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Meath County Council

St Francis Park Navan

Engineering Services Report

St. Francis Park, Navan

Engineering Services Report

Document Control Sheet	
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Revision	Description	Author:	Date	Reviewed By:	Date	Authorised by:	Date
P01	Planning for Issue	AO'S	29/03/2021	PF	29/03/2021	KH	29/03/2021

TOBIN Consulting Engineers

ENVIRONMENT I.S. EN ISO 14001:2015 NSAI Certified

HEALTH & SAFETY I.S. ISO 45001:2018 NSAI Certified

QUALITY I.S. EN ISO 9001:2015 NSAI Certified

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ENGINEERS IRELAND cpd ACCREDITED COMPANY

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1.0 INTRODUCTION

1.1 APPOINTMENT

Tobin Consulting Engineers were appointed by Meath County Council to provide Civil and Structural Engineering Design services for a proposed redevelopment at St. Francis Park, Navan, Co. Meath.

The proposed development will consist of the following;

(a) Demolition of 14 no. existing bay units

(b) Construction of 10 no. dwellings with permanent caravan parking bays

(c) Closure of the existing St. Francis Park entrance and access road on Ratholdren Road and provision of a new entrance and access road from Tailteann Drive

(d) Redesign of landscaping within the site boundary

(e) All associated site development and associated ancillary works.

The proposed housing units will comprise of 1 no. 2 bed single storey dwelling, 1 no. 3 bed single storey dwelling, 2 no. 4 bed single storey dwellings and 6 no. 4 bed two storey dormer dwellings.

Refer Figure 1-1 below.

Figure 1-1: Proposed Site Layout

1.2 ADMINISTRATIVE JURISDICTION

The site is located within the administrative jurisdiction of Meath County Council.

1.3 SITE LOCATION

The proposed planning boundary encompasses approximately 9280sq.m (0.928ha) of an existing development. The site at St. Francis Park is currently in use as traveller specific accommodation and it is proposed to demolish the existing dwellings, including a care take hut as part of the redevelopment.

The site is bounded to the North and West by a residential development, Tailteann Drive, to the East by green fields and to the South by a residential development, Windtown Drive. The site is currently accessed from Ratholdren Road, refer to Figure 1-2 below.

Figure 1-2: Site Location

1.4 PROPOSAL

The purpose of this report is to address the proposed service infrastructural requirements for the development. In the coming sections the Potable Water, Wastewater and Storm Water proposals will be detailed, and the designed layouts showcased.

The design principles adopted will be those of best engineering practices and standards used and will be from the most recent applicable publications.

2.0 ACCESS AND ROADS

The proposed development will be accessed from a new entrance and access road from Tailteann Drive. The development will see the closure of the existing St. Francis Park Entrance and access road on Ratholdren Road. A raised table with an uncontrolled crossing is proposed at the new entrance as this was identified as a key travel desire line for residents of Taiteann Drive.

The road layout is designed in accordance with the recommendations of the Design Manual for Urban Roads and Streets (DMURS).

- The local access street within the development will be 5.6m wide.
- Footpaths of no less than 2.0m are provided throughout the scheme with connections/tie-ins to existing external pedestrian networks.
- Appropriate clear and unobstructed visibility splays, as per DMURS requirements are provided at the entrance, 2.4m x 23m sightlines were provided at the proposed new entrance.
- A pedestrian crossing facility is proposed at the new entrance to the site. The raised top treatment informally asserts a degree of importance to pedestrians.
- A traffic calming ramp is proposed on the internal road.

Details of the road layout can be found on TOBIN Drawing 7997-2030 in Appendix 1.

TOBIN Drawing 7997- 2090 includes Vehicle tracking for the site, refer to Appendix 1.

3.0 POTABLE WATER SUPPLY

Irish Water's records indicate the presence of an existing 100mm diameter watermain within St. Francis Park site which will supply the proposed development. It is proposed to maintain a section of the existing 100mm watermain and grub up the section at the north and east of the site. It is proposed to connect the new loop to the remaining section to serve the development.

The service pipe is to include a bulk water meter, fire hydrants, sluice valves, a scour valve, wash out hydrant and an air valve in accordance with Irish Water's latest standard details and codes of practice. The design is subject to approval by Irish Water after a Connection Application has been made following the grant of planning permission.

The watermain layout and details are in accordance with Irish Water Connection and Developer Services, 'Code of Practice for Water Infrastructure' and 'Water Infrastructure Standard Details'. In accordance with section 7.7 of the '*Residential Caravan Parks for Travellers*', '*no caravan is more than 100m from a hydrant'.*

A Pre-Connection Inquiry has been submitted to Irish Water for Approval on the 24th of February 2021, Irish Water Reference; CDS21001232.

For further information on the proposed Potable Water layout please refer to DWG 7997-2020 in Appendix 1.

4.0 WASTEWATER INFRASTRUCTURE

4.1 INTRODUCTION

Site surveys indicate a 300mm diameter foul line in the main entrance road of St. Francis Park, this is fed by 2no. 225mm diameter lines and 100mm diameter private drainage lines. This foul line discharges to a manhole on Ratholdren Road. These findings are confirmed in Irish Water Records.

4.2 PROPOSAL

Presently, it is proposed to discharge the foul discharge to the existing foul pump station which is located to the east of Tailteann Drive Road, located to the south of the subject site. It is proposed to grub out the existing foul infrastructure within the site as part of the redevelopment. From here, the foul discharge is pumped via a rising main to the gravity line in Ratholdren Road.

The wastewater layout has been designed in accordance with Irish Water's latest standard details and codes of practice. The design is subject to approval by Irish Water after a Connection Application has been made following the grant of planning permission.

The following criteria have been applied:

- Discharge units of 9 units per dwelling
- Pipe Friction (Ks) 1.5 mm
- Minimum Velocity 0.75 m/s (self-cleansing velocity)
- Maximum Velocity 3.0 m/s (1:20 maximum pipe gradient)
- Frequency Factor 0.5 for domestic use

A Pre- Connection Inquiry has been submitted to Irish Water for Approval on the 24th of February 2021, Irish Water Reference; CDS21001232.

For further information on the proposed Wastewater layout please refer to DWG's 7997-2010 & 2011 in Appendix 1.

5.0 SURFACE WATER

5.1 INTRODUCTION

Records indicate that there is a 375mm diameter concrete pipe located in Ratholdren Road to the south of the subject site. The current surface water drainage discharges to this main sewer and it is proposed to maintain this outfall point. The surface water will connect to the public sewer on Ratholdren Road. These findings are confirmed in MCC Records.

5.2 PROPOSAL

It is proposed to discharge the surface water run off generated on site to the public sewer on Ratholdren Road.

Surface water drainage for the proposed development is designed using the recommendations of the GDSDS, EN752 and BS8301:1985, with the following parameters applied:

- Return period for pipe network 2 years,
- Time of entry 4 minutes
- Pipe Friction (Ks) 0.6 mm
- Minimum Velocity 1.0 m/s
- M5-60 17.30mm
- Ratio r (M5-60/M5-2D) 0.329
- Climate Change 20% for rainfall intensities.

The surface water drainage network has been designed and simulated for a range of storm events (including 1 in 1, 1 in 30 and 1 in 100-year storm events) using the Network module of Microdrainage. Refer to Appendix 4 for Microdrainage results. A breakdown of the impermeable areas contributing to the surface water drainage network is included in Table 5-1below

Table 5-1 Breakdown of Impermeable Areas

Type of Surface	Runoff Coefficient	Gross Area (ha)	Total Impermeable Area (ha)
Hard Standing	0.95	0.415	0.395
Open Space/Gardens	0.37	0.512	0.190
Total	-	**0.928**	**0.584**

Sustainable Urban Drainage Systems (SuDs) have been incorporated into the surface water drainage infrastructure proposed for the site, refer to section 5.3 below.

5.3 SUDS

In accordance with the GDSDS, it is proposed to incorporate Sustainable Urban Drainage Systems (SuDs) into the surface water drainage design, for the management of storm-water runoff from the development. The aim of the SuDS strategy for the site is to attenuate surface water runoff rates and volumes; reduce pollutant concentrations in surface water. The most influential SuDs feature for this site is the introduction of soft standing areas.

The most appropriate SuDS feature for the site is a Fuel/oil Bypass Separator where the storm drainage system discharges to the public network. The stormwater from the external paved areas will include run-off from car parking areas and may have hydrocarbons within their flow. These hydrocarbons pollutants require removal, so they are not discharged back into the environment.

5.4 ESTIMATED SURFACE WATER RUNOFF

The existing site comprises a 'brownfield' site, with access road and footpaths, residential units and 'other' areas containing caravans. There is an area of open space to the east and west of the access road and a central open space.

Unattenuated surface water runoff from the site is estimated as follows by means of the modified rational method (Wallingford Procedure):

$$Q = A_p \times i \times C_r \times C_v \times 2.78$$

Q = rate of runoff (l/s);
A_p = Impermeable Site Area (ha)
C_r = Routing Co-efficient = 1.3;
C_v= Volumetric Runoff Co-efficient = 0.95;
i = rainfall intensity (mm/hr) = 50mm/hr;

- Estimated Rate of Existing Surface Water Runoff from the Existing Site

It is estimated that the current site has a permeable area of approx. 0.1080ha, therefore A_p is estimated at 0.772ha.

$$Q = 0.772 \times 50 \times 1.3 \times 0.95 \times 2.78 = 132.52 l/s$$

- Estimated Rate of Existing Surface Water Runoff from the Proposed Development

It is estimated that the proposed site has a permeable area of approx. 0.5126ha, therefore A_p is estimated at 0.415ha.

$$Q = 0.415 \times 50 \times 1.3 \times 0.95 \times 2.78 = 71.24 l/s$$

Section 6.3.3.5 of the Greater Dublin Strategic Drainage Study (GDSDS) - Greenfield Developments and Infill Developments states *'New developments can take place in greenfield or brownfield locations. In theory design criteria need not be any different between these two situations. However, in practice, the precedent of existing high runoff rates from a previously developed site and the political and environmental value of re-using urban areas, often results in more liberal criteria being applied to these sites'.* As demonstrated above, the redevelopment of St. Francis' Park will have a positive impact on the surface water discharge to the local network as the scheme will reduce the quantity of the current hard standing area. The proposed development will reduce the surface water runoff by approx. 61.28l/s. As this is the case, no additional attenuation is proposed for the subject site.

For further information on the proposed Surface Water layout please refer to DWG's 7997-2010 & 2011 in Appendix 1.

6.0 FLOOD RISK ASSESSMENT

This Flood Risk Assessment was prepared and informed by the Department of Housing, Planning and Local Government's publication '*The Planning System and Flood Risk management – Guidelines for Planning Authorities'.* Together with the Technical Appendices.

The guidelines require the planning system to:

a) Avoid developments in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere.

b) Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk, and incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

The sequential approach makes use of existing flood risk assessments and other date identifying flood zones for rivers, coastal and pluvial flooding and the classification of the vulnerability of flooding of different types of development.

The primary objective of the sequential approach is to direct potential developments towards land that is at low risk of flooding.

6.1 STAGE 1 – DESKTOP STUDY

To establish if there is a risk of flooding to the proposed development and its location in Navan, Co. Meath a desk-based Flood Risk study was carried out. As part of the flood risk assessment a number of informative reports, studies and records were researched to determine the risk of Flooding to the proposed site in Meath.

6.1.1 Past Flood Events

The OPW's National Flood Hazard Mapping Summary Local Area Report indicated over 9 reported flooding events which took place within 2.5km of the site, ranging from the year 1965 to 2002. After reviewing each of the reports it was confirmed that no flood event took place on or adjacent the proposed site. Refer to Appendix 5 for the report.

6.1.2 Fluvial Flooding – Catchment Flood Risk Assessment

CFRAMS is a Catchment Flood Risk Assessment and Management Study and its purpose is to manage flood risk to the area being studied. Information from the study can be accessed at http://www.floodinfo.ie/map/floodmaps. The information provided by the study indicated there was no risk of either Coastal or River flooding to the development. Please see Appendix 5 for relevant flood maps, taken from the CFRAM website.

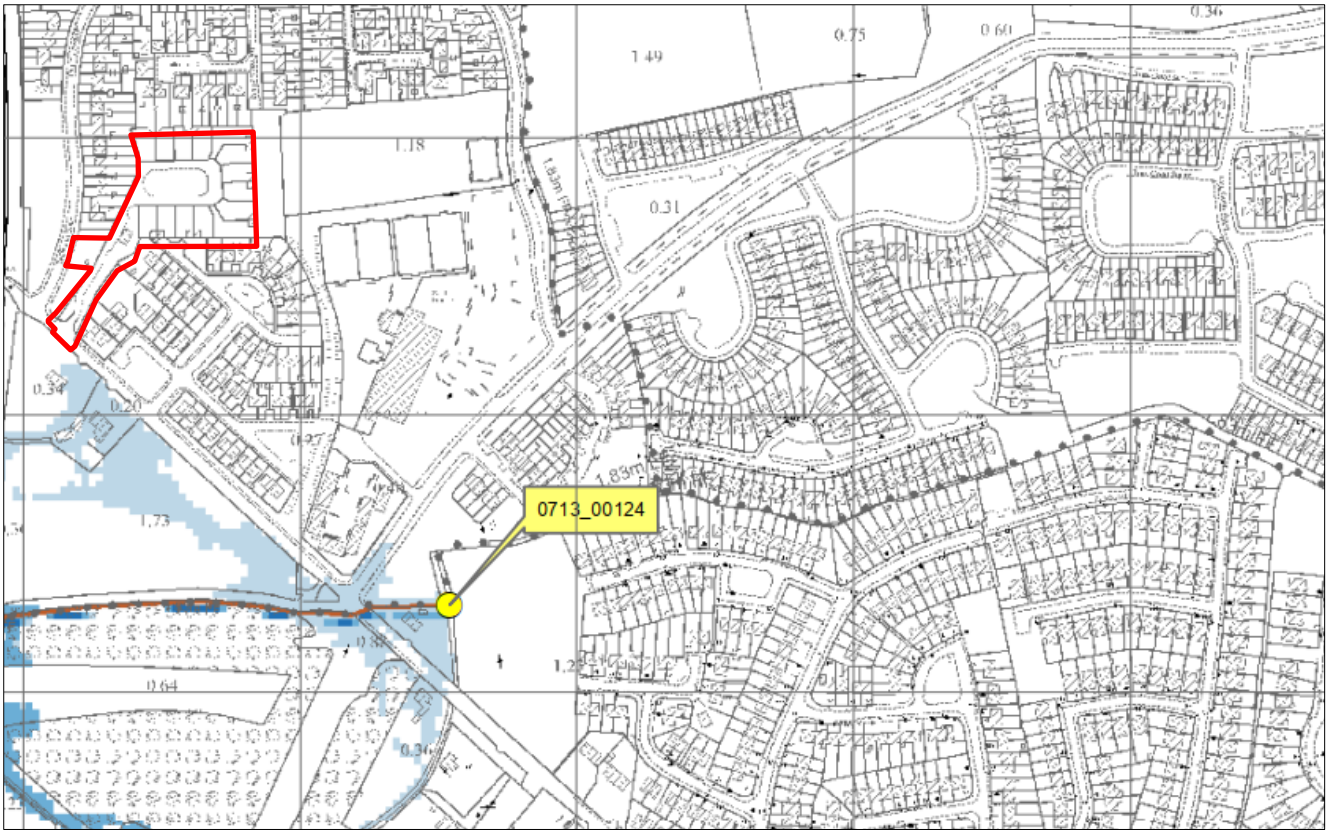

Figure 6-1: Extract from CFRAM Mapping

6.1.3 Flood Risk Assessment and Management Plan for the Meath CDP 2020-2026- Strategic Flood Risk Assessment

The proposed site at St. Francis Park is located outside of Flood Zone A and B as identified on Meath County Council's Flood Risk Assessment and Management Plan for the Meath CDP 2020-2026 completed by JBA Consulting. The site is within Flood Zone C have a low to minimal flood risk.

7.0 CONCLUSION

The proposed development will be accessed from a new entrance and access road from Tailteann Drive. The development will see the closure of the existing St. Francis Park Entrance and access road on Ratholdren Road. The road layout is designed in accordance with the recommendations of the Design Manual for Urban Roads and Streets (DMURS).

There is sufficient capacity within the Potable Water infrastructure for the redevelopment of St. Francis Park.

The wastewater from the development will discharge to windtown pumping station adjacent to the site.

The proposed layout will have a positive impact to the existing surface water infrastructure in the area. Attenuation is not currently proposed for the re development of the site. A petrol interceptor is proposed to collect hydrocarbons from the site at the outfall.

A flooding desktop study was completed for the site. It was determined that the subject site is in Flood Zone C.

Appendix 1 – Proposed Service Infrastructural Layouts

7797-2010 Proposed Drainage Layout Sheet 1 of 2

7797-2011 Proposed Drainage Layout Sheet 2 of 2

7997-2020 Proposed Watermain Layout

7997-2030 Proposed Hardstanding Layout and Site Levels

7997-2090 AutoTrack Layout Sheet 1 of 2

7997-2091 AutoTrack Layout Sheet 2 of 2

THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND ITM COORDINATE SYSTEM

LEGEND

- SITE BOUNDARY
- STORM WATER PIPE
- EXISTING STORM WATER PIPE
- FOUL WATER PIPE
- EXISTING FOUL WATER PIPE
- PRIVATE CONNECTION AND 600mm INSPECTION CHAMBER
- PRIVATE CONNECTION AND 600mm INSPECTION CHAMBER
- PROPOSED STORM MANHOLE
- PROPOSED FOUL MANHOLE
- EXISTING STORM MANHOLE
- EXISTING FOUL MANHOLE
- ROAD GULLY

MH S1 CL 48.820 IL 47.195
MH S2 CL 48.880 IL 46.822
MH S3 CL 49.010 IL 46.722
MH S4 CL 48.860 IL 46.609
MH S5 CL 48.790 IL 46.536
MH S6 CL 48.710 IL 46.355
MH S7 CL 48.510 IL 46.160
MH S8 CL 48.310 IL 46.026
MH S9 CL 48.205 IL 45.881
MH F1 CL 48.820 IL 47.345
MH F2 CL 48.880 IL 46.709
MH F3 CL 49.010 IL 46.583
MH F4 CL 48.860 IL 46.455
MH F5 CL 48.790 IL 46.380
MH F6 CL 48.790 IL 46.165
MH F7 CL 48.510 IL 45.932
MH F8 CL 48.310 IL 45.786
MH F9 CL 48.210 IL 45.637
MH F10 CL 48.318 IL 45.288
MH S10 CL 48.099 IL 45.591
EX MH CL 48.517 IL 45.017
EL 45.218
Existing Pumping Station
FFL 49.010
FFL 49.200
FFL 49.050
FFL 48.860

Foul

Pipe Label	MH Label	Length (m)	Fall (m)	Slope (1:X)	US/IL	US/CL	Cover (m)	MH dia (mm)	Pipe dia (mm)	Pipe Type
F 1.000	F01	41.314	0.636	65	47.345	48.820	1.475	1200	225	uPVC
F 1.001	F02	9.131	0.127	72	46.709	48.880	2.171	1200	225	uPVC
F 1.002	F03	10.565	0.127	83	46.583	49.010	2.427	1200	225	uPVC
F 1.003	F04	6.642	0.075	88	46.455	48.860	2.405	1200	225	uPVC
F 1.004	F05	19.743	0.215	92	46.380	48.790	2.410	1200	225	uPVC
F 1.005	F06	22.871	0.233	98	46.165	48.790	2.625	1200	225	uPVC
F 1.006	F07	14.337	0.146	98	45.932	48.150	2.218	1200	225	uPVC
F 1.007	F08	14.553	0.149	98	45.786	48.310	2.524	1200	225	uPVC
F 1.008	F09	34.165	0.349	98	45.637	48.210	2.573	1200	225	uPVC
F 1.009	F10	6.818	0.07	98	45.288	48.318	3.030	1200	225	uPVC

Stormwater

Pipe Label	MH Label	Length (m)	Fall (m)	Slope (1:X)	US/IL	US/CL	Cover (m)	MH dia (mm)	Pipe dia (mm)	Pipe Type
S 1.000	S01	41.000	0.373	110	47.195	48.820	1.250	1200	375	uPVC
S 1.001	S02	11.068	0.101	110	46.822	48.880	1.683	1200	375	uPVC
S 1.002	S03	12.422	0.113	110	46.722	49.010	1.913	1200	375	uPVC
S 1.003	S04	7.968	0.072	110	46.609	48.860	1.876	1200	375	uPVC
S 1.004	S05	19.896	0.181	110	46.536	48.790	1.879	1200	375	uPVC
S 1.005	S06	21.512	0.196	110	46.355	48.710	1.980	1200	375	uPVC
S 1.006	S07	14.682	0.133	110	46.160	48.510	1.975	1200	375	uPVC
S 1.007	S08	16.030	0.146	110	46.026	48.310	1.909	1200	375	uPVC
S 1.008	S09	31.814	0.289	110	45.881	48.205	1.949	1200	375	uPVC
S 1.009	S10	22.639	0.206	110	45.591	48.099	2.133	1200	375	uPVC
S 1.010	Seperator	18.483	0.37	50	45.286	48.341	2.680	1200	375	uPVC

Rev	Date	Description	By	Chkd.
P01	MAR '21	PLANNING ISSUE	AO'S	KH

Client: comhairle chontae na mí / meath county council

Project: DEVELOPMENT AT ST. FRANCIS PARK, CO. MEATH

Title: PROPOSED DRAINAGE LAYOUT - SHEET 1 OF 2 -

Scale @ A1: 1:250

Prepared by: AO'S | Checked: KH | Date: March 2021

Project Director: Brian Carroll

Status: PLANNING

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Drawing No.: 7997-2010 P01

THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND ITM COORDINATE SYSTEM

LEGEND

- SITE BOUNDARY
- STORM WATER PIPE
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MH S8 CL 48.310 IL 46.026
MH S9 CL 48.205 IL 45.881
MH S10 CL 48.099 IL 45.591
EX MH CL 48.517 IL 45.017
EL 45.218
EX MH CL 48.270 IL 44.470
Existing Pumping Station
Oil/Fuel bypass seperator NSBE 010 or similar Entry IL: 45.326 Exit IL: 45.286
Proposed Connection to Existing 375mm Dia. Surface Water Sewer at EX MH IL: 44.470 EL: 44.916
FFL: 48.860
FFL: 48.050
TURNING

Foul

F 1.000	F01	41.314	0.636	65	47.345	48.820	1.475	1200	225	uPVC
F 1.001	F02	9.131	0.127	72	46.709	48.880	2.171	1200	225	uPVC
F 1.002	F03	10.565	0.127	83	46.583	49.010	2.427	1200	225	uPVC
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Stormwater

S 1.000	S01	41.000	0.373	110	47.195	48.820	1.250	1200	375	uPVC
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Rev	Date	Description	By	Chkd.
P01	MAR '21	Planning Issue	AO'S	KH

Client: comhairle chontae na mí meath county council

Project:

DEVELOPMENT AT ST. FRANCIS PARK, CO. MEATH

Title:

DRAINAGE LAYOUT - SHEET 2 OF 2 -

Scale @ A1: 1:250

Prepared by: AO'S | Checked: KH | Date: March 2021

Project Director: Brian Carroll

Status: PLANNING

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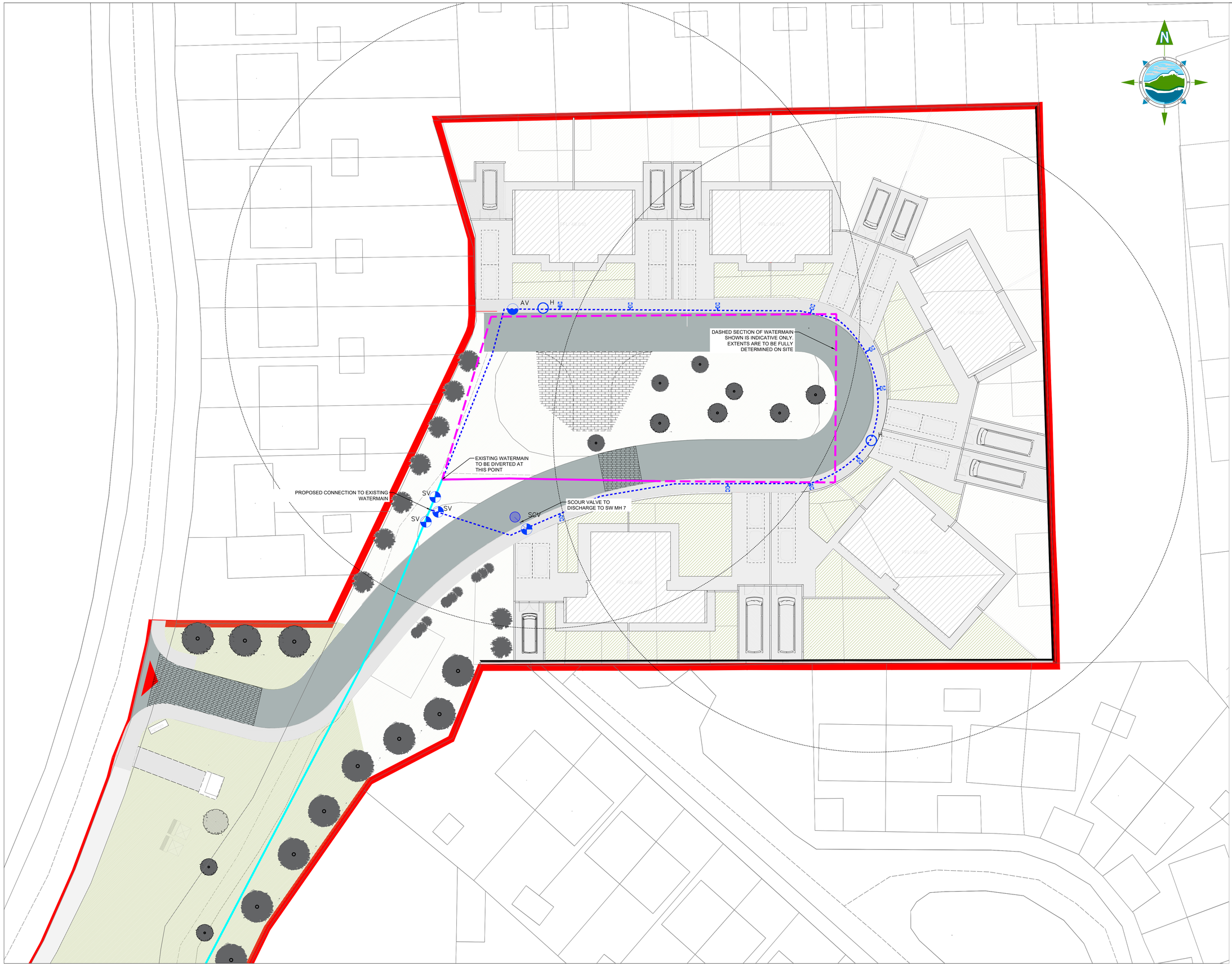
Drawing No.: 7997-2011 | Revision: P01



THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND ITM COORDINATE SYSTEM

LEGEND

- OUTLINE OF PROPOSED SITE WORKS
- EXISTING WATERMAIN FROM IRISH WATER RECORDS
- PROPOSED 100mm WATERMAIN
- EXISTING 100mm WATERMAIN
- INDICATIVE LOCATION OF EXISTING 100mm WATERMAIN TO BE DECOMMISSIONED
- EXISTING 100mm WATERMAIN TO BE DECOMMISSIONED
- H — FIRE HYDRANT
- SV — SLUICE VALVE
- SCV — SCOUR VALVE
- AV — AIR VALVE
- PROPOSED STOPCOCK AND WATER METER BOUNDARY BOX

Rev	Date	Description	By	Chkd.
P01	MAR '21	Planning Issue	AO'S	KH

Client: comhairle chontae na mí meath county council

Project:

DEVELOPMENT AT
ST. FRANCIS PARK,
CO. MEATH

Title:

PROPOSED
WATERMAIN LAYOUT

Scale @ A1: 1:250

Prepared by: AO'S | Checked: KH | Date: March 2021

Project Director: Brian Carroll

Status: PLANNING

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www.tobin.ie

Drawing No.: 7997-2020 | Revision: P01

THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND ITM COORDINATE SYSTEM

LEGEND

- SITE BOUNDARY
- PROPOSED TARMAC ROAD SURFACE
- PROPOSED CONCRETE FOOTPATH WITH NON- SLIP FINISH
- PROPOSED PARKING AREAS
- 99.999 PROPOSED LEVEL
- PROPOSED DROPPED KERB

48.810 48.860 48.810 48.760 48.810 48.960 49.060 48.860 48.900 48.740 48.710 48.760 48.860 48.660 48.660 48.610 48.510 48.410 48.310 48.210 48.110 48.060 48.000

5.60

Insitu Kerb to Detail Design

Proposed Raised Table at Entrance

Existing Pumping Station

2.4m x 23m SIGHTLINE

2.4m x 23m SIGHTLINE

Rev	Date	Description	By	Chkd.
P01	MAR '21	Planning Issue	AO'S	KH

Client: comhairle chontae na mí meath county council

Project:

DEVELOPMENT AT ST. FRANCIS PARK, CO. MEATH

Title:

PROPOSED HARDSTANDING LAYOUT & SITE LEVELS

Scale @ A1: 1:250

Prepared by:	Checked:	Date:
AO'S	KH	March 2021

Project Director: Brian Carroll

Status: PLANNING

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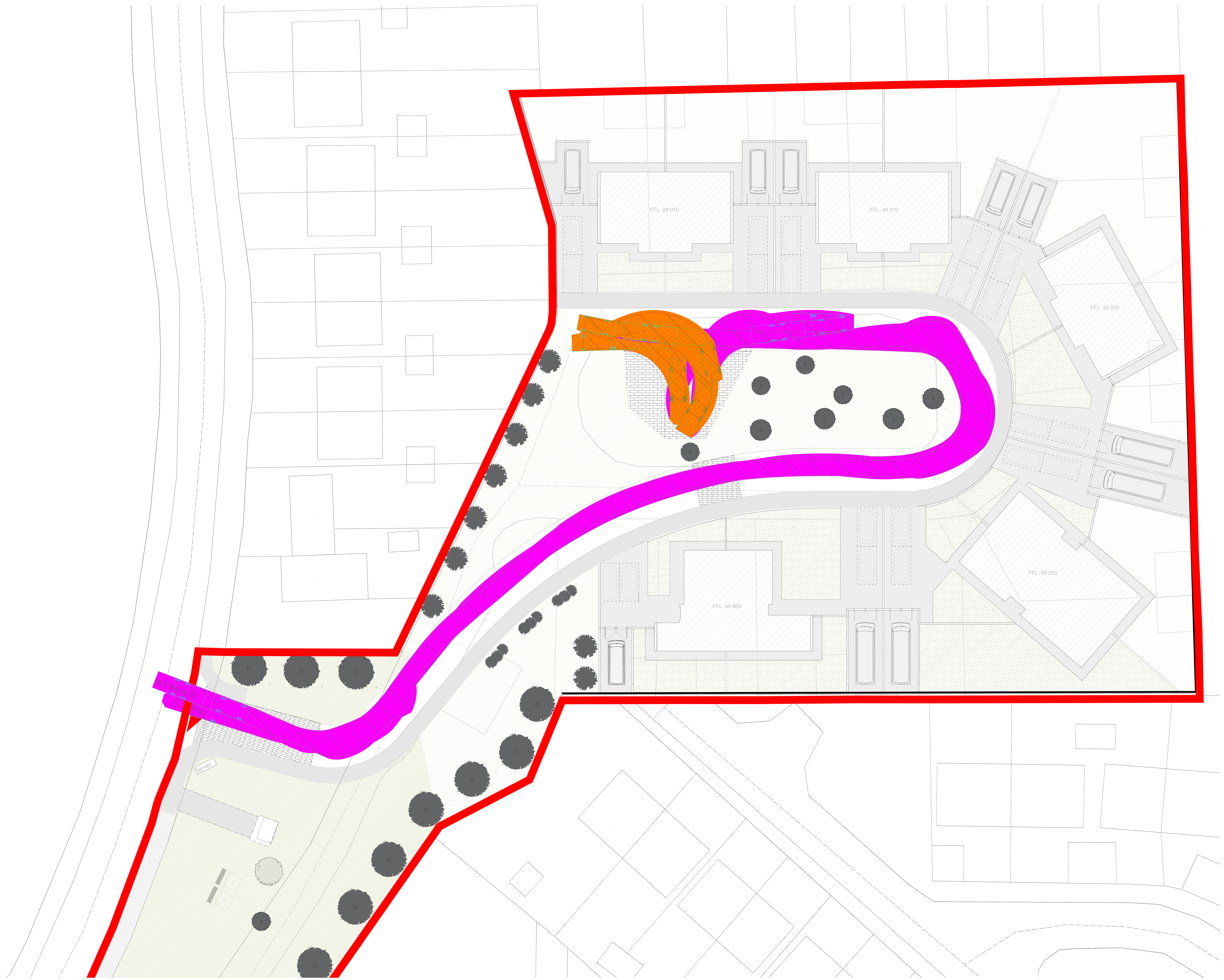
Drawing No.: 7997-2030 Revision: P01



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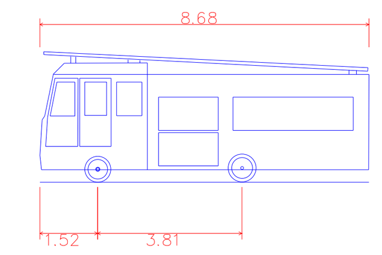

DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	7.910m

Rev	Date	Description	By	Chkd.
P01	MAR-21	ISSUED FOR PLANNING	PK	KH

Client: comhairle chontae na mí meath county council

Project:

DEVELOPMENT AT ST. FRANCIS PARK, CO. MEATH

Title:

AUTOTRACK LAYOUT FIRE TENDER

Scale @ A1: 1:250

Prepared by: PK | Checked: KH | Date: MAR-21

Project Director: Brian Carroll

Status: PLANNING

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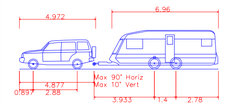
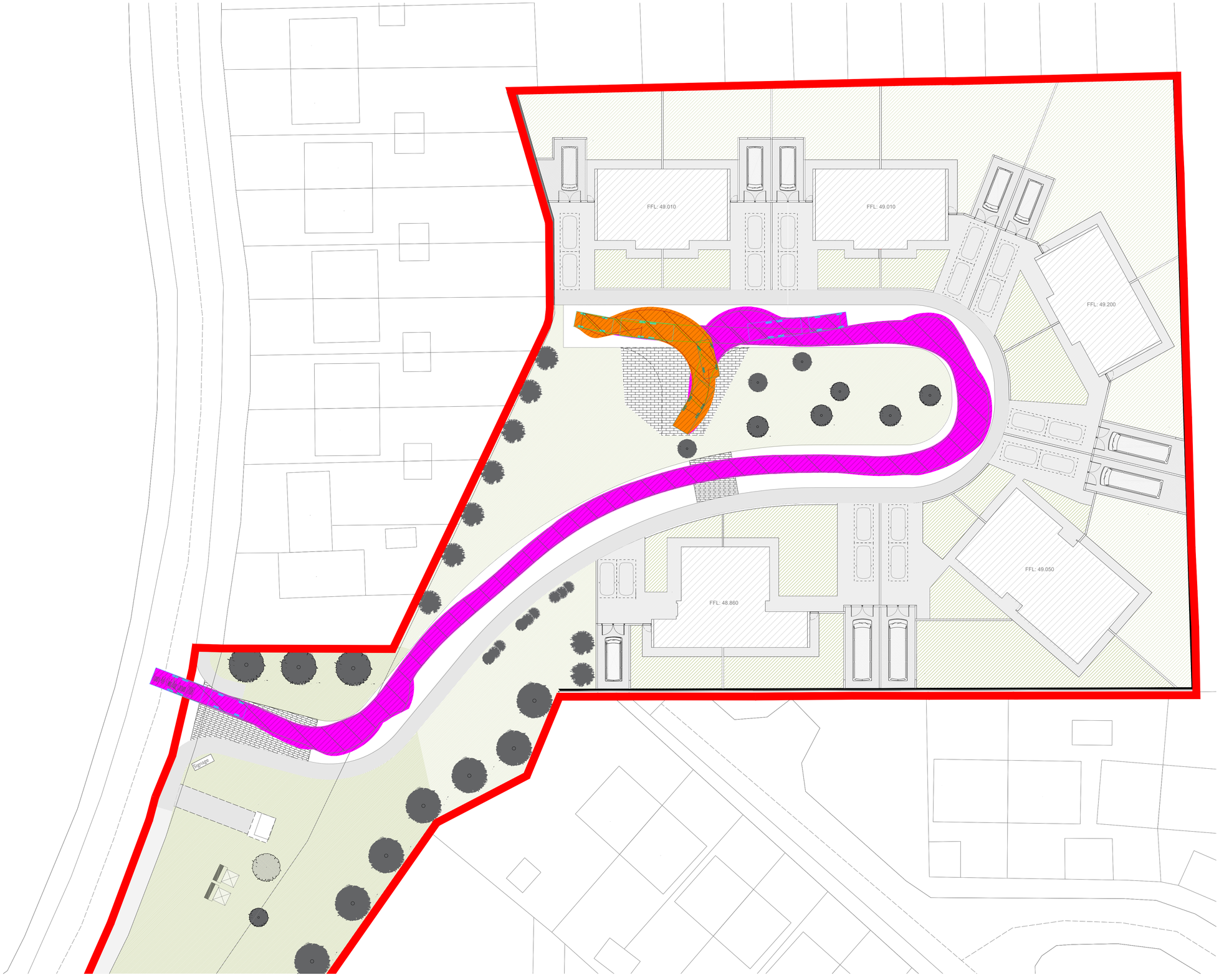
Drawing No.: 7997-2090

Revision: P01

THE INFORMATION ON THIS DRAWING IS TO THE ORDNANCE SURVEY IRELAND ITM COORDINATE SYSTEM



Luxury 4x4 +Twin Axle Caravan (2006)	
Overall Length	12.990m
Overall Width	2.286m
Overall Body Height	2.524m
Min Body Ground Clearance	0.251m
Max Track Width	2.130m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.800m



Rev	Date	Description	By	Chkd.
P01	MAR-21	ISSUED FOR PLANNING	PK	KH

Client:
comhairle chontae na mí
meath county council

Project:
DEVELOPMENT AT
ST. FRANCIS PARK,
CO. MEATH

Title:
AUTOTRACK LAYOUT
CAR WITH CARAVAN

Scale @ A1:	1:250	
Prepared by: PK	Checked: KH	Date: MAR-21
Project Director:	Brian Carroll	
Status:	PLANNING	

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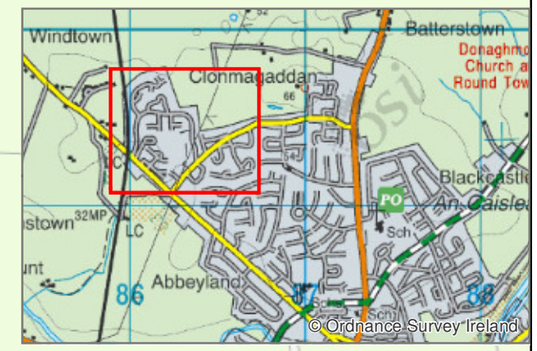
Drawing No.: 7997-2091
Revision: P01

Appendix 2 – Existing Services

Existing Wastewater and Surface Water Infrastructure

Map Template Design: kcarroll@water.ie

N



Sewer Network Records, Navan Town (North West) Navan, Co. Meath

UISCE ÉIREANN : IRISH WATER

Legend

Sewer Mains
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Overflow
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Syphon - Overflow
- Overflow

Sewer Manholes
- Standard
- Other; Unknown

Pump Station
- Pump Station

Surface Water Mains
- Surface Gravity Mains
- Surface Gravity Mains Private

Storm Manholes
- Standard
- Other; Unknown

Storm Discharge Points
- Outfall

80 40 0 m

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3:	1:2,500
Drawing No.:	NVN-WW-03-04
Drawn By:	S. Johnston
Checked By:	
Approved By:	
Drawn Date	05/11/2018
Checked Date:	
Approved Date:	

Appendix 3 – Foul Drainage Calculations

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Unit

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Calculation Method	EN 752	Maximum Backdrop Height (m)	1.500
Frequency Factor	0.50	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	41.314	0.636	65.0	0.000	36.0	0.0	1.500	o	225	Pipe/Conduit	
F1.001	9.131	0.127	72.0	0.000	9.0	0.0	1.500	o	225	Pipe/Conduit	
F1.002	10.565	0.127	83.0	0.000	18.0	0.0	1.500	o	225	Pipe/Conduit	
F1.003	6.642	0.075	88.0	0.000	9.0	0.0	1.500	o	225	Pipe/Conduit	
F1.004	19.743	0.215	92.0	0.000	9.0	0.0	1.500	o	225	Pipe/Conduit	
F1.005	22.871	0.233	98.0	0.000	9.0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	14.337	0.146	98.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	14.553	0.149	98.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.008	34.165	0.349	98.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	
F1.009	6.818	0.070	98.0	0.000	0.0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	47.345	0.000	0.0	36.0	0.0	35	0.75	1.43	56.7	3.0
F1.001	46.709	0.000	0.0	45.0	0.0	38	0.75	1.35	53.8	3.4
F1.002	46.583	0.000	0.0	63.0	0.0	43	0.75	1.26	50.1	4.0
F1.003	46.455	0.000	0.0	72.0	0.0	45	0.75	1.22	48.7	4.2
F1.004	46.380	0.000	0.0	81.0	0.0	47	0.75	1.20	47.6	4.5
F1.005	46.165	0.000	0.0	90.0	0.0	49	0.75	1.16	46.1	4.7
F1.006	45.932	0.000	0.0	90.0	0.0	49	0.75	1.16	46.1	4.7
F1.007	45.786	0.000	0.0	90.0	0.0	49	0.75	1.16	46.1	4.7
F1.008	45.637	0.000	0.0	90.0	0.0	49	0.75	1.16	46.1	4.7
F1.009	45.288	0.000	0.0	90.0	0.0	49	0.75	1.16	46.1	4.7

Appendix 4 – Surface Water Drainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	17.300	Add Flow / Climate Change (%)	20
Ratio R	0.329	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.900	Min Slope for Optimisation (1:X)	250

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	41.000	0.373	110.0	0.096	4.00	0.0	0.600	o	375	Pipe/Conduit	
1.001	11.068	0.101	110.0	0.058	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.002	12.422	0.113	110.0	0.058	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	7.968	0.072	110.0	0.060	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	19.896	0.181	110.0	0.061	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	21.512	0.196	110.0	0.063	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	14.682	0.133	110.0	0.064	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	16.030	0.146	110.0	0.044	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.008	31.814	0.289	110.0	0.042	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.009	22.639	0.206	110.0	0.038	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.010	18.483	0.370	50.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.40	47.195	0.096	0.0	0.0	3.1	1.73	190.7	18.7
1.001	50.00	4.50	46.822	0.154	0.0	0.0	5.0	1.73	190.7	30.0
1.002	50.00	4.62	46.722	0.212	0.0	0.0	6.9	1.73	190.7	41.3
1.003	50.00	4.70	46.609	0.272	0.0	0.0	8.8	1.73	190.7	53.0
1.004	50.00	4.89	46.536	0.333	0.0	0.0	10.8	1.73	190.7	64.9
1.005	50.00	5.10	46.355	0.396	0.0	0.0	12.9	1.73	190.7	77.2
1.006	50.00	5.24	46.160	0.460	0.0	0.0	14.9	1.73	190.7	89.7
1.007	50.00	5.40	46.026	0.504	0.0	0.0	16.4	1.73	190.7	98.3
1.008	50.00	5.70	45.881	0.546	0.0	0.0	17.7	1.73	190.7	106.5
1.009	50.00	5.92	45.591	0.584	0.0	0.0	19.0	1.73	190.7	113.9
1.010	50.00	6.04	45.286	0.584	0.0	0.0	19.0	2.57	283.6	113.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.900	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.900
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	17.300	Storm Duration (mins)	30
Ratio R	0.329		

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.329
Region	Scotland and Ireland	Cv (Summer)	0.900
M5-60 (mm)	17.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Summer	100	+20%	100/15 Summer			
1.001	2	15 Summer	100	+20%	100/15 Summer			
1.002	3	15 Summer	100	+20%	100/15 Summer			
1.003	4	15 Summer	100	+20%	30/15 Summer			
1.004	5	15 Summer	100	+20%	30/15 Summer			
1.005	6	15 Summer	100	+20%	30/15 Summer			
1.006	7	15 Summer	100	+20%	30/15 Summer			
1.007	8	15 Summer	100	+20%	30/15 Summer			
1.008	9	15 Summer	100	+20%	30/15 Summer			
1.009	10	15 Summer	100	+20%	30/15 Summer			
1.010	Seperator	15 Summer	100	+20%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	47.711	0.141	0.000	0.30		52.8	SURCHARGED	
1.001	2	47.641	0.443	0.000	0.52		65.1	SURCHARGED	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

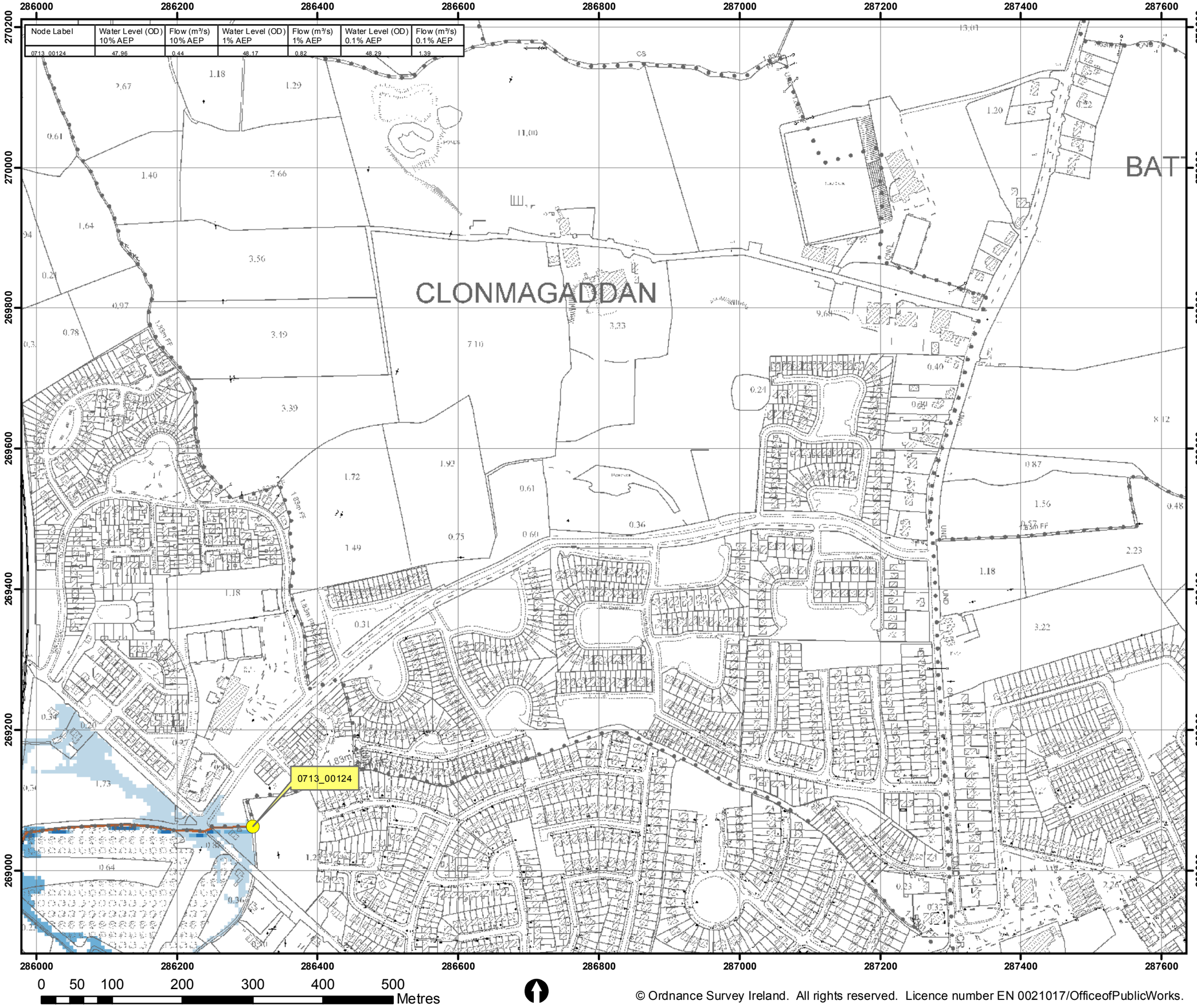
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.002	3	47.530	0.433	0.000	0.65		86.0	SURCHARGED	
1.003	4	47.403	0.419	0.000	1.02		108.9	SURCHARGED	
1.004	5	47.301	0.390	0.000	0.81		128.7	SURCHARGED	
1.005	6	47.149	0.419	0.000	0.91		147.8	SURCHARGED	
1.006	7	47.001	0.466	0.000	1.20		171.2	SURCHARGED	
1.007	8	46.823	0.421	0.000	1.28		190.7	SURCHARGED	
1.008	9	46.593	0.337	0.000	1.22		207.1	SURCHARGED	
1.009	10	46.153	0.186	0.000	1.37		223.3	SURCHARGED	
1.010	Seperator	45.581	-0.080	0.000	0.96		225.7	OK	

Appendix 5 – Flood Mapping

CFRAM mapping

Past Flood Event Local Area Summary Report

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
0713_00124	47.96	0.44	48.17	0.82	48.29	1.39



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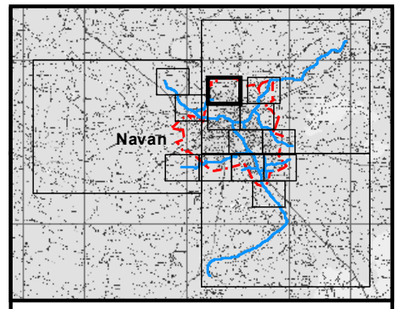

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

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

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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_13

Map Series : Page 13 of 16

Drawing Scale : 1:5,000 @A3

Past Flood Event Local Area Summary Report

Report Produced: **18/3/2021 16:24**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.

Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

9 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Windtown Navan Nov 2000 (ID-712)	06/11/2000	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
2.	Boyne Navan Nov 2000 (ID-417)	06/11/2000	Approximate Point
	Additional Information: Reports (9) Press Archive (3)		
3.	Blackwater Navan Nov 2000 (ID-418)	07/11/2000	Approximate Point
	Additional Information: Reports (4) Press Archive (1)		
4.	Boyne Navan Nov 2002 (ID-420)	15/11/2002	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
5.	Blackwater Kells Dunpatrick Recurring (ID-709)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
6.	Moatville Housing Estate Navan Recurring (ID-716)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (1)		

	Name (Flood_ID)	Start Date	Event Location
7.	Raish Court Navan Recurring (ID-718)	n/a	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
8.	Blackwater Liscarton Dec 1978 (ID-1946)	27/12/1978	Approximate Point
	Additional Information: Reports (1) Press Archive (3)		
9.	Boyne Navan Nov 1965 (ID-1982)	17/11/1965	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		

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