Appendix V3-A: Code of Practice 1
Spatial Planning and Building Regulations

EU Interreg IVB FloodResilienCity Project
Final Report – Dublin
Volume Three: Pluvial Flood Risk Management
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>STRUCTURE OF CODE OF PRACTICE</td>
<td>1</td>
</tr>
<tr>
<td>A2</td>
<td>PLANNING</td>
<td>3</td>
</tr>
<tr>
<td>A2.1</td>
<td>Applying the Principles of the Sequential Approach and Justification</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Test to Pluvial Flood Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>A2.2</td>
<td>Development Planning</td>
<td>4</td>
</tr>
<tr>
<td>A2.3</td>
<td>Development Management</td>
<td>9</td>
</tr>
<tr>
<td>A3</td>
<td>BUILDING CONTROL</td>
<td>12</td>
</tr>
<tr>
<td>A3.1</td>
<td>Development Control</td>
<td>12</td>
</tr>
</tbody>
</table>
A1 STRUCTURE OF CODE OF PRACTICE

This Code of Practice, ‘Spatial Planning and Building Control’, outlines how pluvial flood risk assessment and management can be integrated into the application of sustainable planning and building control activities in Dublin.

Appropriate consideration of pluvial flood hazard within the spatial planning process can be achieved by extending the application of the principles of the Guidelines for Planning Authorities on Flood Risk Management, prepared by the Department of Environment, Heritage and Local Government1 (DEHLG) and the Office of Public Works (OPW) (November 2009). Figure A1.1 is an extract of these ‘DEHLG/OPW Guidelines’ illustrating how the sequential approach principles can be used for the assessment of fluvial and coastal flood risk in the planning process.

Figure A1.1: Sequential approach mechanism in the planning process (DEHLG/OPW, 2009)

Dublin City Council, developers and their agents can apply these sequential approach principles to the assessment of pluvial flood hazard and risk when preparing statutory and non-statutory plans (strategic assessments), developing planning proposals, and

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1 This department is now the Department of Environment, Community and Local Government. References to this publication will use the acronym ‘DEHLG/OPW’, however all other references to this Department will use the new acronym, DECLG.
when assessing planning applications (site-specific assessments). It is intended that the following sections are read in conjunction with the DEHLG/OPW Guidelines as these principles are not repeated in detail; and only those recommendations which will require some diversion from these principles are outlined.

This guidance is grouped according to the following categories:

**Planning**

Spatial planning must recognise and plan for pluvial flooding hazard and the potential risks presented by this. Effective planning can be one of the most cost-effective and sustainable means of mitigating the risk from pluvial flooding when taken into consideration with other types of flooding and acknowledging the interactions between them. Planning policy is a powerful tool which Dublin City Council can use to steer new development away from known pluvial flood hazard areas or, if necessary, to control their development.

In general terms, planning control aims to pursue opportunities for development to respect the natural passage of water and provide mutual benefits of management of flooding and water resources, social and environmental improvement and adaptation to climate change.

**Building Control**

Specific flood management measures can be implemented and monitored through planning or building control. Basements should be given particular consideration in this regard for Dublin City.

In general terms, building control aims to pursue opportunities for future development to respect natural landform (e.g. ensure sufficiently high property thresholds) and rectify existing drainage problems (which although are linked with this Code of Practice, are not addressed here). Addressing urban creep and requirements for building resistance/resilience are other key aspects. It should be noted that specific building resistance and resilience measures for new and retrofit properties are covered in Code of Practice 2: Flood Resilience and Adaptation Measures (Volume Three, Appendix V3-B).

Within this Code of Practice, guidance relevant to both categories - **Planning** and **Building Control** - and applicable for Dublin City Council, developers and their agents is outlined for three stages of the planning and development process: Development Planning, Development Management and Development Control.
A2.1 Applying the Principles of the Sequential Approach and Justification Test to Pluvial Flood Risk Management

Fluvial and coastal flood hazards can pose greater risks to a greater number of citizens than pluvial flooding, particularly when experienced in combination. However, low access threshold and basement properties, of which there are many in Dublin, are likely to be particularly vulnerable to pluvial flooding (as well as fluvial and coastal flooding in some locations), but across a much wider area. Also, pluvial flooding can pose significant risks to children, the elderly as well as vehicles. It is important therefore to be aware of the dominant flood hazard in a particular area so as to focus the appropriate application of the sequential approach principles (refer to Figure A2.1).

![Sequential Approach Principles](image)

**Figure A2.1: Sequential approach principles in flood risk management (DEHLG/OPW, 2009)**

The city-wide and detailed model outputs presented in Volumes Two and Four of this Dublin FRC Technical Report can be used with the outputs of the Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study to identify the dominant flood hazards across Dublin.

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2 References to Boxes 4.1 and 5.1 in the extracted image refer to those contained within the DEHLG/OPW Guidelines
A2.2 Development Planning

Application:
- Dublin City Council - when preparing development and local area plans.
- Developers and agents - when proposing / screening new development.

A2.2.1 Identify pluvial Flood Zones – Dublin City Council

Dublin City Council is required to take account of flood-related issues raised in the Regional Flood Risk Appraisal and undertake Strategic Flood Risk Assessments for future plans in line with the DEHLG/OPW Guidelines. In doing so, the Council is required to adhere to the principles of avoiding risk where possible in preparing future Plans. It is important to note in this regard that due to the extent of pluvial flood hazard across Dublin City (as shown in Volume Two), it will not always be possible to avoid pluvial flood risk. For this reason, the consideration of pluvial flood resilience and adaptation measures in both new and existing development is imperative to the management of pluvial flood risk in Dublin (refer to Appendix V3-B - Code of Practice 2: Flood Resilience and Adaptation Measures).

In the absence of combined flood hazard maps for Dublin, pluvial flood probability maps using indicative areas of pluvial flood hazard as predicted by the Dublin FRC Project can be used to supplement the [fluvial/coastal] Flood Zones A, B, C defined by the DEHLG/OPW Guidelines as an aid to both strategic flood risk assessment and land use zoning.

Pluvial flood probability maps similar to that presented in Figure A2.2 (based on flood depth/hazard) are recommended in preference to pluvial risk maps for the definition and application of Pluvial Flood Zones. The reason for this is that pluvial risk maps present the potential risk to a defined group of receptors and therefore if a receptor group is absent from an area (e.g. a Greenfield site), a low risk would be presented for that area regardless of the potential flood depth or flow velocity. Flood risk mapping (which takes account of receptors) is a useful tool for site specific flood risk assessments, but for the purpose of strategic assessment and land use zoning, flood probability maps (based on flood depth/hazard) are more appropriate as these predict the extent of pluvial flooding in areas with and without receptor groups and not just the consequences of flooding on receptor groups.
The following Pluvial Flood Zones are proposed for Dublin City:

- Zone pA: High Probability - >100mm depth of flooding during a 1 in 100yr (1% AEP) pluvial event AND areas susceptible to high velocity flows;

- Zone pB: Moderate Probability - >100mm depth of flooding during a 1 in 200yr (0.5% AEP) pluvial event AND areas susceptible to moderate velocity flows;

- Zone pC: Low Probability - All other areas.

Figure A2.2 provides an example of how the Pluvial Flood Zones (derived from pluvial hazard mapping) could be displayed as pluvial probability mapping.

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Areas of high and moderate velocity are identified using the areas defined as Significant / Extreme and Moderate hazard respectively in the City-wide pluvial flood hazard maps (refer to Volume Two). As defined in Section 4.1 of Volume Two, Flood Hazard is calculated as a function of depth and velocity. The definition of hazard areas also includes a debris factor that represents the potential for deep, fast flowing flood waters to mobilize loose objects and carry them along within the flow.
It is not considered that Pluvial Flood Zones will replace the Fluvial/Coastal Zones defined by the DEHLG/OPW Guidelines, but their supplementary use can help ensure a pluvial flood risk assessment is triggered where required at an early stage in the planning process.

To supplement the use of Pluvial Flood Zones and help ensure the potential impacts of climate change are acknowledged, climate change has been considered for the 1% (annual exceedance probability (AEP) event modelled for Dublin City (refer to Volume Two). The magnitude of the 1% AEP event in the future with the effects of climate change factored in, is approximately equivalent to a 0.5% AEP event under current conditions. Thus sensitivity to climate change can be assessed by determining areas where 100mm depth of flooding would be exceeded for a 0.5% AEP event (based on current climate conditions) in comparison with equivalent areas for the current 1% AEP event (moderate probability).

A2.2.2 Acknowledge / understand scope of pluvial flood zones – Developers and agents

Prior to the publication of pluvial flood maps and / or definition of Pluvial Flood Zones, developers and their agents should be proactive in establishing an understanding of the pluvial flood hazard when screening for suitable development areas. Early consultation with Dublin City Council Drainage Division is advised.

An important prerequisite for ‘avoidance’ is ‘awareness’, for Council departments, developers, businesses as well as the public. Good awareness will enable sustainable management of all flood hazards in Dublin. This will require a staged approach, firstly increasing awareness, then increasing detail and confidence of flood maps so that the cumulative effects of all flooding hazards can be managed including determination of the dominant flood hazard in any one area. In the early stages, this awareness raising is of particular importance across all departments of Dublin City Council e.g. Parks and Roads as well as the Drainage departments.

A2.2.3 Vulnerability to pluvial flooding – Dublin City Council and Developers/Agents

Application:

- **Dublin City Council** – when preparing development and local area plans, and when assessing a planning application.
- **Developers and agents** - when proposing/screening new development.

The DEHLG/OPW Guidelines classify various land use and development types into the following three vulnerability classes for use when applying the sequential approach for fluvial and coastal flood risk (Table 3.1 of the DEHLG/OPW Guidelines):

- Highly vulnerable development (including essential infrastructure), e.g. dwelling houses, student halls of residence and hostels;
- Less vulnerable development, e.g. includes buildings used for retail, and excludes any long-term ‘dwellings’; and
- Water-compatible development, e.g. docks, marinas and wharves.
Although some land use and development types classified are not fully applicable to the Dublin City administrative area, the division between the ‘highly vulnerable development’ and ‘less vulnerable development’ classes is compatible with vulnerability to pluvial flooding.

Table A2.1 outlines the matrix provided by the DEHLG/OPW Guidelines to illustrate those types of development that would be appropriate to each Fluvial/Coastal Flood Zone and those that would require application of the Justification Test. In the absence of Fluvial/Coastal Flood Zones in any given area, the same matrix can apply to the Pluvial Flood Zones.

**Table A2.1: Matrix of vulnerability versus fluvial/coastal flood zone to illustrate appropriate development and that required to meet the Justification Test**

<table>
<thead>
<tr>
<th>Vulnerability class</th>
<th>Flood Zone A</th>
<th>Flood Zone B</th>
<th>Flood Zone C</th>
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</thead>
<tbody>
<tr>
<td>Highly vulnerable development (including essential infrastructure)</td>
<td>Justification Test</td>
<td>Justification Test</td>
<td>Appropriate</td>
</tr>
<tr>
<td>Less vulnerable development</td>
<td>Justification Test</td>
<td>Appropriate</td>
<td>Appropriate</td>
</tr>
<tr>
<td>Water-compatible development</td>
<td>Appropriate</td>
<td>Appropriate</td>
<td>Appropriate</td>
</tr>
</tbody>
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Figure A1.1 in Section A1 above illustrated how the sequential approach principles can be used with the vulnerability classifications for the assessment of fluvial and coastal flood risk in the planning process. The use of the Pluvial Flood Zones (introduced in Section A2.2.1) in a similar way to the Fluvial/Coastal Flood Zones should result in the same path through the sequential approach e.g. a highly vulnerable development proposed in a [Coastal/River] Flood Zone B triggers a Justification Test – the same would be required for Pluvial Flood Zone pB. Similarly, a less vulnerable development in a [Coastal/River] Flood Zone B would be considered to be appropriate, and the same would be true of the development in Pluvial Flood Zone pB.

However, when the principles are applied to all Flood Zones in combination (i.e. coastal/river and pluvial zones), an alternative path through the sequential approach may be required for certain development types as the Pluvial Flood Zones may highlight a (pluvial) flood hazard in areas not susceptible to fluvial or coastal flooding, i.e. it is possible for a development to be proposed in fluvial/coastal Flood Zone C (which would suggest the development would be “Appropriate”) but the location of the development could also be in Pluvial Flood Zone pA - which would not be “Appropriate”.

The City-wide depth and hazard maps presented in Appendix 2-E of Volume Two – City-wide Pluvial Flood Risk Assessment and the sample area shown in Figure A2.2 above indicate that a significant extent of the Dublin City area is susceptible to pluvial flooding. Therefore, for the purpose of compliance with recent flood policies, the use of Pluvial Flood Zones in combination with the Fluvial/Coastal Flood Zones is important to help trigger an appropriate assessment of vulnerability to pluvial flood hazard when the probability of fluvial/coastal flooding is low or absent. This concept is illustrated by Table A2.2 below which builds on matrix in Table A2.1 by highlighting how the use of Pluvial Flood Zones can trigger these pluvial assessments (Justification Test) when used in combination with the coastal/river Flood Zones. The different outcomes of the matrix are highlighted bold blue text, indicating that the development would require the Justification Test, whereas without considering the Pluvial Flood Zones, the development may have been considered “Appropriate”.
Table A2.2: Matrix of vulnerability versus combination of pluvial and fluvial/coastal flood zones to illustrate ‘appropriate’ development and that required to meet the Justification Test

<table>
<thead>
<tr>
<th>Vulnerability class</th>
<th>Coastal / River Zones</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Flood Zone A</td>
</tr>
<tr>
<td>Highly vulnerable development (including essential infrastructure)</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pA</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pB</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pC</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Less vulnerable development</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pA</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pB</td>
<td>Justification Test</td>
</tr>
<tr>
<td>Flood Zone pC</td>
<td>Justification Test</td>
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</table>

Note: The class ‘Water-compatible development’ is excluded from Table A2.2 as the Pluvial Flood Zone does not affect its status as “Appropriate” in all flood zones.

Table A2.2 indicates that for ‘highly vulnerable development’, the Pluvial Flood Zones pA and pB will trigger the requirement for a Justification Text in areas which are deemed to have a low probability of fluvial or coastal flooding. For ‘less vulnerable developments’, the additional triggers for a Justification Test are relevant to Pluvial Flood Zone pA only.
A2.3 Development Management

**Application**:  
- Dublin City Council – when preparing development and local area plans and when assessing a planning application  
- Developers and agents - when applying for approval of a new development.

The Justification Test should be used to assess the appropriateness, or otherwise, of particular developments being considered in areas of moderate or high pluvial flood probability.

Due to the extent of the existing pluvial flood hazard predicted across Dublin City, it will not always be possible to avoid pluvial flood risk. In this context, the DEHLG/OPW Guidelines recognise that notwithstanding the need for future development to avoid areas at risk of flooding, cities/urban centres have been targeted for growth in the National Spatial Strategy, regional planning guidelines as well as city and county development plans. Also, the DEHLG (now DECLG) development plan guidelines underline the importance of compact and sequential development of urban areas with a focus on town and city centre locations for major retailing and higher residential densities. It is for these reasons that if a vulnerable development or land use type is proposed for a sensitive area, the appropriate consideration of pluvial flood resilience and adaptation measures is expected to form a significant part of any land use zoning decision or planning application. Appendix V3-B - Code of Practice 2: Flood Resilience and Adaptation Measures provides guidance on such measures to be considered.

The DEHLG/OPW guidelines (Box 4.1 and Box 5.1) outline the following two processes for the Justification Test, both of which are fully applicable to pluvial flood risk assessment and should be referred to at this stage of the sequential approach:

- **Plan-making Justification Test**: for use by planning authorities at the plan preparation and adoption stage.
- **Development Management Justification Test**: for use by developers and their agents for planning applications.

To apply the Justification Test, an appropriate flood risk assessment must include the assessment of pluvial flood risk. The principles of flood risk assessment are outlined in the DEHLG/OPW guidelines and further detail of the process is provided in the

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4 References to Boxes 4.1 and 5.1 in the extracted image refer to those contained within the DEHLG/OPW Guidelines  

associated technical appendices, all of which must be used in addressing more detailed implementation of the guidelines.

There are three stages in the assessment of flood risk:

- Stage 1 Flood risk identification;
- Stage 2 Initial flood risk assessment; and
- Stage 3 Detailed flood risk assessment.

The following sections (A2.3.1 – A2.3.3) outline how the Dublin FRC project deliverables can be used to inform these stages of pluvial flood risk assessment. Section A3 (Building Control) then discusses the considerations of the building control system following the completion of a flood risk assessment.

A2.3.1 Strategic flood risk assessments – Dublin City Council

The following Dublin FRC Project deliverables can supplement the application of the DEHLG/OPW guidelines and technical appendices to enable Dublin City Council to undertake both Stage 1 and Stage 2 of the risk assessment process noted above for pluvial flooding for the City Development Plan and Local Area Plans:

- Volume Four of the Dublin FRC Technical Report: Detailed Pluvial Flood Risk Assessment of Pilot Areas. Building on the city-wide assessment, detailed pluvial flood models were developed to understand flood mechanisms and assess pluvial flood hazard and risk in five pilot areas across Dublin City. This modelling included the assessment of broad conceptual designs of flood resilience and adaptation ('corrective') measures aimed at reducing pluvial flood hazard and risk. Applicable to Stages 1 and 2. [Any other detailed assessments that might be undertaken in the future for other areas should also be considered.]
- Volume Five: Pluvial Flood Alerting and Warning System Integration. This document outlines how new and emerging technologies and approaches in both hardware and information systems can best be applied in the implementation of a pluvial flood alerting and warning system (to be integrated with the wider forecasting warning systems for other types of flood risk). Applicable to Stage 2. Future information gathered from this system on an ongoing basis will further inform the assessment of pluvial flood risk across Dublin including trends that may be associated with climate change.

A2.3.2 Site-specific flood risk assessments – Developers and agents

For site-specific flood risk assessments, pluvial flood risk should be incorporated in all three flood risk assessment Stages. The following Dublin FRC Project deliverables can supplement the DEHLG/OPW Guidelines and technical appendices to facilitate the incorporation of pluvial flood risk to site-specific flood risk assessments:

- Volume Two of the Dublin FRC Technical Report: City-wide Pluvial Flood Risk Assessment. Prior to the inclusion of Pluvial Flood Zones or equivalent pluvial flood mapping in Development Plans, this provides an overall assessment of
Dublin City’s vulnerability to pluvial flood hazard and risk. Applicable to Stages 1 and 2.

- Volume Three, Code of Practice 2: Flood Resilience and Adaptation Measures provides relevant information on mitigation measures and their evaluation for ‘at risk’ developments to enable effective resilience and resistance measures to be retro-fitted or included in new development.

A2.3.3 Minor proposals in areas of High or Moderate pluvial flood probability – Dublin City Council and Developers/Agents

Applications for minor development, such as small extensions to houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises, are unlikely to raise significant fluvial or coastal flooding issues, unless they obstruct important flow paths, introduce a significant additional number of people into flood risk areas or entail the storage of hazardous substances. However, such minor developments can be impacted by pluvial flooding and/or have an influence on pluvial flood risk both at the development location and in surrounding areas. Cumulative impacts are also possible. The DEHLG/OPW Guidelines recommend the following approach for minor developments, and this is also recommended for pluvial flood risk assessment:

‘Since such applications concern existing buildings, the sequential approach cannot be used to locate them in lower-risk areas and the Justification Test will not apply. However, a commensurate assessment of the risks of flooding should accompany such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. These proposals should follow best practice in the management of health and safety for users and residents of the proposal’.

In this context consideration of public safety must be applied in terms of pluvial flood risk and particularly in the case of basement or other below-ground properties or infrastructure. Information on relevant aspects and measures is provided in Appendix V3-B and also in Section A3 under Development Control.

Appropriate public awareness and education of pluvial flood hazard and risk is of key importance to help manage such minor developments. A Community Engagement Plan should be the first step of a staged process for the communication of pluvial flood hazard in Dublin City. Means to raise awareness could include information provision through a dedicated website supported by guidance leaflets. Sections B3.1, B5.2 and B5.4 of Code of Practice 2: Flood Resilience and Adaptation Measures (Volume Three, Appendix V3-B) should be referred to for guidance on appropriate measures.
Government policies in Ireland do not advocate the building of dwellings in areas with a significant risk of flooding. However, where development is necessary in such areas (as demonstrated through the Justification Test), national flood risk management policy requires that such developments are safe, do not increase flood risk elsewhere and, where possible, reduce flood risk overall.

A3 BUILDING CONTROL

A3.1 Development Control

Application:

Development Control

- Dublin City Council – when reviewing Commencement Notices and undertaking inspections.
- Developers and agents - when applying for approval of a new development or a modified / extended development (including modified use), and when undertaking construction works.

The Dublin FRC Project risk assessment (Volumes Two and Four) has concluded that extensive parts of Dublin City are susceptible to pluvial flooding, and therefore it will not always be possible to avoid areas of moderate - high pluvial flood risk. For this reason, the consideration of pluvial flood resilience and adaptation measures in building control is an important aspect in the overall management of pluvial flood risk in Dublin (refer to Code of Practice 2: Flood Resilience and Adaptation Measures, Volume Three, Appendix V3-B).

The primary criteria which should be satisfied by the building control system is ‘how is the proposed development designed to be safe during a flood and reduce risk to people and the emergency services?’

Flood risk assessments completed for a development should be used to support a Building Inspector’s appraisal of a contractor’s approach to flood resilience/resistance while assessing compliance with the relevant Building Regulations and considering the wider health, safety and welfare aspects such as the structural stability of a property during a flood event and effectiveness of any proposed emergency access routes (including safe means of egress from basement properties or other below-ground infrastructure). For example, a ‘highly vulnerable’ development proposed in an area with a high-moderate probability of pluvial flooding will have specific measures defined for design and construction.

The following points set out recommendations to amend and / or expand current building regulation guidance to further incorporate pluvial flood resilience / resistance measures so that construction can comply with developing flood policy and legislation:

- The concept of flood-proofing can be introduced to building control guidance as a means of assessing resistance/resilience measures. Such measures should already be defined as part of the sequential approach principles outlined in the DEHLG/OPW guidelines, specifically the Justification Test:
  - Dry flood-proofing: Reducing building contact with floodwaters, e.g. use special sealants, coatings, and equipment such as flood gates, panels
etc. as ‘resistance’ measures to keep flood water out of properties (refer to Sections B3.3 and B6.1 of Code of Practice 2: Flood Resilience and Adaptation Measures). The installation of flood gates etc at the onset of a flood event requires human intervention and sufficient warning time – hence this is sometimes referred to as ‘active’ flood proofing.

- **Wet flood-proofing:** Reducing extent of damage from contact with flood water as ‘resilience’ measures to enable a quick return to normal use after flooding with minimal damage. Flood damage-resistant materials capable of withstanding direct and prolonged contact with flood waters without sustaining any damage that requires more than cosmetic repair are used in areas that can be allowed to flood without damage e.g. lower ground floors, car parks and other below-ground infrastructure, or in combination with resistance measures (refer to Sections B3.4 and B6.2 of Code of Practice 2: Flood Resilience and Adaptation Measures).

- Inspection of **basements/cellars/garden flats** intended for residential occupancy and located in areas susceptible to pluvial flooding should include an assessment of specific safety measures including alarms and defined evacuation routes to enable rapid safe egress in the event of flooding. This should be in addition to other resistance/resilience measures including pumping systems and the assessment of appropriate drainage structures and materials to prevent backflow (as informed by the GDSDS Regional Drainage Policies and Code of Practice for Drainage Works – refer also Sections B3.2 and B6 of Code of Practice 2: Flood Resilience and Adaptation Measures).

- **Basement and Ground Level Access Protection:** Proposed developments should allow for appropriate protection from pluvial flooding e.g. raised or ramped thresholds (refer to Sections B2.4 and B3.2 of Code of Practice 2: Flood Resilience and Adaptation Measures).

- **Application of the DECLG Building Regulations**

  6 Technical Guidance Document Part C ‘Site Preparation and Resistance to Moisture’: This assumes that ‘the site of the building is not subject to flooding or, if it is, that appropriate steps are being taken’. In areas that have a high – moderate probability of pluvial flooding, building inspectors should establish if ‘appropriate steps are being taken’ by undertaking a specific assessment of pluvial flooding measures (see Sections B6.3 of Code of Practice 2). Acknowledgement of any flood risk should be noted in the Commencement Notice (edits to which are recommended to enable building inspectors to prepare for their review of flood resistance/resilience measures).

  6 http://www.environ.ie/en/TGD/

- **Application of the DECLG Building Regulations**

  Technical Guidance Document Part M ‘Access and Use’: Inspection of dwellings to ensure ‘elements of the building do not constitute an undue hazard for people, especially for people with vision, hearing or mobility impairments’ should be extended to include safe routes of exits in a flood event, particularly for basement / low threshold properties.

- Specifications for the location of **electrical sockets/equipment** and communications equipment should be included within future revisions of the Technical Guidance Documents. Building inspections of developments in areas susceptible to pluvial flooding should include an assessment of electrical socket/equipment and communications equipment locations. Appropriate location of sockets and equipment in areas susceptible to flooding will help
minimise damage and facilitate re-occupation (see Sections B3.4 and B6.2 of Code of Practice 2).

- Issues related to provision and resilience of **sanitary facilities, clean water and other service systems** in flood events should be incorporated. For example the incorporation of backflow prevention devices in drainage systems, resilience of water and possibly heating systems etc. (see Sections B3.3 and B6.1 of Code of Practice 2).

As indicated above, the main role of the building regulations in terms of flooding should be to minimise the health and safety risks. It is important that any recommendations for flood resilience/resistance in the building regulations do not negatively impact on other aspects of the regulations such as fire performance, thermal performance and disabled access. Primary responsibility for compliance with the requirements of the Building Regulations rests with the designers, builders and owners of buildings.

Reference material in relation to Sustainable Drainage Systems outlined in the DEHLG/OPW Guidelines and also in Sections B2.6 - B2.10 and B4.3 - 4.5 of Code of Practice 2: Flood Resilience and Adaptation Measures should be considered when addressing SuDS aspects in the context of drainage aspects of buildings and development.

Reference should also be made to the Assessment Template provided in Section B6.3 in Code of Practice 2. This includes a table which summarises the various resistance and resilience measures and provides a broad indication of measures which are likely to be suitable for different circumstances based on type of property and likely depth of flooding. Guidance on undertaking a pre-installation survey is provided to identify appropriate resistance/resiliance measures. Of particular relevance to Building Control is the guidance provided on Inspection and Reporting following the installation of such measures. Achieving consistency in the degree of flood resistance and resilience provided across any one area is important. Inspection following installation could be undertaken directly by Building Control staff.

Building Inspectors should arrange for feedback on the performance and effectiveness of resistance and resilience measures in general and during any flood events that might occur. This can then be used to refine future guidance.