# Convent Road
# Filtered Permeability Scheme

Flood Risk Assessment

Meath County Council

Project number: 60615775

August 2022

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## Quality information

| Prepared by | Checked by | Verified by | Approved by |
|---|---|---|---|
|  |  |  |  |
| Rebecca McCausland<br>Civil Engineer | Edward Mason<br>Senior Engineer | Joanne Titterington<br>Principal Engineer | Jason Doherty<br>Principal Engineer |

## Revision History

| Revision | Revision date | Details | Authorized | Name | Position |
|---|---|---|---|---|---|
| A | 31.08.2022 | Part 8 Planning | J. Doherty | Jason Doherty | Principal Engineer |
| | | | | | |
| | | | | | |
| | | | | | |

## Prepared for:

Meath County Council

## Prepared by:

AECOM Limited
9th Floor, The Clarence West Building
2 Clarence Street West
Belfast BT2 7GP
United Kingdom

aecom.com

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# 1. Introduction

AECOM were appointed by Meath County Council to assist the NTA Cycling Design Office in the Convent Road scheme in Navan Co. Meath. The scheme will formalise the closure of Convent Road to through traffic while formalising a pedestrian and cycle route. This report is a site-specific Flood Risk Assessment for the scheme.

The Convent Road scheme focuses on the growth of green infrastructure and development within the Navan area. The works consist of changing the road from vehicle use to a pedestrian and cycle lane. This will include all appropriate pedestrian and cycle lane signage as well as cycle lane buff surface and high friction surface in front of the school, as well as replacing removal-able bollards and purposed round top ramp.

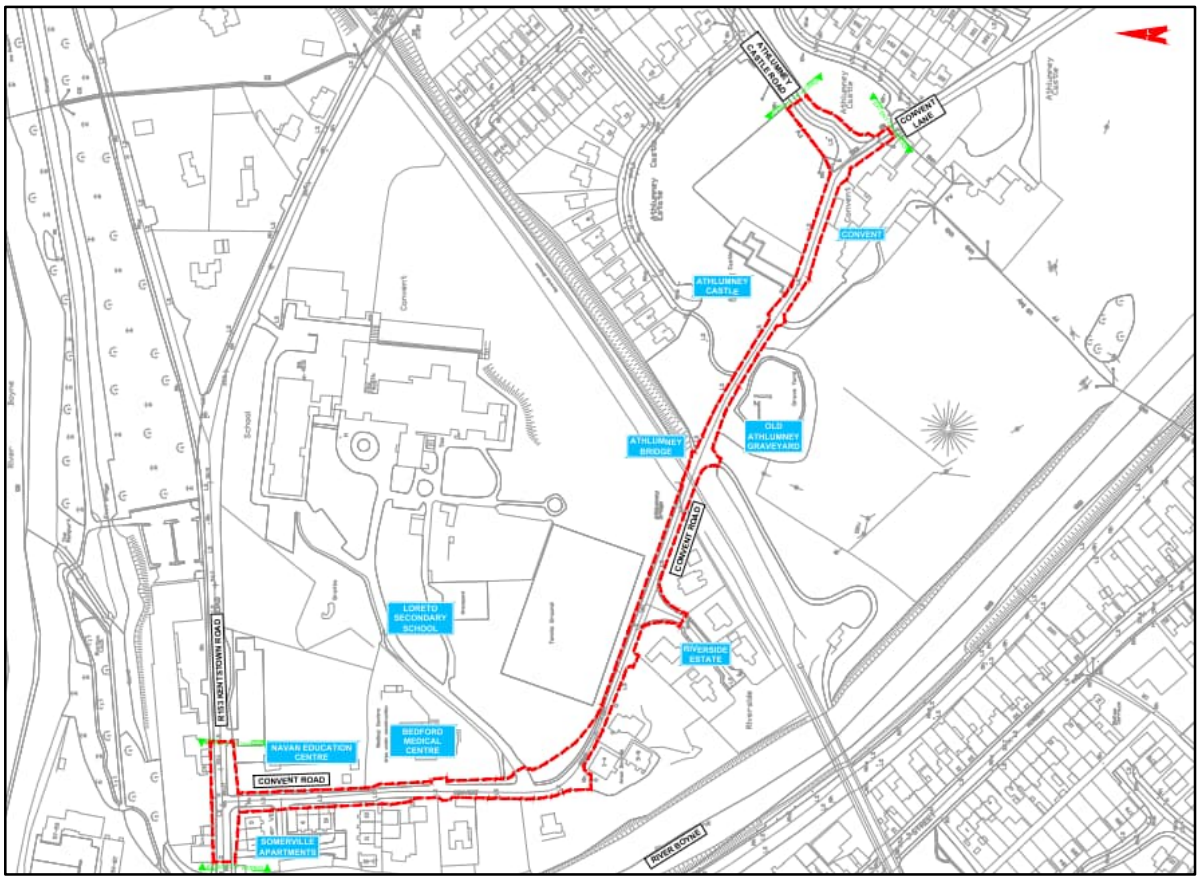



**Figure 1: Site Location**

This FRA study has been undertaken in consideration of the following guidance document:

- 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009

# Scope of services

AECOM is required to undertake a Site-Specific Flood Risk Assessment (FRA) for the proposed works.

This FRA study has been undertaken in consideration of the following guidance document:

- 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009

The assessment will demonstrate that the Proposed Development will:

1. Not increase flood risk elsewhere and, if practical, will reduce overall flood risk.
2. Include measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.
3. Include measures to ensure that residual risks to the area and/or development can be managed to an acceptable level.

# 2. Site Information

The proposed works area is located on an existing road which is situated to the southeast of R153 Athlumney Road, at approximate gird reference 287439, 267591 (Irish Grid Reference). The work extents are shown below in Figure 2 highlighted in purple.

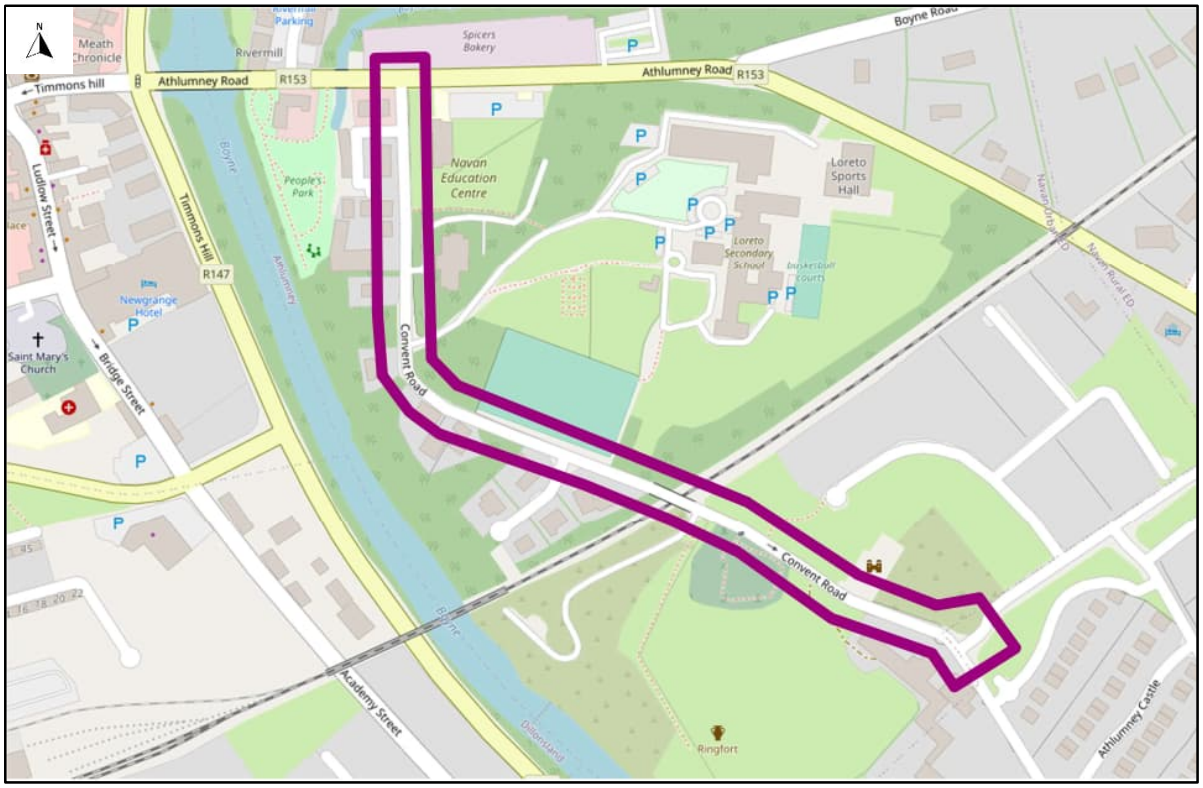



**Figure 2: Section of Road to be upgraded to cycle lane (highlighted in purple)**

# Summary of the Proposed Development

The proposed works include the following:

- Filtered permeability on Convent Road between Riverside estate entrance and Athlumney Castle junction (by use of planters, bollards, etc.) to allow cyclist and pedestrian movement but restrict motor traffic to access only.
- Maintain vehicular access requirements to Tara Mines property and to graveyard.
- Provide CCTV on the route.
- Upgrade public lighting on Convent Road.
- School zoning at the Loreto school entrance to improve pedestrian and cyclist access and safety.
- Raised platforms, new tactile paving etc on Convent Road between Athlumney Road (R153) and Riverside estate.
- Provide associated road markings and traffic signs.
- Landscaping improvements to existing green space to the south of school entrance.
- Existing gullies to be raised to new pavement height where appropriate.

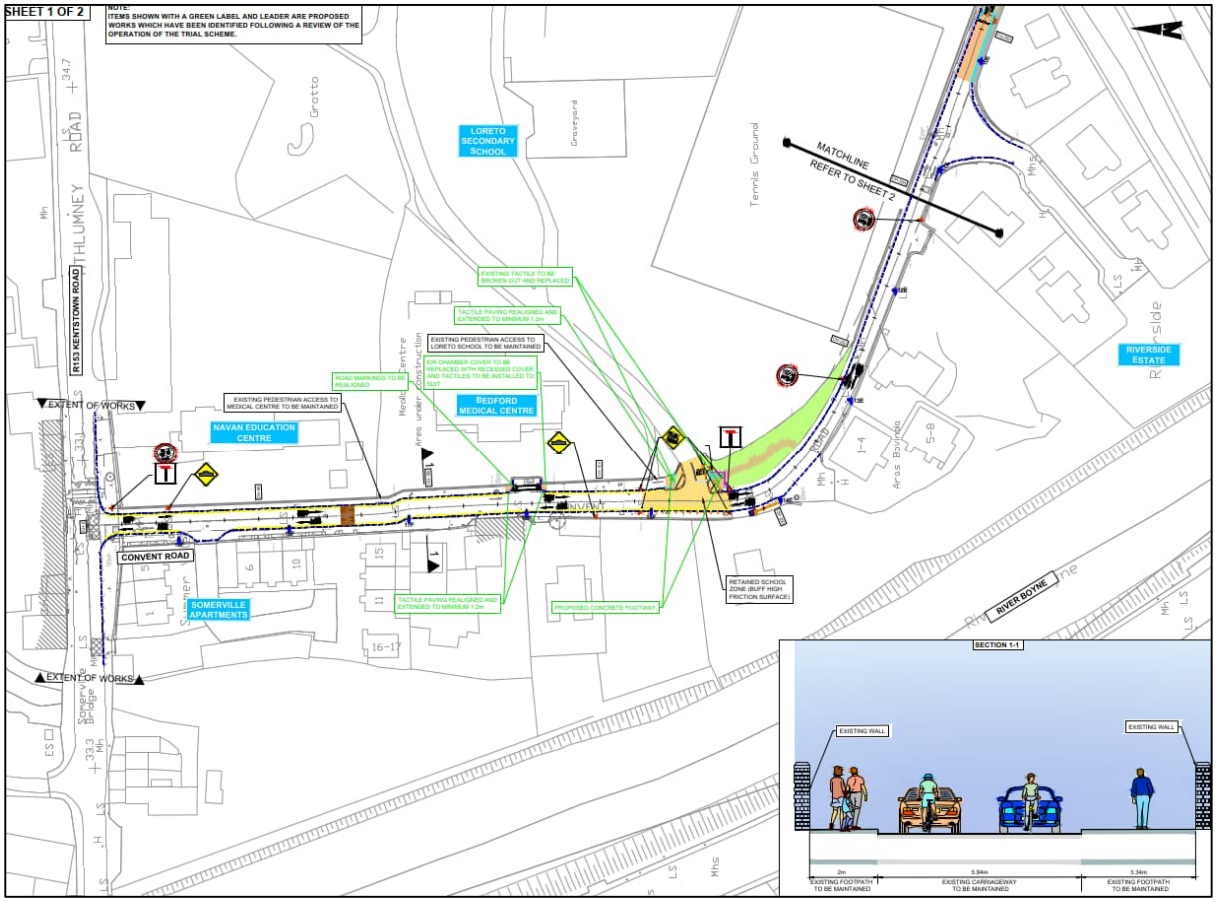



**Figure 3: Purposed Work Section 1 of 2**

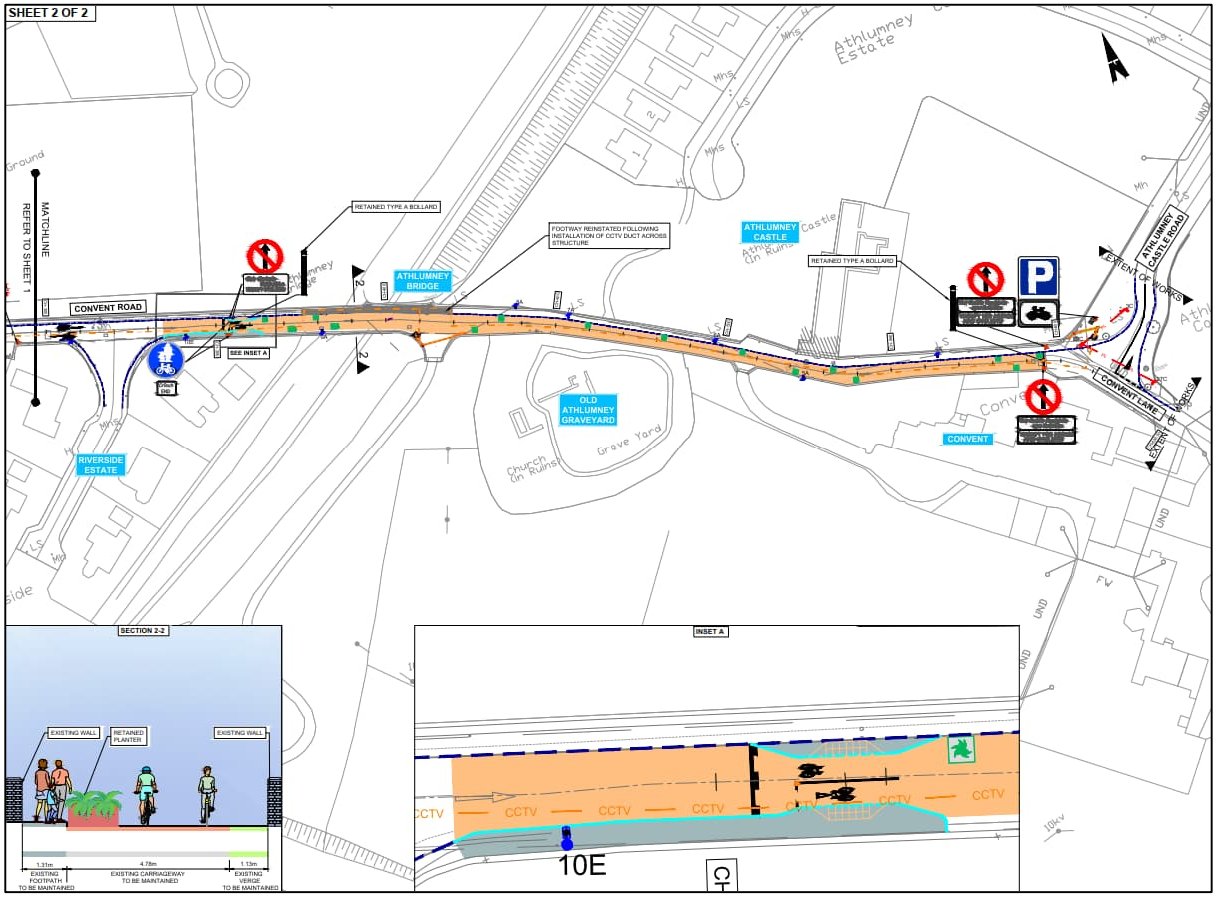



**Figure 4 Purposed Works section 2 of 2**

## 2.2 Site Topography

The site levels are circa 33.32mOD at the northern end of the site at Athlumney Road rising to 43.26mOD at the southeast just before Convent Lane.

## 2.3 Local Hydrology

The River Boyne is approximately 500m from the Northern boundary of the proposed works, the river also runs along the south-western side of the scheme. The River Boyne flows from west to east, where it ultimately discharges to the Irish Sea.


**Figure 5: Watercourses**

# 2.4 Existing Utilities

AECOM have carried out a review of the existing utility infrastructure along the proposed route. This includes review of existing background information made available as part of this contract and also interrogated the Irish Water Collector App ArcGIS and contacted all known utility providers.

There is a foul sewer that runs along the footpath and across Convent Road and between chainage CH-150 and CH-350.

Watermains, road gullies and respective storm water sewers are also present. These are in ownership of Irish Water and Meath County Council, respectively.

ESB and Eirgrid infrastructure is also present within the site.

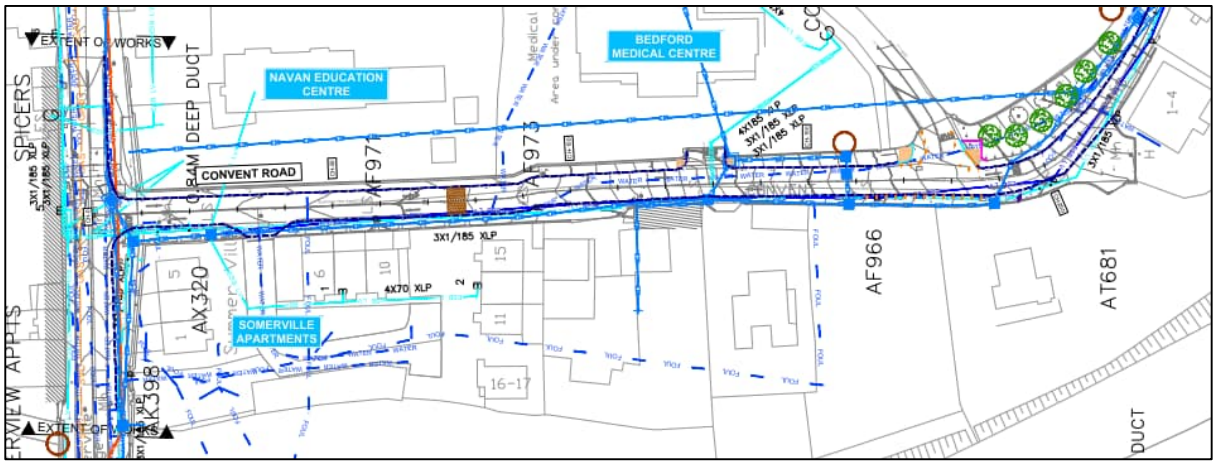



**Figure 6: Utilities Location Extract**

# 3. Stage 1 - Flood Risk Identification

The purpose of Stage 1 is to establish whether a flood-risk issue exists or may exist in the future. If there is a potential flood risk issue then, in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities (DOEHLG 2009)', the flood risk assessment procedure should move to 'Stage 2 – Initial Flood Risk Assessment'. If no potential flood risk is identified during Stage 1 then the overall flood risk assessment can be concluded.

The potential flood risk mechanisms are also discussed in this Section. These include the risk the flooding from fluvial sources which result from the overtopping of the embankments of rivers and streams; the flood risk from pluvial sources which occur when the ground becomes saturated and surface water runoff from rainfall events cannot effectively infiltrate or results in the surface water drainage systems becoming overwhelmed. Lastly, the flood risk from groundwater which may be exacerbated by high groundwater levels is discussed.

The following information and data have been collated as part of the screening assessment for the proposed works.

## 3.1 Hydrometric Data

Existing sources of hydrometric data from the EPA (https://gis.epa.ie/EPAMaps/Water) were investigated, as summarised in. The locations of the nearest gauging stations are as shown in Figure 3-1 below.


**Figure 7 Hydrometric Gauges**

The closest gauge is the Athlumney located downstream of the purposed works on the River Boyne, gauge data is available, but it is not deemed relevant to this FRA.

## 3.2 OPW Hazard Maps

The OPW Flood Hazard Maps Website (https://www.floodinfo.ie/) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrence in the vicinity of the proposed works. No flood events have been recorded within the proposed works boundary.

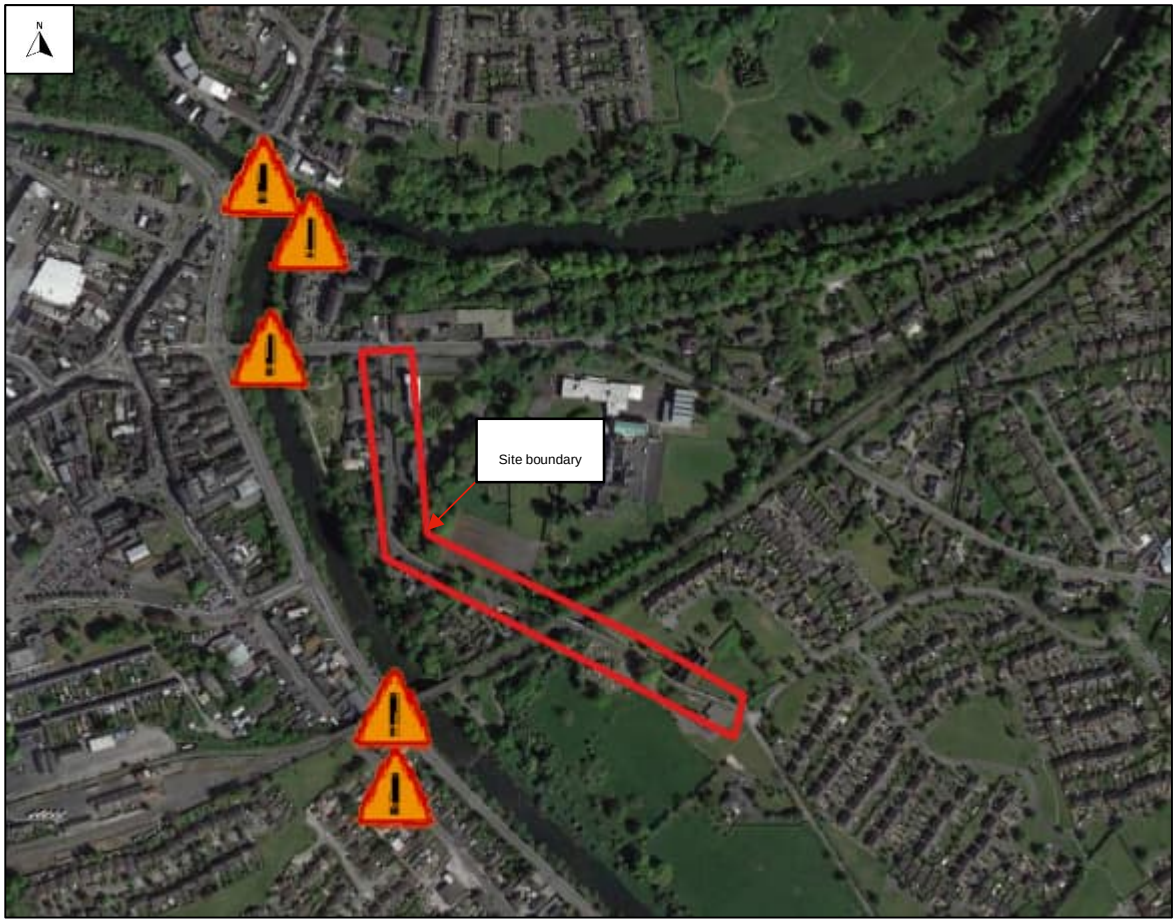



**Figure 8: OPW Hazard Map**

AECOM have reviewed the historic incidents in the vicinity of the site as shown above. The majority of these occurred over 20 years ago on the 14/11/2002 and related the river getting out of bank. However, these did not enter the site boundary.

There are no other known instances of historic incidents within the vicinity of the site.

## 3.3 Groundwater Wells and Springs

Geological Survey Ireland Spatial Resources[1]. mapping in Figure 9 defines the permeability of the underlying geology as 'moderate to high' across the site.

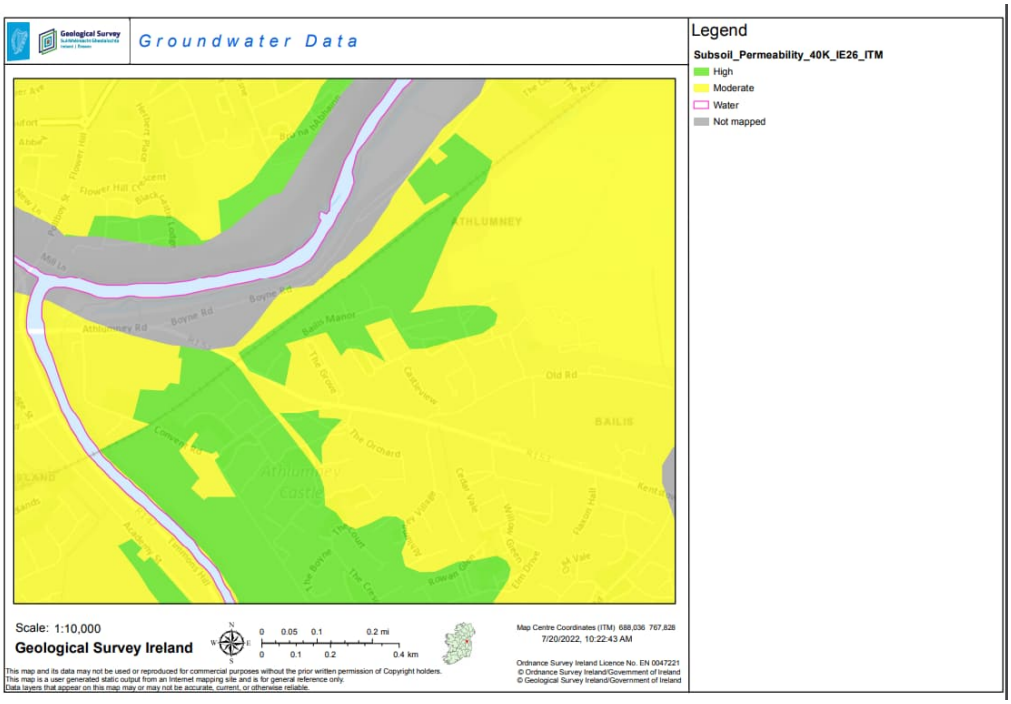



**Figure 9: Permeability of Underlying Geology**

The south-eastern end of the site a domestic well is located called Dug well.

## 3.4 OPW Land Benefitting Maps

The proposed works is not located within an area of "Benefitting Land" according to OPW flood maps.

There is however a flood defence (10% AEP Standard of Protection) constructed on the left and right hand banks of the River Boyne adjacent to the site.

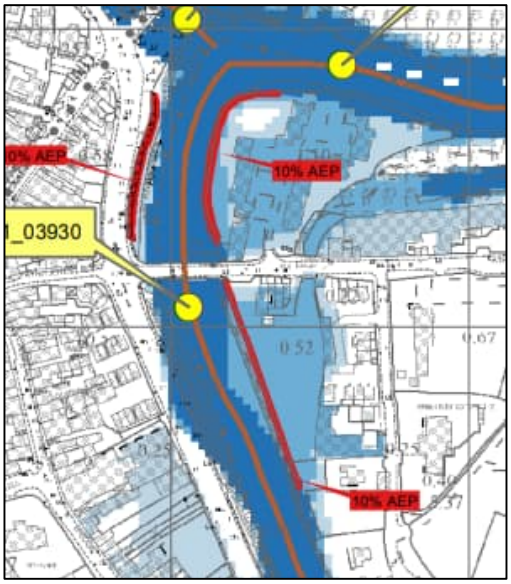



**Figure 10: 10% AEP Defence**

[1] Groundwater Flooding Data Viewer. Available at Groundwater Flooding Data Viewer (arcgis.com).

## 3.5 OPW CFRAM Mapping

Mapping has been produced under the Catchment Flood Risk Assessment and Management (CFRAM) project by OPW. The CFRAM mapping provides maps for both present day coastal and fluvial flooding events. AECOM have utilised the GIS layers from https://www.floodinfo.ie/ to draft the below flood extent figures. The CFRAM flood maps relating to the proposed works are included within Appendix A.

Below these have been reviewed and the risk of flooding assessed for each with regard to the proposed works.

### 3.5.1 Fluvial CFRAM Maps

In order to identify the flood risk posed to the Proposed Development CFRAM mapping (Appendix A) has been reviewed so that the proposed development can be catagorised within a certain flood zone. As per *The Planning System and Flood Risk Management* guidance three levels of flood zone should be identified:

Flood Zone A (Fluvial) – High Probability of Flood (less than a 1 in 100 year flood event)

Flood Zone B (Fluvial) – Moderate Probability of Flood (Between 1 in 100 year and 1 in 1000 year flood event)

Flood Zone C (Fluvial) – Low Probability of Flood (Greater than a 1 in 1000 year flood event)

Figure 11 shows the proposed works is outside the 1% AEP, with a negligible area adjacent to the 0.1% AEP flood event. As the proposed works are effectively a change of use from an existing vehicle carriageway to a permanent cycle way, the proposed works from a fluvial perspective would be deemed a low probability flood risk.


**Figure 11: Present Day - 1% and 0.1% AEP Fluvial Flood Extents**

#### 3.5.1.1 Climate Change

In order to take a precautionary approach it is necessary to understand the flood risk when accounting for climate change. CFRAM flood mapping provides flood maps with allowances in order to account for climate change.

Figure 12 shows the High End Future Scenario (HEFS) Climate change events for the 1% AEP and 0.1% AEP flood events. The northern end of the Convent Road is shown to be within the 0.1% AEP event. However, the works in this location are refined to updating road markings and signage. It is deemed that there is negligible impact on flood risk from the permanent works associated with the pedestrian and cycle lane construction.


**Figure 12: HEFS - 1% and 0.1% AEP Fluvial Flood Extents**

## 3.5.2 Coastal CFRAM Maps

The site is not affected by coastal flooding, and is therefore in Flood Zone C.

# 3.6 Meath County Development Plan (MCDP)

AECOM consulted the Meath County development Plan for Navan 2021-2027[2], associated Strategic Flood Risk Assessment (SFRA) and flood zone mapping (Figure 13).

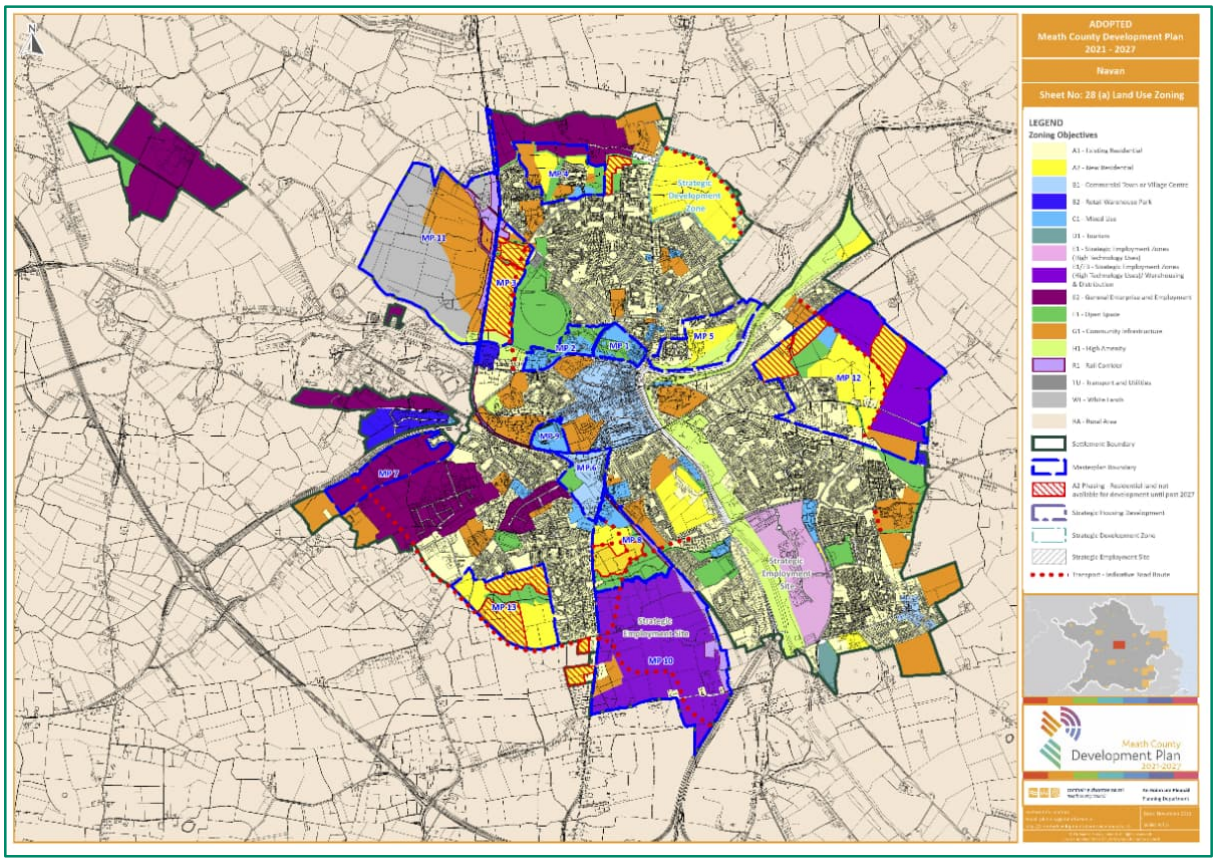



**Figure 13: Navan Flood Zone Map**

The plan indicates that the proposed site works are not located within either Flood Zone A or B. Therefore the site is shown as located within Flood Zone C.

# 3.9 Flood Risk from Reservoirs / Artificial Sources

There are no reservoirs within the vicinity of the purposed scheme.

The risk from this source has been assessed as low.

[2] https://www.louthcoco.ie/en/publications/development-plans/louth-county-development-plan-2021-2027/

## 3.10 Screen Assessment Conclusion

The possible flooding mechanisms in consideration of the proposed works are summarised in Table 3-1 below. The purpose of this screening assessment was to identify whether a potential risk of flooding exists and to what extent within the proposed site. This assessment is based on the collation and analysis of existing current information, historical information and data which may indicate the level or extent of any flood risk.

**Table 3-1: Possible Flood Mechanisms**

| Source of Flooding | Significant? | Comment / Reason |
|---|---|---|
| Tidal / Coastal | No | N/A |
| Fluvial | No | The site is considered to be low risk in the present-day scenarios therefore deemed to be in Flood Zone C based on CFRAM and the Meath County Development Plan. The proposed works ae the change of use from a permanent carriageway to a cycleway and pedestrian route, with associated new signage, bollards and road markings. The northern end of Convent Road is shown to be within the 0.1% AEP climate change event, however, the works in this location are refined to updating road markings and signage, therefore it is deemed to be low fisk from fluvial flooding. Furthermore due to the proposed work for the entire site effectively being a change of use from a vehicular carriageway to a cycleway, it is unlikely that these works would increase flood risk elsewhere. |
| Pluvial | No | The site is considered to be low risk in the present day and climate change scenarios. There is existing road drainage located within the carriageway. It is proposed that this existing drainage will be reviewed and levels raised where required as part of the works to reduce the risk of pluvial flooding. Meath County Development Plan indicated the site is not within Flood Zone A or B. There are no records of any historic pluvial flooding. |
| Groundwater | No | There is evidence of historical groundwater flooding within the area, this is deemed a low risk whilst also taking into consideration the works that are proposed. |
| Reservoirs / Artificial Sources | No | The proposed site is not located within located near a reservoir the risk from this source has been assessed as low. |

In consideration of the data sources assessment, this flood risk assessment is **not** required to proceed to ‘Stage 2 - Initial Flood Risk Assessment’.

# 4. Conclusion

The Site-Specific Flood Risk Assessment for the Proposed Development of formalising the closure of Convent Road to through traffic while formalising a pedestrian and cycle route was undertaken in accordance with the requirements of “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” to demonstrate that the Proposed Development will:

1. Not increase flood risk elsewhere and, if practical, will reduce overall flood risk.
2. Include measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible.
3. Include measures to ensure that residual risks to the area and/or development can be managed to an acceptable level.

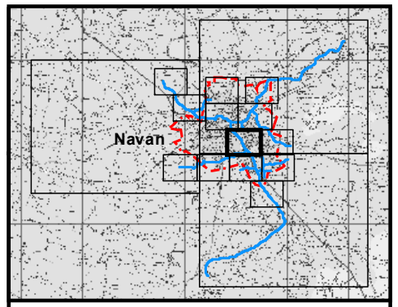
The Stage 1 – Flood Risk Identification determined negligible risk of flooding to the Proposed Development from fluvial, coastal and groundwater sources. The Flood Risk Identification exercise has shown that the Proposed Development is impacted by the 0.1% AEP Climate Change Fluvial Event at the northern end of Convent Road. However, works in this location is refined to new road markings and signage.

It is unlikely that the Proposed Development will increase flood risk elsewhere or require mitigation measures to reduce risk as it is primarily keeping the same surfaces and areas as existing. Existing road gullies are located in the carriageway as adequate drainage and these will be reviewed as part of the works to ensure they are at the correct levels.

It has been concluded that the Proposed Development risk of flooding, and potential impact elsewhere is deemed as negligible.

# Appendix A - CFRAM Maps

| Node Label | Water Level (OD) 10% AEP | Flow (m³/s) 10% AEP | Water Level (OD) 1% AEP | Flow (m³/s) 1% AEP | Water Level (OD) 0.1% AEP | Flow (m³/s) 0.1% AEP |
|---|---|---|---|---|---|---|
| 0714_00040 | 39.17 | N/A | 39.27 | N/A | 39.45 | N/A |
| 0714_00015 | 34.36 | 1.49 | 34.52 | 2.29 | 35.11 | 4.21 |
| 0701_04099 | 33.54 | 264.79 | 34.22 | 378.64 | 34.95 | 524.06 |
| 0701_04071 | 33.34 | 265.30 | 34.04 | 379.64 | 34.80 | 517.07 |
| 0701_04051 | 33.07 | 266.01 | 33.83 | 384.96 | 34.43 | 532.82 |
| 0701_04006 | 32.28 | N/A | 33.07 | N/A | 33.85 | N/A |
| 0701_03956 | 31.75 | N/A | 32.48 | N/A | 33.24 | N/A |




IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

## Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Embankment
- Wall
- Defended Area
- 1% AEP — Standard of Protection of Flood Defence
- 1% AEP — (Walls / Embankments)
- Node Point
- Node ID — Node Label

# FINAL

| REV: | NOTE: | DATE: |
|---|---|---|
| 03 | Amendment made to model | 16/11/17 |
| 02 | Flood Defences added to page 10 | 26/10/17 |
| 01 | Flood Defences added to map. | 05/05/17 |

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT


The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com


**Map:** Navan Fluvial Flood Extents

| | | |
|---|---|---|
| Map Type: | EXTENT | |
| Source: | FLUVIAL | |
| Map Area: | HPW | |
| Scenario: | CURRENT | |
| Drawn By : | F.M.C. | Date : 16 November 2017 |
| Checked By : | S.P. | Date : 16 November 2017 |
| Approved By : | G.G. | Date : 16 November 2017 |

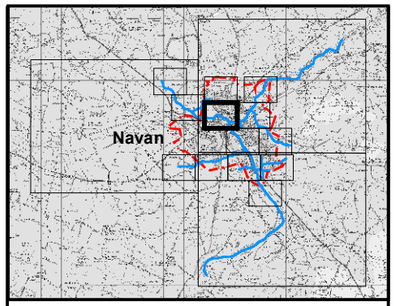
Drawing No. : E07NAV_EXFCD_F3_09

Map Series : Page 9 of 16

Drawing Scale : 1:5,000 @ A3

0 50 100 200 300 400 500 Metres

| Node Label | Water Level (OD) 10% AEP | Flow (m³/s) 10% AEP | Water Level (OD) 1% AEP | Flow (m³/s) 1% AEP | Water Level (OD) 0.1% AEP | Flow (m³/s) 0.1% AEP |
|---|---|---|---|---|---|---|
| 0712_00119W | 35.42 | N/A | 35.93 | N/A | 36.21 | N/A |
| 0712_00068 | 33.49 | N/A | 33.97 | N/A | 34.54 | N/A |
| 0712_00016 | 31.46 | 106.94 | 32.18 | 150.36 | 32.97 | 227.82 |
| 0712_00005 | 31.46 | 109.68 | 32.16 | 150.38 | 32.90 | 208.26 |
| 0701_03930 | 31.52 | 266.16 | 32.24 | 380.30 | 32.98 | 528.22 |
| 0701_03907 | 31.32 | 330.53 | 32.00 | 472.94 | 32.72 | 657.28 |

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**Legend**

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- 1% Fluvial AEP Event
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- Modelled River Centreline
- AFA Extents
- Embankment
- Wall
- Defended Area
- 1% AEP — Standard of Protection of Flood Defence (Walls / Embankments)
- Node Point
- Node ID — Node Label

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EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW — Oifig na nOibreacha Poiblí / The Office of Public Works

RPS


The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com


**Map:**
**Navan Fluvial Flood Extents**

| | |
|---|---|
| Map Type: | EXTENT |
| Source: | FLUVIAL |
| Map Area: | HPW |
| Scenario: | CURRENT |
| Drawn By : F.M.C. | Date : 16 November 2017 |
| Checked By : S.P. | Date : 16 November 2017 |
| Approved By : G.G. | Date : 16 November 2017 |
| Drawing No. : | E07NAV_EXFCD_F3_10 |
| Map Series : | Page 10 of 16 |
| Drawing Scale : | 1:5,000 @ A3 |

0 50 100 200 300 400 500 Metres

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