PG Dip Arb & Urban Forestry

E-mail: cmkhortandarb@gmail.com
Mobile: 087 1182343
Drumone, Oldcastle, Co. Meath A82FK79

CMK
Hort + Arb

CONTENTS

1. Client brief & Methodology

CMK Hort + Arb were commissioned by Ardstone Homes to undertake an assessment of trees on lands at Capdoo, Clane, Co. Kildare. The fieldwork was undertaken on various dates between February and May 2018.

The survey is designed to be an independent analysis of the trees therefore this assessment does not take into consideration any plans for the future development of the site; however, it is recognised that there are proposals to re-develop the site therefore some of the comments within sections 2 and 6 may reference the suitability of trees for retention in this context.

The survey methodology, supporting drawings and documentation follow the recommendations contained within BS 5837 (2012). The analysis of the trees was undertaken using the VTA methodology as developed by Mattheck and Breloer (1994).

Image 1. Site boundary

2. General description of trees

The site is located to the eastern edge of Clane village (image 1) and is a former pony stud / stables. A total of 119 trees were identified and surveyed for this report and they are located within three distinct areas i.e. internal hedgerows, boundaries with public roads and neighbouring properties and the lands associated with the house and stable yards to the east of the site.

There are a number of hedgerows which form field boundaries. These mainly traverse the site in an east-west direction though smaller sections are orientated on a north-south axis (refer to drawing TCLA001 101 Rev C).

The condition of the trees is mixed with a relatively high percentage within the moderate to low categories (refer to table 1 & section 6 of this report). The hedgerows have been poorly managed in recent times. The structure is poor and the diversity of plant species low as a result.

The trees and hedges around the house and stable area include a large Leyland cypress hedge (xCuprocyparis leylandii) along the entrance road to the house (image 2). The Leyland hedge is large, casts extensive shade and is a management liability. A large mature sycamore (*Acer pseudoplatanus*) is located at the entrance to the house on the eastern boundary (image 3) with further large mature ash (*Fraxinus excelsior*) and sycamore trees on the boundary with a neighbouring property near the eastern boundary of the site.

Category	Number	% of total
A	0	0
B	51	43
C	57	48
U	11	9

Table 1. Tree Categories

Image 2. Leyland cypress within stable yard

Image 3. Mature sycamore at eastern entrance to site

The trees on the northern boundary are a mixture of ash and sycamore with occasional elm (*Ulmus procera*). They range from young to old and their condition is mixed with strong competition between trees a factor in their condition and form (image 4). Very limited management inputs have led to very heavy ivy establishment which can be a contributor to a windsail effect and tree failure during storm events.

Image 4. Northern boundary

The hedgerows were most likely managed as clipped hawthorn (*Crataegus monogyna*) with occasional standard trees however due to limited management inputs the hawthorn element in most instances has either been shaded out or become overgrown. With the exception of one hedgerow, standard trees are relatively rare. Where they do occur, the main species represented is ash. The vast majority of these trees are multi-stemmed specimens (image 5) which developed from continual cutting back. When neglected, as in this situation it results in trees of poor structural integrity as areas of weakness develop between stems.

There is a history of horse management on the site and this has had a negative impact on trees particularly the ash within the hedgerows as the horses have de-barked a large percentage of these trees. Though the majority of the trees are alive their long-term potential is limited as a result. Their potential inclusion within any development is thereby reduced.

The extensive bramble (*Rubus fruticosus* agg) growth (image 6) which has developed due to limited management inputs has smothered out most of the potential ground flora within the hedgerows limiting these elements to occasional ferns and grasses. Ultimately the hedgerows are degraded in quality due to mismanagement and neglect.

A small forestry plantation (*Abies spp*) is present on the south-western corner of the site. It has been mostly felled. The remaining trees are un-thinned and of low quality as a result.

Image 5. Hedgerow with multi-stemmed ash

Image 6. Typical hedgerow composition with hawthorn in poor condition and extensive bramble growth smothering ground flora

3. Limitations of Survey

This survey should be regarded as a preliminary assessment of the trees and deals with the current condition as identified during this survey only. Every attempt was made to identify hazardous trees in this report however; this survey was carried out from the ground and therefore cannot be held to have identified elements of decay, which may be hidden out of sight within the crown or beneath ivy or other obstructions. To counter this limitation in the survey process it is vital that during tree works any additional defects found by the climbing arborist are communicated to the consulting arborist to allow appropriate action to be taken.
The details within this survey are based on the condition of the trees during the survey period only. The findings in this survey cannot be held to be valid after any site disturbance, man-made or natural, which may have an adverse effect on any trees present.

4. Relevant legislation

There are no Tree Protection Orders (TPOs) on any of the trees on this site. However unless planning permission which clearly identifies trees for removal has been granted then under Section 7 of the Forestry Act 2014 a person wishing to fell trees must apply to the minister for a licence to do so.
Exempted trees: Section 19 states that the requirement for a felling licence for the uprooting or cutting down of trees does not apply where:

- The tree in question is standing in an urban area
- The tree is considered dangerous and hazardous.
- The tree is within 10m of a public road and regarded as hazardous
- The tree in question is less than 100 ft. / 30m from a dwelling other than a wall or temporary structure;
- The tree in question is a hazel, apple, plum, damson, pear, or cherry tree grown for the value of its fruit or any ozier;

Other exceptions apply in the case of local authority road construction, road safety and electricity supply operations.

The Act is administered by the Forest Service (Department of Agriculture, Fisheries and Food). The Felling Section of the Forest Service is based in Johnstown Castle, Co. Wexford (053-9160200 or 1890-200223).

If you have any queries about felling in general or are unsure whether or not the trees fall under any of the above cases, it is recommended that you seek the advice of the Felling Section or of your local forestry development officer for further information.

Trees may contain bats. Bats are protected under Schedule 5 of the Wildlife Act 1976 and Schedule 1 of the European Communities (Natural Habitats) Regulations 1997. Professional advice from a licenced surveyor should be sought prior to any works commencing on trees.

5. Terminology

Tree categories	
A	Trees of high quality and value due to their size, age, condition, historical/visual merit and/or conservation potential (a minimum of 40 years).
A1	Mainly arboricultural values. Particularly good examples of species, essential components of groups or of formal or semi-formal arboricultural features.
A2	Mainly landscape values. Trees, groups or woodlands which provide a definite screening or softening effects to the locality in relation to views into or out of site, or those of particular visual importance.
A3	Mainly cultural values, including conservation. Trees, groups or woodlands of significant conservation, historical, comparative or other value (e.g. veteran trees or wood-pasture).
B	Trees of moderate quality and value (a minimum of 20 years).
B1	Mainly arboricultural values. Trees that might be included in high categories but are downgraded because of impaired condition (e.g. presence of remedial defects including unsympathetic past management and minor storm damage).
B2	Mainly landscape values. Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal features (e.g. trees of moderate quality within an avenue that includes better A category specimens) or trees situated internally to the site, therefore individually having little visual impact on the wider locality.
B3	Mainly cultural values including conservation. Trees with clearly identifiable conservation or other cultural benefits.
C	Trees of low quality and value (a minimum of 10 years).
C1	Not qualifying in higher categories.
C2	Trees present in groups or woodlands but without conferring on them greater landscape value and/or trees offering low or only temporary screening benefit.
C3	Trees with very limited conservation or other cultural benefits.
U	Trees in such condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management. Trees that are dead, dying or showing immediate and irreversible decline.

Terminology (cont.)

Comments: Refers to the tree's condition and suitability for the site.

Common name: Most widely used non-botanical name.

Co-dominant: Two branches assuming the role of leading shoots. When growing close together may form a weak attachment (included bark) at their point of contact. Trees with this defect may be in danger of splitting at this weak attachment.

Crown Spread: Measured in meters north, south, east and west.

Decay fungi: Refers to those species of fungi which degrade living wood and which may, depending on the degree of degradation, render the tree structurally unsound.

Defects: Refers to cracks, storm damage and any other damage mechanical or biological.

Diameter: Diameter of the trunk (millimetres) at 1.5m. M.S. after the measurement refers to the tree being multi-stemmed.

Genus & Species: Refers to the botanical names for the tree.

Height: Measured in meters.

Monitor: Refers to trees which need to be re-surveyed on a yearly basis to assess their condition. This timescale may be sooner where works or adverse
Weather conditions have impacted negatively on the trees.

Overhaul: A reference to standard tree surgery work which consists of the removal of deadwood, crossing branches and balancing where appropriate.

Recommendations: Indicates surgery work necessary for the retention or, where necessary, removal of the tree.

Tree No. Refers to numbered tag fixed to tree during survey.

6. Tree condition analysis & preliminary recommendations

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
135	Ash Fraxinus excelsior	Mature	Good	A large specimen on boundary with the public road. Trunk co-dominant from 500mm with a wide union between stems. Extensive ivy growth up trunk obscuring view for assessment. A number of lower limbs over-extended toward road.	Remove over-extended limbs toward road. Cut ivy.	B2	40
136	Ash Fraxinus excelsior	Early-mature	Poor	A sub dominant specimen with a strong lean over road. Unsuitable for retention.	Fell	U	<10
137	Elm Ulmus procera	Early-mature	Fair	Co-dominant from base with a tight union between stems. Bark damage present at base but not significant at present. Upper canopy somewhat restricted toward south due to competition from neighbouring tree. Of limited landscape or arboricultural value. Long term potential may be further reduced due to Dutch elm disease.	No action necessary	C2	10
138	Ash Fraxinus excelsior	Mature	Fair	A relatively well developed specimen though trunk with a strong lean toward east. Very heavy ivy growth up trunk obscuring view for assessment. Basal stems present. Very heavy ivy growth up trunk obscuring view for assessment.	Cut ivy	C2	20
139	Ash Fraxinus excelsior	Mature	Good	Located on edge of site adjacent to public road. Very heavy ivy growth up trunk obscuring view for assessment. Upper canopy appears relatively well developed with no visible defects. Ivy becoming a potential hazard through wind-sail development	Cut ivy. Re-assess	B2	40
140	Sycamore Acer pseudoplatanus	Mature	Poor	A poorly developed specimen with extensive bark damage at base. Directly beneath overhead lines. Long term potential limited.	No action necessary	C2	10

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
141	Elm Ulmus procera	Early-mature	Poor	Co-dominant from base. Upper canopy cut back to facilitate overhead line clearance. A tree of very limited landscape or arboricultural value. Potential for contracting Dutch elm disease.	No action necessary	C2	10
142	Sycamore Acer pseudoplatanus	Early-mature	Good	A poorly developed specimen which has been topped to facilitate overhead utility line clearance resulting in a tree of very limited landscape or arboricultural value...	No action necessary	C2	10
143	Elm Ulmus procera	Early-mature	Good	A well-developed specimen with no visible defects. Long term potential may be limited due to Dutch elm disease.	No action necessary	C2	10
144	Ash Fraxinus excelsior	Mature	Fair	A sub dominant specimen with a lean toward south due to competition from a neighbouring tree. Upper canopy limited in extent and swamped in ivy. Long term potential limited.	Cut ivy	C2	10-15
145	Ash Fraxinus excelsior	Mature	Good	A relatively well developed specimen. A number of basal stems present with one with a strong lean toward road to north. Very heavy ivy growth up trunk obscuring view for assessment but upper canopy relatively well developed.	Cut ivy and remove basal stem with lean toward road	B2	40
146	Elm Ulmus procera	Early-mature	Poor	A sub dominant specimen with very limited crown development due to competition from neighbouring tree.	No action necessary	C2	10
147	Ash Fraxinus excelsior	Early-mature	dead		Fell	U	0
148	Ash Fraxinus excelsior	Early-mature	Fair	A sub dominant specimen with crown restricted toward east due to competition from neighbouring tree. No structural issues but suitable for retention within current sheltered environment only.	No action necessary	C2	10-15

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
149	Ash Fraxinus excelsior	Mature	Fair	A multi stemmed specimen located on northern boundary of site. Tight unions between stems but none appear structurally compromised at present. Upper canopy relatively well developed with no visible defects	No action necessary	B2	40
150	Sycamore Acer pseudoplatanus	Early-mature	Good	Located northern boundary of site. A relatively well developed specimen though crown restricted toward north due to competition from neighbouring tree.	No action necessary	B2	40
151	Sycamore Acer pseudoplatanus	Mature	Good	Located on embankment adjacent to public. Trunk co-dominant from 400mm with a tight union and included bark between stems. Stems fused at 2m bringing stability to structure. Upper canopy relatively well developed with no visible defects.	No action necessary	B2	40
152	Ash Fraxinus excelsior	Mature	Good	Located on top of embankment adjacent to public road. Trunk three stemmed from 1.25m with wide unions between stems. A relatively large limb removed at 1.25m to south but no associated decay present. A pocket of decay present in stem to north at 1.25m but unlikely to be significant at present. Upper canopy relatively well developed with no visible defects.	No action necessary	B2	40
153	Ash Fraxinus excelsior	Mature	Good	Located on the edge of embankment adjacent to pi] public road. Three stemmed from base with wide union between stems. Upper canopy relatively well developed though slightly restricted toward west due to competition from neighbouring tree. Minor pockets of decay in lower crown but none significant at present.	No action necessary	B2	40
154	Ash Fraxinus excelsior	Early-mature	Good	A well-developed specimen on boundary embankment with public road. Trunk co-dominant 4m but area obscured by ivy. Upper canopy relatively well developed with no visible defects.	Cut ivy and re-assess	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
155	Sycamore Acer pseudoplatanus	Mature	Good	Located adjacent to public road. Very heavy ivy growth up trunk obscuring view for assessment. Trunk co-dominant from 3m but area obscured by ivy. Upper canopy relatively well developed with no visible defects.	Cut ivy and re-assess	B2	40
156	Ash Fraxinus excelsior	Mature	Poor	Half of tree removed / failed. Remaining tree unsuitable for retention.	Fell	U	<10
157	Elm Ulmus procera	Early-mature	Good	A well-developed specimen adjacent to public road. No visible defects however long term potential limited due to Dutch elm disease.	No action necessary	C2	10
158	Ash Fraxinus excelsior	Mature	Fair	A relatively well developed specimen located adjacent to public road. Very heavy ivy growth up trunk obscuring view for assessment. Upper canopy relatively well developed.	Cut ivy	B2	30
159	Elm Ulmus procera	Young	Fair	A cluster of stems adjacent to public road boundary. No visible defects however long term potential limited due to Dutch elm disease	No action necessary	C2	10
160	Elm Ulmus glabra	Young	Good	A well developed with no visible defects however long term potential may be limited due to Dutch elm disease.	No action necessary	C2	10
161	Ash Fraxinus excelsior	Mature	Good	Located on boundary with public road. Trunk co dominant with a large separation between stems. Unsuitable for retention	Fell	U	<10
162	Ash Fraxinus excelsior	Mature	Good	A large specimen located on boundary with public road. Trunk co-dominant from 300mm with a wide union between stems. Stem to south with a slight lean in this direction but not significantly so. Upper canopy relatively well developed with no visible defects.	No action necessary	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
Tags 163-300	Not in use						
301	Leyland cypress cultivar xCuprocyparis leylandii cv	Young	Fair	Poor quality specimen on boundary with neighbouring property. Foliage bare to west. Potential to negatively impact on boundary wall in future.	No action necessary	C2	10-15
302	Leyland cypress cultivar xCuprocyparis leylandii cv	Young	Poor	Poor quality specimen on boundary with neighbouring property. Foliage bare to east. Potential to negatively impact on boundary wall in future.	No action necessary	C2	10-15
303	Lodgepole pine Pinus contorta	Young	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in future.	No action necessary	C2	20
304	Norway spruce Picea abies	Young	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in future.	No action necessary	C2	20
305	Monterey pine Pinus radiata	Early-mature	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in future.	No action necessary	C2	20
307	Norway spruce Picea abies	Early-mature	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in near future.	No action necessary	C2	10
308	Monterey pine Pinus radiata	Early-mature	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in future.	No action necessary	C2	10
309	Norway spruce Picea abies	Early-mature	Good	A relatively well developed specimen on boundary with neighbouring property. Potential to negatively impact on boundary wall in future.	No action necessary	C2	10

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
310	Norway spruce Picea abies	Early-mature	Poor	A poor specimen topped to facilitate utility line clearance. On boundary with neighbouring property and with potential to negatively impact on boundary wall in future.	No action necessary	C2	20
311	Ash Fraxinus excelsior	Young	B2	A relatively well developed cluster of stems. No visible defects	No action	B2	40
312	Ash Fraxinus excelsior	Young	Good	Located to outer edge of tree group. Trunk multi-stemmed from 1.5m with wide unions between stems.	No action necessary	B2	30
313	Ash Fraxinus excelsior	Early-mature	Good	A tall slender specimen within tree group. No visible defects.	No action necessary	B2	40
314	Lodgepole pine Pinus contorta	Early-mature	Poor	A very poor specimen with very limited long-term potential	Fell	U	<10
315	Lodgepole pine Pinus contorta	Early-mature	Poor	Relatively well developed. Trunk co-dominant from 2.5m with wide union between stems. May be vulnerable with removal of neighbouring trees	Monitor	C2	10-15
316	Lodgepole pine Pinus contorta	Early-mature	Good	Relatively well developed. Trunk co-dominant from 2.5m with wide union between stems. May be vulnerable with removal of neighbouring trees	Monitor	C2	10-15
317	Lodgepole pine Pinus contorta	Early-mature	Poor	A very poor specimen with very limited long-term potential	Fell	U	<10
318	Horse chestnut Aesculus hippocastanum	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
319	Norway spruce Picea abies	Early-mature	Good	Deadwood in lower crown but no visible defects	No action necessary	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
320	Ash Fraxinus excelsior	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
321	Beech Fagus sylvatica	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
322	Ash Fraxinus excelsior	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
323	Beech Fagus sylvatica	Mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
324	Monterey pine Pinus radiata	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
325	Sycamore Acer pseudoplatanus	Early-mature	Good	Multi-stemmed from base with tight unions between stems. Long-term potential reduced as a result.	No action necessary	C2	15-20
326	Sycamore Acer pseudoplatanus	Early-mature	Good	Trunk multi-stemmed from base with tight unions between stems. Long-term potential reduced as a result. Upper canopy relatively well developed.	No action necessary	C2	15-20
327	Sycamore Acer pseudoplatanus	Mature	Good	Trunk co-dominant from 300mm. Tight unions present but not significant at present. Heavy ivy growth obscuring view for assessment.	Cut ivy	B2	20-30
328	Sycamore Acer pseudoplatanus	Mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
329	Ash Fraxinus excelsior	Early-mature	Good	Trunk co-dominant from 4m with a wide union between stems. No visible defects.	No action necessary	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
330	Elm Ulmus procera	Early-mature	Good	A well-developed specimen with no visible defects however Dutch elm disease will ultimately reduce long-term potential.	No action necessary	C2	10
331	Ash Fraxinus excelsior	Early-mature	Good	A well-developed specimen with no visible defects	No action necessary	B2	40
332	Ash Fraxinus excelsior	Young	Poor	In decline	Fell	U	<10
333	Elm Ulmus procera	Early-mature	Good	Trunk co-dominant from base with a further stem lost in the past. Dutch elm disease will ultimately reduce long-term potential.	No action necessary	C2	10
334	Ash Fraxinus excelsior	Mature	Poor	A sub-dominant specimen with crown restricted to north. Suitable for retention within current location only.	No action necessary	C2	10-15
335	Elm Ulmus procera	Early-mature	Poor	Appears to be in decline due to Dutch elm disease	Fell	U	0
336	Elm Ulmus procera	Early-mature	Good	Trunk co-dominant from base with a tight union between stems. Dutch elm disease will ultimately reduce long-term potential.	No action necessary	C2	10
337	Cherry cultivar Prunus cv	Early-mature	Good	A tall slender specimen with crown limited to west but not significantly so.	No action necessary	C2	10
338	Cherry cultivar Prunus cv	Mature	Poor	A poorly developed sub-dominant specimen. Crown very limited to west. Unsuitable for retention outside of current environment.	No action necessary	C2	10
339	Cherry cultivar Prunus cv	Mature	Fair	Multi-stemmed from 1m. A structurally poor specimen. Long-term potential limited	No action necessary	C2	10

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
340	Purple leaved cherry Prunus cv	Mature	Poor	A sub-dominant specimen shaded out by neighbouring trees	No action necessary	C2	10
341	Leyland cypress xCuprocyparis leylandii	Mature	Good	A large hedge within yard. Unmanaged but relatively well developed. Of very limited landscape or arboricultural value	No action necessary	C2	20
342	Sycamore Acer pseudoplatanus	Mature	Good	A large specimen within Leyland hedge. Growth strongly vertical form. A cavity below main point of limb development may reduce trees structural integrity in time but is unlikely to be significant at present.	No action necessary	B2	20-30
343	Sycamore Acer pseudoplatanus	Mature	Good	A large specimen on eastern boundary with public road. Crown wide-spreading and well developed with strong vertical form. No visible defects	Cut ivy	B2	40
344	Leyland cypress xCuprocyparis leylandii	Mature	Good	A gappy hedge with large individual specimens present. Light suppressed deadwood scattered throughout hedge but not indicative of decline.	No action necessary	C2	20
345	Leyland cypress xCuprocyparis leylandii	Mature	Good	A tall slender specimen due to competition from neighbouring trees. Trunk co-dominant from 2.5m with a tight union between stems. Long-term potential reduced as a result. Upper canopy relatively well developed with no visible defects.	Cut ivy	B2	30
346	Sycamore Acer pseudoplatanus	Mature	Good	Trunk co-dominant from 2m with a tight union between stems. Very heavy ivy growth obscuring view for assessment. Upper canopy relatively well developed with no visible defects. A power cable attached to trunk.	Remove cable	B2	40
347	Ash Fraxinus excelsior	Early-mature	Good	On boundary with public road. Very heavy ivy growth obscuring view for assessment. No visible defects	Cut ivy	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
348	Sycamore Acer pseudoplatanus	Mature	Good	A tall slender specimen due to competition from neighbouring trees. Very heavy ivy growth obscuring view for assessment. Unsuitable for isolation from neighbouring tree cover.	Cut ivy	B2	40
349	Sycamore Acer pseudoplatanus	Mature	Good	A tall slender specimen due to competition from neighbouring trees. No visible defects	Cut ivy	B2	40
350	Sycamore Acer pseudoplatanus	Mature	Good	A cluster of self-reliant stems. Very heavy ivy growth obscuring views for assessment. No visible defects.	Cut ivy	B2	40
351	Ash Fraxinus excelsior	Mature	Good	A relatively well developed tree. Very heavy ivy growth up trunk obscuring view for assessment. Sheltered within current location.	No action necessary	B2	40
352	Ash Fraxinus excelsior	Mature	Good	Kink in trunk but vertical from 3m. Upper canopy relatively well developed. No visible defects.	No action necessary	B2	40
353	Sycamore Acer pseudoplatanus	Mature	Good	Co-dominant from base with tight unions between stems. Very heavy ivy growth into crown. No visible defects.	Cut ivy	B2	40
354	Elm Ulmus glabra	Early-mature	Good	A relatively well developed specimen co-dominant from base with tight unions between stems. Dutch elm disease will ultimately reduce long-term potential.	No action necessary	C2	10
355	Sycamore Acer pseudoplatanus	Mature	Good	Co-dominant from base with tight unions between stems. Very heavy ivy growth into crown. No visible defects.	Cut ivy	B2	40
356	Sycamore Acer pseudoplatanus	Mature	Fair	A relatively well developed tree though restricted due to competition from neighbouring trees. No visible defects.	No action necessary	B2	40

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
357	Ash Fraxinus excelsior	Mature	Good	A multi-stemmed specimen with very heavy ivy growth up stems. Grazing damage present to stems.	No action necessary	C2	20-30
358	Ash Fraxinus excelsior	Mature	Good	Multi-stemmed from base with stems at acute angles and with potential for failure as a result. Long-term potential reduced as a result.	No action necessary	C2	10-15
359	Ash Fraxinus excelsior	Mature	Poor	Extensive grazing damage present	Fell	U	0
360	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
361	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
362	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
363	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
364	Elm Ulmus glabra	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
365	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
366	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
367	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
368	Ash Fraxinus excelsior	Early-mature	Good	Multi-stemmed with wide unions between stems. No grazing damage visible.	No action necessary	B2	20-30
369	Ash Fraxinus excelsior	Early-mature	Good	Multi-stemmed with very heavy ivy growth up stems.	Cut ivy	B2	20-30
370	Ash Fraxinus excelsior	Early-mature	Good	Multi-stemmed with very heavy ivy growth up stems.	Cut ivy	B2	20-30
371	Ash Fraxinus excelsior	Early-mature	Good	Multi-stemmed with very heavy ivy growth up stems.	Cut ivy	B2	20-30
372	Ash Fraxinus excelsior	Early-mature	Good	Multi-stemmed with very heavy ivy growth up stems.	Cut ivy	B2	20-30
373	Ash Fraxinus excelsior	Early-mature	Poor	In a state of collapse	Fell	U	0
374	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with no grazing damage	No action necessary	B2	20-30

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
375	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with no grazing damage	No action necessary	B2	20-30
376	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with no grazing damage	No action necessary	B2	20-30
377	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
378	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
379	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
380	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
381	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
382	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
383	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15

Tag No.	Species	Age Category	General vigour	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expect-any
384	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with extensive grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15
385	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with no damage present. Limited long-term potential limited.	No action necessary	C2	10-15
386	Ash Fraxinus excelsior	Mature		A large wide spreading multi-stemmed specimen. No visible defects	No action necessary	B2	40
387	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with no damage present. Limited long-term potential limited.	No action necessary	C2	10-15
388	Ash Fraxinus excelsior	Mature	Good	A relatively well developed multi-stemmed specimen. Very heavy ivy growth up stems. No visible defects	No action necessary	B2	40
389	Ash Fraxinus excelsior	Mature	Good	A relatively well developed multi-stemmed specimen. Very heavy ivy growth up stems. No visible defects	No action necessary	B3	40
390	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed and slightly sub-dominant. Very heavy ivy growth up stems.	Cut ivy	C2	20
391	Ash Fraxinus excelsior	Mature	Good	A relatively large multi-stemmed specimen. Very heavy ivy growth up stems and light grazing damage on stems.	Cut ivy	B2	40
392	Ash Fraxinus excelsior	Early-mature	Poor	Multi-stemmed with grazing damage present. Long-term potential limited as a result.	No action necessary	C2	10-15

7. Tree measurements

Tree No.	Height m.	D.B.H. mm.	Spread m. N,S,E,W	Clear Stem first cardinal point	Root Protection Diameter m.
135	18.5	560	5,5,5,8	4W	6.7
136	7	210	NA	NA	NA
137	12	380	2,1,2,2	6N	4.5
138	12	420	2,2,4,4	10,s	5
139	18	520	NA	NA	6.2
140	13	320	4,2,1,2	1.5N	3.8
141	12	280	1,2,2,2	3W	3.3
142	13	290	5,2,2,2	1N	3.4
143	18	350	3,3,3,3	10W	4.2
144	15	290	1,4,2,4	7S	3.4
145	16	290	7,4,4,4	0N	3.4
146	12	240	NA	NA	NA
147	11	190	NA	NA	2.2
148	12	340	4,1,4,5	4W	4
149	12	450	5,6,3,4	4E	5.4
150	12	320	1,4,5,5	2.25S	3.8
151	12	560	8,8,4,8	3.5W	6.7
152	12	490	3,4,6,6	6W	5.8
153	12	1100	8,5,5,3	7N	10
154	12	420	6,6,6,6	6N	5
155	12	500	5,5,5,5	8E	6
156	12	350	NA	NA	NA
157	12	290	3,3,3,3	10N	3.4
158	12	520	4,4,2,4	4N	6.2
159	12	210 av	2,2,2,2	6N	4
160	12	210	4,4,4,4	6N	2.5
161	12	860	NA	NA	NA
162	12	920	6,8,8,8	6E	10
163-300 Tags not in use					
301	8	200	2112		4
302	8	170	1110		3.5

Tree No.	Height m.	D.B.H. mm.	Spread m. N,S,E,W	Clear Stem first cardinal point	Root Protection Diameter m.
303	9	250	2222	.5se	3
304	10	300	3333	.25se	3.6
305	10	350	3433	.25s	4.2
306	10	280	2333	.25s	3.3
307	10	270	3233	0.25	3.2
308	9	300	3323	.25sw	3.6
309	10	270	3333	.25se	3.2
310	8	300	3333	.25w	3.6
311	9	190	2323	1.5w	4
312	9	280	3233	.5s	3.3
313	11	260	3323	2s	3.2
314	12	260	2222	.25 s	3.1
315	13	320	3233	.25w	3.8
316	13	320	3332	2.5w	3.8
317	12	300	3333	.25w	3.6
318	12	320	3323	.25s	3.8
319	13	300	3343	.25e	3.6
320	13	260	2332	4 w	3.1
321	13	300	2232	.25 w	3.6
322	13	330	3443	.25 s	3.9
324	9	330	3344	.25n	3.9
323	11	320	2233	.25 s	3.8
325	10	350	3443	.50w	4.2
326	10	300	3444	.25w	3.6
327	12	300	3444	2w	3.6
328	12	320	2322	2se	3.8
329	10	300	2323	2.5w	3.6
330	12	350	4433	.25e	4.2
331	12	260	3233	.20e	3.1
332	11	170	2213	.20w	2
333	12	260	3221	2.5s	2.6
334	10	300	2333	.5ne	3
335	11	190	2231	.25s	1.9
335	12	200	3233	.25w	2
336	14	280	3443	1.5w	2.8
337	12	200	3223	2w	2

Tree No.	Height m.	D.B.H. mm.	Spread m. N,S,E,W	Clear Stem first cardinal point	Root Protection Diameter m.
338	12	240	4334	.5 se	2.4
339	12	300	4543	1w	3
340	7.5	190	2332	2s	1.9
341	10	250	3343	.25s	2.5
342	15	550	5555	2nw	6.6
343	14	550	5565	2w	6.6
344	12	300	3323	1.5w	3.6
345	14	320	3433	3w	3.8
346	23	240	5566	2.5se	2.8
347	20	240	5544	4w	2.8
348	16	300	2343	.25s	2.8
349	16.5	300	3343	3sw	3.6
350	16	250	2344	6s	3
351					
352	11	400	3444	4sw	4.8
353	14	410	5544	2.5s	4.9
354	13	250			3
355	15	600	6566	.50w	7.2
356	19	500	6566	3w	5
357	15	220	3443	2sw	2.2
358	13	200	43444	6sw	2
359	15	320	4344	1se	3.2
360	16	300	3324	1.5w	3
361	16	320	4433	2w	3.2
362	16	240	5564	2s	2.8
363	15	180	3344	2s	2.2
364	16	220	3344	2e	2.7
365	16	260	3344	2s	2.6
366	16	220	3344	3nw	2.2
367	16	300	3344	2.5s	3
368	16	180	2233	3 s	1.8
369	15	250	3243	3se	2.5
370	15	270	3344	4sw	2.7
371	11	255	3323	4s	2.5
372	15	300	3373	2s	3
373	15	160	3373	2.5s	1.6

Tree No.	Height m.	D.B.H. mm.	Spread m. N,S,E,W	Clear Stem first cardinal point	Root Protection Diameter m.
374	15	250	3373	2s	3
375	15	300	3373	1e	3.6
376	15	300	3373	1s	3.6
377	15	280	3373	1s	3.3
378	15	250	3373	2.5se	3
379	15	250	3373	2s	3
380	15	160	3373	1.5 s	1.9
381	15	250	3373	2.5s	3
382	15	220	3373	10w	2.6
383	15	250	3373	4w	3
384	15	160	3373	2e	1.9
385	15	240	3373	5s	2.6
386	15	220	3373	2.5w	2.6
387	15	280	3373	3w	3.6
388	15	300	3373	3.	3.6
389	15	280	3373	4w	3.3
391	15	230	3373	3w	2.8
392	15	220	3373	2e	2.6

8. Tree protection

Tree protection fencing must be erected before construction works commence and must be in accordance with BS 5837 (2012).

a. Oil, bitumen, cement or other materials likely to be injurious to a tree should not be stacked or discharged within 10m of a bole, and materials generally should not be stacked or discharged within 5m of a bole. It is essential that allowance is made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

b. Concrete mixing should not be carried out within 10m of a tree.

c. Fires should not be lit in a position where the flames could extend within 5m of foliage, branches or trunk, bearing in mind the size of the fire and the wind direction.

d. As the majority of tree roots occur within the top 600mm of soil changes to soil levels within the root zone can have serious consequences for tree health.

Increases in soil levels within the root zone of trees can lead to root asphyxiation and ultimately to tree decline and/or death.

A reduction in soil levels may expose roots to drying out and/or being damaged and have the same effect on the tree as described above.

Tree root protection

The Root Protection Area should be calculated using as per Table 1 and/or Annex D (BS 5837 2012) as an area equivalent to a circle with a radius 12 times the stem diameter for single stem trees and 10 times basal diameter for trees with more than one stem arising below 1.5m above ground level.

Number of stems	Calculation
Single stem tree	$RPA\ (m^2) = \frac{(\text{stem diameter (mm) @ 1.5 m x 12})^2 \times 3.142}{1000}$
Tree with more than one stem arising below 1.5m above ground level.	$RPA\ (m^2) = \frac{(\text{basal diameter (immediately above root flare (mm) x 10})^2 \times 3.142}{1000}$

9. References

BS 5837 (2012). Trees in Relation to Design Demolition and Construction

Mattheck and Breloer (1994). The body language of trees

LEGEND

TREE CONDITION CATEGORIES

- **A** TREES OF HIGH VALUE AND QUALITY
- **B** TREES OF MODERATE VALUE AND QUALITY
- **C** TREES OF LOW QUALITY AND VALUE
- TREE CONSTRAINTS
- TREE SURVEY BOUNDARY

AP refers to trees not shown on topographical survey drawing but located approximately on the this drawing only. Exact locations may need to be ascertained if the trees are to be retained.

Drawing to be interpreted with reference to Tree Survey document

Tree constraints shown are calculated from guidelines contained within BS5837 (2012)withn dimensions contained within Section 8 of the Tree Survey document. This outline should not be interpreted as the exact extent of root spread however it is considered the optimal area to be retained free of developmental impacts.
Natural and/or man made barriers such as waterlogged soil or buildings may restrict the spread of tree roots. Crown spreads may also prove to be a constraint particularly where crown reduction may not be possible.
The constraints lines shown on this drawing are therefore a guide only. An on–site assessment should be undertaken in the event of any developments being planned within the areas shown for retained trees.

CMK
Horticulture & Arboriculture

CLIENT: ARDSTONE PROPERTIES	**PROJECT:** PROPOSED DEVELOPMENT AT CAPDOO, CLANE, CO. KILDARE			**JOB NO.** TCAP001
	DRAWING: Tree Survey & Constraints	**DATE:** 25–03–19	**SCALE:** 1:1500 @ A1	**DRAWING NO.** 102
NOTES To Not Scale. Use Figured Dimensions Only. Not for Construction Purposes unless Specifically Marked.	**DRAWN BY:** Ciaran Keating		**CK INITIALS**	**REVISION.** C
	STATUS: Planning			

Appendix 11.D Landscape Plans

LEGEND AND SCHEDULE OF MATERIALS

PLANNING APPLICATION SITE BOUNDARY	PROPOSED TREES. REFER TO SCHEDULE OF TREE PLANTING BELOW
SELECTED PAVING	PROPOSED NATIVE FORESTRY TRANSPLANT AND WHIP PLANTING
IN-SITU CONCRETE FOOTPATH TO ENGINEER'S DETAIL	PROPOSED LAWN
SELECTED SMALL FORMAT PAVING AT ENTRANCE / RAISED TABLES	PROPOSED REINFORCED GRASS
SELECTED PERMEABLE BLOCK PAVING TO PARKING SPACES	PROPOSED MEADOW
CARRIAGEWAY SURFACE TO ENGINEER'S DETAIL	PROPOSED GROUNDCOVER PLANTING
COLOURED STONE MASTIC ASPHALT SURFACE TO ENGINEER'S DETAIL	PROPOSED HEDGE PLANTING
CYCLE LANE TO ENGINEER'S DETAIL	PRIVATE REAR GARDENS
IMPACT ABSORBING SURFACE TO PLAY AREA	PROPOSED CONTOURS
PROPOSED LARGE FORMAT PAVING IN SOFT LANDSCAPE	EXISTING CONTOURS
PROPOSED SEATING	+16.85 PROPOSED LEVELS
EXISTING VEGETATION RETAINED	+15.00 ex EXISTING LEVELS RETAINED
	EXISTING TREE RETAINED AND PROTECTED IN ACCORDANCE WITH BS5837:2012. ORANGE DASHED LINE REPRESENTS RPA (ROOT PROTECTION AREA). REFER TO TREE SURVEY BY ARBORIST.

SCHEDULE OF PROPOSED TREE PLANTING FOR TOTAL SITE AREA

TREE REF.	QUANTITY	SPECIES:
Bp	147	*Betula pubescens* 4 xtr., wrb. 4 m h., 1.5-2m spread., 14-16 cm g. feathered
Ps	31	*Pinus sylvestris* 3 x tr., wrb. 2m h., 1 m s.
Ps1	29	*Pinus sylvestris* (semi-mature) 5 x tr., wrb. 3m h., 1.5 m s.
Qr	19	*Quercus robur* 4 xtr., wrb. 4 m h., 1.5-2m spread,16-18 cm g. clear stem min 1.8m.
Qr1	9	*Quercus robur* (semi-mature) 5 xtr., 8m h., 40-45 cm g., clear stem min 2.2m.
Fs	5	*Fagus sylvatica* 4 xtr., wrb. 4 m h., 1.5-2m spread,16-18 cm g. clear stem min 1.8m.
Fs1	2	*Fagus sylvatica* (semi-mature) 5 xtr., 8m h., 40-45 cm g., clear stem min 2.2m.
Cm	92	*Crataegus monogyna* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Psp	60	*Prunus spinosa* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Pa	71	*Prunus avium* 'Plena' 4 xtr., wrb., 2.5m h., 14-16cm g. clearstem min. 1.8m.
Pry	19	*Prunus yedoensis* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Psu	11	*Prunus subhirtella 'Autumnalis'* 3 xtr., wrb., 2m h., 10-12cmg. clearstem min. 1.5m.
Ca	88	*Corylus avellana* 3 xtr., wrb., 3m h., 1-1.5 spread., multistem, minimum 3 stems.
Ac	15	*Amelanchier canadensis* 3 xtr., wrb., 3m h., 1-1.5 spread., multistem.
Mk	56	*Magnolia kobus* 3 x tr., wrb., 2m h., 10-12cm g. clear stem min. 1.5m.

Native forestry transplant and whips mix at 1m centres, In random layout

Betula pubescens	600-900mm h.
Ilex aquifolium	600-900mm h.
Corylus avellana	600-900mm h.
Prunus spinosa	600-900mm h.
Crataegus monogyna	600-900mm h.
Prunus avium	600-900mm h.

GROUNDCOVER AND HERBACEOUS MIX, TYPICALLY:

Dianella nigra 2 ltr cg.
Dryopteris filix-mas 2 ltr cg.
Convalaria majalis 2 ltr cg.
Geranium spp. 2 ltr cg.
Helleborus foetidus 2 ltr cg.
Luzula sylvatica 2 ltr cg.
Luzula nivea 2 ltr cg.
Echinacea purpurea 2 ltr cg.
Hemerocalis sp. 2 ltr cg.
Hyacinthoides spp. 2 ltr cg.
Narcissus spp. 2 ltr cg.
Pulmonaria officinalis 2 ltr cg.
Verbena bonariensis 2 ltr cg.

HEDGE PLANTING:

Native hedge planting typically:

Crataegus monogyna
Prunus spinosa
Corylus avellana
Rosa canina
Prunus padus

1200mm h., min. 900mm hedge width, planted at 600mm centres

Formal hedge planting typically:

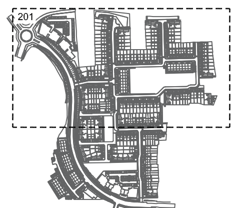
Buxus sempervirens
600mm h., min. 300mm width, clipped at varying heights, planted in 3-4 staggered rows at 450mm centres

Abbreviations:

xtr.	number of transplants in nursery
h.	height
s.	spread
wrb.	wire root-balled
cm g.	girth of tree in centimeters measured 1m above ground
2 ltr. cg.	plants supplied in 2 litre volume containers

SCHEDULE OF PROPOSED PLAY EQUIPMENT FOR TOTAL SITE AREA

REF.	QUANTITY	DESCRIPTION:
P-1	1	Climbing Structure 9
P-2	1	Zig-Zag Stepper
P-3	1	Cross Beam
P-4	1	Twin Beam
P-5	3	Jumping Disc
P-6	1	Jackstraws See-saw
P-7	1	Rotating Disc
P-8	1	Beam See-saw
P-9	1	Totter Beam
P-10	1	Stepping Blocks
P-11	1	Rotating Beam
P-12	1	Play Hut



KEYPLAN NTS

NOTES:

DATE	REV.	DESCRIPTION	DRAWN BY:	CHECKED BY:
09.05.2019	A	Minor amendments to site layout.	ck	lb
29.05.2019	B	Minor amendments to site layout.	ck	lb

DERMOT FOLEY LANDSCAPE ARCHITECTS
MALPAS STREET BLACKPITTS D08 DD56 IRELAND T:+353 1 4545148 WWW.DERMOTFOLEY.COM

CLIENT: ARDSTONE HOMES LTD.
PROJECT: CAPDOO, CLANE
DRAWING: LANDSCAPE PLAN 1
ISSUE STATUS: PLANNING

DRAWING NO.	REVISION
Ar.07-DR-201	B

PROJECT NO	SCALE	SHEET SIZE	DRAWN BY	CHECKED BY	1st ISSUE
Ar.07	1:500	A1+	ck	lb	02.05.2019

NORTH

SFR 26/ISSUE-01/DF/08.09.2009

LEGEND AND SCHEDULE OF MATERIALS

- PLANNING APPLICATION SITE BOUNDARY
- SELECTED PAVING
- IN-SITU CONCRETE FOOTPATH TO ENGINEER'S DETAIL
- SELECTED SMALL FORMAT PAVING AT ENTRANCE / RAISED TABLES
- SELECTED PERMEABLE BLOCK PAVING TO PARKING SPACES
- CARRIAGEWAY SURFACE TO ENGINEER'S DETAIL
- COLOURED STONE MASTIC ASPHALT SURFACE TO ENGINEER'S DETAIL
- CYCLE LANE TO ENGINEER'S DETAIL
- IMPACT ABSORBING SURFACE TO PLAY AREA
- PROPOSED LARGE FORMAT PAVING IN SOFT LANDSCAPE
- PROPOSED SEATING
- EXISTING VEGETATION RETAINED
- PROPOSED TREES. REFER TO SCHEDULE OF TREE PLANTING BELOW
- PROPOSED NATIVE FORESTRY TRANSPLANT AND WHIP PLANTING
- PROPOSED LAWN
- PROPOSED REINFORCED GRASS
- PROPOSED MEADOW
- PROPOSED GROUNDCOVER PLANTING
- PROPOSED HEDGE PLANTING
- PRIVATE REAR GARDENS
- PROPOSED CONTOURS
- EXISTING CONTOURS
- +16.85 PROPOSED LEVELS
- +15.00 ex EXISTING LEVELS RETAINED
- EXISTING TREE RETAINED AND PROTECTED IN ACCORDANCE WITH BS5837:2012. ORANGE DASHED LINE REPRESENTS RPA (ROOT PROTECTION AREA). REFER TO TREE SURVEY BY ARBORIST.

SCHEDULE OF PROPOSED TREE PLANTING FOR TOTAL SITE AREA

TREE REF.	QUANTITY	SPECIES:
Bp	147	*Betula pubescens* 4 xtr., wrb. 4 m h., 1.5-2m spread., 14-16 cm g. feathered
Ps	31	*Pinus sylvestris* 3 x tr., wrb. 2m h., 1 m s.
Ps1	29	*Pinus sylvestris* (semi-mature) 5 x tr., wrb. 3m h., 1.5 m s.
Qr	19	*Quercus robur* 4 xtr., wrb. 4 m h., 1.5-2m spread,16-18 cm g. clear stem min 1.8m.
Qr1	9	*Quercus robur* (semi-mature) 5 xtr., 8m h., 40-45 cm g., clear stem min 2.2m.
Fs	5	*Fagus sylvatica* 4 xtr., wrb. 4 m h., 1.5-2m spread,16-18 cm g. clear stem min 1.8m.
Fs1	2	*Fagus sylvatica* (semi-mature) 5 xtr., 8m h., 40-45 cm g., clear stem min 2.2m.
Cm	92	*Crataegus monogyna* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Psp	60	*Prunus spinosa* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Pa	71	*Prunus avium* 'Plena' 4 xtr., wrb., 2.5m h., 14-16cm g. clearstem min. 1.8m.
Pry	19	*Prunus yedoensis* 3 xtr., wrb., 2m h., 10-12cm g. clearstem min. 1.5m.
Psu	11	*Prunus subhirtella 'Autumnalis'* 3 xtr., wrb., 2m h., 10-12cmg. clearstem min. 1.5m.
Ca	88	*Corylus avellana* 3 xtr., wrb., 3m h., 1-1.5 spread., multistem, minimum 3 stems.
Ac	15	*Amelanchier canadensis* 3 xtr., wrb., 3m h., 1-1.5 spread., multistem.
Mk	56	*Magnolia kobus* 3 x tr., wrb., 2m h., 10-12cm g. clear stem min. 1.5m.

Native forestry transplant and whips mix at 1m centres, In random layout

Betula pubescens	600-900mm h.
Ilex aquifolium	600-900mm h.
Corylus avellana	600-900mm h.
Prunus spinosa	600-900mm h.
Crataegus monogyna	600-900mm h.
Prunus avium	600-900mm h.

GROUNDCOVER AND HERBACEOUS MIX, TYPICALLY:

Dianella nigra 2 ltr cg.
Dryopteris filix-mas 2 ltr cg.
Convalaria majalis 2 ltr cg.
Geranium spp. 2 ltr cg.
Helleborus foetidus 2 ltr cg.
Luzula sylvatica 2 ltr cg.
Luzula nivea 2 ltr cg.
Echinacea purpurea 2 ltr cg.
Hemerocalis sp. 2 ltr cg.
Hyacinthoides spp. 2 ltr cg.
Narcissus spp. 2 ltr cg.
Pulmonaria officinalis 2 ltr cg.
Verbena bonariensis 2 ltr cg.

HEDGE PLANTING:

Native hedge planting typically:

Crataegus monogyna
Prunus spinosa
Corylus avellana
Rosa canina
Prunus padus

1200mm h., min. 900mm hedge width,
planted at 600mm centres

Formal hedge planting typically:

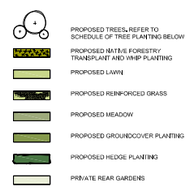
Buxus sempervirens
600mm h., min. 300mm width,
clipped at varying heights,
planted in 3-4 staggered rows at 450mm centres

Abbreviations:

xtr.	number of transplants in nursery
h.	height
s.	spread
wrb.	wire root-balled
cm g.	girth of tree in centimeters measured 1m above ground
2 ltr. cg.	plants supplied in 2 litre volume containers

SCHEDULE OF PROPOSED PLAY EQUIPMENT FOR TOTAL SITE AREA

REF.	QUANTITY	DESCRIPTION:
P-1	1	Climbing Structure 9
P-2	1	Zig-Zag Stepper
P-3	1	Cross Beam
P-4	1	Twin Beam
P-5	3	Jumping Disc
P-6	1	Jackstraws See-saw
P-7	1	Rotating Disc
P-8	1	Beam See-saw
P-9	1	Totter Beam
P-10	1	Stepping Blocks
P-11	1	Rotating Beam
P-12	1	Play Hut



KEYPLAN NTS

NOTES:

DATE	REV.	DESCRIPTION	DRAWN BY:	CHECKED BY:
-	-	-	-	-

DATE	REV.	DESCRIPTION	DRAWN BY:	CHECKED BY:
09.05.2019	A	Minor amendments to site layout.	ck	lb
29.05.2019	B	Minor amendments to site layout.	ck	lb

DERMOT FOLEY *LANDSCAPE ARCHITECTS*
MALPAS STREET BLACKPITTS D08 DD56 IRELAND T:+353 1 4545148 WWW.DERMOTFOLEY.COM

CLIENT: ARDSTONE HOMES LTD.
PROJECT: CAPDOO, CLANE
DRAWING: LANDSCAPE PLAN 2

ISSUE STATUS:
PLANNING

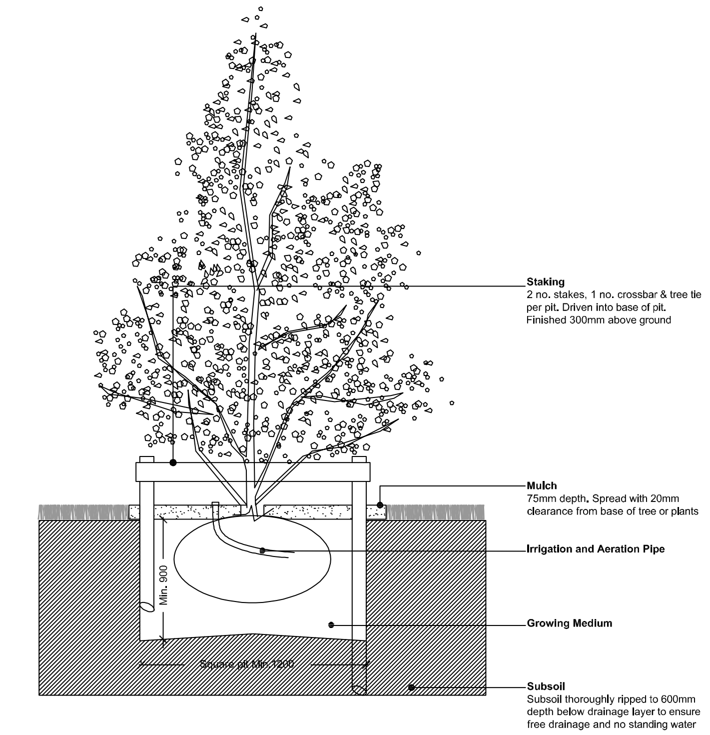
DRAWING NO.	REVISION
Ar.07-DR-202	B

PROJECT NO	SCALE	SHEET SIZE	DRAWN BY	CHECKED BY	1st ISSUE
Ar.07	1:500	A	ck	lb	02.05.2019

NORTH

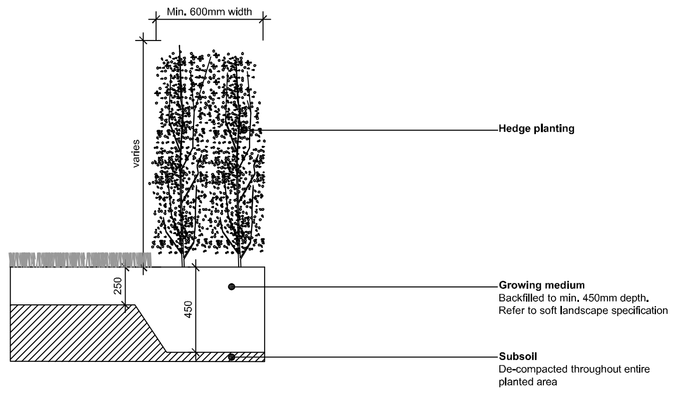
SFR 26/ISSUE-01/DF/08.09.2009

Appendix 11.E Typical Soft Landscape Details



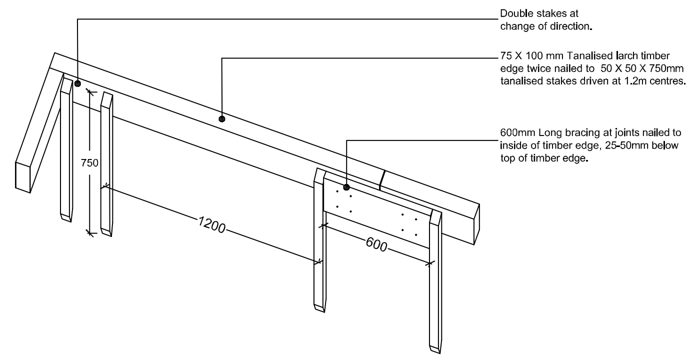
SMALL AND MULTISTEM TREE PLANTING IN SOFT LANDSCAPE

1
260



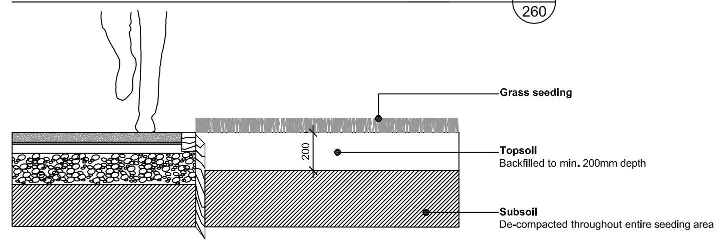
HEDGING IN SOFT LANDSCAPE

3
260



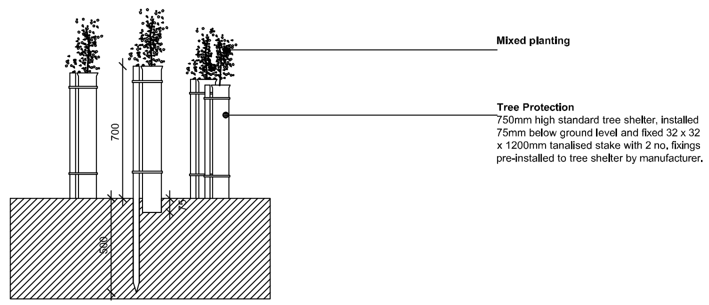
TIMBER EDGING TO LAWN/PLANTING

6
260



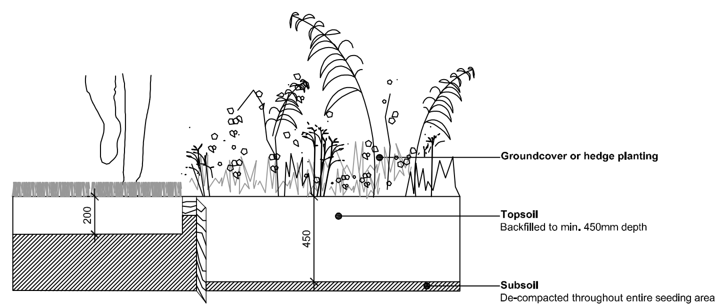
TYPICAL GRASS SEEDED AREA INTERFACE TO TIMBER EDGE

7
260



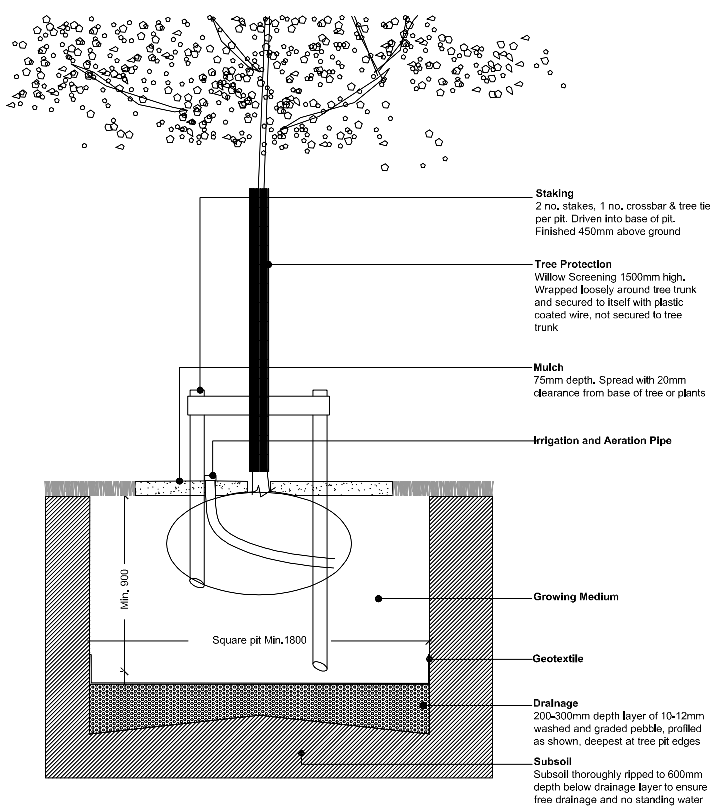
WHIP & FORESTRY TRANSPLANT

4
260



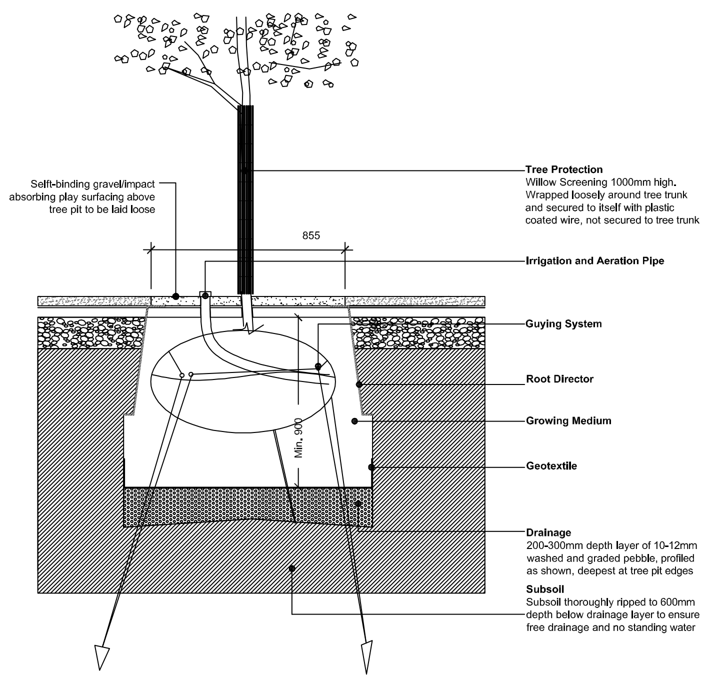
GRASS SEEDED AREA INTERFACE WITH PLANTING

8
260



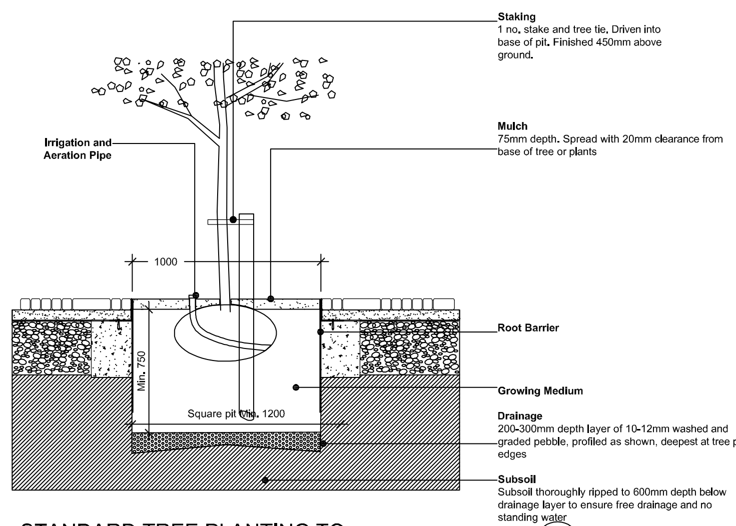
TREE PLANTING IN SOFT LANDSCAPE

2
260



TREE PLANTING IN SELF-BINDING GRAVEL AND IMPACT ABSORBING PLAY SURFACING

5
260



STANDARD TREE PLANTING TO FRONT CURTILAGE

9
260

NOTES:

DATE	REV.	DESCRIPTION	DRAWN BY:	CHECKED BY:
-	-	-	-	-

DERMOT FOLEY LANDSCAPE ARCHITECTS
MALPAS STREET BLACKPITTS D08 DD56 IRELAND T:+353 1 4545148 WWW.DERMOTFOLEY.COM

CLIENT:	ARDSTONE HOMES LTD.				
PROJECT:	CAPDOO, CLANE				
DRAWING:	TYPICAL SOFT LANDSCAPE DETAILS				
PROJECT NO	SCALE	SHEET SIZE	DRAWN BY	CHECKED BY	1st ISSUE
Ar.07	1:20	A1	ck	lb	02.05.2019

ISSUE STATUS: PLANNING

DRAWING NO.	REVISION
Ar.07-DR-260	-

N/A

NORTH

SFR 26/ISSUE-01/DF/08.09.2009

Appendix 11.F Design Rationale

DESIGN RATIONALE - LANDSCAPE ARCHITECTURE

Project: **CAPDOO, CLANE**

Project no.: **Ar.07**

Prepared on behalf of: **ARDSTONE HOMES LTD.**

Prepared by: **DERMOT FOLEY LANDSCAPE ARCHITECTS**

Date of First Issue: **02.05.2019**

Revisions: **-**

ISSUED FOR: INFORMATION/BILLING/**PLANNING**/TENDER/CONSTRUCTION

1 Introduction

The objective of this report is to describe the proposed landscape and external works as part of the proposed residential development at Capdoo, Clane. This report should be read in conjunction with documents issued and included in this submission by Dermot Foley Landscape Architects, McCrossan O'Rourke Manning Architects, Declan Brassil & Company, DBFL Consulting Engineers, CMK Horticulture & Arboriculture and others.

Dermot Foley Landscape Architects visited the site on several occasions from May to September 2018 in order to observe conditions on site, such as existing vegetation, conditions under foot, boundaries and other items which would have a bearing on the design process.

CMK Horticulture & Arboriculture were commissioned to carry out a Tree Survey and Arboricultural Impact Assessment in compliance with BS 5837:2012. These documents are included separately as part of this submission.

The following additional documents have been issued by Dermot Foley Landscape Architects as part of this submission:

No.	Scale	Size	Title
201	1:500	A1+	Landscape Plan 1
202	1:500	A1+	Landscape Plan 2
203	1:1000	A1	Boundary Plan
240	1:100	A1+	Landscape Sections
250	1:20	A1	Hard Landscape Details
251	1:20	A1	Typical Boundary Details
260	1:20	A1	Typical Soft Landscape Details

2 Landscape Appraisal

2.1 General

The site is generally rectangular in shape with undulating topography. Bound by low density one-off rural housing along the local roads to the north and east and a series of residential developments to the south and west, the development area constitutes c.11 hectares. It comprises grassland and formally grazing lands divided by lines of hedgerows. The site is enclosed and is not open to the public at present.

Ground conditions generally vary. The lands seem to be mostly free draining with the north-eastern corner of the site slightly wetter underfoot. An existing driveway to former stables exists along the eastern boundary from the local country road.

From left to right: typical view looking south-west from the center of the site. Typical view looking west from the eastern end of the site, hedgerows divide the site into separate fields.

2.2 Boundaries

The site boundaries vary in character. The southern boundary to Capdoo Park comprises a dense hedgerow made up of mostly hawthorn. It extends north along the western boundary. Further north, a concrete block wall forms the boundary with rear private gardens of adjacent houses. The northern boundary consists of a hedgerow with some mature trees to the north-eastern and western corners. The eastern boundary is generally made up of a mixture of garden hedges and small portions of native hedges. Access from the local road to the east exists at the former stable lands.

From left to right: Image showing western site boundary consisting of hawthorn hedgerow; image showing north-western site boundary consisting of hedgerow with mature tree planting.

From left to right: Image showing eastern site boundary looking north, with existing mature trees overhanging the site from neighboring lands; Image showing eastern site boundary looking south, with existing garden hedge separating the development site and existing housing.

2.3 Existing Trees

The trees located along the boundaries and within the former stables are mixes of native and non-native species, varieties representing ornamental, screening and self-seeded specimens. There is an alignment of ash trees within the main site area. The hedgerows on site and along the boundaries are primarily composed of hawthorn. According to the arboricultural assessment the quality of the trees is mixed, with over half of the trees in the low or very poor categories. The trees located at the boundaries and within the former stables form better specimens. These are proposed to be retained. Mature trees are located along the northeast boundary, within the ownership of a neighboring dwelling. An evergreen hedge is located along the existing driveway to the former stables. A few tree clusters also exist within the site.

From left to right: Image showing existing trees along north-eastern boundary overhanging the site; image showing existing hedgerow, a portion of which is to be retained as part of proposed public open space.

From left to right: Image showing tree cluster at former stable lands, most of the trees are proposed for retention; image showing line of ash trees located within the development site.

3 Landscape Strategy

3.1 General

The proposals in this submission show a lively, innovative and durable landscape and public realm, which integrates the proposed development into the surrounding context and generates new public open spaces and routes throughout. The gently sloping lands offer an exciting challenge from the point of view of accessibility, terracing and creating usable spaces. The proposed landscape strategy has been formulated by the entire design team and client in order to integrate civil engineering, ecological considerations and improved circulation and accessibility.

There are several components making up the overall landscape strategy:

- a diverse range of spaces including flat open spaces, play areas and smaller spaces with native tree planting and ground flora;
- a safe environment which is available to future residents but is also a positive addition to the public realm of the wider area of Clane;
- improved permeability throughout the site for pedestrians and cyclists;
- realistic retention of existing trees and hedgerows.

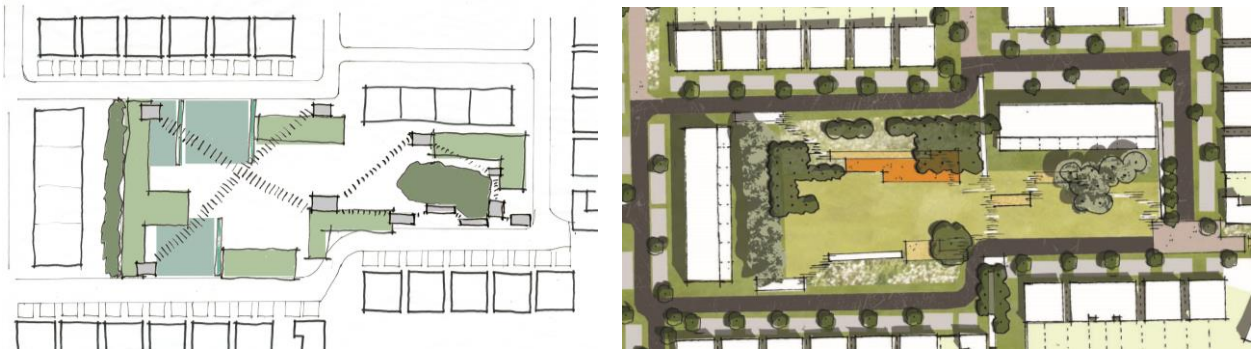
Early landscape concept plan, illustrating character of proposed public open space

3.2 Public Open Space

There are three main large areas of public open space, each of them vary in character. All of the public open spaces are centrally located and overlooked from proposed houses on all sides. Their central locations ensure that the public open space is activated and used to its maximum potential. The landscape elements are arranged in such a way as to utilize as much of the space as possible.

3.2.1 Northern Open Space (Open Space 1)

A central rectangular cut lawn area is framed by series of mainly native Irish tree species planted on a grid, meadow grasses and groundcover and herbaceous planting. A formal open space is created which utilizes both passive and active forms of recreation. The existing topography is exploited to create subtle variations in the character of the landscape. On the periphery, meadow and groundcover areas under tree canopies are broken up by series of paths and access points leading to the central open space.



Early landscape concept plans illustrating design development of the central public open space.

From left to right: Precedent image from Montevrain Park, France, showing tree grid and managed meadow framing open space; precedent image from Barking Riverside, London, showing public open space with informal play overlooked by housing.

3.2.2 Middle Open Space (Open Space 6)

A central lawn area is framed by a monoculture of *Magnolia kobus* trees planted on a grid, meadow grasses and groundcover and herbaceous planting. A formal open space is created which utilizes both passive and active forms of recreation. A play area is located to the north to exploit the aspect. On the north-western and south-eastern periphery, meadow and groundcover areas under tree canopies are broken up by series of paths and access points leading to the central open space.

3.2.3 Southern Open Space (Open Space 2)

This open space is aligned with a retained existing hedgerow and its geometry is a playful arrangement of linear elements, to reflect the linear nature of the hedgerow. Proposed tree planting here is mainly *Pinus sylvestris* with *Betula pubescens.* Over time, it is envisaged that the *Pinus* will form a tall band visible from across the site. A number of play elements are incorporated within this open space.

3.3 Permeability

A key objective of the landscape strategy is to link the new development to the wider context of Clane. A new link road will provide permeability through the lands and act as the main access road to the development. Thus the site will act as a node between the Kilcock and Celbridge Regional Roads. It will provide important connections for vehicles, pedestrians and cyclists.

The proposed internal access roads meander through the proposed development and are broken up by raised tables with pedestrian crossing points to create a safer, calmer environment for pedestrians, cyclists and motorists. In order to differentiate the cul-de-sac areas from the residential streets which provide routes through the development, it is proposed that coloured stone mastic asphalt is used to contrast the tarmacadam surface of the main roads. These areas will facilitate access to dwellings, parking and hammerheads/ turning circles for residents and visitors and at the same time allow for a safe and comfortable pedestrian use. All of the streetscape and open spaces are overlooked for passive surveillance.

A series of smaller pedestrian and cycle links provide routes through adjacent lands to local destinations including shops and Clane town centre.

3.4 Play

Dedicated play areas are located in areas of public open space on site. They comprise secure play areas surrounded by fencing and areas of natural play which are integrated into meadow areas. Play equipment includes a climbing structure, trails of timber logs and balancing equipment. The proposed play equipment will be designed and manufactured in accordance with standards EN 1176 and EN 1177. Impact absorbing surface for specific fall heights from play equipment is proposed to mimic bark and is located where it is required and within the secure play area for 0-5 years. Furthermore the large flat lawn area to the centre of the site can be used for a wide range of informal sports and play. Play equipment is outlined as part of drawing *201 and 202 Landscape Plan 1 and 2* prepared by Dermot Foley Landscape Architects, included in this submission.

Clockwise from top left: Proposed Climbing Structure; proposed timber logs; proposed turning tire; proposed rotating balance beam.

3.5 Proposed Boundaries

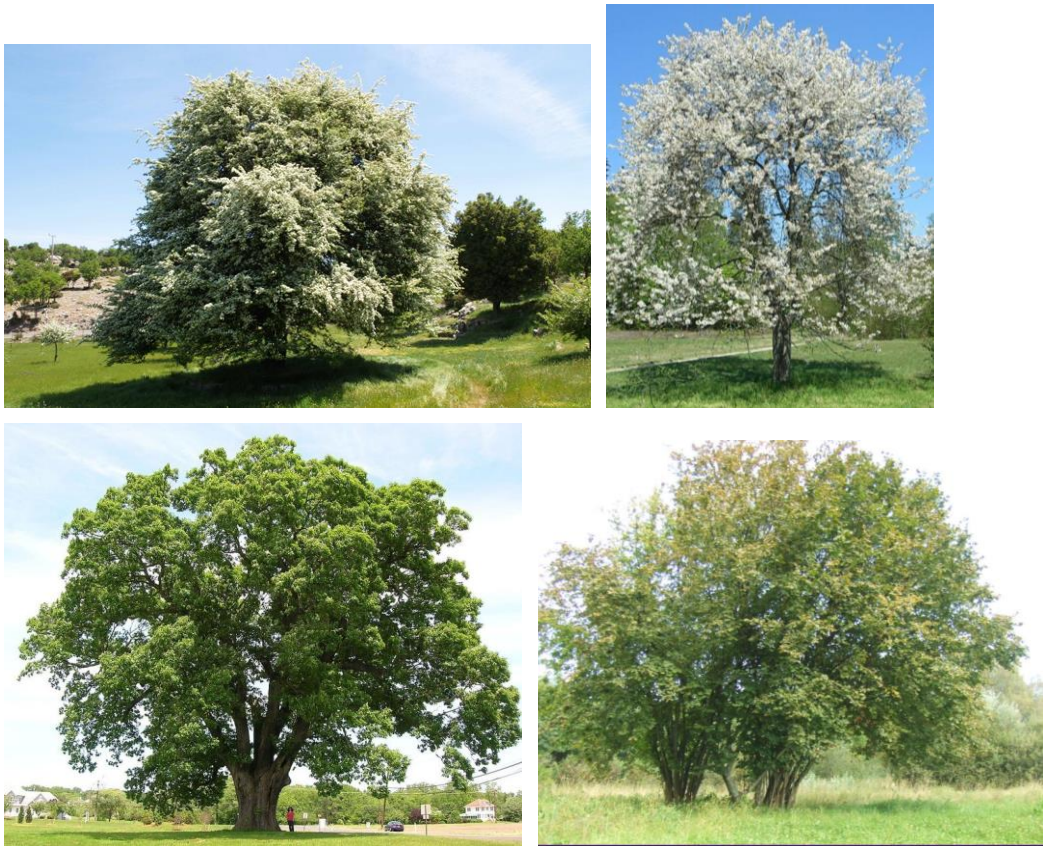
Drawing *203 Boundary Plan* prepared by Dermot Foley Landscape Architects, included as part of this submission illustrates sections of proposed and existing boundaries. The general boundaries strategy involves the retention of existing boundaries where possible and their modification to render them more appropriate to the proposed use. Where proposed private open space adjoins open boundaries, the existing boundary is proposed to be in-filled with concrete post and timber panel fencing. Boundaries to public open space are proposed to be secured using simple mesh fences constructed with minimal point foundations and without the need for strip foundations in order to protect and retain as much existing hedgerow as possible. Where existing vegetation is thin along the boundary, this will be supplemented with additional appropriate planting.

4 Planting

Drawing *201 and 202 Landscape Plan 1 and 2* prepared by Dermot Foley Landscape Architects includes a detailed schedule of proposed planting and illustrates the location and extent of mown grass, managed meadow, reinforced grass, bulb, low groundcover, hedge and tree planting as well as existing ground flora and trees to be retained and managed.

4.1 Tree planting

New trees are proposed in order to compensate for the removal of existing trees. They will also improve the species mix on site. The proposed tree species are selected for longevity, suitability to local soil conditions and microclimate, biodiversity (native species) and where required suitability to close proximity to residential buildings. Proposed tree sizes range from semi-mature (35-40cm girth) specimen trees to multi-stemmed and native forestry transplants and whip planting. A native corridor has been proposed along the new link road across the site. This will provide a total area of approximately 2100m2 of new habitat. Typical tree species are illustrated on the following pages.



Selection of proposed tree species, clockwise from top left: Hawthorn (Crataegus monogyna), Wild Cherry (Prunus avium) Hazel (Corylus avellana), Oak (Quercus spp.).

4.2 . Hedge, Groundcover and Bulb Planting

Low planting is utilized to make and reinforce sub-spaces within the larger landscape spaces, for visual screening, defensible space, visual interest, ecological purposes and to guide or direct people's movement. The low planting is conceived as subtle layering of greens within the open spaces. The planting is layered as follows; lowest - bulb planting, groundcover planting, highest - clipped hedge planting.

Typical species for low clipped vegetation, or boundary treatment with fencing, from left to right: Fagus sylvatica (beech), Caprinus betulus (hornbeam), Crataegus monogyna (hawthorn).

From left to right: typical groundcover under tree canopy; species for shade groundcover – native & exotic including Darmera, Luzula, Dryopteris and Asplenium.

Typical groundcover species, from left to right: Helleborus spp., Hemerocalis sp , Asplenium scolopendrium and Luzula sylvatica.

5 Hard Landscape Materials and Finishes

The selection of paving and other landscape materials is determined by proposed function, longevity and durability. The extent of materials and the locations where a transition is made from one material to another are determined by drainage and other sustainability issues. Paving materials where practical are proposed to be constructed in a way which is sensitively integrated with lawn and soft landscape, in order to minimise the impact of hard landscape surfaces. Primary vehicular, pedestrian and cycle circulation is proposed as a durable, limited range of neutral materials with robust construction. The secondary vehicular routes are designed to ‘play-down’ the impact of the road infrastructure in the landscape setting. Secondary pedestrian routes and private spaces are proposed to be of ‘flexible’ construction and in some cases a mix of paving and lawn.




A range of paving details, clockwise from top left: permeable block paving; natural stone threshold and bituminous macadam detail, natural stone sett paving; self-binding gravel.


Integrating paving and soft landscape, from left to right: natural stone in lawn; reinforced grass using 'Checker Block' concrete modular product.

END