

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
Array 1	5.0	352.0	49,122	0	-
Array 2	5.0	172.0	3,348	0	-
Array 3	4.0	248.0	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
10L Runway	12868	0
10 Runway	21805	0
16 Runway	9173	0
28R Runway	1809	0
28 Runway	1597	0
34 Runway	3729	0
1-ATCT	678	0
2-ATCT	811	0

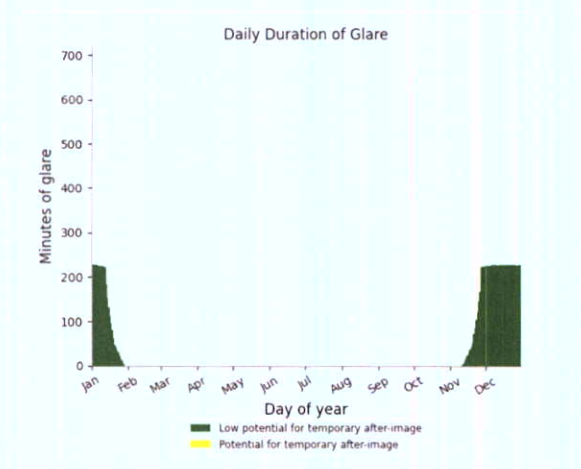
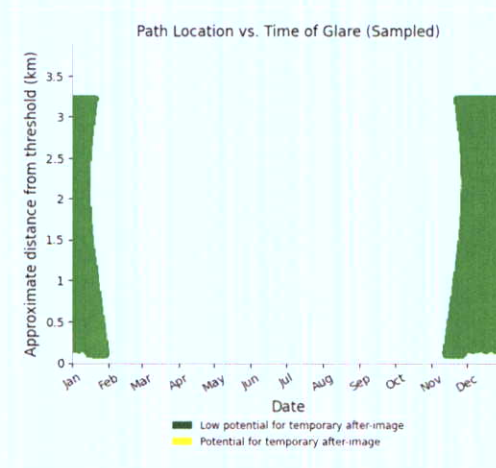
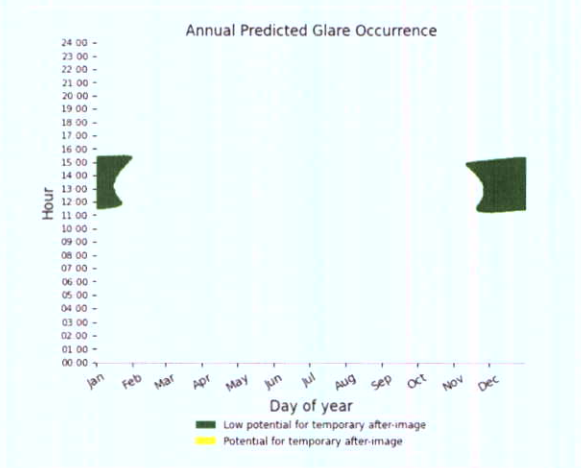
Results for: Array 1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	12868	0
10 Runway	21805	0
16 Runway	9173	0
28R Runway	1807	0
28 Runway	1000	0
34 Runway	980	0
1-ATCT	678	0
2-ATCT	811	0

Flight Path: 10L Runway

0 minutes of yellow glare

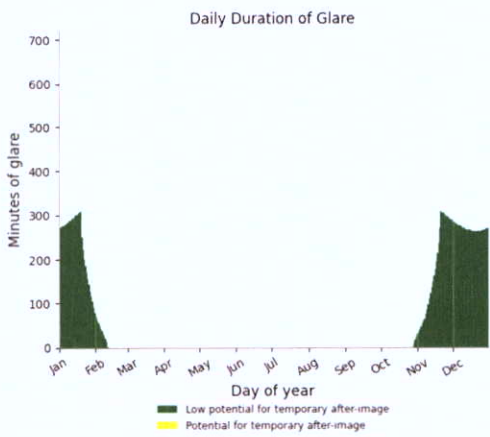
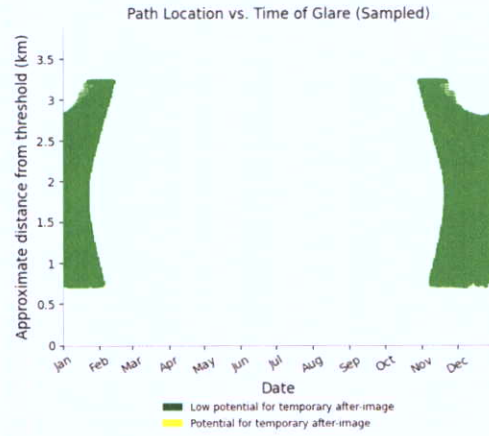
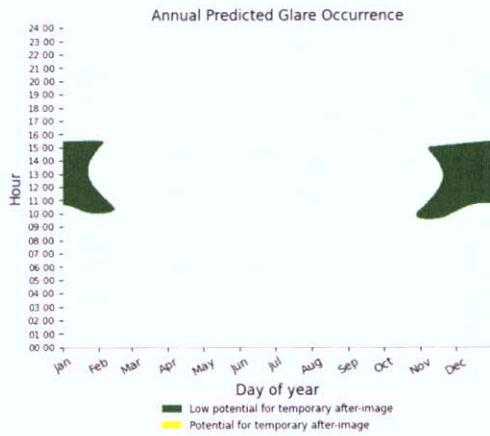
12868 minutes of green glare



Flight Path: 10 Runway

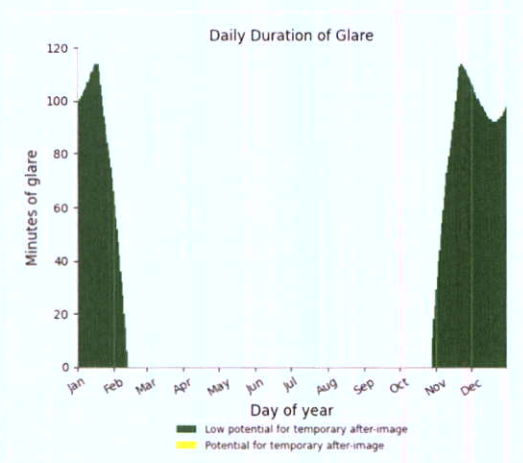
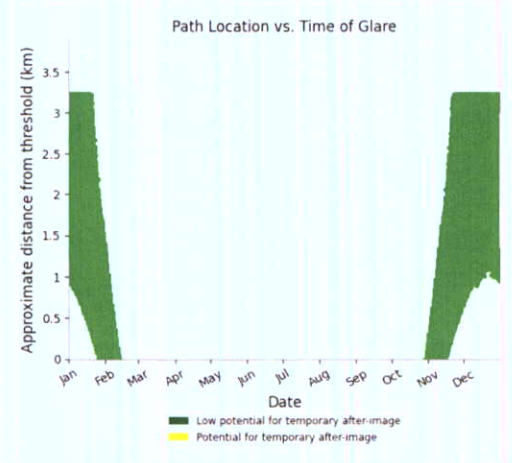
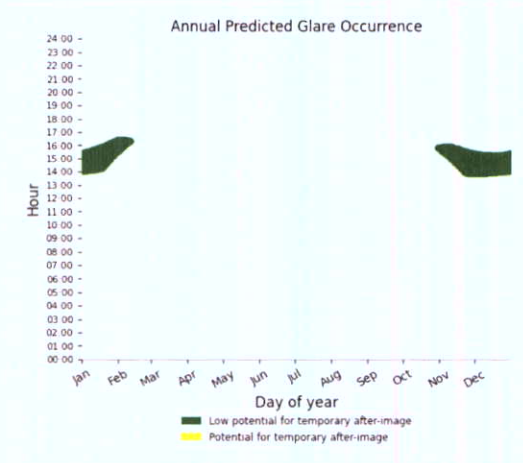
0 minutes of yellow glare

21805 minutes of green glare



Flight Path: 16 Runway

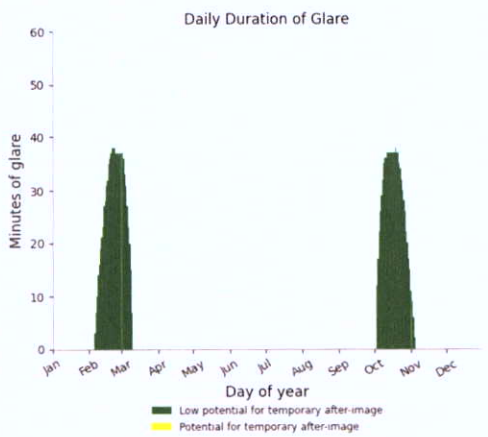
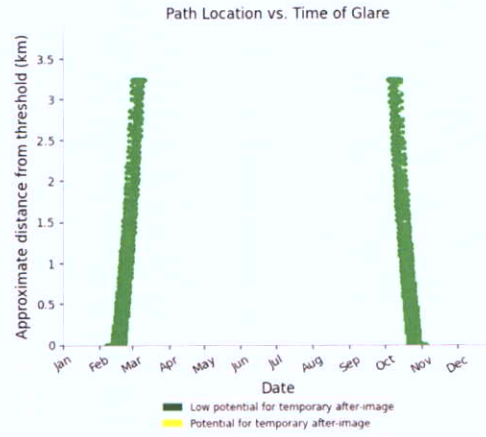
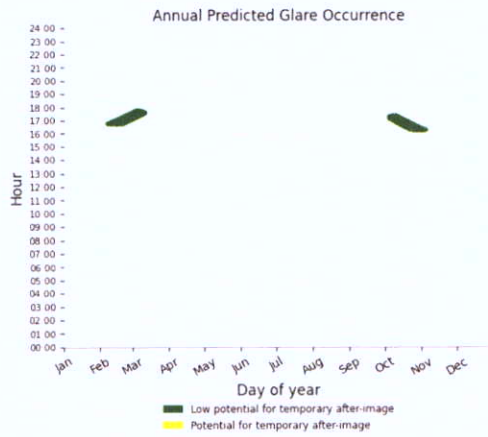
0 minutes of yellow glare
 9173 minutes of green glare



Flight Path: 28R Runway

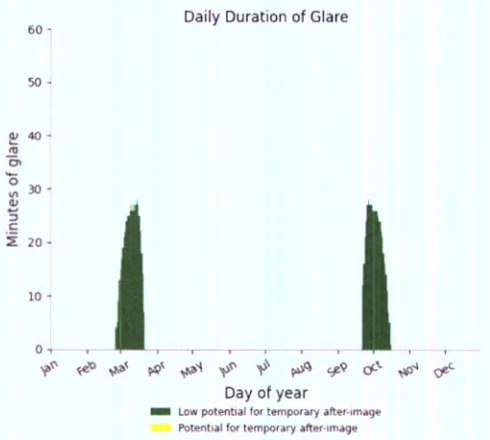
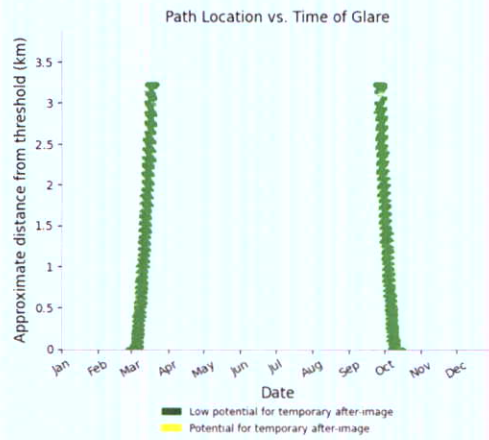
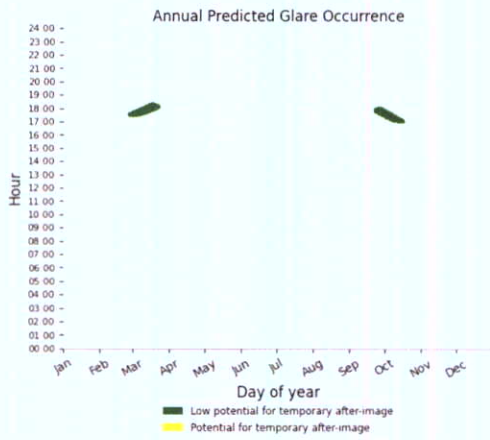
0 minutes of yellow glare

1807 minutes of green glare



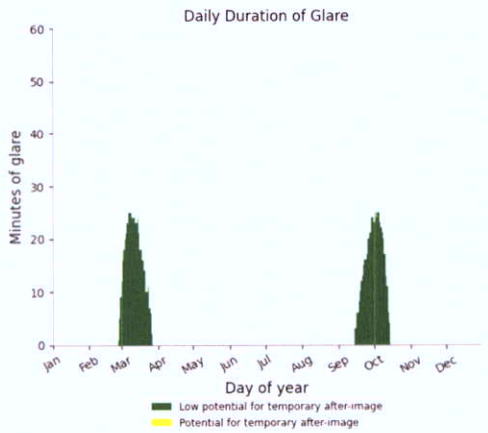
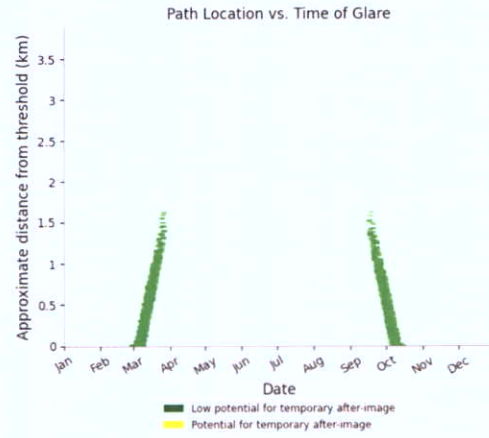
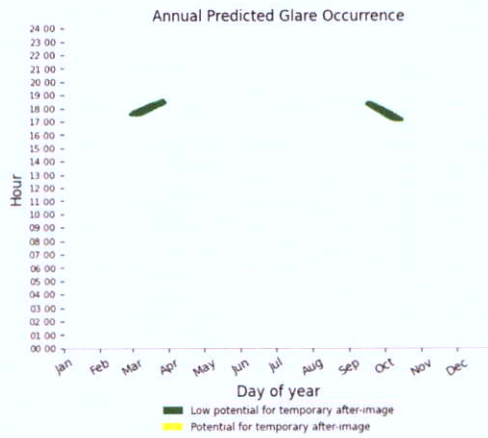
Flight Path: 28 Runway

0 minutes of yellow glare
 1000 minutes of green glare



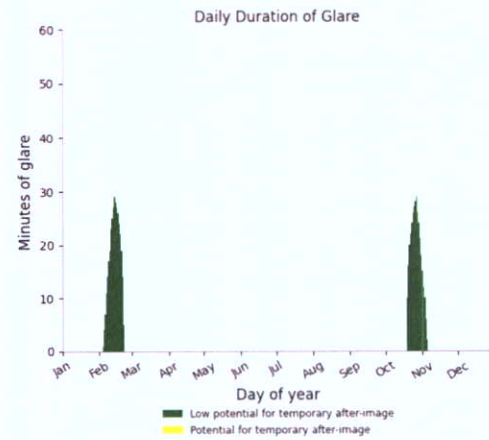
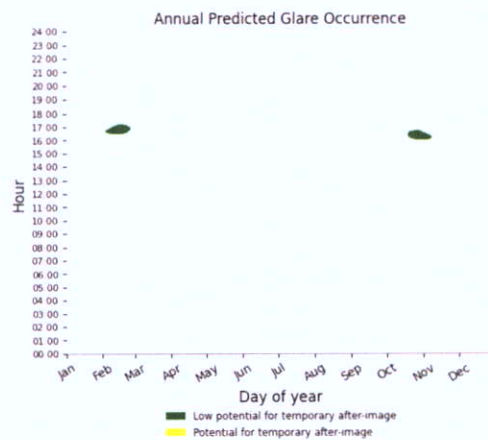
Flight Path: 34 Runway

0 minutes of yellow glare
980 minutes of green glare



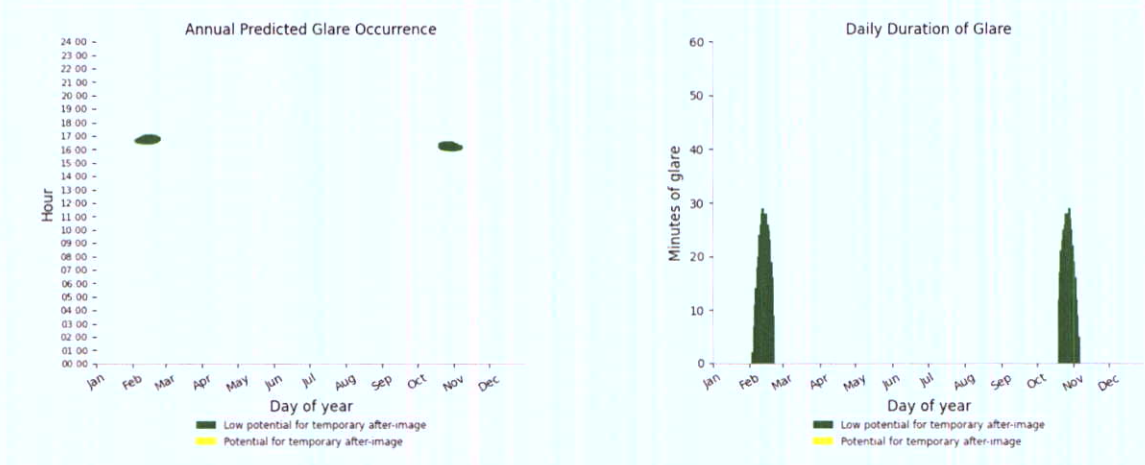
Point Receptor: 1-ATCT

0 minutes of yellow glare
678 minutes of green glare



Point Receptor: 2-ATCT

0 minutes of yellow glare
 811 minutes of green glare



Results for: Array 2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	2	0
28 Runway	597	0
34 Runway	2749	0
1-ATCT	0	0
2-ATCT	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
 0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
 0 minutes of green glare

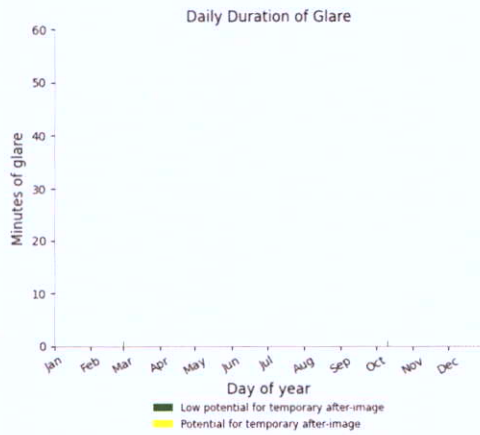
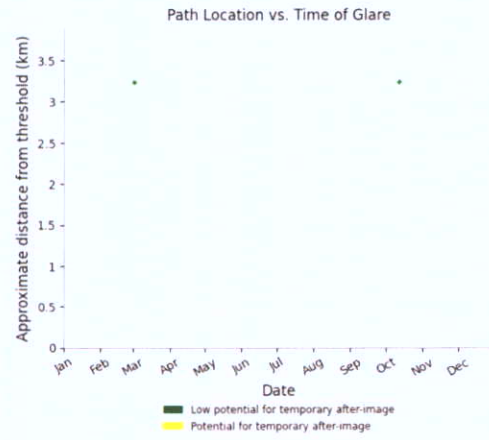
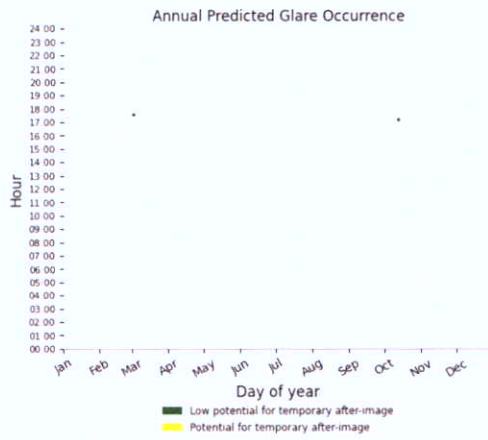
Flight Path: 16 Runway

0 minutes of yellow glare
 0 minutes of green glare

Flight Path: 28R Runway

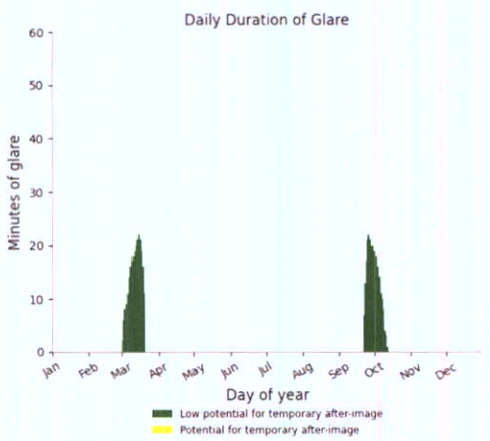
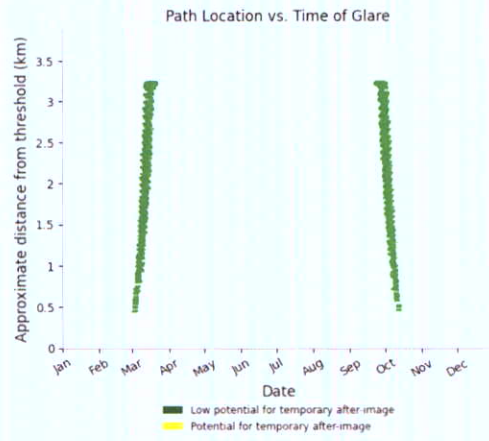
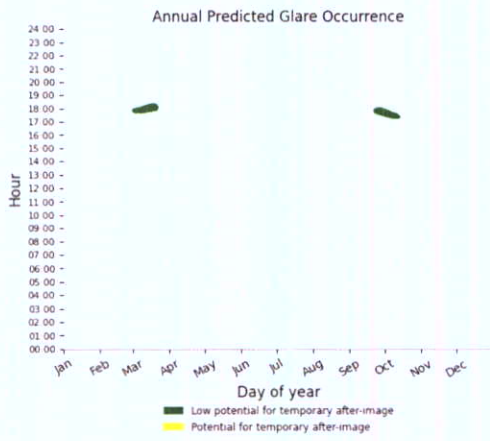
0 minutes of yellow glare

2 minutes of green glare



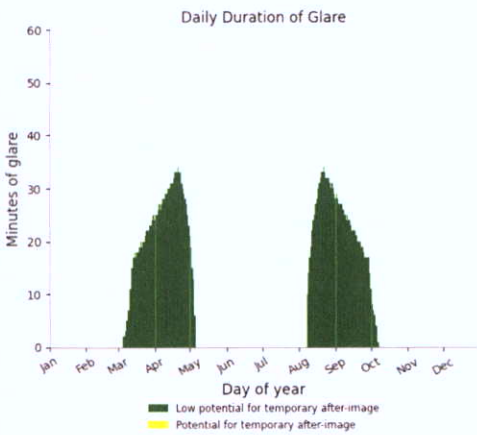
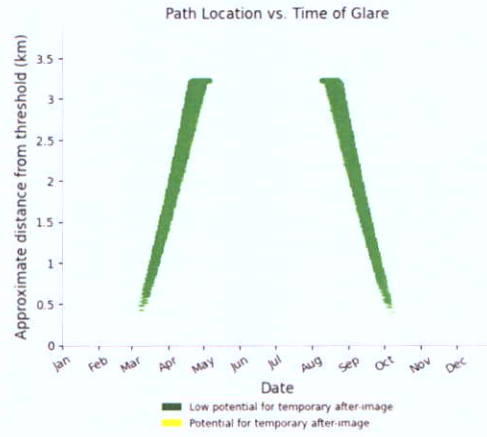
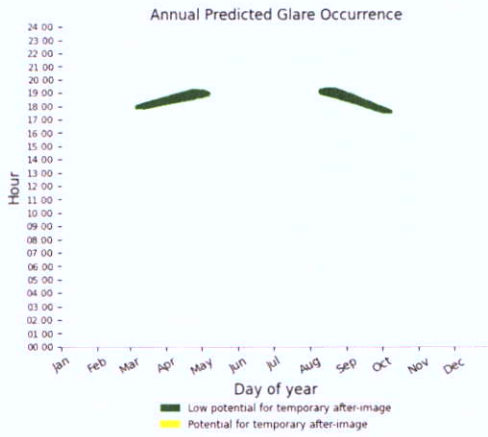
Flight Path: 28 Runway

0 minutes of yellow glare
 597 minutes of green glare



Flight Path: 34 Runway

0 minutes of yellow glare
 2749 minutes of green glare



Point Receptor: 1-ATCT

0 minutes of yellow glare
 0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
 0 minutes of green glare

Results for: Array 3

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 34 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare

0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.

Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.

Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.

The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size.

Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)

Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.

The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Refer to the Help page at www.forgesolar.com/help/ for assumptions and limitations not listed here.

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APPENDIX 11.1

LANDSCAPE



LANDSCAPE MANAGEMENT AND MAINTENANCE PLAN

Huntstown Circular Economy Hub – Phase One

prepared on behalf of

Rathdrinagh Land Limited

April 2023 / Project No.7670

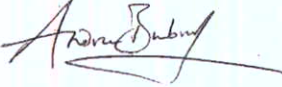
Project Title: **Huntstown Circular Economy Hub Phase One**

Document Title: **Landscape Management and Maintenance Plan**

Client Name:	Rathdrinagh Land Limited
Document Reference:	7670/HCEH1/LMMP/AB
Project Number:	7670

Quality Assurance

Approval Status in accordance with Park Hood’s IMS (ISO 14001:2015, ISO 9001:2015 and ISO 45001:2018 & SSIP).

Issue	Date	Report Prepared by	Planting and Landscape Management Advice
<i>Draft</i>	<i>21-01-2023</i>	<i>Oisín Crossan</i>	<i>Tom Kaiser</i>
<i>Reviewed</i>	<i>30-01-2023</i>	<i>Andrew Bunbury CLMI Landscape Architect and Director; Park Hood</i>	
<i>Planning Issue</i>	<i>03-04-2023</i>		

Disclaimer

All feasible and reasonable attempts have been made to ensure that the information provided by a range of public sector institutions and presented in this report is accurate and up-to-date. Park Hood is not responsible for accidental perpetuation of inaccuracies in these records and any consequent effect on the conclusions in this report.

This report has been prepared by Park Hood with all reasonable skill, care and diligence within the General Terms and Conditions of the Contract with the client.

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- 2 Site Information and Introduction
- 3 Landscape Softworks – Establishment Maintenance
- 4 Landscape Softworks – Long term Management
- 5 Landscape Hardworks – Long term Management
- 6 Conclusions
- 7 Appendices

Notes

This document is to be read in conjunction with the following drawings and documents:

- Drawing No. 7670-L-1000 Landscape Masterplan
- Drawing No. 7670-L-1001 Landscape Proposals – Phase One

1.0 INTRODUCTION

Purpose and Scope

- 1.1 The Landscape Management and Maintenance Plan has been prepared with regard to the *Fingal County Development Plan 2023 to 2029* which is the relevant plan covering the subject site. The plan is part of a standard requirement for the planning application process and relates to the management proposals for external landscape areas which are part of this proposed development.
- 1.2 The proposed development is Phase 1 of the proposed 9.56 ha Huntstown Circular Economy Hub. It comprises a Materials Recovery Facility, a Food Container Cleaning Plant and ancillaries.
- 1.3 The Plan shall be taken to include this document and any supporting plans, reports and specifications approved as for this proposed Materials Recovery Facility. This includes any documentation containing quantitative and qualitative information about the external areas of the site that will be useful to those responsible for managing and maintaining them. Phase 1 comprises the MRF (5,302m²), Food Container Cleaning Plant (5,302m²), two Storage Buildings, paved open yards, weighbridge, car and bicycling parking areas, surface and foul water drainage systems, landscaping.
- 1.4 The Management Plan sets out the management aims and objectives for the site along with the specific management objectives for each landscape component, and the associated maintenance works required on an Annual and Occasional basis. Annual Works are those works that will be required every year, such as watering, weeding and cleaning. Occasional Works are those that will be required on an irregular or cyclical basis, such as repairs and renewals.

Contract Requirements

- 1.5 The company undertaking any part of the works:
 - must adhere to all local government legislations and regulations concerning their respective industry;
 - must adhere to all local government legislations and regulations concerning health and safety; and
 - must be a member of the local statutory body representing and regulating their respective industry.
- 1.6 Any personnel working on site:
 - must be supervised by an appointed senior member of staff;
 - must be suitable trained in their respective task;
 - must hold the necessary government approved certificates if required (i.e., use of chemicals, machinery etc.)
- 1.7 Any hazardous material:

- has to be correctly labelled, stored and used as per the concerning local government regulations;
- shall only be used by a supervised, trained, certified (if applicable) and appointed member of staff; and
- must be approved for use by a representative of the owner.

Health & Safety

- 1.8 Management of all areas will be undertaken in accordance with current Health and Safety regulations and Safety, Health and Welfare at Work Acts 2005 and 2010. This will include the Safe System of Work Plan (SSWP) which complements the Safety Statement required under the Safety, Health and Welfare at Work Act.
- 1.9 This will include staff must undergoing a site health and safety induction course regarding the site-specific issues and submission of a Health and Safety Plan prior to commencement of any works.

2.0 SITE INFORMATION AND INTRODUCTION

Table 1 General Site Information

Site Location	Lands in the townlands of Huntstown and Coldwinters
Council Authority	Fingal County Council
Client	Rathdrinagh Land Limited t/a Irish Recycling Limited
Nature of Development	Phase 1 of the proposed 9.56 ha Huntstown Circular Economy Hub. It comprises a Materials Recovery Facility, a Food Container Cleaning Plant and ancillaries.

Table 2 Landscape Works and Types Summary

<p><i>Summary description of external Landscape treatments, areas and components</i></p>	<p>Soft Landscape Areas include the following elements:</p> <ul style="list-style-type: none"> • (Management of) existing trees and hedgerows; • Grass Seeding; • Groundcover and shrub planting; • Tree and woodland planting; • Buffer Planting; and • Hedgerow planting <p>Hard Landscape Areas include the following elements:</p> <ul style="list-style-type: none"> • Footpaths / hard landscape treatments; • Roads; • Walls and Copings; and • Gates, railings and fencing.
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Management Plan Objectives

- 2.1 The aim of the Management Plan is to coordinate a high standard for maintenance and management of landscape elements across the site to ensure successful visual integration of the development proposal into the surroundings and to protect and enhance nature conservation interests in accordance with the design objectives in the approved planning documents. This includes the appropriate maintenance of existing retained and proposed landscape components within an easily maintained comprehensive landscape framework that can provide (where possible) a diversity of landscape experiences.

2.2 The objectives are summarised as follows:

- To ensure a high standard of sustainable management of all landscape areas in a neat, tidy and substantially weed free condition;
- To ensure that all seeded areas are established and maintained in a condition that contributes to the visual amenity of the MRF site and local area;
- To establish and maintain tree and shrub planting to provide an overall landscape framework and landscape character;
- To maintain and enhance biodiversity and fulfil all legal requirements in relation to the protection and management of ecological features and the protection and management of protected species.
- To ensure health and safety to minimise risk of injury and damage to people and property;
- To provide a mechanism or monitoring and review with practices reviewed on an annual basis in accordance with changing site circumstances and the views of key stakeholders.

2.3 There will be a five-year guarantee after construction that all the proposed planting works still exist and is established in line with landscape design expectations. This is to ensure that no planting has been removed or damaged due to the subsequent construction or plant failure.

2.4 If removal of any tree is necessary, agreement shall be reached with the Council as to replacement with matching or appropriate species in the next planting season.

Landscape Maintenance Specifications and Drawings

2.5 Landscape works to be undertaken by an ALCI approved landscape contractor and in accordance with BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces). The general landscape proposals are indicated on Drawing No. 7670-L-1000 Landscape Masterplan and 7670-L-1001 Landscape Proposals.

2.6 When using pesticides, the Contractor must use a certified operator and take appropriate safety precautions in accordance with the European Communities (Sustainable Use of Pesticides) and Sustainable Use Directive (SUD) Regulations and the Irish National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products) Feb 2019 .

2.7 Plant supply shall be obtained from a nursery that are members of the Horticultural Trades Association Nursery Certification Scheme and approved by the project and local authority landscape architect.

2.8 All planting stock shall be of local provenance or if unavailable national provenance. Origin and provenance have the meaning given in the National Plant Specification and grown in Ireland corresponding to the lists provided in the All-Ireland Pollinator Plan 2015-2020.

Ground Preparation

2.9 Prior to cultivation, planted areas shall be cleared of all loose debris, rubbish, stones over 25mm in diameter, roots, and other extraneous matter. Grass and weeds shall be sprayed with 'Glyphosate' or

similar *SUP / SUD* approved herbicide.

2.10 Topsoil Depths: spread over prepared subsoil in layers not exceeding 150 mm, each layer firmed before spreading the next. Top Soils shall comply with multipurpose grade within *BS 3882:2015: Specification for Top Soil*. Overall minimum depths after firming and settlement to be:-

- Shrub / Hedgerow areas 500 mm
- Lawn and Grass areas 150mm

2.11 Planted areas to be cultivated to a depth of 300mm by hand or rotovator, incorporating planting compost, soil improver and fertilizer base dressing of the types. The topsoil shall have been reduced to a fine tilth on completion of the cultivation works.

Timetable for Landscape Works

2.12 The landscape works shall be undertaken by the end of the next available planting season and during the following periods:

- Deciduous trees and shrubs: Late October to late March;
- Conifers and evergreens: September/ October or April/ May; and
- Container grown plants: At any time if ground and weather conditions are favourable.

Proposed Standard Tree Planting

2.13 Tree supply and planting shall correspond to *BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations*. Planting of trees shall be undertaken in favourable weather conditions between October 31st to March 31st.

2.14 Tree pits shall be excavated to suitable dimensions to accommodate roots or root-balls or baskets with bases and sides broken up to a minimum depth of 150mm to assist drainage and root penetration. Any unsuitable material such as large clay lumps, bricks, concrete, timber and sand shall be removed off-site. All tree pits shall be backfilled, after planting, with a 3:1 volume mixture of topsoil and mulching compost/manure or similar approved.

2.15 The planted trees shall be full and well-shaped with crowns thinned by 30% according to good horticultural practice and in a manner that does not affect the overall stature, structure or good appearance of the tree. All work shall conform to a minimum standard as set out in *BS 4043:1989 Recommendations for transplanting root-balled trees*.

Proposed Woodland Belts

2.16 Trees supply and planting shall correspond to *BS 8545: 2014 Trees: from nursery to independence in the landscape - Recommendations*. Planting of trees shall be undertaken in favourable weather conditions between October 31st to March 31st.

2.17 Transplants shall be of the size stated in the schedules and conform to *BS 3936 - Part 1: Nursery stock specification for trees and shrubs*. Planting pockets 400x400x300mm deep with cultivated and evenly incorporated: organic manure 100mm layer over area of pit, fertiliser 35g at 2.0m centres.

Proposed Shrub and Groundcover Planting

- 2.18 Shrub plants to be planted at 2 to 3 plants per m² to linear strip to base of bank. Transplants and container grown shrubs shall be of the size stated and conform to *BS 3936 - Part 1: Nursery stock specification for trees and shrubs*.
- 2.19 Planting pockets 400x400x300mm deep with cultivated and evenly incorporated: organic manure 100mm layer over area of pit, fertiliser 35g. 75mm depth bark mulch dressing on completion of planting.

Hedgerow Planting

- 2.20 Hedgerow plants to be planted at 4 per linear meter (in double staggered row at 500mm centres) to top of bank. Transplants shall be of the size stated, shall conform to *BS 3936 - Part 1: Nursery stock specification for trees and shrubs*.
- 2.21 Planting pockets 400x400x300mm deep with cultivated and evenly incorporated: organic manure 100mm layer over area of pit, fertiliser 35g. 50mm depth bark mulch dressing on completion of planting.

Grass Seeding

- 2.22 To be undertake with a grass seed suitable for general amenity areas. Sowing rate 35g per m².

Performance Criteria

- 2.23 Performance criteria are indicators for assessing the quality and success of the particular plant mixtures used for a purpose i.e., screen planting, seeding, tree planting etc. Such indicators will be based upon aspects such as:-
- Health and condition of planting;
 - Plant growth; and
 - Achievement of desired visual effect.

Existing Trees and Boundary Hedgerows

- 2.24 There are existing hedgerows to be retained and protected (in accordance with the recommendations included in BS 5837: 2012). This covers:-
- The provision of adequate fencing around trees to prevent harmful encroachment / damage by vehicles or storage of materials during construction;
 - The avoidance of any reduction in levels in the root protection area of individual trees; and
 - Inspect for disease, dead wood or storm damage and, if necessary, treat or carry out tree surgery accordingly (using advice of qualified tree surgeon if necessary).

Protection Measures during Construction Works – Generally

- 2.25 A protective barrier, 2.3m high and comprising a vertical and horizontal framework of scaffolding, well braced to resist impacts and securely supporting weldmesh panels, (as illustrated in Figs 2 & 3 of

BS5837:2012) shall be erected around the base of all trees to be retained on site. No construction traffic, materials or debris will be permitted within this zone of protection.

Protection Measures – Post Construction

- 2.26 The management company will be responsible for the maintenance and upkeep of trees within the property boundary. Protected trees should be visually reviewed annually by the managing company and subject of regular ongoing health and condition inspections undertaken at 5-year intervals.

3.0 LANDSCAPE SOFTWORKS – ESTABLISHMENT MAINTENANCE

General Introduction

- 3.1 Establishment maintenance will form part of the landscape contractors works. The period of establishment maintenance will be 12 months after the completion of the planting and grassing works prior to handover.
- 3.2 Prior to handing over, all plants deaths shall be replaced, and all defects made good to the satisfaction of the landscape architect and/or the management company.

Establishment Maintenance Operations – Grass Areas

- 3.3 The developer and contractor shall be responsible for maintaining all grassed areas in a neat and tidy, weed free and litter free condition, throughout the complete growing season, or when the landscape works are completed, whichever is the later.

Works required prior to First Cut

- 3.4 When the new sward has reached a height of 50mm the contractor shall remove all loose debris, stones and rubbish above 25mm in any direction prior to cutting. Following the surface clearance and prior to cutting the contractor shall lightly roll all newly grassed areas with a smooth and even weight.

First Cut

- 3.5 All new grass sward shall be given first cut at least two days after rolling. The first cut shall leave not less than 35mm height.

Subsequent and Management

- 3.6 Grass shall be cut regularly (a total of 12-16 times during the growth season) to a length consistent with the season and quality of growth. The normal establishment of cut shall be 25mm. All arisings shall be removed if the height of the grass exceeds 100mm prior to cutting.
- 3.7 All established grass areas shall receive an application of an approved top dressing (N:P:K) (20:10:10) at the rate of 15g/M² as directed by the site management or landscape architect.
- 3.8 Any areas of settlement or local depressions shall be made up and re-sown by the contractor at his own expense.
- 3.9 The edges of seeded areas, adjacent to shrub beds and margins are to be carefully trimmed square and to a true line. The contractor should note that this also applies to the area around the base of trees planted in grass areas.
- 3.10 All areas of failed grass shall be reinstated using the seed mix as specified within the landscape contract, with ground cultivation prior to seeding meeting the same requirements.
- 3.11 All new grass areas shall be handed over as complete, well established sward at the end of the establishment maintenance period.

Establishment Maintenance Operations – Planting operations

- 3.12 Weed Control: All planted areas shall be kept entirely weed free throughout the establishment maintenance period, using approved residual and translocated herbicides, or mechanical means, or a combination of both.
- 3.13 Wind Firming: All plants shall be inspected at monthly intervals for wind firmness, and re-firmed as necessary.
- 3.14 Stakes & Tree Ties Checking: Stakes shall be checked monthly for firmness, and re-firmed as necessary, and all tree and plant ties inspected and loosened as required.
- 3.15 Pruning: Shall be carried out on a monthly basis, and will include the removal of minor dead wood or damaged wood. Formative pruning shall be undertaken at the appropriate time of the year for the species involved in order to enhance the plants best feature e.g., flowering, stem colour etc.
- 3.16 Inorganic Fertilizer: All shrub-planting areas shall receive a fertilizer top dressing in July of ‘Osmocote’ slow-release fertilizer (N:P:K) (18:11:10) to be lightly raked in.
- 3.17 Watering: All plants shall be watered as required during the establishment maintenance period to ensure survival of all plant material. Suggested water requirements for tree irrigation are as per following **Table 3 Watering Requirements** below.

	Feathered	Light Standard	Standard	Heavy Standard	Extra Heavy Standard	Semi-Mature
Girth (cm)	6	6-8	8-10	10-12	12-14	14-16
Height (m)	1.8-3.0	2.4-2.7	2.7-3.0	3.0-3.6	3.6-4.2	4.2-4.8
Estimated daily* transpiration rate (litres)	1	1	1.2	2	3	4
Suggested first season summer watering requirements (litres per month)	36	36	45	75	115	150

*Calculations for transpiration and suggested watering requirements are based on a typical Plane Tree in a tree pit ameliorate with 25% peat and with a 50mm mulch layer. The figures are approximate and are for guidance only. Allow an extra day for every 10mm of rainfall.

- 3.18 Litter Removal: Litter that may have accumulated in grass and planted areas must be lifted and removed from the site each month.
- 3.19 Failed Planting Areas: Prior to the end of the establishment maintenance period, the contractor will receive from the landscape architect a list of plant material that must be replaced by the contractor. Any plant material which has failed to establish, or has died, throughout this period must be replaced with healthy plant stock of similar specification at the contractors own expense. Successfully established plant material shall be those plants showing positive signs of growth i.e., shoot extension and growth over time. Breaking into leaf is not to be taken as evidence of successful establishment.
- 3.20 Handover of Planted Areas: All newly planted areas shall be handed over as complete and well established at the end of the establishment maintenance period.

4.0 LANDSCAPE SOFTWORKS – LONG TERM MANAGEMENT

Grass Areas

- 4.1 Performance Criteria: Grassed areas shall have good grass cover without obvious bare patches.
- 4.2 Maintenance Objectives: To establish and maintain an even cover of grass sward.

Maintenance Operations Years 1 – 20

- Grass Cutting: All grassed areas will be maintained between 20 – 40mm in height during April to August inclusive and between 30 – 50mm at all other times;
- Frequency of cuts may be up to 20 cuts per annum, dependent on the length of the growing season and weather, with the majority undertaken during the spring and summer months. Clippings may be let fly, but all adjacent hard surfaces shall be swept clean after cutting with all clippings removed to contractors tip;
- Grass Verges & Edges: All edges to grassed areas against buildings, footpaths, roadways, trees and any other obstruction shall be kept neat and tidy. Border edges shall be clipped and not exceed 50mm length at any time;
- Weeding: Spot weeding of isolated areas of weed infestation may be undertaken using an approved selective herbicide; and
- Reinstatement of failed areas: All areas of failed grass shall be reinstated using the seed mix as specified within the original landscape contract, with ground cultivation prior to seeding meeting the same requirements.

Groundcover and Shrub Planting Areas

- 4.3 Performance Criteria: By year 5 all ground cover planting shall have achieved closed canopy and shall have been thinned and pruned.
- 4.4 Maintenance Objectives: To establish and maintain a weed free cover of healthy growth, clipped or pruned as necessary to give a neat and tidy finish contained within the planted area.

Maintenance Operations Years 1 – 3

- Monthly inspection for wind firming and watering to establish good growth;
- Annual application of an approved fertilizer in July of 17:17:17, N:P:K at a rate of 30g/M²; and
- Remove and replace all dead, dying and diseased or vandalized plant material, replacements to be as originally specified within the main landscape contract or as agreed with Management Company.

Maintenance Operations Years 3 – 5

- Annual application of an approved residual herbicide in the winter months, with removal or spot treatment with an approved translocated herbicide during the main growing season;

- In the appropriate season for the species involved, prune and tidy the plants removing dead, dying or diseased plant material;
- Selectively thin plants that are restricting the natural and attractive development of their neighbours; and
- Remove all arising from site.

Maintenance Operations Years 5 – 20

Operations to include the above, plus:

- Bi – annually prune and tidy the plants removing all dead, dying or diseased plant material from the site; and
- Replace as necessary all shrubs that are not contributing satisfactorily to overall objectives of the landscape management plan. Replacements shall be approved with the supervising officer.

Hedgerows

- 4.5 Performance Criteria: All hedges shall have a complete canopy and be managed to form a continuous impenetrable thicket to the desired height by year 5.

Maintenance Operations Years 1 – 3

- Monthly inspection for wind firming and watering as required ensuring establishment and survival of plant material;
- Pruning shall be directed at maintaining true and even levels as necessary during the growing season, with all arisings removed from site;
- The first cut can commence when all danger of frost has receded. When cutting avoid strong sunlight, best carried out on a dull and wet day;
- The last cut shall commence no later than 4 weeks before the first frost. Annual application of an approved fertilizer in July of 17:17:17, N:P:K at a rate of 30g/M²;
- Maintain the planted area weed free by applying an annual dressing of an approved residual herbicide in the winter months and spot treatment with an approval translocated herbicide during the growing season; and
- Remove and replace all dead, dying, diseased or damaged plant material, replacements to be as originally specified within the main landscape contract, or as agreed with management company representative.

Maintenance Operations Years 3-20

Operations to include the above, plus:

- Maintain top and side of hedges in a rectangular profile using suitable, approved mechanical methods, to true and even levels. Remove any cuttings lodged in the surface of the hedge and rake up and remove all arisings; and

- Maintain weeds or grass growth at the base of the hedge to a maximum height of 100mm by regular hand cutting or by application of an approved residual herbicide.

Woodland Belts

- 4.6 Performance Criteria: By year 7, shrub planting will have achieved closed canopy and have been thinned and pruned; and
- 4.7 Maintenance Operations: To establish and maintain a wooded landscape, allowing plants to achieve natural form whilst avoiding obstruction to footways and windows.

Maintenance Operations Years 1 – 3

- Hand hoe all planted areas fortnightly during the main growing season in order to maintain a substantially weed free soil surface. This can be reduced to monthly out with the main growing season;
- Monthly inspection for wind firming and watering to establish good growth;
- Annual application of an approved fertilizer in July of 17:17:17, N:P:K at a rate of 30g/M2;
- In the appropriate season for the species involved, prune and tidy the plants removing dead, dying or diseased plant material, and to develop the desired characteristics;
- Remove intermediate plants that restrict the natural and attractive development of their neighbours;
- Remove and replace all dead, dying, diseased or damaged plant material, replacements to be as originally specified within the main landscape contract or as agreed with the supervising officer; and
- Remove all arising from site.

Maintenance Operations Years 3 – 10

Operations to include the above, plus:

- Maintain woodland substantially weed free by applying an annual application of an approved residual herbicide in the winter months, with removal or spot treatment with an approved translocated herbicide during the main growing season.

Maintenance Operations Years 10 – 20

Operations to include the above, plus:

- Prune trees as necessary, in appropriate season to achieve their desirable screening or wooded effect and to prevent them from overgrowing footways or blocking light from windows;
- Replace as necessary all trees and scrub that are not contributing satisfactorily to the overall objectives of the landscape management plan.

Standard Tree Planting

- 4.8 Performance Criteria: To provide a healthy growing tree that contributes to the overall aesthetics of the landscape.
- 4.9 Maintenance Objectives: To ensure establishment and maintenance of trees with a well-shaped habit.

Maintenance Operations Years 1 – 3

- Monthly inspection for wind firming and watering as required ensuring establishment and survival of plant material (fortnightly during dry spells);
- Bi-monthly tree tie check to ensure that the trees are not being strangled by support. Loosening of trees ties as necessary;
- Maintain a 1m diameter area of weed free soil around the base of each tree by hand. This to be carried out monthly during the main growing season and bi-monthly thereafter;
- Annual application of an approved fertilizer in July of 17:17:17, N:P:K at a rate of 60g/tree;
- Remove and replace all dead, dying, diseased or damaged plant material, replacements to be as originally specified within the main landscape contract, or as agreed with the supervising officer;
- Prune the trees to remove any dead, dying or diseased shoots and limbs to create a balanced form for future growth, remove; and
- Tree Guards and Grilles: Where supplied and fitted, tree guards (mild steel and 'Weldmesh') are to be inspected, re-fixed or replaced as necessary to original specification and to prevent chaffing of tree.

Maintenance Operations Years 3-5

Operations to include the above, plus:

- Removal of tree stakes, tree ties and tree guards as necessary, as trees become wind firm and established to prevent strangulation of tree.

Maintenance Operations Years 5-20

Operations to include the above, plus:

- Some selective thinning of tree groups may be required during this period, at years 10 and 20;
- Visibility Splays: Any vegetation other than grass on visibility splays or road sight lines will be kept to below 600mm above channel lines on road. In addition, the visibility splay will be kept free of all structures or vegetation other than that approved in the planning consent.

Watering

- 4.10 In any period of extended drought ensure survival of all plants, for recommended water requirements refer to Table 3 for guidance.

Existing Trees

4.11 Management Objectives:

- To maintain the trees in as healthy and attractive condition for as long as possible;
- To ensure continuity in tree cover and their contribution to the landscape structure, biodiversity, and screening/amenity value of the site;
- To ensure that trees are healthy and safe, particularly in places in proximity to adjacent properties and with public access; and
- In certain locations, arising's from woodland management activity can be used as basis for opportunities for amphibians, invertebrates and bryophytes micro-habitats by leaving piles of dead wood or recumbent dead logs.

Maintenance Operations – Annual and Occasional

- Trees should be regularly visually checked for the presence of any diseased or rotten wood; fungal or other infections/disease; and stability. If any such issues are identified then the advice of qualified Arboricultural consultant should be sought immediately;
- The health of the trees shall be monitored and any works required for health and safety or to promote the health and sustainability of existing trees shall be identified, scheduled and actioned at a suitable time of year;
- All works should be completed at an appropriate time of year and in accordance with relevant EU legislation. Where possible this should be outside of the bird nesting season (i.e., between October through to March inclusive). In any event according to the nature of the works, there may be an additional requirement for monitoring or a watching brief by a qualified ecologist to ensure there are no nesting birds or bats present;
- All works shall be carried out by a skilled, qualified and approved Arboricultural Contractor in accordance with *BS3998: 2010 'Tree Work - Recommendations*.
- Where possible, and where health and safety constraints permit, arisings may be formed into habitat piles within public open spaces, and standing dead wood maybe left within the woodland to provide additional dead wood habitats to maximise invertebrate biodiversity. All other brushwood and logs that result from surgery and felling of trees on site shall be removed off site. Brushwood may be chipped on site, but all wood chippings resulting from these operations shall be raked up, bagged and removed;
- Where surgery works affect carriageways or public roads, the Arboricultural Contractor shall ensure the relevant permissions and road control permits are obtained, and all necessary health and safety parameters are met;
- Selective thinning and coppicing of existing scrub and trees is to be assessed on site. This will allow trees and shrubs to develop diversity of form and different types of nesting, feeding and foraging

habitat and extend the potential life of individual plants. Additional thinning of the scrub areas may be required at intervals following an initial selective thin and coppice. The timing of thinning should be informed by an assessment on site. A competent person, such as a qualified arboriculturist should plan thinning and coppicing operations. All thinning and coppicing operations should be undertaken between October and February; and

- Possible damage to drainage/services and adjoining building foundations must be considered before choosing a replacement tree species and location.

Monitoring Objectives and Performance Criteria

- 4.12 At the end of the defects liability period (1 year), the overall soft landscape areas shall be in a visually neat and tidy condition and completed to the contract specification prior to handing over to the appointed management company. The management company will inspect all areas of seeding and planting regularly throughout the year, to ensure the landscape management objectives are achieved.
- 4.13 The landscape sub-contractors with responsibility for the site shall record all site visits, maintenance operations undertaken and any other significant events i.e., fire, theft or vandalism of plant materials. This information shall be used to prepare an annual report at the end of each year that will summarize maintenance operations together with an assessment by the contractor of the current state of the site.
- 4.14 The appointed supervising officer shall prepare a long-term review after years 5, 10, 15 and 20. This report shall summarize the management undertaken together with an assessment of the performance of the landscaped areas against the performance criteria stated within this plan. This review shall include recommendations for improving the management plan, if necessary, dependant on findings.

5.0 LANDSCAPE HARDWORKS – LONG TERM MANAGEMENT

Paved Areas

- 5.1 Performance Criteria: All hard surface areas shall remain in good repair and free of any trip hazards.
- 5.2 Maintenance Objectives: To repair any sunken/raised paving elements, making good damaged units or subsistence to match original materials and retain the paved areas in clean condition.

Maintenance Operations

- Annual inspections of hard surface areas and maintenance carried out as necessary e.g., re-pointing as required;
- Sweep with pedestrian equipment and dispose arisings (1 x per month, March – September);
- Apply herbicide, weed wipe (1 x per year); and
- Clean paved surfaces according to manufacturer’s recommendations including removal of stained surfaces and removal of chewing gum.

Gates, Fencing, Barriers & Bollards

- 5.3 Performance Criteria: All fences shall remain in good visual condition.
- 5.4 Maintenance Objectives: To repair any damaged elements and ensure barriers succeed in design objective e.g., protect planting.

Maintenance Operations

- Annual inspections of hard works areas and maintenance carried out as necessary;
- Extension or strengthening of barriers as required;
- Clean bollards and barriers only according to manufacturer’s recommendation; and
- Repaint fencing as required and as per manufacturer’s recommendation.

Walls and Copings

- 5.5 Performance Criteria: All walls, planters and copings shall remain in good visual condition.
- 5.6 Maintenance Objectives: To repair any structural damage as required and retain surfaces in clean condition.

Maintenance Operations

- Annual inspections of hard surface areas and maintenance carried out as necessary;
- Maintain and clean painted surfaces;
- Remove graffiti as required; and
- Repaint and/or re-point as required and as per manufacturer’s recommendation.

Light Fittings

- 5.7 Performance Criteria: All external lighting within public realm areas should remain in good working order and good visual condition.
- 5.8 Maintenance Objectives: To maintain lighting fitting in good working order.

Maintenance Operations

- Regular inspections and repair as necessary;
- Clean and/or repaint as required and as per manufacturer's recommendation;
- All repair works to be carried out according to the latest H&S and BS legislation; and
- All repair works to be inspected and signed off by a certified electrician.

6.0 GENERAL SUMMARY

Introduction

- 6.1 All works, materials and operations will be in accordance with relevant legislation, European Standards, Regulations (including the CDM Regulations) and Codes of Practice.
- 6.2 It is important that all maintenance activities, significant events, surveys and monitoring activities are recorded. These provide an effective database against which the effects of maintenance and management activities can be assessed.
- 6.3 The landscape contractor responsible for maintaining the site shall maintain a record of site visits and the maintenance operations undertaken. The landscape contractor shall also record any significant events, i.e., fire, theft or vandalism of plant material or fencing. Specialist Contractors may be used on an as needs basis to complete specialist operations and/or occasional works.

Process for Monitoring and Review

- 6.4 The Landscape Management Plan and maintenance schedules will be monitored and assessed for their effectiveness on an annual basis for the first five years following the completion of the development. The review will include advice from specialist consultants as required (such as a qualified arboriculturist and ecologist), the Landscape Management Contractor and other stakeholders. The review shall include (as appropriate):
- Technical Reports - advising on particular aspects such as protected species, general management and health & safety issues;
 - Records / Attendance sheets demonstrating the maintenance work undertaken;
 - Site visit to assess landscape components, condition, and need for any mitigation or enhancement; and
 - Record and Minutes.

Annual Reviews

- 6.5 The landscape contractor will prepare an annual report at the end of each year of maintenance that shall be made available to the appointed member of the management committee supervising the maintenance contract.
- 6.6 The report will include a summary of the maintenance tasks undertaken during the course of the year together with an assessment by the landscape contractor of their perceived effects be they positive or negative. The appointed member will prepare a long-term review report after 5, 10 and 15 years of the maintenance contract.
- 6.7 The report shall include a brief summary of the preceding period of the management plan together with an assessment of the performance of the landscape areas against the performance criteria stated in this plan. The review shall also include recommendation for future maintenance including potential remedial or enhancement works.

Five Year Review

- 6.8 The Landscape Management Plan will be reviewed every five years, or as required to ensure the satisfactory management of the landscape in perpetuity.

Appendix A Management and Maintenance Report

SAMPLE MAINTENANCE REPORT			
Date		Weather	
Start Time		Finish Time	
Personnel on Site			
Staff Names		Skills	
Tasks Undertaken			
Management Tasks	Tick Box	Comments	
Cutting Grass	<input type="checkbox"/>		
Weeding	<input type="checkbox"/>		
Strimming Meadow	<input type="checkbox"/>		
Pruning	<input type="checkbox"/>		
Dead-heading	<input type="checkbox"/>		
Litter Picking	<input type="checkbox"/>		
Weed Spraying	<input type="checkbox"/>	Specify chemicals and location	

Other	<input type="checkbox"/>		
Tasks incomplete			
Management Task	Specify Reasons		
Management and Maintenance Notes			
Date of next site Visit			

Management Signoff

Site Foreman		Signature	
Approved Manager		Signature	

Appendix B Specifications for Replacements - Post planting

Plant Material Generally

- B1 Trees, shrubs and other plant materials as specified on the drawing shall be supplied from an approved source. Landscape products will be obtained from sustainable sources and from suppliers committed to sustainability.
- B2 All trees and shrubs shall correspond exactly with the species, varieties and sizes shown on the planting plan, and shall comply with the relevant sections of *BS 3936 - Part 1: Nursery stock specification for trees and shrubs*.
- B3 All shrubs, hedging plants, whips, feathered whips and climbing plants shall be properly grown, healthy, well established nursery transplants of good form, stock & strain, and shall have a well-developed fibrous root system.

Trees and Woodland Areas

- B4 All trees shall have a well – balanced crown with an established framework of branches consistent with the species, a single straight stem and a well-developed fibrous rooting system.
- B5 Bare rooted trees, where specified shall conform to the above.
- B6 Root-balled trees, where specified shall be supplied with a root-ball of diameter and depth appropriate to the size and species of the tree. The minimum diameter shall be no less than ten times the diameter of the stem measured at 300mm above ground level. The root-ball shall be thoroughly moistened, prior to lifting from the nursery.

Appendix C Maintenance Task Schedules

Month	Location	Task	Duration	Comments
January	Lawn Shrubs/Borders	Cut and collect arising Weeding/Litter picking	Every 3 weeks Every 3 weeks	
February	Lawn Shrubs/Borders	Cut and collect arising Weeding/Litter picking	Every 3 weeks Every 3 weeks	
March	Lawn Shrubs/Borders Roses Rhododendrons Topiary	Apply slow release fertiliser Cut and collect arising Apply Medium release fertiliser Weeding/Litter picking Mulch all beds Apply slow release fertiliser Remove dead buds Prune dead wood Prune into shape	Once Every 2 weeks Once Every 2 weeks Once Once Once Once Once	10%N:5%P ₂ O ₅ :3%K ₂ O 7%N:7%P ₂ O ₅ :7%K ₂ O 15%N:6%P ₂ O ₅ :12%K ₂ O Only light prune
April	Lawn Shrubs/Borders	Cut and collect arising Weeding/Litter picking	Every 2 weeks Every 2 weeks	
May	Lawn Shrubs/Borders Rhododendrons	Cut and collect arising Weeding/Litter picking Apply herbicide/pesticide Dead Heading	Every 2 weeks Every 2 weeks Once Every 2 weeks	Aphids, Vine Weevil, Black Spot, Mildew etc. Start as soon as the flowers are going over
June	Lawn Shrubs/Borders	Water on Sulphate of Ammonium Cut and collect arising Weeding/Litter picking	Once Weekly Weekly	Only necessary if lawn appears pale Aphids, Vine Weevil, Black Spot, Mildew etc.

	Rhododendrons	Apply herbicide/pesticide Dead Heading	Every 2 weeks Weekly	
July	Lawn Roses Shrubs/Borders Rhododendrons	Water on Sulphate of Ammonium Cut and collect arising Apply slow release fertiliser Dead Heading Weeding/Litter picking Apply herbicide/pesticide Dead Heading	Once Weekly Once Weekly Weekly Every 2 weeks Weekly	Only necessary if lawn appears pale 15%N:6%P ₂ O ₅ :12%K ₂ O Aphids, Vine Weevil, Black Spot, Mildew etc.
August	Lawn Roses Shrubs/Borders Rhododendrons Topiary	Cut and collect arising Dead Heading Weeding/Litter picking Apply herbicide/pesticide Dead Heading Prune into shape	Weekly Weekly Weekly Every 2 weeks Weekly Once	Aphids, Vine Weevil, Black Spot, Mildew etc. Only guidance prune
September	Lawn Shrubs/Borders Rhododendrons Lavenders	Apply slow release fertiliser Aerate and overseed Cut and collect arising Weeding/Litter picking Apply herbicide/pesticide Apply medium release fertiliser Dead Heading Dead Heading	Once Once Every 2 weeks Every 2 weeks Every 2 weeks Once Once Every 2 weeks Every 2 weeks	10%N:5%P ₂ O ₅ :3:K ₂ O Aphids, Vine Weevil, Black Spot, Mildew etc. 7%N:7%P ₂ O ₅ :7%K ₂ O
October	Lawn Roses Shrubs/Borders Rhododendrons Lavender Climber Topiary Hedges	Cut and collect arising Prune back Weeding/Litter picking Prune back Apply herbicide/pesticide Prune out dead wood Cut back Prune back Prune into shape Prune into shape	Every 2 weeks Every 2 weeks Once Every 2 weeks Every 2 weeks Once Once Once Once Once	Aphids, Vine Weevil, Black Spot, Mildew etc. Hard prune and shaping for next year Hard prune and shaping for next year

			Once	
November	Lawn Shrubs/Borders	Cut and collect arising Weeding/Litter picking Apply herbicide	Every 2 weeks Every 2 weeks Every 2 weeks	
December	Lawn Shrubs/Borders	Cut and collect arising Weeding/Litter picking Apply herbicide	Every 3 weeks Every 3 weeks Every 3 weeks	

APPENDIX 12.1

ARCHAEOLOGY



ARCHAEOLOGICAL IMPACT ASSESSMENT REPORT: PROPOSED RESEARCH AND DEVELOPMENT BUILDING, HUNTSTOWN/COLDWINTERS, COUNTY DUBLIN



Client:

Rathdrinagh Land Ltd., c/o Beuparc, Renewable Energy Solutions, Ballymount Road
Upper, Ballymount, Dublin 24

Archaeological Excavation Licence:

20E0601

Planning Reference:

FW20A/0063

Report author and licenced archaeologist:

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12.3.2021



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Document title	Archaeological Impact Assessment Report: Proposed Research and Development Building, Huntstown/Coldwinters, County Dublin
Document type	Archaeological Impact Assessment
Issue number/date	12.3.2021; FINAL
Irish National Grid	711670 741091
Planning Reference	FW20A/0063
Archive location	Kilkenny Archaeology, 12 Parliament street, Kilkenny
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12.3.2021

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1. INTRODUCTION

This report details the results of an archaeological impact assessment of a proposed research and development building development at Huntstown/Coldwinters, Co. Dublin (Figures 1, 3). The report was commissioned by the client to respond to a request for Further Information from Fingal County Council in relation to planning application reference FW20A/0063. This report presents the results of archaeological test excavations undertaken within the development site by the author in December 2020 under archaeological excavation licence reference 20E0601, as well as historical and archaeological research which is used to present an assessment of the potential impact(s) of the development on archaeology. Finally, mitigation measures to ameliorate any potential adverse affects are recommended.



Figure 1: Location of proposed development site (Ordnance Survey Ireland).

2. THE PROPOSED DEVELOPMENT AND REASON FOR ARCHAEOLOGICAL INTERVENTION

2.1 Description of development

Planning permission is being sought from Fingal County Council for construction of a single storey 5,000m² research and development building, which will specialise in developing pilot scale circular economy solutions for a range of discarded resources; including associated office and welfare facilities (Figure 2). The development includes

fencing and boundary treatment, signage, internal access roadways and a site entrance. Permission is also sought for all associated site works and services.

2.2 Reason for archaeological intervention

Item 7 of the Further Information request from Fingal County Council requests the following in relation to planning application reference FW20A/0063:

7. The applicant is requested to submit an Archaeological Impact Assessment in order to assess the potential impact, (if any), of the proposed development on possible archaeological remains in the area.

(i) This Assessment should be carried out by a suitably qualified archaeologist. No sub-surface work should be undertaken in the absence of the archaeologist without his/her express consent;

(ii) The archaeologist should carry out any relevant documentary research and inspect the site. Test trenches may be excavated at locations chosen by the archaeologist (licensed under the National Monuments Acts 1930-2004), having consulted the site drawings.

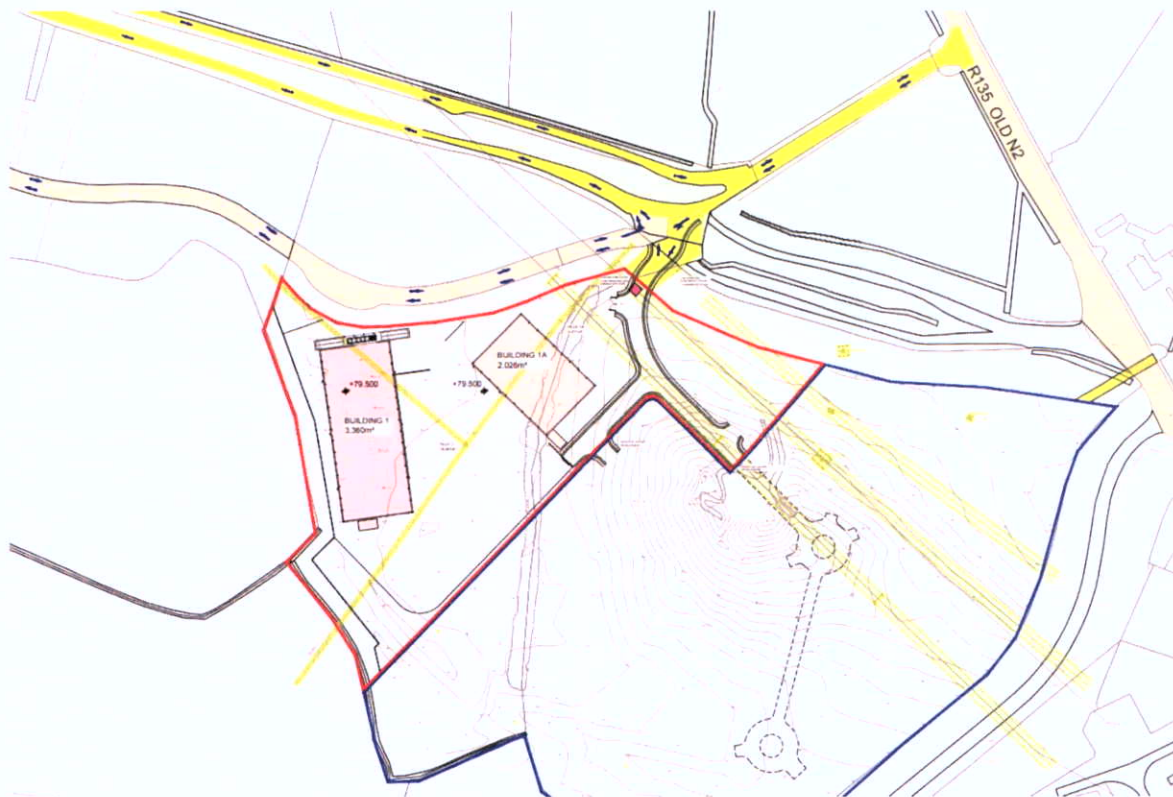


Figure 2: Proposed development layout (Loscher Moran Design Practice)



Figure 3: Proposed development area from south, December 2020.

3. ASSESSMENT METHODOLOGY

The assessment methodology responds to the further information request and conforms to the methodologies recommended in 'Framework and Principles for the Protection of the Archaeological Heritage' issued by the Dept. of Arts, Heritage, Gaeltacht and the Islands (1999). It is also in conformance with the requirements of the Fingal Development Plan 2017-23, section 10.1 of which contains the objective to 'Ensure archaeological remains are identified and fully considered at the very earliest stages of the development process, that schemes are designed to avoid impacting on the archaeological heritage. Require that proposals for linear development over one kilometre in length; proposals for development involving ground clearance of more than half a hectare; or developments in proximity to areas with a density of known archaeological monuments and history of discovery; to include an Archaeological Impact Assessment and refer such applications to the relevant Prescribed Bodies'.¹ The content

¹ https://www.fingal.ie/sites/default/files/2019-03/Fingal%20Development%20Plan%202017-2023%20-%20Written%20Statement_compressed_compressed.pdf

of this report is also in accordance with the legislative frameworks of the *National Monuments Acts 1930-2004*, the *Heritage Act 2000* and the *European Convention on the Protection of the Archaeological Heritage (ratified by Ireland 1997)*.

3.1 Assessment Components

This assessment comprised a desk-based study, a field survey of the application area and archaeological test excavations.

Desk-based study

The desk study aims to present, through a review of primary and secondary documentary sources (see bibliography), the archaeological and historical background to the proposed development area and to describe previous archaeological investigations that have been undertaken within the vicinity of the site.

Field Survey

Field inspection is undertaken with the aim of identifying any potential impacts that the development may have upon recorded archaeological monuments in the environs of the application area and also to identify any previously unrecorded archaeological monuments or areas of archaeological potential.

Archaeological Test Excavations

Archaeological test excavations (under archaeological excavation licence reference 20E0601) were undertaken across the site in December 2020, in accordance with a method statement submitted to the National Monuments Service and the National Museum of Ireland. This report presents an overview of the findings of the test-excavations.

Sites and Monuments Record Reference	Townland	Description
DU014-122001-	Kildonan	This monument was subject to geophysical survey (Licence no. 09R195) and test excavation (Licence no. 10E0462) as part of the proposed Metro West development. A sub rectangular enclosure (35m x 25m.) was identified on the geophysical survey and confirmed through test excavation. Two postholes were located either side of the ditch (0.55m wide and 0.25m deep) suggesting the possibility of a palisade. Two corn-drying kilns (DU014-122002-; DU014-122003-) are situated at the S of the enclosure (O'Donovan 2010, 18).
DU014-122002-	Kildonan	This monument was subject to geophysical survey (Licence no. 09R195) and test excavation (Licence no. 10E0462) as part of the proposed Metro West development. A comma-shaped corn-drying kiln and the probable flue of a second corn-drying kiln were located to the S of an enclosure (DU014-122001-). The former (2.1m wide and 0.51m deep) contained three fills (O'Donovan 2010, 17).
DU014-102----	Baleskin	A large circular enclosure visible as a crop mark on an aerial photograph (SMR file; pers. comm. T. Condit). Relatively low lying field north of M50 and west of N2. No visible remains.
DU014-124---	Baleskin	Located in large arable field close to the field's northern boundary, c. 148m north-east of a large cropmark enclosure (DU014-102----), cropmarks indicate the presence of a subsurface ditch. The cropmarks are visible on Google Earth imagery on 24 June 2018, viewed on 17 September 2020. The enclosure is subcircular in plan (diam. c. 32.3m N-S x c. 24.5m E-W). There is no evidence for an entrance gap through the ditch (diam. c.2m). A linear cropmark, a subsurface ditch, can be seen adjoining the enclosure along its southern perimeter.
DU014-015----	Coldwinters	Located in pasture (formerly the green of a golf course) between the Dublin-Ashbourne Road and the N2. A circular cropmark (diam. c. 15m) visible on an aerial photograph (CUCAP, BDQ 66). Not visible at ground level.

Table 1: Sites and Monuments Record monuments within environs of proposed development site.

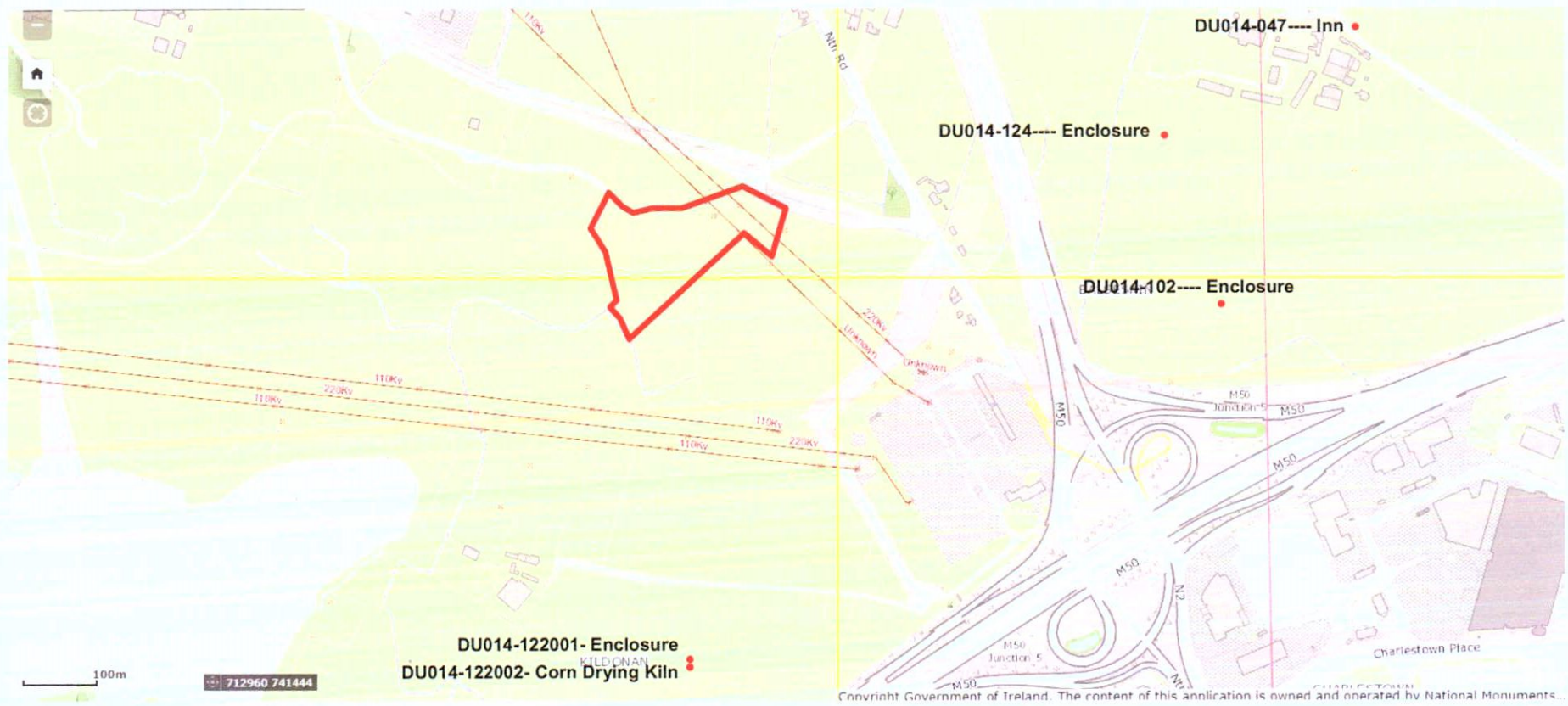


Figure 4: Proposed development area and surrounding Recorded Monuments (see Table 1).

4. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Introduction

The proposed development area is a 22 acres greenfield site located between the M50 motorway 450m to its east and the Huntstown Power Station 520m to its north-west, 2.5 km north-west of Finglas in north Co. Dublin (Figure 1). The western part of the site is a scrub field and is defined on the west by a field boundary (Figure 3). A second field boundary traverses the site on the east and marks the division with a second tillage field to the east (Figure 1). This field contains a steep hill which has been partially quarried for gravel. The gravel pit is marked on the first edition Ordnance Survey map and subsequent editions (Figures 7, 8).

4.2 Archaeological Background

The following is a chronological review of the archaeology and history of the application area and its surrounding landscape. All cultural heritage sites (protected and non-protected by law) within a c. 2 km radius of the application area were reviewed to ensure the fullest and most comprehensive picture of settlement in the area. This zone is hereto referred to as the study area while the proposed location of the development is referred to as the subject site. Note that the descriptions on RMP sites that follow are sourced largely from www.archaeology.ie. Summaries of archaeological investigations in the Excavation Bulletins are referenced in the text. Copies of the RMP entries are in table 1 and the excavation bulletin entries are set out in Appendix 1.

Prehistoric Period

Only five prehistoric sites (pre c. 500 AD) are known within the study area. The low number may be attributed to the flat terrain and heavy soils of north county Dublin (Dineen and Sutton 2003). The most significant prehistoric site is a Neolithic causewayed enclosure in Kilshane townland [DU014-093], which is located 1.5 km north of the application site on a gently undulating gravel ridge associated with tributaries of the Ward River. This site was uncovered during excavations that were carried out in advance of the N2 Finglas-Ashbourne road scheme in 2004 (Moore 2008). These types of monuments are the oldest substantial Neolithic monument type in Ireland. The enclosure was oval

shaped (NW-SE 38.5m, NE-SW 27.5m) and was defined by a series of segmented ditches. There was no evidence of an internal or an external bank, which may have been ploughed out. Many of these ditch segments contained large quantities of animal bone in their deposits (Moore 2004, NRA 2005).

Later prehistoric evidence is also present in the study area. Ring-ditch [DU014-015], which is located 500m to the north of the application site in the townland of Coldwinters (Figure 4). It is a type of funerary monument that can date from the Early Bronze Age through to the Late Iron Age. The example at Coldwinters is no longer visible at ground level. It was identified on old aerial photographs prior to its locality being transformed into a golf course. The photograph showed a circular cropmark with a diameter of 15m. A second ring-ditch [DU014-100], known only as a cropmark, is 1200m to NE of the application site in Newtown. The position of these two ring-ditches on relatively high points in the local terrain with prominent views is a common occurrence for this monument type in Ireland. Bronze Age funerary activity in the form of cremation pits and a single inhumation were also found at the causewayed enclosure in Kilshane. A flanged axe find from Newtown townland is also known (NMI Reg. No. 1962: 259).

Two burnt mound sites [DU014-050 & Site 1 of 03E1450] are further instances of prehistoric activity in the study area. These site types are amongst the most commonly found monument type in Ireland and are often associated with water sources. Site DU014-050 is located in Grange townland 1300m west of the application site. It was discovered during the excavation of the Northeast gas pipeline in 1988 (Conway 2000a). The works exposed a surface spread of charcoal-blackened soil and peat-cracked stone (6m E-W; 5m N-S). Site 1 of 03E1450 contained a burnt spread (3.5m by c. 10m with an average depth of 0.15m) and associated features. This site was found on the N2 Finglas-Ashbourne road project in the townland of Newtown, 1km north of the application site. It was found adjacent to a natural waterlogged peat basin. There was no indication of the nearest water source of the burnt spread in Grange but it is located not far from a tributary of the Tolka River. A third possible burnt mound site was reported by Simpson (1994) in an area to the south of the central quarry deposits (see Dineen and Sutton, 2003 – precise location not known). Burnt mounds are often found in close proximity to water sources because their function was to boil water in troughs dug into the ground. This was done through the heating of stones in a fire adjacent to the trough and then the placement of these stones within the trough to boil the water. The reasons for what the

boiling water was used for vary from ritual activity, cooking, to brewing beer. These sites are fairly easy to identify in the landscape because they leave behind a waste pile of shattered blackened stones, often forming a horseshoe shape around a trough. Many have been ploughed out over the centuries but black stained soil and shattered stone is often detected when topsoil is removed ahead of building or infrastructural developments.

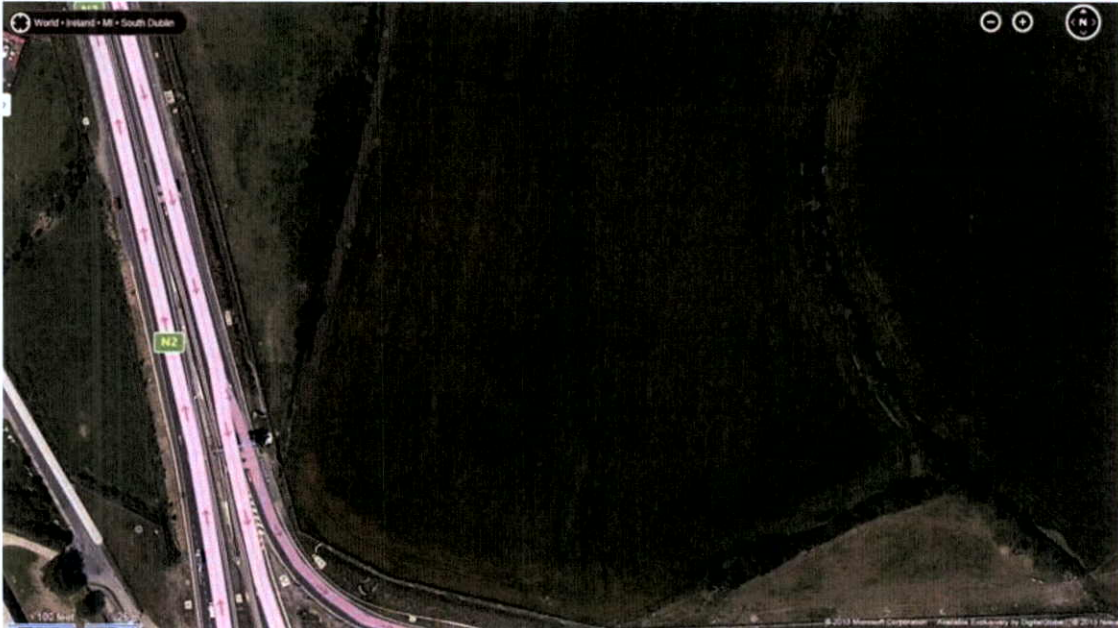


Figure 5: Baleskin DU014-102---- enclosure



Figure 6: Baleskin DU014-124---- enclosure

Early Medieval Period

The study area is within the plain of Brega and earliest historical records note that the *Síl nÁedo Sláine*, a dynasty of the southern Uí Néill, were the dominant rulers in the area during the early medieval period (Byrne 1973, 88 in Dineen and Sutton, 2003). The most dominant monument from this era (500 – 1169 AD) is the ringfort. Ringforts were defended farmsteads comprising most commonly a circular space enclosure by a defence ditch and bank (univallate) or a series of ditches and banks (bivallate or multivallate). These monuments were primarily settlement foci and may also have been for people to retreat into at times of conflict, or enclosures to protect cattle. Sometimes within such monuments souterrains have been found, which are stone or wooden lined tunnels leading to chambers or hidden exits. Four possible ringforts, five enclosures and one souterrain fall within the study area. All but one of the ringforts is extant. The nearest ringfort to the application site is c. 1.3km to the N in the townland of Newtown within the site of a former golf club. This levelled monument [DU014-006002] was recorded prior to its destruction in 1953 and from cropmarks seen on later aerial photography. Stout and Stout (1992) recorded two phases of construction – a roughly circular 45m diameter enclosure and the second phase a 90m diameter enclosure with a surrounding ditch and bank – the classic ringfort design. O’Carroll (2004), who rediscovered the site in a phase of archaeological testing for an industrial development, said of the monument that it ‘displays characteristics of an early medieval multivallate ringfort’, and that a piece of probable prehistoric pottery was found within its extent. The discovery of pottery lends weight to Stout’s interpretation of two phases of construction – perhaps one prehistoric and one early medieval, rather than both as possible ringforts as Stout suggests. Elsewhere in Newtown, a probable levelled ringfort [DU014-097] was identified from cropmarks on aerial photography c. 250m east of [DU014-006.001], itself another possible ringfort adjacent to [DU014-006.002]. Also in Newtown is an oval enclosure [DU014-007]. An enclosure [DU014-016] recorded from aerial photography in neighbouring Coldwinters townland with a diameter of 45m may also have been a ringfort. It was not relocated during testing by O’Carroll (2004), probably she says because it was removed by landscaping for the golf course. The site is located 800m east of the application area. Another possible enclosure is recorded 1100m to the east at DU014-017.

Two enclosures in Baleskin [DU014-124---- and DU014-102----] are represented by cropmarks and are located 650m and 750m to the east of the application area respectively

(Figures 4, 5, 6). Three enclosures (possible ringforts) and a possible souterrain are located in Cloghran, 1.7 – 1.8km west of the application site. These were again identified as cropmarks on aerial photography. The one considered most likely to have been a ringfort [DU014:014.001] was on a north facing slope under tillage and had an irregular oval shape (dims. 40m E-W; 30m N-S). The remaining two [DU014:014.001 and DU014:014.001:002] were in similar topographic positions to DU014:014.001 and were subcircular (dims.30m E-W; 42m N-S) and oval (dims. c. 40m NW-SE; 33m E-W) in plan respectively. The possible souterrain [DU014:001.003] was identified within the latter possible ringfort [DU014:014.002]. Finally, one more ringfort [DU014-029] is known from Cappoge 1.5km south of the application site. Unlike the other possible ringforts mentioned, this one is still visible, albeit damaged from farm machinery. It is on level land which slopes away slightly to the SW. This site comprises a circular platform (diam. 34m; H 1-1.8m). The bank has not survived and there are no traces of an external ditch. It is possible that some of the churches and graveyards discussed in the next section may have early medieval origins, although this is not certain. A possible candidate is a series of 123 Christian burials excavated on the northeast gas pipeline in 1988, many of whom were children and adolescents (site 99E0220, 1800m NW of application site) (Conway 2000b, Mount 2012).

Medieval Period

The arrival of the Anglo-Normans signalled profound changes in the cultural and political landscape of Ireland. King Henry II in 1172 made Hugh de Lacy palatinate of the lands of Meath, which probably included the Barony of Castleknock. De Lacy then granted Hugh Tyrell the lands of Castleknock on behalf of the king. Tyrell was the first of eight to assume the title Baron of Castleknock into the 14th century (Ball 1920). There are scarce references to Huntstown townland during the medieval period and medieval monuments occupy it and its environs. The name itself is thought to translate as the land of the Hunt family, an Anglo-Norman family who briefly feature in documentary sources until the 14th century, when the last member of the lineage was executed for treason (Dineen and Sutton, 2003. The Statute Rolls of Ireland record that Huntstown townland was under the control of Nicholas Barnwell in 1463-4, although Conbhui (1962) notes that this refers to Huntstown of Santry Parish and not the Huntstown of the application site.

Anglo-Norman settlement in this part of Ireland was characterised initially by the development of motte and bailey castles, which were often set up along strategic locations overlooking rivers or important routeways. They comprised a large earthen mound on top of which would have been a timber castle within a palisade. A fosse or moat would have encircled the mound to provide added defensive security, and sometimes an outer area known as a bailey was constructed. This too was delineated by a defensive ditch or palisade. There are two motte and bailey castles within the study area – Newtown [DU014-013] and Dunsoghly (known on the six inch map as Connaberry Moat) [DU014-005.003]. Newtown is 900m north-west of the application site and Dunsoghly a 1.7km away in the same direction. At less than 1km away along an open flat landscape, the proposed development area may have come under the control of the motte at Newtown. The John Rocque map of 1760 (Figure 7) depicts a pond c.400m north of the application site from which a stream drains northwards to pass very close to the motte. The motte was destroyed in 1952. It was recorded prior to its removal as a circular platform (diam. 28m; H 3m) which was enclosed around the base by a wide fosse. This flat-topped platform was further enclosed by an oval earthwork or bailey (dims. 100m E-W; 70m N-S). The site is visible as a soil mark on aerial photographs and is also hachured on the six inch map. Pre-development testing in the vicinity of the monument in 2001 failed to uncover contemporary archaeological deposits (Fitzpatrick 2003). Unlike Newtown, Dunsoghly motte still partially survives on a natural rise in the landscape not least because a modern farm is built on the top of it. However, it is not possible to discern at ground level. Its mound is oval shaped and measures 80m NE-SW; 65m SE-NW; H 3m. Traces of an outer bank are visible on an aerial photograph.

Castle forms in Ireland changed from mottes to tower houses as the Middle Ages progressed. Tower houses are substantial stone structures that are often square or rectangular shaped with few windows. Their design reflects the high levels of hostilities that were present during this period in Ireland. There are two tower houses in the study area. One is at Dunsoghly [DU014-005001] approximately 250m NW of Dunsoghly motte and c. 2km from the application site, and the second at Cappoge [DU014-027], 1.6km south of the application site. The absence of a tower house near the motte at Newtown would suggest the previous prominence of this area may have waned at the expense of nearby Dunsoghly.

Dunsoghly castle [DU014-005001] is a well preserved tower house dating to the late 15th-century. It is associated with the Plunkett family (Tutty, 1979, 155-7). It is four storeys high and has four corner towers. It is built of limestone - the rock so often quarried in the study area - and contains dressed stone quoins and a base batter. Passage through the ground floor entrance leads to a vaulted chamber where evidence of wicker-work is evident above. Three of the four towers contain chambers and the fourth a stairwell leading up to the first floor, which is lit by tall rectangular windows. Other features include a fire place and a garderobe, corbels for the second floor level, roof timbers for the third floor level, musket holes, battlements, and Tudor style chimneys on the roof. Adjoining the castle is the medieval church DU014-005002. Cappoge castle has not survived the like Dunsoghly. This tower house is depicted on a drawing of 1776 by Gabriel Beranger as a three storey structure and in a written account of 1778 by Austin Cooper it is described as a three-storey tower house with corner turret. It was knocked down before 1860. The Woodcock family was associated with this castle from the thirteenth to the sixteenth century (Ball 1920, 18-19). An earthwork marked on six inch historic mapping and visible on aerial photography in Ballycoolen townland was listed as a moated site [DU014-025] but archaeological investigations found that it was a natural feature (Mount 2012). It measures 40m x 30m and 20m high. A possible church, burying ground and a domestic well are marked on the first edition map [DU014-012 001-3] 1km north of the application site at Kilshane. However, no burials or an associated church have been found and this area has been subjected to extensive quarrying (Mount 2012). Excavations to the north of the latter site uncovered a medieval cemetery (99E0220) (Excavations 1988, 17).

Post-Medieval Period

There is a substantial increase in the number of cultural heritage sites within the study area during the post-medieval period (*c.* 17th to *c.* 19th century). Twenty structures date to this period. None are recorded in the National Inventory of Architectural Heritage for Fingal but five entries appear in the Sites and Monuments Record. These include a 16th / 17th century probable fortified house at Dubber [DU014-018], which is 1.8km from the application site, a house in the same area built out of the ruins of Dubber castle [DU084-017], an Inn in Dubber [DU014-017], and two houses / a chapel and a crucifixion plaque at Dunsoghly [DU005-002, -004, -005, -006], 1.9km NE of the application site. Fourteen quarries and six gravel pits, including that situated immediately to the east of the subject site, probably date from the post-medieval period. These may

have been used to source the stone work for the buildings and gravel for lane surfaces and other building purposes. Such quarries are pre-emptive of Huntstown quarry today, which was opened in the 1970s and not developed from an earlier quarry. Two limekilns are also known from the study area. Given the substantial increase in cultural heritage sites and associated literary sources for this period, the rest of this section will focus exclusively on Huntstown townland.



Figure 7: Approximate location (arrowed) of proposed development area on 1760 John Rocque map of north Dublin.

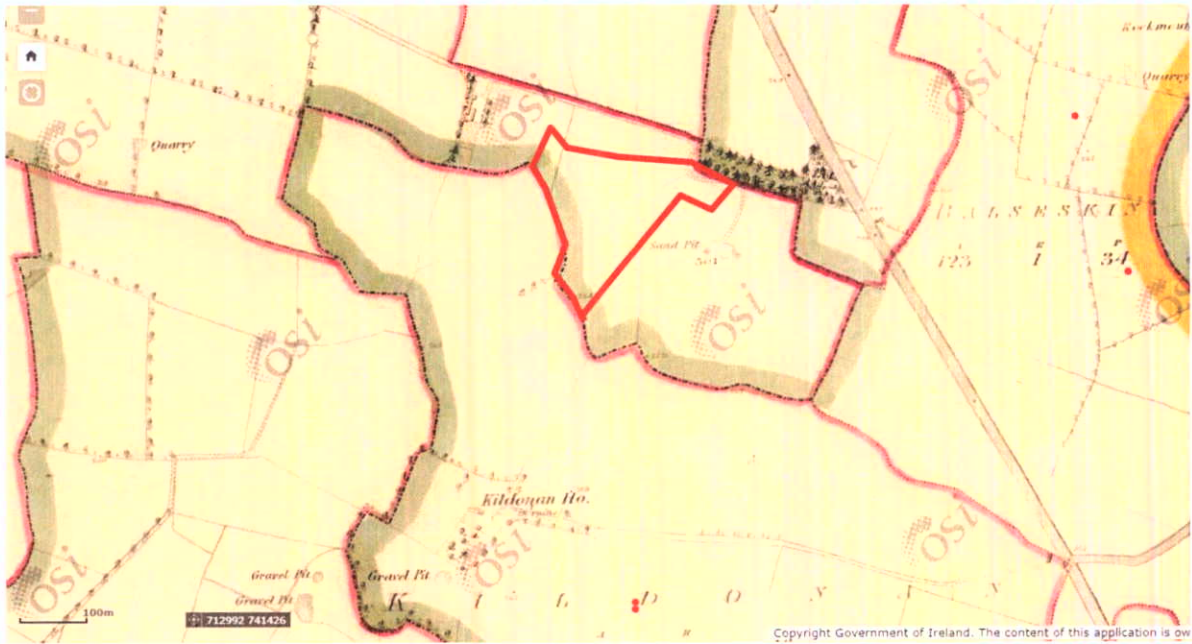


Figure 8: Proposed development area on first edition Ordnance Survey map 1840 (Sheet 14 extract).

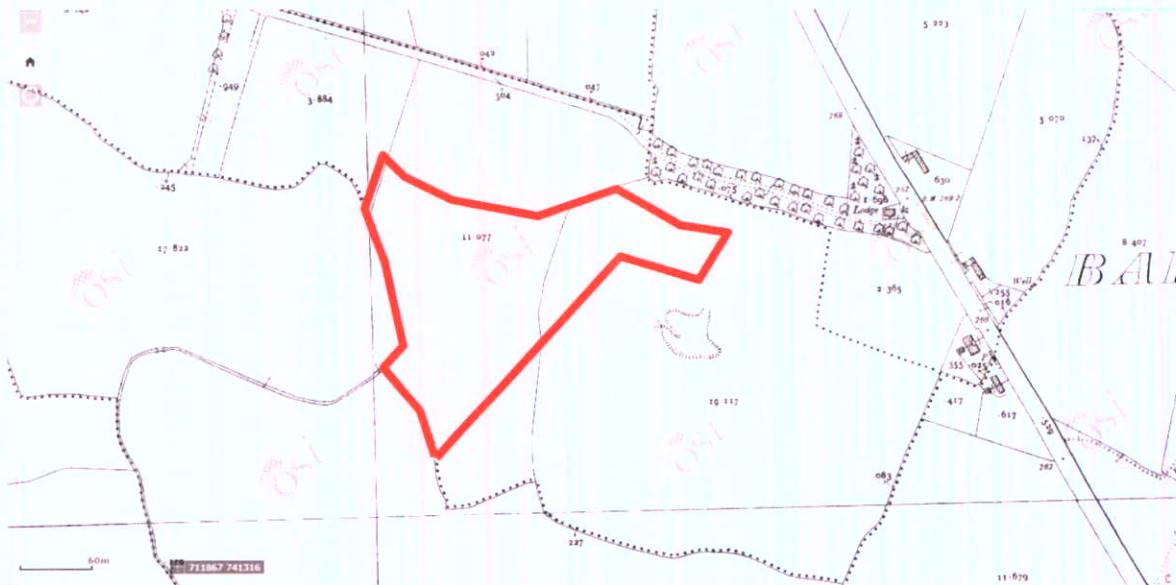


Figure 9: Proposed development on site location on 25-inch Ordnance Survey map 1910 (extract).

There are references to Huntstown in historical sources although there are three townlands with the name of Huntstown in Dublin, two of which are in the Barony of Castleknock and one in the Barony of Coolock. Care is thus needed when assigning documentary evidence to Huntstown townland. References to the Luttrell and MacFarlane families in 16th to 19th century records relate to Huntstown of Mulhuddart Parish in Castleknock. Huntstown of Mulhuddart is noted in 1540 as forming part of the

lands of St Mary's Abbey (Conbhui 1962). The 1656 Civil Survey of Dublin notes that Huntstown townland was the property of James Barnwell of Dunbro. It also states that Huntstown called Huntstown & Mestallstown belonged to Martin Dillon of Huntstown (Mount 2012). However, the entries probably relates to Huntstown of Santry Parish in Coolock, which is near Dunbro and was associated with the aforementioned Nicholas Barnwell in the medieval period. Genealogical sources support this view as they record that a Martin Dillon (b1635) married Alison Barnwell (b1649) and that they had a family in Huntstown.

The earliest mentioned definitive person linked to Huntstown of Castleknock Parish is a merchant by the name of Hoxes Cotes 'of Huntstown and Johnston in Castleknock Parish, Co. Dublin, 1766' who is mentioned in association with an estate map in the National Archives. The estate almost certainly includes Huntstown house, which is labelled 'Newtown' on the Rocque map of 1760 (Rocque instead labels Kilshane house as 'Huntstown') and which is shown on six inch and 25 inch historic mapping (Figure 7). There are no other houses in Huntstown or Johnstown on the Rocque map. Given that Cotes is from 'Huntstown and Johnstown', the application site probably falls within his former estate.

The site of Huntstown house is 1.4 km NW of the application area. The house has been entirely removed by Huntstown quarry, which now covers an extensive area of Huntstown and neighbouring townlands (Mount 2012). The house is difficult to make out on the 1760 map but it appears to be made up of five buildings and an adjoining formal garden, all within a large square plot of land (Figure 7). The map shows that its original entrance was to the south off the Finglas-Cloghran Rd near Cappoge Castle. There was also a lane linking Huntstown house with Kilshane house. The fields surrounding the house are depicted, probably schematically, as a mixture of tillage and pasture.

The Rocque map of 1760 depicts no buildings or features of archaeological significance in the approximate area of the application site (it is difficult to precisely place the location of the application site on this map). A pond is shown on the Rocque map c.300m north of the application site (Figure 7).

The layout of Huntstown House differs on the historic six inch map of 1843 compared to the Rocque map (compare Figures 7 and 8). This reflects changing styles and increased wealth between 1760 and 1843. The house plan has T-shaped and L-shaped wings that semi-enclose a courtyard. A formal garden is still shown and the lands of the estate take on a more managed appearance with neatly subdivided fields, including the field of the application site. The entrance approach to Huntstown House also changes with the southern lane to Cappoge and the northern lane to Kilshane being superseded by a west-east aligned lane linking the house to the Dublin-Slane Road. This lane today is the main access route to Huntstown Quarry and to the application site, which is located in a field immediately south of this lane. The six inch map shows an area of trees at the point where the new road met the Dublin-Slane Rd, making it difficult to discern the nature of the entrance at that time. There was no gate lodge there like there was at the entrance to Huntstown House at the opposite side of the townland, which itself is not as old as the house as it is not depicted on the 1760 map (Figure 7).

The Griffiths Valuation, which was the primary valuation of property in Ireland between 1847 and 1864, indicates that the person who lived in Huntstown House when the survey for Dublin was completed in 1853 was Mr. Christopher Kelly. He did not own the house but leased it from Anthony Hawkins, Esq. Mr Kelly also leased the three fields east of his house which formed the eastern end of Huntstown townland. These totalled 91 acres. The presence of the new road dissecting the townland from west to east, the construction of Mr Kelly's house and the leasing of associated land, and the renting out of the gate lodge all point to the original estate of Huntstown House being sold at some point to a property developer, perhaps Anthony Hawkins Esq. or an earlier developer, and being put to economic gain. The presence of the sandpit in the field to the east of the application site also supports this hypothesis.

Aerial photographs from recent years show the larger (west) field in the application area has been disturbed by construction works, probably associated with the adjoining road network and Huntstown Power Station.

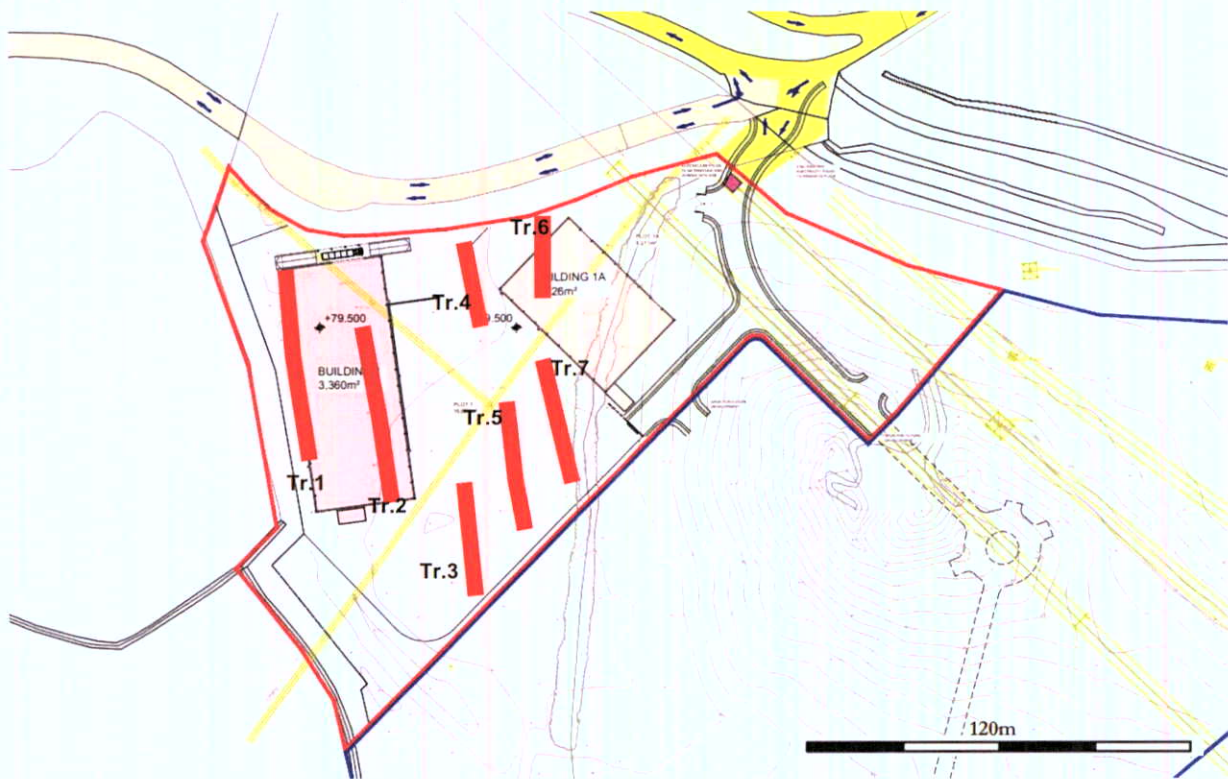


Figure 10: Location of 20E0601 archaeological test trenches overlain on proposed development layout plan.



Figure 11: 20E0601 Test-Trench 1 from north.



Figure 12: 20E0601 Test-Trench 2 from north.



Figure 13: 20E0601 Test-Trench 3 from north.



Figure 14: 20E0601 Test-Trench 4 from north.



Figure 15: 20E0601 Test-Trench 5 from north.



Figure 16: 20E0601 Test-Trench 6 from north.



Figure 17: 20E0601 Test-Trench 7 from south.

5. ARCHAEOLOGICAL TEST EXCAVATIONS

5.1 Introduction

The following provides the results of archaeological testing within the application site in December 2020. In total seven archaeological test-trenches were excavated across the site by a 10 ton tracking machine with a toothless grading bucket (Figure 10). Trenches were excavated to the level of the underlying glacial subsoil. Overhead power lines precluded test trenching across much of the site as these areas had to be avoided with the mechanical excavator.

5.2 Results

Test-trench 1 (Figures 10, 11)

This trench measured 60m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

Test-trench 2 (Figures 10, 12)

This trench measured 57m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

Test-trench 3 (Figures 10, 13)

This trench measured 36m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

Test-trench 4 (Figures 10, 14)

This trench measured 25m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and

gravel. Various modern field drains were noted cutting the glacial clays. Nothing of archaeological interest was noted.

Test-trench 5 (Figures 10, 15)

This trench measured 40m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

Test-trench 6 (Figures 10, 16)

This trench measured 25m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

Test-trench 7 (Figures 10, 17)

This trench measured 40m L x 2m W and was excavated to an average depth of 0.4m. The sod and topsoil was 0.3m deep and had been previously disturbed throughout much of the length of the trench. Underlying the topsoil was a hard glacial boulder clay and gravel. Nothing of archaeological interest was noted.

6. ARCHAEOLOGICAL IMPACT STATEMENT

6.1 Impact Statement and Mitigation Recommendations

The outcome of desk study research, archaeological test excavations, a review of previous excavations and inspection of the application site and its surrounds facilitates the collation of a comprehensive archaeological impact statement and archaeological mitigation strategy for the proposed development. The proposed development area is a 22 acre green-field site that does not contain any previously recorded archaeological or built heritage sites. The closest Recorded Monument to the application area is a ring ditch site [DU014-015----] which is situated 500m to its north (Figure 4). Archaeological

test excavations within the application site did not uncover any archaeological deposits, features, structures or objects within the excavated trenches (Figure 10).

Notwithstanding the absence of evidence for archaeological materials within the application site the scale of the development (22 acres) gives rise to the possibility that archaeological materials could be impacted upon during construction of the development. Accordingly, as mitigation it is recommended that a structured programme of archaeological monitoring by a suitably experienced archaeologist of all sub-surface groundworks, including site investigations, associated with the development shall be undertaken under licence to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht. Should archaeological materials be encountered during the course of the works the monitoring archaeologist shall be empowered to halt construction works in the affected area pending receipt of further recommendations from the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

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Appendix 1: Previous licenced archaeological excavations in environs of proposed development area.

Dublin

1994:091

'Dunsoghly Castle', Dunsoghly

Medieval tower house

O154410

A watching brief was carried out at Dunsoghly Castle during the construction of the film set for Braveheart in July 1994. The construction of the film set necessitated minor excavation in four separate areas in the immediate vicinity of the castle. Three of these four areas involved digging several holes 0.4m wide and 0.6m deep to receive wooden posts for the mock houses. The fourth area involved the excavation of a trench 9m wide, 7m in length and 1m deep which would act as a ditch or moat under the drawbridge. The film set was constructed on the south side of the castle and none of the four areas were excavated to subsoil.

In Area 1 to the south-west of the castle, the topsoil was 0.15m in depth and lay over a light brown sandy soil. The only finds recovered were sherds of post-medieval willow pattern. Below the topsoil in Areas 2 and 3 to the south of the castle, a 0.1m thick stony layer was uncovered. The stones were about 50mm in size and may have formed part of a path although they did not seem hardpacked. No finds were recovered. The trench opened in Area 4 to the south of the castle revealed a 0.3m thick topsoil above a yellow clay which extended to a depth of 0.58m under which was a yellow/grey layer extending to the bottom of the 0.96m deep trench. Like Areas 2 and 3, no finds were recovered. The only finds from the site came from a narrow ESB trench running southwards away from the set which was not excavated under archaeological supervision. The finds included clay pipes, sherds of black glazed earthenware and an iron stake or hook. This trench was excavated through the topsoil and an underlying grey loam and disturbed a stone wall or drain.

Donald Murphy, Archaeological Consultancy Services, 30 Laurence St., Drogheda, Co. Louth.

Dublin

1999:161

BALLOUGH TO KILSHANE GAS PIPELINE

Various

SMR 7:15, 11:84, 14:0490

99E0395

Monitoring of topsoil removal for the construction of the northern section of the new NEP 3 gas pipeline was undertaken between April and September 1999. The pipeline will extend south from Ballough as far as Brownsbarn, Co. Dublin, reusing sections of the previously excavated NEP 1 and 2 pipelines (1983 and 1988). The first stage of this route saw monitoring of the pipeline excavation from Ballough to Kilshane. The remaining stages of pipeline construction south of Kilshane as far as Brownsbarn will be undertaken from summer 2000.

From Broghan the pipeline extended to Kilshane, following the line of NEP 2 between the townlands of Kilshane and Broghan. The pipeline itself switched to 5m east of the original line, and the original wayleave was reused and slightly widened to the end of this stage of pipeline at the block valve at Kilshane. The cemetery site at Kilshane (SMR 14:0490) uncovered during the NEP 2 operation (Margaret Gowen in Excavations 1988, 17) lies c. 420m north-east of the block valve. The cemetery extends to the west of the former pipeline corridor and may extend into the adjacent field on that side. The eastern limit of the burial area was defined during excavation.

Geophysical survey was undertaken before an archaeological assessment of the site took place, providing a number of targets for testing. A single archaeological feature was revealed and excavated in a location east of the cemetery site and does not appear to be related to it (see No. 253 below).

No further archaeological features or burials were encountered during monitoring of the pipeline construction.

Malachy Conway for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Dublin

1999:253

KILSHANE

Unenclosed cemetery

31037 24281

SMR 14:48

99E0220

An assessment and subsequent monitoring (see No. 161 above) of topsoil removal were undertaken at Kilshane, Co. Dublin, as part of the reinforcement of the Brownsbarn to Ballyogh Gas Pipeline (formerly known as the Northeastern Pipelines, Phases I and II). The name Kilshane contains the element 'Kil', or Cill, signifying a church, while the second element is less certain, but in at least one other instance (in County Limerick) a church site called Cill Senaig has been anglicised as Kilshane. That being the case, the County Dublin site may well represent the church of Senach.

The site, first discovered on removal of topsoil during the Phase II pipeline operation in 1988, is in a flat, low-lying area c. 0.5 miles to the west of the N2, near St Margaret's. During Phase II pipeline operations an unenclosed cemetery comprising 123 individuals was revealed over a 21m stretch of the pipeline corridor (see report by Margaret Gowen in Excavations 1988, 17). Consequent to this discovery, the site was included in the SMR by the National Monuments and Historic Properties Service.

The new reinforcement pipeline corridor runs parallel to the existing and archaeologically resolved area of 1988 and thereby encroached the SMR constraint area for the cemetery site. Geophysical survey of the proposed corridor was undertaken before the assessment.

In summary, the assessment revealed one feature of archaeological potential, and no further features or finds were revealed during subsequent monitoring of topsoil-stripping before pipe-laying.

Magnetic gradiometry and electrical soil-resistivity surveys were undertaken at the site. The former technique indicated strong ferrous (iron) interference within the western area of the survey grid, along with two anomalies representing possible ditch features. One

these anomalies is just beyond the disturbance zone caused by the existing gas pipe and is almost certainly ditch F140 revealed in the NEP II 1988 operation. Various clusters of small anomalies were also discerned, along with regular linear-trending anomalies, suggesting changes in the underlying geology. The resistivity survey revealed a number of low-resistance linear trends, which coincide with the magnetic anomalies, indicating possible ditches. However, the majority of the resistivity responses appeared to reflect natural variations in resistance values across the site, especially along the western edge of the survey grid, which would suggest disturbance from the pipe and 1988 construction. The same may also be said of a number of linear trends in the north-eastern corner of the survey grid, which equate with plough action or other modern disturbances.

Four test-trenches were excavated across the proposed 30m wayleave realignment corridor. The trenches were directly east of the area excavated and resolved in 1988. The position of the trenches was largely determined by the anomalous responses from the geophysical survey carried out before the assessment.

Trenches 1 and 2 were conjoined in T-shaped plan, with Trench 1 orientated north-west/south-east and Trench 2 set perpendicular to its centre and extending away in a south-west direction. The position of Trench 1 was determined by the double-ditch-like response from the geophysical survey, which correlates with a ditch excavated at the eastern limit of the 1988 NEP II pipeline corridor and which appeared to mark the eastern boundary of the cemetery. The position of Trench 2 was also determined by geophysical responses, in this case a number of roughly west-east-lying linear anomalies. Trenches 3 and 4 were conjoined in T-shaped plan, as with Trenches 1 and 2, and were positioned south of these. Only a few limited anomalous responses were detected in the southern portion of the survey grid, and the position of Trenches 3 and 4 was largely designed to test a number of these responses as well as to examine areas that failed to give a response.

Trench 1 was positioned 112m from the eastern field boundary and measured 22m by 2m. Removal of topsoil 0.25-0.3m deep revealed two modern drainage features between 0.4 and 0.5m wide and cut directly into subsoil, which in this area was brown, sandy clay containing frequent stones. The eastern half of the test-trench was completely devoid of features and was characterised by grey clay subsoil with less stone than on the western side.

Trench 2, 29m by 2.1m, was conjoined with Trench 1. Several roughly north-west/south-east-aligned features, mostly natural, were revealed on removal of topsoil. Only one item of archaeological significance was revealed, a west-east linear feature, which extended beyond the western limit of the test-trench. The feature, initially defined by several longitudinally set stones, was characterised by a roughly linear spread of dark soil containing charcoal and numerous (apparently heat-shattered) angular stones. The feature, which survived in the trench in a truncated form, was up to 1.9m long by at most 0.75m wide and at its deepest point, the west section, was found to be up to 0.15m deep. A single fragment of iron slag was recovered from the fill of the feature at the western section. The east end of the feature was rounded in plan and delimited by iron staining in the subsoil. It was significantly shallower than the western end and contained a thin lens of grey clay flecked with charcoal, overlying and partially cutting into the brown clay subsoil at this point. The western section of the feature comprised charcoal-flecked, grey clay overlying a deposit of orange, friable ash and a basal deposit of soil charcoal. None of the stones either within or forming the limits of the feature were found to be burnt. It was estimated that the feature could extend, at most, only a further 0.3m beyond the

western section face, which was confirmed during later monitoring. In attempting to date this feature, and also taking into account that some possible fragments of bone were associated with the uppermost fill deposit, it would seem that the feature is fairly late, possibly after AD 1700.

The excavation of Trenches 3 and 4 failed to reveal deposits, features or finds of archaeological significance. A simple sequence of topsoil, between 0.25m and 0.3m deep, was found to overlie either yellow/brown clay or grey boulder clay.

No further features were revealed during topsoil removal of the pipeline corridor in late July 1999. The solitary archaeological feature, revealed in Trench 2, appears to be an isolated linear feature, which in the absence of clearly datable finds would appear to be post-17th-century in date.

Malachy Conway for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Dublin

1999:269

NEWTOWN LINK ROAD, ST MARGARET'S

Cultivation furrows

O120418

99E0028

A second phase of monitoring of topsoil-stripping was undertaken from 10 to 12 March 1999. The area to be stripped lay outside and to the north of the area that had previously been studied archaeologically for the construction of the new road. The area had to be stripped to allow the laying of a drainage pipe leading from the road north to the stream that flows north-eastwards just east of Connaberry Motte and for the construction of a paddock.

As this area lay outside the study area and was close to Connaberry Motte and Dunsoghly Castle, the topsoil was removed using a toothless grading bucket. A series of cultivation furrows was uncovered. They were aligned roughly north-south and were regularly spaced, 3m apart. They varied from less than 55m wide and from 20mm or less to 60mm wide. They were only visible where they cut into subsoil and did not survive in the north-west side of the stripped area, owing to the stony nature of the underlying subsoil there. The furrows were filled with grey, loamy silt, and no finds were retrieved from any of them. However, several sherds of medieval pottery (North Leinster cooking wares and wheel-thrown Dublin wares) were uncovered from the topsoil that overlay them.

The furrows are the remains of ridge-and-furrow cultivation, which is probably of medieval date. The proximity of the site to both the Connaberry Motte and to Dunsoghly Castle means that the cultivation system could have been used by the occupants of either site.

Claire Walsh, Archaeological Projects Ltd, 25A Eaton Square, Terenure, Dublin 6W.

Dublin

2000:0213

BROWNSBARN-KILSHANE BORD GÁIS ÉIREANN PIPELINE

Various

00E0043

Monitoring of topsoil construction for the southern section of the new North-Eastern

Pipeline 3 was carried out in mid-2000. The Bord Gáis Éireann pipeline will extend south from Ballough to Brownsbarn, Co. Dublin, reusing sections of the previously excavated NEP 1 and NEP 2 (1983 and 1988, see Excavations 1988, 43, note by Margaret Gowen). The first stage of the Ballough to Brownsbarn pipeline involved topsoil-stripping from Ballough to Kilshane. This was monitored by Malachy Conway in 1999 (Excavations 1999, 50–1, 99E0395). The construction of the southern section entailed the monitoring of topsoil-stripping from Kilshane to Brownsbarn.

From the southernmost portion of the pipeline at Brownsbarn to the Naas Road (N7) the pipeline ran through relatively low-lying land that has been intensively farmed. A series of plough-truncated cut features was detected in this area. A small, undated pit in Cheeverstown townland contained occasional fragments of animal bone. To the north of this, the possible remains of a fulacht fiadh were revealed in Kingswood townland. This consisted of a pit filled with a mix of charcoal-blackened clay and silt with heat-shattered stone. A large field boundary ditch running on a south-west/north-east axis was found closeby. A possible flint thumbnail scraper was found in ploughsoil at this point.

To the north of the Naas Road in Baldonnell Lower townland a cluster of small, shallow, burnt spreads were observed. These remained undated. Further north in Ballyowen townland an elaborate French drain was revealed. This was composed of mortared side-walls and large lintel stones. To the north of the N4 Galway road in Fonthill townland, a burnt spread was detected on the southern bank of the Liffey. This was resolved by John Ó Néill under licence 00E0447 (see below No. 298).

On the north bank of the Liffey, in Astagob townland, a small modern layer of burnt material was revealed. In December 2000, owing to difficulties in tunnelling under the Liffey at this point, the contractors sought to construct an interconnector pipe between the completed northern section of the pipeline and the previously constructed NEP 2 pipeline some 400m to the east. This entailed excavation along the Strawberry Beds road parallel to the Liffey. A stretch of some 100m was excavated through a ploughed field. A single masonry wall on a north–south axis was revealed. This is likely to be associated with an industrial complex referred to as the ‘New Holland Fruit and Starch Works’, depicted on the 1843 1:10,560 Ordnance Survey map (Sheet 17). In the northern part of Astagob townland a small subcircular pit was excavated. This had a charcoal-rich fill.

Further north, in Ballycoolen townland, a small pit containing charcoal and vitreous slag-like material was found. In the townland of Mitchelstown two modern metallised surfaces were revealed. A shallow charcoal-rich pit was found to the north of this.

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Dublin

2000:0214

BALLYCOOLIN ROAD, CAPPOGE

Adjacent to castle

31064 23986

SMR 14:27

99E0724

Four test-trenches were mechanically excavated in the field opposite the site of Cappoge Castle on the site of a proposed industrial/warehouse development. Field-walking, previously carried out for the purposes of an EIS, located considerable amounts of medieval pottery and oyster shell in the north-western portion of the site, furthest away

from the castle site. Further quantities of oyster shell and sherds of post-medieval pottery were recorded closer to the castle, near a triangular hollow, which was filled with water.

Three of the test-trenches extended radially from that point of the site closest to the castle site for a distance of c. 200m, and a further test-trench was excavated across the north-western portion of the site.

The results of the trenches excavated closest to the site of the castle did not indicate the presence of archaeological deposits. It is likely, therefore, that if associated structures or features existed to the west of the site they are located closer to the castle or underneath the road. Trench 4 did not locate archaeological activity to the north-west of the site. The ploughsoil, however, was rich in pottery, glass and clay pipe fragments. The pottery spanned all periods from the late medieval to the present and was evenly scattered throughout the field.

The evidence from the test-trenching would therefore suggest that the area of the proposed development had always been a greenfield site and that the surface finds were introduced with the topsoil at some period during the last twenty years.

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Dublin

2001:430

Huntstown

No archaeological significance

31064 23986

01E1108

A monitoring brief was undertaken in advance of the expansion of an existing quarry at Huntstown, Finglas, Co. Dublin. The area of topsoil-stripping was c. 10–12 acres. Nothing of archaeological significance was noted throughout all subsurface works within the development area.

Fintan Walsh, Irish Archaeological Consultancy Ltd, 8 Dungar Terrace, Dun Laoghaire, Co. Dublin.

Dublin

2001:456

Newtown

Site of motte and bailey

SMR 14:13

01E1214

An assessment of a proposed development in the townland of Newtown, Kilshane, Co. Dublin, found that one monument, the site of a possible motte and bailey, was located within its boundary. The site was visited in 1952 by a representative from the National Museum of Ireland, prior to its demolition. It was recorded as a circular platform 28m in diameter and 3m in height. The base of the flat-topped platform was enclosed by a wide ditch, which was in turn enclosed by an oval earthwork (100m by 70m). At present the site is only visible as a soil-mark on aerial photographs. Consequently, monitoring of ground disturbance at the site was recommended by the assessment.

Seven test-pits were excavated. No features or artefacts of archaeological significance were revealed. The trenches excavated were small in comparison to the area of the proposed development. Consequently, while no archaeological features were encountered, it is possible that such features do exist, particularly in the vicinity of the

motte and bailey site in the north.

Fiona Rooney, Archaeological Consultancy Ltd, Ballydavid South, Athenry, Co. Galway.

Dublin

2002:0449

Airport–Balbriggan Bypass

Monitoring

00E0953

This report comprises the results of the monitoring of topsoil-stripping and of trenches dug before fence construction and drainage on the Northern Motorway/Airport–Balbriggan Bypass, Contract 1, during 2000 and 2001. The part of the route involved in this phase of the motorway was in County Dublin. The townlands affected by the stripping were Barryspark, Cloghran, Commons East, Drinan, Green Fields, Lissenhall Great, Lissenhall Little, Mantua, Marshallstown, Seatown East, Seatown West and Stockhole.

During the monitoring, four archaeological features were uncovered; as a result, three excavations were undertaken.

Site 1, Stockhole Lane, was reported on in Excavations 2000, No. 342, 00E0376.

Site 2, Stockhole Lane, was reported on in Excavations 2000, No. 343, 00E0950.

Site 3, Stockhole Lane, was reported on in Excavations 2000, No. 344, 00E0951.

Site 4, Drinan (NGR 31937.586 245631.433), consisted of several small areas of charcoal-enriched soil and was 30m to the west of a stream. It was securely fenced off, but subsequently the fencing was removed and the site was destroyed by the subcontractors on the drainage scheme. This area has been scheduled by Fingal County Council to be used as a graveyard.

Site 5, Mantua, had been disturbed previously by the construction of Swords Industrial Park. One area of possible archaeological significance was uncovered during topsoil removal. On examination it was found to consist of charcoal-enriched soil and burnt animal bone. Rotten grass was identified beneath this layer. The deposit was considered to result from work in the adjoining (not associated) building site.

Editor's note: Though carried out in 2001, this excavation was not reported on in time for inclusion in the bulletin of that year.

Patricia Lynch, 27 Hilltown Way, Swords, for Valerie J. Keeley Ltd.

Dublin

2002:0450

Airport–Balbriggan ByPass, Phase 2

Monitoring

00E0953 ext.

Monitoring of trial-pits, topsoil-stripping and drainage trenches was carried out on the second contract of the Airport–Balbriggan Bypass. The following townlands were affected, before the construction of the motorway, bridge, trial-pits, drainage trenches, and access and slip roads: Baldrummon, Ballough, Ballystrane, Bellinstown, Coldwinters, Corduffhall, Hedgestown, Jordanstown, Lissenhall Great, Lissenhall Little, Nevitt, Newtowncorduff, Richardstown, Rowans Little, Staffordstown, Thomondtown, Turvey and Woodpark, all in County Dublin. Twenty-four archaeological features were uncovered, and 22 investigations were undertaken.

- Site 1, Bellinstown, see No. 473 below, 01E0744: Iron Age ring-barrow with three phases of burial activity;
- Site 2, Lissenhall Little (Excavations 2001, No. 444, 01E1074): Early Neolithic habitation site, excavated by Fiona O'Reilly;
- Site 3, Staffordstown, see No. 683 below, 01E0831: fulacht fiadh;
- Site 4, Coldwinters (Excavations 2001, No. 344, 99E0548 ext.): prehistoric ritual site, excavated by Hilary Opie;
- Sites 5 (1 and 2), Coldwinters (Excavations 2001, No. 345, 01E1062): (1) fulacht fiadh, (2) Late Neolithic pit, excavated by Kieran Campbell;
- Site 6, Woodpark, see No. 693 below, 01E1156: small Bronze Age pit with burnt-mound material;
- Site 7, Richardstown, 02E0050: small Bronze Age pit containing cremated bone, not excavated;
- Site 8, Newtowncorduff (Excavations 2001, No. 457, 01E1124): Iron Age ring-ditch with associated Neolithic arrowheads, excavated by John Channing;
- Site 9, Nevitt, see No. 633 below, 01E1155: no archaeological significance;
- Site 10, Woodpark, see No. 694 below, 01E1157: no archaeological significance;
- Site 11, Woodpark, see No. 696 below, 02E0051: small pit with associated medieval pottery;
- Site 12, Ballystrane, see No. 469 below, 02E0052: no archaeological significance;
- Site 13, Ballystrane, see No. 468 below, 00E0953 ext.: no archaeological significance;
- Site 14, Richardstown, see No. 654 below, 02E0014: the feature was modern in origin;
- Site 15, Richardstown, see No. 656 below, 02E0128: kilns excavated by Kieran Campbell;
- Site 16, Corduffhall, see No. 502 below, 02E0038: burnt-mound material, not excavated;
- Site 17, Ballough, see No. 457 below, 02E0078: ditch containing medieval pottery, excavated by Robert M. Chapple;
- Site 18, Corduffhall, see No. 501 below, 01E1158: no archaeological significance;
- Site 19, Woodpark, see No. 695 below, 02E0042: no archaeological significance;
- Site 20, Thomondtown, see No. 690 below, 01E1159: fulacht fiadh;
- Site 21, Thomondtown, see No. 691 below, 01E1160: fulacht fiadh;
- Site 22, Colecot, see No. 500 below, 00E0953 ext.: possible fulacht fiadh;
- Site 23, Ballough, see No. 458 below, 01E1138, Bronze Age pits and related burnt-mound material, excavated by Robert M. Chapple;
- Site 24, Nevitt, see No. 634 below, 02E0053: no archaeological significance.

Editor's note: Though carried out in 2001, this excavation was not reported on in time for inclusion in the bulletin of that year.

Patricia Lynch, 27 Hilltown Way, Swords, for Valerie J. Keeley Ltd.

Dublin

2002:0636

Newtown

Near motte and bailey

SMR 14:13

01E1214 ext.

Testing was recommended to assess the potential impact on archaeological remains in the area of the proposed development at Newtown, Kilshane, and to establish a buffer zone around the motte and bailey situated in a field proposed for development. During 2001 seven test-pits were excavated by Fiona Rooney; no features or artefacts of archaeological significance were revealed (Excavations 2001, No. 456).