Fortunestown Local Area Plan

- Initial Strategic Flood Risk Assessment -



South Dublin County Council

12th August 2011

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1 INTRODUCTION AND BACKGROUND

1.1 Introduction and Context

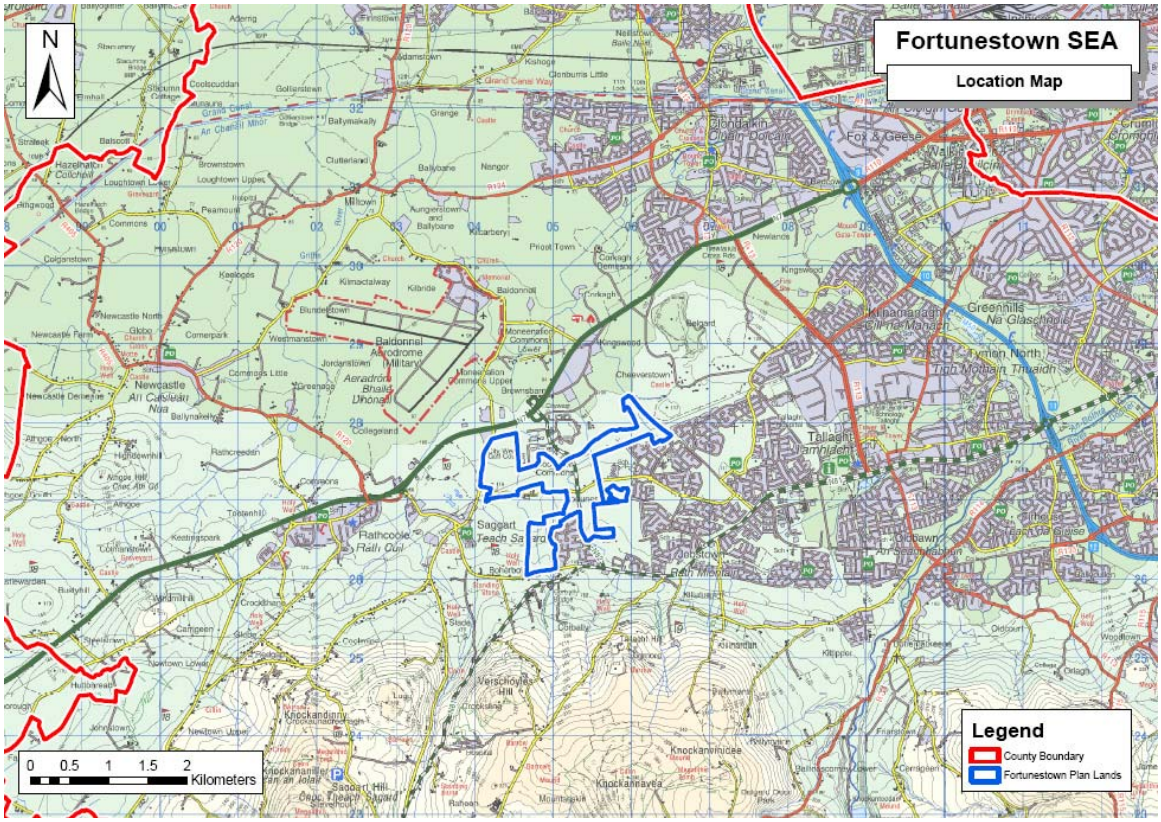
This report is the Initial Strategic Flood Risk Assessment of the Fortunestown Local Area Plan (LAP). The assessment is a requirement for Local Area Plans as set out in *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"* and the ", Regional Planning Guidelines for the Greater Dublin Area 2010~2022".

The lands within the LAP were identified on the basis of:

- Specific Local Objective (SLO) 67 in the South Dublin County Council Development Plan 2010 - 2016, which requires the preparation of a Local Area Plan for circa 33 hectares (82 acres) of lands that were rezoned as 'Objective A1' (To provide for new residential communities in accordance with approved action plans) under the current County Development Plan. The SLO lands straddle Fortunestown Way and were previously zoned 'Objective E' (To provide for Enterprise, Employment and Related Uses) under the South Dublin County Council Development Plan 2004 – 2010.

- The existence of circa 75 hectares (185 acres) of further undeveloped 'Objective A1' zoned lands in the adjoining Cooldown Commons, Boherboy and Saggart.

- The opportunities created by the opening of the Luas Line A1 extension, which traverses the SLO lands and is straddled by the A1 zoned lands in Fortunestown, Cooldown Commons and Saggart.



1.2 Policy Framework

1.2.1 EU Floods Directive

European Directive 2007/60/EC on the assessment and management of flood risks aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

The Directive requires Member States to carry out a preliminary assessment by 2011 in order to identify the river basins and associated coastal areas at risk of flooding[1]. Flood risk maps are required to be drawn up for such zones by 2013. Flood risk management plans focused on prevention, protection and preparedness must be established by 2015.

The Directive is to be carried out in coordination with the Water Framework Directive and Flood Risk Management Plans and River Basin Management Plans.

1.2.2 Flood Risk Guidelines

The recently released *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"* provide the policy framework for Local Authorities. These Guidelines were issued by the Minister of the Environment, Heritage and Local Government under Section 28 of the Planning and Development Act 2000 whereby Planning authorities are required to have regard to the Guidelines in carrying out their functions under the Planning Acts.

The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The key principles that should be adopted by regional and local authorities, developers and their agents should be to:

- Avoid the risk, where possible,
- Substitute less vulnerable uses, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

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[1] It is important to note that compliance with the requirements of *The Planning System and Flood Risk Management - Guidelines for Planning Authorities*, and of the Floods Directive 2007 60/EC is a work in progress and is currently based on emerging and incomplete data as well as estimates of the locations and likelihood of flooding. In particular, the assessment and mapping of areas of flood risk awaits the publication both of Catchment-based Flood Risk Assessment and Management Plans [CFRAMs]. As a result, this Initial Strategic Flood Risk Assessment for the Fortunestown Local Area Plan is based on currently available information.

Accordingly, all information in relation to flood risk is provided for general policy guidance only. It may be substantially altered in light of future data and analysis. As a result, all landowners and developers are advised that South Dublin County Council and its agents can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands in which they have an interest prior to making planning or development decisions.

Issues raised in the Guidelines include: -

- Need to identify and safeguard flood plains;
- Implementation of Sustainable Drainage Systems;
- Flood risk is to be considered in Development and Local Area Plan SEA documents as key environmental criteria.
- The sequential approach to managing flood risks utilizing flood zones is to be undertaken.
- A justification test[2] for development proposed within zones of flooding probability is to be provided.

The Guidelines provide an outline of the stages of a Flood Risk Assessment as follows;

Stage 1 Flood risk identification – to identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation;

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 determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and

Stage 3 Detailed 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, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model of the river cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved.

1.2.3 Greater Dublin Area Regional Planning Guidelines

The Regional Planning Guidelines for the Greater Dublin Area 2010~2022 give regional effect to the National Spatial Strategy and guide the development plans in each Local Authority area. The guidelines have effect for six years.

The Guidelines contain a Regional Flood Risk Appraisal (RFRA), which is a high-level broad-brush appraisal of flood risk across the entire regional authority area, based on existing available information. The impact of flood risk within the context of the Regional Planning Guidelines and decisions regarding future directions of growth is recognised and has been incorporated into the policies of the RPGs, both within the main document and within the Strategic Environmental Assessment process associated with the preparation of the Guidelines as set out below.

Strategic Policy FP1

That flood risk be managed pro-actively at all stages in the planning process avoiding development in flood risk areas where possible and by reducing the risks of flooding to and from existing and future development.

Strategic Recommendations

FR1 New development should be avoided in areas at risk of flooding. Alongside this, the Regional Flood Risk Appraisal recognises the need for continuing investment and development within the urban centres of flood

[2] The Development Management Justification Test from *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"* is replicated in Appendix 1

vulnerable designated growth towns and the City and for this to take place in tandem with the completion of CFRAM Studies and investment in comprehensive flood protection and management.

FR2 Development and Local Area Plans should include a Strategic Flood Risk Assessment and all future zoning of land for development in areas at risk of flooding should follow the sequential approach set out in the Departmental Guidance on Flood Risk Management. All Flood Risk Assessments and CFRAM studies should take place in coordination and consultation with adjoining local authorities and regions and in coordination with the relevant River Basin Management Plans.

FR3 Local authorities should take the opportunities presented to optimise improvements in biodiversity and amenity when including policies and actions in development plans/local area plans (such as flood plain protection and SuDS) for existing and future developments.

FR4 Plans and projects associated with flood risk management that have the potential to negatively impact on Natura 2000 sites will be subject to a Habitats Directive Assessment (HDA) according to Article 6 of the Habitats Directive and in accordance with best practice and guidance.

Role of Local Authorities

Local Authorities must take account of the issues raised in this Regional Flood Risk Appraisal and undertake Strategic Flood Risk Assessment for future plans in line with the Department's Guidance on the Planning System and Flood Risk Management Guidelines.

The RPGs seek to emphasise the need to protect across the GDA the natural flood plains and riparian corridors of all rivers that have not already been built on, and seek that this is explicitly stated and spatially designated in all future Development and Local Area plans following the completion of CFRAMs for the area in question or through using other data from the OPW and existing studies and historical information available, and, where necessary, through additional studies or investigations.

In Preparing Plans

In the preparation of future Development and Local Area Plans, Local Authorities are advised to:

- *Identify and consider at the earliest stage in the planning process flood hazard and potential risk.*
- *Identify flood risk areas on the Development Plan and Local Area Plan maps.*
- *Review existing Development Plans and Local Area Plans to ensure that issues of Flood Risk has been addressed in a manner consistent with the Flood Risk Management Guidelines. Where lands are already zoned for housing or other vulnerable development in flood risk areas, the Council should undertake a re-examination of the zoning in accordance with the sequential approach. RPGs may need to identify Plans which will require a variation to take account of FRA.*
- *Include policies which ensure that flood risk areas targeted for development following the sequential approach should be planned, designed and constructed to reduce and manage flood risk and be adaptable to changes in climate.*
- *Include policies to ensure that flood risk and impact is considered as a key element in the assessment of future waste and mineral planning strategies and developments.*
- *Include policies that ensure that the location of key infrastructure will be subject to FRA.*
- *Include policies on the importance of the inclusion of Sustainable Drainage Systems (SuDS) in future developments, in accordance with the recommendations of the Greater Dublin Strategic Drainage Study Guidelines and Appendix B of the Flooding Guidelines published by the Department and the OPW.*

Protecting Key Assets

Flooding events, whether widespread or extremely localised, can cause serious damage to key infrastructure (e.g. power stations, sub-stations, communication hubs, wastewater treatment plants etc.). The cost of such disruption is significant to business, causes hardship to residents and also can place people in at risk situations. For this reason, it is recommended that on completion of CFRAMs and the identification of areas of

high flood risk in each Council area, that key infrastructure suppliers are advised of the risk to such installations and encouraged to assess current infrastructure for risk and stress test future projects against flood risk, where this has not been previously undertaken.

1.2.4 South Dublin County Development Plan 2010-2016

South Dublin County Council aim "*to facilitate and guide the sustainable development of the County in suitable locations through the continued improvement of water and drainage infrastructural services and appropriate environmental protection and management.*" One of the Council's principal strategies for this is to " ***Ensure that existing and proposed developments are not subject to undue risk of flooding***". A series of policies and objectives are outlined in the County Development Plan as follows;

2.3.9 Ground and Surface Waters.
Applications for large to very large developments shall: Include an assessment of the impacts of climate change on their development and to make provision for these impacts in particular relating to drainage design.

All developments should incorporate:
• Designs and layouts for basements and underground car parks that do not result in any potential for them to flood from within or without;
• Sustainable Urban Drainage Systems (SuDS) that balance the impact of urban drainage through the achievement of control of run-off quantity and quality and enhance amenity and habitat. The website www.irishsuds.com should be consulted for guidance.

The Planning Authority will:
• Discourage culverting of streams unless considered absolutely necessary. Where culverting of a stream is unavoidable it shall be required to obtain a consent from the Office of Public Works in accordance with S.50 of the *Arterial Drainage Act*, 1945;

• Require in developments adjacent to watercourses, that any structure must be set back a minimum distance of 10m from the top of the bank to allow access for channel cleaning and maintenance, unless otherwise agreed with the Planning Authority. This may be increased depending on the size of the watercourse and any particular circumstances;

• Only permit development when satisfied that new and existing developments are not exposed to increased risk of flooding and that any loss of flood storage is compensated for elsewhere in the river catchment;

• When considering planning applications which include significant hard surfacing, attach conditions which seek to minimise and limit the extent of hard surfacing and paving as well as requiring the use of sustainable drainage techniques, including in particular permeable paving or surfaces such as gravel or slate chippings. The aim generally being to reduce run-off rates and flow volumes from parking areas as well as access roads

2.3.12.ii Policy WD6: Sustainable Urban Drainage Systems (SuDS)
It is the policy of the Council to ensure that all development proposals incorporate Sustainable Urban Drainage Systems (SuDS).

2.3.21 Risk of Flooding
One of the effects of climate change that can be anticipated, and a key adaptation issue, is the management of water and the maintenance of quality standards as the global temperature increases and rainfall patterns change. Flood risk needs to be considered at all stages of the land-use planning process and managed in an environmentally sensitive way.

The Planning System and Flood Risk Management: Guidelines for Planning Authorities (2009) are intended to ensure a more rigorous and systematic approach to integrating flood risk management in the preparation of

Development Plans, Local Area Plans and in the determination of planning applications. The Guidelines describe good practice in the consideration of flood risk in planning and development management and aim to integrate flood risk management into the overall planning process from strategic consideration to site specifics.

The core objectives of the Guidelines are to:
• Avoid inappropriate development in areas at risk of flooding;
• Avoid new developments increasing flood risk elsewhere, (including that which may arise from surface run-off);
• Ensure effective management of residual risks for development permitted in floodplains;
• Avoid unnecessary restriction to national, regional or local economic and social growth;
• Improve the understanding of flood risk among relevant stakeholders and Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The key principles of a risk-based assessment to managing flood hazard and potential risk in the planning system are based on a sequential approach as set out in the Guidelines. The sequential approach involves:
• Avoiding development in areas at risk of flooding;
• If this is not possible, consider substituting a land use that is less vulnerable to flooding and
• Only when both avoidance and substitution cannot take place should consideration be given to mitigation and management of risks. Possible exceptions to restriction of development due to potential flood risks are provided for through the use of a Justification Test, whereby the overriding planning need and the sustainable management of flood risk to an acceptable level can be demonstrated.

Based on best practice the Council will promote the following objectives:
• To preserve riparian strips free of development and of adequate width (minimum of 10m from the top of the bank) to permit access for river maintenance;
• To integrate comprehensive flood risk assessment and management in the overall planning process to include forward planning and development management;
• To avoid flood risk to people and property, where possible;
• To seek to manage the risks to acceptable levels through the use of flood relief schemes, and/ or flood-resistant and flood-resilient construction methods, where avoidance is not possible and
• To address flood risk management in the detailed design of development, as set out in Appendix B of the Guidelines.
• To ensure the protection, management, and as appropriate, enhancement, of existing wetland habitats where flood protection/management measures are necessary.

2.3.22 POLICY
2.3.22.i Policy WD13: Risk of Flooding
It is the policy of the Council to fulfill its responsibilities under the Flood Risk Directive 2007/60/EC and to implement the recommendations of the Planning System and Flood Risk Management: Guidelines for Planning Authorities (2009) including using the Guidelines to assess applications for planning permission.

2.3.23 Identified Flood Risk Areas
Where development has to take place in identified floor risk areas, in the case of urban regeneration for example, the type of development has to be carefully considered and the risks should be mitigated and managed through location, layout and design of the development to reduce flood risk to an acceptable level.

Planning applications for development in areas where flood risk may be present will be assessed in accordance with the provisions of The Planning System and Flood Risk Management: Guidelines for Planning Authorities (2009). Where flood risk is potentially considered to be an issue a flood risk assessment should be carried out that is appropriate to the scale and nature of the development and the risks arising. Information on flood risk assessments and the sources of information are contained in the Guidelines.

Where flood risk is present an applicant should address flood risk by adopting a sequential approach in terms of location of uses in areas of lower risk, the consideration of less vulnerable use types and other mitigation through design measures. Sustainable drainage should be integral to the design and formulation of proposals. The Guidelines provide information on how new development in flood risk areas should be planned, designed and constructed to reduce and manage flood risk and be adaptable to changes in climate.

Minor proposals in areas of flood risk, such as small extensions to houses, and most changes of use of existing buildings, are unlikely to raise significant flooding issues, unless they introduce a significant additional number of people into flood risk areas or obstruct important flow paths. A brief assessment of the risk of flooding should accompany any such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. Where new development in flood risk areas is granted permission, the applicant shall supply details of the flood risk, mitigation measures and residual risk to the major emergency management committee (MEMC) of this local authority for inclusion in their major emergency risk assessment protocols.

2.3.24 POLICY

2.3.24.i Policy WD14: Identified Flood Risk Areas

It is the policy of the Council not to permit development in identified flood risk areas, particularly floodplains, except where there are no alternative and appropriate sites available in areas at lower risk that are consistent with the objectives of proper planning and sustainable development.

2.3.25 Flood Risk Assessment and Management Plans

Any recommendations and outputs arising from the Catchment Flood Risk Assessment and Management Plans (CFRAMS) for the County will require to be incorporated into the Development Management process. In partnership with other organizations, the Office of Public Works is developing a series of country-wide CFRAMS. These Plans will establish long-term strategies and programmes for managing flood risk within the relevant river catchment. These Plans will identify areas of floodplain importance for conveyance and natural storage and areas where flood risk management measures may need to be implemented. CFRAMS have commenced for the Dodder and Liffey catchments.

It is an objective of the Council that flood alleviation schemes shall be assessed to ascertain compliance with the requirements of The Planning System and Flood Risk Management: Guidelines for Planning Authorities (2009).

2.3.26 POLICY

2.3.26.i Policy WD15: Flood Risk Assessment and Management Plans

It is the policy of the Council to assist and co-operate with the Office of Public Works in developing Catchment-Based Flood Risk Assessment and Management Plans.

3.2.13.ii Policy EE14: Biodiversity, Flora and Fauna within Employment Priority Areas

It is the policy of the Council to protect and preserve the biodiversity value and significant landscape and cultural heritage features of lands rezoned for Enterprise Priority Two and Three employment uses through requiring design frameworks, which have been informed by site analysis, the location of biodiversity corridors and site features and will provide for new landscaping and a cohesive approach to treatment of roads, footpaths and boundary treatments.

It is an objective of the Council that should further proposals to rezone land for Enterprise Priority Three use arise that this proposal be subject to a Sustainability Assessment.

3.2.13.iii Policy EE15: Natural Features in Enterprise Priority Areas

It is the policy of the Council where existing streams, watercourses, are located on land zoned for Enterprise Priority One, Enterprise Priority Two and Enterprise Priority Three purposes, they should

be protected and incorporated within the overall design for the area, thereby contributing to and connecting into the overall green network policy for the County. Riparian corridors should be kept free from development and be used as amenity for workers and visitors on the site, taking due care to protect and enhance the corridor's native biodiversity resource.

3.2.13.iv Policy EE16: Enterprise Priority Areas and Sustainability
It is the policy of the Council that areas zoned as Enterprise Priority One, Enterprise Priority Two and Enterprise Priority Three employment uses, contribute towards greater sustainability.

Industrial plots may often be characterised by large expanses of hard paving and in order to mitigate the problems associated with this resulting in drainage issues, increased runoff and flooding, proposals are required to incorporate Sustainable Urban Drainage Systems (SUDS) and other measures that address adaptation to climate change including the creation of integrated wetlands, the construction of green/living roofs whereby opportunities for exploiting solar energy and wind energy are taken.

4.3.7.xix Policy LHA21: River and Stream Management
It is the policy of the Council to implement a strategy (prepared on a regional basis) for the management of rivers and streams throughout the County.

The purpose of the strategy is to implement an integrated programme for the management of rivers and streams, dealing with the creation of riparian zones, issues such as nature conservation, flood control, pollution control, general recreation, walking and angling. It will facilitate monitoring of changes in water quality and aquatic habitats, and assist in the preparation of landscape improvement schemes for existing rivers and streams. The strategy will be prepared in consultation with local community and environmental groups, angling organisations and fisheries authorities and should have regard to the *"E.U. Water Framework Directive",(2000)* and the *"EU Floods Directive", (2007).* With respect to river and stream management it is an objective of the Council that existing County flood plain management policy seeks to limit development in identified floodplains and to preserve riparian corridors. Development proposals in river corridors will only be considered providing they:

• Dedicate a minimum of 10m each side of the waters edge for amenity, biodiversity and walkway purposes where practical. This may be increased depending on the size of the watercourse and any particular circumstances;
• Do not have a negative effect on the distinctive character and appearance of the waterway corridor;
• Preserve the biodiversity of the site;
• Do not involve land filling, diverting, culverting or re-alignment of river or stream corridors.

4.3.7.xx Policy LHA22: Watercourses
It is the policy of the Council to protect, maintain, improve and enhance the natural and organic character of the watercourses in the County and to promote access, walkways and other recreational uses of their associated public open space, subject to a defined strategy of nature conservation and flood protection.

SLO 7. Areas of Flooding Potential – Assessment of Planning Applications:
The areas of flooding potential as indicated in the Dodder Catchment Flood Risk Assessment Management Study (CFRAMS) and the OPW alluvial soils floodplain maps are to be taken into account along with the requirements of Section 5 of The Planning System and Flood Risk Management Guidelines (November 2009) when assessing planning applications, with a view to restricting or, if necessary, refusing development proposals within such areas in order to avoid flooding events.

2 CAMAC CATCHMENT DESCRIPTION [3]

2.1. Introduction

"The Camac rises in the Dublin Mountains at Mount Seskin and flows westerly before entering Brittas pond. The river exits Brittas pond and takes a generally north/north-westerly course through South West Dublin passing through Saggart, Clondalkin, Lansdowne Valley, Inchicore and Kilmainham before discharging to the Liffey through a new culvert under Heuston Railway Station just downstream of the Liffey freshwater limit at Islandbridge weir.

The River Camac is approximately 24 km in length, and has a catchment area of approximately 51 km2 and a mean slope of 1.6% over its natural length. Rising at an elevation of 380 m MHD from Mount Seskin the river is fast flowing, particularly in times of flood. Conversely, following any prolonged dry periods, the river is subject to particularly low flows. Historically, flooding in the catchment has posed a problem within the heavily urbanised areas causing damage to adjacent properties. However, some flood alleviation measures have recently been undertaken on the main channel at Corkagh Park and in Clondalkin and along the Robinhood Stream.

The River Camac catchment has significantly different land-use characteristics over its run from source to the River Liffey. The first 13 km of river length between the rivers source and Corkagh Park has a catchment and floodplains that can be classed as predominantly rural. However, the lower parts of this reach are developing rapidly. The remaining catchment from Clondalkin to the outfall at the Liffey contains existing major suburban areas, highly industrialised or older residential areas of Dublin, and a river that is mostly channelised with walled banks. The river drains large areas of residential and industrial lands and also two major roads, the Western Parkway Motorway (M50) and the N7, Naas Road.

The River Camac has nine tributaries along its course and their sub-catchments comprising a total area of 2,825 ha of the total catchment area of 5,108 ha. These tributaries are:

1. *Boherboy Stream*
2. *Brownsbarn Stream*
3. *Fettercairn Stream*
4. *Coolmine Stream*
5. *Robinhood Stream*
6. *Walkinstown Stream*
7. *Gallanstown Stream*
8. *Galblack Stream*
9. *Blackditch Stream*

Of these tributaries, the first four join the Camac between the Naas Road Dual Carriageway and the Corkagh Demesne Park in the developing portion of the River Camac. The remaining five tributaries join the Camac within the vicinity of the Bluebell Industrial area.

2.2 Boherboy Catchment

The 508 ha Boherboy Catchment is the largest predominantly rural sub catchment area that contributes run-off to River Camac. Like the River Camac, the Boherboy Catchment rises at Mount Seskin and consists of localised pockets of urban development at Saggart and a portion of the Fortunestown suburban area. The Boherboy Stream is 4.8 km in length and also falls at a relatively steep mean slope of 6% in its upper reach before flattening considerably in its lower section prior to discharging to the River Camac north of the Naas

[3] The description of the Camac River catchment and the Boherboy, Brownsbarn and Fettercairn Streams and the map extract are taken from the Greater Dublin Strategic Drainage Study – Camac River Catchment Area (August 2006)

Road. Along its route, the Boherboy Stream is culverted under several roads including the Blessington Road (N81), Fortunestown Lane (N82), and the Naas Road (N7).

The development potential in this catchment is quite substantial. A further 68 ha of future development including 36 ha of industrial and 32 ha of residential is proposed for the catchment. The industrial zoning is at City West Business Campus which is developing continuously. There is also a large green belt between Saggart and Westbrook Glen Estate in which low density residential development could be possible in the long term future. If the lands currently zoned for future development are built on it would represent an increase of 380% in urban area within the catchment. All future development will be able to drain directly to the Boherboy Stream via new drainage systems without affecting existing development. The expansion of the Westbrook Glen Estate and an industrial area located downstream of the Naas Road (N7) has been the most significant development within the Boherboy Catchment since the 1990 Stormwater records sheets were drawn.

2.3 Brownsbarn Catchment

The 256 ha Brownsbarn catchment, rising just south of the Naas Road, includes approximately 75 ha of urban area and 181 ha of rural area. The urban area comprises the developing City West area and Fortunestown areas. The catchment drains to the 3.2 km long Brownsbarn Stream that heads in a northerly direction to join the River Camac at reach 3, just south of Baldonnel House. According to the River Camac Improvement Scheme Phase II (B. Whyte, F. Coffey, 1997), runoff from City West development is controlled by a hydrobrake system.

The Brownsbarn catchment contains the largest area of planned development draining to a single stream in the River Camac catchment. Zoned future development consists of approximately 30 ha of residential development and 128 ha of industrial and commercial development at the City West Business Campus, which is continuously expanding and, when complete, will result in a highly urbanised catchment..

2.4 Fettercairn Catchment

The 293 ha Fettercairn Catchment comprises 91 ha of urban and 202 ha of rural land use. There is a 77 ha area adjacent to the subcatchment which drains to Belgard Quarry. The catchment rises from the Fortunestown urban development near Tallaght and includes two primary pipe networks, each consisting of a 1350 mm trunk drain. The two primary networks discharge to a single 1800 x 1500 mm box culvert located north of the urban area and outfalling to the head of the 1.5 km Fettercairn Stream. The stream generally flows northwards in open channel, traversing the Naas Road via culvert, and discharging to the River Camac just west of Corkagh Demesne Park.

There are currently 59 ha of planned future industrial development and 12 ha of planned future residential development. This equates to an increase of approximately 90% in urban area, within this catchment. The future industrial development in the catchment is part of a large industrial development zoning in the SDCC development plan, which includes the existing City West Business Campus. Run-off from the future development areas will most likely drain into either the existing core drainage network in the upper portion of the catchment, or directly to the Fettercairn Stream via its own local drainage network in the lower portion of the catchment."

STRATEGIC FLOOD RISK APPRAISAL FOR FORTUNESTOWN

3.0 Introduction

The Fortunestown LAP area is fully within the Camac River and the stream catchments of Boherboy, Brownsbarn and Fettercairn. The flood risk information sources in relation to this area of the catchment are alluvial soils as a surrogate for Flood Risk, OPW recorded Flood Events, the *Greater Dublin Strategic*

Drainage Study – Camac River Catchment Area (August 2006) and indicative Flood Risk mapping from JBA Consulting.

3.1 Identification of flooding incidences within the Local Area Plan area.

3.1.1 Review of OPW National Flood Hazard Mapping website-find and identify flood zone maps.

A review of the OPW National Flood Hazard Mapping website has been undertaken. A number of flooding points were identified in the Fortunestown area. These points are identified on the attached OPW Summary Local Area Report, see Appendix II. The historical flooding information from the website within the LAP area has recorded a single flood event point just north of the City West Shopping Centre where local flooding resulted in the 12 hour closure of Fortunestown Lane in November 2000 (the OPW National Flood Mapping Website).

The website also includes information on a range of flood surrogate information. There are no "Benefiting Lands" or "Land Commission and Drainage District Maps" indicated within the area.

A desk study review of older Ordnance Survey maps (25" and 6") was also undertaken, with a view to noting areas where 'liable to flood' had been recorded. None of the maps for the Fortunestown area indicated such places.

3.1.2 Mineral Alluvial Soil Mapping

The soils and subsoils maps were created by the Spatial Analysis Unit, Teagasc. The project was completed in May 2006 and was a collaboration between Teagasc, Geological Survey of Ireland, Forest Service and the EPA. The presence of alluvial soils can indicate areas that have flooded in the past (the source of the alluvium). There is no indication of alluvial soils in the Plan area.

3.1.3 Greater Dublin Strategic Drainage Study – Camac River Drainage Area

The GDSDS modelled and assessed the performance of the existing river and drainage system across almost 50 catchments using InfoWorks, examined the impact of various development options and finally recommended policies, strategies and works to address specific concerns. The model of the rivers included the Camac River and its tributaries including the Boherboy , Brownsbarn and Fettercairn Streams. The pipe network model incorporated the urban areas up as far as Saggart and included the contributing pipe networks to the river and tributaries as far down as the confluence with the River Liffey.

The model consisted of a fully integrated model of the river and urban piped stormwater drainage system. The Camac River and its tributaries were topographically surveyed in order to complete the hydraulic description of the river in terms of channel shape, floodplain and control structures such as weirs, bridges and culverts. Data from a short-term flow survey was used to verify the major piped systems. Long-term river flow data (where available) and short-term flow survey data were also used to calibrate the river flows and depths.

Several key deficiencies were identified by the initial performance review from existing information. The deficiencies were generally identified within the Camac River reach stretching from Clondalkin to just upstream of the Bluebell Industrial area.

The model was also used to assess the performance of the River Camac using the 100-year rainfall event combined with high water spring tides. Analysis of the hydraulic performance identified almost 30 individual sites in the urban catchment on which properties are at risk of flooding. Large reaches in the rural portion of the catchment were also at risk of bank overtopping however in most of these cases properties were not at

risk of inundation by flood waters. A series of sites within the urban area (from Corcagh Park, Clondalkin downstream) which required the implementation of flood alleviation measures were listed.

An assessment of the impact of 2011 and 2031 development scenarios for future development were undertaken and changes in deficiencies were identified. The majority of planned development in the catchment was located in the undeveloped but zoned upper reaches of the catchment, which lie in the South Dublin County administrative area. Any development in the catchment after the 2011 design horizon was assumed to incorporate SuDS technology designed for the 100-year event and would therefore not affect runoff volumes.

A series of hydraulic deficiencies (flooding in the piped network of the catchment) were identified including in the Boherboy and Fettercairn catchments. These were derived by running the 2011 and 2031 models for a series of design events and were used to compare the network hydraulic performance against the 'trigger' levels of service from the Performance Criteria agreed and outlined in the Regional policies.

Performance criteria for the river specified that properties adjacent to the channel should not be at risk of flooding in the 100-year critical event. The critical duration for the Camac was found to be a 420 minute storm. The majority of existing development is in the lower catchment, i.e. downstream of Corkagh Park, and the 30 individual sites found to be at risk are in this portion of the catchment. For the 2011 scenario, levels were not found to increase significantly in the channel. However, introduction of climate change in the 2031 scenario results in greater peak water levels and increased risk of property flooding.

No river drainage areas within the Fortunestown LAP area were identified in the 100 year Flood Event scenarios for either 2011 or 2031,

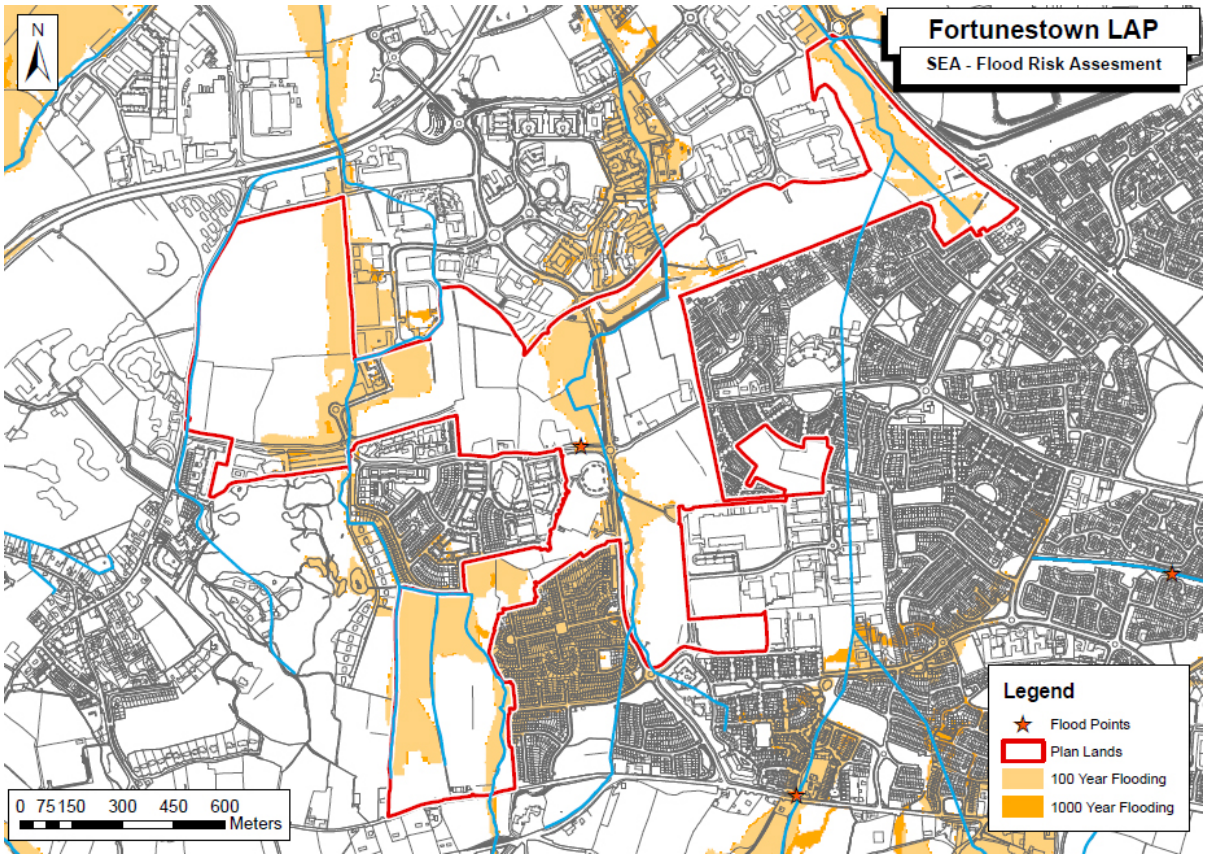
3.1.4 JBA Flood Probability Mapping

The JBA flood probability mapping shows Flood Zones A and B for watercourses identified in the Fortunestown area, in accordance with *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"*. These Flood Zones can be described as follows:

- Flood Zone A - shows the area that could be affected by flooding from rivers, if there were no flood defences. This area contains river flooding from a flood that has a 1% (1 in 100) or greater chance of happening each year.
- Flood Zone B - shows the additional extent of an extreme flood from rivers, without the influence of flood defences. These outlying areas are likely to be affected by a major flood, with between a 1% (1 in 100) and 0.1% (1 in 1000) chance of occurring each year.

The JBA maps are based on broadscale 2 dimensional hydraulic modelling, which routes flows over a Digital Terrain Model based on LiDAR (Light Detection and Ranging). Individual structures such as culverts and bridges have not been modelled.

It should be emphasized that the JBA flood probability maps are intended for guidance purposes, and are not a substitute for detailed hydraulic modeling such as may be required to assess the level of flood risk for a specific development. However, they highlight areas where avoidance of flood risk is easily achieved (i.e. Flood Zone C) and areas where flood risk may exist, and a more detailed assessment should be undertaken.



3.1.5 LAP Area Walk-through

Ground observation within the area indicates three small streams which are tributaries of the River Camac. The most significant is the Boherboy Stream whose source is on the slopes of Knochannavea approximately 2 kilometres from and 200m higher than where the stream enters the plan lands. There is at least one spring in land adjoining the stream (indicated on the Green Infrastructure Map[4]). The second stream flows alongside the N82 and is culverted at either end of its course through the Plan lands. The third stream/ditch, the smallest, is culverted until it emerges adjoining the Outer Ring Road.

The flood probability mapping showing areas of potential flooding in the west Boherboy area may be open to interpretation as there is a fall of 20 metres over 500 metres in this area.

3.1.6 Down-stream improvements on the Camac

South Dublin County Council has initiated a number of major schemes to enhance the surface water drainage in the County including the Camac River Phase II Improvement Scheme which was required to prevent flooding in the Clondalkin area.

3.1.7 Forthcoming Information

The EU 'Floods' Directive requires Member States to prepare catchment-based Flood Risk Management Plans (FRMPs) by 2015 that will set out flood risk management objectives, actions and measures. The OPW

[4] See Appendix 3

in co-operation with various Local Authorities are producing Catchment Flood Risk Assessment and Management Studies. These CFRAMS aim to map out current and possible future flood risk areas and develop risk assessment plans. They will also identify possible structural and non-structural measures to improve the flood risk of the area.

This Initial Strategic Flood Risk Assessment is based on currently available data and in accordance with its status, it will be subject to modification by these emerging datasets of maps and plans as they become available.

SECTION 4 FORTUNESTOWN LAP FLOOD RISK MANAGEMENT POLICIES

Following on from the policy context outlined in Section 1 and from the information currently available to South Dublin County Council in relation to Flood Risk in the Fortunestown area, Section 2, the information and objectives in relation to Flood Risk at present in the Draft Fortunestown LAP[5] is detailed below.

It should be noted as previously described in Section 1.1, the lands within the LAP boundary are already zoned for development and as a consequence, the proposed use of the Justification Test is confined to the Development Management Justification Test[6] only.

4.9 Flood Risk (extract from LAP)

The Plan Lands are situated within the catchment of the River Camac. A number of small streams also flow directly off the foothills of the Dublin Mountains and through these lands.

Flood risk information sources on the Plan Lands comprise information on alluvial soils as a surrogate for Flood Risk, OPW recorded Flood Events, and indicative flood risk mapping from JBA Consulting.

In accordance with the requirements of 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (2009), the indicative flood risk mapping from JBA Consulting includes details on flood zones (Flood Zone A and Flood Zone B) for each watercourse that traverses the Plans Lands in terms of flood risk assessment. These flood zones are illustrated in Figure 4.4 as 100 year (Flood Zone A) and 1,000 year (Blood Zone B) zones.

Flood Zone A comprises the area that could be affected by flooding from rivers, if there were no flood defences, and relates to a flood that has a 1% (1 in 100) or greater chance of happening each year.

Flood Zone B comprises areas that include and extend beyond Flood Zone A that could be affected by flooding from rivers, if there were no flood defences, and relates to a major flood event that has a chance of occurring between 1% (1 in 100) and 0.1% (1 in 1000) each year.

The JBA flood probability information is intended for guidance purposes, and is not a substitute for detailed hydraulic modeling that may be required to assess the level of flood risk for a specific development.

The OPW historical information includes a record of a single flood event point just north of the City West Shopping Centre where local flooding resulted in the 12 hour closure of Fortunestown Lane in November 2000.

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[5] It should be note that the full range of policies and objectives contained within the South Dublin County Council Development Plan 2010 – 2016 will apply to all development proposals within the Fortunestown Local Area Plan.

[6] The Development Management Justification Test from *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"* is replicated in Appendix 1

5.3.2 Incorporation of Watercourses within Green Infrastructure Network (extract from LAP)

The three streams that occur within the Plan Lands provide opportunity in terms of maintaining biodiversity and improving amenity but there are also implications in terms of developing adjoining lands.

The development of greenfield sites will reduce the extent of permeable land for natural drainage and increase surface water run-off. Using SUDS techniques, water should be infiltrated or conveyed more slowly to watercourses via ponds, swales or other installations.

It is therefore an objective of the proposed Local Area Plan that:

- A 10-15 metre (min) corridor (measured from the top of the bank) shall be maintained either side of the sections of watercourse that are designated for preservation under the proposed Local Area Plan. These corridors shall protect, improve and enhance the natural character of the streams and accommodate pedestrian and cycle corridors. Culverting of sections of watercourses that are designated for preservation will not be permitted. (Objective GI4)

- The use of SUDS is a requirement for all new developments in order to reduce surface water run-off and to minimise the risk of flooding of the Plan Lands and surrounding lands. Existing springs will be protected and maintained and incorporated into SUDS. (Objective GI5)

5.3.4 Flood Risk Management (extract from LAP)

The requirements of the 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009), need to be taken into account in order to ensure that flooding within the Plan Lands does not impact on human health, property, the ability to meet the requirements of the EU Water Framework Directive, or need to protect biodiversity.

In assessing development proposals in areas identified at risk of flooding (see Green Infrastructure Map Fig. 4.4) South Dublin County Council will adopt a risk-based sequential and balanced approach, while at the same time allowing consideration of appropriate and necessary development, including the application of the Justification Test in accordance with Polices WD13 (Risk of Flooding) and WD14 (Identified Flood Risk Areas) of the South Dublin County Council Development Plan. It is therefore an objective of the proposed Local Area Plan that

- All planning application for residential and/or commercial floorspace on sites in areas at risk of flooding shall be accompanied by a Flood Risk Assessment that is carried out at the site-specific level in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (2009). The scope of flood risk assessment shall depend on the type and scale of development and the sensitivity of the area. (Objective GI7)

5. CONCLUSION

The content of this Initial Strategic Flood Risk Assessment is based on currently available information as well as estimates of the locations and likelihood of flooding. In particular, the detailed assessment and mapping of areas of flood risk awaits the publication both of Catchment-based Flood Risk Assessment and Management Plans [CFRAMs]. Despite this, the Flood Risk mapping does indicate areas where flood risk may exist and where more detailed assessment should be undertaken and indicates areas where the Development Management Justification Test and Site –Specific Flood Risk Assessments will be required in the event of development proposals.

Box 5.1 Justification Test for development management (to be submitted by the applicant)

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
   - (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
   - (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
   - (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
   - (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

The Development Management Justification Test from *"The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009"*

OPW *National Flood Hazard Mapping*

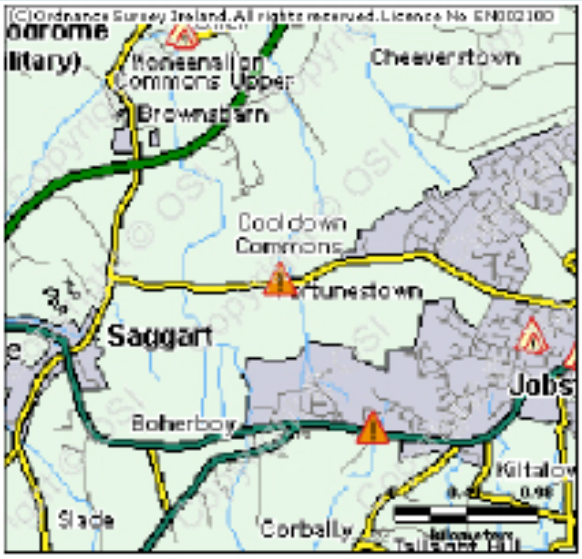
Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 053 271



Map Scale 1:40,449

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

5 Results

1. Fortunestown Lane Nov 2000 — Start Date: 06/Nov/2000
County: Dublin — Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

2. Jobstown N81 Nov 2000 — Start Date: 05/Nov/2000
County: Dublin — Flood Quality Code:3
Additional Information: Reports (1) Press Archive (2) More Mapped Information

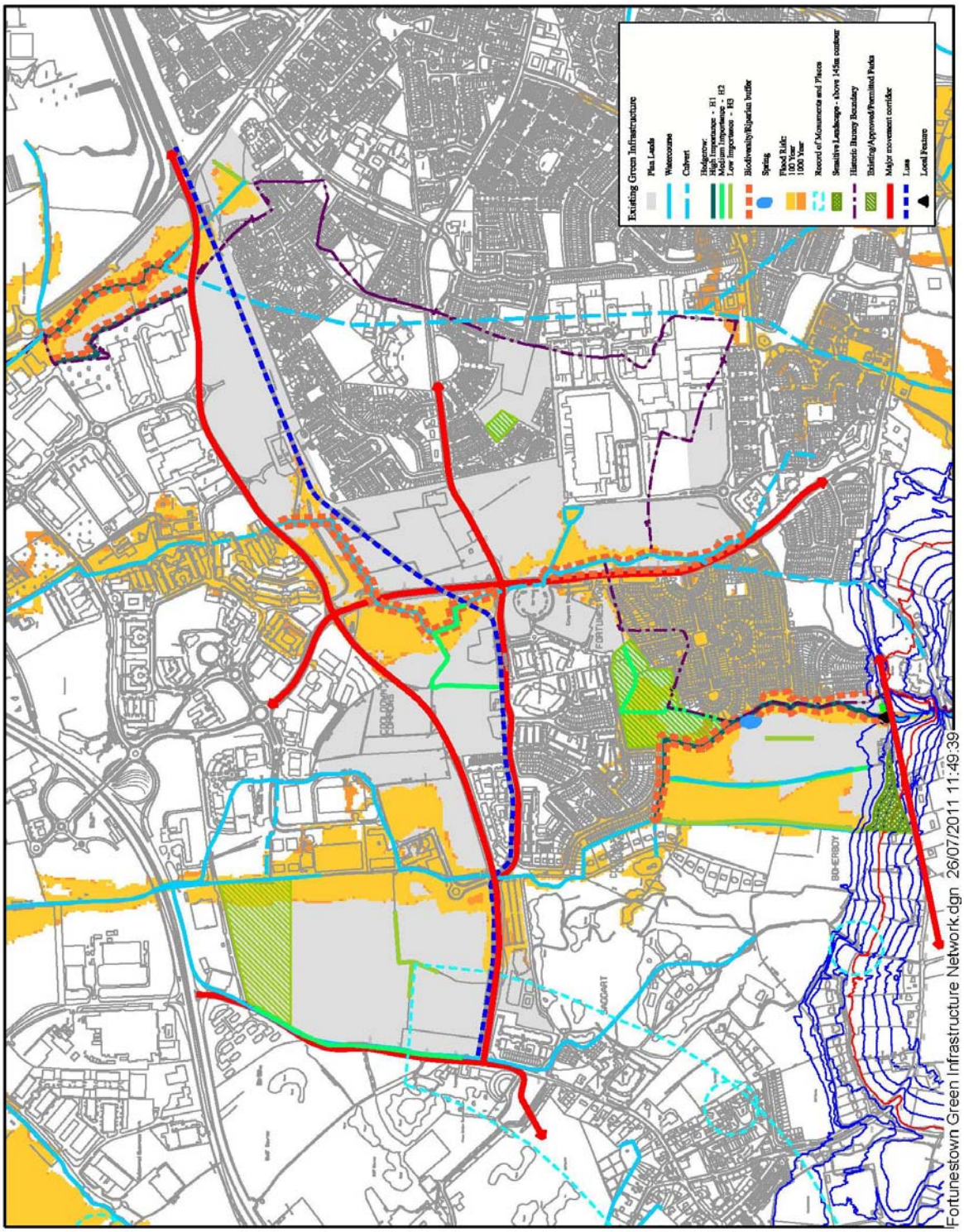
3. Baldonnell Barneys Lane Recurring — Start Date:
County: Dublin — Flood Quality Code:4
Additional Information: Reports (1) More Mapped Information

4. Killinarden Stream Jobstown recurring — Start Date:
County: Dublin — Flood Quality Code:4
Additional Information: Reports (1) Press Archive (1) More Mapped Information

5. Killinarden Stream N81 Jobstown Recurring — Start Date:
County: Dublin — Flood Quality Code:4

Report Produced: 01-Jul-2011 11:02

Appendix III: Green Infrastructure Map (Fortunestown Local Area Plan)



ADDENDUM TO FORTUNESTOWN LOCAL AREA PLAN - INITIAL SFRA

1) Boherboy Lands on 25th Oct 2011-12-0 (morning after floods)

A walk-about in the fields adjoining the Boherboy Stream on the morning following the extreme rainfall event on the 24th Oct 2011 revealed that considerable overflow from the stream had occurred. These overflow areas have been mapped on an aerial photograph based on the occurrence of surface water and stone, silt , mud and debris that were apparent, see photos. A contributory factor to the overflow had been the failure to remove extensive lopping of the streamside vegetation which had occurred in February 2011. At least one house on Carrigmore Avenue, immediately north of the aerial photograph was flooded (correspondence to Council).

Map of Flooded Areas based on day after Flood

Upper Field Adjoining Boherboy Stream

Mid Field Adjoining Boherboy Stream

Mid to Lower Field Adjoining Boherboy Stream

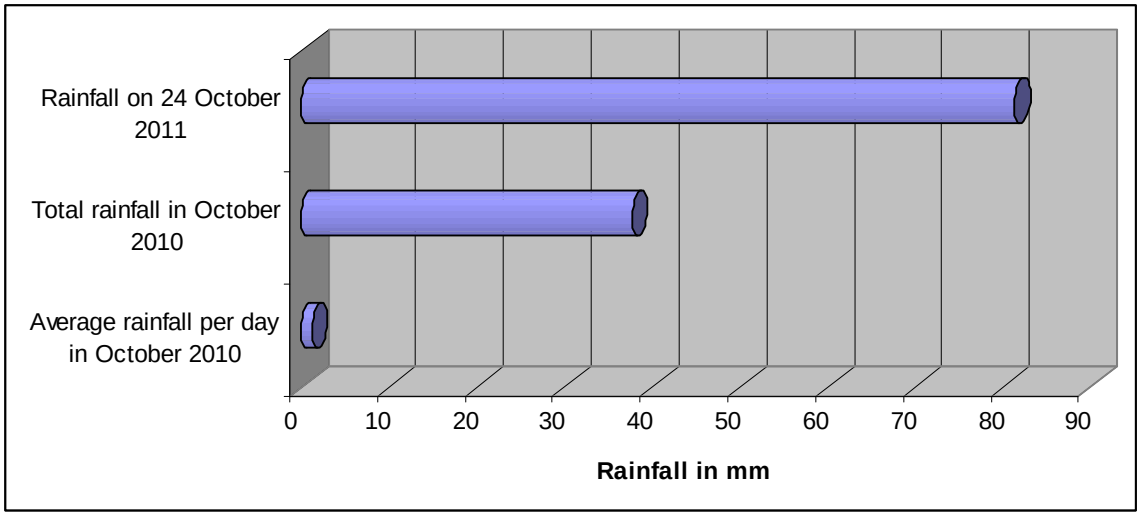
2) Major Flooding Emergency of 24th /25th October 2011 (extracts relevant to Tallaght)

The table below shows the pattern of rainfall on the day in question, Monday 24th October 2011, recorded by a number of South Dublin County Council rain gauges which are in place at Council facilities around the County.

Rainfall in period (mm) vs. Rain gauge Location	Quarryvale	Saggart	Brittas	Tallaght	Average
Total rainfall in the day	81.6	84.8	88.8	87.8	81.4

The 81.4mm of rain that fell on 24 October 2011 is 216% of the total rainfall recorded at Casement for the entire month of October 2010.

The chart below illustrates the quantity of rain that fell on 24 October 2011 (81.4mm taken from the SDCC rain gauges), against average rainfall per day in October 2010 (1.2mm per day) and total rainfall that occurred in the month of October 2010 (37.7mm).



Activation of the Major Emergency Plan

Between 6.00 and 7.00 p.m. there were calls between South Dublin County Council and Dublin City Council establishing the extent of the incident and the required responses. It was agreed to have wider engagement across the Principle Response Agencies (PRAs) and the first conference call between the PRAs took place at 19:52pm with Dublin City Council, South Dublin County Council, Dublin Fire Brigade, the HSE, An Garda Siochana and Dublin Civil Defence participating. A Major Emergency was declared simultaneously at 20:15pm by the County Manager and the Dublin City Manager as it was clear that more than a single agency response was now required.

Response of South Dublin County Council

On the evening and night in question the Council's drainage maintenance section mobilised all available staff and crews as well as appropriate plant to assist in alleviating the flooding. The drainage operation was overseen through the evening and night by Inspectors and senior Engineering staff. The road maintenance section mobilised all of their available crews and appropriate plant in that evening and night to deal with localised flooding incidents. Various mechanical plant was also deployed to assist with the clearing of drains gullies and screens on river and stream channels. A full list of plant is contained in a schedule at the rear of the report.

The Council's Management Team continued to meet hourly from 7.00 a.m. over the Tuesday to review the situation, assign crews as needs arose and to update the mapping of the events and the current situation

The response of the housing maintenance and environment sections, to flooding of Council houses and general clean up respectively, commenced early on the morning of October 25th. All available staff from the Drainage Maintenance Section, Water Maintenance Section, Road Maintenance Section, Housing Maintenance section, Operations and Cleansing sections and Parks Section assisted in the recovery operation after the flooding and the remedial phase is now continuing. This involved the clearing out of Council houses which had been flooded and removal of this material for disposal, the sweeping of roads and footpaths and cleaning of road gullies in affected areas, the clearing of screens on river channels, the clearing of blockages from surface water drains and foul sewers, the removal of debris from roads where boundary walls had been knocked by the floods etc.

The Council's Road Maintenance and Cleansing Sections assisted by a number of contractors took until 5pm on Tuesday October 25th to clean silt, stones, debris and liquid mud from the N81 at Jobstown, such was the extent of the flood at this location and the quantity of material deposited at this location by the Tallaght stream.

Future Works

A list of areas where cleaning of roads, footpaths and road gullies has been prepared and this work is progressing. The process of preparing a schedule of works to be carried out to help alleviate matters in the event of such extreme flooding recurring is currently being undertaken by the Council's Drainage Section. A comprehensive listing of small works will be discussed with the Inter-Departmental Grouping. A further review of CFRAMS (Catchment Flood Risk Assessment Management Study) in the light of the flooding incident is also being undertaken.

Specific Response to Flooding in Local Authority Housing

Up to 95 Social/ former social houses were identified as damaged due to the severe weather conditions of the 24th October.

The majority of the damage was caused in Cloonmore Avenue, Bawnlea Crescent, Killinarden Estate, Knockmore Avenue and Park, all in the West Tallaght Area. There was minor damage in pockets throughout the County also including Woodview Cottages. Crews of staff from the both depots assisted tenants in cleaning out their houses by removing damaged furniture and taking up floor coverings. The Council carried out a removal service of debris and damaged goods for all residents during this period.

Damage to residential and commercial areas

The following is a list of properties, both Council and private housing as well as commercial properties that were damaged by the flooding. Further information is still coming to hand in this regard and being taken from a number of different sources, therefore the numbers given below cannot yet be considered to be final. The extent of the damage caused and repairs necessary varied from house to house and included such items as replacement of floors, fitted kitchens, doors, plasterwork and re-decoration. Houses in the Killinarden and Knockmore areas suffered a loss of power due to the junction boxes for their power supply being flooded as they are located at ground level on the external walls of the houses. In some areas the foul sewer surcharged and mixed with surface water which then flooded houses. The area worst affected was Knockmore where the flooding did not recede until 5pm on Tuesday October 25th. Total number of premises affected in South Dublin was 225 domestic houses and 42 commercial premises.

Tallaght area	Killinarden Estate	14 houses
	Bawnlea Crescent and Avenue	7 houses
	Cloonmore Avenue	13 houses
	Knockmore Park, Avenue and Green	33 houses
	Cushlawn Park	4 houses
	Bolbrook Drive	2 houses
	Tamarisk Avenue	1 house
	Gibbons Cottages	2 houses

Flooding and closure of Roads and Impact on Public Transport

The following is a list of roads that were closed or partially blocked by flooding as a result of the severe weather, the worst of these being the N81 at Jobstown which remained closed until 5pm on Tuesday October 25th. A number of roads, many in the up lying areas, have been badly damaged by surface water run-off and this is currently being assessed by the Council's roads maintenance section. Many other roads and housing estates, including the above addresses, require cleaning of the road surface and road gullies as a result of silt, mud and other debris deposited by flood waters. In addition a number of walls were badly damaged and some collapsed due to pressure of water.

- N7 (Naas Road) between Longmile Road and Kylemore Road, also at Citywest
- N81 closed at Jobstown, also flooded at Avonmore and Old Bawn Rd junction
- Belgard Road at Mayberry Road junction and at Belgard Fire Station
- Maplewood Road flooded in 4 locations at Springlawn, Fernwood Way and Raheen
- Cookstown Road at Ashgrove
- Old Bawn Road / Firhouse Road West junction
- Knockmore Park

- Kingswood Estate
- Ballinascorney Road at Fort Bridge
- Saggart at Garter Lane, Mill Road and Luas Terminus
- Kingswood Village flooded

The extent of the flooding as detailed above had a major impact on Dublin Bus as well as Bus Eireann services trying to leave Dublin City. Other transport services such as Iarnrod Eireann and Luas services were also affected due to rising flood waters lifting rail ballast and leaving use of the rail line network unsafe in many locations. This led to delays and cancellation of some services.

Causes of flooding.

A variety of problems arose on the day however the most common cause of flooding was the lack of capacity in the drainage systems including streams and rivers to cope with the intensity of the rain that fell over a short period of time. In essence there was more rainfall in 24 hours than in any month in 2011 to date. There were flooding incidents in the catchment areas of the Camac, Poddle and Owendoher Rivers and also the Tallaght and Robinhood Streams. There were also isolated problems in some areas such as blocked gullies, blocked screens on open channels and surcharging of poorly designed and constructed drainage systems that are prone to blockages from time to time which led to localised incidents of flooding. While the screens had been cleaned the previous week the strong winds on Saturday 22nd October exacerbated the situation. In a number of locations foul sewers also surcharged indicating a problem of mis-connections between foul sewer and surface water systems.

Evacuation

As detailed above a large number of houses in the County were flooded on this occasion, to varying degrees. Some minor incidents involved minimal damage to houses where water ingress of one or two inches occurred. Major incidents of flooding also occurred where it is reported that in the region of 5 feet of water flowed into some houses in the Tallaght area. On the night in question Council staff assisted in the evacuation and allocation of temporary accommodation to 2 individuals primarily due to medical conditions. It appears that those whose homes were affected have for the most part made alternative arrangements themselves, and many were assisted by family and friends on the night. It was necessary for Dublin Fire Brigade to evacuate the TLC Nursing Home in Citywest; they had been called to assist at this location where the basement and ground floor had flooded. The Fire Brigade deemed it necessary to evacuate the 35 residents from this complex and they were relocated to the TLC Nursing Home in Santry by the voluntary services who were assisting with evacuation, temporary accommodation and welfare measures during the emergency.