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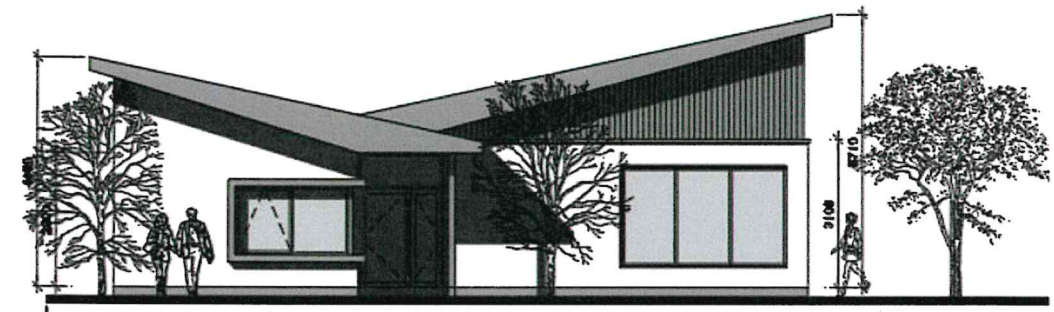
Site Flood Risk Assessment

for

Proposed Athy Welfare Facility,
Gallow Hill,
Athy,
Co. Kildare.



CLARKE & COMPANY – ATHY WELFARE FACILITY – FLOOD RISK ASSESSMENT

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Approved: Ronan Clarke Title: Chartered Engineer	Date: March 2020

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Contents

Notes

1. Introduction

This Flood Risk Assessment was prepared in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' issued by the Department of Environment, Heritage and Local Government in November 2009. Flood Risk from fluvial, surface water and groundwater sources has been assessed based on existing available information.

This assessment will evaluate that risk and outline any mitigation measures that may be required.

1.1 Scope

This assessment considers the following:

- The Department of Environment, Heritage and Local Government guideline document to Planning Authorities in relation to Flood Risk Management.
- Risk of flooding to the proposed commercial development from flood flow from neighbouring watercourses.
- Risk of flooding due to direct rainfall.
- Risk of flooding from groundwater.
- Impact of presence of the Commercial Development on the existing flood risk regime at its proposed site.
  The impacts addressed under this heading comprise:
    - The impact of surface water runoff from the sites on the flow regimes in neighbouring watercourses.
    - Loss of floodplain.
- Review of data on recorded historic floods.

2. Planning Guidelines

In November 2009 the Department of Environment, Heritage and Local Government issued a guideline document to Planning Authorities in relation to Flood Risk Management.

These Guidelines set out the policy on development and flood risk in Ireland and provide a framework for the integration of flood risk assessment into the planning process. The objective is to ensure that flood risk is taken into account at all stages in the planning process and as a result to:

- Avoid inappropriate development in areas at risk of flooding,
- Avoid new developments increasing flood risk elsewhere
- Ensure effective management of residual risks for development permitted in floodplains

The guidelines set out a staged approach for the consideration of flood risk in relation to developments as follows:

Stage 1: Flood risk identification – to identify whether there may be any flooding or surface water management issues related to either the area of regional planning guidelines, development plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower level plan or planning application levels;

Stage 2: Initial flood risk assessment – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped; and

Stage 3: Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

This assessment is undertaken where stage 1 and stage 2 indicate that a proposed area of possible zoning or development may be subject to a significant flood risk.

The guidelines classify developments into three vulnerability classes based on the effects of flooding

(i) Highly vulnerable development,

(ii) Less vulnerable development and

(iii) Water Compatible development.

This development which is non essential infrastructure is classed as a less vulnerable development.

The Guidelines classify Land areas within three flood zones based on the probability of flooding. Flood zones are defines in the Guidelines:

- Zone A is at highest risk. In any one year, Zone A has a 1 100 year (1%) chance of flooding from rivers and a 1 in 200 year (1%) chance of flooding from the sea.
- Zone B is at moderate risk. The outer limit of Zone B is defined by the 1 in 1,000 year (or 0.01%) flood from rivers and the sea.
- Zone C is at low risk. In any one year, Zone C has less than 1 in 1,000 year (<0.01%) chance of flooding from rivers, estuaries or the sea.

In the identification of flood zones, no account is taken of any flood relief walls or embankments.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 1: Matrix of Vulnerability versus zone to illustrate appropriate development and that required to meet the Justification Test (reproduced from Table 3.2 of Ref 1)

Table 1, which is reproduced from the guideline document to Planning Authorities in relation to Flood Risk Management states that other than essential infrastructure this development can be located within Flood Zone B. Section 5 of this Flood Risk Assessment document, will consider the Flood Zone assignment for the proposed site.

Table 1 refers to the use of a Justification Test under certain circumstances. In cases where there are insufficient sites available to locate a development in the appropriate low flood risk zone, the guideline documents allow for consideration of the sites within the light of proper planning and sustainable development objectives, this is not the case with the site in question.

This report considers the Flood Risk of the proposed Development in relation to Stages 1 and 2 of the staged approach outlined above.

3. Site Description

The site for the Athy Welfare Facility is located to the East of Athy Town and forms part of an existing Kildare County Council Depot (**ref Fig 1**). The development site is 0.14ha and the overall site is 2.56ha (hatched Green) and is fully serviced with foul sewer outfall to public mains and surface water discharging to the ground.

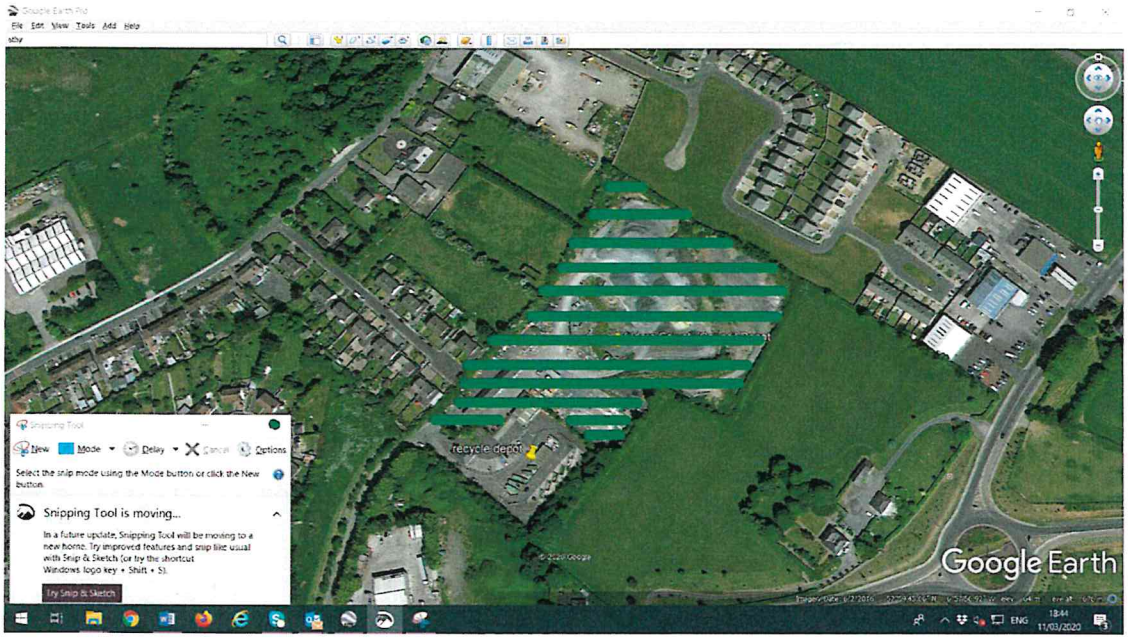


Figure 1

There are no drainage ditches or water courses in the area of site.

When proposed development is completed its access will be off the existing road networks. The boundary of the existing and proposed development will remain unchanged. The proposed development layout is shown in black in (**fig 2**).

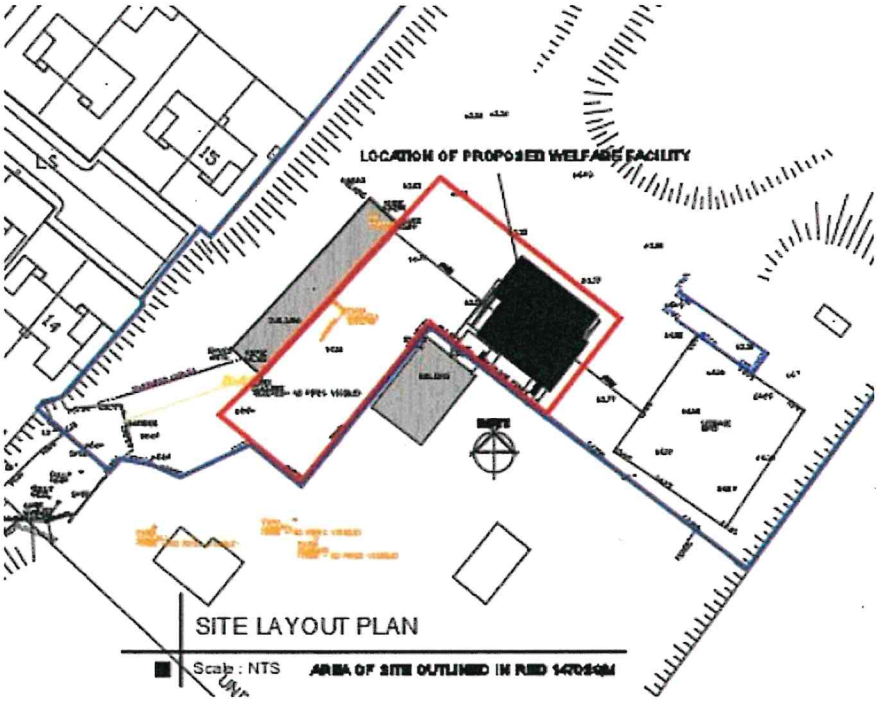


Figure 2

4. Methodology

This flood risk assessment will utilise the source – pathway – receptor (S-P-R) model to assess and inform the management of risk. An initial assessment will examine the overall flood risk relating to the proposal. This will use existing data / studies. Mitigation will then be identified.

5. Flooding Risk

Flood risk to the site is considered in relation to the following criteria:

- Fluvial Risk: Inundation from flow from neighbouring watercourses
- Pluvial Risk: Flooding due to direct rainfall
- History of Flooding
- Available Predictive Flood Risk Mapping
- Impact of presence of the Development on the existing flood risk regime at its proposed site.

5.1 Fluvial Flood Risk

5.1.1 Description of Site

The site is located to the east of Athy Town, Co. Kildare. Topographically, the development area falls from Dublin road in a westerly direction at an elevation of approximately 64.35m AOD. on Dublin Road side to 62.63m AOD. at existing Depot Building.

There are no land drains on the development site. The site is accessed from Dublin Road.

5.1.2 Flood Risk Identification

The initial flood risk assessment utilised a number of information sources to assess flood risk of the proposed site. They were:

(a) OPW Flood Mapping
(b) Ground Level Contour Survey
(c) Kildare Council Development Plan Strategic Flood Risk Assessment

(a) OPW Flood Mapping

The OPW Flood Mapping website provides information about the location of known flood risk events. A map report generated by the website indicates that there are no flood events specific (**fig 3**). to the site (indicated in green) in question. Details of these are shown below:-

(**figure 3**).

(b) Ground Level Contour Survey

A ground level contour survey of the site was undertaken and is shown in **figure 4**.

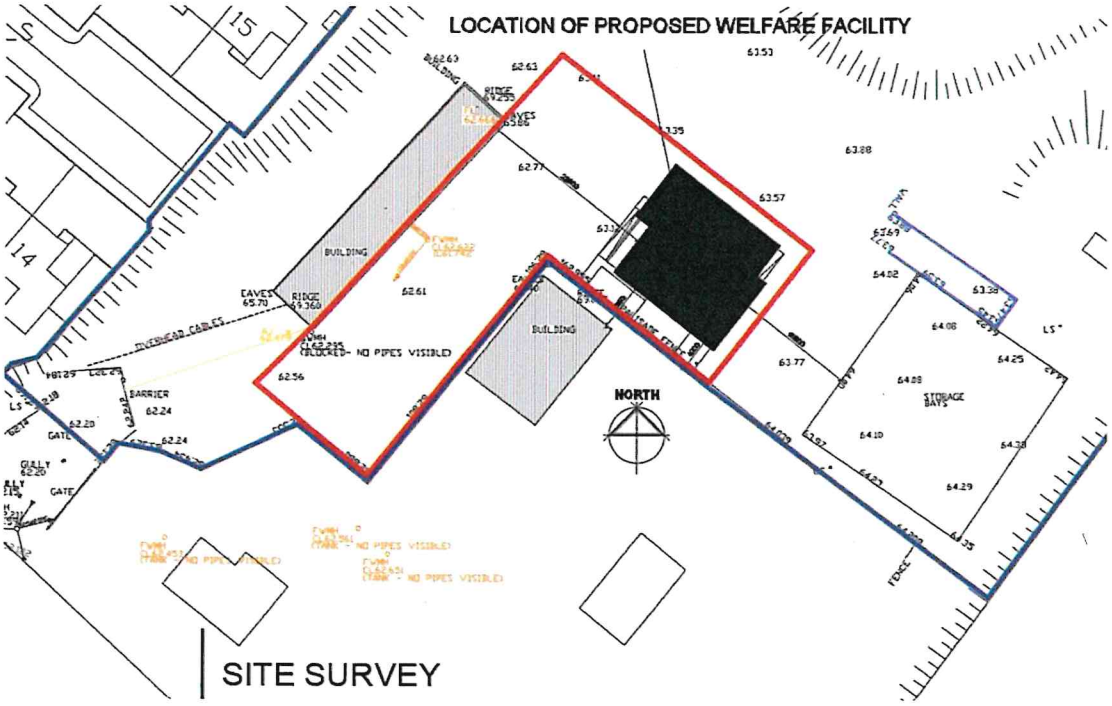


Figure 4

This site topography indicates the ground level is 62.77m AOD. The proposed Ground floor level is 63.70m OD. The site slopes away in a westerly direction (towards Shamrock Drive) indicating that floor level is well in excess of any possible flood plain.

Mitigation: There is minimal risk of Fluvial flooding therefore no mitigation measures required.

(c) Kildare County Council Strategic Flood Risk Assessment of the Development Plan 2017 - 2023

Kildare County Development Plan 2017-2023 incorporates the area formerly within the administration areas of Athy Town Council.

The site is zoned: Public Utilities which is appropriate to the proposed development.

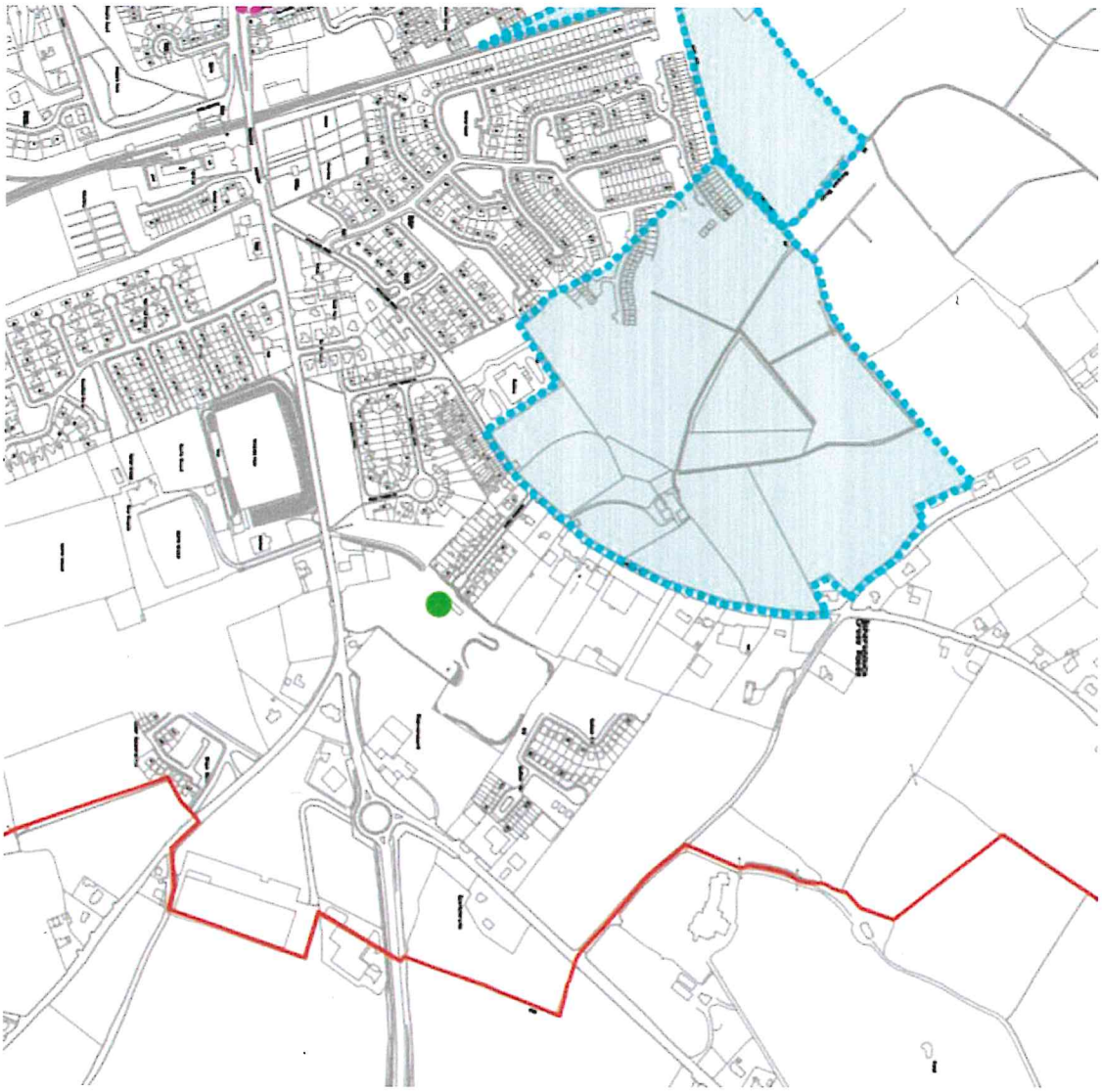
Kildare County Council has prepared a Draft Athy Local Area Plan 2019 - 2025 in accordance with the requirements and provisions of the Planning and Development Act 2000, (as amended) (the 'Act'). KCC commissioned RPS to carry out a Strategic Flood Risk Assessment (SFRA) to support the preparation of the LAP. The SFRA for the County examined flood risk in the Town Environs, Towns, villages and Settlements. The Larger towns such as Athy is subject to its own Local Area Plan and SFRA which was prepared by Killgallon & Partners, Athy Town Development plan 2012 -2018.

The SFRA is prepared in accordance with the requirements of The Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The SFRA therefore informs policy regarding inappropriate development in areas at risk of flooding and identifies areas where Site Specific Flood Risk Assessments (SSFRAs) should be undertaken for development.

The site is located in an area where there is no history of flooding (**fig 5 & fig 6**). and the land vulnerability is negligible..

(**figure 5**).

Figure 5 Indicates a red continuous line as 100 year flood line and green continuous line as 1000 year flood line in the vicinity of the subject site, indicated as a green dot.



(**figure 6**).

Figure 6 indicates the town boundary as a red continuous line. The blue is a area that requires additional flood risk assessment and/or Justification Testing in the vicinity of the subject site which is indicated as a green dot.

Mitigation: There is minimal risk of Fluvial flooding therefore no Mitigation measures required.

5.1.3 Groundwater Flood Risk

Ground water can sometimes present a risk of flooding due to the fact that high ground water levels can prevent surface water from infiltrating below ground level during extreme rainfall events. This can result in site flooding in the form of ponding.

Data from the site investigation carried out in 2007 has been used to determine groundwater levels.

The trial pit records indicated that the site is underlain by stiff brown slightly sandy gravelly silty clay with cobbles.

Groundwater was not encountered in the trial hole.

Mitigation: There is minimal risk of Fluvial flooding therefore no mitigation measures required.

5.2 Pluvial Flood Risk

The proposed development does not increase the impermeable area of the existing site, as it is presently covered in Hardstanding or Buildings and hence surface water runoff from the site won't be increased. Therefore there is no risk of pluvial flooding on site.

The site surface water drainage system will be designed to best practice to provide protection from the surface runoff (pluvial flooding) due to direct rainfall. Particular attention will be given to the management of runoff upslope of the development area.

The drainage system design will reflect the latest rainfall-return period guidance from Met Eireann.

Surface water runoff from the site will be collected throughout the site and will be piped to Stormwater Management system where it will discharge to the ground..

Mitigation: There is minimal risk of Pluvial flooding therefore no mitigation measures required

5.3 History of Flooding

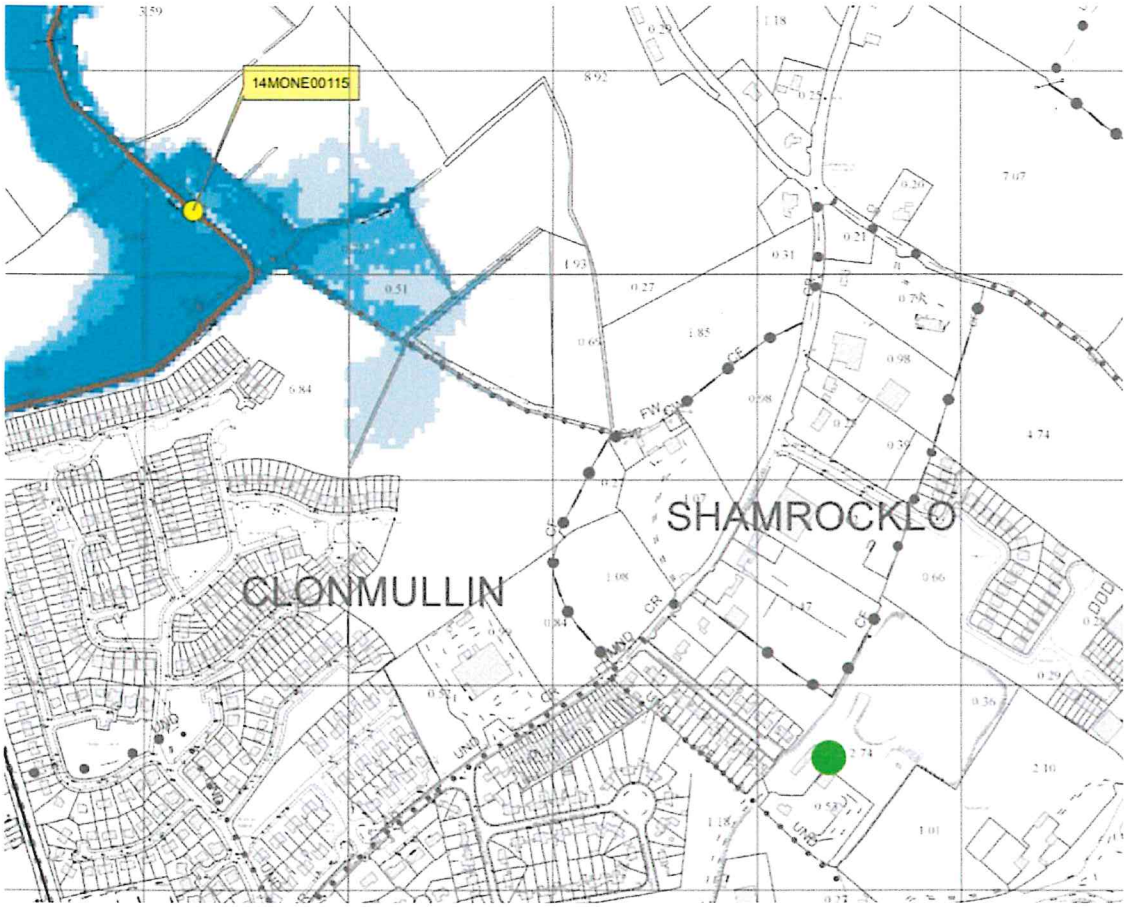
As part of Ireland's obligations under the "Floods" Directive, the Office of Public Works (OPW) is currently engaged in the generation of the new mapping which will provide predictive estimates of the extent of floodplains as part of its Catchment Flood Risk Assessment Management Studies (CFRAMS). The aim of these studies is to assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding.The flood hazard areas have been identified as being potentially at risk from significant flooding, including areas that have experienced significant flooding in the past.

The site is located within the Eastern River Basin District. Final Flood Rule Mapping from the CFRAM study is available dated 18th July 2016.

According to the OPW, the PFRA has been undertaken by:

- Reviewing records of historic floods
- An assessment to determine areas vulnerable to future flooding
- Consultation with relevant bodies (Local Authorities, Government departments and agencies)

This assessment considered flood risk from rivers, the sea and estuaries, direct rainfall and groundwater. Mapped output from the PFRA, with explanatory notes, is available for public consultation on the following Web site: http://www.cfram.ie/pfra/interactive-mapping/



(**figure 7**).

The site (Green Dot) is located on Map Series Page 7 of 11, Athy Fluvial Flood Extents identifies that the subject site is outside any flood event 1100m to the northwest of the subject site there is a node point ref 14MONE00115 that indicates the following water levels:

10% AEP Water Level: 55.05m OD
1% AEP Water Level: 55.28m OD
0.1% AEP Water Level: 55.63m OD

All areas of the proposed development are located above possible flood levels, the proposed Ground Floor Level is 62.77mOD.

Mitigation: There is minimal risk of flooding therefore no mitigation

5.4 Impact of Development on Current Flood Regime at Site

5.4.1 Impact of Site Surface Water Runoff

All surface runoff from the site will be collected in a dedicated drainage network. This network will discharge to the ground..

5.4.2 Impact of Site Foul Water

The foul sewage outfall from the site will be directed to Town foul sewage pipe running to the North west of the site. The pipe eventually discharges to Athy waste water treatment plant.

5.4.3 Loss of Floodplain

This site is not located in a floodplain

Mitigation: There is minimal risk of flooding therefore no mitigation
Measures required

6. Historic Flooding.

The review of historic flooding was undertaken using the Office of Public Works (OPW) Website www.floodmaps.ie

This website www.floodmaps.ie forms a record of all available flood records held by the OPW, all local authorities and other relevant state organisations such as the EPA and the Department of Environment, Heritage and Local Government.

As part of the data collection exercise, present and previous landowner were interviewed and the strategic Flood Risk Assessment for Athy was studied.

Mitigation: There is minimal risk of flooding therefore no mitigation
Measures required

7. Climate Change

Predictions of increases in rainfall due to climate change are very uncertain, but in autumn and winter in mid-century it is expected to be of the order of 5 – 10%

The SuDS drainage design system already in use with an attenuation Stormwater management system can accommodate I in 100 year flood flow plus 20% for climate change.

Mitigation: There is minimal risk of flooding therefore no mitigation
Measures required

8. Conclusions

It is reasonable to conclude that the site lies within Flood Zone C as defined by the guideline document to Planning Authorities in relation to Flood Risk Management.

Based on the information in this report, it indicates that flood risk of the site is considered low. The development will not increase the current flood risk in the catchments.

All areas of the proposed development are located above possible flood levels of 55.05m AODm.

There are no records of flooding occurring at the said site or associated flooding on land adjacent to the site.

In summary the flood risk relating to the works proposal is summarised below:

Source/pathway	Receptor	Risk	Comment
Fluvial	People/ property	Low	No Flooding Risk
Pluvial	People/ property	Low	Surface water system designed to SuDS and 20% climate change
Operation	People/ property	Low	Risk associated due to surcharging of foul sewer

A sequential approach to flood risk management was adopted in accordance with the 2009 Planning Guidelines. After assessing the flooding risk, the proposed residential development is considered to be appropriate in this location.

There is a minimal risk of flooding to the site due to the development.

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