ENVIRONMENTAL IMPACT ASSESSMENT REPORT

NON-TECHNICAL SUMMARY

ASTON LTD

Great Connell
Strategic Housing Development
Newbridge
County Kildare

O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

April 2022

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1. NON-TECHNICAL SUMMARY

1.1 Introduction

This Non-Technical Summary provides an overview of the proposed development, the scope of the environmental assessment completed, the findings of that assessment, the prevention and mitigation and monitoring measures that will be applied to prevent and/or minimise the impacts, and an evaluation of the residual impacts. It uses, in so far as possible, non-technical language and is for information purposes only to guide readers to the sections of the Environmental Impact Assessment Report that contain the detailed assessments of the impacts of the proposed development.

1.2 Proposed Development

Aston Ltd intends to apply to An Bord Pleanála (the Bord) for permission for a residential development at Great Connell, Newbridge, County Kildare. Given the scale of the development it is classed as Strategic Housing Development.

It involves the demolition of two former private residences, two former agricultural buildings and a shed; the phased construction of five hundred and sixty nine residential units made up of a mix of houses and apartments with associated car parking and bicycle spaces; the construction of a neighbourhood centre and a crèche; the provision of sanitary waste water and surface water drainage systems; the formation of a series of landscaped parks and open spaces and the construction of a section of the Newbridge Southern Relief Road.

1.3 Environmental Impact Assessment

The European Union (EU) Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment is known as the EIA Directive. Its objective is to ensure that developments that are likely to have significant effects on the environment are the subject of an assessment of their likely impacts. The most recent amendment of the EIA Directive was transposed into Irish law in 2018.

When preparing a planning application for a development the first step is to confirm if the proposed project is one of the activities listed in the EIA Directive. If it is, then an Environmental Impact Assessment Report (EIAR) must be prepared. The proposed development is of a type listed in the EIA Directive i.e. 'Construction of more than 500 dwelling units' and therefore an EIA is required.

The purpose of an EIAR is to report the impacts, if any, that a proposed development will have on the environment. The EIA Directive requires an EIAR to describe the likely significant impacts on:

- Population (local services, economic activity).
- Human health (impacts on air quality, likelihood of nuisances and risk of major accidents and natural disasters).
- Biodiversity (habitats, flora, fauna, and sites that have national and international important ecological value).

- Land and soil including loss of land used for food production or recreation);
- Water (streams ,rivers and groundwater);
- Air, including air quality issues that can affect people's health
- Climate, including the implications for climate change
- Material assets (roads, water supplies, wastewater treatment, energy supplies)
- Cultural heritage (protected archaeological features and buildings)
- Landscape, and
- Interactions between the above.

This EIAR was prepared in accordance with European Commission's Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (2017) and the Environmental Protection Agency's (EPA) Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2017).

The assessment of the impacts is based on the existing land use, population distribution, local services, the environmental setting and developments either already underway in the vicinity of the proposed development site or have either received permission or are at an advanced planning stage.

The early anticipation of impacts is the most effective means of avoiding negative impacts. This requires forming preliminary opinions on the approximate significance, extent, duration and type of the likely impacts, which can then be considered at the design stage to identify the measures required prevent or minimise (mitigate) i.e. 'design out' adverse impacts.

Impacts are assessed in terms of the likely changes to the environment resulting either directly, or indirectly from the proposed development. Where possible, the impacts are described in terms of quality, significance, extent (magnitude), probability, duration, and type, as defined in the EPA's 2017 Draft Guidance.

It is not always either possible, or practical to prevent all adverse impacts and those that remain after mitigation are referred to as 'Residual Impacts. These are the impacts that cannot be reasonably avoided and are a key consideration in deciding whether or not a development should be granted planning permission.

1.4 Consultation

Aston Ltd, as required by the Strategic Housing Development Regulations, consulted with Kildare County Council (the Council) and An Bord Pleanála (the Bord) regarding the site layout, building design, infrastructure services, hydrology, provision of public open spaces, landscaping and environmental protection measures. The Design Team incorporated the Council's and Bord's comments into the design of the final site layout.

Aston Ltd formally contacted Irish Water regarding approval to connect to the mains water supply and the foul sewer. Irish Water has confirmed it consents to both connections. Aston Ltd also contacted ESB Networks regarding a connection to the national electricity grid and received agreement in principle.

1.5 Project Team

The Project Team Members are listed in the Table below. All have the relevant qualifications and experience to meet the competent expert requirements of the EIA Directive.

Chapter	Title	Prepared By	Contributor
1	Introduction	O'Callaghan Moran & Associates (OCM)	
2	Existing Site Description	OCM	Declan Brassil & Company
3	Project Characteristics	OCM	O'Flynn Architects/ Punch Consulting Engineers/ Applicant
4	Alternatives	OCM	O'Flynn Architects; Punch Consulting Engineers; TBS Landscape Architects. JBA Consultants
5	Air	Katestone	Punch Consulting Engineers
6	Climate	Katestone	Punch Consulting Engineers
6	Land & Geology	OCM	Byrne Looby
7	Water	OCM/JBA Consultants	Punch Consulting Engineers/ Byrne Looby
8	Biodiversity	Dixon Brosnan	Arborist Associated Ltd TBS Landscape Architects/Sabre Electrical Services Ltd
9	Population & Human Health	OCM	KPMG / TBS Landscape Architects/ Punch Consulting Engineers
10	Population & Human Health: Noise & Vibration	dBA	Punch Consulting Engineers
12	Archaeology, Architecture & Cultural Heritage	Byrne Mullins & Associates.	
13	Material Assets: Traffic & Transport	Punch Consulting Engineers	OCM
14	Materials Assets Services	OCM	Punch Consulting Engineers, Metec Consulting Engineers
15	Landscape & Visual Impact	TBS Landscape Architects	O'Flynn Architects, 3 D Bureau Design
16	Interactions	OCM	

No difficulties were encountered in compiling the required information

2. EXISTING SITE DESCRIPTION

2.1 Site Location and Layout

The site is on the eastern outskirts of Newbridge, approximately 1km from the Town Centre (Figure 2.1). It covers 27.64 hectares (ha) and the layout is shown on Drawing PA 012. It is zoned for residential development and open space in the current Newbridge Local Area Plan. Most is in agricultural use, currently tillage.

An open, overgrown drainage ditch runs along the northern border and extends into the central area. There are hedgerows along the northern, southern, and eastern boundaries and a small woodland area in the southwest, on the eastern bank of the River Liffey.

There is a former agricultural yard near the centre of the site containing three sheds and a car park. There is house to the east of the agricultural yard and a second one in the north-east corner of the site. Both houses are owned by the applicant.

2.2 Surrounding Land Use

To the south and south-east are agricultural lands and to the east, across the Great Connell Road, are the Murphy Ireland Ltd offices and compound. Wellesley Manor housing estate adjoins the north-eastern boundary.

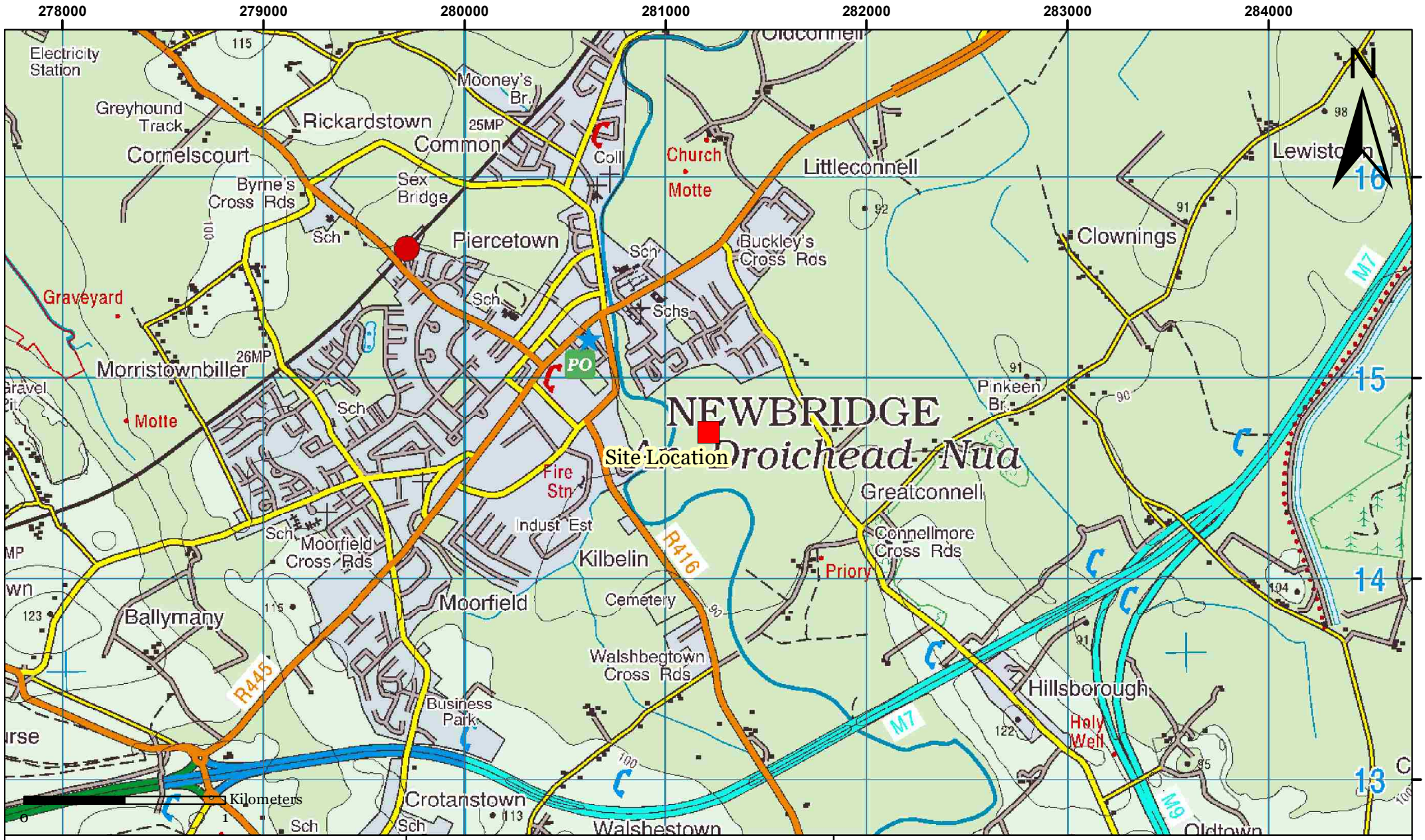
The Dr Pepper plant is 500m to the north-east and the Pfizer plant is 800m to the north. The Baroda Stud Farm is 500m to the south-east. To the south-west, across the River Liffey, the Ardstone residential development is currently being built. Planning permission has been granted for the distribution warehouse on lands approximately 200m to the north-east**.**

2.3 Environmental Setting

The site is in the catchment of the River Liffey, which flows through the south-west of the lands. The ditches inside the site boundary follow a historic meander of the Liffey and provide a flow path for flood water for flood waters from the river across the site

The soils in the western half of the site are alluvium (river deposits), with the eastern half underlain by gravels. The soils are between 16.5m and 18m thick and overly limestone bedrock. The geological Survey of Ireland classifies the gravels as a locally important aquifer and the underlying bedrock as regionally important aquifer. The water table ranges from 1m to 2.9m below ground level.

The site is dominated by large fields of tillage land, with small area in the centre, east and north-east occupied by buildings. The northern, southern and eastern boundaries are defined by hedgerows. A mixed broadleaved woodland in the south-west corner of the site is the most valuable habitat.



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Environmental Management for Business

CLIENT
Aston Ltd

TITLE
Site Location

Details:
Site Location

Figure 2.1

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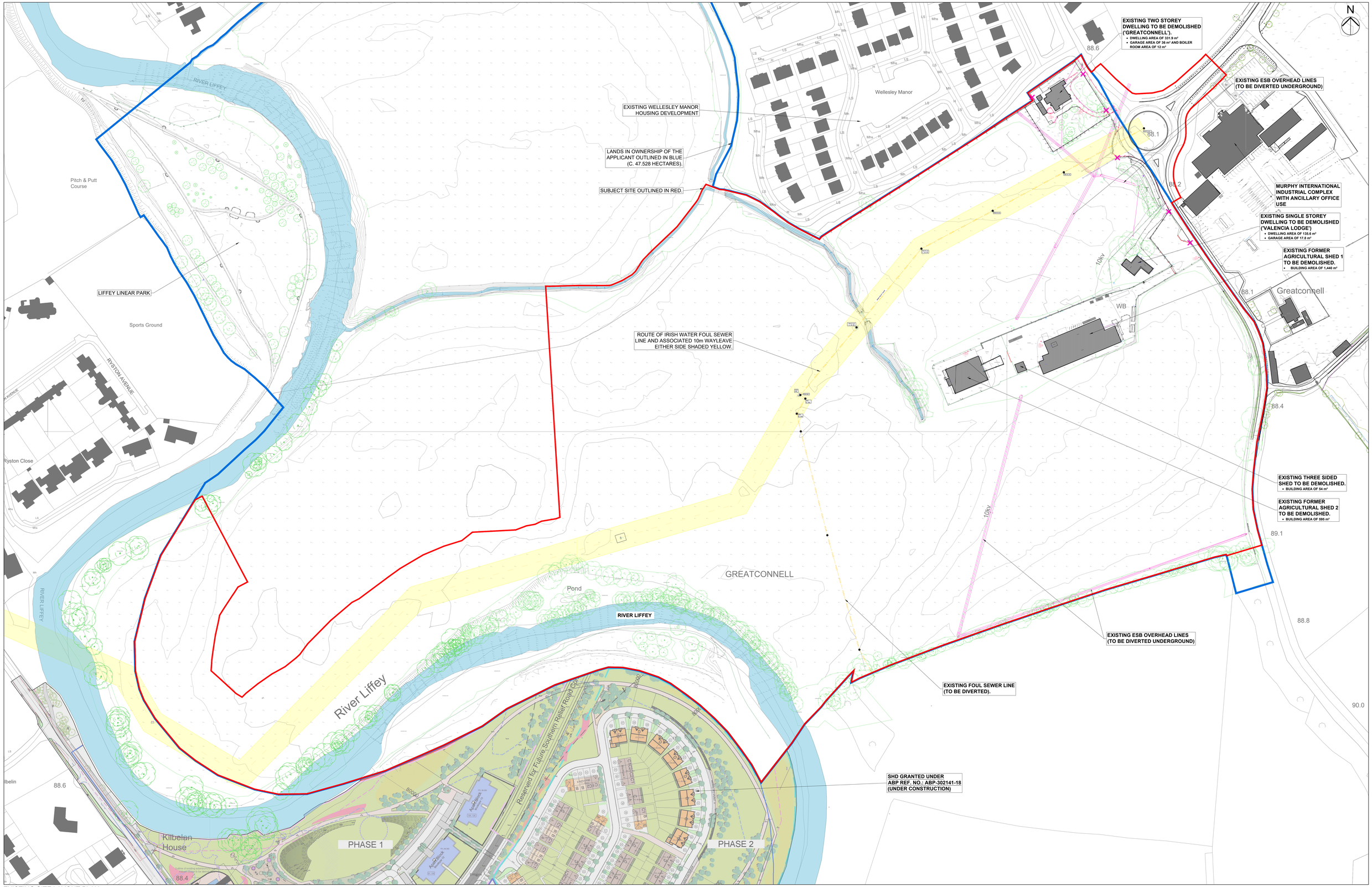

EXISTING SITE LAYOUT PLAN @ 1:1,000

NOTES:

DO NOT SCALE. USE ONLY FIGURED DIMENSIONS WHICH SHOULD BE CHECKED ON SITE BEFORE WORK COMMENCES.

ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE LATEST BUILDING REGULATIONS.

REFER TO STRUCTURAL ENGINEER'S DRAWINGS AND SPECIFICATION FOR ALL STRUCTURAL WORK.

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RIAI Practice Member 2021

PROJECT:	PROPOSED GREAT CONNELL SHD AT NEWBRIDGE, CO. KILDARE.
TITLE:	EXISTING SITE LAYOUT.
CLIENT:	ASTON LTD.
STAGE:	PLANNING
PROJECT NO.:	19070
DRG. NO.:	PA-012
SCALE:	1:1,000
DATE:	MARCH 2022
DRAWN:	POF
CHECKED:	POF

There is an 80m riparian zone (strip of vegetation that border water bodies) either side of the River Liffey, within which are small stands of the invasive species Himalayan Balsam. The nearest designated site of ecological importance (Natura 2000 Site) is the Pollardstown Fen Special Protection Area, which is 2.6km to the west.

2.4 Site Services

There is a water main along the Great Connell Road to the east of the site. A storm water sewer serving Wellesley Manor runs from north-east to south-west along the north-eastern boundary and discharges into a tributary stream of the Liffey.

A foul sewer serving Wellesley Manor flows north to south through the centre of the site. A second foul sewer, installed as part of the upgrade of the Upper Liffey Valley Sewerage Scheme, runs from north-east to south-west across the site. There is an overhead electricity line crossing the site which drops to underground for a section of its run.

2.5 Roads

The site is accessed off the Great Connell Road Roundabout. Great Connell Road links the R445 at Buckley's Cross with the L2032. The roundabout provides access to the residences on the western side of the Great Connell Road, the Murphy International offices and compounds and the Dr Pepper plant. The Ballyfarm Road connects Great Connell Roundabout with the Lidl Distributor Road to the north.

3. PROJECT CHARACTERISTICS

3.1 Proposed Development

The development, which is shown on Drawing No PA-002, involves the demolition of two private residences, two former agricultural buildings and a shed; the phased construction of 569 residential units comprising a mix of 2, 3 and 4 bedroom houses, 1, 2 and 3 bedroom apartments, with associated car parking (1,008) and bicycle (734) spaces; the construction of a neighbourhood centre and a crèche, and the provision of approximately 11.3 ha of parks and open communal spaces.

The existing foul sewer serving Wellesley Manor will be diverted to connect to the Upper Liffey Valley Sewerage Scheme sewer. The overhead power lines also will be diverted, and a connection made to the electricity grid. A connection will also be made to the mains water supply

There will be a pumped sewage connection to the Upper Liffey Valley Sewerage Scheme and this requires the provision of a pumping station. An emergency storage tank (245m^3) will be provided in the station to contain sewage in the event of a pump failure. Surface water flow attenuation will be provided for rainwater run-off before it discharges to an existing ditch and the River Liffey.

The development includes the construction of a 350m section of the Newbridge South Outer Orbital Route (Newbridge Southern Relief Road) that will extend from the existing Great Connell Roundabout towards the southwestern boundary. The development will be accessed off the Great Connell Road, and the roundabout will be upgraded to a signalised junction.

3.2 Development Design

The layout design was influenced by the proximity to the River Liffey, the existing site services, the proposed route of the Newbridge Southern Relief Road, the need to retain the hedgerows and trees along the boundaries and an area of woodland in the south of the site, minimise the loss of trees inside the site and include flood protection measures.

The houses and apartments design is energy efficient, minimises traffic noise effects, ensures they receive adequate daylight and will not interfere with the daylight conditions of the existing nearby residences and other units in the development. A series of eighteen public landscaped spaces, including play areas and parks, will provide safe amenity use for all future residents.

The internal roads are designed to ensure resident and visitor safety and facilitate connectivity to the adjoining lands to the north and south and to Newbridge Town Centre.

3.3 Development Phases

The development will be carried out in four phases, as shown on Drawing No PA-008 and it expected the final phase will be completed six years after the first phase begins. The neighbourhood centre, crèche and the sewage pumping station will be completed in the initial phase.

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LEGEND:

3 STOREY 4 BED HOUSE (8 PERSON):	
2 STOREY 4 BED HOUSE (7 PERSON):	
2 STOREY 3 BED HOUSE (6 PERSON):	
2 STOREY 3 BED HOUSE (5 PERSON):	
2 STOREY 2 BED HOUSE (4 PERSON):	
1 BED OWN DOOR APARTMENT UNIT (2 PERSON) IN 2 STOREY BLOCK—1 UNIT ON EACH FLOOR:	
3/4 STOREY 1/2/3 BED APARTMENT BLOCK:	
3 STOREY 2 BED (4 PERSON) & 3 BED (5 PERSON) DUPLEX BLOCK—2 BED ON GROUND FLOOR & 3 BED ON 1ST & 2ND FLOOR:	
2 STOREY 2 BED (4 PERSON) BLOCK—1 UNIT ON EACH FLOOR—ADJOINING 3 STOREY DUPLEX BLOCK:	
3 STOREY 2 BED (4 PERSON) & 3 BED (5 PERSON) DUPLEX BLOCK ADJOINING TERRACED HOUSING:	
PRIVATE AMENITY SPACE:	
PUBLIC OPEN SPACE:	
CHILDCARE FACILITY:	
NEIGHBOURHOOD CENTRE:	
LINK STREET / ARTERIAL LINK (NSOORR):	
LOCAL / LINK STREET:	
LOCAL STREET:	
CYCLE WAY:	
FOOTPATH:	
LOCAL STREET WITH HOMEZONE / SHARED SURFACE (PAVED FINISH):	
PAVED ON-STREET / SHARED CAR PARKING SPACES:	

SCHEDULE OF ACCOMMODATION:

HOUSE TYPE	TOTAL	(AND %)
2 BED HOUSE (2 STOREY MID TERRACE)	64	(11.2%)
TOTAL NO. OF 2 BED HOUSES	**64**	**(11.2%)**
3 BED HOUSE (2 STOREY MID TERRACE)	41	(7.2%)
3 BED HOUSE (2 STOREY END TERRACE)	64	(11.2%)
3 BED HOUSE (2 STOREY SEMI-DETACHED)	68	(12.0%)
TOTAL NO. OF 3 BED HOUSES	**173**	**(30.4%)**
4 BED HOUSE (2 STOREY END TERRACE)	32	(5.6%)
4 BED HOUSE (2 STOREY SEMI-DETACHED)	48	(8.5%)
4 BED HOUSE (3 STOREY END TERRACE)	08	(1.4%)
TOTAL NO. OF 4 BED HOUSES	**88**	**(15.5%)**
TOTAL NO. OF HOUSES	**325**	**(57.1%)**

OWN DOOR APARTMENTS	TOTAL	(AND %)
1 BED OWN DOOR APARTMENT	16	(2.8%)
2 BED OWN DOOR APARTMENT UNDER 3 BED DUPLEX	66	(11.6%)
2 BED OWN DOOR APARTMENT	16	(2.8%)
3 BED OWN DOOR DUPLEX APARTMENT (2 STOREY)	66	(11.6%)
TOTAL NO. OF OWN DOOR APARTMENTS	**164**	**(28.8%)**

STANDARD APARTMENTS (SHARED ACCESS)	TOTAL	(AND %)
1 BED APARTMENT	17	(3.0%)
2 BED APARTMENT	53	(9.3%)
3 BED APARTMENT	10	(1.8%)
TOTAL NO. OF STANDARD APARTMENTS	**80**	**(14.1%)**
TOTAL NO. OF APARTMENTS	**244**	**(42.9%)**

COMBINED UNIT MIX (APARTMENTS & HOUSES)	TOTAL	(AND %)
1 BED UNIT	33	(5.8%)
2 BED UNIT	199	(35.0%)
3 BED UNIT	249	(43.7%)
4 BED UNIT	88	(15.5%)
TOTAL NO. UNITS	**569**	**(100%)**

SITE STATISTICS:

APPLICATION SITE AREA (RED OUTLINE)	**27.635 HA**
ZONED LAND EXTENT (INCL. NSOORR ROUTE & IRISH WATER WAYLEAVE BUT EXCL. GREAT CONNELL ROAD)	**17.346 HA**
ZONED NET DEVELOPMENT AREA (EXCL. NSOORR ROUTE & IRISH WATER WAYLEAVE & GREAT CONNELL ROAD)	**15.978 HA**
NET DENSITY (569 / 15.978)	**35.6 UNITS / HA**
PUBLIC OPEN SPACE WITHIN ZONED LAND EXTENT (OPEN SPACE AREAS INDICATED ON LAYOUT)	**3.05 HA (17.6% OF ZONED LAND EXTENT) (19.1% OF ZONED NET DEVELOPMENT AREA)**

MASTER SITE LAYOUT PLAN @ 1:1,000

NOTES:

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RIAI Practice Member 2021

PROJECT:	PROPOSED GREAT CONNELL SHD AT NEWBRIDGE, CO. KILDARE.		
TITLE:	PROPOSED MASTER SITE LAYOUT PLAN.		
CLIENT:	ASTON LTD.	STAGE:	PLANNING
PROJECT NO.:	19070	DRG. NO.:	PA-002
SCALE:	1:1,000	DRAWN:	POF
DATE:	FEBRUARY 2022	CHECKED:	POF

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PHASE 1: 169 UNITS

PHASE 2: 103 UNITS

PHASE 3: 99 UNITS

PHASE 4: 198 UNITS

NEWBRIDGE SOUTHERN ORBITAL RELIEF ROAD (NSORR)

(NSORR EXTENDED ROAD AND BRIDGE CROSSING SUBJECT TO SEPARATE PLANNING APPLICATION WITH KILDARE COUNTY COUNCIL—SECTION 247 KCC PRE-PLANNING CONSULTATION REFERENCE: PP5299)

PHASE 1 WORKS TO BE COMPLETED:

- 169 RESIDENTIAL UNITS AND THE NEIGHBOURHOOD CENTRE INCL. CRECHE ARE TO BE CONSTRUCTED;
- THE SIGNALISED JUNCTION THAT IS TO REPLACE THE EXISTING GREAT CONNELL ROUNDABOUT & C. 350m EXTENT OF THE NSORR THAT IS TO SERVE THE PROPOSED DEVELOPMENT IS TO BE COMPLETED;
- EXISTING FOUL SEWER LINE THROUGH THE SITE IS TO BE DIVERTED;
- EXISTING OVERHEAD ESB LINES THROUGH THE SITE ARE TO BE DIVERTED UNDERGROUND;
- RELEVANT INFRASTRUCTURAL WORKS TO SERVE THE PROPOSED PHASE (FOUL PUMPED SYSTEM, SURFACE WATER, UTILITIES, ROADS, FOOTPATHS ETC.) ARE TO BE COMPLETED.
- OPEN SPACES 9, 10, 11, 12, A, B & C ARE TO BE COMPLETED ALONG WITH RELEVANT LANDSCAPING & FLOOD COMPENSATION STORAGE WORKS WITHIN THE RIPARIAN / ZONED AMENITY LANDS;

PHASE 4 WORKS TO BE COMPLETED:

- 198 RESIDENTIAL UNITS ARE TO BE CONSTRUCTED;
- OPEN SPACES 1, 4, 5, 6, 7, 8, D & E ARE TO BE COMPLETED;
- RELEVANT INFRASTRUCTURAL WORKS TO SERVE THE PROPOSED PHASE (FOUL GRAVITY SYSTEM, SURFACE WATER, UTILITIES, ROADS, FOOTPATHS ETC.) ARE TO BE COMPLETED.

PHASE 3 WORKS TO BE COMPLETED:

- 99 RESIDENTIAL UNITS ARE TO BE CONSTRUCTED;
- OPEN SPACES 3 & F ARE TO BE COMPLETED;
- RELEVANT INFRASTRUCTURAL WORKS TO SERVE THE PROPOSED PHASE (FOUL GRAVITY SYSTEM, SURFACE WATER, UTILITIES, ROADS, FOOTPATHS ETC.) ARE TO BE COMPLETED.

PHASE 2 WORKS TO BE COMPLETED:

- 103 RESIDENTIAL UNITS ARE TO BE CONSTRUCTED;
- OPEN SPACE 2 IS TO BE COMPLETED ALONG WITH RELEVANT LANDSCAPING WORKS WITHIN THE RIPARIAN / ZONED AMENITY LANDS;
- RELEVANT INFRASTRUCTURAL WORKS TO SERVE THE PROPOSED PHASE (FOUL GRAVITY SYSTEM, SURFACE WATER, UTILITIES, ROADS, FOOTPATHS ETC.) ARE TO BE COMPLETED.

RIVER LIFFEY
Sports Ground
Wellesley Manor
Greatconnell
GREATCONNELL
RESERVED FOR FUTURE SOUTHERN RELIEF ROAD CONNECTION
Pond
River Liffey
88.6
88.1
88.4
89.1
88.8
N

SITE LAYOUT SHOWING PROPOSED PHASING PLAN @ 1:1,250

NOTES:

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PROJECT:	PROPOSED GREAT CONNELL SHD AT NEWBRIDGE, CO. KILDARE.		
TITLE:	SITE LAYOUT SHOWING PROPOSED PHASING PLAN.		
CLIENT:	ASTON LTD.	STAGE:	PLANNING
PROJECT NO.:	19070	DRG. NO.:	PA-008
SCALE:	1:1,250	DRAWN:	POF
DATE:	FEBRUARY 2022	CHECKED:	POF

3.4 Construction Stage

The construction stages will involve setting up a contractor's compound; site clearance, soil excavation for building foundations, underground services and new roads; diversion of above existing above and underground services where required; installation of surface water and foul water drainage systems; building the houses and apartments, and the provision landscaped open amenity spaces.

Construction will be carried out in accordance with a Construction Environmental Management Plan and Resource & Waste Management Plans, approved in advance by Kildare County Council, that specify the control measures that will ensure the works do not cause either environmental pollution, or nuisance to nearby residents. An Ecological Clerk of Works will be appointed to implement the measures set out in the Plans and noise, dust, archaeological and ecological monitoring will be carried out during the works.

Preliminary plans have been prepared as part of this application and these will be updated before construction works begins to take account of the conditions set in the permission and the outcome of the detailed design stage, where the emphasis will be on minimising the amount of waste generated in the works and maximising recycling and recovery rates.

3.5 Other Developments

In October 2018 permission Ardstone Ltd was granted permission on lands to the southwest the River Liffey for a large (343 unit) residential development. This scheme (Belin Woods), which also includes the delivery of a section of the Newbridge Southern Relief Road, is currently being constructed.

In November 2021 Barola Capital DAC was granted permission for a distribution warehouse and offices on 15.42 ha site to the north-east of the proposed development. Construction has commenced and it is likely it will be in use before Phase 1 of the proposed development begins. Ballyfarm Road which will be taken in charge by Kildare County Council is scheduled to open in June 2022.

In December 2021, Murphy Ireland International Ltd. lodged an application for two manufacturing buildings at their compound to the east of the proposed development site. If the construction of the buildings overlaps with Phase I of the proposed development, there is the potential for cumulative effects on air quality.

The completion of the of the stretch of the Newbridge Southern Relief Road between Great Connell Roundabout and the Athgarvan Road requires the construction of a bridge over the Liffey to tie into the section being provided as part of the Ardstone residential development. This will involve a separate planning application and Aston Ltd has engaged with Kildare County Council on progressing this application. At the time of the preparation of this EIAR the alignment and design of the bridge are indicative only.

4. ALTERNATIVES

4.1 Site Location

This site is zoned for residential development in the Newbridge Local Area Plan and the only alternatives are other residentially zoned lands.

4.2 Alternative Layout

The initial site layout was influenced by the existing conditions and design objectives, including

- Need to integrate the development into the existing built environment.
- Proximity to the Liffey and the opportunity to avail of its amenity.
- Need to provide compensatory flood measures.
- The proposed route of the Newbridge South Relief Road through the site and its alignment with the propose bridge and the section of the relief road in the Ardstone Ltd development to the west of the river,
- Presence of the existing Irish Water sewer system.
- The design objectives of retaining, to the greatest extent possible, the existing hedgerows and trees, and.
- Providing ample, well designed and landscaped and safe open public and amenity areas accessible to all future residents.

The initial layout was revised five times based on inputs from the design team members in relation to preventing and minimising (designing out) to the greatest extent possible the environmental impacts and to take account of comments made by Kildare County Council and the Bord in relation to building positioning, roads' provision of open space and flood risk.

4.3 Alternative Services

It was a design objective to provide a gravity foul water drainage system; however, the site topography did not facilitate this approach and required the provision of a pumped system. Several surface-water flow attenuation designs were assessed, including the provision of above-ground storage in the west of the site. However, this would at times, result in water being up to 2m deep and in the interest of safety underground attenuation was selected.

4.4 Alternative Mitigation Measures

The proposed mitigation measures identified at the design stage and those that will be implemented in the construction and operational stage are appropriate for the location and scale of the development and alternative controls were not considered necessary.

5. CLIMATE

This Chapter examines the impacts of the proposed development on the climate and the vulnerability of the development to the effects of climate change. It describes the prevention and mitigation measures to reduce the significance of the impacts. It also assesses the baseline scenario, discusses the cumulative effects and concludes on the residual impacts.

The Chapter was completed by Dr. Micheal Fogarty B.Eng M.Eng PhD, Lisa Smith B.Eng M.Eng Environmental Management and Mr. Simon Welchman B.Eng of Katestone, all of whom have the qualifications and experience required to be a competent expert.

5.1 Methodology

The assessment was based on Ireland's commitments to tackle climate change by reducing greenhouse gas emission; information on Ireland's current and predicted greenhouse gas emission from repots prepared by the Environmental Protection Agency; the energy efficient design of the buildings and the emissions from the additional traffic associated with the proposed development.

5.2 Proposed Development

Those aspects of the proposed development relating to climate are:

- Impacts on climate by greenhouse gas emissions from construction activities and emissions in the operational stage (heating, ventilation and lighting) and from the additional traffic associated with the proposed development.

- The potential effects of climate change on the development in the future.

5.3 Receiving Environment

The Environmental Protection Agency (EPA) is responsible for tracking and reporting on Ireland's progress towards meeting it climate change objectives, which includes achieving its emission reduction targets for 2020 and 2030 as set out under the European Union Emissions Sharing Regulations (ESR) and the Emissions Trading System (ETS). The ETS applies to large greenhouse gas producers like power stations. Other activities, which include house building, belong to what is called the Non-ETS Sector.

The EPA predicts that Ireland can meet its Non-ETS Sector targets over the period 2021 to 2030 assuming full implementation of the Climate Action Plan and the use of the flexibilities it allows. However more ambitious targets as presented in the European Climate Law and Ireland's Climate Act will require many as yet unidentified additional measures.

Increased renewable electricity generation, including offshore wind generation, is expected to assist in achieving a 70% renewable energy in electricity generation by 2030. Energy industry emissions are projected to decrease by one third by 2030 compared to the most recent figures in 2019.

The Covid-19 pandemic highlighted the need for homes to become far more energy efficient, particularly in the context recent regulations to encourage working from home. Implementing the

2019 Climate Action Plan measure for the installation of over 600,000 heat-pumps by 2030 as well as retrofitting 500,000 homes to a B2 equivalent Building Energy Rating will help achieve this.

The EPA predicts that Ireland will miss its target for compliance with the ESR based on the emissions between 2013 and 2020; however in the medium term, Ireland will meet its 2030 target under the ESR provided there is full implementation of the Climate Action Plan measures.

The binding annual greenhouse gas emission target for Ireland is a reduction of 30% in emissions by 2030 compared to 2005 levels. In 2005 the annual greenhouse gas emissions for the non-ETS sector were 47.30 million tonnes of carbon dioxide and the 2030 target is 33.58 million tonnes. The EPA predicts that non ETS greenhouse gas emissions in 2024, when it is expected that Phase I of the development will open, will range from 40.04 to 42.9 million tonnes of carbon dioxide.

In addition to the impact of the proposed development on climate change, the vulnerability of the development to the impacts of climate change is assessed. The greatest risk to the proposed development is extreme rainfall events leading to flooding, due to the proximity to the River Liffey. A detailed flood risk assessment has been completed including a detailed design of the proposed surface water drainage system.

5.4 Impacts

The greenhouse gas emissions in the construction stage include those with the manufacturing and transport of building materials as well as the construction works themselves. The estimated emissions from the overall construction stage will be 40, 600 tonnes of carbon dioxide, which is between 0.09 and 0.1 % of the predicted non ETS emissions in 2024. As the development will be carried out in four phases, the actual emissions in 2024 will be lower. The emissions are considered to be not significant.

When the development is completed and fully occupied the sources of greenhouse gas emissions will be traffic and the space heating, ventilation, water heating and lighting in the apartments, houses neighbourhood centre and crèche. This is estimated to be 1,550.8 tonnes of carbon dioxide per year, which will be 0.0039% of Ireland's 2030 target and is considered to be not significant.

5.5 Baseline Scenario

If the development does not proceed there will be no additional greenhouse gas emissions.

5.6 Prevention & Mitigation Measures

5.6.1 Design Stage

The buildings will comply with the EU Energy Performance of Buildings Directive that came into effect in 2019. The Directive defines a Nearly Zero Energy Building as a building that has a high energy performance, typically achieved by the Building Energy Rating (BER) A2 that is the design objective for the proposed development. Energy efficiency measures that will be incorporated into the building design include solar panel and heat pumps. Electrical vehicle charge points will also be provided.

5.6.2 Construction Stage

As the impact of the greenhouse gas emissions from the construction stage will not be significant site specific mitigation measures are not needed, however the following construction best practices will

be use to minimise emission from construction traffic, fossil fuel powered equipment and waste generation.

- Planning routes and schedules for the delivery and removal of materials.
- Efficient use of construction equipment and resources.
- Minimisation of waste generated from construction activities.

5.6.3 Operational Stage

Due to the mitigation measures incorporated into the building design, the impact of emissions in the operational stage will not be significant and no additional site-specific mitigation measures are required.

The risks associated with the impacts of climate change on the proposed development are addressed in the Site-Specific Flood Risk Assessment and in the design of the surface water drainage system, which are discussed in Chapter 7

5.7 Monitoring

Monitoring is not required in either the construction, or operational stages.

5.8 Cumulative Effects

For the assessment of cumulative effects, it was assumed the section of the Newbridge South Relief Road connecting Great Connell Roundabout to the Athgarvan Road will be operational and the associate greenhouse gas emissions from the traffic was assessed.

The EIAR prepared for the distribution warehouse to the north-east of the proposed development site concluded that in the operational phase its operation will have an imperceptible, negative and long-term impact on climate. Construction of the warehouse is due to start in May 2022 and it is likely that it will be operational before the start of Phase 1 of the proposed development.

5.9 Residual Impacts

The Construction Stage impacts will be negative, slight, at a national level, likely to occur and long term. In the Operational Stage the impacts will be negative, imperceptible, at a national level, likely to occur and long term.

6. LAND & GEOLOGY

This Chapter examines the impacts of the proposed development on Land & Soil, which includes land use, soils and the bedrock. It describes the impacts associated with the proposed development and the prevention and mitigation and monitoring measures to reduce their significance. It also assesses the baseline scenario, discusses the cumulative effects and concludes on the residual impacts. The assessment was completed by Mr Austin Hynes, BSc MSc and Mr Sean Moran BSc MSc.

6.1 Methodology

The assessment was based on information obtained from the Geological Survey of Ireland, Teagasc and the Central Statistics Office, site inspections and a site investigation commissioned to establish the ground conditions, which included the excavation of trial pits, the drilling of boreholes and the collection and testing of samples for geotechnical properties and soil quality.

6.2 Receiving Environment

The site is dominated by large fields of tillage land, with small areas in the centre, east and north-east occupied by buildings. The soils in the western half of the site are alluvium (river deposits), with the eastern half underlain by gravels. The soils are between 16.5m and 18m thick and overly limestone bedrock.

6.3 Impacts

The development will result in the loss of approximately 23 ha of arable land, soil stripping and excavation for building foundations and underground services and raising of ground levels for flood protection purposes. The development does not require excavation of the bedrock.

In the construction stage all of the excavated soils will be retained on site and additional clean soils will be brought to the site to raise the ground level. There is the potential for spills/leaks to occur in areas where polluting substances (e.g. oils) are handled and refuelling mobile plant occurs that could impact the exposed subsoils. In the operational stage there is the potential for oil leaks from vehicles that could infiltrate to ground[1].

6.4 Baseline Scenario

If the proposed development does not proceed the site will remain in its current condition with no impacts on land and geology.

6.5 Prevention & Mitigation Measures

6.5.1 Design Stage

Given the nature of the development there are no design prevention and mitigation measures to reduce the effects of the loss of the arable land; however, 11.4 ha or 41% of the total development

[1] Ref to Chapter 7 for more details

site will be open space for amenity use. The permeable paving used in car parking areas are designed to filter out oil from leaks from vehicles.

6.5.2 Construction Stage

A Preliminary Construction Environmental Management Plan (CEMP) describing the proposed construction mitigation measures for all sensitive environmental receptors and human beings has been prepared. For Land & Geology these measures include:

- Restricting the storage and handling of oils and chemicals to dedicated areas.
- The provision of appropriate storage containers and bunds to retain accidental spills.
- Provision of appropriate equipment and staff training to ensure any spills are quickly cleaned up.
- Scheduling the soil stripping to times that minimise the risk of erosion, and
- Operating machinery and materials storage in ways to minimises the risk of soil compaction.

6.5.3 Operational Stage.

No additional mitigation measures are required.

6.6 Monitoring

Monitoring is not required in either the construction or operational Stages

6.7 Cumulative Impacts

The 18.4 ha Ardstone Ltd residential estate to the west of the Liffey and the 15.4 ha site of distribution warehouse that will be constructed to the north east of the proposed development site involve the long-term land take of agricultural land.

6.8 Residual Impacts

The loss of the arable land will have a negative, but imperceptible, long term impact. The rainwater infiltration to ground will have a negative and imperceptible long-term impact.

7. WATER

7.1 Introduction

This Chapter examines the impacts of the proposed development on Water, which includes rivers and streams and groundwater. It describes the impacts associated with the proposed development and the prevention and mitigation and monitoring measures to reduce their significance. It also assesses the baseline scenario, discusses the cumulative effects and concludes on the residual impacts.

The assessment of the impacts on water flows and quality was completed by Ms Marzena Nowakowska BSc MSc and Mr Austin Hynes BSc MSc of O'Callaghan Moran & Associates. The assessment of the flood risk was carried out by Ms Orla Hannon BSc and Mr Ross Byrant BSc, MSc of JBA Consulting Engineers (JBA).

7.2 Methodology

The assessment was based on information obtained from the Geological Survey of Ireland, the EPA; the River Basin Management Plan 203-2018 , site inspections, a detailed flood risk assessment and a site investigation commissioned to establish groundwater conditions, which included the drilling of wells, recording the depth to the water table and the collection and testing of groundwater samples.

7.3 Receiving Environment

The site is in the catchment of the River Liffey, which flows through the south-west of the lands. The ditches inside the site boundary follow a historic meander of the Liffey and provide a flow path for flood water from the river across the site. The gravels are a locally important aquifer and the underlying bedrock as regionally important aquifer. The water table ranges from 1m to 2.9m below ground level.

7.4 Impacts

The construction stage involves the excavation of the soils and subsoils for the building foundations and underground services, but these will not extend into the water table. There is the potential for spills/leaks to occur in areas where polluting substances (e.g. oils) are stored and handled that infiltrate to groundwater.

There is also the potential for rainwater run-off from areas where the soils are excavated/stockpiled to contain high levels of silt, which presents a risk to water quality in the Liffey and the drainage ditch.

When developed, rainfall on new impermeable areas, along with the permeable paved areas during heavy rainfall event, will result in an increase in the volume of rainwater run-off compared to the undeveloped sit. The run-off will also reduce the volume of rainwater infiltration, also known as recharge, to the groundwater. In areas used by vehicles there is the potential for small oil leaks to occur and contaminate the run-off.

7.5 Baseline Scenario

If the proposed development does not proceed the current land use will continue, with no increase in the volumes of rainwater run-off, no risk of impact on the River Liffey and the drainage ditch and no impacts on groundwater.

7.6 Prevention & Mitigation Measures

7.6.1 Design Stage

As requested by Kildare County Council separate drainage systems were designed for the residential areas and the stretch of the Newbridge South Relief Road that is part of the proposed development.

The sewage pumping station will have an emergency storage tank (245m^3) that will contain the sewage in the event of a pump failure.

Kildare County Council also requested that a detailed flood risk assessment be completed. This was done by JBA and involved detailed computer modelling for a range of different scenarios, including the construction of the bridge over the Liffey to complete the final section of the Newbridge South Relief Road between the Great Connell and Athgarvan Roads

The assessment established the extent of future flooding taking into account the effects of climate change. JBA recommended the following measures to effectively mitigate the risk of flooding inside and outside the site boundary:

- The provision of compensatory flood storage areas in the south west of the site where the flood waters will be temporarily stored before flowing back to the river;
- Raising the ground levels to where the building floors will be at least 500mm above the worst case (1:1000 year event) predicted flood levels;
- Ensuring the building floor levels are at least 150 mm above the road levels, and
- The provision of sustainable urban drainage features in the surface water drainage system.

Kildare County Council requested that the JBA report be independently reviewed by another experienced and qualified flood risk consultant. This review was carried out by Arup Consulting Engineers, who agreed with the JBA conclusions and recommendations.

All of the JBA recommendations were incorporated into the development design.

The sustainable drainage features include:

- Green roofs where plants absorb rainfall, with the surplus water being collected in water barrels for use in the gardens;
- Soakaways in the gardens where overflows from the barrels can percolate to ground;
- Open drainage channels, known as swales, that allow rainwater flowing through them to percolate to ground;

- Permeable paving in driveways that allows rain to percolate through to the ground while at the same time absorbing an oil that may be present as a result of minor leaks from car engines, and

- In heavy rainfall events where the drainage measures described above cannot accommodate the volumes, the run-off will be diverted to underground storage tanks where it will be temporarily retained and discharged to the drainage ditch and the Liffey at flow rates similar to that from the undeveloped sites. This is achieved by flow regulation devices fitted on the outlet from each tank. There will be seven tanks on the system serving the residential development and the two on the system serving the Newbridge South Relief Road.

In addition to protecting the drainage ditch and the Liffey, the soakaways, swales and permeable paving also reduce the groundwater recharge loss associated with the development, while the permeable paving is designed to filter out oil.

To protect the water quality in the drainage ditch and river oil interceptors, designed to remove oil to levels that do not present a significant environmental risk, will be installed between each of the attenuation tanks and the discharge outlets.

7.6.2 Construction Stage:

The mitigation measures for surface water and groundwater in the Preliminary Construction Environmental Management Plan include:

- Restricting the storage and handling of oils and chemicals to appropriately constructed dedicated areas;

- The provision of appropriate storage containers and bunds to retain accidental spills;

- Provision appropriate equipment and staff training to ensure any spills are cleaned up quickly, and

- Maintaining buffer zones between the construction areas the river and the drainage ditch to prevent the entry of silt laden run-off.

7.6.3 Operational Stage

In the operational stage the oil interceptors will be subject to regular inspection and cleaning. The foul water pumping station will also be regularly inspected and maintained.

7.7 Monitoring

In the construction stage the Ecological Clerk of Works will regularly inspect the excavation areas to ensure that the buffer distances between the working areas and the water courses are maintained.

7.8 Cumulative Effects

The 18.4 ha Ardstone Ltd residential estate to the west of the Liffey and the 15.4 ha site of distribution warehouse that will be constructed to the north east of the proposed development site involve the construction of impermeable areas and the provision of new storm water drainage systems.

Both developments will result in an increase in the volume of rainwater run-off compared to greenfield conditions; however design mitigation measures ensure that the run-off rate does not exceed greenfield rates and that the quality of the run-off will not be significantly affected. Both will also result in a reduction in groundwater recharge.

7.9 Residual Impacts

The JBA Flood Risk assessment identified the sources of residual flood risk as blockages at the proposed new bridge and failure of the upstream ESB Poulaphuca and Golden Falls dams. JBA concluded that as the proposed piers will have a minimum span of 24m and will not be located in the river that the risk of blockages was low. . JBA modelled a dam failure and found that even in this scenario the building floor levels would be 170mm above the maximum predicted flood level.

The proposed development will have no impact on flooding outside the proposed development site boundary. The site design measures, which take on board future climate change impacts, will ensure that flooding will not affect the residential units, neighbourhood centre and the crèche.

The proposed development will have a negative, imperceptible, long term impact on water quality in the drainage ditch and the River Liffey. It will have no impact on water flows in either the drainage ditch or the Liffey. It will have a negative, imperceptible, long term impact on groundwater quality and resource.

8. BIODIVERSITY

8.1 Introduction

This Chapter examines the impacts of the proposed development on Biodiversity which includes habitats, plants (flora) and animals (fauna). It describes the impacts associated with the proposed development and the prevention, mitigation and monitoring measures to reduce the significance of the impacts. It also assesses a baseline scenario, discusses the cumulative effects and concludes on the residual impacts. The Chapter was prepared by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology). The fieldwork was conducted by Cian Gill MSc (Ecological Monitoring) and Mark Donnelly BSc (Forestry).

8.2 Methodology

The assessment was based on desk top study and ecological field surveys. The desktop study included reviews of databases on protected species held by National Parks and Wildlife Service (NPWS); Environmental Protection Agency (EPA): National Biodiversity Data Centre (NBDC); Bat Conservation Ireland, and Birdwatch Ireland. In addition, the National Biodiversity Action Plan 2017-2021 (NPWS 2017); Kildare County Development Plan 2017-2023; County Kildare Biodiversity Plan and the Newbridge Biodiversity Action Plan 2021-2025 were reviewed.

The ecological surveys were completed in December 2020 and May 2021 with a final walk over survey in March 2022 to ensure there had been no-significant changes and to include an extension of the site boundary to accommodate flood compensatory areas. They included:

- Habitat survey
- Invasive species survey
- Bat emergence survey
- Otter and general mammal survey
- Breeding bird survey
- Rare floral species

Habitats were mapped according to the classification scheme outlined in the Heritage Council publication A Guide to Habitats in Ireland and following the guidelines contained in Best Practice Guidance for Habitat Survey and Mapping. Bat activity surveys were conducted under suitable weather conditions, with the dusk activity surveys starting 15 minutes before sunset and ending two hours after sunset.

The otter survey followed the guidance in National Roads Authority publication and included searches for breeding or resting sites within 150m of the proposed development site boundary. The breeding bird survey was based on the British Trust for Ornithology Common Bird Census methodology and Breeding Bird Survey (BBS) and focused on terrestrial habitats within the development site boundary.

The conservation status of birds was recorded with regard to the species listed in the EU Birds Directive and identified by BirdWatch Ireland as 'Birds of Conservation Concern in Ireland', which are species suffering declines in population size. These birds have been classified as being in Red, Amber and Green lists. Red List species are of high conservation concern and the Amber List species are of medium conservation concern. Green listed species are regularly occurring, whose conservation status is currently considered favourable.

The assessment also took into consideration the findings of the Soil & Geology, Water, Air and the Material Assets: Noise Chapters.

8.3 Receiving Environment

The proposed development site is approximately 1km southwest of Newbridge town centre approximately 1.2km north of the M7 motorway. The lands to the north, east and west are dominated by residential dwellings and retail developments. The lands to the south and southwest are largely agricultural, with a mixture of tillage and pasture.

The proposed development site covers an area of 27.64 ha, most of which is used for tillage. Three former agricultural buildings are in the centre of the site. There is a former residential dwelling along the eastern boundary and a second residence in the north-east corner of the site.

The River Liffey flows through the southwestern corner of the site, with an area of treelines and woodland along its boundary. A drainage ditch at the centre of the site connects to another drainage ditch on the northern boundary, which ultimately flows into the River Liffey to the west of the proposed development site boundary.

8.3.1 Designated Conservation Sites

Designated conservation sites in what is termed the zone of influence of the proposed development were identified. This included (Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA), and Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA). These are listed in the Table below, which also includes the distances from the proposed development site and in the case of those sites where the River Liffey provides a direct connection the distance downstream

Designated Sites within the ZoI of the Proposed Development Natura 2000 Sites	**Site Code**	**Distance at closest point and potential source-pathway-receptor link**
Special Area of Conservation (SAC)		
Pollardstown Fen SAC	000396	2.6km west/northwest.
Mouds Bog SAC	002331	3.2km north
Ballynafagh Lake SAC	001387	10.5km north
Ballynafagh Bog SAC	000391	12.4km north
River Barrow and River Nore SAC	002162	12.9km southwest
South Dublin Bay SAC	000210	43.6km northeast (59.2km downstream)
North Dublin Bay SAC	000206	45.4km northeast (61.8km downstream)
Special Protection Area (SPA)		
Poulaphuca Reservoir SPA	004063	14.7km southeast.

South Dublin Bay and River Tolka Estuary SPA	004024	41.8km northeast (59.2km downstream)
North Bull Island SPA	004006	43.0km northeast (61.8km downstream)
Natural Heritage Area (NHA)/proposed Natural Heritage Area (pNHA)		
Curragh Kildare pNHA	000392	2.6km southwest
Grand Canal pNHA	002104	2.7km southeast
Pollardstown Fen pNHA	000396	2.6km northwest
Liffey Bank Above Athgarven	001396	3.0km south
Mouds Bog pNHA	000395	3.2km north

8.3.2 Habitats

The dominant habitat at the site was arable lands, which are largely cultivated for Spring Barley. Fields cultivated for arable crops have a limited diversity of grasses and herbaceous species. Species present include the Common Poppy and Common Field-Speedwell, both of which are common weeds in agricultural land.

The site is generally bordered by hedgerows and treelines. Along the southern and western boundaries are treelines (trees taller than 5m). The dominant mature trees include Beech, Sycamore and Scots Pine, with Poplar also present. The undergrowth includes Bramble, Elder, Cleavers and Common Vetch.

The northern and eastern boundaries include hedgerows (trees less than 5m), with occasional trees including those mentioned above along with Hawthorn and Sessile Oak, Scrub is common and includes Rosebay, Willowherb, Cow Parsley, Guleder Rose, Hedge Mustard, Groundsel, Silverweed and Dandelion.

There is a small area of wider woodland bordering the River Liffey in the south of the site. Some conifers are present, however broadleaved species predominate including Beech and Sessile Oak, with some Scots Pine and Sycamore also present. The under growth includes Sycamore, Hawthorn, Bracken and Common Vetch. Crack Willow and Goat Willow is present.

A drainage ditch runs through the site and along part of the northern site boundary. The channel is approximately 2m wide and flow is limited, with isolated pools during low flow conditions. Plants in the ditch include Water Crowfoot and Blanket Weed. The drier parts of the ditch support Soft Rush and Meadow Grass. The banks are overgrown with Bramble, Rosebay Willowherb, and Soft Rush.

Given the limited size of the drain, limited prey availability and frequent dog walking this habitat is unlikely to be of significant value for otters and no signs of otter were recorded during site surveys. Minnow were noted in small pools, although they are unlikely to survive during drier periods when the drain is essentially stagnant or dry. As Minnow is common in the River Liffey it can readily recolonise the drain when flows increase and so this habitat is not considered a critical resource for this species.

The section of the drainage ditch parallel to the northern boundary has narrow strips of riparian woodland where periodic flooding occurs. Willows species are dominant with Alder and Gorse also present. Wetland species such as Common Reed and Reed Canary Grass are present but do not dominate. Other species include Nettle, Hemlock Water-Dropwort and Creeping Buttercup.

The River Liffey has not been designated as a Natura 2000 site but is considered a high value habitat at a regional level. The stretch flowing through the proposed development site is approximately 23m wide and fast flowing with low, sloping banks. Filamentous algae covers a significant proportion of the

riverbed, greatly reducing the overall spawning value and, to a lesser extent, nursery habitat for fish species.

Bankside vegetation includes Elder, Beech, Sycamore, Hawthorn and the undergrowth includes Bramble, Bracken, Nettle and Hogweed. Hemlock Water-Dropwort is very common at the water's edge and in-stream species include Water Crowfoot.

The former agricultural buildings and yard and the former residences are classed as buildings and artificial surfaces. All structures are relatively modern and none have openings that are suitable for bats.

8.3.3 Flora

The National Biodiversity Data Centre (NBDC) provides data on the distribution of mammals, birds, and invertebrates within 10 x 10 km squares (100km^2) knows as Hectads. The proposed development site is located in Hectad N81. Some 336 flowering plants are listed as present in HN81. Of these two Cornflower and Green-flowered Helleborine are listed as threatened.

Cornflower was previously a common arable weed; however it is now more commonly found on waste ground and roadsides. This species was not recorded during the site survey. Green-flowered Helleborine, which is one of Ireland's rarest orchids, was also not recorded. No other rare or protected plant species were recorded during the site survey and given the current maintenance regime/intensive farming practices, are unlikely to occur.

8.3.4 Invasive Species

Invasive non-native species can out compete native vegetation, affecting plant community structure and habitat for wildlife; cause damage to roads, pathways and walls and have an adverse effect on landscape quality.

The NBDC lists the aquatic and terrestrial high impact invasive plant species recorded in Hectad N81. This information relates to the entire 100km^2 area and does not meant that the listed species are present at the proposed development site.

Himalayan Balsam was recorded along the banks of the River Liffey inside the proposed development site boundary. Himalayan Balsam is a member of the Busy Lizzie family and, as its name suggests, is native to the Himalaya region of Asia.

8.3.5 Fauna

8.3.5.1 Bats

The NBDC database indicates that six of the nine protected Irish bat species have been recorded within Hectad N81.

A preliminary roost assessment of the buildings that will be demolished was carried out and this concluded that the potential for roosting was low. A survey of the mature trees that will be removed was also completed and concluded that none of the trees were considered to be of significant value to bats; however, one oak tree along the north-eastern boundary was assessed as being of moderate roost potential for bats. The presence of occasional roosting bats cannot be ruled out.

Bat activity surveys focused on the site buildings, treelines and the River Liffey recorded one Common Pipistrelle and two Soprano Pipistrelle of bats foraging in the vicinity of warehouse buildings; however no emergence from the buildings was recorded. Higher numbers of bats (Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Daubuenton's Bat) were recorded foraging along the treeline bordering the River Liffey. Small numbers of Soprano and Common Pipistrelle foraged along the southern treeline.

The woodland, treelines and hedgerow habitat on the southern boundary of the proposed development site, in conjunction with the River Liffey, provides high value foraging habitat for bats at a local level. The remaining habitats provide some limited foraging and commuting habitat for bats and are of low to moderate value at a local level

8.3.5.2 Otter

Otters have been recorded in Hectad N81 on eleven occasions, with the most recent being in 2018. Otter are widespread throughout this stretch of the River Liffey; however a fisheries assessment of the Liffey completed in 2020 (on behalf of Waterways Ireland) did not find any signs of otter in the vicinity of the development site.

The Dixon Brosnan field surveys did not find any signs of otter within 150m of the proposed development site and noted that large areas of the site are unsuitable for breeding due to frequent access by people and dogs. However as the River Liffey is a high value habitat for this species and taking a worst case scenario approach it is assumed that otter forage in the river where it flows through the site.

8.3.5.3 Other Mammals

Seventeen other species of terrestrial mammal have been recorded within Hectad N81. Nine of these are protected under the Wildlife Act; Badger, Irish Stoat, Irish Hare , Hedgehog, Red Squirrel, Pygmy Shrew , Pine Marten, Sika Deer and Fallow Deer. The site surveys did not identify the presence of any of these species; however based on the habitat types it was assumed Hedgehog, Pygmy Shrew, Irish Stoat and Red Squirrel species could be present.

8.3.5.4 Amphibians

The NBDC lists the Common Frog and Smooth Newt as being present within Hectad N81. The Common Frog is protected under the Wildlife Act. The drainage ditches provide potential habitats for Common Frog, but no signs were found during the Spring and Summer surveys. While commonly encountered near water bodies, adult newts are terrestrial, only returning to water bodies to breed. The proposed development site does not include waterbodies suitable for this species.

8.3.5.5 Reptiles

The NBDC has no record of any reptile species within Hectad N81 of the site. No reptiles were recorded during site surveys.

8.3.6 Birds

The NBDC lists ninety-six bird species within Hectad N81. Of these species, the following are listed in the Birds Directive Kingfisher, Corn Crake, Golden Plover, Hen Harrier, Little Egret, Short-eared Owl and Whooper Swan. Species listed in Directive are considered a conservation priority. The field surveys did not identify any of these species.

Overall, the proposed development site is of local value for the terrestrial bird species that are relatively common in the Irish countryside, as the good quality treelines, woodland and hedgerows at provide a range of nesting habitat for common bird species.

The Liffey has the potential to provide foraging habitat for Kingfisher; however the low sloping river banks at the site are not a suitable nesting habitat. No signs of wintering waders or waterfowl were recorded; however, Whooper Swans are known to forage on agricultural grassland and cereal stubble in autumn and winter. While Whooper Swan could potentially forage at the site during the winter months, given the large areas of arable farming in the region the area within the proposed development site does not provide critical habitat for this species.

One Red List species Yellowhammer was recorded within the treeline/hedgerow in the south of the site. Historically, this species was widespread throughout the country, but has declined due to the decrease in cereal crop cultivation. Due to this decline, the majority of the Yellowhammer population is confined to the east and south of Ireland. Two Amber List species Swallow and Willow Warbler were recorded.

Overall, the site supports a mixture of terrestrial bird species that are relatively common in the Irish countryside.

8.3.7 Other Species

While no site is without invertebrate interest, it is considered unlikely that the proposed development site supports any protected invertebrate species as the habitats are common.

The River Liffey supports Brown Trout, European Eel, Lamprey, Minnow, Roach, Three-spined Stickleback, Pike, Perch and Stone Loach. It also supports White-Clawed Crayfish, which is favoured prey species for otter. However high nutrient levels leading to excessive algal has reduced the overall ecological value of this section of river as spawning ground and nursery habitat.

8.4 Impacts

Those aspects of the development relevant to biodiversity are:

- Construction Stage loss of habitat and plant species;
- Construction Stage disturbance of species due to noise and light emissions and human activity;
- Construction Stage landscaping measures:
- Operational Stage disturbance of species due to light, noise and human activity.
- Operational Stage impact on water quality in the Liffey linked to the rainwater run-off discharges.

8.5 Baseline Scenario

If the proposed development does not proceed the current activities will continue with no change to the risk presented to biodiversity.

8.6 Prevention & Mitigation Measures

8.6.1 Design Stage

It was a design objective to retain the existing boundary hedgerows and treelines to the greatest extent possible and minimise the removal of mature trees inside the site.

The surface water drainage system is designed to ensure that flow rates remained at greenfield levels, while taking account of the implications of climate change. The design also included measures (silt traps and oil interceptors) to minimise impacts on water quality.

8.6.2 Construction Stage

The mitigation measures that will be implemented to mitigate the effects on soils, water and human beings are also effective in relation to protecting biodiversity. In addition

- Site lighting will be at the lowest level needed for safety and security purposes and wherever possible will be will be restricted to the working area and set up to avoid overspill and shadows on sensitive habitats outside the construction area, particularly the woodland close to the Liffey.

- Where possible trees will be not be removed between 1st March and 31st August.

- Where possible the demolition of buildings will take place between October and March when bats will be hibernating, as they have negligible potential as winter hibernation sites. Before demolition a bat specialist will inspect the buildings. Emergence surveys will be carried out if buildings are demolished between April and September. If bats are identified the bat specialist will identify the appropriate mitigation measures and obtain the required licence from the National Parks and Wildlife Service.

- Before felling a bat specialist will inspect the trees. The felled trees will not be mulched immediately and will be left lying several hours and preferably overnight to allow any bats within the tree to emerge and avoid accidental death.

- Treelines outside the proposed development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.

- As a biodiversity enhancement measure 10 bat boxes and 10 bird nesting boxes will be provided within the site

- Trees will be removed outside of the bird breeding season where possible and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the study area boundary.

- The landscaping works including woodland planting and the use of more diverse grassland will provide additional nesting and feeding sites for birds, particularly as these habitats mature.

- Before the start of the construction an invasive species survey will be undertaken to determine if invasive species have spread to other areas since they were first identified. The EIAR contains mitigation measures for how the Himalayan Balsam will be treated.

8.6.3 Operational Stage

The primary mitigation relates to bats, as these are considered the most sensitive species in relation to night time lighting, but it will also lessen the impact on other nocturnal species such as hedgehog and otter.

- Light emitting diode (LED) type bulbs that do not emit ultraviolet and infra-red wave lengths are considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement to foraging areas.

- The height of the lighting columns will be kept as low as possible, bearing in mind the need to prevent damage by vandalism.

8.7 Designated Sites.

The closest Natura 2000 Sites are the Pollardstown Fen SAC and Moud's Bog Fen SAC which are 2.6km northwest and 3.2km north respectively. Although these are within the Liffey catchment, they are upstream of the proposed development site and in separate sub catchments meaning there is no pathway between them and the proposed development site.

The Poulaphouca Reservoir SPA is 14.7km southeast of the proposed development site. It has been designated due to the presence of Greylag Goose and Lesser Black-backed Gull, both of which could potentially forage on or near the proposed development site and therefore be impacted by disturbance during the construction on operational stages.

There are four Natura 2000 Sites in Dublin Bay that are hydrologically connected to the River Liffey. These are South Dublin Bay SAC; South Dublin Bay and River Tolka Estuary SPA; North Dublin Bay SAC and North Bull Island SPA and are between 59 and 61.8km downstream of the proposed development site.

An Appropriate Assessment Screening concluded the likelihood of effects on the Natura 2000 Sites in Dublin Bay is low, however using an abundance of caution on potential identified impact pathways a Natura Impact Statement was prepared. This concluded that the proposed development will not have a significant effect on any Natura 2000 Sites.

8.8 Monitoring

A bat specialist will examine the buildings prior to demolition and the mature trees prior to removal to determine the presence/absence of bats.

8.8 Cumulative Effects

A number of developments/plans are proposed and permitted in the vicinity of the proposed development and the potential for cumulative effects with these projects/plans were considered. The proposed development has avoided significant impact on the River Liffey and its surrounding habitats at the design stage. In this context, cumulative effects will only arise in relation to noise/disturbance and water quality impacts.

Given the dilution provided in the River Liffey and implementation mitigation measures, no significant effect on water quality or in-combination effects are predicted to occur. In the context of the existing environment, which is subject to background noise and disturbance, the increase in noise and disturbance associated with other plans/projects will not be significant. Should any plan/project run concurrently with the proposed development the implementation of mitigation measures will mean that no significant cumulative effect from noise and disturbance during construction will occur. No cumulative effects were identified

8.9 Residual Impacts

The impact on habitats will be negative, imperceptible, to non-significant likely and long term. The impact on bats will be negative, slight, local, likely and long term. The impact on otter will be negative, slight, local, likely and long term. The impact on other mammals will be negative, not significant, local, likely and long term. The impacts on amphibians and reptiles will be negative, slight, local, likely and long term. The impacts on birds will be negative, slight, local, likely and long term.

9. AIR

9.1 Introduction

This Chapter examines the impacts of the proposed development on air quality. It describes the impacts associated with the proposed development and the prevention and mitigation measures to reduce the significance of the impacts. It also assesses a baseline scenario, discusses the cumulative effects and concludes on the residual impacts. The assessment was completed by Dr. Micheal Fogarty B.Eng, M.Eng, PhD, Mr Ricky Gellataly B.Eng and Mr Simon Welchman B.Eng of Katestone.

9.2 Methodology

The assessment was based on information on air quality obtained from EPA databases, meteorological data from the closest Met Eireann station at Casement Aerodrome, which is 25km to the north-east and the traffic and transport assessment completed by Punch Consulting Engineers.

The identification and evaluation of impacts followed guidance documents on the impacts of construction projects issued by the National Roads Authority and the Institute of Air Quality Management and the Quarries and Ancillary Activities Guidelines for Planning Authorities issued by the Department of Environment Local Government and Heritage. The traffic impacts were assessed in accordance with the Highways England Design Manual for Roads and Bridges.

9.3 Receiving Environment

The average annual rainfall at Casement Airport, which is the nearest weather station, is 754 mm, the mean daily temperature 9.7^{0}C, the average humidity is 83.6% and the winds are predominantly from the south-west, so the climate at the proposed development site can be described as mild and wet.

The European Union Air Quality Framework Directive requires Member States to identify Zones for air quality assessment purposes. In Ireland, four zones, A, B, C and D are defined in the Air Quality Standards (AQS) Regulations. (2002 SI No. 271 of 2002)

- Zone A – Dublin Conurbation
- Zone B – Cork Conurbation
- Zone C – Large Towns with a Population > 15,000
- Zone D – Remaining Area of Ireland

The proposed development site is in Zone C

The AQS Regulations sets limit values for sulphur dioxide, nitrogen oxide, particulate matter, benzene and carbon monoxide in ambient air. For particulates Regulations set ambient limits for 2.5 micron(µm) and 10 µm particulates to protect human health, but do not set limits for dusts >10µm, which typically relate to nuisance effects rather than potential health effects. For assessment purposes the deposition limit applied by the EPA in the licences the issue was used.

The EPA implements an air quality monitoring programme throughout the country and the nearest monitoring station to the proposed development site is in a carpark in Newbridge Town Centre, approximately 1.1 km from the nearest housing unit of the proposed development.

The monitoring location is in an area where the magnitude of measured of air contaminants is heavily influenced by local traffic and emissions from residential areas of the town and local businesses. So in addition to the data from the Newbridge monitoring station, long-term background air quality data for Zone C was obtained from EPA reports on air quality data from their network air monitoring stations across Ireland.

The results indicate that the air quality at the proposed development site is good, with the level of contaminants below the AQS limit thresholds.

The sensitive receptors that are of greatest interest in the construction stage are houses and businesses close to where construction works will be carried out, and the local road network. Seven sensitive areas were identified which includes three areas in Wellesley Manor, three commercial operations east of Great Connell Road and the Ardstone development. In the operational stage the sensitive receptors will be residences closest to the Newbridge Southern Relief Road that will run through the proposed development.

Two ecologically sensitive sites (Pollardstown Fen and Mouds Bog) within 10 km of the proposed development site, with the nearest being 2.7 km away.

9.4 Impacts

9.4.1 Construction

In the construction stage the impacts are associated with dust emissions from the building demolition, soil excavation and stockpiling, building construction, landscape works, wind-blown dusts from access roads and from mud tracked out from the site on vehicle wheels, and exhaust gases from the materials delivery and staff vehicles and mobile plant.

The potential for dust emissions during construction depends on ambient conditions, including rainfall, wind speed, wind direction and on the distance to potentially sensitive locations. Most the dust generated is deposited close to the source and any impacts are typically within a hundred metres or so of the construction area. Depending on the size of the particles dust can result in soiling of houses, gardens and cars, while the smaller particles that are breathed in can affect health.

9.4.2 Operational

In the operational stage the impacts are associated with the exhaust gases from the traffic associated with development.

9.5 Baseline Scenario

If the proposed development does not proceed there will be no new emissions to air and no change to the potential for impacts on air quality. Air quality levels at the site will change over time in line with general trends in air quality for Newbridge Town and the wider surrounding area.

9.6 Prevention & Mitigation Measures

9.6.1 Construction Stage

The following will be implemented to ensure dusts do not result in any significant adverse impacts on air quality in the construction stage.

- Water spraying of exposed earthworks and site haul road during dry weather using mobile units.
- Provision of a wheel cleaner at the site entrance to remove dirt from vehicles prior to exiting the site.
- Regular inspection of the approach roads and cleaning as needed using a road sweeper.
- Control of vehicle speeds within the site, and
- Material drop heights from plant to plant or from plant to stockpile will be minimised.

Emissions from construction traffic, the use of fossil fuels to power onsite equipment will be minimised through:

- Planning delivery routes and schedules for the delivery and removal of materials.
- Efficient use of construction equipment and resources.

9.6.2 Operational Stage

The impact of emissions in the operational stage will not be significant and no additional site specific mitigation measures are required.

9.7 Monitoring

Dust deposition monitoring will be carried out at locations and frequencies agreed with Kildare County Council.

9.8 Cumulative Effects

If the construction of the distribution centre to the north-east of the proposed development site overlaps with the construction of Phase 1 there is the potential for cumulative dust impacts on sensitive receptors .

The assessment of cumulative effects of vehicle emisisons assumed the the section of the Newbridge Southern Relief Road between Great Connell Roundabout to the Athgarvan Road has been constructed and is in use and no significant effects were identified.

9.9 Residual Impacts

The implementation of the CEMP will ensure that levels of impact identified in the assessment of construction impacts will be minimised to levels that are imperceptible, negative and temporary.

The impact of the operational stage on human health will be not significant**,** negative and long-term. In relation to ecological sites the impact of the proposed development will be imperceptible, negative and long-term.

10. POPULATION & HUMAN HEALTH

10.1 Introduction

This Chapter describes the population distribution in the vicinity of the proposed development and assesses the impacts of the proposed development on the population and human health. The assessment considered a 'baseline' scenario and identifies the prevention and mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts.

In relation to human health impact assessment of impacts focused on:

- Population.
- Biodiversity, with particular attention to protected species and habitats.
- Land, soil, water, air and climate.
- Material assets, cultural heritage and the landscape.
- Interactions between the above factors.

10.2 Methodology

The assessment was based on the planning zoning status, the land use in the vicinity of the development site, population density and employment sectors, a Social Infrastructure Assessment completed by KPMG Analytical Services, the Universal Access Statement prepared by O'Flynn Architects: a daylight and sun light and shadow assessment completed by 3D Design Bureau and the findings of the assessment of impacts on human health associated with emissions to air (Chapter 9), noise and vibration (Chapter 11) and flood risk (Chapter 7).

10.2.1 Consultation

In the statutory consultation stage Kildare County Council emphasised the need for high-quality landscaping and design and the provision of appropriate storage areas for both the apartments and house. The Bord requested that the open spaces should incorporate high-quality design to ensure that they are useable and functional for all sectors of the community.

10.3 Development Description

The aspects of relevance to Population & Human Health are:

- The construction and occupancy and use of.
    - 569 residential units (325 house and 224 apartments),

- A neighbourhood centre with 11 commercial units and,
- A crèche with the capacity of 154 children.

- Provision of 18 open space areas.

- Existing Social Infrastructure
- Flood Risk

10.4 Receiving Environment: Population

10.4.1 Surrounding Land Use

The proposed development site is on the eastern outskirts of Newbridge, ca 1km from the Town Centre and main retail area. To the south and south-east are agricultural lands. To the east, across the Great Connell Road, are the Murphy Ireland Ltd offices and compound. To the north, the site bounds the Wellesley Manor which has closest residential dwellings.

10.4.2 Demographics

Kildare is one of the most populated counties in the State and with a population of 222,504 has the fifth highest population of all local authority areas in Ireland. The county has experienced consistent population expansion in recent years. Different age groups have different requirements, with young families needing educational and childcare services, the working age population requiring employment opportunities and those in retirement age in need of care and health services.

A custom population projection exercise was completed to estimate population change within a 2km radius of the development site. This found the study area experienced a significant increase in population between 2006 and 2016, when it rose from 21,727 to 26,258 and it is projected that by 2031 the study area will have a population of 32,721, dominate by those of a 'working age' (c.68.8%), with a smaller number of younger people (c.17.1%) and older people (c.14.1%)..

10.4.3 Economy

The dominant industrial sectors for Kildare workers are 'Commerce and Trade' (26.6%) and 'Professional Services' (22.8%) - both accounting for nearly half of all Kildare resident workers.

10.4.4 Employment

In 2015 there were 10,314 active business in Kildare, which comprises 4.1% of all active businesses in the country. The economic profile of the study area is similar to the county as a whole.

10.4.5 Connectivity

Newbridge train station is approximately 2 km to the north-west of the site, within 40 minutes walking distance. There are a number of bus services within 25 minutes walking distance from the site. The M7 motorway south of site provides access to the national motorway network.

10.4.6 Social Infrastructure

Given its position there are many social services within 2 km of the proposed development site. An infrastructure audit identified 120 social facilities including health centres, childcare, schools, emergency services, and amenity area

10.4.7 Receiving Environment: Human Health

Given the residential nature of the development the environmental factors that are considered relevant to human health are Major Accidents/Natural Disasters and impacts that either directly impinge on standards designed to protect health (Air Quality), or are indirectly associated with nuisance, which can induce stress (Noise).

10.4.8 Major Accidents/Natural Disasters

10.4.8.1 Major Accidents

The Seveso II Directive 96/82/EC is concerned with the prevention of major accidents that involve dangerous substances. There are two Seveso facilities in Kildare located in Collinstown Industrial Park in Leixlip and at Clonagh in Enfield respectively and both more than 5km from the proposed development.

10.4.8.2 Natural Disasters

The proposed development site is not in an area at risk of land instability. The majority of the site is at low risk of flooding; however there is an overland flood flow path through the site.

10.4.9 Air Quality

The air quality at and in the vicinity of the proposed development is good and contaminants with the potential to affect human health are below the relevant air quality standards.

10.4.10 Noise & Vibration

The main noise source audible at development site is from traffic on the surrounding road network,

10.5 Impacts

Large scale residential developments have the potential to impact both positively and negatively on population and human health.

10.5.1 Construction Stage

In the construction stage there is an economic benefit to local shops and businesses and construction material suppliers; however noise and air emissions from have the potential to result in localised, if temporary, nuisance.

10.5.2 Operational Stage

The provision of additional housing is positive in the context of the current national housing demand; however, depending on the location, an increase in local population can negatively affect local services

thereby impacting the existing population and the new residents. Additional traffic can contribute to a deterioration in local air quality, with consequent effect on human health, while traffic noise can be a source of persistent nuisance.

10.6 Baseline Scenario

At present there are no occupied private residences within the development boundary. If the development does not proceed there will be no local economic benefits, no contribution to meeting housing needs and no impacts on the local social infrastructure and services.

10.7 Prevention & Mitigation Measures

10.7.1 Design Stage

Amenity and Public Realm

The design stage took into consideration the need to provide high standard of amenity and a safe and secure public realm for the residents. The site layout includes 11.359 ha of public open space that will be accessible to all residents

Noise

The design stage took into consideration the need to minimise noise impact both on existing residents in the vicinity of the development and future occupants.

Daylight, Sunlight and Shadow Assessment.

The site layout and building positioning took into account the need to avoid interference with the amount of daylight and sunlight received by neighbours and future residents and to avoid overshadowing.

Flood Risk Assessment

The design stage involved the completion of a detailed flood risk assessment that identified the appropriate mitigation measures, which were then incorporated into the building design and the storm water management system to ensure that the development will not give rise to flooding inside, or outside the development boundary.

Social Infrastructure

The development includes the provision of a crèche and neighbourhood centre which will service the existing residential areas and those in the proposed development.

10.7.2 Construction Stage.

The Preliminary CEMP includes the mitigation measures to prevent and mitigate adverse impact on human beings.

10.8 Cumulative Impacts

The assessment of the impacts on air, water and noise took into account the cumulative effects of the permitted Murphy International and Barola developments and the delivery of the planned Newbridge South Relief Road and bridge crossing. It also took account of predicted increased in population in their assessment of the capacity of the existing social infrastructure.

10.9 Monitoring

Noise monitoring will be carried out in the construction stage at frequencies and locations to be agreed with Kildare County Council. The results will be submitted to the Council.

10.10 Residual Impacts

The development will have a temporary, slight, positive impact on the local economy during the construction stage. In the operational stage the local economy will also benefit from residents availing of local services.

The existing social infrastructure is capable of serving the existing population and potential demand generated by the proposed development.

Currently the air quality in the vicinity of the site is good. The assessment of the impacts on air quality (Chapter 9) concluded that the proposed development will not present any public health risk.

The noise and vibration assessment (Chapter 11) concludes that the development will have a slight, adverse, temporary impact in the construction stage, with an imperceptible impact on the local population and human health in the operational stage.

11. POPULATION & HUMAN HEALTH: NOISE & VIBRATION

11.1 Introduction

This Chapter examines the impacts of noise and vibration from the proposed development population and human health. It describes the impacts associated with the proposed development and the prevention and mitigation measures included in the development design and those that will be implemented in the construction stages and when the development is occupied to reduce the significance of the impacts. It also assesses a baseline scenario, need for monitoring measures and discusses the cumulative effects and concludes on the residual impacts.

The assessment was completed by Mr Damian Brosnan of Damian Brosnan Acoustics MSc (Acoustics) who has over 20 years of noise & vibration assessments.

11.2 Methodology

Potential noise & vibration impacts fall into the following categories:

- Construction stage noise effects on surrounding receptors.
- Construction stage vibration effects on surrounding receptors.
- Operational stage noise effects on surrounding receptors.
- Operational stage vibration effects on surrounding receptors
  .
- Noise effects within the completed development from external sources ('inward impacts').

A preliminary scoping exercise identified that the proposed development will not give rise to any vibration impacts in the operational stage and therefore there was no need to address this category.

A noise survey was carried out to establish the ambient noise levels and to identify appropriate construction phase noise assessment criteria. The construction plant and equipment were identified, and their noise emissions data used to predict likely noise levels at surrounding receptors. The predicted levels were assessed against established criteria, and mitigation measures were identified. Potential sources of vibration during the construction phase were identified and impacts assessed by reference to commonly applied criteria. The relevant guidance documents were

- British Standard Code Of Practice For Noise And Vibration Control On Construction And Open Sites Part 1: Noise (2014).
- The Good Practice Guidance For The Treatment Of Noise During The Planning Of National Road Schemes (2014).
- ProPg Planning & Noise: Professional Practice Guidance On Planning & Noise – New Residential Development (2017),

- British Standard :Methods for Rating And Assessing Industrial And Commercial Sound (2014)

- World Health Organisation (WHO) Environmental Noise Guidelines for The European Region (2018)

- The Third Noise Action Plan 2019-2023 (Kildare County Council, 2019)

11.3 Receiving Environment

The local landscape is semi-urban in character, although quickly becomes entirely urban to the north and west. To the south and east, the landscape is rural. The northeast corner of the proposed development site adjoins Wellesley Manor housing estate. A large residential development (Ardstone) is being constructed on lands to the southwest. There are a number of industrial facilities to the northeast, including Pfizer and Dr. Pepper. The Murphy International facility is to the east of the site and a large warehouse distribution centre will be built on a site to the northeast.

The main roads in the area are regional route R445, 770 m to the north at its closest, Great Connell Road which forms the eastern boundary, Athgarvan Road which runs to the west across the river, and the M7 motorway 1100 m to the south. The proposed Newbridge South Orbital Road will run through the proposed development site when complete, connecting the R445 to Athgarvan Road, and onwards to Green Road.

A baseline noise assessment was completed on 27th October 2021 at three on-site monitoring locations. The main noise source audible at all three stations was traffic on the surrounding road network, which was continuously audible at all times in the background throughout daytime, evening and night-time periods. Distant M7 traffic was audible in the night-time. Other significant noise sources were birdsong and aircraft.

For noise and vibration assessments residential dwellings are considered to be sensitive receptors. The nearest receptors to the proposed development site are:

- Wellesley Manor outside the northeast corner, and detached dwellings on the other side of Great Connell Road.

- Residential estates along Athgarvan Road to the west, particularly a small estate close to the river.

- Ardstone residential development under construction to the immediate southwest of the site.

11.4 Impacts

11.4.1 Construction Stage

During the construction phase the chief source of noise emissions will be the plant and equipment including excavators, dump trucks, teleporters, mobile cranes, mobile generators and dozers. Trucks

delivering construction materials will also be sources. Noise emissions will vary considerably due to the size of the site, duration of the construction phases, the use of different type of equipment and progressive screening by the new built units. Construction noise levels at all sensitive receptors will be lower than the relevant noise criterion (65dBA). No vibration impacts will arise.

Potential sources of vibration include delivery truck movements, equipment movements, groundwork and rollers used for compaction. Piling and rock breaking are not required. Given the type of development, where the plant machinery is likely to be small to mid-sized, similar to those used in urban construction projects, vibration impacts will not be significant.

11.4.2 Operational Stage

Noise sources in the operational stage will vary. Across most of the site, emissions will be typical of residential estates, such as playing children, lawnmowers, and cars. Delivery vans and waste collection trucks will also be sources. All such emissions are highly unlikely to be significant either on or off-site. On-site traffic speeds will be low, thus minimising tyre rolling noise.

At the neighbourhood centre external noise emissions may arise from air handling units such as fans, vents and air conditioning cassettes installed on external walls. Emissions from these are highly unlikely to be audible beyond 20 m, and therefore will not be significant. Noise emissions from vehicle movements associated with these units, including delivery and visitor traffic, will be minimal in the context of surrounding road traffic noise.

On the basis of the foregoing, it is highly unlikely that noise emissions from on-site operational noise sources will be audible beyond the site boundary. It follows that these sources will not be audible at receptors in the surrounding area.

11.5 Baseline Scenario

If the proposed development does not proceed, the local noise environment is likely to remain semi-urban in character, with the chief background noise sources being local and distant traffic. In the medium term, traffic noise levels are likely to increase across the study area due to continuing development across Newbridge, particularly at industrial areas to the east and northeast.

11.6 Prevention & Mitigation

11.6.1 Design Stage

The design stage took into consideration the need to minimise noise impact both on existing residents in the vicinity of the development and future occupants. The internal noise criteria will be met using a specified standard thermal glazing (minimum R_W value of 30 dB).

11.6.2 Construction Stage

- Although construction phase noise emissions will be short term, and will not exceed construction phase criteria, the following mitigation measures will be implanted

- Works will generally be confined to 8am to 6pm Monday to Friday and 8am to 4pm on Saturday

- Where plant has to operate between 7am and 8am at locations within 100m of sensitive receptors, standard 'beeper' reversing alarms will be replaced with flat spectrum alarms.

- Construction plant will be maintained in a satisfactory condition, with exhaust silencers fitted and functional.

- Queuing of trucks near off-site receptors will be prohibited and engine idling will be prohibited.

- Where generators or compressors are used within 100 m of sensitive receptors these will either be fitted with acoustic enclosures or screened by a local acoustic screen or soil stockpile.

11.6.3 Operational Stage

The completed residential development will not give rise to noise or vibration emissions at offsite receptors, and no mitigation requirements required. At the neighbourhood centre noise emissions may arise from extraction fans, vents and air conditioning cassettes; however these emissions are unlikely to be audible beyond 10m, and so highly unlikely to affect offsite receptors.

11.7 Monitoring

Noise monitoring will be carried out in the construction stage at frequencies and locations to be agreed with Kildare County Council. The results will be submitted to the Council.

11.8 Cumulative Effects

The only potential cumulative impacts that may arise relate to the construction phase, specifically the possible overlap of onsite construction with construction of the extension of the Newbridge Southern Relief Road and bridge, as well as the Ardstone development site to the southwest.

The most vulnerable receptors here are those at Wellesley Manor, and houses to the west. While some dwellings at the Ardstone development and the proposed development site may be completed and occupied, any construction noise affecting these receptors are likely to originate from local activity at their respective sites (i.e. ongoing construction of new phases).

The noise model took into consideration the construction of the road and bridge, which included piling. The predicated cumulative noise levels were lower than the relevant noise criterion (55dB). Cumulative impacts are therefore expected to be not significant to slight, adverse, and temporary.

11.9 Residual Impacts

11.9.1 Construction Stage

Impacts will range from not significant to slight adverse, will be localised to the nearest sensitive receptors and will be temporary. No vibration impacts will arise.

11.9.2 Operational Stage

Impacts will be neutral, imperceptible, no receptors affected and permanent.

12. LANDSCAPE & VISUAL IMPACT

12.1 Introduction

This Chapter assesses the landscape and visual impacts of the proposed development on the surrounding landscape. It examines and evaluates the impacts in terms of landscape character and visual alterations and identifies the proposed mitigation and monitoring measures to achieve the long-term integration of the proposed development in the surrounding landscape. The Chapter was prepared by The Big Space Landscape Architects

12.2 Methodology

The assessment followed the Guidelines for Landscape and Visual Impact Assessment (Landscape Institute & IEMA., UK 2013). It took into consideration the requirements of the Kildare County Development Plan and the Newbridge Local Area Plan; The Landscape Plan prepared by TBS, the Arboricultural Assessment completed by Arborist Associates Ltd and photomontages prepared by 3D Bureau. The site and the surrounding area was visited to establish the views of the area and the landscape character

12.3 Receiving Environment

The development site is east of Newbridge town centre. The land within and surrounding the site are gently undulating and largely composed of arable land, with mature hedgerows and trees along the field boundaries. The site is accessed off the Great Connell Road to the east, is bound to the north-east by Wellesley Manor and agricultural lands to the south and west The Ardstone residential development is being constructed to the south west across the River Liffey, which runs through the south west of the Aston site.

There are no *' Listed Views or Prospects*' as designated in the County Development Plan in or near the site, with the closest being views of the River Liffey from St. Conleth's Bridge at Main Street, Newbridge. There are no protected structures and monuments inside the site boundary and there are no Architectural Conservation Areas and no designated ecological site either within, or close to the site.

There are no tree preservation orders with the site boundary. The hedgerow at the south-eastern boundary is designated as a '*key hedgerow*' in the Newbridge LAP and it is an objective of the LAP that all such features be retained, where appropriate, and integrated into the design of new developments.

The site is visible from the public roads and spaces and residential areas in the immediate vicinity. Further away, views are restricted by the topography, the existing mature trees, woodland and hedgerows and the existing residential developments.

12.3.1 Landscape Character

The County Development Plan defines fifteen Landscape Character Areas based on morphology and identifies five classes of sensitivity (Class 1 Low Sensitivity to Class 5 Unique Sensitivity) based on an individual area's ability to accommodate developments.

The majority of the site is an area classified as 'Northern Lowlands', with the lands adjoining the River Liffey classified as 'River Valley'. The 'Northern Lowlands' have a generally flat terrain and open lands with regular field patterns. Hedgerows are generally well maintained and low, with scattered trees along the field boundaries that partially screen the lowest lying areas. Nevertheless, the generally low lying vegetation of the area allows long-distance and extensive visibility. The 'River Valley' class is characterised mostly by smooth terrain and low vegetation and has extensive open mountain views and localised river views.

The 'Northern Lowlands' is Class 1: Low Sensitivity. Low Sensitivity applies to areas with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area. The River Liffey, which flows thought the through the southwest of the site is Class 4 (Special Sensitivity). Such areas have a low capacity to accommodate uses without significant adverse effects on the appearance or character of the landscape having regard to special sensitivity factors.

The Arboricultural Assessment included all of the trees and hedge rows at the site and classed them based on quality (A High, B Moderate and C Low).

12.4 Impacts

12.4.1 Trees and Hedgerows

The development will result in the loss of one High, quality, nine Medium quality and twenty-six Low quality trees, along with seventeen Low quality trees from a tree line. The '*key hedgerow*' along the south-eastern boundary will be largely retained, except for openings for pedestrian and car access. Due to the necessary removal of a number of trees and hedgerows the overall impact of the proposed development will be slight and negative in the construction stage.

In the operational stage, taking into consideration the proposed planting measures, the proposed development will have a not significant to slight negative impact in the short term, reducing to slight and neutral impact in the long term.

12.4.2 Landscape Character

The proposed development will result in a change to the landscape character, most noticeable locally for example from the Great Connell Road. However, the proposed development is appropriate to its setting close to Newbridge town centre and other residential developments, such as Wellesley Manor and Ardstone.

In the construction stage the visual disturbance caused by the construction equipment, for example cranes, and temporary lighting may be perceived as a moderate and negative impact. However in the operational stage the planting measures will lessen the impact and the proposed development will have a slight and negative impact.

12.4.3 Views

General Impacts

In the Construction Stage the works, including site clearance, erection of hoarding, use of lighting and cranes and stockpiling of soils, have the potential to cause visual impacts; however these will be short term.

Impacts on Listed Views

There are no '*Listed Views or Prospects*' within or in close proximity to the subject site,

Impacts on Visibility into the Site

Eighteen viewpoints were selected to represent the likely visual impact from a variety of distances and direction around the site. Priority was given to views from main roads, public open spaces and from potentially sensitive locations such as adjacent residential areas. Computer generated photomontages of the construction and operational stage were compiled for each viewpoint.

Depending on the position the predicted impacts of the construction stage range from imperceptible and neutral to moderate and negative and all will be short term. Again, depending on position, in the operational stage, before the planting matures, the impacts will range from imperceptible and neutral to moderate and neutral. As the planting matures the impacts will change to slight and negative to not significant and negative.

12.5 Baseline Scenario

If development does not proceed the development site will continue in its current use, primarily agricultural. As the lands are zoned for 'residential development' it is likely that some form of development will take place on them in the near future.

12.6 Prevention & Mitigation

12.6.1 Design Stage

The following were taken into consideration at the design stage:

- Retention of as much of the existing vegetation as possible and where tree removal can't be avoided, replacement planting will take place.
- Integrating the development into the surrounding area, minimising landscape and visual impact in particular upon nearby residential developments.
- Provision of planting at the entrance and boundaries.
- Provision of amenity opportunities for the future residents and the public.

- Lighting of pedestrian walkways by high quality, modern standing fixtures using low level and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area.

12.6.2 Construction Stage

Careful attention will be paid to avoiding any potentially adverse construction related effects on the adjacent residences. Operating a well-managed, organised and planned construction site, with adequate control of construction traffic and working activity, is key to avoiding/minimising such impacts. In addition, any lighting required will be located sensitively to avoid unnecessary light spill into the surrounding residential areas.

12.7 Monitoring

Prior to site clearance works all of the trees and hedgerows that are to be retained and removed will be clearly identified and protection measures provided as required.

- During site excavations vegetation will be inspected to ensure it is adequately protected and that topsoil is being correctly stripped and stored.

- Regular inspections to ensure that landscape proposals are being implemented correctly

- In the operational stage periodic visits will be required to ensure that any defects that may occur are rectified, that the planting is establishing and being correctly maintained.

12.8 Cumulative Effects

There is a mix of residential and commercial developments in close proximity to the proposed development site, including:

- Wellesley Manor residential development, to the north
- Murphy Group complex, to the north-east
- Ardstone residential development (currently under construction), to the south-west

Cumulatively these developments, together with the proposed development, in the absence of any mitigation measures have the potential to have a slight-moderate and negative impact on the character and views of the landscape, due to the intensification of land use.

It is anticipated that once the landscaping mitigation measures that are part of the proposed development are implemented, the cumulative impact on the landscape and views from the surrounding areas will be reduced to slight and negative, and their visual impact will continue to lessen as the planting proposals establish and mature.

12.9 Residual Impacts

While it is inevitable that there will be some negative impact associated with the proposed development it is considered that the benefits outweigh the negative, resulting in the potential for slight and negative-neutral residual impacts.

13. ARCHAEOLOGY, ARCHITECTURE & CULTURAL HERITAGE

13.1 Introduction

This Chapter examines the impacts of the proposed development on archaeology, architecture and cultural heritage and the prevention and mitigation and monitoring measures that will be implemented in the construction stage to reduce the significance of the impacts. It also assesses a baseline scenario, discusses the cumulative effects and concludes on the residual impacts.

The assessment was completed by Martin E Byrne MA, Dip. EIA Mgmt., MIAI of Byrne Mullins & Associates Archaeological & Historical Heritage Consultants, who has over 30 years' experience in preparing Archaeological and Cultural Heritage Assessments

13.2 Methodology

The assessment was based a desk study review of the records and archaeological field testing. The desk study comprised a review of the Records of Monuments and Places published by the Department of Arts, Heritage & Gaeltacht, Topographical Files of the National Museum of Ireland; relevant documentary sources including previous field investigations in the vicinity and the Kildare County Development Plan (2017-2023).

The field testing was completed in March 2021 under licences issued by the Department of Department of Housing, Local Government & Heritage and included geophysical surveys; the excavation of twenty seven (27) test trenches and a wade survey of the proposed river crossing in July 2021.

13.3 Receiving Environment

13.3.1 Historical Background

The subject lands form parts of the townlands of Great Connell and Kilbelin, in civil parish of Great Connell and barony of Connell. The origin of the name Great Connell is unclear; the Irish form of the name Connail Mhór; be translated as the 'great pleasant area' or great area of [Corn] stalks or stubble; Kilbelin derives from *Coill Bhéalain* – 'Belin's Wood'. There are no significant historical events associated with the proposed development lands that have the potential to be impacted by the proposed development.

13.3.2 Archaeology

There is an existing commercial compound in the east of the site. In addition, a foul water sewer was installed through the northern half of the site in 2018/2019 and the site is crossed by a number of electrical overhead lines. At the time of the geophysical survey the site was largely covered in stubble following the cereal harvest in autumn 2020.

Archaeological heritage encompasses all the material remains of past societies that have the potential to enhance the understanding of such societies. It includes the remains of features such as settlements, burials, ships and boats and portable objects of all kinds and evidence of the environment in which those societies lived. The terms "site" or "monument" generally refer to fixed structures or areas of activity, as opposed to particular moveable objects.

There are no previously identified monuments located either in, or in the immediate environs of the development area. A review of historic Ordnance Survey maps and aerial photographs and the site walk over reconnaissance survey did not identify any surface traces of archaeological potential.

The development site is between 70 – 250m outside the northern extent of the Zone of Archaeological Potential/Notification established for Greatconnell Ecclesiastical and Secular Settlement Complex, which is associated with the Augustinian Friary of Great Connell and linked (secular) settlement and includes a number of individual monuments/features.

The geophysical survey identified impacts from recent land use in the form of abundant small and large-scale ferrous items, buried services and overhead power lines, former boundaries and cultivation, punctuated by weaker soil/geological variations to the east and west.

Anomalies were encountered across the entire site and buried archaeological remains were identified in the southern and south-eastern areas. These include the partial remains of a potentially large settlement, probably mediaeval in origin and characterised by a series interconnecting sub-rectangular enclosures, with a possible former road or trackway extending to the north-east. The remains extend for a distance of c.0.35km and represent the northern limit of areas of archaeological potential recorded by a geophysical survey in 2020 completed for a development to the south of the Aston site.

The proposed development area was subjected to a programme of Archaeological Testing (Licence No: 21E0106) to determine the archaeological nature and validity of the detected geophysical remains. A total of 17 test trenches were excavated at locations selected on the results of the geophysical survey, the topography and the proposed development layout.

Many of the geophysical anomalies were found to be geological, associated with natural variations in the subsoil, including iron-panning or modern disturbance or recent agricultural practices, such as ploughing and the burning of cereal stubble.

Evidence of a former land division (ditch) detected by the geophysical survey, proved to be a shallow ditch feature. The fill contained 19th century pottery and it's possible that this was associated with a former residential plot in the south-easternmost area of the site.

A possible ditch or road/trackway feature, detected by the geophysical survey, proved to be a former alluvial channel, the base of which was largely formed by clay marl in contrast to the immediate surrounding gravels and sands. Some possible narrow ditch or furrow features were revealed in the southern area, both filled with orange/red silty sand clay, possibly dumps of burnt material.

A series of three 'cut-features' were uncovered of probable medieval date, based on artefactual material recovered from the surface areas of the respective fills. They are in the south east of the site and appear to represent a series of pits rather than ditches.

A narrow (300mm) trench of red-clay, representing an un-fired brick-making clamp, was uncovered in the central northern area. The brick-clay was not very firm and there was no evidence for burning along the edges of the clamp or between the bricks; instead, these areas were filled with a dark grey/light black organic soils, possibly representing decayed/desiccated wood.

No other features of archaeological interest/potential were identified by the testing, which included areas where no geophysical anomalies were detected.

Wade surveys of the drainage ditches, using a batyscope/aquascope underwater viewer were undertaken in late July 2021 and nothing of archaeological or structural interest was noted; likewise a limited wade survey of the River Liffey was undertaken and nothing of interest was noted. Visual examinations undertaken of exposed soils along the edges of the streams and river did not reveal anything of archaeological, structural or historical interest.

13.3.3 Architecture & Cultural Heritage

There is one listed structure located within the subject study area, but outside the proposed development site boundary. This is the 'ruins of Great Connell Abbey and Medieval Carved Stone'. There are no structures of Architectural Heritage interest listed within the subject study area; likewise, there are no Garden Survey sites.

13.4 Impacts

The proposed development will have no impact on any feature associated with historical events or of listed architectural and cultural heritage

A number of subsurface features were identified including a series of three 'cut-features' (pits) of medieval date and evidence of nineteenth century or early twentieth century brick making. The overall extent of these features has not been determined, although based on the results of the archaeological testing and geophysics, they are likely to be small-scale in form and of very localised extent.

The subsurface features of archaeological interest/potential are located in areas where construction-works will be undertaken. This will require disturbance to, and/or removal of, the features. Furthermore, it is considered that there is low-moderate potential for further subsurface archaeological remains to be uncovered within the site, with increased potential for the recovery of additional archaeological artefacts, particularly pottery/ceramics.

13.5 Baseline Scenario

If the development does not proceed the site will remain in its current condition, with no changes to the potential impacts on the overall cultural heritage.

13.6 Prevention & Mitigation Measures

13.6.1 Construction Stage

Prior to the start of the construction works a suitably qualified and experienced archaeologist will be appointed to monitor all topsoil stripping and excavations on surface of the underlying subsoils.

The overall extents of the three 'cut-feature' together with the brick-making feature will be determined and undergo archaeological excavation (preservation by record).

If the additional subsurface features of archaeological interest are identified on-site works in the immediate area of such features will stop and the archaeologist will seek the advice of the National Monuments Service, Department of Housing, Local Government and Heritage to determine what additional action should be implemented.

Should additional archaeological/historical artefactual material be recovered during these further work works, the archaeologist will ensure that the requirements of the National Museum of Ireland with regard to such items should be implemented.

Following the completion of the archaeological excavation and monitoring, and any other possible archaeological interventions/investigations, the archaeologist will prepare a full and final report for submission to the Planning Authority, the Department of Housing, Local Government and Housing and the National Museum of Ireland.

13.7 Monitoring

The monitoring described in Section 13.6.1 will be implemented.

13.8 Cumulative Effects

The cumulative impact of the proposed development, together with the proposals for an extension of the Newbridge Southern Relief Road and associated bridge crossing of the Liffey, as well as other existing and/or approved developments in the area was assessed by taking into account the existing baseline environment and the predicted impacts of this and other approved developments in the area. It is not envisaged that any negative cumulative effects will occur with respect to Cultural Heritage assets as a result of the proposed development.

13.9 Residual Impact

The overall impact of the proposed development on archaeological monuments will be neutral and of imperceptible significance.

Subject to the adoption and implementation of the mitigation measures set-out above the negative impacts on archaeology will negated, resulting in a positive value to the archaeological heritage record, particularly in terms of wider area of Newbridge, as well as a positive, significant impact of overall indirect effect.

In terms of the overall Cultural Heritage of the wider Newbridge area the residual impact relate to the subsurface archaeological features within the site, which will be subject to a process of ‘preservation by record’, adding a significant value to the archaeological heritage record of the area.

14. MATERIAL ASSETS: SITE SERVICES

14.1 Introduction

This Chapter describes the material assets on and in the environs of the site. It identifies the potential impacts, describes the proposed prevention and mitigation and monitoring measures. It assesses the impacts, including residual impacts. It also addresses a 'baseline' scenario.

This Chapter describes the site services in the vicinity of the proposed development and assesses the impacts of the proposed development. The assessment considered a 'baseline' scenario and identifies the prevention and mitigation and monitoring measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. The Chapter was prepared Jim O'Callaghan BA (Mod) MSc of O' Callaghan Moran & Associates.

14.2 Methodology

The assessment was based on the Planning Engineering Services Report and the ESB Infrastructure Report.

14.3 Receiving Environment

14.3.1 Site Location

The site is on the eastern outskirts of Newbridge, approximately 1km from the Town Centre. To the south and south-east are agricultural lands and to the east, across the Great Connell Road, are the Murphy Ireland Ltd offices and compound. Wellesley Manor housing estate is to the north east and the Ardstone residential development is being constructed on lands west of the River Liffey.

14.3.2 Services

There is a water main along the Great Connell Road to the east of the site. A storm water sewer serving Wellesley Manor runs from north-east to south-west along the north-eastern boundary and discharges into a tributary stream of the Liffey.

A foul sewer serving Wellesley Manor flows north to south through the centre of the proposed development site. A second foul sewer, installed as part of the upgrade of the Upper Liffey Valley Sewerage Scheme, runs from north-east to south-west across the site.

There is an overhead electricity line crossing the site which drops to underground for a section of its run. There is no waste management infrastructure at the existing site.

14.4 Impacts

14.4.1 Construction Stage

A pumped foul water drainage system will be installed and will connect to the Upper Liffey Valley Sewerage Scheme.

A surface water flow attenuation will be installed that will discharge at four outlets to the drainage ditch and two on the Liffey. The overhead power lines will be diverted. A connection will be made to the national electricity grid, which will require the provision of new electricity substations. A connection will be made to the mains water supply.

There construction works will result in the consumption of natural resources and construction and demolition waste will be generated.

14.4.2 Operational Stage

In the operational stage approximately 280,355 litres of sanitary wastewater will discharge daily to the Upper Liffey Valley Sewerage Scheme sewer which connects to the Irish Water Wastewater Treatment Plant in Osberstown. Approximately 254,868 litres of water will be obtained from the Irish Water mains supply. Electricity will be obtained from the national grid and the estimated demand is 3 megawatts. The PV solar panels on the individual units will also provide electricity and heat pumps will contribute to meeting heating needs

Household and commercial wastes will be generated at the residential units and the neighbourhood centre & crèche respectively. .The household wastes will be collected by authorised waste collectors that provide a four bin (food waste; dry recyclables; glass and residual non-recoverable/recyclables) service. The waste from the neighbourhood centre and crèche will be collected by a commercial waste contractor, who also provides a source separated collection service.

14.5 Baseline Scenario

If the proposed development does not proceed there will be no new connections to the mains water, foul water system and electrical networks and consequently no additional demand on these services. Wastes will not be generated and there will be no demand on the existing waste management service providers and infrastructure.

14.6 Prevention & Mitigation Measures

14.6.1 Design Stage

The design stage included engagement with the ESB and Irish Water in relation to electricity supply, water supply and wastewater treatment, which established that the existing infrastructure has the capacity to accommodate the proposed development.

Water conservation is primarily a behavioural issue with limited scope to ‘design in’ conservation measures. However to reduce the demand dual flush toilets and rain water harvesting will be provided in the units. The surface water drainage system includes a comprehensive range of measured to limit run-off to the river to pre-development levels.

All of the apartments and houses will be designed to ensure that the energy performance of the building limit the amount of energy required for habitable use and all will have a Building Energy Rating of A2.

The measures to minimise waste generation and resource consumption in the construction stage will be identified in the Detailed Resource & Waste Management Plan that will be prepared at the detailed design stage of the proposed development.

Own door apartments and terrace housing will have appropriate storage locations for refuse bins and each apartment block will be provided with suitably screened areas where materials can be sorted and stored prior to collection for recycling).

14.6.2 Construction Stage

The connection to the electricity grid will be managed by ESB Networks, which should limit any disruption and ensure that residents/ businesses in the affected areas receive advance notice of the planned disruptions.

14.6.3 Operational Stage

In the operational stage responsibility for water and energy consumption and waste management will rest with the individual occupants of the housing units, the neighbourhood centre and the crèche. All occupants will be provided with sufficient information about the building, the fixed services, controls and their maintenance requirements to facilitate the use of the building to use no more fuel and energy than is reasonably required

14.7 Monitoring

Monitoring is not required in the construction stage. In the operational stage energy and water usage will be monitored at the individual units and the foul water pumping station will be regularly inspected.

14.8 Residual Impacts

The proposed development will result in an increased demand on the Irish Water mains water supply and foul water treatment systems and on the electricity supply. In relation to waste generation, while this will increase locally there will not be a significant addition at a national level, as the majority of the future occupants are already living in Ireland.

15. TRAFFIC & TRANSPORT

15.1 Introduction

This chapter describes the existing road network and traffic conditions and the impacts of the proposed development, including a 'baseline' scenario. It identifies the prevention and mitigation measures that will be implemented to reduce the significance of the impacts and assesses the residual impacts. The Chapter was completed by Ms Julie Tiernan B.Eng., CEng.

15.2 Methodology

The assessment was completed in accordance with Transport Infrastructure Irelands' Traffic and Transport Assessment Guidelines (May 2014), while information from the Newbridge Local Area Plan (2013-2019) and the Kildare County Council Development Plan (2017- 2023) was used to describe the development location and its local context in relation to transportation objectives. Traffic count surveys were carried out on approach junctions on 10th November 2021 a time when schools were fully open and the government was not advising work from home during the Covid-19 pandemic.

15.3 Receiving Environment

The proposed development site is located to the east of Newbridge town centre on the eastern side of the River Liffey. The R416 Athgarvan Road to the west is a Regional Road linking Newbridge and Athgarvan. It is a single lane two-way carriageway with footpaths on both side of the carriageway mainly along developed areas. There are no cycle lanes.

The Great Connell Road is a Local Primary Road linking the R445 with the L2032. It is a single lane two-way carriageway with a footpath generally on the western side of the road between the R445 junction and the Great Connell Roundabout. The roundabout provides access to the residential development on the western side of the Great Connell Road, the Murphy International offices and compounds and the Dr. Pepper beverage manufacturing plant.

15.4 Impacts

15.4.1 Construction Stage

Access to the site will be via the existing Great Connell Roundabout and the Newbridge Southern Relief Road, thereby avoiding travelling through Newbridge Town Centre and the residential area of Great Connell. Traffic to and from the development site will comprise construction staff private vehicles and materials delivery vehicles, including articulated and rigid body trucks and ready-mix concrete trucks. Vehicles used inside the site will include excavators, dump trucks and cherry pickers.

The traffic volume associated with the construction phase site is not considered to be excessive and will be spread out over the duration of the construction stage. Staff will generally arrive before 8am and leave after 5pm thereby avoiding the morning and evening peak hour traffic. Many of the staff will arrive in shared vehicles. Given the scale of the development it is likely that between 40-50 construction workers will be on site at any time.

Deliveries will be spread evenly throughout the course of the day to reduce the impact during peak traffic periods. It is anticipated that 10-50 heavy goods vehicles will access the site per day during the busiest period of construction.

15.4.2 Impacts Operational Stage

As the proposed development is primarily residential, peak traffic flows in the vicinity of the site will typically occur on weekdays in the morning between 7am and 9pm and in the evening between 4 and 6pm.

The traffic volumes associated with proposed development were calculated using the Trip Rate Information Computer System based on the trip rates approved by Kildare County Council for the Ardstone development. This estimated that in the morning peak 123 vehicles will arrive and 184 depart and in the evening peak 181 will arrive and 142 depart.

The travel direction was based on flows observed in the November 2021 surveys. Following the completion of the Newbridge Southern Relief Road traffic on the local network will be redistributed due to the new link between the Athgarvan Road and the Naas Road (R445) and the connection with the Great Connell Road, all of which will provide an alternative route using the Liffey Bridge in Newbridge Town Centre.

Scoping discussions with Kildare County Council Roads Department identified the need to assess the following junctions, as shown on Figure 15.1:

1. Great Connell Roundabout

2. Lidl Distributor Roundabout

3. The Hall/R416 Athgarvan Road/New Newbridge Southern Relief Road (East) Signalised Junction.

4. St. Conleth's Bridge Signalised Junction

5. Buckley's Cross (Roundabout/Signalised Solutions)

Traffic surveys established that the morning peak hour traffic flow at the junctions occur between 8 and 9 am, with the evening peak between 5 and 6pm.

The following scenarios were agreed with the Council.

A. No section of the Newbridge Southern Relief Road open – current day scenario

B. Only Ballyfarm Road section of the Newbridge Southern Relief Road open

C. Newbridge Southern Relief Road fully complete

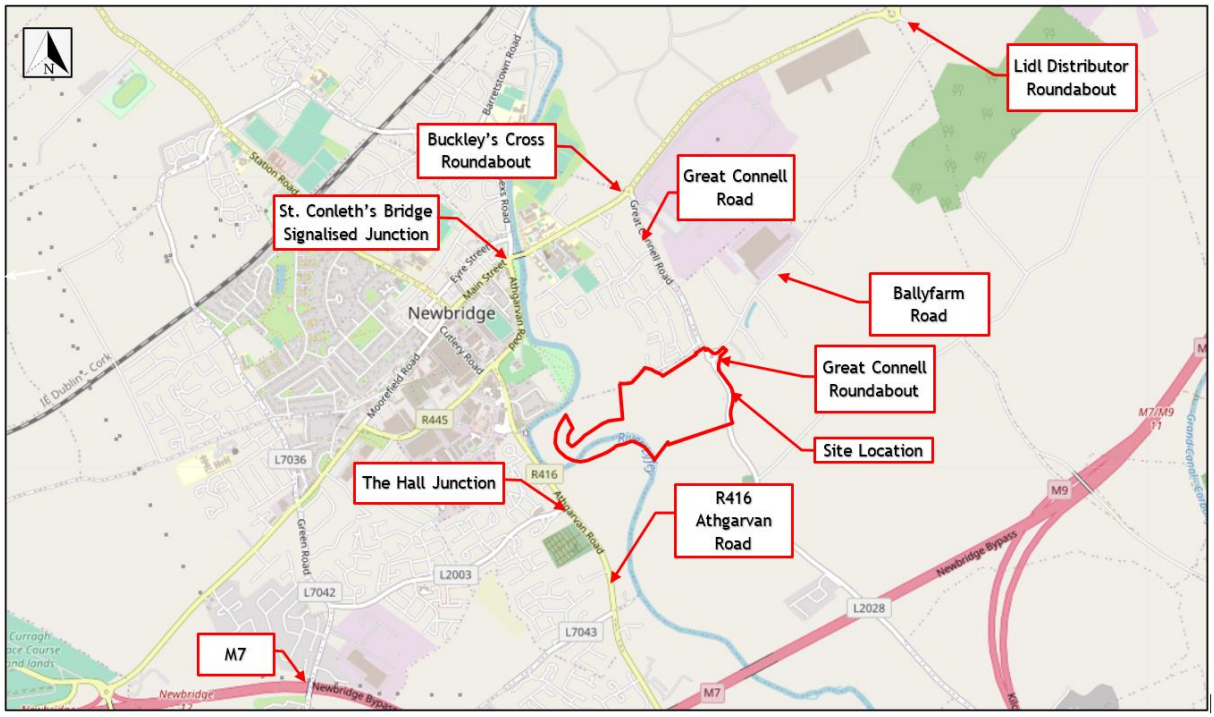

Figure 15.1 Local Roads and Junctions

The following were analysed at all of the specified junctions for each of the above scenarios:

1. Opening year: 2024

2. Design year: opening year + 5 years: 2029

3. Design year: opening year + 15 years: 2039

The analysis involved examining the predicted traffic on the local road network both 'with' and 'without' the proposed development in place. The morning and evening peak periods were examined to assess the busiest case in terms of the local traffic and traffic generated by the proposed development.

The Ratio of Flow to Capacity (RFC) describes the capacity of each approach to a junction. An RFC below 0.85 (85%) implies that an approach road is operating satisfactorily well within capacity (0.90 for signalised junctions), between 0.85 to 1.0 RFC means the approach operates well within capacity but at less optimal efficiency; an RFC above 1.0 is deemed to be above capacity.

Great Connell Roundabout is within the design threshold of RFC<85% in all scenarios. The opening of the Newbridge Southern Relief Road moves traffic onto the roundabout, which has capacity to receive it. By 2039 the junction will be operating within the design threshold during both the morning and evening peak hours for all scenarios. Kildare County Council have requested the Great Connell Roundabout be signalised for safety reasons rather than capacity reasons and this upgrade forms part of the proposed development

The Lidl Distributor Roundabout was constructed in 2020 in accordance with current design standards. The junction is well within the design threshold of RFC<85% in all of the scenarios. The relative impact of the proposed development is also improved with the opening of the Newbridge Southern Relief Road.

The Hall Signalised Junction operates under a control system that reacts to traffic as it approaches the junction. The opening of the Ballyfarm Road section of the Newbridge Southern Relief Road has no impact on the existing signalised junction capacity. The opening of the Bridge section of the Newbridge Southern Relief Road moves traffic onto this signalised junction due to traffic rerouting.

St Conleth's Bridge Signalised Junction also operates under a system that reacts to traffic as it approaches the junction. The junction is already operating above its design capacity in the morning and evening peak hours. The opening of the Ballyfarm Road section of the Newbridge Southern Relief Road has no impact on the junction.

The opening of the bridge section of the Newbridge Southern Relief Road significantly improves the situation meaning it would not reach the current level by 2039, even with the full proposed development traffic added. The relative impact of the proposed development on the existing junction is also improved with the full opening of the Newbridge Southern Relief Road.

Buckley's Cross Roundabout is above design capacity (>85%RFC) in the current scenario without any development is place. The opening of Ballyfarm Road improves the existing scenario however in the morning peak it is still above the design threshold

When the full Newbridge Southern Relief Road is open, the capacity of Buckley's Cross Roundabout will be significantly improved and will be below the design threshold evening peak up to 2039 and approximately 2027 in the morning peak.

15.5 Baseline Scenario

If the proposed development does not proceed there will be no additional traffic in the locality and no impacts of the local road network and junctions.

15.6 Prevention &Mitigation

15.6.1 Design Stage

The measures include:

- Signalising of Great Connell Roundabout for safety and not capacity reasons.
- Provision of future suitable pedestrian and cyclist links, including access to Wellesley Manor and the private Ballyfarm Road at the Great Connell Road Roundabout.
- A traffic-calmed strategy including the provision of designated turning areas for visitors/deliveries/drop offs and on and off-street parking. Occupants of the houses will mainly have off street parking, with apartment residents using on-street parking.
- A speed limit 30km/hour that will be achieved by the use of short lengths of straight road, tight turning corners and change of surface materials.
- Light emitting diode (LED) luminaires will be positioned to ensure a uniform lighting spread is achieved and dark corners are avoided.

- A signalised Toucan Pedestrian/Cyclist crossing point will be provided on the section of the Newbridge Southern Relief Road passing through the development.

- Bus Stops will be provided on either side of the Newbridge Southern Relief Road.

- The corners of the main access roads off the Newbridge Southern Relief Road will be 4.5m to allow for larger vehicle access. The corners of "local streets" within the development will be 3m.

- The road widths will range from 5.5m on the local streets, to 6m on the main access roads and 6.5m along the Newbridge Southern Relief Road to facilitate two-way traffic and the turning requirements of fire tender and waste collection vehicles.

- The visibility on the local streets and the Newbridge Southern Relief Road will be based on a 30 kilometres per hour (kph) 50 kph speed limits respectively.

- The parking spaces for the houses and apartments meet the minimum requirements of the Kildare County Council Development Plan.

15.6.2 Construction Stage

The Construction Environmental Management Plan will include a Traffic Management Plan and the scope will be agreed in advance with Kildare County Council. The objective of the plan is to minimise traffic disruption in the vicinity of the site and ensure the safety of both residents and construction staff.

15.7 Monitoring

Monitoring is not required in either the construction, or the operational stages.

15.8 Cumulative Effects

The assessment of the traffic impacts linked to the proposed development took into consideration the cumulative effects of the existing traffic, the Ardstone development across the River Liffey, the construction of the Newbridge Southern Relief Roads and future predicted traffic growth rates.

15.9 Residual Impacts

The Great Connell Roundabout and Lidl Distributor Roundabout are large enough to cater for the proposed development traffic up to 2039 and are well within the design threshold of RFC<85% for all of the scenarios considered.

While the capacity of Buckley's Cross Roundabout will be above the design standards at completion of Phase 1 when the Ballyfarm Road is in use the level of congestion will be similar to that expected in urban areas. The opening of the proposed bridge section of the Newbridge Southern Relief Road will further improve the capacity of the roundabout.

Aston Ltd is progressing a separate planning application for a bridge over the Liffey which will speed up delivery of the full Newbridge Southern Replier Road. Kildare County Council are actively seeking funding for the bridge construction, and it is reasonable to assume that the bridge could be open by 2029.

An alternative signalised junction design of Buckley's Cross has been prepared that improves capacity for all scenarios if the bridge cannot be progressed. The works will be completed by Kildare County Council.

16. INTERACTION OF THE FOREGOING

Previous Chapters describe the impacts associated with the proposed development and the prevention and mitigation measures that will be implemented. This Chapter discusses the significance of the actual and potential direct, indirect and cumulative effects of the changes due to interaction between relevant receptor. It is based on the physical and environmental conditions of the proposed development site and the predicted impacts of the development.

16.1 Population & Health/Air/Traffic

The development has the potential to impact on human beings from, air quality (including vehicle exhaust gases) and noise. The proposed construction methodology, building design and site layout have taken these into account, effective mitigation measures identified and incorporated into the design, construction and operational stages and the residual impacts assessed.

16.2 Water & Biodiversity

In the construction stage there is the potential for run-off from the site to impact on water quality in the drainage ditch and the River Liffey with consequent impacts on Biodiversity. The proposed construction methodology and the design of the surface water drainage system have taken these into consideration, effective mitigation measures identified and incorporated into the design and construction stages, and the residual impacts assessed.

16.3 Climate & Water

The effects of Climate Change were factored into the design of the surface water drainage system and the site specific flood risk assessment. Appropriate mitigation measures were identified, incorporated into the development design and the residual impacts assessed.

16.4 Climate/Traffic/Material Assets

The development will impact on Climate as a result of increased greenhouse gas emissions from traffic and the raw materials consumption in the construction stage and the energy consumption in the operational stage. The cumulative impacts of these interactions were assessed and mitigation measures to minimise impacts were incorporated into the development design.

16.5 Land & Geology/Biodiversity

The land take, involving the long-term loss of arable land, will reduce the habitat and impact on the use of the site by Bat, Otter, Other Mammals and Birds. The impacts were taken into consideration and appropriate mitigation measures identified.