Waste Material	List of Waste Code
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

** individual waste type may contain hazardous substances*

4.0 ESTIMATED WASTE ARISINGS

4.1 DEMOLITION WASTE GENERATION

Demolition works at the site will involve the demolition of existing structures on site. Demolition figures published by the EPA in the *'National Waste Reports'*[12] and data from previous projects have been used to estimate the approximate break-down for indicative reuse (offsite), recycling and disposal targets of demolition waste. This breakdown is shown in Table 4.1.

Table 4.1 *Estimated off-site reuse, recycle and disposal rates for demolition waste*

Waste Type	Tonnes	Reuse/Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	118.8	0	0.0	85	101.0	15	17.8
Concrete, Bricks, Tiles, Ceramics	673.2	30	202.0	65	437.6	5	33.7
Plasterboard	52.8	30	15.8	60	31.7	10	5.3
Asphalts	13.2	0	0.0	25	3.3	75	9.9
Metals	198.0	5	9.9	80	158.4	15	29.7
Slate	105.6	0	0.0	85	89.8	15	15.8
Timber	158.4	10	15.8	60	95.0	30	47.5
Total	1320.0		243.5		916.7		159.7

The appointed demolition contractor will be required to prepare a detailed demolition management plan prior to work commencing which should refine the above estimated waste figures.

4.2 CONSTRUCTION WASTE GENERATION

The below Table 4.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports, the GMIT*[13] and other research reports.

Table 4.2 *Waste materials generated on a typical Irish construction site*

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	100

An assessment has been undertaken to estimate the quantity of construction waste likely to be generated from the proposed development.

Table 3 below shows the estimated construction waste generation for the development based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated waste amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 4.2.

Table 4.3 *Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D Waste	501	10	50	80	401	10	50
Timber	425	40	170	55	234	5	21
Plasterboard	152	30	46	60	91	10	15
Metals	121	5	6	90	109	5	6
Concrete	91	30	27	65	59	5	5
Other (includes cabling, ducting, conduits, packaging and plastics)	228	20	46	60	137	20	46
Total	1519		345		1031		143

In addition, as noted in Section 3.2, the quantity of excavated material that will be removed has been estimated by Pinnacle the project engineers to be c. 5,875 m^3 of subsoil and stones material.. In addition c. 16,117 m^3 of topsoil is to be excavated, it is currently proposed that the majority of this excavated topsoil will be reused on site for landscaping.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict the construction waste that will be generated from

9.0 CONSULTATION WITH RELEVANT BODIES

9.1 LOCAL AUTHORITY

Once the main contractor has been appointed and prior to removal of any waste materials offsite, details of the proposed destination of each waste stream will be provided to the local authority for their approval.

The local authority will also be consulted, as required, throughout the construction phase in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

9.2 RECYCLING/SALVAGE COMPANIES

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. Where a waste contractor is engaged, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and facility COR/permits/licences are held. In addition, information regarding individual construction materials will be obtained, including the feasibility of recycling each material, the costs of recycling/reclamation, the means by which the wastes will be collected and transported off-site and the recycling/reclamation process each material will undergo off site.

10.0 REFERENCES

1 Waste Management Act 1996 (No. 10 of 1996) as amended 2001 (No. 36 of 2001), 2003 (No. 27 of 2003) and 2011 (No. 20 of 2011). Subordinate and associated legislation includes:

- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended 2011 (S.I. No. 323 of 2011)
- Waste Management (Collection Permit) Regulations 2007 (S.I No. 820 of 2007) as amended 2008 (S.I. No. 87 of 2008) and 2016 (S.I. No. 24 of 2016)
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended 2008 (S.I. No. 86 of 2008). 2014 (S.I. No. 310 and S.I. No. 546 of 2014) and 2015 (S.I. No. 198 of 2015)
- Waste Management (Licensing) Regulations 2000 (S.I. No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004) and 2010 (S.I. No. 350 of 2010)
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended 1998 (S.I. No. 164 of 1998), 2001 (S.I. No. 356 of 2002) and 2011 (S.I. No. 126 and No. 192 of 2011)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended 2015 (S.I. No. 190 of 2015)
- European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
- European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended 2015 (S.I. No. 542 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended 2014 (S.I. No. 349 of 2014) and 2015 (S.I. No. 347 of 2015)
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000)
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended by European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
- The European Communities (Trans frontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988) o European Union (Properties of Waste Which Render It Hazardous) Regulations 2015 (S.I. No. 233 of 2015)

2 Environmental Protection Act 1992 (Act No. 7 of 1992) as amended by the Protection of the Environment Act 2003 (Act No. 27 and S.I. No. 413 of 2003) and amended by the Planning and Development Act 2000 (Act No. 30 of 2000) as amended.

3 Litter Pollution Act 1997 (Act No. 12 of 1997) as amended by the Litter Pollution Regulations 1999 (S.I. No. 359 of 1999) and Protection of the Environment Act 2003, as amended.

4 Eastern-Midlands Waste Region, Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).

5 Department of the Environment, Heritage and Local Government (DoEHLG). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, (2006).

6 FÁS and the Construction Industry Federation (CIF). Construction and Demolition Waste Management – a handbook for Contractors and Site Managers, (2002).

7 Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways. A Policy Statement (1998).

8 Forum for the Construction Industry, Recycling of Construction and Demolition Waste (1999).

9 Department of Communications, Climate Action and Environment (DCCAE). Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).

10 South Dublin County Council (SDCC). Development Plan 2016-2022 (2016)

11 EPA. Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)

12 Environmental Protection Agency (EPA). National Waste Database Reports 1998 – 2012.

13 EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).

Table A.10.2 Albedo based on an area-weighted arithmetic mean of the land use over a 10km x 10km area centred on Casement Aerodrome.

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter[Note1]
0.5% Water, 30% Urban, 0.5% Coniferous Forest 38% Grassland, 19% Cultivated Land	0.155	0.180	0.187	0.187

Note 1: For the current location autumn more accurately defines "winter" conditions at the proposed facility.

Bowen Ratio

The Bowen ratio is a measure of the amount of moisture at the surface of the earth. The presence of moisture affects the heat balance resulting from evaporative cooling which, in turn, affects the Monin-Obukhov length which is used in the formulation of the boundary layer. The area-weighted geometric mean Bowen ratio derived from the land use classification over a 10km x 10km area centered on Casement Aerodrome is shown in
Table A.*10.3*.

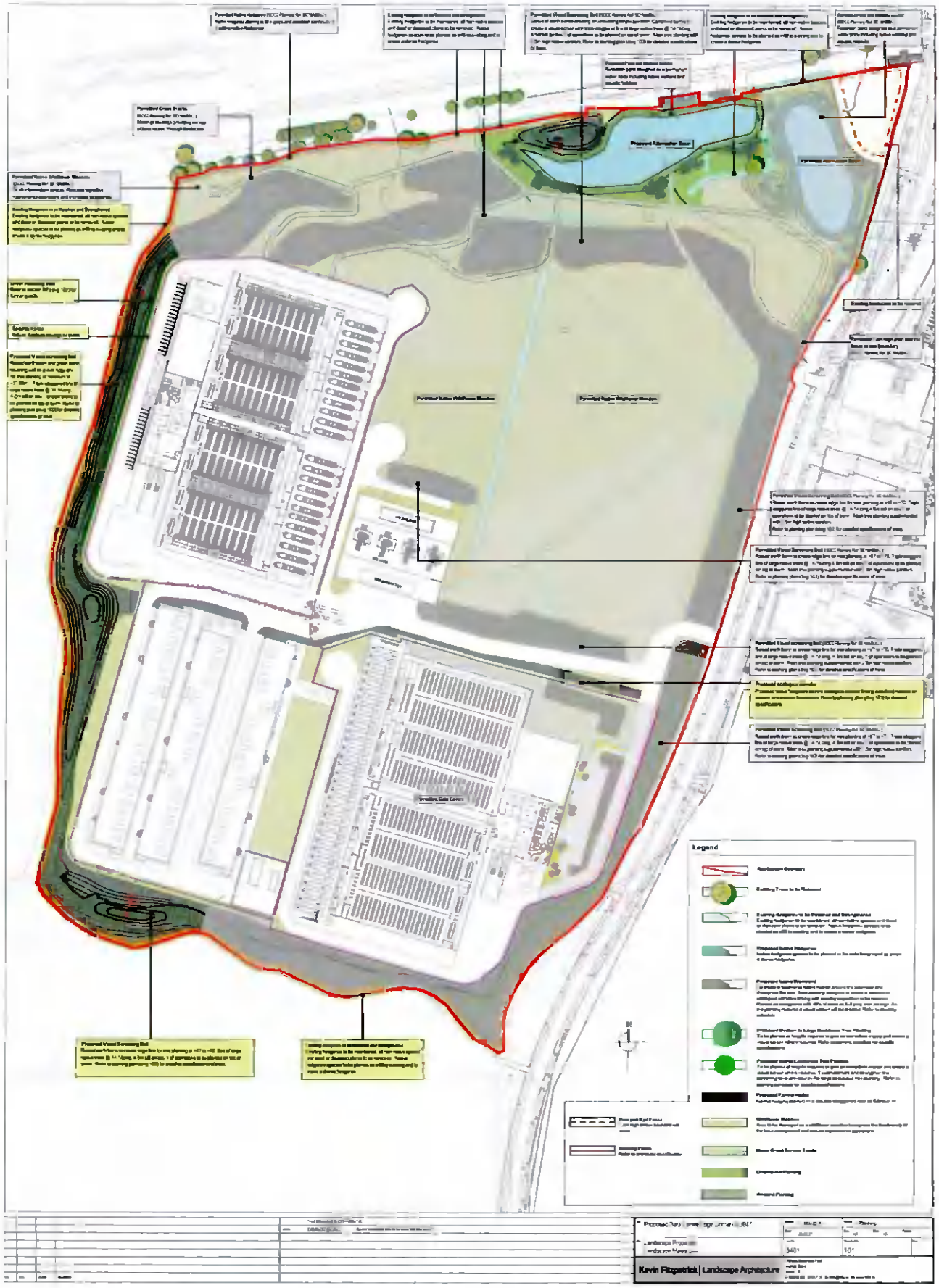
Table A.10.3 Bowen ratio based on an area-weighted geometric mean of the land use over a 10km x 10km **area** centred on Casement Aerodrome.

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter[Note1]
0.5% Water, 30% Urban, 0.5% Coniferous Forest 38% Grassland, 19% Cultivated Land	0.549	1.06	1.202	1.202

Note 1: For the current location autumn more accurately defines "winter" conditions at the proposed facility.

CHAPTER 11 - LANDSCAPE AND VISUAL IMPACT

Appendix 11.1 Proposed Landscape plan



Proposed new data centre in Ballymakaily

Method Statement - Photo-montage production.

1. Photographs are taken from locations as advised by client with a full frame SLR digital camera and prime lens. The photographs are taken horizontally with a survey level attached to the camera. The photographic positions are marked (for later surveying), the height of the camera and the focal length of the image recorded.

2. In each photograph, a minimum of 3no. visible fixed points are marked for surveying. These are control points for model alignment within the photograph. All surveying is carried out by a qualified topographical surveyor using Total Station / GPS devices.

3. The photographic positions and the control points are geographically surveyed and this survey is tied in to the site topographical survey supplied by the Architect / client.

4. The buildings are accurately modelled in 3D cad software from cad drawings supplied by the Architect. Material finishes are applied to the 3D model and scene element are place like trees and planting to represent the proposed landscaping.

5. Virtual 3D cameras are positioned according to the survey co-ordinates and the focal length is set to match the photograph. Pitch and rotation are adjusted using the survey control points to align the virtual camera to the photograph. Lighting is set to match the time of day the photograph is taken.

6. The proposed development is output from the 3D software using this camera and the image is then blended with the original photograph to give an accurate image of what the proposed development will look like in its proposed setting.

7. In the event of the development not being visible, the roof line of the development will be outlined in red if re-quested.

8. The document contains:

a) Site location map with view locations plotted.
b) Photo-montage sheet with existing or proposed conditions.
c) Reference information including field of view/focal length, range to site / development, date of photograph.

9. The proposed view will contain the building where visible or partially visible. Where the building is not visible or where the visible proportion of the building is not perceptible then a redline will indicate the extent of the proposed development in the background. Where there are other developments in the vacinity with planning permission or under construction a blue line and or grey massing will represent the adjacent development.

digital dimensions
architectural visualisation

Project KFLA Dub5

digital | interiors
architectural visualisation

Location Map

Project KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 1 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

digital dimensions
architectural visualisation

Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 1 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA DubS

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 2 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 2 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA Dub5

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 3 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

digital dimensions
architectural visualisation

Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 3 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project KFLA Dub5

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 4 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

digital dimensions
architectural visualisation

Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 4 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

digital dimensions
architectural visualisation

Project KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 5 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA Dub5

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 5 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA DubS

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 6 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 6 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA DubS

digital dimensions
architectural visualisation

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 7 Existing	04-02-2021	73°	24mm	174m	Canon EOS 5DS

digital dimensions
architectural visualisation

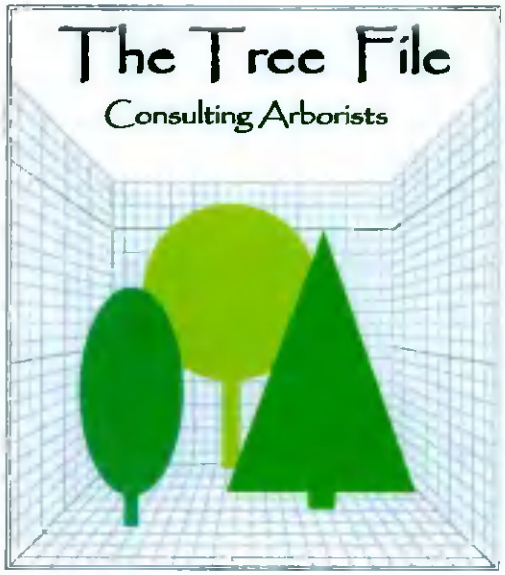
Project: KFLA Dub5

Location	Date	Field of view	35mm equivalent	Distance to site	Camera model
View 7 Proposed	04-02-2021	73°	24mm	174m	Canon EOS 5DS

Project: KFLA Dub5

digital dimensions
architectural visualisation

Appendix 11.3 Tree survey



Preliminary Tree Survey and Report
Trees at Proposed Site at
Newcastle Road
Grange Castle
Co Dublin

February 2021

The Tree File Ltd
Consulting Arborists
Ashgrove House
26 Foxrock Court
Dublin 18

086-3819011

Contents

This report should be read in conjunction with the "Tree Constraints Plan" drawing "Grange Castle Tree Constraints Plan"

1.0 Summary of Findings

1.1 This survey builds upon an earlier review of site vegetation. from which no substantive changed have been recorded. However. the northern site has become increasingly overgrown. Additionally. a greater proportion of the young emergent Elm population has now been affected by Dutch Elm Disease

1.2 Much of the material associated with this site relates to its original agricultural usage. All described hedge lines being represented on both the 1837-42 and the 1888-13. though the historical mapping shows that some hedges. particularly to the south of the site have been lost. Current field demarcation is dominated by hedges. that appear to be associated with topographical features including ditches and embankments. In some instances. the features are large however. in other instances. for example towards the north of the site. such features tended to be of a smaller scale and in some instances have been partially eroded out. Nonetheless and in respect of any intent to retain such material. it must be appreciated that the retention of hedges is intrinsically linked with the retention and preservation of the ditches or embankments that support them.

1.3 Many of the hedges appear to have originated as Hawthorn alignments. While many of these Hawthorns remain. many hedges are now becoming invaded by other species. most notably Blackthorn. Elder. Bramble. Ash and Wych Elm. Many of the hedges retain reasonable continuity however. such continuity is not always provided by the original Hawthorn.

1.4 Regarding the southernmost areas of the site. note is made of the numbers of emergent Elms arising from hedgerows. Since the survey undertaken in 2018. it is noted that many more trees have died because of ongoing Dutch Elm disease attack. It is likely that many is not all remaining Elm on the site will be lost to the disease in the near future.

1.5 Similar concerns are developing in respect of Ash. Chalara Canker disease is developing widely in Ireland. with many specimens already affected or dead. Therefore Ash should not be relied upon as part of sustainable tree retention strategy as the Ash on the site at present may be lost in the near future.

1.6 Within the region of the outbuildings and farm yards towards the north of the site. note is made of substantial. apparently recent environmental change and vandalism that has seen substantial ground works and ground disturbance as well as fire damage. Many such hedges are beyond any reasonable suitability for retention.

1.7 It is about the north of the site that we see most individual tree specimens. Unfortunately. very few specimens can be regarded as being suitable for retention and indeed some are recommended for immediate removal.

1.8 With regard to the western end of the site's northern boundary. note is made that though located outside of the site confines. the embankment descending towards the Grand Canal supports a developing tree population typically including Sycamore. Alder and Ash. Many such trees would be suitable for retention and have immense potential for ongoing growth over time. Note should however be made that there is evidence to suggest substantial fill and disturbance along the boundary line that may have disturbed both trees directly adjoining and some metres outside of the site. Note is also made that

some trees in this area and particularly a Crack Willow, are in particularly poor condition. As noted within the survey, an Ash and Sycamore have been harshly cut back because of their position beneath high tension cables and the Crack Willow has collapsed affecting another described Ash. These poorly condition trees are located substantially outside of the site confines but potentially close enough to influence them as result of ongoing growth over time.

1.9 In conclusion it is worthy of note that the site supports little material of Arboricultural interest though it is appreciated that some elements may have ecological and heritage value. Regarding the tree population very few specimens would be regarded as valuable though it is appreciated that some of the hedges, dependent upon the context within which they might be retained, do offer some degree of sustainability.

2.0 Introduction

2.1 **Kevin Fitzpatrick Landscape Architecture**
4 Main Street
Raheny
Dublin
D05 NY56

2.2 The survey has been prepared by-
Andy Worsnop Tech Arbor A. NCH Arb (PTI LANTRA)
The Tree File Ltd
Brookfield House
Carysfort Avenue
Blackrock
Co Dublin

Report Brief

2.3 In accordance with the request for information. the intention of the tree survey is to register. describe and evaluate the trees regarding their current health status and current condition within their current context. The survey is based upon and has been compiled considering the recommendations of BS5837: 2012 Trees in Relation to Design. Demolition and Construction – Recommendations.

Report Context

2.4 In line with the recommendations of "BS5837: 2012 Trees in Relation to Design. Demolition and Construction – Recommendations". this assessment has been advised by the results and findings of a tree survey. the findings of which are included as "Appendix 1" to this report.

2.5 In line with client instructions. this report comprises a simple qualitative tree survey and a summary report describing the material of Arboricultural interest. upon and adjoining the subject site.

2.6 This information has been provided without any review of possible construction or development works. Accordingly. this information does not include any "Arboricultural Implication Assessment". nor does not provide an "Arboricultural Method Statement" or "Tree Protection Plan" and therefore is not a full Arboricultural report.

2.7 It does however provide some of the basic information that would assist in the compilation of such information and documentation. should it be requested required in the future.

2.8 This tree report should be read in conjunction with the combined tree constraints plan "Grange Castle Tree Constraints Plan". This drawing provides a graphic representation of the tree survey depicting the constraints and the spatial retention requirements of the trees. as well as colour coded categorisation their condition and potential value.

2.9 Accordingly, and in line with BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations, this documentation does provide an invaluable "design tool" in respect of the review of potentially sustainable trees on a particular site.

Report Limitations

2.10 This report is based on the Arborists interpretation of information provided to his prior to report compilation and gained from the site during the undertaking of the site review. The site review data is subject to the limitation as set out under "Inspection and Evaluation Limitations and Disclaimers" in "Appendix 1" to this report. The findings and recommendations made within this report are based upon the knowledge and expertise of the inspecting Arborist.

3.0 Management Recommendations

3.1 Preliminary management recommendations have been put forward within the context of the survey table (see column PMR). Such recommendations are based on the current and "do nothing" site scenario. They do not consider any possible construction activity or site developments that may affect the trees.

3.2 In the case of construction or development works, it will be necessary for the project Arborist to re-assess all trees in respect of development impacts and implications, including shelter loss and exposure and any other changes in site context.

3.3 Regardless of any possible site development, it is advised that all retained trees be reviewed on regular basis and particularly, after any actions that may affect the trees, be those site development works, or tree management works that involve tree removal or pruning.

3.4 It should be appreciated that some of the concerns raised in the tree survey were based on evidence suggesting ongoing decline or mechanical failure. Such deterioration may well continue to a point where additional trees need to be removed. For this reason, trees must be reviewed regularly so that early intervention and action can be applied in a timely manner.

3.5 Additionally, many of the sites trees were affected by Ivy development. Whilst itself not an indicator of ill-health, Ivy cover can readily obscure signs and symptoms of ill-health or physical defect. Therefore, and whilst nominal assessments have been made for the purposes of this survey, the true condition of trees affected by Ivy cover might not be fully known until Ivy cover has been dealt with, either by cutting resulting in shedding or by the undertaking of climbing inspections.

4.0 Development Implications

4.1 This document comprises only a review of trees that exist upon or adjoining the site in respect to its existing context and relating to the "do nothing" scenario. It is appreciated that site development works may alter this scenario or may affect the suitability of various trees to be retained.

4.2 In respect of this, any development proposals must be reviewed under the auspices of

an "Arboricultural Implication Assessment" that will review the development proposals and provide an assessment of the potential for tree retention within the new context. This information can then be used to develop an "Arboricultural Method Statement" and a "Tree Protection Plan" to control and guide site works in a manner that will be least detrimental to tree health and thus may maximise tree sustainability.

5.0 Bibliography

5.1 British Standards Institution (2010) BS 3998:2010: Tree Work - Recommendations. London: British Standards Institution.

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5.3 Jackson, R.B et al (1996) A Global Analysis for Root Distribution in Terrestrial Biomes Oecologica. 108 (1996) pp389-411. Springer Verlag

5.4 Lonsdale, D. (2005) Principals of Tree Hazard Assessment and Management, London, TSO

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5.6 Roberts, J. and Jackson, N. and Smith, M. (2006) Tree Roots in the Built Environment, London, TSO

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A1 Appendix 1 – Tree Survey

Nature of Survey

A1.1 This survey has been based upon many of the criteria put forward in BS 5837: 2012 – Trees in Relation to Design. Demolition and Construction – Recommendations. The data collected has been represented in table form as "Table 1" within "Appendix 1" to this report. This appendix includes a Survey Methodology. Survey Key. Survey Abbreviations. Condition Category Definitions.

A1.2 The survey relates to the site and the conditions thereon at the time of the survey. It is likely that changes in site usage. development or other environmental changes will require an amendment of recommendations and in some instances. may require the re-classification of a tree's category and/or suitability for retention.

Drawing References

A1.3 The survey must be read in conjunction with drawing "Grange Castle Tree Constraints Plan". This provides a scaled graphic representation of tree positions. crown forms. "RPA" (root protection area) extents and a colour reference to category systems. Where tree positions were not indicated on the supplied topographical drawing. their positions may have been given a "sketched" location within "Grange Castle Tree Constraints Plan". It is advised that any such trees are accurately located by professional means so that the constraints such trees have upon the site can be accurately gauged.

A1.4 Each tree is represented by a coloured spline. scaled to represent the north. east. south and west crown radii as denoted in the survey table. Each tree (categories A-green. B-blue and C-grey only) have been apportioned a "Root Protection Area" (RPA) denoted as a dashed orange circle. This circle represents the nominal minimum area requiring protection from the effects of development activity. It should. for the purposes of design. be considered. as approximating the position of the tree protection fencing that must be erected prior to the commencement of any site works. thus excluding all site activities other than those dealt with by way of the "Arboricultural Implication Assessment" and "Arboricultural Method Statement"

Survey Intent and Context

A1.5 Intention of this document is to describe the extent. nature and quality of material of Arboricultural interest on the site in question.

Site Description

A1.6 The site in question is located south of Lucan. Co Dublin and to the south of the Grand Canal with the sites eastern boundary being adjoined by the Lucan to Newcastle road. The site appears broadly level and comprises agricultural land divided into various fields. Towards the north of the site area and adjoining the canal towpath there are several derelict buildings and farm yards.

A1.7 In comparison to the current context. he 18th century historical mapping notes a single building group referred to as The Grange accessed from the Newcastle Road and within the townland of Ballymakailly. To the west of the house. there appears to have been areas of quarrying.

A1.8 Much of the vegetation associated with the site is associated with field or paddock demarcations with the site supporting a larger number of hedges and alignments than it does individual trees. All of the hedges remaining to date are noted on historical mapping. though it appears that some hedges have been removed during the 20th century. The 1837-42 mapping suggests most field demarcations supported vegetation, most likely hedges. If trees had existed. there is nothing remaining still on the site that would date from this period.

A1.9 During the review. the bulk of the central and southern portion of the site exhibited evidence of recent agricultural use however. the northern area. south of the towpath and associated with the derelict buildings and outbuildings appears to have undergone varying degrees of disturbance and modification in the recent past.

Survey Intent and Context

A1.10 This document intends to highlight the extent and nature of the material of Arboricultural interest on the site in question.

Survey Data Collection and Methodology

The Survey

A1.11 The original survey was carried out in December of 2018 and updated in February of 2021. This survey portion of the overall report is not an Implication Assessment though but provided some of the basic information regarding its compilation. The compilation of this survey was guided by the recommendations of BS 5837: 2012. This survey typically includes trees of stem diameters exceeding 150mm at approximately 1.50 metres from ground level. The survey relates to current site conditions, setting and context.

A1.12 Each tree in the survey has a consecutive number that relates directly to the survey text. Measurements are metric and defined in metres and millimetres. All trees referred to in the survey text have been measured to provide information regarding canopy height and canopy spread (north, east, south, and west radii), level of canopy base and stem diameter at 1.50 meters from ground level. The dimensions provided are intended to provide a reasonable representation of a tree's size and form. While efforts are made to maintain accuracy, visual obstruction, especially regarding trees in groups, requires that some tree dimensions be estimated only.

Inspection and Evaluation Limitations and Disclaimers

A1.13 The information set out in this report relates to the review of a tree population on the site in question. As such, the information provided is based on a general review of trees and does not constitute a detailed review of any one of the individual specimens. Such an evaluation (tree report) would require the gathering of substantially more information than that dealt with in this survey.

A1.14 The survey is not a safety assessment and the parameters reviewed within this survey context would be substantially deficient in extent to provide for a reliable safety assessment. The survey is intended to provide a general and qualitative review to assist in gauging the suitability of an individual tree for retention within a development context. All trees are subject to impromptu failure and damage. The assessment of risk as may be presented by a tree requires the review of numerous factors more than those noted herein and as such, remains outside the scope of this document and any attempt to use the information herein for such proposes will render the information invalid.

A1.15 A competent and experienced Arborist has completed all inspection and tree assessment. The inspection involves visual assessment only, which has been carried out

from ground level. No below ground, internal, invasive, or aerial (climbing) inspection has been carried out.

A1.16 Trees are living organisms whose health, condition and safety can change rapidly. All trees should be re-evaluated regarding their condition on an annual basis or after substantial trauma such a storm event, other damage, or injury. The results and recommendations of this survey will require review and reassessment after one year from the date of execution. This survey does not constitute a review of tree or site safety. Attempts to use the contents herein for such purposes will render the contents invalid.

A1.17 Throughout the undertaking of the survey, several factors acted against the inspectors, contriving to reduce the accuracy of the survey.

Seasonality

A1.18 The surveys were carried out during the winter periods. Some of the signs, typically symptomatic of ill-health or defect within a tree, may not have been available to view at the time of the survey or may have been obscured by seasonality related factors. Some of the fruiting bodies of various fungi, parasitic upon or causing decay or disease in trees, may have been out of season and unavailable to view. This survey can only comment upon symptoms of ill-health or defects visible at the time of the inspection.

A1.2 Survey Key

Species	Refers to the specific tree species
Age	Referred to in generalized categories including: -
Y - Young	A young and typically small tree specimen.
S/M - Semi-Mature	A young tree, having attained dimensions that allow it to be regarded independently of its neighbours but typically, would be less than 50% of its ultimate size.
E/M - Early-Mature	A specimen, typically 50% - 100% of ultimate dimensions but with substantial capacity for mass and dimensional increase remaining.
M - Mature	A specimen of dimensions typical of a full-grown specimen of its species. Future growth would tend to be extremely slow with little if any dimensional increase.
O/M - Over-Mature	An old specimen of a species having already attained or exceeded its naturally expected longevity.
V - Veteran	An extremely old, veteran specimen of a species, usually of low vigour and typically subject to rapid decline and deterioration or of very limited future longevity.
Tree Dimensions	All dimensions are in meters. See notes regarding limitation of accuracy.
Ht.	Tree Height
CH	Lowest canopy height

N. E. S. W		Tree Canopy Spread measured by radii at north. east. south. and west
Dia.		Stem diameter at approx. 1.50m from ground level.
RPA		Root Protection Area. as a radius measured from the tree's stem centre.
Con		Physical Condition
G	Good	A specimen of generally good form and health
G/F	Good/Fair	
F	Fair	A specimen with defects or ill health that can be either rectified or managed typically allowing for retention
F/P	Fair/Poor	
P	Poor	A specimen whom through defect. disease attack or reduced vigour has limited longevity or maybe un-safe
D	Dead	A dead tree
Structural Condition		Information on structural form. defects. damage. injury. or disease supported by the tree
PMR – Preliminary Management Recommendations		Recommendation for Arboricultural actions or works considered necessary at the time of the inspection and relating to the existing site context and tree condition. Works considered as urgent will be noted.
Retention Period		
S – Short		Typically. 0 -10 years
M – Medium		Typically. 10 -20 years
L – Long		Typically. 20 – 40 years
L+		Typically. more than 40 years
Category System		The Category System is intended to quantify a tree regarding its Arboricultural value as well as a combination of its structural and physical health.
Category U		Particularly poor quality. dangerous or diseased trees that offer no realistic sustainability
Category A		A typically a good quality specimen. which is considered to make a substantial Arboricultural contribution
Category B		Typically including trees regarded as being of moderate quality
Category C		Typically including generally poor-quality trees that may be of only limited value.
		The above categories are further subdivided regarding the nature of their values or qualities.
Sub-Category 1		Values such as species interest. species context. landscape design or prominent aspect.
Sub-Category 2		Mainly cumulative landscape values such as woods. groups. avenues. lines.
Sub-Category 3		Mainly cultural values such as conservation. commemorative or historical links.

Table 1 – Tree Data Table

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
12	Ash *(Fraxinus excelsior)*	M	P	12.00	3.00	5.00	3.50	3.50	2.00	1	471	5.65	A poor-quality specimen in a state of ongoing decline and exhibiting evidence of Polyporus infection. Is wholly unsuitable for retention in roadside position.	Remove immediately.	N/A	U
13	Sycamore *(Acer pseudoplatanus)*	M	F	10.00	2.00	5.00	5.50	4.50	4.50	1	681	8.17	Is of variable vigour and vitality, arising from what appears to be disturbed ground. Note is made of buttress root damage and localised bark loss about buttress zone.	Review regarding retention context	M	C2
14	Horse Chestnut *(Aesculus hippocastanum)*	M	P	8.00	2.00	5.00	5.00	5.00	5.00	1	993	11.92	Crudely decapitated and affected by chronic limb loss and decay. Is unsuitable for retention.		N/A	U
15	Sycamore *(Acer pseudoplatanus)*	M	D	11.00	2.00	4.00	4.00	4.00	4.00	1	780	9.36	Completely dead and in a state of ongoing collapse.	Remove immediately.	N/A	U
16	Ash *(Fraxinus excelsior)*	E/M	F	12.00	2.25	4.00	4.00	3.00	4.00	1	376	4.51	Relatively young and still vigorous. Arises from disturbed bank and area of dumped spoil between Canal towpath and area of hardstanding. Vigour and vitality appear reasonable however much of tree is obscured by dense Ivy cover.	Cut Ivy and rereview.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
17	Ash Group *(Fraxinus excelsior)*	E/M	F/P	12.00	3.00	5.00	5.00	4.00	4.50	4	462	5.54	Close-knit group of multiple stems arising from disturbed spoil between Canal towpath and area of hardstanding. Eastern and south-eastern stems have sustained notable mechanical damage. Broader crown appears be maintaining reasonable vigour and vitality.	Review regarding retention context.	M	C2
18	Crack Willow *(Salix fragilis)*	E/M	F/P	10.00	1.00	3.00	5.00	5.00	5.00	3	493	5.92	Distorted and apparently naturally arising comprises part of a broader multi-stemmed thicket development to north and north-east. Tree vigour and vitality remains good though tree has been subject to prior mechanical damage and has sustained notable bark wounding to south of lower stems.	Review regarding retention context.	M	C2
19	Ash Group *(Fraxinus excelsior)*	E/M	F	9.00	2.50	0.00	4.50	4.00	4.00	1	290	3.48	One-sided and typically unbalanced to south as a result of being part of a broader group that extends down embankment to north and towards Canal. Tree appears broadly vigorous though has been affected by substantial dumping and creation of embankment to south of stem.		M	C2
20	Ash *(Fraxinus excelsior)*	S/M	F	6.00	1.00	1.00	2.00	2.00	1.50	1	207	2.48	Suppressed distorted and affected by failure of Willow from Canal embankment	Review regarding retention context	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
21	Ash Group *(Fraxinus excelsior)*	E/M	P	12.00	0.00	5.00	4.00	3.00	2.00	6	592	7.10	A broader multi-stemmed group arising from lower embankment above Canal. Has been crudely decapitated in past presumably in respect of position adjoining and beneath high-tension power cables. Is of poor quality and ill-suited to retention.	consider early removal	S	C2
22	Sycamore *(Acer pseudoplatanus)*	M	P	13.00	0.00	6.00	4.00	2.00	5.00	1	576	6.95	Crudely decapitated with much of southern upper crown removed to facilitate clearance of overhead power cables. Is of dubious sustainability.		S	C2

Tree Lines and Hedges

H1	Hedge 1 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Privet *(Ligustrum ovalifolium)* Spindle *(Euonymus europeus)* Dog Rose *(Rosa canina)*	M	F	3.00-6.00	0.00	Spread 4.00-6.00m	m/s	2017	2.48	A broadly can tenuous but highly variable hedge arising from the descending slope of a shallow embankment that descends to a ditch circa 1.50 m below field levels to the South. the original Thorn is of variable continuity with notable gaps, particularly where suppression has occurred as a result of ash, elder and Bramble infestations. There are multiple sections where hedge continuity is provided solely by low level Bramble thicket. suitability for retention will be context dependent and dependent upon management needs/potential. The alignment supports a notable, emergent tree population, typically dominated by ash and which Elm. All trees are present can be readily regarded as semimature most not exceeding 5 – 6.00 m. Note is made of the proportion of elms that have died, presumably as result of Dutch Elm disease. Those remaining alive are not expected to last beyond imaging short-term.		M	C2

H2	Hedge 2 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Privet *(Ligustrum ovalifolium)*	M	F	1.25-7.00	0.00	Spread 1.50-4.00m	m/s	2017	2.48	This hedge is associated with a shallow but nonetheless raised embankment located on the western side of a substantial ditch. A large proportion of the material associated with this alignment arises from the eastern bank of the ditch and appears to include a distinct hedge format at the upper edge of the ditch embankment that has been added to by natural thicket development extending to the east by circa 3 – 4.00 m Elements of this hedge exhibit evidence of mechanical cutting to circa 1.25 m though other areas are substantially outgrown. Continuity is again a result of plant combinations with substantial elements comprising Bramble thicket only. This alignment supports a more significant emergent tree population. this time dominated by ash though all specimens remain young with most being between a semi maturity and early maturity. Suitability for retention will again be context and management potential dependent.	M	C2

H3	Hedge 3 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)*	M	F	4.00-6.00	0.00	Spread 5.00-7.00m	m/s	2017	2.48	The hedge alignment arises predominantly to the north of a substantial ditch and in association with a raised embankment. The original hedge thicket has been substantially contributed to by extensive thicket development. typically dominated by Blackthorn and Bramble Note is made of a substantial number of emergent trees that at this time would be regarded as semimature including both ash and which Elm. Already. numerous specimens of the Wych Elm exhibit evidence of Dutch Elm disease suggesting limited sustainability and an unlikelihood of survival beyond the immediate short-term	M	C2
H4	Hedge 4 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F	1.50-3.50	0.00	Spread 5.00m	m/s	2017	2.48	A broadly continuous alignment arising from the ascending embankment to a notable ditch to the west with the embankment to the east Small elements of this alignment have been destroyed through fire damage though elsewhere the alignment tends to be broadly continuous however. continuity tends to be as a result of vegetation combinations as opposed to the original Thorn hedge. In this respect, note is made of the substantial proportion of the hedge continuity is provided by Bramble.	M	C2

H5	Hedge 5 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Holly *(Ilex aquifolium)*	M	F	2.50-6.00	0.00	Spread 4.00-6.00m	m/s	2017	2.4k	Continuity within this hedge remains good notwithstanding the proportion provided by Bramble at lower levels. The hedge supports only a small number of emergent Ash that could readily be regarded as semimature only with singular poor-quality poplar at its northernmost end. Once again, this hedge exists in association with a ditch and embankment feature with the more significant material arising from the north-western embankment of the ditch	M	C2
H6	Hedge 6 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F	1.00-2.50	0.00	Spread 3.00m	m/s	2017	2.4k	Substantially smaller than previously reviewed hedges with an apparent reduced degree of maturity. Continuity within the line is substantially contributed to by Bramble thicket at lower levels. In keeping with other hedges, the materials associated with a substantial ditch and embankment feature with most of the significant material arising from the northern bank of the ditch feature	M	C2

H7	Hedge 7 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F	5.00-7.00	0.00	Spread 5.00-7.00m	m/s	2017	2.4k	A mature hedge, originally dominated by Hawthorn but where broader continuity is now provided by a combination of plants, most notably elder and emergent ash. Eradication of invasive species would leave a particularly fragmented alignment. Note is made that many of the emergent trees tend to be of poor quality, namely being distorted as result of prior decapitation presumed to be associated with original hedge management works.	M	C2
H8	Hedge 8 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)*	M	F	2.50-5.50	0.00	Spread 3.00-4.00m	m/s	2017	2.4k	A broadly mature hedge alignment of reasonable continuity associated with the eastern ascending embankment from a ditch feature. General continuity amongst the thorns tends to be broadly good though suppression is developing as result of more invasive plants such as Elder and ash. The hedge alignment is affected by only a small number of gaps where continuity is provided for only by lower level Privet and Bramble Scrub.	M	C2

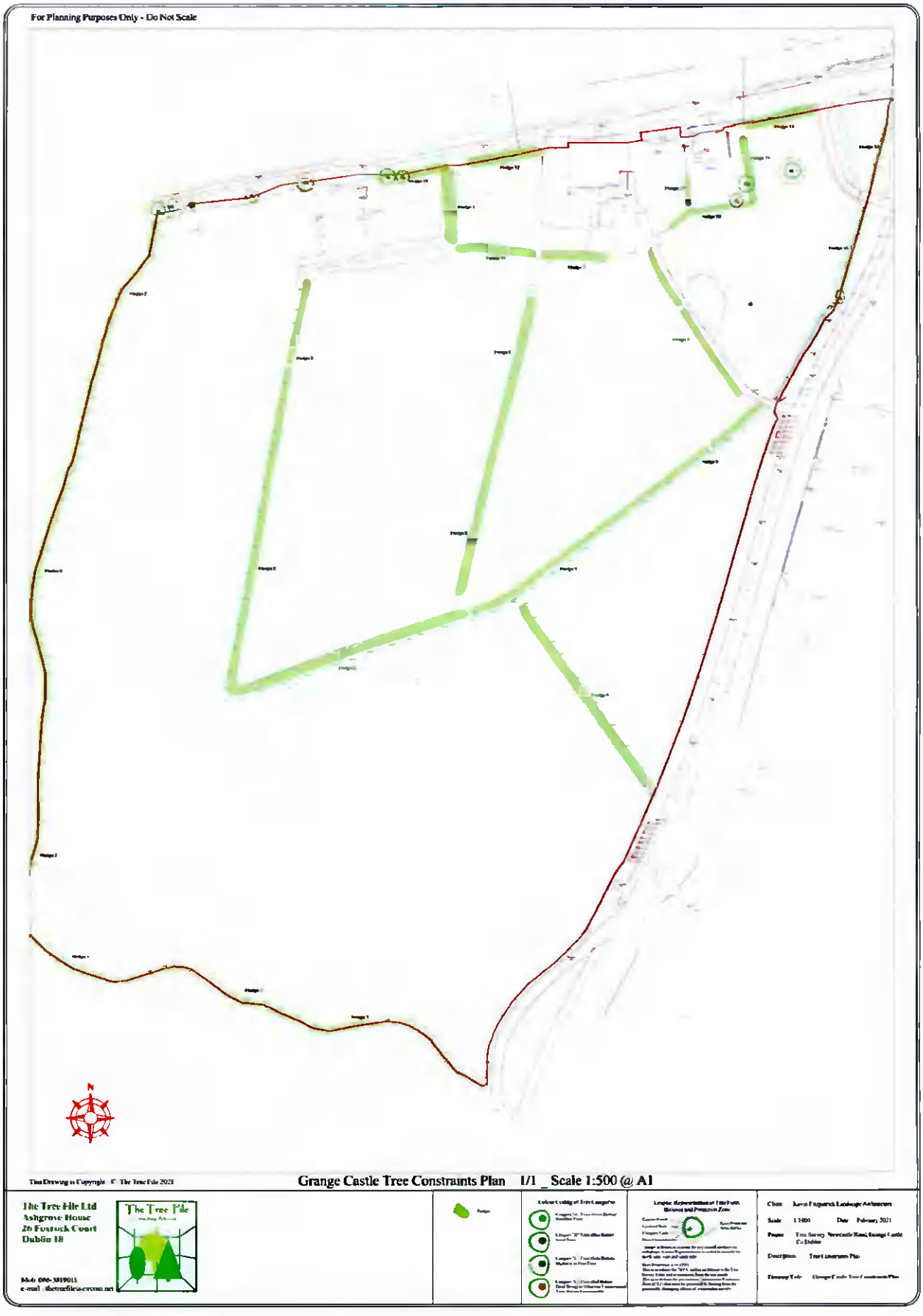
H9	Hedge 9Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Ivy *(Hedera helix)* Bramble *(Rubus fruticosus)* Ash *(Fraxinus excelsior)*	M	F	2.50-5.50	0.00	Spread 3.00-4.00m	m/s	2017	2.48	A broadly continuous hedge associated with a raised embankment on the eastern side of a drainage ditch Some continuity tends to be reasonable though imperfect with the small number of gaps being filled by invasive species such as Elder and Bramble. The alignment supports only a small number of emergent trees typically not exceeding 6.00 m and regarded as being of poor quality being distorted as a result of prior hedge management related decapitation		M	C2
H10	Hedge 10 Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)*	M	F?P	5.00-6.00	0.00	Spread 5.00-6.00m	m/s	2017	2.48	A remnant of an original Thorn based hedge however, at this time for you of the thorns remain with the broader alignment continuity being provided for by emergent elder. In individual terms, most plants are reasonable but overall the hedge alignment is of broadly poor quality. Substantially eroded, the hedge appears to be associated with a shallow ditch and embankment feature		M	C2

H11	Hedge 11 Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)*	M	P	0.00-1.00	0.00	Spread 3.00m	m/s	2017	2.48	A particularly overgrown and effectively defunct hedge comprising a broad corridor of material loosely based around an original Hawthorn alignment. The original alignment appears to be associated with a raised and embankment though this is substantially dilapidated and broadly eroded, particularly considering earthworks having occurred at its northernmost end Additionally, note is also made at circa 30 m of the hedge at its northernmost end has been destroyed by what appears to be recent fire damage		N A	U
H12	Hedge 12 Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)*	M	P	7.00	0.00	Spread 6.00-7.00m	m/s	2017	2.48	A dilapidated section of hedging originally comprising a Thorn hedge but now supporting only an intermittent alignment of plants, some of which have been affected by either ground disturbance or by fire damage. The few remaining Hawthorne's are substantially affected by chronic Ivy cover to the point where there are effectively defunct and unworthy of retention.	Consider early removal	N A	U

H13	Hedge 13 Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Sycamore *(Acer pseudoplatanus)*	M	P	3.0(H)-4.0(W)	11(H)	Spread 5.00	m/s	2017	2.48	Effectively comprises a thicket development only with no evidence remaining of any original Thorn based hedge. The material arises from both sides of an apparent field drainage ditch.		M	C2
H14	Hedge 14 Sycamore *(Acer pseudoplatanus)* Ash *(Fraxinus excelsior)* Hawthorn *(Crataegus monogyna)* Bramble *(Rubus fruticosus)* Elder *(Sambucus nigra)* Ivy *(Hedera helix)*	M	P	1.5(H)-5.0(W)	0(H)	Spread 3.00m	m/s	2017	2.48	A relic an old hedge now substantially disturbed by ongoing earthworks. Original ground contours in vicinity of this hedge have effectively been lost and the few remaining plants are considered unsuitable for retention.	Remove	N/A	U

H15	Hedge 15 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Elder *(Sambucus nigra)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F	2.5(H)-3.0(W)	0(H)	Spread 3.00m	m/s	2017	2.48	A short remnant section of hedging disturbed to its eastern side as result of ongoing roadworks. The hedge appears to be broadly young and in general terms remains continuous however, a notable proportion of the hedge alignment contiguity is provided by spurious invasive plants such as Bramble.	Review regard retention context.	M	C2
H16	Hedge 16 Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Snowberry *(Symphoricarpos Sp.)* Cherry Laurel *(Prunus laurocerasus)*	M	P	4.0(H)-5.0(W)	0(H)	Spread 3.00-4.00m	m/s	2017	2.48	A dilapidated and effectively defunct remnant of an original hedge now best defined by low level thicket development. Is considered Unsuitable for retention.	Remove.	N/A	U

H17	Hedge 17 Elder *(Sambucus nigra)* Cherry Laurel *(Prunus laurocerasus)* Lawson Cypress *(Chamaecyparis lawsoniana)*	M	D	4.50-5.00	0.00	Spread 4.00-6.00m	m/s	207	2.48	Effectively defunct and much material is now dead as a result of fire damage.	Remove	N/A	U
H18	Hedge 18 Sycamore *(Acer pseudoplatanus)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Hawthorn *(Crataegus monogyna)* Ivy *(Hedera helix)*	M	P	2.00-4.00	0.00	Spread 5.00m	m/s	207	2.48	A defunct thicket now dominated by Bramble. Unsuitable for retention.	Remove.	N/A	U
H19	Hedge 19 Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F/P	4.00-6.00	0.00	Spread 4.00-5.00m	m/s	207	2.48	A dilapidated and disturbed remnant of an original hedge now affected by spoil dumping. Ground conditions in vicinity of hedge are substantially disturbed. Very few of the original Hawthorn is remain suggesting limited sustainability.	Consider early removal.	N/A	U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Grange Castle Tree Constraints Plan 1/1 _ Scale 1:500 @ A1
The Tree File Ltd
Ashgrove House
26 Foxrock Court
Dublin 18
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CHAPTER 13 CULTURAL HERITAGE

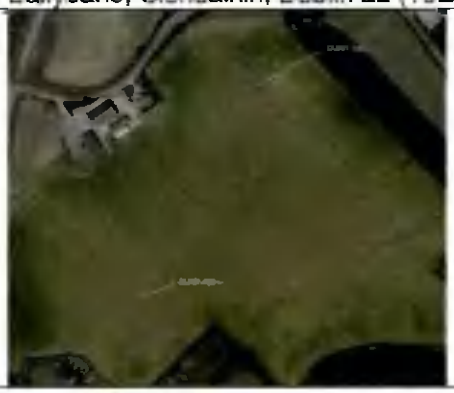
Appendix 13.1 Record of Monuments and Places

The recorded archaeological sites within c. 1km of the development are listed below, all noted in the Record of Monuments and Places for Co. Dublin.

RMP No.	**DU017-029----**
Townland	Adamstown (Newcastle By.)
Site Type	Castle - tower house
NGR	702836, 732705
Description	Located on flat ground between the canal and the railway. A three-storey tower house, which was oblong in plan with a projecting turret and stepped crenellations. Demolished in the 1960s. No visible at ground level (Compiled by: Geraldine Stout, Date of upload: 26 August 2011, Date of last visit: 23 July 1993.
Sources	RMP Healy, P. 1974 Report on Monuments and Sites of Archaeological Interest in County Dublin, p. 22 Ball, F. E. 1906 Parish of Arderrig Part 4, 58-60; Dix, E. R. 1897 The lesser castles of Co. Dublin, in Irish Builder, p. 12.

RMP No.	**DU017-034----**
Townland	Grange (Newcastle By.)
Site Type	Castle - tower house
NGR	703857, 731879
Description	Attached to a farmhouse in flat, low-lying ground. Shown as a castle on the Down Survey (1655-6) map. This is a rectangular tower house with a square tower that's projects to the N in the NE corner. The tower house is three storeys high. The walls are plastered but where stonework is visible it is coursed limestone with roughly dressed quoins. The windows are all later insertions. Entrance is in the N wall through a round-headed doorway. There is a murder hole over the entrance lobby which leads into a vaulted ground floor (int. dims. L 7.08m; Wth.5.2m). Access to stair turret is off the lobby through a round-headed doorway. First floor not accessible. Second floor is accessed through a two-centred arched doorway. There is a garderobe chute in the SE corner which is supported by corbels and entered through a narrow round-headed door to a small circular chamber lit by a single ope. The jambs are hammer-dressed. There is a square stair tower or cap house which rises above parapet level (Healy 1974, 22; Mc Dix 1897, XXXIX, 22). A drawing by Beranger in 1773 shows stepped crenellations at parapet level (Harbison 1998, 168-9). In 1997 monitoring and excavation were undertaken in the vicinity of the castle, in advance of the construction of an access road and the excavation of foul sewers for a Business Park at Grange Castle. A curving ditch was identified orientated north-east/south-west. It was 30m in length, 0.8-0.9m deep, and 1.2-2.4m wide. The upper fills contained charcoal, mortar, flint and animal bones, and were aceramic. A decorated bone comb, stick-pin and knife gave the later ditch phase a terminus ante quem of from the 12th to the 13th century AD. A stone causeway, 0.5-0.6m wide and 0.06-0.1m deep, crossed the ditch. The evidence suggests that extensive early medieval and post-medieval activity survives in this area; the ditches can be interpreted as medieval field boundaries (O'Brien, R. 1998, 26-7). (Compiled by: Geraldine Stout, Date of upload: 26 August 2011, Date of last visit: 03 October 1986)
Sources	RMP Healy, P. 1974 Report on Monuments and Sites of Archaeological Interest in County Dublin, p. 22. Ball, F. E. 1906 Parish of Arderrig Part 4, 65 Dix, E. R. 1897 The lesser castles of Co. Dublin, in Irish Builder, p. 22 Cooper, A. 1780 Down Survey.

RMP No.	DU017-093
Townland	GOLLIERSTOWN
Site Type	Enclosure
NGR	701891, 732600
Description	A rectilinear enclosure visible as crop marks on an aerial photograph (SMR file; pers. comm. Tom Condit, 11 March 2015).
Sources	RMP Google Maps.
Images	

RMP No.	DU021-108
Townland	BALLYBANE
Site Type	Concentric enclosure
NGR	703060, 730985
Description	Not indicated on any OS map a large concentric enclosure is visible as a crop-mark on an aerial photo. A second enclosure (DU021-109----) is visible to the SW. The area of AH1 contains a recorded concentric enclosure (DU021-108). This site contains subsurface remains of a large double ditched enclosure and the morphology of this monument and its associated ditches suggest it is of possible early medieval date. However, 12th to 13th century pottery finds associated with the upper fills of both the internal and external ditch appear to suggest multiple periods of activity. Internal features and deposits within the enclosure are suggestive of settlement evidence. This monument has a diameter of approximately 60m (Stirland 2016, 10).
Sources	RMP Google Maps. Stirland, J. (ACS) 2016 Archaeological testing at Grange Castle South Business Park Ballybane, Clondalkin, Dublin 22 (16E0531).
Images	

RMP No.	DU021-109
Townland	BALLYBANE
Site Type	Enclosure
NGR	702937, 730716
Description	Not indicated on any OS map this enclosure is as a crop-mark on an aerial photo. A second larger enclosure (DU021-108----) is visible to the NE. AH5 – the archaeological test trenching confirmed the presence of a single-ditched circular enclosure (DU021-109), 44m in diameter with the ditch measuring 3m wide and 1.6m deep. The general appearance of this features is suggestive of a possible

the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

All waste arising during the construction phase will be transported off-site by an approved waste contractor holding a current waste collection permit. All waste arising requiring reuse, recycling, recovery or disposal off-site will be brought to facilities holding the appropriate COR, licence or permit, as required.

4.3 PROPOSED WASTE MANAGEMENT OPTIONS

4.3.1 Waste Management Options for Excavated Materials

The Waste Management Hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. Any excavations carried out will be required to facilitate construction works.

In the event that any excavated material is removed off-site for reuse as a by-product (and not as a waste), it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form. However, it is not currently anticipated that any excavated material will be removed offsite for reuse as a by-product. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27.

If any excavated material requires removal from site and is deemed to be a waste, then removal and reuse/recycling/ recovery/disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. The volume of waste removed will dictate whether a COR, permit or licence is required by the receiving waste facility. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the unlikely event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

4.3.2 Waste Management Options for other Construction Wastes

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring reuse, recycling, recovery or disposal off-site will be transferred to a facility holding the appropriate COR, permit or licence, as required.

Mixed C&D waste (classified under the List of Waste code 17 09 04) is permitted for acceptance at a number of waste facilities in the region including Integrated Material Solutions landfill in north Dublin and a number of waste transfer stations.

Written records will be maintained by the contractor detailing the waste arising throughout the construction phase, the classification of each waste type, the contact details and waste collection permit number of all waste contractors who collect waste from the site and the end destination details for all waste removed and disposed offsite.

Dedicated storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc., as required. The containers used for storing hazardous liquids will be appropriately bunded or will be stored on suitably sized spill pallets.

It should be noted that until the main contractor is appointed, it is not possible to provide information on the specific destinations of each waste stream. Prior to commencement construction of the proposed development and removal of any waste off-site, details of the proposed destination of each waste stream will be provided to the local authority. The management of the main construction waste streams are detailed as follows:

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be placed into a dedicated skip and recycled off-site. Clean timber is typically recycled as chipboard.

Metal

Metals will be segregated and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

Plasterboard from the construction phase will be stored in a separate skip, pending collection for recycling. The site manager and project engineers will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical and Electronic Equipment

Waste electrical and electronic equipment (WEEE) will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling off site.

Other Recyclables

Where any other recyclable wastes such as cardboard and soft plastic are generated, these will be segregated at source into dedicated skips and removed offsite.

Non-Recyclable Waste

Construction waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team (see Section 6.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil in the unlikely event that it is encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

4.4 TRACKING AND DOCUMENTATION PROCEDURES FOR OFF-SITE WASTE

All waste will be documented prior to leaving the site. Waste will be weighed by the waste contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the contractor.

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Act 1996* as amended, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority COR, waste permit or EPA Waste/IE Licence for that site will be provided to the nominated project Waste Manager. If the waste is being shipped abroad, a copy of the TFS document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities

in Ireland) and kept on-site along with details of the final destination (permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

If any surplus soil or stone is being removed from the site for reuse on another construction site as a by-product, this will need to be done in accordance with Article 27 of the *EC (Waste Directive) Regulations, 2011*. Similarly, if any soil or stone are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. It is not currently envisaged the Article 27 will be used for this development.

All information will be entered in a waste management recording system to be maintained on site.

5.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is provided below. The total cost of construction waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

5.1 REUSE

By reusing materials on site, there will be a reduction in the transport and offsite recycling/recovery/disposal costs associated with the requirement for a waste contractor to take the material away to landfill.

Clean and inert excavated material which cannot be reused on site may be used as capping material for landfill sites, or for the reinstatement of quarries, etc. as previously discussed. This material is often taken free of charge for such purposes, reducing final waste disposal costs. However, it is not currently anticipated that there will be surplus excavated material.

5.2 RECYCLING

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips. Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will typically charge less to take segregated wastes, such as recyclable waste, from a site than mixed waste streams.

5.3 DISPOSAL

Landfill charges in the Eastern-Midlands region are currently at around €130-150 per tonne (which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a fee for provision and collection of skips.

Collection of segregated construction waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a registered, permitted or

licensed facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill.

6.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the Waste Manager to ensure commitment, operational efficiency and accountability during the construction phase of the project.

6.1 WASTE MANAGER TRAINING AND RESPONSIBILITIES

The nominated Waste Manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid him/her in the organisation, operation and recording of the waste management system implemented on site. The Waste Manager will have overall responsibility to oversee, record and provide feedback to the Project Manager on everyday waste management at the site. Authority will be given to the Waste Manager to delegate responsibility to subcontractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The Waste Manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The Waste Manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D WMP.

6.2 SITE CREW TRAINING

Training of the site crew is the responsibility of the Waste Manager and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

7.0 RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arising's on site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or waste manager with a waste docket (or

WTF for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC/LoW

The waste transfer dockets will be transferred to the site waste manager on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the SDCC Waste Regulation Unit when requested.

Alternatively, each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets/WTF maintained on file and available for inspection on site by the main contractor as required.

A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR/permit/licence for the receiving waste facilities and maintain a copy on file available for inspection on site as required.

8.0 OUTLINE WASTE AUDIT PROCEDURE

8.1 RESPONSIBILITY FOR WASTE AUDIT

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

8.2 REVIEW OF RECORDS AND IDENTIFICATION OF CORRECTIVE ACTIONS

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the project. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery/reuse/recycling targets for the site.

Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.