

Rialtas na hÉireann Government of Ireland

Tionscadal Éireann Project Ireland 2040



Comhairle Contae **Lú Louth** County Council



Ardee FLOOD RELIEF SCHEME

ARDEE EMERGING OPTIONS PUBLIC CONSULTATION 25TH NOVEMBER 2022



Scheme Introduction

- 1. Dundalk, Blackrock and Ardee flood relief scheme development is the continuation from the Neagh Bann Catchment Flood Risk Assessment (CFRAM).
- 2. The CFRAM study has identified potential flood hazards and flood risks in the study area.
- 3. Identified existing structural and non-structural options for effective flood risk management.



Scheme Introduction

Nicholas O'Dwyer / Binnies JV have been tasked to:

- 1. Prepare flood relief scheme for the CFRAM flood risk areas.
- 2. Review previous studies (CFRAM), update catchment information and hydraulic model for the study area.
- 3. Assess number of flood defense options and check response in flood risk scenario.
- 4. Determine Design Protection Level for Flooding this is usually 1%AEP or 100 year flood event
- 5. Prepare Designs for the preferred scheme that is social, economically and environmentally acceptable



Stage I: Options Assessment & Scheme Development

- Topographic & CCTV Surveys Completed •
- Hydrological Analysis Completed
- Hydraulic Modelling Completed
- Environmental Surveys & Assessments *In Progress*
- Options & Scheme Development *Ongoing*



Stage II: Planning

Project Stages

Stage III: Detailed Construction Design & Tender

Stage IV: Construction

Stage V: Handover

Rathgory Watercourse



Ardee Timelines for Stage I - V

Ardee FRS

Activity	202	0	202	1	202	2	202	3	202	4	202	5	202	6	202	7	202	8	202	9	203	0
Stage I - Scheme Development & Design																						
Stage II - Planning/Development Consent																						
Stage III - Detailed Design and Tender																						
Stage IV - Construction																						
Stage V - Handover of Works																						



NICHOLAS O'DWYER

Drainage catchment Watercourses:

- River Dee
- Mullameelan Stream
- Rathgory Stream
- Cappocksgreen Stream
- Boharnamoe stream
- Mullameelan & Rathgory Watercourses drain to River Dee via modified open channels and underground storm water culverts (pipes) along the N2, through residential properties and down Stoney Lane outfalling to River Dee at Riverside Apartment complex upstream of Bridge St Bridge
- Culverts are referred to on maps as C1, C2, C3, C4, C5 & C6



Overview of Mullameelan , C5, Rathgory C4 , C6



Flood Risk Potential for 100 Year Event:

- Flooding occurring in natural floodplain.
- The culverts have debris and siltation build up
- C4 and C6 might be partially blocked resulting in water heading downstream on the road due to natural elevation. The channels alongside roads are overgrown

Flooded Areas identified by the Modelling



Overview of Mullameelan, C5 and Rathgory C4, C6

















Overview of Mullameelan, C1, Mullameelan, C3, C2

Flood Risk Potential for 100 year Event:

- The C1 & C2 culverts have insufficient storage.
- The flooding along C3 culvert shows Complete inadequacy in size and design.

Flooded areas by Model























Overview of Cappocksgreen

 Low capacity of existing stream – lands flooded







Overview of River Dee

- Green area on river left liable to some flooding of green area.
- Some flooding of green area adjacent to Wastewater Treatment Plant

Flooded areas by Model



Overview of area River Dee from Cuirt na hAbhann to Wastewater Treatment Plant







Emerging Preferred Options from NOD/Binnies

- A number of local interventions (14) were considered to alleviate flooding in the areas in Ardee
- The 4 options outlined are combinations of several of these proposed interventions to reduce the overall flood risk in Ardee
- The proposed interventions are shown in more detail in the following slides
- The preferred option following consultation will be assessed with regard to environmental, social and economic sustainability as well as climate adaptability



Options Considered to alleviate flooding from 100yr Event:

ltem	Proposed Flood Alleiation Works	OPTION A	OPTION B	OPTION C	OPTION D
	1New Online Flood Storage west of N2 on Mullameelan Stream	Y	N	N	Y
	2Stoney Lane Culvert Upgrade - Culvert C3	Y	Y	Y	N
	3Stoney Lane Outfall Channel Upgrade to River Dee - Culvert C3	Y	Y	Y	N
	4N2 to Stoney Lane Channel Improvements - Culvert C2	Y	Y	Y	N
	5 Cherrybrook Estate Access Road - Linked to Culvert C1	Y	Y	Y	Y
	6Short Culvert Upgrades (Lidl to Cherrybrook)	Y	Y	Y	Y
	7Short Culvert Upgrades (Lidl to Cherrybrook)	Y	Y	Y	Y
	8 Culvert Bypass along N2 from Culvert C5 to C4	N	Y	N	N
	9Culvert C6 Rathgory. Rear of Lidl	Y	Y	N	Y
-	0Culvert C5. Crossing the N2	v	N	v	v
1	1 ocal Bund/ wall at head of Culvert C4	v	v	v	v
	2 Proposed Bathgory Stream Linstream Flood Storage	N	N	v	N
	2 Proposed Natigory Stream Upstream Flood Storage		N N	T Y	N N
		N	N	Y	I IN
	4 Diversion channel and culvert from C1 to the River Dee	N	N	N	Y

1. Mullameelan On-Line Storage west of N2

- Flows breach banks flooding agricultural fields. Overground flows from C5 re-enter main channel
- Online storage area to attenuate flows upstream of Culvert C4.
- Potential to landscape area and increase amenity value
- Land purchase required
- Environmental considerations / potential biodiversity gain







2. Upsize Culvert C3 Inlet - Stoney Lane



Upgrade the initial section of the culvert 1m x 1.5m, provide

a new screen and undertake channel improvements as

Existing small culvert inlet with rustic screen resulting in flows breaching banks, overtopping and extensive flows along Stoney Lane.



required.

2. Upsize Culvert C3 - Stoney Lane





Extreme Flows overtop at the inlet flow overground along Stoney Lane until they re-enter the River Dee.

There are multiple existing changes in dimensions, alignment, cross section and gradients in the existing culvert which cause flow restrictions.

Upgrade selected sections of the culvert as follows:

- C.100m of twin 900mm pipes changed to 1.0m x 2.0m PCC Box Culvert,
- C.164m of 1.0m x 1.5m Culvert changed to 1.0m x 2.0m PCC Box Culvert,
- C.20m of 1.3m x 0.95m Culvert changed to 1.0m x 2.0m PCC Box Culvert,
- New inlet and screen at upstream end,
- New open channel at outlet (see next slide).

The above works resolve the overground flooding on Stoney Lane.

3. Culvert C3 - Stoney Lane Outlet



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River view restricted

 Redevelop park to provide larger improved and landscaped channel with potential for increased Public amenity and biodiversity gain.



4. Upsize Culvert C2 - N2 to Stoney Lane



Mix of Culvert and Open Channel resulting in localised flooding at open channel.

Improvements to open channel and upgrade of C3 Inlet at Stoney Lane resolves localised flooding.



5. Cherrybrook Estate

Stone-lined channel and piped road crossing at Cherrybrook Estate entrance resulting in restriction.





Upgrade the culvert at the Cherrybrook entrance to a 1.0m x 1.5m PCC Box Culvert and repair channel stonework.



6/7. Short Culverts (Lidl to Cherrybrook)



5 No. existing locations with different size / configurations of pipes – localised restrictions.

Upgrade all of the individual pipe to 1.0m x 1.5m PCC Box Culverts for consistent flows.



8. New Culvert Bypass along N2 from C5 to C4



Alternative to online Storage west of N2

- New 525mm culvert 350m long from Culvert C5 at Mullameelan to C4 at Rathgory along N2.
- Avoids crossing N2
- Avoids need for inline storage west of N2
- Low maintenance
- Potentially low environmental impact
- Some land/ wayleave may be required
- Trees may need to be replaced





9. Culvert C6 North of Lidl



Existing 500mm dia pipe is undersized, flows breaching banks causing overground flooding. CFRAMS included walls in this area.

Add a new 525mm dia. pipe to supplement existing. Provide earthwork embankments & channel improvements or walls.



10: Culvert C5 on the N2



Existing 750mm Pipe – Flows breach banks and travel overground at culvert inlet.



Upgrade to 1.0m x 1.0m PCC Box Culvert – Flows contained in channel and surface flooding route eliminated.



11. Bund / Wall at C4 on the N2



Existing Culvert – minor flooding upstream.



Wall at entrance to C4 culvert to contain flow



12/13 Storage Alternatives





Upstream Storage at Rathgory & Mullameelan

- Rathgory Storage Volume estimate 21,500m3 (Peak level = 37.63mOD; Area = 17,730m2). Maximum discharge downstream is 0.1m3/s (volume = 5,800m3)
- Mullameelan Storage (CFRAM 2): Volume is 51,500m3 (Peak level = 45.00mOD; Area = 64,800m2). Maximum discharge downstream is 2.3m3/s (volume = 263,500m3)
- Large volume of storage required
- Land purchase required
- Works downstream in culverts on Stoney lane and N2 still needed
- Potential environmental impacts
- Economically potentially high cost

15. N2 Flow Diversion Alternative





- intercept all flows at the Culvert C2 Inlet and divert them along new route to River Dee (Red Oval).
- This would remove all of the flows currently flowing through the Stoney Lane Culvert (Blue Oval), thereby negating the need for any works on Stoney Lane.
- This solution would require extensive land acquisition and c.1km of culvert and channel construction works.
- It was calculated to be less cost effective than the Stoney Lane upgrade works.

Sustainability and Biodiversity Solutions

Where possible public amenity and positive biodiversity solutions could be implemented into the proposed schemes in the forms of:

- Channel Rehabilitation and Improvement Areas,
- Naturalised On-Line Flood Storage Area,
- New Landscaped Amenity Parkland Areas;
- Locations for consideration would include:
- Mullameelan Off-Line Storage,
- Stoney Lane Outfall,
- Around the Wastewater Treatment Plant,
- Cuirt na hAbhann Housing Estate,
- Cappocks Green Area.

