CONSTRUCTION MANAGEMENT PLAN

FOR

DEMOLITION OF EXISTING BUILDINGS AND CONSTRUCTON OF A NEW RESIDENTIAL DEVELOPMENT

AT

GLENCARRIG,
CELBRIDGE,
CO. KILDARE

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Provision of a residential development on a site where significant demolition works are to take place prior to construction works commencing. The development will comprise of both apartment and housing dwellings, works will include ancillary site works + associated landscaping at Glencarrig, Celbridge, Co. Kildare. This plan is based on information received to date from the client and the design team members.

General Statement of Health and Safety Principles and Objectives for the Project

The project will be carried out in accordance with the Safety, Health and Welfare at Work Act Construction Regulation 2013.

Details of the works are indicated in the contract documentation and the drawings, specifications and schedules which were provided under a separate cover by others.

Health & Safety Objectives for the Project

To comply fully with all relevant legislation and regulatory requirements to provide a safe working environment, commit to continual improvement in health and safety performance, to reduce or where possible eliminate risks. Provide training to employees to ensure competency in the performance and execution of their duties.

To consult and communicate with all employees and contractors in matters relating to health and safety to ensure all understand their obligations and take responsibility for their own safety and the safety of their colleagues, contractors and visitors.

1.0 DESCRIPTION OF PROJECT

1.1 PROJECT DESCRIPTION

1.1.1 General Description of Site

This development will be situated at Glencarrig, Celbridge, Co. Kildare. The subject site currently contains a number of existing buildings to be demolished prior to construction works commencing. The exact nature of the demolition works will be detailed by the engineer. The site is situated in a busy residential area, with occupied dwellings to the north of the site. The site is bounded to the east Hazel Hatch Road and to the south Simmonstown Road. There is 1no. large detached dwelling and outbuildings on the northern end of the site and these will be demolished before the construction stage. Access to the site is currently provided off the Simmonstown Road to the south. There is an existing overhead line coming into the site running parallel to the entrance. The contractor is to use goal posts and must fully comply with the ESB Code of Practice for Avoiding Danger from Overhead Lines. In relation to parking for site staff, the works will be organised to provide for on-site parking for staff throughout the construction period. There is an attenuation tank area proposed beneath the central open space. This will be one of the first items constructed. When the tank is in place and covered this will become a parking area for the duration of the construction and the landscaping of this area will be a final undertaking at the end of the construction period – at which time, staff parking can be accommodated in the newly paved parking areas. Below is a site plan of the proposed development, this drawing is from the project architect John Fleming Architects, Drawing No. HZL-JFA-SP-00-DR-A-P1003 Site Layout Plan.

1.1.2 General Description of the Works

The proposed development will consist of:

(a) the demolition (total area approx. 800 sqm) of the existing buildings on site and the existing front boundary treatment; and
(b) the construction of a new residential and creche scheme of 137 no. units in a mixture of houses and apartment units ranging from 2 to 5 storeys in height as follows:

- Block A (3-5 storey apartment block) comprising 39 no. apartments (19 no. 1 bed and 20 no. 2 bed units)

- Block B (4-5 storey apartment block) comprising 51 no. apartments (24 no. 1 bed and 27 no. 2 bed units)

- Block C (3-4 storey apartment block) comprising 25 no. apartments (11no. 1 bed and 14no. 2 bed units)

- Houses (2 -3 storeys) comprising 22 no. house units (5no. 4-bed semi-detached, 4no. 3 bed semi-detached, 4no. 3-bed terraced and 9no. 3-bed end of terrace).

A separate building will accommodate a Childcare Facility/creche of approx. 248 sqm with outdoor play area of 460 sqm. Bike Store building (86 sqm) and Plant Room/ ESB-Sub-station building (66.9 sqm).

Each residential unit will be afforded with private open space in the form of a balcony or terrace in the case of the apartment units and a rear garden in the case of the housing units. Public open space is proposed in the form of play areas, outdoor seating and planting and pedestrian and cyclist links (approx. 4,380 sqm).

A total of 135no. car parking spaces are provided at surface level, including 7 no. Accessible spaces; 80 no. bicycle spaces (for Visitors and Residents, in bike stands) together with 124 no. Secure bicycle spaces within 4no. Bike stores.

The development shall be served via a new vehicular access point from the L5062. Upgrade works are proposed to the vehicular access point from the R405 onto the L5062 to facilitate the proposed development and to provide for improved access and egress for the overall development.

New pedestrian and cyclist access points will be provided on to the R405 from the site. The associated site and infrastructural works include provision for water services; foul and surface water drainage and connections; attenuation proposals; permeable paving; all landscaping works; boundary treatment; internal roads and footpaths; waste storage areas and electrical services and all associated site development works.

The location of site compound facility and access routes will be detailed in a separate traffic management plan, with works sequencing to be planned to allow for sufficient compound facilities to be provided throughout the duration of the project.

The phasing of the construction works will be as follows;

- Site Mobilization: Secure site, establish site compound facility, internal traffic routes, equipment and materials
- Demolition works – will be detailed by the engineer.
- Site Clearance: Remove existing topsoil and demolition waste from site, survey and mark out various elements of the construction works as required
- Construction: Construct 22no. houses and 3no. apartment blocks. It is anticipated that the development will be constructed in 1 phase.

- Landscaping: Significant landscaping will be required as well as the establishment of a public open space.

Construction is proposed as:

In relation to the overall works particular attention is drawn to the following:

- A traffic management plan will be required to take into account deliveries and removals including a CSCS as required, e.g. signing, lighting, and guarding. Deliveries are to be planned to avoid peak school times.

- The demolition contractor is to take note of all findings from the site investigation study completed on the existing site.

- A refurbishment and demolition survey for asbestos containing materials, prior to any demolition works commencing.

- Ensure the safety of the public for the duration of the works. Hoardings and signage will be erected to prevent unauthorised access to the site.

- Prior to commencement the contractor shall make enquiries to establish the position of any existing services within or adjacent to the environments of the site. The PSCS shall check for the existence of all services in the area of work and locate and mark or arrange for the owning authorities to locate/mark any services which may be affected by the works. The contractor shall review utility services drawings. The contractor should take all normal precautions against the risk of exposure to any live underground and overhead services within and in the vicinity of the site area.

- Excavation will require job specific method statement and support as appropriate.

- Hazardous levels of noise and dust to be controlled by the contractor. The PSCS must do everything possible to minimise disruption, disturbance, noise, arising from construction activities. This must be monitored to ensure it does not affect the surrounding activities. The contractor is required to take account of conditions of planning permission in relation to noise levels, working times and adjacent areas.

- Given the location deliveries/ removals are to phone ahead, receive precise directions and named person to liaise with on site. Contractor to erect required signage approaching site and ensure deliveries are programmed to cause minimal disruption.

- Contractors to appoint temporary works designer as required for development of design. Design to be submitted to the PSCS, PSDP and permanent works designers in advance of works being carried out.

- Main contractor to monitor level of vibrations on site to ensure maximum levels are not exceeded due to works being in close proximity to local residents.

- No person other than a competent scaffolder will be permitted to alter, erect, dismantle or otherwise interfere with any scaffolding. Scaffolds must be erected on ground or surfaces that have been prepared, levelled and consolidated.

- The contractor must ensure that work to be completed should be segregated and should not interfere with the public as far as reasonably possible particularly at the entrance to the site where construction vehicles will be required to cross the public pedestrian footpath. There shall be perimeter site fencing/ hoarding to secure the site. All works to be carried out in the vicinity of the public road to be appropriately planned and agreed in detail in accordance with

Regulation 97 of the Safety Health and Welfare at Work Construction Regulations 2013 and should comply with Chapter 8 of the Traffic Signs Manual.

- The risk of falling from height is consistent with normal construction including leading edge during construction, service voids, exposed floor/ roof edges and deep excavations. Take particular note of lift shafts, service ducts and smoke shafts during the construction period.

- Appropriate P.P.E. is required to be used by all operatives working on the site.

- Provision for maintaining the stability of the structure during the construction period and provision of appropriate temporary works design to be allowed for.

- Hazardous manual handling operations are to be avoided so far as is reasonably practicable.

- The PSCS must ensure that all works are carried out in accordance with the Health and Safety Authority guide Code of Practice for Avoiding Danger from Underground Services and also the ESB Code of Practise for Avoiding Danger from Overhead Lines.

- Provisions for appropriate disposal of waste will be required. The contractor is required to comply with planning permission conditions in relation to Waste disposal.

- Ensure the safety of the public for the duration of the works. This will require overall management and supervision of site access taking into consideration existing site restrictions and constraints. Protective hoarding to be erected. Procedures to be in place to prevent unauthorised access onto the site. Hoarding/ protection will be required to ensure unauthorsied access into the live site. Prevention against unauthorised access to site area, design and specification. Signage and barriers to be erected.

Note that waste generated by the project to be in compliance with Waste Management Act 1996 and Waste Management (amended) Act 2003 and associated Regulations.

1.1.3 Location and Layout of the Project

This development will be situated at Glencarrig, Celbridge, Co. Kildare. The subject site currently contains a number of existing buildings to be demolished prior to construction works commencing. The site is situated in a busy residential area with occupied dwellings to the north of the site and farmland to the south and west of the site. The site is bounded to the east by the Hazel Hatch Road. There is 1no. large detached dwelling situated in the centre of the site and outbuildings situated to the north of the site. Access to the site is currently provided off the Simmonstown road located to the south of the site.

A road traffic management plan is required before the construction stage. Among other items it shall consider;

1. Access arrangements for labour
2. Access arrangements for plant and materials
3. Location of plant and equipment
4. Traffic management – debris removal;

1.1.4 Time Scales for the Completion of the Project

Project Programme

The project is expected to take a total of 24 months.

Reviewing the information made available to us, we would consider the time scale reasonable given that the contractor allocates adequate resources to ensure completion of the Works by the completion dates and the scope of works not being altered.

1.1.5 The Project Supervisor (Construction)

The PSCS is required to assess whether the intended programme and initial dates stated in the tender documentation are achievable in view of the Safety and Health issues.

1.2 DETAILS OF DESIGNERS TEAM

The Client, for the purposes of the Safety Health & Welfare at Work (Construction) Regulations 2013 is.

1.2.1 The Client:

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Dublin 12

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1.2.2 Architect

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Clonskeagh

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1.2.3 Civil & Structural Engineers

Kavanagh Burke Consulting Engineers
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Ballymount
Dublin 12

Contact: Declan Lawlor
Telephone: +353 (01) 4500694

1.2.4 Landscape Engineer

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Rathcoole,
Co.Dublin
Ireland

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Email: ronan@RMDA.ie

1.2.5 Health & Safety Consultants/ Project Supervisor (Design Process)

Garyaron Homes Ltd
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1.3 EXTENT AND LOCATION OF EXISTING RECORDS AND PLANS

1.3.1 Safety Statements

The Safety Statement of the Main Contractor should be appended to the Developed Safety and Health Plan for the Construction Stage.

1.3.2 The Safety File

The Project Supervisor for the Construction Stage should coordinate arrangements among contractors to ensure the provision of relevant information, in writing, necessary for the project supervisor for the design process to complete the safety file referred to in Regulation 13, monitor the implementation of the arrangements and take any necessary corrective action, as set out in Regulation 20, and provide in writing to the project supervisor for the design process all relevant information necessary for that project supervisor to complete the safety file referred to in Regulation 13.
The Project Supervisors for the Design Process will prepare a safety file appropriate to the characteristics of the project, containing relevant safety and health information, including any information provided under Regulation 21, to be taken into account during any subsequent construction work following completion of the project, and promptly deliver the safety file to the client on completion of the project.
Note that the PSCS safety file information for construction is to be available upon completion. This information to be collated and formatted prior to this stage in consultation with the PSDP to enable handed over to the client in a timely manner.

(Allow for 2 hard copies and a digital copy of the safety file information)

2.0 CLIENT'S CONSIDERATIONS AND MANAGEMENT REQUIREMENTS

2.1 STRUCTURE AND ORGANIZATION

Garyaron Homes Ltd
Unit H2
Merrywell Business Park
Ballymount
Dublin 12

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Email:garethmchale@yahoo.com

2.2 RECORD KEEPING, MONITORING AND REVIEW

Record keeping is required for proof of compliance as well as for monitoring the effectiveness of the health and safety management system.

Records should include:

- The risk assessments, hazards and precautions
- Written work instructions, including those related to safety
- Training records and list of authorised persons
- Inspection and maintenance records, including those for PPE, and especially those relating to the statutory examinations of plant and machinery
- Any permits to work
- Equipment specification, CE compliance and any noise level figures provided by the manufacturer.
- Records of any reported defects, incidents or accidents and actions taken (this will also include accident investigation reports).

2.3 PERMITS AND AUTHORIZATION REQUIREMENTS

The following operations will need to be undertaken by means of a permit to work system.

- All metal grinding or other abrasive wheel work, or sand blasting.
- Hot works
- Hazardous material removals

2.4 EMERGENCY PROCEDURES

LPC Guidelines in relation to Fire Safety on Construction Sites are to be adhered to.

A number of site specific rules are brought to the attention of the contractor. Variations or amendments to these must be agreed by the Client and the Project Supervisor for the Construction Stage, otherwise they are to be applied to site operations in full.

The contractor shall draw up an appropriate list of rules covering site safety and site personnel and submit it for discussion to the Project Supervisor Construction Stage.

The contractor / PSCS shall include a site fire escape plan indicating e.g. assembly points, escape routes etc.

2.5 SITE RULES

A number of site specific rules are brought to the attention of the contractor. Variations or amendments to these must be agreed by the Client and the Project Supervisor for the Construction Stage, otherwise they are to be applied to site operations in full.

The contractor shall draw up an appropriate list of rules covering site safety and site personnel and submit it for discussion to the Project Supervisor Construction Stage.

2.5.1 Site Specific Rules

Define and maintain safe pedestrian and vehicular routes.

Provide secure materials storage.

The Contractor shall implement an appropriate booking in and out and induction system for all site operatives and visitors.

Site working hours: The proposed working hours on this project will be set out by the planning authority.

Warning signs sealed off access signs/barriers and "out of bounds" notices must be provided where relevant as the works proceed.

Contractor to comply with general fire safety regulation and ensure compliance with the fire protection system.

The PSCS will confirm working hours prior to the commencement of the project and shall be in accordance with the planning authority conditions. Deviation from the agreed times will only be allowed in exceptional circumstances where prior written approval has been received from the planning authority.

Variations to the site specific rules will be accepted subject to an agreed procedure to ensure a satisfactory level of site control and safety management is maintained at all times.

Provide appropriate edge protection while working adjacent to roof perimeters and changes of level.

The use of hot work methods on the site will not be permitted, without a Permit to Work System.

Procedures for the emergency evacuation of the site and for the call-out of emergency services must be established prior to the commencement of the works and be incorporated within the Construction Phase Safety and Health Plan.

The Contractor shall ensure the exclusion of personnel or sub-contractors with unsatisfactory safety records unless evidence of retraining can be shown.

The Contractor's accommodation, welfare facilities, workshops and storage containers must be located within the curtilage of the site. Provision of welfare facilities and details shall be included within the Construction Phase Health and Safety Plan. This shall include full details of emergency procedures, First Aid equipment, location of trained First Aid personnel and emergency telephone.

Unauthorised access must be prevented during and out of normal working hours. Site personnel and visitors must be controlled.

The contractor must ensure, so far as is reasonably practicable, that noise and vibration is kept to a minimum throughout the course of the Contract.

The contractor must ensure, so far as is reasonably practicable, that the generation of dust, fumes and smoke is kept to a minimum throughout the course of the Contract.

The contractor is to ensure that all cables, loose wires etc and other trip hazards are avoided and procedures are implemented to prevent their occurrence.

2.5.2 Training

General Requirements

The contractor is required to provide suitable training and instruction, to minimise risk of injury to employees and other persons using the workplace. Three types of training should be considered.

1. **Induction -** ensuring that new recruits are clear about the key rules, and the need to follow them and accept supervisory scrutiny and guidance from experienced colleagues.

2. **Basic Training -** usually provided as a formal training programme either provided in a block or in short modules during the first days / weeks of working.

3. **Reminder / skill development -** best provided topic by topic in 10 minute "toolbox talks" with an opportunity for staff to comment and ask questions, thereby forming part of the organisation's employee staff consultation process.

2.5.3 Training for Persons Directly Involved

All those workers who operate and maintain plant and machinery, or work in the field of operations operatives, and their direct supervisory staff should receive training and instruction.

2.5.4 Instruction for Other Persons on Site

Other contractors and visitors, who enter the area where operations take place, should be aware of the hazards likely to be present and the safety rules and procedures they must observe. These will include the emergency procedures for First Aid etc., and the prohibition on anyone operating or working on cutting machinery unless trained and authorised. The degree of detail needed for these other staff and visitors who are not directly involved in the operations may not be as great as for the workers who operate, maintain and clean the machine. Written details should be given to contractors together with other site rules before they come on site.

2.6 ACTIVITIES ON OR AJDECENT TO THE SITE DURING THE WORKS

2.6.1 Surrounding Land Use

Surrounding land use contains additional residential accommodation and farmland.

2.6.2 Planning Conditions & Requirements for Preservation

The contractor will refer to the Client for details of planning approvals and any conditions imposed upon the project prior to going on site.

2.6.3 Existing Services

Prior to commencement the contractor shall make enquiries to establish the position of any existing services within or adjacent to the environments of the site. The PSCS shall check for the existence of all services in the area of work and locate and mark or arrange for the owning authorities to locate/mark any services which may be affected by the works. The contractor shall review utility services drawings. The contractor should take all normal precautions against the risk of exposure to any live underground and overhead services within and in the vicinity of the site area. The contractor is to ensure compliance with the Code of Practice for Avoiding Danger from Underground Services and also the ESB Code of Practise for Avoiding Danger from Overhead Lines.

All existing gas pipes, water pipes, electric cables, sewers, drains and other services which do not in the opinion of the Engineer require to be changed in location, shall be carefully supported and protected from damage by the Contractor and in the case of injury shall be restored by him to as good condition as that in which they were found.

2.6.7 Existing Traffic System & Access Storage and Contractors Vehicles

The agreed access route should be established and defined pedestrian and vehicular access and entrance signage should be in place before work commences. It is proposed that construction access shall be from Simmonstown Road.

The road and existing site lines must be kept clear at all times. The parking of Contractor's vehicles should be set out on site and agreed. Visibility at the site entrance in particular should not be affected.

The Contractor shall submit proposals for on-site storage areas for approval by the Project Supervisor (Construction) and segregate these from the works.

The Contractor shall submit and agree with any other Contractors a programme of deliveries and access requirements.

All deliveries to the site shall be made via the approved access roads. Adequate manning and use of banks man to be allowed. The Contractor shall submit proposals for on-site storage areas for approval by the Project Supervisor (Construction) and segregate these from the works. Prior to works commencing on site

The Construction Phase Safety and Health Plan shall incorporate a drawing which shall clearly define the areas of the contractor's operations.

2.6.8 Contractor's Personnel and Site Visitors

The Contractor shall implement an appropriate booking in and out system for all site operatives and visitors. Contractor's personnel shall carry appropriate identification at all time on site. All site

personnel to have Safe Pass and Construction Skills Certification where appropriate. Unauthorised access to the site should be prevented. Site safety representative shall be appointed. The contractor shall institute a formal site induction procedure including issue of P.P.E. as appropriate for all personnel.

2.6.9 Vehicular Transitional Hazards

A speed limit of 5 km per hour should be observed on site.

It is essential that a traffic management plan is developed taking account of access egress routes, high volumes of surrounding traffic and requirements for emergency access to the site.

2.6.10 Pedestrian Transitional Hazards

Warning signs sealed off access signs/barriers and "out of bounds" notices must be provided where relevant as the works proceed.

The contractor is advised of the requirements for safe pedestrian access to be maintained at all times to the rest of the site.

Temporary signs, sealed off access signs, barriers and "out of bounds" notices will be provided where relevant as the works proceed.

Hoarding and site security generally must be of a high standard.

Site access points must be manned and monitored at all times when work is in progress, and secured when work is not in progress.

2.6.11 Contractor's Deliveries

Contractor's deliveries must only be made at agreed times and must not disrupt other road traffic.

Deliveries must be immediately secured within the contractor’s area of operation. Deliveries shall not be deposited, even temporarily, where others may gain access.

2.6.12 Existing Structures and Buildings

There are existing buildings on the site which are to be demolished prior to construction works commencing, a pre-refurbishment/ demolition asbestos survey must be carried out on all existing structures to be demolished prior to any demolition works taking place.

2.7 CONTINUING LIAISON

The following procedures shall be in place with respect to considering the Health and Safety implications of design decisions, which remain to be made or where design changes occur or where time required for the completion of the project or phases of the project occurs.

The relevant design decisions, design changes or time changes should only be those which materially affect the information provided with respect to particular risks as defined under the Regulations or to the nature and scope of the project as to the extent necessary to enable the Project Supervisors to comply with the Safety Health and Welfare at Work (Construction) Regulations, 2013.

The Project Supervisor (Construction Stage) will promptly bring to the attention of the Project Supervisor Design Process any such design decisions that he is aware of.

Designers are to notify promptly both the Project Supervisor Design Process and Project Supervisor (Construction Stage) of design decisions and provide them with sufficient information, i.e. copies of documentation etc., in order for them to carry out the necessary assessments before the revised work is carried out and to give directions regarding same when the assessment has been completed.

The Project Supervisor Design Process will be copied with the minutes of all on site meetings where design decisions are involved and all written instructions or confirmation of verbal instructions issued by the Design Team which are relevant decisions or changes as defined above.

The Project Supervisor Design Process and the Project Supervisor (Construction Stage) shall meet as necessary to co-ordinate information received from all designers. The frequencies of such meetings are matters to be addressed by the Project Supervisor (Construction Stage) in the developed Health and Safety Plan. Health and Safety must be headed up as an item to be addressed at all Project Site meetings, including the contractors' meetings with designer's subcontractors, suppliers, employees etc.

Where unforeseen eventualities arise during project execution resulting in substantial design changes or affecting the time period for the project, the Designers shall promptly notify the Project Supervisors (Design Process) and (Construction Stage) and provide these with relevant information together with the Designer's Risk Assessment. Directions shall be issued as necessary by the Project Supervisor (Construction Stage) acting on the information and work assessment supplied.

2.8 SECURITY ARRANGEMENTS

Security arrangements are to be put in place by the PSCS to prevent unauthorised access, this includes restricting access for both pedestrians and plant/vehicles.

2.9 TEMPORARY WORKS MANAGEMENT COORDINATION

The main contractor is to allow for the appointment of a designated competent person to take overall design responsibility for the stability of the environs of the works during the construction phase and a competent temporary works engineer, both of whom are to liaise with the PSDP and PSCS. Co-ordination of temporary works is to occur with the use of temporary works design certificates as issued by the Health and Safety Authority with the process as per the following flow chart.

Identification of temporary works design items is the responsibility of the PSCS / temporary works designer and given the fluid nature of the building process should be constantly monitored and reviewed. Provision of design to the permanent works engineer and the PSDP is to be provided allowing adequate time frames for appropriate assessment.

2.10 WORKS AFFECTING PUBLIC ROAD

In the event of any works which could affect the public, the following is to be noted.

The contractor/ PSCS is required to provide adequate guarding and lighting appropriate to the circumstance, traffic signs should be placed and maintained where necessary, operated as reasonably required for the safe guidance or direction of persons with regard to the needs of people with disabilities. The contractor/ PSCS shall comply with Regulation 97 of the Safety, Health and Welfare at Work (Construction) Regulations 2013.

Works to roads, footpaths and cycle tracks shall be carried out and supervised by competent persons who have been issued with a valid construction skills registration card, i.e signing, lighting and guarding on roads.

At all times when workers are on site and works are in progress on roads, footpaths and cycle tracks at least one person who has been issued with a valid construction skills registration card, i.e signing, lighting and guarding on roads"

Where any construction work obstructs a roadway or where pedestrians, persons with disabilities or cyclists on a cycle track that forms part of a footpath are diverted onto the road the contractor is required to have in place on site at all times at least one person who has been issued with a valid constructions skills registration card when road signing, lighting and guarding is being installed, modified or removed.

The contractor's proposed personnel holding a valid construction skills registration card will have responsibility for the implementation of the signing, lighting and guarding of the site in question to protect the safety of persons at work and others while the works are being completed. The works must be monitored and corrective action taken where required.

Works in this regard may be required for connection of drainage.

Provisions for works affecting internal vehicular and pedestrain routes are to be simmilar and laid out in the traffic and management plan.

3.0 ENVIRONMENTAL RESTRICTION AND EXISTING ON-SITE RISKS

3.1 THE DESIGN AND PARTICULAR RISKS

3.1.1 Designer's Risk Assessments

The Contractor's designers, (including those of subcontractors) in respect of Contractor design items, will be required to develop the necessary Risk Assessments before commencement of the appropriate section of the works. Reference should be made back to the Project Supervisor Design Process as design development or major changes to design occur. The design team shall prepare design risk assessments during the design phase and submit to the PSDP for inclusion in the Preliminary Safety & Health Plan.

The Contractor is to consider and make provision to minimise the identified risks during the construction phase. The schedule will not be an exhaustive list and the Contractor should exercise due care and diligence throughout the works together with continued liaison with the Project Supervisor Design Process as required for Design Amendments which may affect Safety and Health issues.

3.1.2 Risk Assessments

Risk Assessments will be developed prior to work commencing on site to identify risk and implement necessary control measures.

3.1.3 Contractor's Method Statement

Updating of Risk Assessment Method Statements (RAMS) will be required throughout the project.
There are particular method statements for each work element. The contractor will be advised of a non-exhaustive list of method statement at tender stage. The contractor is to ensure that method statements are available for all specific work activities.

3.1.4 Contractors Design

The Project Supervisor (Construction) will ensure that the Project Supervisor (Design) is informed of any design issues which may have Health & Safety implications.

Note: Designers as defined under the Regulations has a broader definition than just activities by the Design team (see Regulation 2 definitions) of S.I. No 291, Safety, Health & Welfare at Work (Construction) Regulations, 2013.

3.2 SAFETY OF PERSONNEL ON SITE

3.2.1 Plant & equipment

Care should be taken to ensure that plant equipment is:

(a) of an appropriate type and standard having regard to the location and type of work involved,
(b) in the charge of a competent operator, and
(c) maintained in good working condition at all times.

The equipment should be of adequate power and stability for the use intended. The operator should be experienced in the use of equipment and there should be a high standard of inspection and maintenance.

Plant and equipment should comply with the requirements of all applicable British Standards

3.2.2 Protection of Site Personnel

During operations all operators should wear adequate protective clothing and, where appropriate, protective equipment such as safety goggles, ear defenders and respirators, complying with the requirements of the appropriate British Standards. Relevant standards include, but are not limited to, the following:

BS EN 136:1998	Respiratory protective devices. Full face masks. Requirements, testing, marking.
BS EN 167 :2002	Personal eye protection. Optical test methods.
BS EN 168:2002	Personal eye protection. Non-optical test methods.
BS EN 169:2002	Personal eye protection. Filters for welding and related techniques. Transmittance requirements and recommended use.
BS EN 345:1993	Safety footwear for professional use
BS EN 362:1993	Personal protective equipment against falls from a height. Connectors
BS EN 364:1993	Personal protective equipment against falls from a height. Test methods
BS EN 365:1993	Personal protective equipment against falls from a height. General requirements
BS EN 371:1992	Specification for AX gas filters and combined filters against low boiling organic compounds used in respiratory protection equipment.
BS EN 371:1992	Specification for SX gas filters and combined filters against specific named compounds used in respiratory protection equipment.

High levels of noise can cause permanent hearing damage to workers. Attention is drawn to the Health and Safety Executive Publication *Code of practice for reducing the exposure of employed persons to noise,* which contains advice on the levels of noise that are a serious hazard and the precautions that can be taken. When noisy machinery is used, ear defenders may be necessary.

For specific operations where intervention or action levels have been or will be identified in relation to heavy metals in particular, which may prejudice the health of persons using the site, special precautions should be taken regarding protective clothing, goggles and the use of respirators.

3.3 OTHER PRECAUTIONS

3.3.1 General

- Every working place and approach and all openings dangerous to persons employed and others should be properly illuminated and protected.
- Before carrying out any part of the work the contractor should consider prevailing weather conditions and weather forecasts. Attention should be paid to the effects of wind (especially when operating cranes).
- When materials and debris are lowered, care should be taken to prevent the material from swinging in such a manner that it creates a danger to the safety of either personnel or the surrounding structure.

3.3.2 Confined Spaces

Potentially any enclosed structure in which people work, could be or could become a confined space. Examples of possible confined spaces include any vessel, tank, container, vault, silo, hopper pit, bund, pipe, sewer, flue, well, chamber, compartment, cellar or similar space (e.g. lift well, excavations, basement areas, roof space or sealed room etc) by virtue of its enclosed nature creates conditions which give rise to a likelihood of accident, harm or injury of such nature as to require emergency action due to:

(a) the presence or reasonable foreseeable presence of
  (i) Flammable or explosive atmospheres (e.g. flour dust)
  (ii) Harmful gas, fumes or vapours
  (iii) Free flowing solid or an increase level of liquid (consider basin location)
  (iv) Excess of oxygen
  (v) Excessively high temperature

(b) The lack or reasonably foreseeable lack of oxygen

Examples of possible confined spaces include working in/near foundation trenches, possibly attenuation tank, basement plant areas, basement under croft.

Note: these are just examples; any enclosed structure has the potential to become a confined space. Due to the transient nature of the construction process, identifying potential confined spaces is an ongoing activity for the PSCS.

3.3.3 Electrical Hazards

Prior to commencement the contractor shall make enquiries to establish the position of any existing services within or adjacent to the environments of the site. The PSCS shall check for the existence of all services in the area of work and locate and mark or arrange for the owning authorities to locate/mark any services which may be affected by the works. The contractor shall review utility services drawings. The contractor should take all normal precautions against the risk of exposure to any live underground and overhead services within and in the vicinity of the site area.

The main hazards arising from electricity on this project include electric shock, burns, fires and explosions. A planned schedule shall be used for the testing and inspection of portable electrical equipment. This shall include the strength and capability of electrical equipment, protection against adverse/hazardous conditions. Persons working on electrical equipment shall have the necessary competence requirements to carry out their work safely and not endangering themselves or others.

When mechanical plant is used, care should be taken to ensure that no part of such machines can come into direct contact or in close proximity to overhead cables.

NOTE: Additional safety advice on the danger from electricity overhead lines and underground cables is given in Guidance Noted GS6 published by the Health and Safety Executive and in the booklet *Recommendations on the avoidance of danger from underground electricity cables* published by the National Joint Council Utilities Group of British Telecom, the Electricity Council, British Gas and the British Water Council and E.S.B. Guidelines code 9803203, Health & Safety Authority which are similar in scope. The ESB Code of Practice for Avoiding Danger from Overhead Electricity Lines and The Code of Practice for Avoiding Danger from Underground Services must be taken account of when working with electrical hazards.

3.3.4 Fire or Explosion Risks

Precautions should be taken to prevent the risk of fire or explosion caused by gas or vapour. When the thermal reaction or thermal lancing methods are used, consideration should be given to the prevention of oxygen enrichment and the attendance risk of explosion or ignition of flammable vapour. Containers of oxygen, acetylene or liquefied petroleum gas should be handles with care and stored and used in accordance with good practice.

Gas cylinder and similar containers, whether empty, in use or spare, should be stored in a safe place, in accordance with good practice, since if they become involved in a fire any resulting explosion may cause injury to persons and damage to property.

Flammable liquids shall be used only in small amounts in approved, self-closing safety cans and shall be stored in approved flammable liquid cabinets.

“NO SMOKING” signs shall be posted where appropriate and will be strictly observed.

Access to fire extinguishers and other fire fighting equipment must not be obstructed.

Water-type extinguishers shall not be used on electrical fires.

Know the location and the correct operation of the nearest fire extinguisher.

When used, fire extinguishers shall be recharged prior to being returned to service.

Fire extinguishers shall be inspected at least monthly and shall be maintained fully charged.

Report all fires to your supervisor.

A Company Welding and Flame Permit shall be issued before welding or cutting in close proximity of flammable and combustibles.

3.3.5 Safety and Convenience of Third Parties

A person carrying on operations should make sure that any works partially complete and its site is, so far as is reasonably practicable, properly secured or closed against entry at all times when operations are not in progress. The site should be left in a safe condition at the close of each day’s work.

All reasonably practicable steps should also be taken to prevent the exposure of third parties to substances hazardous to health that are or could be present during operations work.

3.3.6 Excavations

Numerous hazards associated with excavation work exist: contact with over ground/underground lines/services, collapse of excavation sides, materials, vehicles and people falling in to the excavation, materials falling onto people in the excavation, people being struck with plant, groundwater, soil, fumes and accident to members of the public.
A safe system of work plan shall be used for the start of each new activity. Supervisions must be completed at the start of each activity and reviewed appropriately. A competent person shall supervise the installation, alteration or renewal of excavation supports. The contractor is to ensure compliance with the Code of Practice for Avoiding Danger from Underground Services.

See also the Health & Safety Authority's Publication: A Guide to Safety Excavations.

3.3.7 Working at Height

Work at height is work in any place, including a place at, above or below ground level, where a person could be injured if they fell from that place. Taking this into account, work at height activities shall be identified as the works progresses. The regulations shall be applied continuously throughout the project, most notably during work in/near excavations in addition to the extension and even the refurbishment works.
The main onus in relation to these regulations include: to carry out a risk assessment, to follow the General Principles of Prevention (taking steps to prevent, avoid or reduce risks) and finally to choose the correct equipment and select collective measures to prevent falls (i.e. guard rails, working platforms etc.). These should be selected before other measures which may only reduce the distance and the consequence of the fall.

A safe system of work is required when planning to do work at a height. This system should include; appropriate supervision where necessary, weather conditions workers may be exposed to and emergency/rescue procedures that may be required.

3.3.8 Housekeeping

This is a significant issue during the internal works. It's also important within the designated site compound.
The main onus on all contractors is related to their organisation/co-operation with a view to protecting workers & preventing accidents on site. The main issues that need to be addressed continually include general material storage, access & egress within the site and ensuring that traffic routes (horizontal & vertical) are kept clear. Housekeeping is vital to prevent slips, trips and falls and falling materials. It should cover the storage, use, cleanup and adequate disposal of materials. Good housekeeping results in a safe, efficient and non-polluting site.

3.3.9 Demolition

- Demolition is a hazardous operation and the methods, material and equipment used should be accord with the need to safeguard life and property. It is essential that precautions be taken both before and during actual construction. Such precautions may be categorized under the following three headings:
- Precautions aimed at safeguarding those engaged on the site of the works;
- Precautions that are necessary for the safety and convenience of persons not connected with the works, including members of the public;
- Precautions necessary for the protection of property likely to be affected by the construction works;

During the demolition process, consideration should include the following:

- The sequence & method of proposed demolition
- Details of the plant required, including the capacities and location of the cranes and the methods pf placing and recovering plant to be used enclosed within the structure
- Site traffic plan, detailing arrangements for, and the control of site traffic
- Contingency arrangements, for e.g. partial collapse
- Detailed programme and timetable of event
- Arrangements for protecting the public (site security, containment of demolition materials etc
- Arrangements for structural stability (avoidance of unplanned, including premature collapses, details of any temporary works to provide support, designed by a competent engineer)
- Safety of the workforce (details of personnel access and working platforms, including the procedure for their maintenance and removal as the structure is reduced, adequate working space and exclusion zones, arrangements for the protections of persons including permit to work procedures

Suitable methods of demolition are to be employed such that no shocks or vibration likely to damage surrounding property or equipment housed herein, or buried elements services.

Please refer to engineer for exact details and nature of structures to be demolished.

3.3.10 Asbestos

The contractor shall carry out an demolition asbestos survey for this project prior to works commencing. Any Asbestos Containing Materials (ACM's) suspected during the works that have not been previously identified, works will immediately cease until a survey has been completed by a specialist licensed contractor. No works shall be undertaken by any persons on any known or suspected ACM's without site management authorization. In the event of uncovering of any suspect material the contractor should immediately cease work in the area and notify the Project Supervisor (Construction) and Design Process

Asbestos removal works shall be carried out in accordance with details outlined in the Pre Demolition Refurbishment Asbestos Survey.

The method statement must be in accordance with the Air Pollution Act 1987 (No. 6 of 1987) and the Waste Management Acts 1996 to 2005.

3.4 OCCUPATIONAL HEALTH

3.4.1 Manual Handling

Manual handling requirements shall be reduced as far as reasonably practicable. The PSCS should ensure that specialist lifting equipment is used where required for any heavy items. All staff must be trained in manual handling and a detailed method statement must be completed concerning manual handling of heavy equipment. The method statement must comply with the Safety Health and Welfare at Work Act General Application Regulations 2007.

3.4.2 Dust

Construction dust can seriously damage your health. Exposure to the three main types of dust; silica dust (concrete, sandstone etc.), wood dust lower toxicity dusts (gypsum, marble etc.) shall be reduced as far as reasonably practicable. A risk assessment shall be carried out to assess the risks linked to the works and the materials. Where possible the risk materials are to be substituted with a suitable alternative.

Dust to be controlled by using water to dampen down dust clouds or using local exhaust ventilation (LEV) system fitted directly onto the tool. Respiratory protection equipment (RPE) should be provided where the exposure to dust is not reduced to an acceptable level. RPE is the last line of protection and if you are relying on RPE only it has to be justified. RPE will need to be adequate for the amount and type of dust, suitable for the work, compatible with other types of protective equipment, worn correctly and fit the user. Face fit testing is required for tight fitting masks.

3.4.3 Noise

Noise should be minimised as far as possible, in particular by limited the use of compressors and other plant to stated hours and by the fitting and use of silencing devises wherever practicable. Attention should be paid to the recommendations given in BS 5228. To limit the spread of noise, plant or processes should be replaced by less noisy alternatives (if reasonably practicable). Sources of particular noise shall be enclosed and/or increased their distance from occupied buildings. Every effort should be made to minimise any nuisance to the adjoining areas and occupiers.

Construction plant used on site should comply with the relevant Irish regulations in relation to noise and vibration requirements. The contractor is required to ensure compliance with the Safety Health and Welfare at Work Act General Application Regulations 2007 and Amendments as well as the Safety Health and Welfare at Work Act Construction Regulations 2013.

High levels of noise can cause permanent hearing damage to workers. Attention is drawn to the Health and Safety Executive Publication *Code of practice for reducing the exposure of employed persons to noise,* which contains advice on the levels of noise that are a serious hazard and the precautions that can be taken. When noisy machinery is used, ear defenders may be necessary.

The works shall be carried out in compliance with BS 5228-1:2009, +A1:2014.

3.4.4 Vibration

Exposure to whole body and/or hand-arm vibration shall be reduced as far as reasonably practicable. (Exposure is via driving/using heavy equipment vehicles etc. and hand tools such as pneumatic tools and jackhammers etc). The PSCS shall seek technical advice such as ensure that exposure is not above the daily exposure action level.

Risk assessments shall be conducted to highlight the key risk areas. Control measures like the following will be implemented: Information on hazards/risks, employee health records, alternative work methods (if applicable), work schedules arrangements to reduce exposure time, adequate clothing etc.
The contractor is required to ensure compliance with the Safety Health and Welfare at Work Act Construction Regulations 2013, Safety Health and Welfare at Work Act General Application Regulations 2007 and all amendments.

Works shall be carried out in compliance with BS 5228-2:2009, +A1:2014.

3.4.5 Hazardous Materials

Should any asbestos containing materials be suspected during the construction phase that have not been previously identified, works will immediately cease until a survey has been completed by a specialist licensed contractor. No works shall be undertaken by any persons on any known or suspected material without site management authorization.

In the event of uncovering of any suspect material the contractor should immediately cease work in the area and notify the Project Supervisor (Construction) and Design Process.

4.0 SIGNIFICANT DESIGN AND CONSTRUCTION HAZARDS

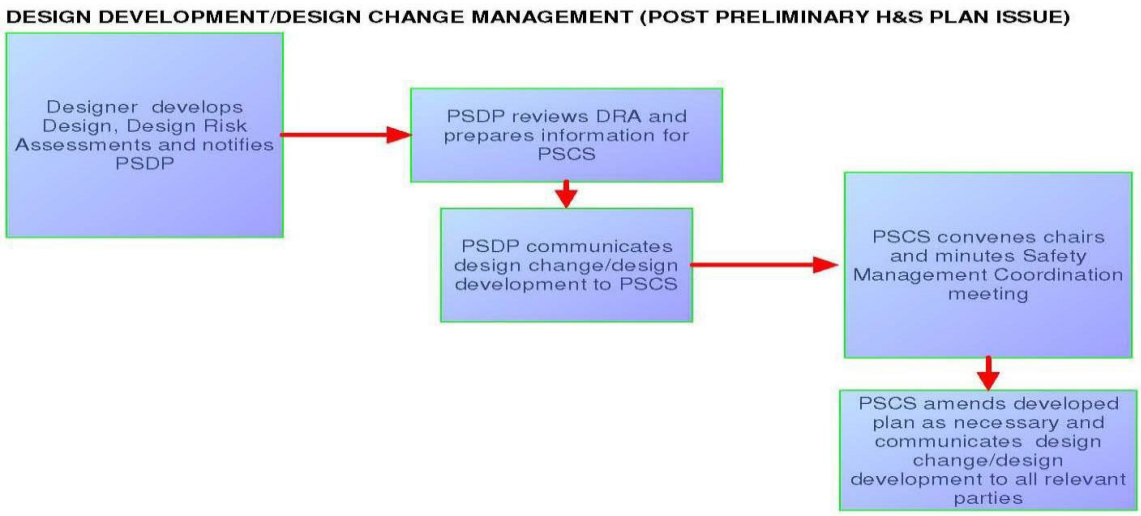
4.1 DESIGN ASSUMPTIONS & CONTROL MEASURES

Design assumptions and control measures assumed will be outlined in the designer risk assessment. Works are to be in accordance with The HSA Approved Code of Practice where applicable and are top accord with the General Principles of Prevention outlined in the Safety Health & Welfare at Work (General Application) Regulations. **The purpose of the General Principles of Prevention is to provide a framework within which design and detailing issues can be assessed.**

For reference purposes these principles are outlined below.

i) The avoidance of risks
ii) The evaluation of unavoidable risks
iii) The combating of risks at source
iv) The adaptation of work to the individual, especially as regards the design of places of work, the choice of work equipment and systems of work, with a view to alleviating monotonous work and work at a predetermined rate and to reduce their effect on health
v) The adaptation of the workplace to technical progress
vi) The replacement of dangerous articles, substances or systems of work by non-dangerous articles, substances or systems of work.
vii) The development of an adequate prevention policy in relation to safety, health and welfare at work, which takes account of technology, organization of work, working conditions, social factors and the influence of factors related to the working environment.
viii) The giving to collective protective measures of priority over individual protective measures.
ix) The giving of appropriate training and instruction to employees.

4.2 ARRANGEMENTS FOR COORDINATION OF ONGOING DESIGN



4.3 MATERIALS RISK ASSESSMENTS

The Contractor is to provide Risk Assessments for all materials subject to control under the following statutory instruments applicable to construction sites.

a) Safety, Health & Welfare at Work (Carcinogen) Regulations 2001 (S.I. No. 078 of 2001)
b) Safety, Health & Welfare at Work (Exposure to Asbestos) Regulations 2006 (S.I. No. 386 of 2006)
c) Safety, Health & Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001)
d) Safety, Health & Welfare at Work (Control of Noise at Work) Regulations 2006 (S.I. No. 371 of 2006)
e) European Communities (Classification, Packaging and Labelling of Dangerous Preparations) (Amendment) Regulations 2007 (S.I. No. 76 of 2007)
f) European Communities (Classification, Packaging and Labelling and Notification of Dangerous substances) (Amendment) Regulations 2006 (S.I. No. 25 of 2006)

The materials specified for use on this project will be identified as part of the design process.

5.0 PARTICULAR RISK ASSESSMENTS

Assessment of Particular Risks Undertaken in accordance with the first schedule of the Safety Health & Welfare at Work (Construction) Regulations, 2013.

NON-EXHAUSTIVE LIST OF WORK INVOLVING PARTICULAR RISK TO THE SAFETY AND HEALTH OF PERSONS AT WORK
Please tick the appropriate box to identify whether the particular risk has been identified as present

	YES	NO
Work which puts persons at work at risk of burial under earth falls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work on site.	Yes	
Work which puts persons at work at risk from chemical or biological substances constituting a particular danger to the safety and health of such persons or involving a legal requirement for health monitoring.		No
Work with ionising radiation requiring the designation of controlled or supervised areas as defined in Article 20 of Directive 80/836/Euratom		No
Work near high voltage power lines	Yes	
Work exposing persons at work to the risk of drowning		No
Work on wells, underground earthworks and tunnels.		No
Work carried out by drivers at work having a system of air supply.		No
Work carried out in a caisson with a compressed-air atmosphere.		No
Work involving the use of explosives.		No
Work involving the assembly or disassembly of heavy prefabricated components.	Yes	

6.0 GENERAL RISK ASSESSMENTS

RISK ASSESSMENT RECORD	ITEM No. 1
POTENTIAL HAZARD: Concrete Works	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Safe means of access to be provided at all times.
2	Suitable and sufficient mechanical lifting to be provided to avoid manual handling.
3	Personnel to be provided with appropriate P.P.E. during work with concrete – gloves, rubber safety footwear, hearing protection etc. Training to be given on hazards associated with work with concrete.
4	Hand and power tools to be properly maintained. Defective tools will not be used. (Abrasive wheels training).
5	Dangerous moving parts of machinery will be guarded.
6	Protruding items to be highlighted or covered with a soft material.

RISK ASSESSMENT RECORD	ITEM No. 2
POTENTIAL HAZARD : Working off Ladders	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	All ladders must be erected at a maximum angle of 70 degrees i.e. 1 in 4.
2	All ladders must be tied or footed by a responsible person while the ladder is in use.
3	Ladders are not working platforms with the exception of A frame ladders which are generally used by electricians.
4	All ladders must be checked for their integrity and suitability for the work.
5	No wooden ladders will be painted.
6	All damaged ladders will be taken out of service as soon as it is discovered.
7	All operatives must check that the ladder is suitable and in good condition.
8	All ladders used for access purposes must extend a minimum of 1 metre above the landing area and must be secured.
9	No person may straddle any A frame ladder while carrying out any works.
10	No person may work any higher than 2 rungs from the top of any A frame type ladder at 2 metres high and 3 rungs from the top on all ladders in access of 2 metres.

RISK ASSESSMENT RECORD	ITEM No. 3
POTENTIAL HAZARD : Use of Hazardous Substances	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Assessments on the hazards and risks to health by potentially harmful substances will be carried out. These assessments will detail the control measures that will be taken to reduce risks to health.
2	Material safety data sheets and assessments of the risk and necessary control measures will be in place prior to the work being carried out.
3	Personnel will be instructed to take appropriate precautions to protect their health from the hazards. Training will be given in the correct use and maintenance of personal protective equipment.
4	Hazardous substances will be stored in a safe manner. Materials will be segregated in accordance with good practice e.g. keeping oxidising and reducing agents apart.
5	Contingency arrangements will be in place to initiate the spillage of any hazardous substance.

RISK ASSESSMENT RECORD	ITEM No. 4
POTENTIAL HAZARD : Electrical	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Trained and competent electricians will carry out electrical work. These persons will have the technical knowledge and experience to understand the hazards that may arise during the work and the precautions which need to be taken.
2	There will be significant tree felling required on site. Developed method statement to include provisions in relation to the overhead power lines. Safe distances are to be set out as ESB guidelines.
3	Work on live conductors, or on electrical equipment, which has been made dead, will be carried out only under an appropriate permit to work procedure. Safe means of access will be provided for electricians required to work at height e.g. ladders scaffold towers etc.
4	Insulated tools will be used in order to carry out electrical work.
5	
6	

RISK ASSESSMENT RECORD	ITEM No. 5
POTENTIAL HAZARD : Hot Works (Welding)	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Before welding operations are carried out, the materials involved and their by-products will be identified, the risks assessed and necessary control measures identified in order to prevent possible respiratory disease/systemic poisoning (e.g. cadmium, stainless, galvanised, lead coated materials).
2	Welders will be provided with and wear the following personal protective equipment: ▪ Welding gloves ▪ Overalls ▪ Welding goggles with correct filter ▪ Respirable Protective Equipment (R.P.E.) (where identified).
3	In order to prevent risk of Arc Eye injury to other personnel, suitable screens will be placed around the welders working area.
4	Flammable materials will be removed from areas where welding is to be undertaken.
5	If (4) is not practicable, other suitable precautions will be taken to alleviate fire and explosion risk e.g. provision of fire blanket/fire watcher.
6	Fire extinguisher to be immediately available in the area of any welding operation.
7	Welding cables and cable joints will be maintained in a good condition.
8	Welding returns will be firmly connected to the metal on which welding is taking place. This will be carried out by means of well-constructed earthing clamps only.
9	Damp, humid and wet conditions will be a consideration for the voltage and type of transformer used.

RISK ASSESSMENT RECORD	ITEM No.6
POTENTIAL HAZARD : Hot Works (Cutting / Grinding)	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Grinders to be maintained in good condition and inspected prior to use.
2	Guards to be fitted to grinders.
3	Changing of abrasive wheels to be carried out by trained and authorised personnel using proper disc spanners.
4	Personnel carrying out grinding work will wear suitable eye protection and hearing protection.
5	Grinding operations in live plant areas, will be carried out in accordance with the permit to work requirements.
6	Grinding operations will be controlled in order to prevent the risk of injury to other personnel from sparks/metal splinters.
7	Housekeeping in the areas at grinding operations to be maintained to a high level.

RISK ASSESSMENT RECORD	ITEM No.7
POTENTIAL HAZARD : Erection of Fencing & Hoarding	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	The erection of fencing will be carried out by personnel who have been briefed in the correct method of work.
2	Good housekeeping standards will be maintained during the work.
3	The correct tools will be used during the stretching of mesh.
4	Posts will be lifted with mechanical assistance in order to alleviate manual handling.
5	Personnel will wear gloves, safety footwear and safety helmets during the work.
6	Training will be given on the hazards associated with work with cement/concrete.
7	Permit(s) to work will be required when working adjacent to overhead lines, underground utilities etc.

RISK ASSESSMENT RECORD	ITEM No. 8
POTENTIAL HAZARD : Removal of Waste Materials	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Personnel engaged in the removal of waste material will wear gloves, safety footwear and safety helmets.
2	Light waste will be swept up and removed in a wheelbarrow.
3	Waste material will be stored in designated areas in skips.
4	Waste material classified as hazardous will be removed by a contractor classed as competent for the task.

RISK ASSESSMENT RECORD	ITEM No. 9
POTENTIAL HAZARD – Brick	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Detailed written method statement to be provided by the specialist subcontractor before work commences.
2	Safe means of access/egress to be provided by means of MEWP'S, scaffolds and the like.
3	Plant/equipment to be maintained in a safe condition, carry the appropriate current certification and be operated by trained authorised personnel.
4	Assess weight and handling issues and provide the necessary training in manual handling techniques but, whenever practical, mechanical lifting aids such as cranes, forklifts etc. to be used.
5	Where installation necessitates the removal of ties from the scaffold the supervisor to ensure that alternative arrangements are made for tying in the scaffolding.
6	All personnel to wear the appropriate P.P.E. including gloves when handling.
7	Take account of the weather conditions prior to commencement of each period of work.

RISK ASSESSMENT RECORD	ITEM No.10
POTENTIAL HAZARD : Working at heights from MEWPs	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	All persons working in MEWPs must wear a safety harness and be hooked to machine at all times.
2	Great care must be taken by operatives to ensure that no equipment falls from unit while work is being undertaken.
3	All surface areas must be checked prior to setting up the unit for integrity and compaction. Also work area around it kept free from debris.
4	No more than the manufacturers specified number of persons may be in the unit at any time.
5	The unit is for use of men and tools only.
6	Under no circumstances is the unit to be used for lifting any materials.
7	The unit must be checked in accordance with the manufacturer's instructions each day prior to being put into service and carry the appropriate current certification.
8	The safe working load of the unit must be displayed and strictly adhered to.
9	Operatives using the unit must be suitably trained

RISK ASSESSMENT RECORD	ITEM No. 11
POTENTIAL HAZARD : Roof Works – Working at Heights	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Detailed written method statement to be provided by the specialist subcontractor before work commences.
2	Safe means of access/egress to be provided by means of MEWP's, scaffolds and the like.
3	Plant/equipment to be maintained in a safe condition, carry the appropriate current certification and be operated by trained and authorised personnel.
4	Assess weight and handling issues and provide the necessary training in manual handling techniques but, whenever practical, mechanical lifting aids such as cranes, forklifts etc. to be used.
5	Where installation necessitates the removal of ties from the scaffold, the supervisor must ensure that alternative arrangements are made for tying in the scaffold.
6	All personnel to wear the appropriate P.P.E. including gloves when handling.
7	All personnel must wear a Safety Harness at all times when working at heights over 2m where no edge protection is present or on roof work.
8	All roofing materials must be lashed down when not in use.
9	All waste materials must be deposited in the receptacles provided.
10	All receptacles for containing waste materials must be temporarily secured to suitable anchorage points.
11	When working at edge work all personnel must be harnessed at all times via a fall arrester system connected to suitable anchorage points.

RISK ASSESSMENT RECORD	ITEM No.12
POTENTIAL HAZARD: Loading Dumper	MEDIUM

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Only approved plant will be used to transport heavy loads and all plant will be maintained in a good condition.
2	Vehicles will not be overloaded and the loads will be evenly distributed secured and not projecting beyond the sides or back of the vehicle. If some projection is unavoidable then the load will be properly marked in order to ensure that the projection is clearly visible.
3	Drivers will not remain in their vehicles whilst they are being loaded with loose materials.
4	The loading and unloading of tipper lorries will be attended by a competent banksman (banksman to wear orange high vis vest/jacket as a means of identification).Tipper lorries will not be allowed to move off until the body has been lowered.
5	Dumpers will not be allowed to travel with the body in a raised position unless inching forward to discharge the load.
6	All machines to be serviced and maintained at regular intervals by qualified persons.
7	Stops/barriers or banksmen to be provided where vehicles are working adjacent to excavations.

RISK ASSESSMENT RECORD	ITEM No.13
POTENTIAL HAZARD: Site works/All Deliveries	LOW

No.	CONTROL MEASURES TO BE IMPLEMENTED
1	Site conditions will be taken into account in the selection of plant. Drivers will be fully trained in the operation of plant and will be aware of the limitations of their machines/vehicles and in safe operating procedures.
2	Vehicles will be maintained in an efficient state, in efficient working order and in good repair. Basic maintenance will be carried out by the driver/operator on a daily/weekly basis. Defects found will be repaired before the vehicle is put into service. Periodic servicing of vehicles will be carried out in accordance with the manufacturer's instruction.
3	Speed limits will be established and clearly displayed for travelling on site access roads.
4	Personnel working adjacent to access roads will wear high visibility jackets and suitable warnings will be displayed where people can see them in good time.
5	The possibility of vehicles coming into contact with overhead structures or power lines will be reduced by erecting height gauges of the goal post type, constructed from non-conducting material, distinctively marked with red and white stripes or bunting.
6	Drivers will be instructed not to leave vehicles with their engine running.
7	Drivers will be instructed not to carry unauthorised passengers.
8	Safe working procedures will be planned in order to reduce the possibility of personnel being struck by reversing vehicles. These may include i) avoiding the need to reverse by providing a one-way system ii) the exclusion of pedestrians from areas where vehicles have to reverse iii) the provision of banksmen iv) the fitting of reversing alarms to vehicles.
9	Vehicles will be prevented from falling into excavations by a) clearly marking haul roads and securely fencing off the immediate excavation area b) providing a banksmen to guide the vehicle and warn personnel in the excavation to keep clear and c) by providing a fixed stop e.g. timber bulk, securely anchored, well back from the edge.

APPENDIX 1 ECOLOGY IMPACT ASSESSMENT REPORT

MWP

Ecological Impact Assessment

Glencarrig, Celbridge, Co. Kildare

Garyaron Homes Ltd.

August 2022

Contents

Tables

Figures

Appendices

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
22439	6004	A	22/11/2021	MKy	NoL	MKe	Final
22439	6004	B	17/05/2022	MKv	NOL	CF	Final
22439	6004	C	23/08/2022	MKv	NOL	CF	Final

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1. Introduction

Planning permission for a 'Large-scale Residential Development' (LRD) application is being lodged to Kildare County Council under the appointment of the applicant Garyaron Homes Ltd, on lands at Glencarrig House, Simmonstown, Celbridge, Co. Kildare. Permission is being sought for the construction of 137 No. residential units with creche, landscaped spaces and associated works and services (hereafter referred to as the 'proposed development').

Malachy Walsh and Partners Engineering and Environmental Consultants (MWP) has been engaged by John Fleming Architects (JFA) to prepare an Ecological Impact Assessment (EcIA) report on the proposed works to accompany the application. This report describes the existing biodiversity and ecological characteristics of the proposed development site. A Stage 1 Screening for Appropriate Assessment report has been completed and will also be submitted as part of the application.

1.1 Overview of the Project

The proposed development site covers an area of circa 2.1 Ha. The proposed development will result in the construction of 137 no. residential units comprising of:

a) the demolition (total area approximately 800 m^2) of the existing buildings on site and the existing front boundary treatment; and

b) the construction of a new residential and creche scheme of 137 no. units in a mixture of houses and apartment units ranging from 2 to 5 storeys in height as follows:

- Block A (3-5 storey apartment block) comprising 39 no. apartments (19 no. 1 bed and 20 no. 2 bed units);
- Block B (4-5 storey apartment block) comprising 51 no. apartments (24 no. 1 bed and 27 no. 2 bed units);
- Block C (3-4 storey apartment block) comprising 25 no. apartments (11 no. 1 bed and 14 no. 2 bed units); and
- Houses (2 -3 storeys) comprising 22 no. house units (6 no. 4-bed semi-detached, 6 no. 3 bed semi-detached, 5 no. 3-bed terraced and 6 no. 3-bed end of terrace).

A separate building will accommodate a Childcare Facility/creche of approximately 248 m^2 with outdoor play area of 460 m^2. A Bike Store building (86 m^2) and Plant Room/ ESB-Sub-station building (66.9 m^2) are also proposed.

A total of 129 no. car parking spaces are provided at surface level (44 housing/81 apartments/4 creche), including 7 no. Accessible spaces; 80 no. bicycle spaces (for Visitors and Residents, in bike stands) together with 124 no. secure bicycle spaces within 5 no. bike stores.

Providing green spaces is key to the overall objective of the proposed development. The design of the green spaces is intended to enable easy pedestrian links, connecting people to each other and to the town. A standalone Creche is located on the south-west corner of the site, with access to a private enclosed play space. It is envisaged that the creche will be managed by a third party creche operator.

The proposed development also makes provision for a connection to the undeveloped lands to the south via cycle lanes/footpaths. There are currently no extant permissions on these lands (KDA Simmonstown).

New pedestrian access points separate from vehicular access will be located at various points along the proposed development site to improve pedestrian permeability. At the top of the site a new pedestrian connection will be made with the existing footpath along Hazelhatch Road. It is proposed to provide vehicular access to the proposed development site from the local road L5062, with the road widened and improved from the junction of the R405 to accommodate the increased traffic flow.

Parking will be provided around the site, with the number of spaces appropriate for a development of this scale and location, and proposals for charging points for electric cars will be included.

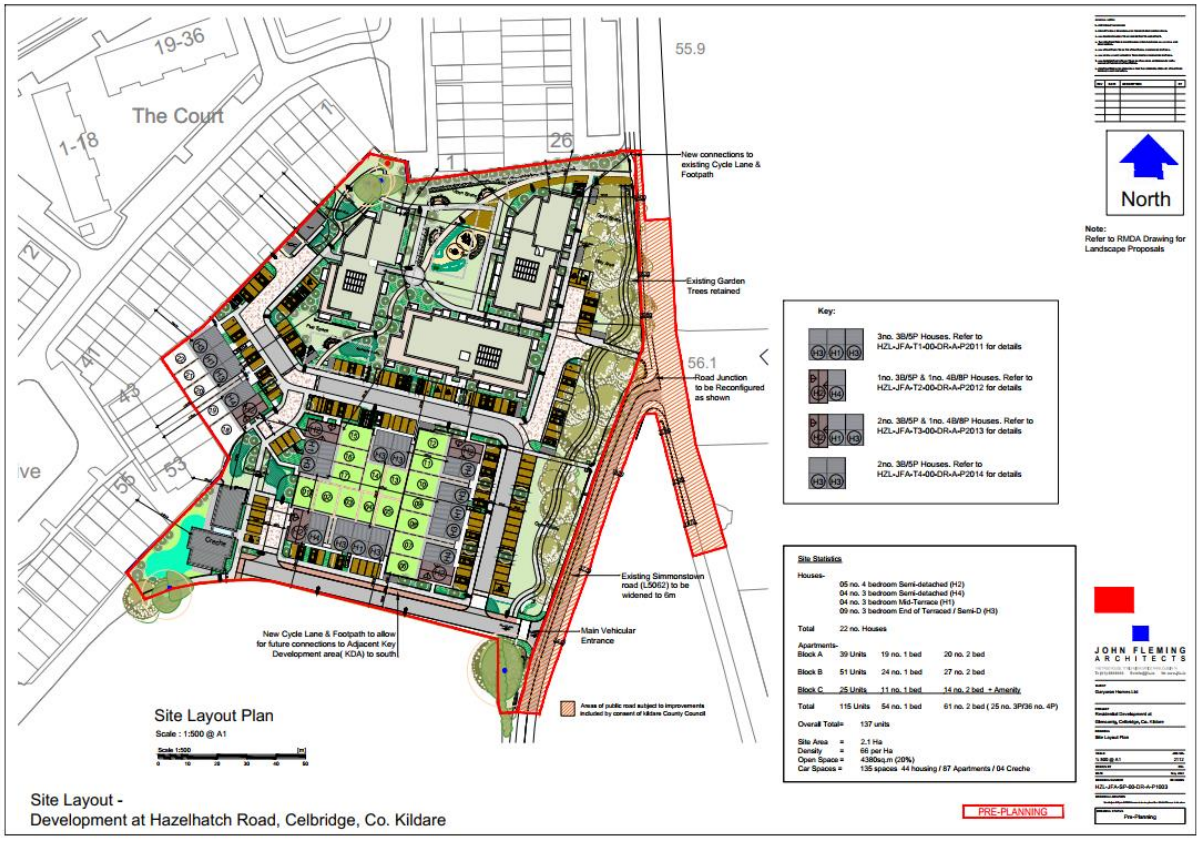

Figure 1: Site layout plan

1.2 Scope of Assessment

- Identify and document protected habitats and species in the study area through desk top studies
- Undertake baseline ecological surveys at the site
- Evaluate the nature conservation importance of the ecological resources identified using a scientifically robust and objective methodology based on current National and International best practice guidelines
- Predict the potential direct, indirect and cumulative effects of the project on biodiversity
- Prescribe mitigation measures to minimise potential effects on biodiversity
- Identify habitats within the study area that can benefit from ecological management for the purpose of local biodiversity enhancement.

1.3 Statement of Competency

All assessments have been carried out by appropriately qualified, trained and competent professionals with several years of experience in ecology survey and assessment.

This EcIA has been prepared by Muiréad Kelly (BSc. MSc.) Ecologist at Malachy Walsh and Partners (MWP). Muiréad has over ten years' experience in ecological surveying, ecological impact assessment and the appropriate assessment process. She is an appropriately qualified, trained and competent professional. She has completed numerous ecological assessments for a wide variety of projects including for renewable energy projects, infrastructure and coastal projects, and various other development projects. She is an experienced field ecologist and has a diverse ecological survey profile, including habitats and flora, mammals, birds and terrestrial/aquatic invertebrates. She has held NPWS Licences for small mammal trapping, tape lure/endoscope bird surveys, disturbance of bats and Kerry slug and photographing wild animals.

The bat roost assessment and survey report was undertaken by Domhnall Finch Senior Ecologist and Technical Director of Finch Geospatial and Environmental Consultants (FGE, 2021).

Domhnall Finch (PhD, MSc, BSc, PgCert, ACIEEM, AHEA), has over 10 years' experience conducting technical assessments for a range of development types including infrastructure and residential. Domhnall is a specialist in the field of bat, mammal and avian ecology and survey methodology.

2. Details of Proposed Development

2.1 Site Location and Context

The proposed development site is located on the south east edge of the village of Celbridge, Co. Kildare, within 1.5 km of Celbridge town centre, within a semi-urban area. The proposed development site is bounded to north and west by Hazelhatch park, Simmonstown Stud Farm to the south and Simmonstown Road (L502) and Hazelhatch Road (R405) to the east. Celbridge GAA is located to the east of the south, across the R405.

The proposed development site is relatively flat. Structures onsite included a two-story house, with a shed, barn building and stables to its north. The proposed development site borders consist of mature non-native treelines and small mixed woodlands. The proposed development site is located within the townlands of Commons and Simmonstown.

Figure 2: Site location map

2.2 Characteristics of the Project

- Existing buildings will be demolished.
- Existing trees and woodlands will be felled and cleared.
- Roads, carparking and footpaths/cycle paths will be constructed.
- 137 no. residential units and a creche will be constructed.
- The adjoining Hazelhatch road will be widened and the junction between Simmonstown Road and Hazelhatch Road will be reconfigured
- New storm water and foul water systems with attenuation and pumping infrastructure will be established. These will connect to the existing municipal network.

3. Methodology

3.1 Legislation and published guidance

This assessment was undertaken with regard to the following publications:

- Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)

- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland published by the Institute of Ecology and Environmental Management (IEEM, 2006; 2016; 2018)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)

The following legislative framework was also considered:

- EU Habitats Directive (92/43/EEC);
- EU Birds Directive (79/409/EEC);
- EU Water Framework Directive (WFD, 2000/60/EC);
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011), as amended;
- Planning and Development Act 2000, as amended;
- Wildlife Act 1976, as amended;
- Flora (Protection) Order, 2015; and
- European Communities (Quality of Salmonid Waters) Regulations, 1988.

3.2 Desk-top Study

A desktop study was carried out to collate and review available information and documentation relating to the biodiversity of the site and the geographical area extending away from it. The following publications, which include current best practice guidance, current scientific literature, up to-date data and data-sets were reviewed:

- OSI Aerial photography and 1:50,000 mapping
- National Parks and Wildlife Service (NPWS) (website and on-line map viewer)
- National Biodiversity Data Centre (NBDC) (on-line map viewer)
- Teagasc soil area maps (NBDC website)
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- Eastern River Basin District (ERBD) datasets (Water Framework Directive)
- Water Framework Directive Cycle 2 datasets (online)
- Bat Conservation Ireland (BCIreland)
- Kildare County Council Development Plan 2017 - 2023
- Celbridge Local Area Plan (2017-2023).
- Review of requested records from NPWS Rare and Protected Species database
- Review of records of plant species protected under the Flora (Protection) Order of 2015 and the Irish Red Data Book (Wyse et al., 2016)
- Other information sources and reports footnoted in the course of the report.

3.2.1 Database Searches and Data Requests

The study area lies within the hectad N93. Concise and site-specific information on species records available in this hectad was retrieved from the NBDC on-line database and reviewed. A data request for records of any rare or protected flora and fauna within the 10km grid square N93 was also submitted to the National Parks and Wildlife Service (NPWS). Data was received from NPWS on the 14th October 2021. Data was supplied by NPWS for an area of 5 km around a centroid of the site.

Information received in response to the NBDC database search and the NPWS data request is incorporated into this report and was used to help inform the impact assessment in relation to the proposal.

3.2.2 Desk-top Review for Bats

A desktop review of publicly available relevant data was undertaken on the National Biodiversity Data Centre (NBDC) and NPWS websites. The National Biodiversity Data Centre was reviewed for relevant data, specifically i) existing species records for the 10km square in which the study site is located and ii) an indication of the relative importance of the wider landscape in which the study site is located, based on Model of Bat Landscapes for Ireland (Lundy et al. 2011). In the latter, the index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats.

3.3 Zone of Influence

The study area for the proposed development includes all lands within the red line boundary, as well as the adjacent habitats ecologically connected to them. The following were considered when identifying the potential ZOI at the initial stages of the proposed development:

- The nature, size and location of the project
- Identification of sensitive habitats and species in the study area
- Identification of suitable habitats for high conservation value species within the study area, and extending away from the study area
- Ecological connectivity between the project and the wider landscape
- The sensitivities of the relevant key ecological receptors
- Identification of potential effect pathways to key ecological receptors
- Habitat connectivity and foraging ranges of fauna.

3.4 Key Ecological Receptors (KERs)

A Key Ecological Receptor (KER) is defined as a site, designated site, habitat, ecological feature, assemblage of species or individual protected species that occurs within the vicinity of a proposed project upon which effects are likely (NRA, 2009).

3.5 Field Surveys

The desk top study undertaken by MWP was supplemented by an ecological walkover survey of the proposed development site to determine the scope of the ecological assessment. This survey included habitats, flora and fauna (excluding bats).

The ecological features of interest within and connected to the site were recorded and used to identify the KERs of the development. The following literature was referred to:

- Animal Tracks and Signs (Bang and Dahlstrom, 2006)
- Birds of Conservation Concern in Ireland 4: 2020 – 2026 (Gilbert et al., 2021)
- Checklists of protected and threatened species in Ireland (Nelson, et al., 2019)

Summaries of MWP field survey methodologies are provided in Section 3.5.1 below. Bat surveys within the proposal site were undertaken separately by FGE Consulting (Dr. Domhnall Finch) (see Section 3.5.2 below).

3.5.1 Habitats, Flora and Fauna (excluding bats)

The ecological walkover survey was undertaken on 9th August 2021. The walkover survey had regard to 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011) and 'A Guide to Habitats in Ireland' (Fossitt, 2000). As part of this survey, habitats within and bounding the development site were categorised to Level 3 according to Fossitt (2000). Habitats occurring within the site were assessed for their potential suitability for terrestrial mammal species. Evidence of terrestrial mammals such as tracks, feeding signs and droppings were searched for. Any bird species observed or heard calling during the walkover survey were recorded. Any invasive alien plant species (IAPS) observed within the site during the walkover survey were also recorded.

Following the walkover survey, a habitat map for the development site was prepared (see Section 4.3.1 below).

3.5.2 Bats

The following surveys were undertaken by FGE Consulting in view of guidance by Collins (2016);

- Daytime Visual Roost Inspections
- Dusk/Dawn Emergence/Re-entry Surveys
- Bat Activity Transect

A summary of the bat survey methods employed at the subject site are provided below. Please refer FGE, 2021 for more detail (Appendix 2).

3.5.2.1 Daytime Visual Roost Inspections

The initial daytime search involved a methodical search, using high powered torches and an endoscope, where the structure is examined using best practice techniques to locate droppings beneath gable ends, on windowsills, under hanging tiles, fascia's, on windows or on walls. In addition, the structure is examined for urine and oily residue stains, scratch marks and the remains of insect prey (moth wings etc.) to try identify Potential Roost Features (PRFs).

Following the external search, all of the internal areas are examined for bat signs in the form of bat droppings, urine and oily residue stains as well individual bats present in lofts or crevice locations. Head torches, handheld torches and endoscopes are used for these searches.

3.5.2.2 Dusk/Dawn Emergence/Re-entry Surveys

Using the evidence gathered during the initial daylight site inspections at each potential roost, dusk/dawn roost surveys are then conducted using Echo Meter Touch Pro's. A dusk survey is

conducted a 15 mins before dusk until 1.5 – 2 hours after dusk and a dawn survey is conducted 1.5 – 2 hours before dawn until 15 mins after dawn.

3.5.2.3 Bat Activity Transect

Walked bat activity transects were conducted following Collins (2016) guidelines. Ultrasonic detection was carried out using Wildlife Acoustics full spectrum Echo Meter Touch Pro 2 bat detectors. A contact ("bat pass"), as recorded in the results from these surveys, describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Bat contacts do not equate to numbers of bats as individual bats of the same species cannot be differentiated. A single bat continuously foraging in proximity to the detector can generate a large number of contacts in one night. In addition, variability occurs in the likelihood of detection between species. When several bats of the same species were encountered together, they were recorded under the one contact. A separate contact was recorded for each pass. A contact finished when the recorder assumes the bat is no longer present. The same bat may be recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity; the amount of uses bats make of an area/feature.

3.6 Assessment Criteria

This section outlines the criteria upon which evaluations of the importance of ecological features and the assessments of the ecological impact of the project on these features are made, referring to relevant legislation and guidelines.

3.6.1 Evaluation

The evaluation outlined in this report and the assessment of the effects of the proposed project follows methodologies set out in 'Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018)' and 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

These guidelines set out the context for the determination of value on a geographical basis with a hierarchy (International through to Local) assigned based on the importance of any particular ecological receptor. The guidelines provide a basis for determination of whether any particular site, habitat, or species is of importance on the following adapted scale:

- International
- National
- County
- Local Importance (higher value) and
- Local Importance (lower value)

The NRA Ecological Impact Guidelines (2009) clearly set out the criteria by which each geographic level of importance can be assigned. At the lowest end of the scale, Locally Important (lower value) receptors contain habitats and species that are widespread, of low ecological significance, and are of importance only in the local area. In contrast, Internationally Important sites are either designated for conservation at an international level as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna.

The criterion used to evaluate the value of ecological resources has been included in **Appendix 1**. The value of habitats is assessed based on habitat condition, size, rarity, conservation and legal status. The value of fauna is assessed on biodiversity value, legal status and conservation status. Biodiversity value is based on its national distribution, abundance or rarity, and associated trends.

KERs are referred to by NRA (2009) as those ecological features for which detailed assessment is required. KERs are taken to be those features that are evaluated as Locally Important (higher value) or higher. The significance of the ecological effects of the project was assessed on each of the KERs identified.

3.6.2 Impact Assessment

The significance of an effect is determined with the use of EPA criteria for assessing impact (EPA, 2022). Professional judgement is used.

The criteria for assessing quality of effects and significance of effects are set out in **Table 1** and **Table 2** below.

Table 1. Criteria for assessing impact quality based on EPA (2022)

Quality of Effect	Criteria
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Table 2. Criteria for assessing impact significance based on EPA (2022)

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment
Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

The following terms are used when quantifying the duration and frequency of the potential effects:

- Momentary – effects lasting from seconds to minutes

- Brief – effects lasting less than a day
- Temporary – effects lasting less than a year
- Short-term – effects lasting 1 to 7 years
- Medium term – effects lasting 7 to 15 years
- Long term – effects lasting 15 to 60 years
- Permanent – effects lasting over 60 years
- Reversible – effects that can be undone, for example through remediation or restoration
- Frequency – How often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Where ecological effects were assessed to be potentially significant, mitigation measures were incorporated into the project design to remove or reduce the effects. The significance of the cumulative effects of the proposed development was also assessed by determining the ecological effects of the proposal in combination with other developments that have planning permission, that are under construction or are in existence in the area. The cumulative impact with existing activities in the area is also considered. The significance of the residual effects after mitigation was then assessed.

3.6.3 Assessment Criteria for Bats

An assessment as to the significance of bat roosts was conducted using NRA, 2005 best practice guidelines. Evaluation of ecological features followed the NRA (now TII) publication 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (2009). Bat impact assessment followed 'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' published by the EPA (2022).

Refer to FGE Consulting, 2021 for more information on assessment criteria used in relation to bats.

4. Description of Existing Environment

4.1 Site Overview

The proposed development site is located on the south east edge of the village of Celbridge, Co. Kildare, within 1.5 km of Celbridge town centre, within a semi-urban area. The proposed development site is bounded to north and west by Hazelhatch park, Simmonstown Stud Farm to the south and Simmonstown Road (L502) and Hazelhatch Road (R405) to the east. Celbridge GAA is located to the east of the south, across the R405.

The proposed development site is relatively flat. Structures onsite include a two-story house, with a shed, barn building and stables to its north. The proposed development site borders consist of mature non-native treelines and small mixed woodlands. The proposed development site is located within the townlands of Commons and Simmonstown.

As per Celbridge Local Area Plan (LAP) 2017-2023, the majority if the proposed development site is zoned as 'B - Existing Residential and Infill'. The land use objectives of these zoning categories are as follows:

- B- "*To protect and enhance the amenity of established residential communities and promote sustainable intensification*".

The Zoning Matrix within the LAP illustrates a range of land uses together with an indication of their broad acceptability in each of the land use zones. 'Dwellings' have been identified as being acceptable in the B land use zoning.

The proposed development site is flat. The elevation of the proposed development site is 60 m above sea level. The predominant CORINE (2018)[1] landcover at the proposed development site is classed as 'Artificial Surfaces/Urban fabric'.

According to the online Geological Survey Ireland (GSI) online mapper[2], the proposed development site is underlain by Dark limestone & shale (`calp) from Lucan Formation. Soil at the proposed development site is categorised as poorly deep well drained mineral (mainly basic). Suboils are classed as 'Limestone till (Carboniferous)'. The acquirer is designated as a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones'.

4.1.1 Hydrology and Hydrogeology

The proposed development site is located within the 'Liffey and Dublin Bay' Water Framework Directive (WFD) catchment (Code: 09) and the Liffey_SC_070 sub-catchment (Code: 09). This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km².

There are no watercourses in the site. The Hazelhatch Stream flows north approx. 80m east of the proposed site. Its source is just south of the Grand Canal and it flows through fields until it reaches the R405, of which it is culverted under. It flows through the residential estate, Willow Park, and is culverted under the main Dublin Road (R403) before it joins the River Liffey. Two local drains run along east and west side of the Hazelhatch Road. Both of these drains discharge into the Hazelhatch Stream.

The River Liffey (flowing in a northeast direction) is located approximately 750 m to the northwest of the proposed development site. Loughlinstown river (flowing in a southwest direction) is located approximately 200 m to the southwest of the proposed development site. The EPA has classed the water quality of the River Liffey as 'Good' from a monitoring station located near Primrose Hill bridge, and 'Not at Risk' of failing to meet its WFD objectives. The Shinkeen and Hazelhatch Streams flow from the south east through the Commons and Simmonstown areas of the town respectively

A Flood Risk Assessment (FRA) was undertaken for the site (JBA, 2022). The proposed development site is identified as being partially within Flood Zone B[3] in the Hazelhatch Further Study (HFS) (JBA, 2022) and is identified as being at risk of flooding during the 0.1% AEP event.

[1] Co-ordinated information on the Environment – dataseries established by the European Community
[2] GSI Mapper Accessed 06/08/2021
[3] Moderate probability of flooding, between 1% and 0.1% from rivers and between 0.5% and 0.1% from coastal/ tidal.

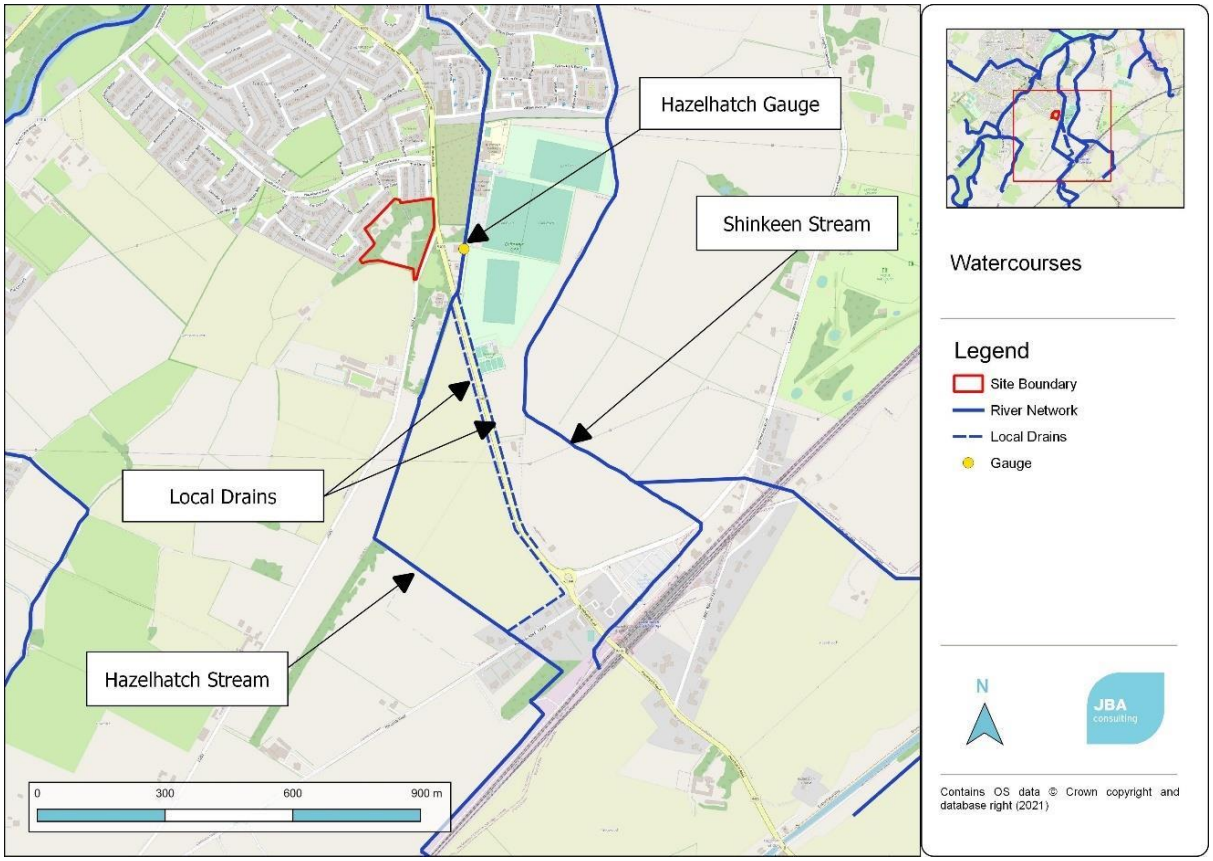

Figure 3: Local watercourses (from FRA report, JBA Consulting, 2022)

4.2 Designated Sites

This section describes the designated sites considered to be within the ZOI of the proposal, including their qualifying features, distance from the proposed development, and whether it is considered that a source-receptor ecological pathway exists between the proposed development and each designated site.

Designated sites within 15 km of the proposed development are described in this section. With regards to the nature of the project, it is considered that anything beyond this zone is highly unlikely to experience any impact from the proposed works. Therefore, all designated sites within 15 km of the proposed development are considered to be within the ZOI of the proposal. Designated sites beyond 15 km are considered to be outside the ZOI of the proposed development.

4.2.1 Sites of International Importance

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats of wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which form part of Natura 2000, a network of protected sites throughout the European Community. Table 3 below lists the Natura 2000 sites located within 15 km or the ZOI of the proposed development and includes each site's qualifying features of conservation interest.

Table 3. Natura 2000 sites within 15 km or the ZOI of the proposed development

Designated Site	Distance from subject site	Qualifying Features of Conservation Interest
Rye Water Valley/Carton SAC	5km N	[1014] *Vertigo angustior* [1016] *Vertigo moulinsiana* [7220] * Petrifying springs with tufa formation (*Cratoneurion*)
Glenasmole Valley SAC	13km SE	[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [7220] Petrifying springs with tufa formation (*Cratoneurion*)
Red Bog Kildare SAC	15km S	[7140] Transition mires and quaking bogs
Poulaphouca Reservoir SPA	17km SE	[A043] Greylag Goose (*Anser anser*) [A183] Lesser Black-backed Gull (*Larus fuscus*)

The Natura 2000 sites within 15 km or the ZOI of the proposed development are shown on a map in **Figure 4** below.

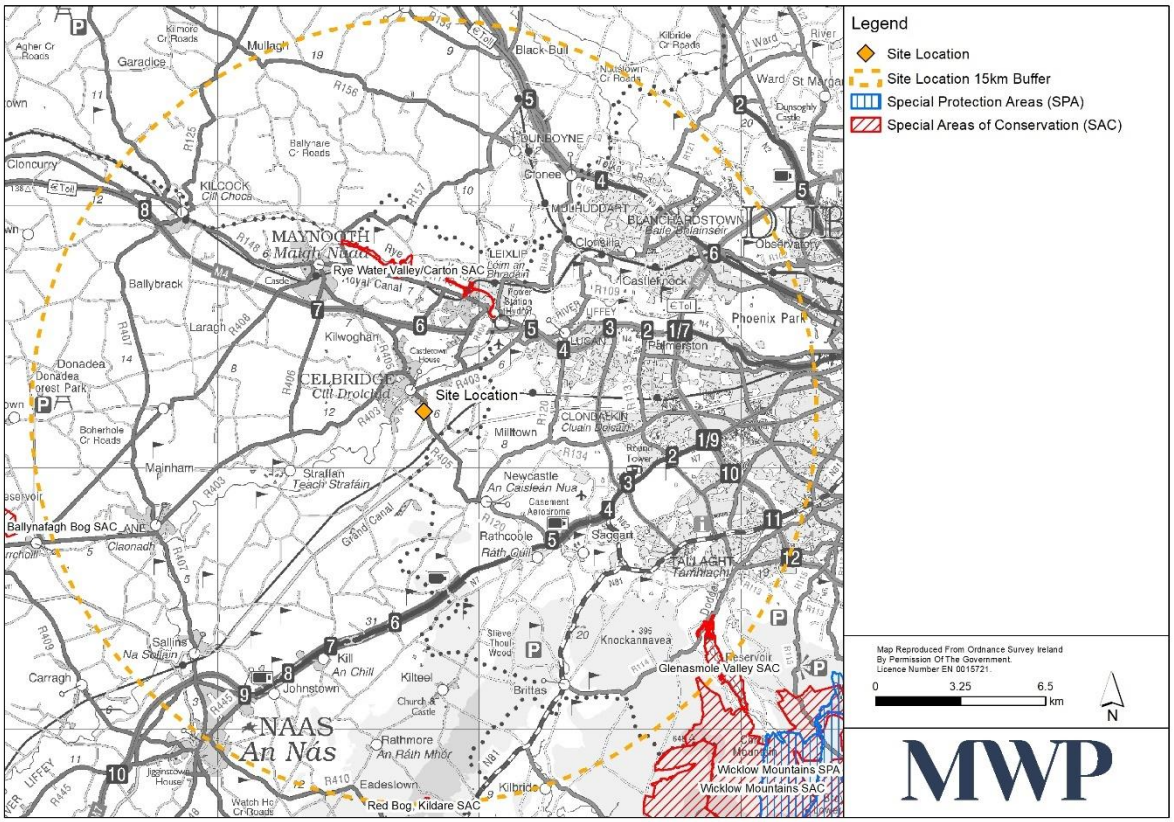

Figure 4: Natura 2000 sites within the ZOI

4.2.2 Sites of National Importance

In Ireland, sites of national importance are termed Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). While the Wildlife (Amendment) Act 2000 has been passed into law, pNHAs will not have legal backing until the consultative process with landowners has been completed. This process currently remains ongoing.

Table 4. Designated sites of national importance within 15 km or ZOI of the proposed development[4]

Designated Site	Distance from subject site	Features of Interest
Dodder Valley pNHA (000991)	13 km to SE of subject site	Natural river bank vegetation
Grand Canal pNHA (002104)	1.6 km to SE of subject site	Supports diverse habitats and species including hedgerow, calcareous grassland, reed fringe, scrub, woodland, otter and smooth newt
Glenasmole Valley pNHA (001209) *Overlaps with the Glenasmole Valley SAC*	13.5 km to SE of subject site	As above
Lugmore Glen pNHA (001212)	11 km to SE of subject site	Good example of wooded glen with good representation of woodland plants including rare plant species
Slade of Saggart and Crooksling Glen pNHA (000211)	9.5 km to SE of subject site	Good example of wooded river valley and a small wetland system. Rare plant and invertebrate species present with a variety of wildfowl also
Liffey Valley pNHA (000128)	5 km to N of subject site	Diversity of habitats ranging from aquatic to terrestrial with a number of rare and threatened plant species
Rye Water Valley/Carton pNHA (001398) *Overlaps with the Rye water Valley/Carton SAC*	5 km to NW of subject site	As above
Royal Canal pNHA (002103)	6 km to N of subject site	Supports diverse habitats and species including hedgerow, tall herb, calcareous grassland, reed fringe, scrub, woodland and otter
Grand Canal pNHA (002104)	1.6 km SE of subject site	Supports a diverse range of species long its linear habitats including otter, common newt and opposite leaved pondweed.
Donadea Wood pNHA (001391)	14.6 km to W of subject site	This is a Coillte site with coniferous and deciduous forests

Nationally designated sites within 15 km or the ZOI of the proposal are shown on a map in **Figure 5** below.

[4] Features of interest taken from https://www.npws.ie/sites/default/files/general/pNHA_Site_Synopsis

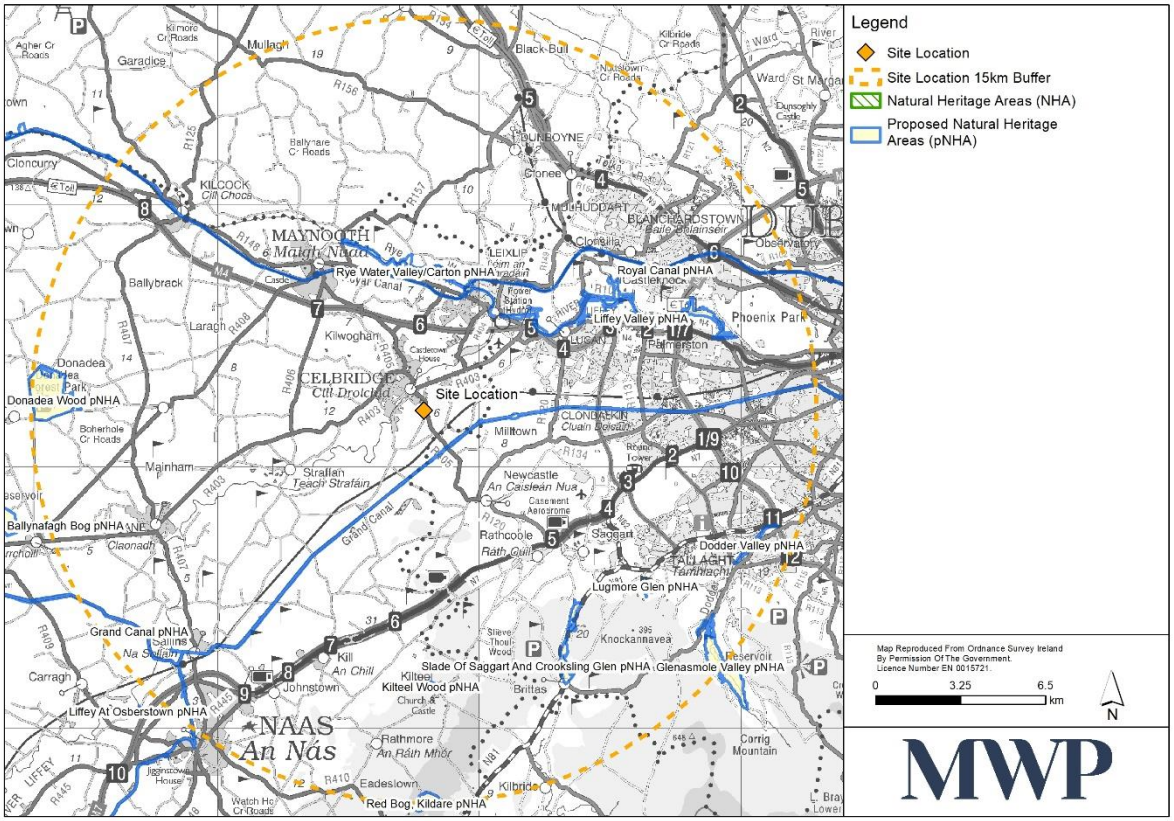

Figure 5: NHA and pNHA sites within the ZOI

4.2.3 Other Designated Sites

The Convention on Wetlands of International Importance especially as Waterfowl Habitat, more commonly known as the Ramsar Convention, was ratified by Ireland in 1984 and came into force for Ireland on 15th March 1985. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 Ha. There are no Ramsar sites located within 15 km of the proposed development site. There are two located within 26km, these are 'Sandymount Strand/Tolka Estuary' (Ramsar Site No. 832) located 23 km to the east and 'North Bull Island' (Ramsar Site No. 406) located 26 km to the north-east[5]. These Ramsar sites are outside the ZOI of the proposed development.

The Important Bird and Biodiversity Areas (IBAs) Programme, overseen by Birdlife International, aims to identify, conserve and protect those areas throughout the world considered to be of the greatest significance to bird populations[6]. Bird Life International has produced a compendium of Important Bird Areas (IBAs) in Europe. The IBA programme of BirdWatch Ireland is a worldwide initiative aimed at identifying and protecting a network of critical sites of importance for birds. There are 105 IBA's on the island of Ireland in which the majority support wintering water birds.

'Dublin Bay' IBA (IE109) is located 26 km to the east of the proposed development site and overlaps with both of the Ramsar sites mentioned above. It is a wetland of international importance for waterfowl, regularly supporting over 20,000 wintering birds. Species wintering in numbers of national importance include *Tadorna tadorna*, *Anas penelope*, *Anas crecca*, *Anas acuta*, *Anas clypeata*, *Pluvialis squatarola*, *Calidris alba* and *Limosa limosa*.

[5] Available at: https://rsis.ramsar.org/
[6] Available at: http://www.birdlife.org/worldwide/programmes/important-bird-and-biodiversity-areas-ibas

This IBA is outside the ZOI of the proposed development.

4.2.4 Evaluation of Designated Sites as Ecological Receptors

A screening for Appropriate Assessment report has been undertaken to determine whether the project, alone or in combination with other plans or projects, is likely to result in significant effects on nearby Natura 2000 sites considered to be within the ZOI of the project in view of the site's Conservation Objectives. This screening for Appropriate Assessment report concluded that significant effects on these Natura 2000 sites as a result of the project can be excluded. Therefore, these designated sites, as listed in Table 3 above, will not be considered further in this evaluation. Please refer to the screening for Appropriate Assessment report which has been submitted with the planning application for the proposed development for more information.

Due to the fact that the nationally designated sites identified to be within the zone of potential impact influence of the project, namely Glenasmole Valley pNHA and Rye Water Valley/Carton pNHA spatially overlap with Natura 2000 Sites, as outlined in Table 4 above, it is considered that potential impacts on these pNHAs arising from the project have been fully considered as part of the screening for Appropriate Assessment report which has concluded that significant effects can be excluded. Therefore, these pNHAs will not be considered further in this evaluation.

With regard to the remaining nationally designated sites identified to be within the zone of potential impact influence of the project, namely Dodder Valley pNHA, Grand Canal pNHA, Lugmore Glen pNHA, Slade of Saggart and Crooksling Glen pNHA, Liffey Valley pNHA, it is considered that due to the intervening distances between these sites and the subject site and the absence of potential impact pathways (see Table 4 above), significant effects on these sites as a result of the proposed development are not envisaged. These sites are therefore not considered to comprise KERS of the project and will not be considered further in this evaluation.

4.3 Habitats and Flora

4.3.1 Habitat Identification

4.3.1.1 Buildings and artificial surfaces (BL3)

The existing buildings, the tarmacked driveway and paved areas within the site are classified as artificial surfaces.

Plate 1. 'Buildings and artificial surfaces (BL3)' habitat

4.3.1.2 Amenity grassland (improved) (GA2)

The dominant habitat within the site is amenity grassland (GA2). As is typical of this habitat-type, this habitat is managed, having been recently mown at the time of the survey. This habitat was found to be species-poor with some common broad-leaved herbs such as daisy (*Bellis perennis*), self-heal (*prunella vulgaris*), chickweed (*Stellaria media*), dandelion (*Taraxacum* spp.) and clover (*Trifolium* spp.) noted.

Plate 2. 'Amenity grassland (GA2)' habitat

4.3.1.3 Scattered trees and parkland (WD5)

There are many mature trees predominantly ornamental within the amenity grassland surrounding the house. Species recorded include sycamore (), crab apple (), ash (), silver birch (), cedar (), walnut ().

Plate 3. 'Scattered trees and parkland (WD5)' habitat

4.3.1.4 Mixed conifer/broadleaf woodland (WD2)

The site is boarded to the north, east and south-west by areas of woodland. These areas are predominantly comprised of non-native species including lime, sycamore, cedar, sweet chestnut, horse chestnut, cherry laurel, and Portuguese laurel. The ground flora in these areas was almost exclusively ivy with no established herb layer evident. Some ground elder was recorded. The shrub layer was comprised of immature trees, and occasional holly. Trees were observed to be regenerating naturally. Native species recorded were Scots pine, sliver birch and ash (with dieback). A tree survey and tree impact assessment was undertaken for this proposal (Arborist Associates Ltd. 2021). Trees on the site were categorised according to condition. Category A trees are high quality value trees with a life expectancy of 40 years. Category B trees are of moderate quality value and have a life expectancy of 20 years. Category C trees are considered to have low quality value with a minimum life expectancy of 10 years. Category U trees are trees that are of such condition that their existing value would be lost within 10 years. It is proposed to remove 249 of the 334 trees from the proposed development site to accommodate the proposed development. The quality value of the trees which will be removed is outlined below;

- 46 No. of 46 (100%) Category 'U' trees.
- 6 No. of 7 (85.7%) Category 'A' trees.
- 78 No. of 106 (73.5%) Category 'B' trees.
- 119 No. of 175 (68.0%) Category 'C' trees

Plate 4. 'Mixed broadleaf/conifer woodland (WD2)' habitat

4.3.1.5 Hedgerow (WL1)

A hedgerow runs along the north-eastern boundary of the proposed development site, preceding the woodland in this location. It is a boxwood hedge (*Buxus* spp.) which appears to delineate the garden. A Leyland hedge bisects the southern garden area. There are a number of other smaller non-native hedges within the woodland habitat that surround the proposed development site.

Plate 5.'Hedgerow (WL1)' habitat

4.3.1.6 Recolonising bare ground (ED3)

The yard in front of the outbuildings/stables to the west of the proposed development site appears to be recolnising bare ground. Species recorded included spear thistle, ragwort, bramble, clover, creeping buttercup, self-heal, herb Robert, American willowherb. There was a considerable volume of old grass clippings in open shed.

Plate 6.'Recolonising bare ground (ED3)' habitat

4.3.1.7 Grassy verge (GS2)

Where the access track between the woodland and northern boundary wall of the proposed development site has become unmanaged, unused and overgrown, the habitat is now categorised as grassy verge. The field to the north-east of the site is also classified as GS2 having become rank and overgrown due to lack of grazing or management. The species recorded in this habitat included nettle, creeping buttercup, sorrel, plantain, willowherbs (*Epilobium* spp.), thistle (*Cirsium* sp.), tufted vetch (*Vicia cracca*), red clover (*Trifolium pratense*) and dock (*Rumex* sp.).

Plate 7.'Grassy verge (GS2)' habitat

Figure 6: Habitat map

4.3.2 Records of Rare and Protected Flora

An on-line search of the NBDC database for species of conservation interest recorded within the hectad N93 was carried out. Results of a data request from NPWS for the hectad were also reviewed. Green figwort (*Scrophularia umbrosa*), Upright brome (*Bromopsis erecta*), Shepard's needle (*Scandix pecten-veneris*), Hairy St. John's-wort (*Hypericum hirsutum*) and red hemp nettle (*Galeopsis angustifolia*) have been recorded in the hectad N93.

There were no rare or protected fauna recorded in the site during the August 2021 survey.

4.3.3 Non-native/ Invasive Flora

NBDC on-line records of non-native/invasive species of flora previously recorded in hectad N93 were reviewed. *Rhododendron ponticum*, Butterfly-bush (*Buddleja davidii*), Cherry Laurel (*Prunus laurocerasus*), Giant Hogweed (Heracleum mantegazzianum), Indian Balsam (*Impatiens glandulifera*), Japanese Knotweed (*Fallopia japonica*), Three-cornered Garlic (*Allium triquetrum*), Sycamore (*Acer pseudoplatanus*), Tree-of-heaven (*Ailanthus altissima*) and Wild Parsnip (*Pastinaca sativa*) have all been recorded in the hectad N93.

Invasive alien plant species recorded in the proposed development site, were snowberry (*Symphoricarpos*), located in the wooded area to the north-east and Cherry laurel, recorded in the wooded areas to the north-east of the proposed development site.

4.4 Fauna

4.4.1 Terrestrial Mammals

NBDC species lists and distribution maps generated on-line and data received from NPWS were examined to assess the distribution of rare and protected terrestrial mammal species within the hectad N93. Table 5 below lists protected mammal species which have been previously recorded and summarises their legal and conservation status in Ireland with regards to national and international legislation, and the most recent Irish Red List for Mammals (2019)[7].

Table 5. Records of rare and protected terrestrial mammal species within the hactad N93

Species	Distribution	Conservation/Legal Status[11]
Hedgehog *Erinaceus europaeus*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts
Irish stoat *Mustela erminea*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts
Otter *Lutra lutra*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; EU Habitats Directive Annex II and IV; Wildlife Acts; CITES Appendix 1
Red squirrel *Sciurus vulgaris*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts
Pygmy shrew *Sorex minutus*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts
Badger *Meles meles*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts
Pine marten *Martes martes*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; EU Habitats Directive [92/43/EEC] Annex V; Wildlife Acts
Irish hare *Lepus timidus* subsp. *Hibernica*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts; EU Habitats Directive Annex V
Red deer *Cervus elaphus*	Throughout Ireland	Irish Red Data Book: 'Least Concern'; Wildlife Acts

NBDC species lists generated on-line were also examined to assess the distribution of invasive terrestrial mammal species within the hectad N93. The following invasive species have been recorded; American mink (*Mustela vison*), Eastern grey squirrel (*Sciurus carolinensis*), European rabbit (*Oryctolagus cuniculus*), Feral Ferret (*Mustela furo*), greater white toothed shrew (*Crocidura russula*), house mouse (*Mus musculus*) and brown rat (*Rattus norvegicus*).

There was evidence of terrestrial mammal foraging and commuting activity within the site, including fox runs and badger snuffle holes. The area was thoroughly searched for breeding sites; however, none were recorded. There was extensive evidence of commuting at the proposed development site boundaries, which suggests that mammals are coming into the site from adjoining lands to forage.

[7] https://www.npws.ie/sites/default/files/publications/pdf/Red%20List%20No.%2012%20Mammals.pdf

4.4.2 Bats

The following species have previously been recorded in the 10km square (N93) in which the proposed development site is located:

- Brown long-eared bat (Plecotus auritus)
- Daubenton's bat (Myotis daubentonii)
- Leisler's bat (Nyctalus leisleri)
- Natterer's bat (Myotis nattereri)
- Common pipistrelle (Pipistrellus pipistrellus)
- Soprano pipistrelle (Pipistrellus pygmaeus)
- Whiskered bat (Myotis mystacinus)

The overall bat suitability index value (29.78) according to 'Model of Bat Landscapes for Ireland' (Lundy et at. 2011) suggests the landscape in which the proposed site is located is of low suitability for bats in general.

4.4.2.1 Survey Results

Daytime Visual Roost Inspections

Based on visual inspection numerous small gaps between the eaves and the wall of the main house were observed. In addition, some of the eaves had cracks at the end which show suitability for potential roosting locations for bats. Stains were also observed coming out of a hole near the top of the chimney. Both the barn building and the stables had multiple PRFs for bats, with missing tiles, gaps between the eaves/the side walls of the building and cracks in the wood (at the south-eastern side of the stables). Based upon the evidence from the visual roost assessment, and considering the local context, the proposed development was considered to be of 'moderate' likelihood to support roosting bats. The farm shed did not have any PRFs, as such it was deemed to have negligible bat roosting suitability. No trees due to be removed were deemed to have suitable PRFs for bats.

Dusk/Dawn Emergence/Re-entry Survey

Bats were confirmed roosting in the main house – two common pipistrelle bats were recorded re-entering the house underneath tiles at the joints of the dormer window on the southern side of the house.

Bat Activity Transects

During both walked transect surveys a low–moderate level of bat activity was observed on-site, with a total of 33 bat passes, from four different bat species, being recorded. These included common pipistrelle (n=17), soprano pipistrelle (n=4), Leisler's bat (n=10) and Natterer's bat.

Please refer to FGE (2021) for more information on bat survey results.

Figure 7: Transect routes and bats recorded (Source: FGE Consulting bat report)

4.4.3 Birds, Fish, Amphibians, Reptiles and Invertebrates

Reviews of the species list generated via the NBDC on-line mapping tool and data received from NPWS for rare and protected bird species were carried out. A wide variety of bird species, including some species of conservation concern, have been previously recorded within the hectad N93. These species are considered typical of the habitats in the general vicinity of the subject site and the surrounding area.

During the on-site survey, the following bird species were recorded; blackbird (*Turdus merula*), chaffinch (*Fringilla coelebs*), goldcrest (*Regulus regulus*), pied wagtail (*Motacilla alba*), bullfinch (), coal tit (), wood pigeon(), and rook (*Corvus frugilegus*). Overall, the habitats occurring within the site and surrounds are of moderate to high ecological value for birds with corvids observed roosting in the tall conifers to the north-east. The wooded areas in general are suitable for local populations of nesting birds.

Brown/sea trout (*Salmo trutta*) and freshwater white-clawed crayfish (*Austropotamobius pallipes)* are known from N93. There are no watercourses draining the proposed development site.

NBDC records within N93 exist for common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*) and common lizard (*Zootoca vivipara*), although none of these species were recorded on-site. Common frog has a widespread distribution in Ireland. Smooth newt is widespread in Ireland but locally distributed. Newts and frogs are amphibious, breeding in freshwater and utilising woodland, damp grassland, marsh and scrub for foraging. The habitats within the proposed development site are considered suitable for either species.

Common lizards are primarily found in areas of bog, heath, coastline and along the fringes of coniferous woodland, but may also occupy other habitats, such as non-intensive grassland, gardens and built-up areas (NRA, 2008).

None of the typical primary habitat-types for common lizard occur within the proposed development site. Common lizard was not recorded during surveys.

NBDC records from the hectad indicate documented records for butterflies and moths (Lepidoptera), beetles (Coleoptera), bees (Hymenopteran) and other terrestrial invertebrate groups.

5. Identification and Evaluation of Habitats, Flora and Fauna as Key Ecological Receptors

The habitats and associated flora, fauna and other ecological features or resources identified in Section 4.3 and 4.4 are now evaluated on the basis of their local, national and international conservation importance using the evaluation criteria described in Section 3.6 above and Appendix 1.

On the basis of these evaluations an assessment will then be made as to which of these habitats or species are considered key ecological receptors (KERs) that may be impacted upon by the project i.e. which habitat or species has potential to be significantly impacted during the construction or operational phase of the proposed project (see Table 6 and Table 7 below).

With regard to designated sites, please refer to Section 4.2.4 above.

5.1 Habitats

The following table (Table 6) presents an evaluation of the importance value of the habitats identified within the receiving environment of the proposed development, and rationale for inclusion, or exclusion as a KER.

Table 6. Evaluation of habitats within the study area

Habitat type	Ecological value relative to study area (NRA, 2009)	Key Ecological Receptor (Y/N)	Rationale
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No	Artificial habitat of limited biodiversity value.
Amenity grassland (improved) (GA2)	Local importance (lower value)	No	Modified and intensively managed habitat. Species-poor.
Dry meadows and grassy verges (GS2)	Local importance (lower value)	No	Modified/previously disturbed habitat comprising mainly rank grasses and ruderal species.
Scattered trees and parkland (WD5)	Local importance (lower value)	No	Modified and managed habitat with a non-native component. Of some local biodiversity value for range of fauna such as birds and invertebrates.
Hedgerows (WL1)	Local importance (lower value)	No	Disturbed habitat with non-native component. Of some local biodiversity value for range of fauna such as birds and invertebrates.
Mixed conifer/broadleaf woodland (WD2)	Local importance (higher value)	Yes	Managed, planted treelines of predominantly non-native species. Self-regenerating. Of local biodiversity value for range of fauna such as birds, mammal, amphibians and invertebrates.

5.2 Rare and Protected Flora Species

There are no records for rare and protected plant species within the subject site and none were recorded during the ecological walkover. The habitats which occur are not considered suitable for the vast majority of the species listed in NBDC and NPWS databases, which have been recorded in the hectad N93. None of the species outlined in Section 4.3.2 above are considered to comprise KERs for the project and so will not be considered further in this evaluation.

5.3 Fauna

The following table (Table 7) presents an evaluation of the importance value of the faunal species identified within the receiving environment of the proposed development and rationale for inclusion, or exclusion as a KER.

Table 7. Evaluation of faunal species within the study area

Species	Ecological value relative to study area (NRA, 2009)	Description at the site	Key Ecological Receptor (Y/N)	Rationale
Hedgehog *Erinaceus europaeus*	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site; however, potentially suitable habitat occurs and records exist in the general area. Precautionary principle.
Irish stoat *Mustela erminea*	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site. No records from the area. Habitats considered suitable. Precautionary principal.
Otter *Lutra lutra*	Local importance (lower value)	Not recorded during surveys.	**No**	No evidence of this species recorded within the site. No records from the area. Habitats not considered suitable.
Red squirrel *Sciurus vulgaris*	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site. Records from the area. Habitats within the site considered suitable. Precautionary principal.
Pygmy shrew *Sorex minutus*	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site; however, potentially suitable habitat occurs. Precautionary principle.
Badger *Meles meles*	Local importance (higher value)	Feeding evidence recorded during surveys.	**Yes**	Evidence of this species recorded within the site. Records from the area. Habitats considered suitable.
Pine marten *Martes martes*	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site. Records

Species	Ecological value relative to study area (NRA, 2009)	Description at the site	Key Ecological Receptor (Y/N)	Rationale
				from the area. Habitats within the site considered suitable.
Irish hare *Lepus timidus* subsp. *Hibernica*	Local importance (lower value)	Not recorded during surveys.	**No**	No evidence of this species recorded within the site. No records from the area. Habitats within the site not considered suitable.
Red deer *Cervus elaphus*	Local importance (lower value)	Not recorded during surveys.	**Yes**	No evidence of this species recorded within the site. Records from the area. Habitats within considered suitable. Precautionary principal.
Birds	Local importance (higher value)	Small number of bird species typical of habitats occurring recorded during the survey.	**Yes**	Habitats within the site of local value to birds. Habitats provide potential foraging and breeding habitat for a range of species, including raptors, passerines, pigeons and corvids.
Amphibians	Local importance (higher value)	Not recorded during surveys.	**Yes**	No evidence recorded within the site. Records from the area. Habitats within the site considered suitable. Precautionary principal.
Bats	Local importance (higher value)	Four species (Leisler's bat, natterer's bat, soprano pipistrelle and common pipistrelle) recorded during surveys. Two no. common pipistrelle bats recorded roosting in the dwelling house.	**Yes**	Roosting, foraging and commuting recorded in low levels. Records for the area. Habitats suitable.

6. Do-nothing Scenario

The proposed development site comprises existing buildings and associated artificial surfaces located within an landscaped and wooded site, on the edge of an urban and built-up setting. The landscape extending south of the site is more agricultural in nature.

If the proposed development does not progress beyond the planning application stage, it is likely that the proposed development site will continue to be utilised by mammals and birds.

7. Potential Impacts of the Project

There is potential for the proposed development to impact on the natural environment (habitats, flora, fauna and water quality). This section will identify the ecological impacts of the construction, operational and decommissioning phases of the proposed development on the local natural environment. For the project, the construction phase is likely to have the most potential for effects on biodiversity.

The potential impacts of the proposed project were considered and assessed to ensure that all effects on KERs are adequately addressed and no significant residual effects are likely to remain following the implementation of mitigation measures, and best practice construction methodology.

7.1 Construction Phase

The construction phase effects associated with the proposed development are considered to be/may comprise the following:

Table 8. Construction phase effects potentially associated with the proposed debelopment

Construction Phase Effect	Source
Direct habitat loss and alteration	Construction of temporary site compound, felling of trees/vegetation clearance, demolition works, excavations for structure foundations, ancillary site development works, landscaping and installation of services. Construction works also pose a risk of spreading of invasive species
Indirect surface or ground water quality effects/Indirect habitat alteration	Construction phase run-off/connection to existing storm network. Sediment/pollutant laden run-off may arise from exposed areas during groundworks and excavations, from material storage areas or from construction vehicles/plant. On-site temporary toilets and washing facilities. Leaching of fuels/oils etc to groundwater in the event of accidental spillage.
Direct species disturbance/displacement	Increased activity and human presence, noise/vibration/lighting/vegetation clearance associated with construction works.

7.2 Operational Phase

The operational phase effects associated with the proposed development are considered to be/may comprise the following:

Table 9. Operational phase effects potentially associated with the proposed development

Operational Phase Effect	Source
Indirect surface water quality effects/Indirect habitat alteration	Via storm water/wastewater discharges to the public system which could lead to secondary effects such as alteration of aquatic habitat.
Direct/indirect species disturbance/displacement	Due to increased habitat loss, lighting/noise, indirect water quality effects, indirect impacts on prey biomass, indirect alteration of foraging, breeding or commuting habitat.

8. Assessment of Potentially Significant Effects

8.1 Construction Phase

8.1.1 Direct habitat loss/alteration

The habitats occurring within the proposed development site comprise mainly man-made/artificial and/or managed habitats which are considered to be of low ecological value, which were evaluated as 'Local importance (lower value)' and thus are not considered to comprise KERS for the proposed development (refer to Table 6 above).

The only habitat considered to be of high ecological value at a local scale is the predominantly non-native mixed conifer and broadleaf woodland which surrounds the proposed development site. This habitat provides shelter, foraging habitat and commuting corridors for local mammal populations, as well as potential breeding habitat for local bird populations. This habitat also provides a continuous connected corridor through the proposed development site to the agricultural habitats located further south.

The loss of this habitat will have a short-term moderate negative effect on a local scale.

8.1.2 Impacts to water quality/Indirect habitat alteration

There are no watercourses draining the proposed development site. The proposed development site is not directly connected to any other downstream stream, river or lake. The existing site connects to the municipal network, which is connected to the Leixlip WWTP. There is no ecological pathway to water quality effects or indirect habitat alteration in any ecologically valuable aquatic habitats in the locality.

8.1.3 Impacts to faunal species

The following table (Table 10) describes the potential construction phase effects on faunal KERS at the proposed development site, and the significance of the impact.

In terms of potentially significant disturbance/displacement of species, it is considered that habitat loss, noise and increased human activity required for construction of the proposed development, and potential water quality impacts, have the most potential for disturbance/displacement effects to faunal KERS. Mobile species, such as birds and mammals (excluding bats)are expected to temporarily leave the area once works begin owing to noise and human activity.

Table 10. Potential impacts on faunal species identified as KERs during the construction phase and the significance of the impact

KER	Ecological value relative to study area	Unmitigated Impacts	Significance of unmitigated impacts (NRA, 2009 and EPA, 2017)
Hedgehog	Local importance (higher value)	No evidence of hedgehog on-site. There will be loss of areas of potentially suitable habitat for hedgehog; most notably the woodland and grassy areas. This will be off-set through landscaping and planting.	Potential habitat effects on hedgehog assessed as **Short-term Moderate Negative effects**.

KER	Ecological value relative to study area	Unmitigated Impacts	Significance of unmitigated impacts (NRA, 2009 and EPA, 2017)
		Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential direct disturbance/ displacement effects on hedgehog assessed as **Short-term Not Significant Negative effects.**
Irish Stoat	Local importance (higher value)	No evidence of Irish stoat on-site. Species not strongly associated with sparse natural habitats in heavily urbanised areas. There will be loss of potentially suitable habitat for Irish stoat; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on Irish stoat assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on Irish stoat assessed as **Short-term Not Significant Negative effects**.
Red squirrel	Local importance (higher value)	No evidence of red squirrel on-site. Species not strongly associated with sparse natural habitats in heavily urbanised areas. There will be loss of potentially suitable habitat for red squirrel; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on red squirrel assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on red squirrel assessed as **Short-term Not Significant Negative effects**.
Pygmy shrew	Local importance (higher value)	No evidence of pygmy shrew on-site. There will be loss of potentially suitable habitat for pygmy shrew; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on pygmy shrew assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on pygmy shrew assessed as **Short-term Not Significant Negative effects**.
Badger	Local importance (higher value)	There was evidence of foraging badger on-site. There will be loss of potentially suitable foraging habitat for badger; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on badger assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on badger assessed as **Short-term Not Significant Negative effects**.
Pine marten	Local importance (higher value)	There was no evidence of pine marten on-site. Species not strongly associated with sparse natural habitats in heavily urbanised areas. There will be loss of potentially suitable habitat for red deer; however, this will be off-set through landscaping and planting.	Potential habitat effects on pine marten assessed as **Short-term Moderate Negative effects**.

KER	Ecological value relative to study area	Unmitigated Impacts	Significance of unmitigated impacts (NRA, 2009 and EPA, 2017)
		Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential direct disturbance/ displacement effects on pine marten assessed as **Short-term Not Significant Negative effects**.
Red deer	Local importance (higher value)	There was no evidence of red deer on-site. Species not strongly associated with sparse natural habitats in heavily urbanised areas. There will be loss of potentially suitable habitat for red deer; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on red deer assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on red deer assessed as **Short-term Not Significant Negative effects**.
Birds	Local importance (higher value)	There will be loss of potentially suitable nesting/foraging habitat for birds including some mature trees; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on birds assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on birds assessed as **Short-term Not Significant Negative Effects**.
Amphibians	Local importance (higher value)	There will be loss of potentially suitable habitat for frogs and newts; however, this will be off-set through landscaping and planting. Direct disturbance and/or displacement effects could potentially ensue as a result of increased noise, lighting and human activity.	Potential habitat effects on amphibians and reptiles assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects amphibians and reptiles assessed as **Short-term Not Significant Negative effects**.
Bats	Local importance (higher value)	A low level of bat activity (foraging and commuting) recorded on-site. Two no. common pipistrelle were recorded roosting in the main house building. Species not strongly associated with sparse natural habitats in heavily urbanised areas. There will be a loss of roosting habitat and foraging/commuting habitat. The loss of commuting/foraging habitat will be off-set through landscaping and planting. Direct/indirect disturbance/displacement effects on bats could potentially ensue via noise/lighting disturbance, loss or alteration of foraging/commuting habitats.	Potential habitat effects on bats assessed as **Short-term to Permanent Moderate Negative effects**. Potential direct/indirect effects on bats assessed as **Temporary to Short-term Moderate Negative effects**.

8.2 Operational Phase

8.2.1 Impacts to water quality/Indirect habitat alteration

The proposed development site will be connected directly to the municipal foul and storm water networks and, as a consequence, no outflow to any natural water body will occur, thereby, precluding direct or indirect water quality impacts. The Leixlip WWTP has adequate capacity to service the proposed development and is currently operating below its population equivalent (p.e.) design. The WWTP is currently in compliance with its Emission Limit Values (ELVs)[8]. Upgrading of storm water overflows were due to be complete by December 2021. Storm water will be primarily dealt with on-site through a landscape-based approach to attenuation, which will keep discharges at greenfield rates. The proposed development site is identified as being partially within Flood Zone B from an overland flow route along the local access road from the south; however, the FRA concluded that the overland flow route will be maintained but will be contained to the main access road to the proposed development site and also the green space along the eastern boundary (JBA, 2022).

There is no ecological pathway to water quality effects or indirect habitat alteration in any ecologically valuable aquatic habitats in the locality.

8.2.2 Impacts to faunal species

During the operational phase, there is likely to be some disturbance to terrestrial mammals and birds owing to increased noise, traffic and human activity associated with the change of land use in the proposed development site. With regard to terrestrial mammals, it is expected that human activity will be greatest during the day with relatively low levels at night, during which time many mammal species are more active. However, overall, the degree of activity within the proposed development site will increase from existing levels, while the amount of available suitable habitat will decrease.

It is considered that the potential disturbance or displacement impacts to mammals and birds as a result of the operational phase of the proposed development will be Long-term, Moderate Negative Effects on a local scale.

The increase in human activity (noise and light levels) as a result of the proposed development during operation, will temporarily impact the local bat populations. The operation phase of the development will constitute a permanent change for onsite bat populations (FGE, 2021).

Bat mitigation measures are presented in Section 9.4 below in order to protect the on-site bat populations.

9. Mitigation

9.1 Construction and Environmental Management Plan (CEMP)

A CEMP will be prepared for the proposed development by the appointed Contractor which would incorporate relevant environmental avoidance or mitigation measures to reduce potential environmental impact. The finalised CEMP will be implemented by the appointed Contractor before commencing work on-site. The CEMP will manage the environmental commitments of the proposed development. The implementation of proposed mitigation measures, as well as the monitoring and supervision of these measures, will be managed through the

[8] Lower Liffey Valley Regional Sewerage Scheme (Leixlip) WWTP D0004-02 Annual Environmental Report (2020)

CEMP. Mitigation measures will be monitored for compliance in-line with the requirements of the Planning Consent.

The finalised CEMP will take cognisance of the following Best Practice Guidance:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001)
- CIRIA C648 – Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006)
- CIRIA C753 – The SUDS Manual
- CIRIA C698 – Site handbook for the construction of SUDS
- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- Bat Conservation Trust (2018). Guidance Note 08/18. Bats and Artificial Lighting in the UK - Bats and the Built Environment Series.

The CEMP will also include the following elements:

- Noise, Vibration, Dust and Air Control Plan
- Construction and Demolition Waste Management Plan
- Water Quality/Sediment and Erosion Control Plan
- Fuel Management Plan
- Emergency Response Plan (in the event of a spill of chemical, fuel or other hazardous wastes, a fire, or non-compliance incident with any permit of license issues).

9.2 Environmental Officer

Regular routine inspections of construction activity will be carried out by Contractor staff to ensure all controls to prevent environmental impact are in place. Only suitably trained staff will undertake environmental inspections at the proposed development site.

9.3 General Protection of Water Quality during Construction

The Contractor will appoint a suitably qualified person to oversee the implementation of general measures for the prevention of pollution to the aquatic environment. The following best practice measures will be put in place to avoid or minimise negative effects to water quality as a result of the project during the construction phase.

9.3.1 Site Compound

- Adequate parking facilities will be made available within the Construction Compound for all site workers during the course of construction.
- A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.

9.3.2 Excavated Materials, Soil and Surface Water Management

- Measures will be implemented throughout the construction stage to reduce and attenuate site run-off and protect the existing drainage network from excessive silt load.
- Topsoil on-site will be preserved where possible. All topsoil stripping will be scheduled to be carried out during dry weather and all stockpiling will be kept as far away as possible from drains.
- To reduce potential increases in flows into the existing drainage system during construction, the period of exposure of bare areas and uncontrolled runoff will be limited as much as possible. Early covering/seeding/planting of exposed surfaces will be undertaken once opened areas have been reinstated.
- Excavated material will be deposited in designated material deposition areas.
- The scheme drainage system will be inspected daily during construction, or after storm events, to check for blockages/drainage issues. Where any drainage issues are identified, these will be addressed on the same day to ensure water quality protection.

9.3.3 Dewatering of Excavations

- The contractor shall develop an appropriate dewatering scheme to keep the basement/excavations free from water and ensure the quality of water leaving site is high.
- Any excavations that need to be pumped clear of groundwater should be pumped to a settlement tank with sufficient retention time before the water is allowed to discharge to the drainage network. Water will only be discharged following treatment.
- Discharge of water will be regularly monitored visually for hydrocarbon sheen and suspended solids.

9.3.4 Storage of Construction Materials

- Construction materials should only be stored in designated material storage areas.
- Material stockpiles should be kept to a minimum size. Material stockpiles should be stored away from watercourses and drains, on an impermeable base and away from moving plant and machinery.

9.3.5 Storage of Fuels/Oils and other Hazardous Materials

- The storage of oils, chemicals and hydraulic fluids is to take place in secure, designated areas within the site compound.
- All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks/containers with the capacity to hold 110% of the volume of chemicals and fuels contents.
- Bunds will be located on flat ground a minimum distance of 50m from any watercourse or drain
- Spill kits will be kept on site at all times and all staff trained in their appropriate use.

9.3.6 Refuelling of Construction Plant

- All plant will be refuelled at designated refuelling locations within the site compound. Rigid and articulated vehicles will be fuelled off site as will all site vehicles (jeeps, cars and vans).

- Designated fuel filling points will have appropriate oil and petrol interceptors to provide protection from accidental spills.
- Only designated trained and competent operatives will be authorised to refuel plant on site.
- All plant used should be regularly inspected for leaks and fitness for purpose.

9.3.7 Spill Control Measures

- Measures will be implemented throughout the construction stage to prevent contamination of the soil and drainage network from oil and petrol leakages.
- Spill kit containment equipment will be stored at all work areas for use in the event of an emergency. The contents of the spill kit will be replenished if used and they will be checked on a scheduled basis during environmental inspections and audits. All crews will be trained in the use of spill kit equipment.
- An Emergency Response Plan will be implemented in the event of any environmental incidents such as spillage of oil/fuel during the construction/operational phase of the project.
- All emergency procedures and equipment will be in place prior to the commencement of any works.
- The local authority will be informed immediately of any spillage or pollution incident that may occur on-site during the construction phase.

9.3.8 Use of Concrete

- Wet concrete is silty and very alkaline (high pH) and can have a serious effect on watercourses and aquatic life if ingress occurs. Concrete should not enter site water.
- Pouring of cementitious materials will be carried out in the dry. A designated trained operator, experienced in working with concrete, will be employed during any concrete pouring.
- The use of concrete close to drainage features will be carefully controlled to avoid spillage.
- Washout of mixing trucks and plant is to be carried out in designated, contained, impermeable areas.
- Any small volumes of incidental wash generated from cleaning hand tools, cement mixers or other plant, will be trapped on-site to allow sediment to settle out and reach neutral pH before clarified water is released to the drainage network or allowed to percolate into the ground. Settled solids will need to be appropriately disposed of off-site.

9.3.9 Construction Wheel-wash Facilities

- Wheel wash facilities are to be provided at all entrances/exits for the site. All construction vehicles leaving site will be required to drive through these wheel wash areas.
- The wheel wash area will be cleaned regularly so as to avoid build-up of residue.
- Vehicle washdown water will discharge to the drainage system for treatment and attenuation.

9.3.10 Weather/Flood Risk

- The works will only commence when a suitable weather window is forecast and in agreement with the relevant local authority representative.

9.4 Protection of Bats

The following measures are recommended by FGE, 2021 for the protection of the local bat populations.

9.4.1 Timing of Structural Works

The removal of the main house and any removal/replacement of the roofing of the building should be undertaken, under licence, within the period from September to the end of February when all bats, including the young, are able to fly and fewer animals are expected to be in these buildings. This should lessen the impact on these animals and will also avoid the bird breeding seasons. Outside of these months, it is possible to undertake works but there is an increased risk of encountering bats and birds in buildings so such works could be external or in areas not being used by protected species.

9.4.2 Removal of the roof from the farmhouse and outbuildings

The removal of the roof of the main house prior to the removal of the structures shall be undertaken manually and carefully. Roofing material will be removed by hand in the knowledge that a few bats may be found beneath. Any animals discovered should be safely retained, under licence, in a secure box until dusk when they should be released onsite.

9.4.3 Provision of artificial bat boxes

To offset the loss of bat roosting site and to further enhance the area's woodland, a bat box scheme should be provided onsite. Six Schwegler 6F bat boxes should be erected; 'Schwegler' woodcrete bat boxes have been proven to be acceptable alternatives for bats and they are readily occupied; these could be mounted on any large tree (as directed by a licenced ecologist). Bat boxes require annual monitoring to ensure effectiveness and also need cleaning occasionally if regularly used. Such monitoring is a licensed activity.

9.4.4 Lighting

In general, artificial light creates a barrier to commuting bats and it can also result in roosts being abandoned therefore onsite lighting should be avoided. Where absolutely necessary, directional lighting (i.e., lighting which only shines downwards on targeted areas and not nearby countryside) should be used to prevent overspill. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. LEDs should be used, as these emit minimal ultra-violet light; and white and blue wavelengths should be avoided, with wavelength <4,200 kelvin being preferred.

9.5 General Protection of Fauna

- Construction materials and wastes are to be kept in designated areas to reduce risk of accidental injury/entrapment of any wildlife on-site.
- Removal of vegetation will only be undertaken outside the bird breeding and nesting season (March 1st to August 31st inclusive), in accordance with Section 40 of the Wildlife Acts.
- All temporary construction lighting is to be turned off after daylight hours.

- Should any resting, hibernating or breeding place of any protected species be discovered within the site during construction works, works will cease immediately, the area will be cordoned off and the advice of NPWS sought.

9.5.1 Landscaping

It is recommended to provide continuous cover of native trees, hedges and shrubs around the perimeter of the proposed development site in order to provide shelter, foraging and commuting habitat and to maintain connectivity throughout the landscape for fauna. Additional landscaping and planting will include native species of local and county scale only.

A Tree Impact Assessment Plan has been created by Arborists Associates Ltd. which will be implemented during the construction phase of the proposed development.

9.6 Management of Invasive Species, Site Bio-security

- Construction personnel involved in works should be trained in basic invasive species prevention and management measures.
- Vehicles, machinery, equipment/tools and PPE should arrive to site clean.
- Invasive species management methodologies and plans outlining Best Available Techniques (BAT) will be sourced from current best practice and will have regard to 'The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' (NRA 2010).
- Management and treatment of any invasive plant species found on-site e.g. *Snowberry and Cherry laurel*, will be overseen by a suitably-experienced and qualified person. Best-practise protocols will be implemented to ensure the proper removal and disposal of the plant(s) in question.
- In the event that the use of pesticides/herbicides is required, these should be applied strictly in accordance with the manufacturer's recommendations, by a registered Professional Pesticides User, and fully in compliance with the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. 155 of 2012).

10. Cumulative Impacts

10.1 Plans

With regards to the potential for cumulative or in-combination effects, the Kildare County Development Plan (2017-2023) and the Celbridge Local Area Plan (2017-2023) were considered. As per Celbridge Local Area Plan (LAP) 2017-2023, the majority if the proposed development site is zoned as 'B -Existing Residential and Infill'. The land use objectives of these zoning categories are as follows:

- B- "*To protect and enhance the amenity of established residential communities and promote sustainable intensification*".

The Zoning Matrix within the LAP illustrates a range of land uses together with an indication of their broad acceptability in each of the land use zones. 'Dwellings' have been identified as being acceptable in the B land use zoning.

In general, County Development Plans and Local Area Plans have a range of environmental and natural heritage policy safeguards in place. These safeguards to protect the natural environment will also apply to the proposal described in this report. No significant cumulative impacts are predicted with either the Kildare County Development Plan (2017-2023) and the Celbridge Local Area Plan (2017-2023).

10.2 Permitted and Proposed Developments in the Locality

A search of Kildare County Council's online planning enquiry system for recent granted or on-going planning applications located within the vicinity of the proposed development site was undertaken. These pertain primarily to construction, alteration and modification of existing houses/dwellings, as well as construction of three other strategic housing developments:

- SHD 201802 251 residential units,
- SHD 201809 467 residential units,
- SHD 201901 372 residential units.

There have been no recent planning applications on the current application site. The Key Development Area (KDA) No. 5 at Simmonstown is located to the south of the proposed development site between Hazelhatch Park and Temple Manor residential estates to the northeast and southwest respectively. The lands measure approximately 35 ha in area and are currently in agricultural use[9].

With regard to cumulative species disturbance/displacement impacts to bats, birds, amphibians, reptiles and mammals due to increased light levels and habitat loss, implementation of the recommended mitigation measures, as outlined in Section 9 above, will avoid any significant residual disturbance/displacement effects. Therefore, no significant cumulative disturbance/ displacement impacts to bats, birds, amphibians, reptiles and mammals are envisaged as a result of potential interaction between the proposal and permitted developments elsewhere within the area with regard to lighting and habitat loss effects.

No significant cumulative species disturbance/displacement impacts due to interaction between the proposal and the permitted developments elsewhere in relation to increased noise or human activity are envisaged as the proposed development site is located in an urban area close to roads and residential/retail estates.

10.3 Existing Land-use, On-going Activities and Water Quality

Celbridge is a predominantly residential area, with commerce, tourism, light industry, and agriculture being the main activities in and around the town. The Celbridge LAP outlines strategic locations for new roads and road improvements, key development areas for new residential and community developments and strategic locations for new water connections across the River Liffey. Such developments will be subject to environmental assessment as stated in the LAP.

The proposed development site will be connected to the Leixlip WWTP which has the capacity to service the project and is currently treating a population equivalent (p.e.) below that which it is designed to treat. The WWTP treats waste water to a tertiary standard which includes N&P removal. Storm water emissions from the proposed development site will predominantly infiltrate on-site, with attenuated storm water flows, which will not include N & P loads, being discharged only during extreme weather events. No significant cumulative species disturbance/displacement impacts due to interaction between the proposal and the existing land-use and on-going activities in relation to increased noise or human activity are envisaged.

[9] Celbridge Local Area Plan Accessed 06/08/2021

11. Residual Effects

Residual effects are from impacts that remain, once mitigation has been implemented or, impacts that cannot be mitigated.

Table 11 below provides a summary of the predicted residual effects for the KERS identified which are the most ecologically valuable at the site.

Table 11. Potential impacts on faunal species identified as KERs during the construction phase and the significance of the impact

KER	Construction phase effects (without mitigation)	Operational phase effects (without mitigation)	Mitigation measures	Residual effects
Hedgehog	Potential habitat effects on hedgehog assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on hedgehog assessed as **Short-term Not Significant Negative effects.**	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Irish Stoat	Potential habitat effects on Irish stoat assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on Irish stoat assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Red squirrel	Potential habitat effects on red squirrel assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on red squirrel assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Pygmy shrew	Potential habitat effects on pygmy shrew assessed as **Short-term**	Potential disturbance or displacement	CEMP	Potential residual habitat effects assessed as **Long-term Slight Negative effects**.

KER	Construction phase effects (without mitigation)	Operational phase effects (without mitigation)	Mitigation measures	Residual effects
	Moderate Negative effects. Potential direct disturbance/ displacement effects on pygmy shrew assessed as **Short-term Not Significant Negative effects**.	impacts assessed as **Long-term, Moderate Negative Effects**	Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Badger	Potential habitat effects on badger assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on badger assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Pine marten	Potential habitat effects on pine marten assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on pine marten assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Red deer	Potential habitat effects on red deer assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects on red deer assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Birds	Potential habitat effects on birds assessed as	Potential disturbance or displacement	CEMP	Potential residual habitat effects assessed as **Long-term Slight Negative effects**.

KER	Construction phase effects (without mitigation)	Operational phase effects (without mitigation)	Mitigation measures	Residual effects
	Short-term Moderate Negative effects. Potential direct disturbance/ displacement effects on birds assessed as **Short-term Not Significant Negative Effects**.	impacts assessed as **Long-term, Moderate Negative Effects**	Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Amphibians	Potential habitat effects on amphibians and reptiles assessed as **Short-term Moderate Negative effects**. Potential direct disturbance/ displacement effects amphibians and reptiles assessed as **Short-term Not Significant Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**
Bats	Potential habitat effects on bats assessed as **Short-term to Permanent Moderate Negative effects**. Potential direct/indirect effects on bats assessed as **Temporary to Short-term Moderate Negative effects**.	Potential disturbance or displacement impacts assessed as **Long-term, Moderate Negative Effects**	CEMP Compliance with Wildlife Acts regarding vegetation removal Lighting measures Bat boxes Roof removal measures Landscaping Best practice	Potential residual habitat effects assessed as **Long-term Slight Negative effects**. Potential residual disturbance/displacement effects assessed as **Temporary to Short-term Not Significant Negative effects**. **No significant residual effects.**

12. Enhancement Opportunities

12.1 Landscaping

Extensive soft landscaping is proposed as part of the proposed development. Planting of mature and semi-mature trees, amenity planting and hedgerow will enhance biodiversity by providing valuable habitat for a wide variety of fauna, of value within an urban environment. The proposed planting will compensate for loss of low-value semi-natural habitat within the proposed development site.

It is recommended that native tree, shrub and plant species are utilised as much as possible as part of site landscaping. The planting list should incorporate a diverse range of pollinator/bee-friendly tree/plant species as much as possible to support local biodiversity. Pollinator-friendly, native tree species include willow, hawthorn, blackthorn, wild cherry, and crab apple.

It is recommended that recommended as per the All Ireland Pollinator Plan 2021-2025 and Celbridge Biodiversity Action Plan 2021-2025 are incorporated where possible.

12.2 Other Measures

Bird boxes can be installed in appropriate locations within the site (taking target species size, height above ground, and aspect into consideration).

13. Conclusion

Residual impacts on biodiversity including impacts to designated sites, habitats, flora, fauna and water quality are not considered significant provided best practice methodologies and mitigation measures are employed during the construction and operational phases.

Provided that the proposed development is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant effects on KERS are not anticipated at any geographical scale.

The application of construction and operational phase mitigation and protection measures will ensure that no significant residual ecological impacts, either alone or in combination with other plans or projects, will arise from the proposed development.

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Examples of valuation at different geographical scales (Source NRA, 2009)

International Importance	• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA). • Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network.[1] • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level)[2] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[3]
National Importance	• Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); • Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level)[4] of the following: • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing 'viable areas'[5] of the habitat types listed in Annex I of the Habitats Directive.
County Importance	• Area of Special Amenity.[6] • Area subject to a Tree Preservation Order. • Area of High Amenity, or equivalent, designated under the County Development Plan. • Resident or regularly occurring populations (assessed to be important at the County

	level)[7] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. • County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP,[8] if this has been prepared. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Locally Important (higher level)	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; • Resident or regularly occurring populations (assessed to be important at the Local level)[9] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Locally Important (lower level)	• Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; • Sites or features containing non-native species that are of some importance in maintaining habitat links.

[1] See Articles 3 and 10 of the Habitats Directive.

[2] It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[3] Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

[4] It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

[5] A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

[6] It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

Appendix 2 Bat Report

BAT ROOST ASSESSMENT AND SURVEY

for the

Development of Residential Houses in

Hazelhatch, Co. Kildare

prepared for **Gareth MacHale**

by FGE Consulting

FGE
Consulting

August 2021

Document Details

Client	Gareth MacHale
Document Title	Bat Roost Assessment and Survey for the Development of Residential Houses in Hazelhatch, Co. Kildare
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Prepared by	Domhnall Finch, PhD, MSc, BSc, PgCert, ACIEEM
Approved by	Domhnall Finch, PhD, MSc, BSc, PgCert, ACIEEM
Date	17/08/2021
Status	Final

1. Introduction

FGE Consulting were commissioned by Gareth MacHale to undertake a visual roost inspection, bat emergence survey, and bat activity surveys of the site of an existing house, barn building and stables in Celbridge, Co. Kildare. The aims of the study were to determine the following:

- To assess and evaluate the likely importance of the existing structures to bats.
- The diversity and relative abundance of bats present within the study area and its immediate environs.

1.1. Site Location and Description

The site and associated buildings (Plates in Appendix), are located in a semi-urban area. The site is surrounded by agricultural fields and public amenity sites on three sides, to the north lies an existing housing estate. The site is located on the south east edge of the village of Celbridge, Co. Kildare and is within 1.5 km of Celbridge town centre itself. Structures onsite included a large two-story house, with a shed, barn building and stables to its north. The site borders consist of mature treelines and small woodlands. A site location map is presented in Figure 1.1.

Figure 1.1: Location of the proposed development[1].

1.2. Legal Status and Conservation Issues of Bats

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Act (2000). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. Across Europe, they are further protected

[1] Proposed development displayed in the map is indicative of redline boundary only

under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat is further listed under Annex II.

Also, it should be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements re: European Protected Species.

> *NB: Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence.*

The current status and legal protection of the known bat species occurring in Ireland is given in Table 1 below (Marnell *et al.* 2009).

Table 1: Legal status and protection of the Irish bat fauna

Common and scientific name	Wildlife Act 1976 & Wildlife (Amendment) Act 2000	Irish Red List status	Habitats Directive	Bern & Bonn Conventions
Common pipistrelle *Pipistrellus pipistrellus*	Yes	Least Concern	Annex IV	Appendix II
Soprano pipistrelle *Pipistrellus pygmaeus*	Yes	Least Concern	Annex IV	Appendix II
Nathusius' pipistrelle *Pipistrellus nathusii*	Yes	Not referenced	Annex IV	Appendix II
Leisler's bat *Nyctalus leisleri*	Yes	Near Threatened	Annex IV	Appendix II
Brown long-eared bat *Plecotus auritus*	Yes	Least Concern	Annex IV	Appendix II
Lesser horseshoe bat *Rhinolophus hipposideros*	Yes	Least Concern	Annex II Annex IV	Appendix II
Daubenton's bat *Myotis daubentonii*	Yes	Least Concern	Annex IV	Appendix II
Natterer's bat *Myotis nattereri*	Yes	Least Concern	Annex IV	Appendix II
Whiskered bat *Myotis mystacinus*	Yes	Least Concern	Annex IV	Appendix II
Brandt's bat *Myotis brandtii*	Yes	Data Deficient	Annex IV	Appendix II

1.3. Statements of Authority

Domhnall Finch Senior Ecologist and Technical Director:

Domhnall Finch (PhD, MSc, BSc, PgCert, ACIEEM, AHEA), has over 10 years' experience conducting technical assessments for a range of development types including infrastructure and residential.

Domhnall is a specialist in the field of bat, mammal and avian ecology and survey methodology. He has been the lead Project Ecologist of a number of medium and large-scale projects, including the largest bat and mammal survey works of any infrastructure to be undertaken in Ireland. This project was a wind farm development for Bord na Mona that spanned 22,000 ha, and it required intensive sampling effort, survey design, mapping and precise report writing. He has been involved in the production of over 25 wind farm avian reports and has a wealth of experience in Habitat Surveys & Mapping (Fossitt 2000), Marsh Fritillary Surveys, Electro-fishing Surveys and Q-sampling. Through his experience he has refined his report writing skills and has produced top quality reports for Article 6 Appropriate Assessments, Natura Impact Assessments, Construction Environmental Management Plan, Ecology Report and Flora and Fauna chapters for various projects. Throughout his professional career he has had to liaise with a number of stakeholders, from clients in large corporations such as BnM, ESBN, ESBI, OPW, and Coillte, to farmers/landowners and subcontractors. Domhnall has a firm understanding of the legislations surrounding planning and the environment and has a positive working relationship with many of the statutory consultees such as NPWS and IFI.

Domhnall has had a keen interest in ornithology since childhood and has honed and refined his bird identification skills over a number of years having working in the UK for the RSPB and also for

Birdwatch Ireland at their Head Quarters. Beyond ecology and project management, Domhnall has extensive experience in GIS and has conducted variety mapping and analysis techniques for projects. These including the use of Network Analysis, remote sensing techniques, DEMs, spatial analytics, landscape modelling, predictive modelling, ecosystem services/habitat/connectivity mapping and data processing.

Kieran Finch – Ecologist

Kieran Finch (BSc) is a specialist in field ecology, from ID to survey design. He has over 35 years' experience in botanical ID and project management, from initial floral assessments and requirements to designing of plant layout, replanting species and monitoring their condition afterwards. He has been lead consultant on a number of successful large road and development schemes from new service stations to housing developments. He has experience in using Fossit (2000) to map and survey habitats from costal shores and estuaries to woodlands and uplands.

He has extensive experience, over 40 years, in bird surveys and species ID. Taking part in numerous Breeding Bird Atlases and surveys. In addition, he has taken part in annual seabird monitoring projects for BirdWatch Ireland and worked on the Future of the Atlantic Marine Environment (FAME) sea bird counts. From this extensive sea bird experience, he has led on the assessment of the potential impact tourism is having on protected bird species within SPA's and the habitats associated with them along the Wild Atlantic Way.

He has over 10 years' experience in observing, trapping and identifying a range of insect species, specialising in butterflies, macro and micro moths. He has recorded a number of county first moth species within Ireland and has been a moth specialist for the national Bioblitz on Bere Island in 2016. He has also taken part in large scale habitat management and surveys for the protected Marsh Fritillary butterfly. In addition to moths and butterflies he has extensive experience surveying and ID'ing bumblebees, solitary bees, hoverflies, ladybirds, wasps, shieldbugs, dragonflies and damselflies.

Throughout his professional career he has had to liaise with a number of stakeholders, from clients in large corporations such to farmers/landowners and subcontractors. Kieran has a firm understanding of the legislations surrounding planning and the environment and has a positive working relationship with many of the statutory consultees such as NPWS and National Biodiversity Data Centre.

2. Methods

2.1. Desktop Review

A desktop review of publicly available relevant data was undertaken on the National Biodiversity Data Centre (NBDC) and National Parks & Wildlife Service (NPWS) websites. The National Biodiversity Data Centre was reviewed for relevant data, specifically i) existing species records for the 10km square in which the study site is located and ii) an indication of the relative importance of the wider landscape in which the study site is located, based on Model of Bat Landscapes for Ireland (Lundy et al. 2011). In the latter, the index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats.

2.2. Visual Roost Inspection Survey

All surveys undertaken on site followed the methods outlined in the Collins (2016) guidelines. As part of these guidelines, it is suggested that an initial site visit and daylight roost inspection takes place for two reasons:

1. To ascertain if there were any obvious signs of bat activity at the structure/potential roosting areas associated with the structure and
2. To ascertain if there were any health and safety hazards associated with the structure.

The initial daytime search involved a methodical search, using high powered torches and an endoscope, where the structure is examined using best practice techniques to locate droppings beneath gable ends, on windowsills, under hanging tiles, fascia's, on windows or on walls. In addition, the structure is examined for urine and oily residue stains, scratch marks and the remains of insect prey (moth wings etc.) to try identify Potential Roost Features (PRFs).

Following the external search, all of the internal areas are examined for bat signs in the form of bat droppings, urine and oily residue stains as well individual bats present in lofts or crevice locations. Head torches, handheld torches and endoscopes are used for these searches.

The aims of the bat roost survey in buildings are to:

- Determine if bats are currently present or have been present in the past
- Determine the bat species
- Determine the number of bats
- Determine the roost category or categories e.g., the purpose and therefore the importance of the structure/tree
- Determine the bats' entry and exit points within the structure(s)
- Determine the bats' roosting locations within the structure
- Determine the commuting corridors used by bats to and from their roost(s) with a description of any vegetation or other linear features of importance to bats

It is important to note that each species of bat have specific roosting requirements. For example, brown long-eared bats have a preference for older buildings where pipistrelles are commonly found in modern buildings. Daubenton's bats are frequently found roosting underneath bridges, and leiseler's colonies are most frequently found in big trees. However, each species can be found in alternate roosting locations. Roost suitability/condition is determined by site context and the characteristics of the PRF in questions; such as temperature, humidity, height above ground level, light levels or levels of disturbance etc. (see Table 1 for further details).

Table 2: Roost feature suitability descriptions taken from Collins (2016).

Suitability	Description of Roosting Habitats	Description of Commuting and Foraging Habitats
Negligible	Negligible habitat features on site, unlikely to be used by roosting bats.	Negligible habitat features on site, unlikely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used opportunistically by individual bats. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[2] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation[3]). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential[4].	Habitat that could be used by a small number of commuting bats such as isolated hedgerows with substantial gaps in them or un-vegetated streams that are not very well connected to the surrounding landscape by other habitats. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost location that could be used be by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessment in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscaper that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitats that are connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland and water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time	Continuous high-quality habitat connected to the wider landscaper that could be used by bats for commuting such as river valleys, streams, hedgerows, lines of trees and woodland edge.

[2] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
[3] Evidence from the Netherlands shows mass swarming events of common Pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et., al.,* 2015). This phenomenon requires some research in the UK and Ireland but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
[4] This system of categorising aligns with BD 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

	due to their size, shelter, protection, conditions and surrounding habitat.	High-quality habitat that is well connected to the wider landscape that is likely be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

If PRFs are identified following the inspection, they are categorised according to the description in Table 2; and are subsequently ranked in order of priority. The descriptions, classification and rankings assigned to each PRF are then used to identify the requisite level of surveying required to ensure compliance with the guidelines. Table 3 identified the dawn/dusk survey effort required for each of the roost suitability categories - low, moderate and high.

Table 3: Survey effort required for roost suitability categories according to Collins (2016).

Low Roost Suitability	**Moderate Roost Suitability**	**High Roost Suitability**
One Dusk/Dawn Survey between May to August (structures) No further surveys required (trees)	Two Dusk/Dawn surveys between May to September[5], with at least one of the surveys between May and August[6]	Three Dusk/Dawn survey between May to September, with at least two of the surveys between May and August

For roost inspection surveys it is obligatory that surveys be undertaken by licenced, appropriately trained and experienced bat specialists to prevent roost abandonment and accidental injury or death to bats.

2.2. Dusk/Dawn Emergence/Re-entry Bat Survey

Using the evidence gathered during the initial daylight site inspections at each potential roost, dusk/dawn roost surveys are then conducted using Echo Meter Touch Pro's. A dusk survey is conducted a 15 mins before dusk until 1.5 – 2 hours after dusk and a dawn survey is conducted 1.5 – 2 hours before dawn until 15 mins after dawn. The dusk/dawn surveys should be carried out in optimal weather conditions e.g., mild temperatures, light winds and no rainfall to maximise the results of the roost surveys (Kelleher and Marnell 2007, Collins 2016).

Once surveys have concluded and a roost is located an assessment as to the significance of the roost can be conducted using best practice guidelines (NRA, 2005). These guidelines provide a basis for

[5] September surveys are both weather and location dependent. Conditions may become more unsuitable in these months, particularly in northerly latitudes, which may reduce length of the survey season.

[6] Multiple survey visits should be spread out to sample as much of the recommended survey period as possible; it is recommended that surveys are spaced at least two weeks apart, preferable more, unless there are specific ecological reasons for the surveys to be closer together (for example, a more accurate count of a maternity colony is required built it is likely that the colony will soon disperse). If there is potential for a maternity colony then consideration should be given to delectability. A survey on the 31st of August followed by a mid-summer survey is unlikely to pick up a maternity colony. An ecologist should use their professional judgement to design the most appropriate survey regime.

comparing the importance of different building roosts nationally and internationally (Table 4). Evaluation of ecological features follows the NRA (now TII) publication 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (2009). Impact assessment follows 'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' published by the EPA (2017). Reporting follows Chartered Institute of Ecology and Environmental Management (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine'.

Table 4: Bat species roosts and their ecological significance.

Species	Indicator	Significance
Lesser Horseshoe Bat	SAC	Very significant
	If present	Significant
Whiskered/Brandt's	>10	Very significant
	If present	Significant
Natterer's	>10	Very significant
	If present	Significant
Daubenton's	Maternity roost	Very significant
Leisler's	Maternity roost	Very significant
Common Pipistrelle	Maternity roost	Significant
Soprano Pipistrelle	Maternity roost	Significant
Brown long-eared	Maternity roost	Significant

2.3. Bat Activity Survey (Transects)

Walked bat activity transects were conducted following Collins (2016) guidelines. Ultrasonic detection was carried out using Wildlife Acoustics full spectrum Echo Meter Touch Pro 2 bat detectors. All activity surveys were carried out in suitable weather conditions (minimum 10°C, light wind and no precipitation). Details on survey effort in different habitat suitability's and timings of the surveys can be found in Table 5 and Table 6.

A contact ("bat pass"), as recorded in the results from these surveys, describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Bat contacts do not equate to numbers of bats as individual bats of the same species cannot be differentiated. A single bat continuously foraging in proximity to the detector can generate a large number of contacts in one night. In addition, variability occurs in the likelihood of detection between species. When several bats of the same species were encountered together, they were recorded under the one contact. A separate contact was recorded for each pass. A contact finished when the recorder assumes the bat is no longer present. The same bat may be recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity; the amount of uses bats make of an area/feature. These contacts were GPS tagged using the Echo Meter Touch Pro 2. If multiple visits for a transect are required, the start and end points of transect walks were alternated between visits to intersperse time and location (i.e., to prevent bias

due to certain areas always being surveyed close to dusk). These surveys give a good initiation of bat activity levels present at a location; however, they are only a snap shot in time.

Table 5: Survey effort required for habitat suitability categories according to Collins (2016).

Low Habitat Suitability	Moderate Habitat Suitability	High Habitat Suitability
One survey visit[7] per season (Spring – April/May, summer – June/July/August, autumn – September/October)[8] in appropriate weather conditions for bats Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone.	One survey visit[9] per month (April to October) [10] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (Or dusk to dawn) within one 24-hour period.	Up to two survey visits[11] per month (April to October) [12] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (Or dusk to dawn) within one 24-hour period.

Table 6: Survey effort required for roost suitability categories according to Collins (2016).

Survey Type	Start Time	End Time
Dusk survey – bat activity	Sunset[13]	2–3 hours after sunset
Dusk survey – swarming	2 hours after sunset	5 hours after sunset
Dusk to pre-dawn survey	Sunset	Sunrise or later if bats still active
Pre-dawn survey	2 hours before sunrise	Sunrise or later if bats still active

The overall aim of the night-time activity transects are to investigate bat activity in the zone of influence of the proposed development and to detect any bats which may be emerging/re-entering roosts at dusk/dawn. While a daytime visual inspection may detect signs of any large aggregations of roosting bats, smaller numbers of bats or bats roosting in discrete locations may not be apparent

[7] A survey visit should aim to cover all habitats represented in the survey area that could be impacted by the proposed activities. This may consist of a single transect carried out on a single night for small sites with low habitat diversity but could range up to multiple transects carried out over one or several nights on a larger site with greater habitat diversity.
[8] April, September and October surveys are both weather and location dependent. Conditions may become more unsuitable in these months, particularly in northerly latitudes, which may reduce length of the survey season.
[9] A survey visit should aim to cover all habitats represented in the survey area that could be impacted by the proposed activities. This may consist of a single transect carried out on a single night for small sites with low habitat diversity but could range up to multiple transects carried out over one or several nights on a larger site with greater habitat diversity.
[10] April, September and October surveys are both weather and location dependent. Conditions may become more unsuitable in these months, particularly in northerly latitudes, which may reduce length of the survey season.
[11] A survey visit should aim to cover all habitats represented in the survey area that could be impacted by the proposed activities. This may consist of a single transect carried out on a single night for small sites with low habitat diversity but could range up to multiple transects carried out over one or several nights on a larger site with greater habitat diversity.
[12] April, September and October surveys are both weather and location dependent. Conditions may become more unsuitable in these months, particularly in northerly latitudes, which may reduce length of the survey season.
[13] Adjust to earlier if in darker habitats such as woodland or if data justifies (e.g., if bats are already out by sunset on previous surveys or automated detectors show pre-sunset activity).

during daytime visual inspection. The night-time activity surveys primarily utilised visual detection, with the support of ultrasonic detection equipment.

2.4. Survey Limitations

There were no seasonal or climatic constraints as the survey was undertaken at the optimum time of year when bats are fully active. Full access to the interior and exterior of the house, barn building and stables was provided by the Client.

3. Results

3.1. Desktop Review

The following species have previously been recorded in the 10km square (N93) in which the site is located:

- Brown long-eared bat (*Plecotus auritus*)
- Daubenton's bat (*Myotis daubentonii*)
- Leisler's bat (*Nyctalus leisleri*)
- Natterer's bat (*Myotis nattereri*)
- Common pipistrelle (*Pipistrellus pipistrellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Whiskered bat (*Myotis mystacinus*)

The absence of other bat species records may reflect lack of data as opposed to an absence of bats from the relevant area.

The overall bat suitability index value (29.78) according to 'Model of Bat Landscapes for Ireland' (Lundy et at. 2011) suggests the landscape in which the proposed site is located is of low suitability for bats in general. Species specific scores are provided in Table 7.

Table 7: Suitability of the study area for the bat species according to 'Model of Bat Landscapes for Ireland' (Lundy et al. 2011).

Common name	Scientific name	Suitability index
All bats		29.78
Soprano pipistrelle	*Pipistrellus pygmaeus*	37
Brown long-eared bat	*Plecotus auritus*	44
Common pipistrelle	*Pipistrellus pipistrellus*	47
Lesser horseshoe bat	*Rhinolophus hipposideros*	0
Leisler's bat	*Nyctalus leisleri*	44
Whiskered bat	*Myotis mystacinus*	23
Daubenton's bat	*Myotis daubentonii*	29
Nathusiius pipistrelle	*Pipistrellus nauthusii*	5
Natterer's bat	*Myotis nattererii*	39

3.2. Visual Roost Inspection Survey

Daytime visual assessments were carried out by Domhnall Finch (DER/BAT 2020-03 and C20/2021), on the 5th of July 2021 to identify any bat roosting potential which may exist associated with the development site.

Bats were not confirmed to be roosting at the proposed development during the internal and external visual inspections of the house, barn building and stables. However, based on visual inspection numerous small gaps between the eaves and the wall of the main house were observed. In addition, some of the eaves had cracks at the end which show suitability for potential roosting locations for bats. Stains were also observed coming out of a hole near the top of the chimney.

Both the barn building and the stables had multiple PRFs for bats, with missing tiles, gaps between the eaves/the side walls of the building and cracks in the wood (at the south eastern side of the stables).

Based upon the evidence from the visual roost assessment, and considering the local context, the proposed development was considered to be of 'moderate' likelihood to support roosting bats.

The farm shed did not have any PRFs, as such it was deemed to have negligible bat roosting suitability. No trees due to be removed were deemed to have suitable PRFs for bats.

3.3. Dusk/Dawn Emergence/Re-entry Bat Survey

Two emergence/re-entry surveys (one dawn and one dusk) were carried out by Domhnall Finch and Kieran Finch on both the main house and the barn/stable buildings (Table 8).

Table 8: Details of the two emergence surveys undertaken at the proposed development.

Building Area	Date	Sunset/ sunrise [HH:MM]	Start Time [HH:MM]	End Time [HH:MM]	Temp [°C]	Precipitation	Cloud Cover [%]	Wind Condition [km/h]
Main House	7th of July	21:54	21:35	23:30	18.6 – 20.1	Dry	30	0.7 – 7.9
Stables	8th of July	05:09	03:35	05:25	11.3 – 18.7	Dry	10	1.4 – 2.3
Stables	3rd of August	21:18	21:00	22:55	13.1 – 15.2	Dry	30	0.4 – 1.7
Main House	4th of August	05:48	04:15	05:10	14.1 – 14.7	Dry	40	0.4 – 0.7

Bats were confirmed roosting in the main house – two common pipistrelle bats were recorded re-entering the house underneath tiles at the joints of the dormer window on the southern side of the house at 05:26 (32 minutes before sunrise; lux – 720.9).

3.4. Bat Activity Survey (Transects)

Walked transects were undertaken on the 5th of July and the 4th of August 2021 by Domhnall Finch (Table 9).

Table 9: Details of the two emergence surveys undertaken at the proposed development.

Date	Sunset/ sunrise [HH:MM]	Start Time [HH:MM]	End Time [HH:MM]	Temp [°C]	Precipitation	Cloud Cover [%]	Wind Condition [km/h]
5th of July	21:55	21:55	23:09	14.4 – 16.8	Dry	50	0.4 – 3.9
4th of August	21:16	21:30	22:45	15.8 – 16.6	Dry	30	1.4 – 5.8

During both walked transect surveys a low–moderate level of bat activity was observed on-site, with a total of 33 bat passes, from four different bat species, being recorded. These included common pipistrelle (n=17), soprano pipistrelle (n=4), Leisler's bat (n=10) and Natterer's bat (n=2; Figure 3.1).

Figure 3.1: Transect route taken and bat species recorded for both activity surveys.

Overall, common pipistrelle and Leisler's bat were the most abundant species along the walked transect. It is likely that they utilise all habitat types within the boundary of the site. Leisler's bats were mainly recorded in the open habitat to the south of the main house, to the east of the barn building and to the orchard to the east of the main house; while both pipistrelles' species were more associated with the treelines within the site. Common pipistrelle was also recorded feeding in the courtyard area outside stables/barn buildings and along the track which runs through the centre of the site. Both Natterer's bat passes were recorded within the small woodland to the south of the main house, while individual soprano pipistrelle passes were recorded throughout the site.

4. Discussion

4.1. Potential Impact of the Planned Development on Bats

The proposed removal of the existing buildings on-site and redeveloping the area will result in increased human presence onsite and, inevitably, a temporary increase in noise and light levels due to human activity. Changes to the existing buildings will cause temporary disturbance and permanent change for onsite bat populations and, without mitigation measures to safeguard and retain these animals, the proposed development could result in the loss of some of the site's existing bat colonies.

4.2. Mitigation Measures for the Protection of Bats

Specific mitigation measures are required to protect the on-site bat populations and a derogation licence is required for the proposed removal of the main house building that is currently in use by bats – see Bat Mitigation Guidelines for Ireland (Legislation and Licensing; Kelleher and Marnell 2007). As all bat species are protected under existing legislation and a bat roosting site or resting place is protected whether bats are present or not, an application for a derogation licence shall be made to the Licensing Department of the National Parks and Wildlife Service to allow these works.

4.2.1. Timing of Structural Works

The removal of the main house and any removal/replacement of the roofing of the building should be undertaken, under licence, within the period from September to the end of February when all bats, including the young, are able to fly and fewer animals are expected to be in these buildings. This should lessen the impact on these animals and will also avoid the bird breeding seasons. Outside of these months, it is possible to undertake works but there is an increased risk of encountering bats and birds in buildings so such works could be external or in areas not being used by protected species.

4.2.2. Removal of the Roof from the Farm House and Outbuildings

The removal of the roof of the main house prior to the removal of the all structures shall be undertaken manually and carefully. Roofing material will be removed by hand in the knowledge that a few bats may be found beneath. Any animals discovered should be safely retained, under licence, in a secure box until dusk when they should be released onsite.

4.2.3. Provision of Artificial Bat Roosts

To offset the loss of bat roosting site and to further enhance the area's woodland, a bat box scheme should be provided onsite. Six Schwegler 6F bat boxes should be erected; 'Schwegler' woodcrete bat boxes have been proven to be acceptable alternatives for bats and they are readily occupied; these could be mounted on any large tree (as directed by a licenced ecologist). Bat boxes require annual monitoring to ensure effectiveness and also need cleaning occasionally if regularly used. Such monitoring is a licensed activity.

4.2.4. Lighting

In general, artificial light creates a barrier to commuting bats and it can also result in roosts being abandoned therefore onsite lighting should be avoided. Where absolutely necessary, directional lighting (i.e., lighting which only shines downwards on targeted areas and not nearby countryside) should be used to prevent overspill. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. LEDs should be used, as these emit minimal ultra-violet light; and white and blue wavelengths should be avoided, with wavelength <4,200 kelvin being preferred.

5. Conclusion

The Hazelhatch site is locally important for bats and the proposed redevelopment of the site can be achieved without negatively impacting the site's protected species. It is considered that, following completion of the proposed works, with mitigation, the bat colonies present will persist and the numbers of bats onsite will probably increase.

Overall, the following mitigation measures need to be implemented to safeguard the bat populations at the proposed development:

- A bat derogation licence needs to be obtained before any works can take place on-site.

- The removal of all roof of the main house should be completed manually and under the supervision of a suitably qualified ecologist acting as an ecological clerk of works (licenced bat ecologist).
- Six Schwegler 2F bat boxes and two enclosed bat boxes (e.g., Habibat Bat Box or Ibstock Enclosed Bat Box 'C') should be erected (locations decided by a suitably qualified ecologist).
- External lighting within the proposed development should be limited and if it is required measures should be implemented to decrease light spill (e.g., cowls, shield, directional facing, using LED lights with wavelength <4,200 kelvin etc.). These measures should be designed and implemented with an appointed ecological clerk of works.

6. References

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NRA (National Roads Authority, now TII), 2005. Guidelines for the Treatment of Bats during the Construction of National Road Schemes. National Roads Authority, Dublin.

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7. Appendix

Title: Front of main house from the south.

Title: Rear of main house from the north.

Title: Track through the centre of the site.

Title: Stables, showing courtyard, from the south.

Title: Barn building beside stables from the south of the site.

Title: Farm shed near the stables.

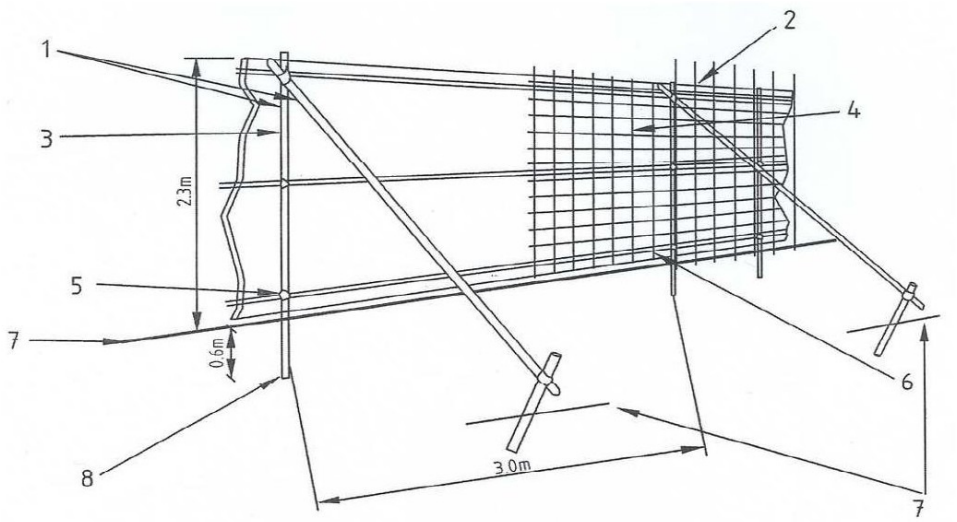
Title: Southern boundary of the site.

Title: View looking northwards from southern end of the track.

Title: Orchard area to the east of the site.

Title: Treeline along the north eastern side of the site.

APPENDIX 2 TREE PROTECTIVE FENCE DETAIL



1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and, where necessary, standard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6m driven into the ground

Sample of signage to be placed on fence panels

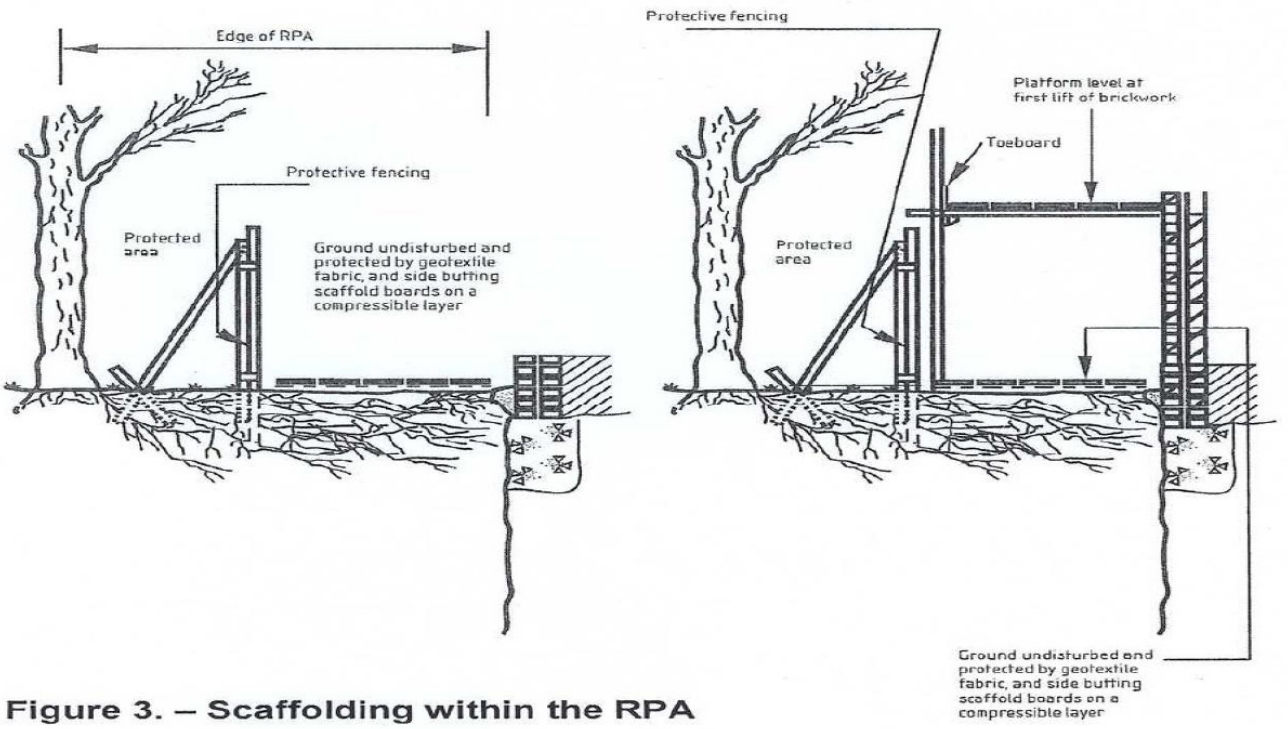
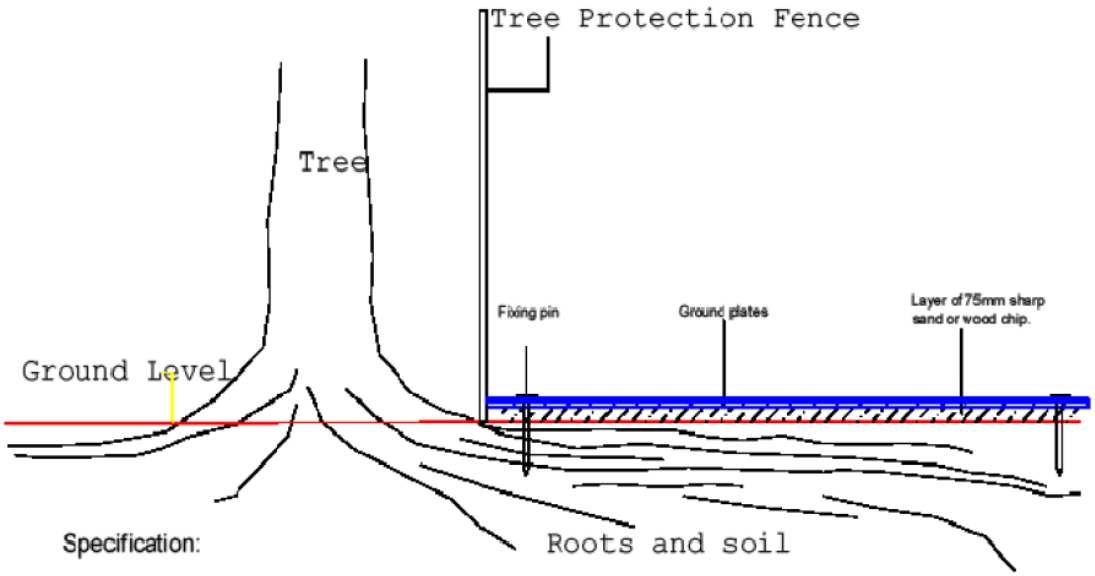


Figure 3. – Scaffolding within the RPA



Specification:

1. Lay min. 75m depth of sharp sand/wood chip over identified ground area
2. Lay side-butting scaffold boards/15mm poly propylene road plate over sand/wood chip
3. Fix ground protection cover into place with pins/pegs

APPENDIX 3 METHOD STATEMENT REQUIREMENTS

- Title i.e. Method Statement for ……
- Work location (e.g. where on Site?)
- Description of work
- Statement of who will carry out works
- Sequence of work elements
- Risk Assessment for each element
- Safety control measures for each element
- Any services at risk (electricity, gas, etc.)

Note the following must be considered:

Safe access/ egress
Control measures for particular hazards
Control measures for utility & other services at risk
Installation/ Safe Work Methods
Personal protective equipment required
Protection for other workers adjacent
Protection for public (including signs)
Emergency procedures
Explanation of method statement to personnel involved
Review during operation to check success of method
Stop and adapt to suit if initial method is not successful.