Cambridge City Council **Item**

To:	Executive Councillor for Planning Policy and Transport: Councillor Kevin Blencowe
Report by:	Joint Director of Planning and Economic Development for Cambridge and South Cambridgeshire
Relevant scrutiny committee:	Development Plan Scrutiny Sub Committee 6 December 2016
Wards affected:	All wards

CAMBRIDGESHIRE FLOOD AND WATER SUPPLEMENTARY PLANNING DOCUMENT

Not a Key Decision

1. Executive summary

1.1 The Cambridgeshire Flood and Water Supplementary Planning Document (SPD) has been produced by Cambridgeshire County Council, in partnership with the city and district councils, in their role as Lead Local Flood Authority. It provides detailed guidance to support the implementation of flood and water related policies in each of the Cambridgeshire local planning authorities local plans.

1.2 The emerging Local Plan is still at the examination stage, which means that the Council is unable to adopt the Cambridgeshire Flood and Water document as an SPD until the Local Plan has been found sound and adopted. In the interim period, prior to adoption of the SPD, the Cambridgeshire Flood and Water document provides context and guidance as material consideration in the planning process.

1.3 In accordance with the process of preparing an SPD, consultation on the draft document was carried out over a 6 week period between 4 September and 16 October 2015.

1.4 Appendix A provides the Statement of Consultation, which incorporates at Annex B summaries of the representations received to the draft SPD and sets out the proposed responses. Appendix B provides the final version of the SPD.

1.5 No significant changes are proposed as a result of the consultation. However some minor amendments to the SPD are proposed and are set out in Annex B of Appendix A, reflecting the comments received during the public consultation. A number of changes have also been made to Section 4.4 on the sequential test in light of an appeal decision issued in April 2016[1]. As a result, amendments have been made to the guidance on the sequential test to ensure that the guidance provided is consistent with national guidance and the appeal Inspectors findings.

2. Recommendations

2.1 This report is being submitted to the Development Plan Scrutiny Sub-Committee for prior consideration and comment before decision by the Executive Councillor for Planning Policy and Transport.

2.2 The Executive Councillor is recommended:

- To agree the responses to the representations received during public consultation and the consequential amendments to the SPD (see Annex B of Appendix A);
- To approve the SPD (Appendix B) in anticipation of the adoption of the Local Plan, and to agree that it should be carried forward for adoption as an SPD at the same time as the Local Plan.

3. Background

3.1 A significant amount of new development will occur in Cambridgeshire over the next 20 years and beyond. In order to reduce impact on the water environment, development must be appropriately located, well designed, managed and take account of climate change. The aim of the SPD is to provide guidance on the approach that should be taken to manage flood risk and the water environment as part of new development proposals.

3.2 The SPD provides detailed supplementary guidance for applicants on developing proposals that:

- Are not at risk of flooding and that do not increase the risk of flooding elsewhere, including providing guidance on the Sequential and Exception Tests, how to produce a Site Specific Flood Risk Assessment and measures that can be taken to manage flood risk;

[1] The appeal decision related to a residential development in Farnham, Surrey (APP/R3650/W/15/3136799).

- Include the use of sustainable drainage systems (SuDS) that effectively manage surface water, are aesthetically pleasing, conserve, accommodate and enhance biodiversity and provide amenity for local residents; and
- Either enhance the quality of the water environment and/or do not have an adverse impact on the quality of water bodies including rivers, lakes and groundwater.

3.3 The Cambridgeshire Flood and Water SPD has been developed by Cambridgeshire County Council (as Lead local Flood Authority) in conjunction with each of the Cambridgeshire local planning authorities. The SPD provides detailed guidance on the implementation of flood and water related policies in each authority's respective local plans, supplementing policies in the following documents:

- The submission version of the Cambridge Local Plan 2014;
- The South Cambridgeshire Development Control Policies Development Plan Document (DPD) (2007) and submission version of the South Cambridgeshire Local Plan 2014;
- The adopted East Cambridgeshire Local Plan (April 2015);
- The adopted Fenland Local Plan (May 2014); and
- The adopted Huntingdonshire Core Strategy (2009) and emerging Local Plan.

3.4 The decision to produce a county wide SPD has been taken on the basis that it would ensure a consistent, locally appropriate approach to flood risk and water management across Cambridgeshire.

Public Consultation

3.5 After being approved for public consultation at Development Plan Scrutiny Sub Committee (DPSSC) on 16 June 2015, the draft Cambridgeshire Flood and Water SPD was the subject of consultation for 6 weeks between 4 September and 16 October 2015.

3.6 In line with the consultation standards set out in the council's Statement of Community Involvement and in accordance with the Town and Country Planning (Local Development) (England) Regulations 2004 (as amended), the consultation documents were sent to the statutory and other consultees. All of the consultation material was made available on the council's website and Huntingdonshire District Council's online consultation system was utilised to allow people to submit their comments via the internet (hard

copies of the response forms were made available to those who do not have access to the internet). A notice was placed in the 4 September 2015 edition of the Cambridge News containing information about the consultation and how people could get involved.

Results of consultation

3.7 At the end of the consultation period, a total of 149 separate representations were received, of which 14 were supportive, 119 were comments/observations and the remainder, 16 were objections.

3.8 In summary, the key issues raised were:

- Acknowledgement of the differences in landscapes and topography across the county (city to fen) should be made. Often it is perceived that SuDS cannot be used in fen areas; however this is not the case and therefore a paragraph related to this should be added;
- Clarification on the role of Internal Drainage Boards sought;
- Strengthen the document to ensure the maximum benefit of any SuDS schemes for wildlife and people;
- Include a statement that acknowledges that the Water Framework Directive categorises water bodies into natural or heavily modified/artificial, which in turn directs the appropriate course of action of ecological status or ecological potential;
- Further clarity regarding the requirement for developers to provide evidence in relation to the sequential test;
- Provide more information on the likely impacts on the historic environment;
- Emphasise the need to design biodiversity into SuDS so these can function in the future to manage flood risk and hence avoid unnecessary conflict over maintenance and the risk of disturbing protected species;
- The SPD should further recognise the importance of more trees and woodlands in and around our towns and cities where they can safeguard clean water, help manage flood risk or improve biodiversity.
- Make the document as user friendly as possible;
- Create a better quality document in terms of design and clarity of images and graphs.

3.9 Officers have worked through all representations and have drafted responses. Summaries of all representations and proposed responses with recommended changes to the SPD have been attached as

Appendix A (annex B) to this report. The main changes to the SPD as a result of the responses are:

- Amendments to the layout of the document to make it more user friendly, and specific chapters have been restructured in response to the comments received;
- Guidance on the sequential and exceptions test, and undertaking flood risk assessments, has been revised and restructured to provide clarity for users;
- Additional information included to explain the differences in landscapes across the county and how these differences should be considered when mitigating flood risk and designing SuDS;
- Simplification of information relating to Internal Drainage Boards, including on their role and requirements;
- Additional information added on designing SuDS, including consideration of maintenances and creating benefits for both wildlife and people;
- References added to ensure that the historic environment is considered when mitigating and managing flood risk and designing SuDS;
- Inclusion of guidance on the use of trees to help manage flood risk and improve biodiversity; and
- Information added to explain the categorisation of waterbodies and their associated environmental objectives.

Next Steps

3.10 As the emerging Local Plan is still at the examination stage, and we do not have a relevant policy in the current 2006 Cambridge Local Plan, the council is unable to adopt the Cambridgeshire Flood and Water SPD until the emerging Local Plan has been found sound and adopted. Subject to approval by the Executive Councillor, the Cambridgeshire Flood and Water SPD will be carried forward for adoption at the same time as the Local Plan. In the interim the Cambridgeshire Flood and Water SPD provides guidance as a material consideration in the planning process, which does afford the document some weight in the decision making process.

3.11 The other local planning authorities involved in the production of the SPD are in slightly different situations to the council in that they already have adopted development plan documents against which the SPD can be adopted. To date, the SPD has been adopted by

- South Cambridgeshire District Council (on the 8 November 2016);
- East Cambridgeshire District Council (on the 16 November 2016); and

Fenland District Council will be asked to agree the adoption of the SPD on the 15 December 2016 while it is anticipated that Huntingdonshire District Council members will be asked to agree the adoption of the SPD in 2017. Cambridgeshire County Council have endorsed the SPD as a technical document to be used as a material consideration in determining planning applications.

4. Implications

Financial Implications

4.1 There are no direct financial implications arising from this report. Policies related to flooding and water have been included in the emerging Local Plan, which has already been included within existing budget plans.

Staffing Implications

4.2 There are no direct staffing implications arising from this report. The review of the Local Plan has already been included in existing work plans.

Equality and Poverty Implications

4.3 An Equalities Impact Assessment has been prepared by Cambridgeshire County Council. This assessment highlighted that a strategy that has a positive impact upon all the residents of Cambridgeshire, specifically the old, young and vulnerable is likely to lead to greater benefits in the long term. There is likely to be a positive impact on people with physical disabilities. The SPD can be used to ensure that future developments integrate mechanisms and physical alterations, including those where disabled persons may be limited to ground floor accommodation. Furthermore, the SPD encourages a better quality of life through the promotion of Sustainable Drainage Systems (SuDs) to be incorporated into new developments throughout Cambridgeshire, where considered appropriate, having pleasant green spaces and water features.

Environmental Implications

4.4 The Cambridgeshire Flood and Water SPD will help to ensure that development is directed away from areas at highest risk of flooding, as well as ensuring that developments do not increase flood risk elsewhere, through the use of SuDS and other flood mitigation techniques. In producing site specific flood risk assessments and drainage strategies, account must be given to the impacts of climate

change, as set out in the SPD. This will ensure that developments are safe for their lifetime. The use of SuDS across sites will also have wider climate change adaptation benefits, not only reducing the risk of surface water flooding, but helping to reduce the impacts of the urban heat island effect, offering benefits related to water recycling, which will help with the issue of water stress, and helping to enhance biodiversity. Overall there should be a positive climate change impact.

Procurement

4.5 There are no direct procurement implications arising from this report.

Consultation and communication

4.6 The consultation and communication arrangements for the SPD were carried in line with the council's Statement of Community Involvement 2013, and Code for Best Practice on Consultation and Community Engagement as outlined in paragraphs 3.4 and 3.5.

Community Safety

4.7 The Cambridgeshire Flood and Water SPD will help benefit community safety by steering development away from areas at high risk of flooding. The guidance contained within the SPD will also help to ensure that not only the developments themselves not at risk from flooding, but that they do not increase the risk of flooding downstream of developments. In many cases, the drainage measures proposed for new developments are capable of providing betterment to communities downstream from developments.

5. Background papers

5.1 The following background papers were used in the preparation of this report:

- Cambridge Local Plan 2014: Proposed Submission: https://www.cambridge.gov.uk/public/ldf/draft_submission/Full%20Plan/Full%20Draft%20Plan%20with%20title%20pages%20reduced%20size.pdf
- Addendum to the Cambridge Local Plan 2014: Proposed Submission – Schedule of Proposed Changes
- Sustainability Appraisal of the Cambridge Local Plan 2014: https://www.cambridge.gov.uk/sites/www.cambridge.gov.uk/files/documents/Final%20SA%20Report%20for%20Printing.pdf

- Habitats Regulations Assessment Screening Report of the Cambridge Local Plan 2014;
  Part 1 – https://www.cambridge.gov.uk/sites/www.cambridge.gov.uk/files/documents/Appropriate%20Assessment%20Part%201%20-%20FINAL_0.pdf
  Part 2 – https://www.cambridge.gov.uk/sites/www.cambridge.gov.uk/files/documents/Appropriate%20Assessment%20Part%202%20-%20FINAL.pdf
- Appeal decision for residential development in Farnham, Surrey (August 2016): https://acp.planninginspectorate.gov.uk/ViewDocument.aspx?fileid=17386968

6. Appendices

- Appendix A: Statement of Consultation incorporating summaries of representations received and Councils responses;
- Appendix B: Cambridgeshire Flood and Water Supplementary Planning Document

7. Inspection of papers

To inspect the background papers or if you have a query about the report, please contact:

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Author's phone number: 01223 457170
Author's email: emma.davies@cambridge.gov.uk

Appendix A: Statement of Consultation incorporating summaries of representations received and Councils responses

Cambridge City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council and South Cambridgeshire District Council

Cambridgeshire Flood and Water Supplementary Planning Document

Consultation Statement

1. Introduction

1.1. The Town and Country Planning (Local Planning) (England) Regulations 2012 require a local planning authority to consult the public and stakeholders before adopting a Supplementary Planning Document (SPD). Regulation 12(a) requires a statement to be prepared setting out who has been consulted while preparing the SPD; a summary of the main issues raised; and how these issues have been addressed in the SPD.

1.2. This statement sets out details of the consultation which has informed the preparation of the SPD.

1.3. The Cambridgeshire Flood and Water SPD has been prepared to provide guidance on the implementation of flood and water related planning policies contained within the draft or adopted Local Plans of Cambridge City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council and South Cambridgeshire District Council. Such policies address matters of flood risk, including use of Sustainable Drainage Systems (SuDS), water quality and water resources.

1.4. The SPD has been prepared to provide further guidance on flood risk and water management matters to support the policies in the local plans. It will assist developers, householders and landowners in preparing planning applications for submission to the local planning authority and will also help the Councils in determining relevant planning applications.

2. Consultation Undertaken

2.1. The SPD has been prepared by the Local Planning Authorities within Cambridgeshire, Environment Agency, Anglian Water and Internal Drainage Boards. A steering group was set up with representatives from each of these organisations.

2.2. Formal public consultation on the SPD was undertaken from 4 September 2015 until 16 October 2015. The draft Flood and Water SPD and supporting documents (Equalities Impact Assessment, Strategic Environmental Assessment (SEA) Screening Statement, and Consultation Statement) were made available on each of the Councils website, and comments could be made online using Huntingdonshire District Council's consultation system (http://consult.huntingdonshire.gov.uk/portal/pp/spd/fw).

2.3. A total of 149 representations were received on the draft SPD, and the breakdown was as follows:

- 14 support
- 16 object
- 119 observations

2.4. The SPD consultation was publicised in the different Cambridgeshire local newspapers after a press release was sent out by the County Council prior the consultation. A public notice in the form of a poster was included in the Cambridge News on 4 September 2015.

3. Issues Raised During the Production Stage of the Draft SPD

3.1. Comments made by members of the Steering Group were generally supportive, with more focused comments being given on particular sections of the draft SPD.

3.2. The Internal Drainage Boards (IDBs), in particular the Middle Level Commissioners, made detailed comments in respect of Chapter 6 (Surface Water and SuDS chapter), focusing on the management of surface water into the IDBs drains.

3.3. The Environment Agency and the local planning authorities also made substantial comments regarding the challenges presented within chapter 6, but focused mainly on ensuring that Chapter 4 regarding the Sequential and Exception tests were precise, and provide the right level of guidance for both applicants and the local planning authority.

3.4. The Steering Group also made substantial changes to Chapter 7 to make it more concise.

3.5. In response to further comments by the Steering Group, it was agreed to revise the length and number of appendices forming the SPD. Some of the detail was considered irrelevant and unnecessary, and did not add to the purpose of the document.

4. Issues Raised During the Public Consultation

4.1. The following issues were raised as part of the public consultation:

- Make the document as user friendly as possible;
- Better quality document in terms of design and clarity of images and graphs;
- Acknowledgment of the differences in landscapes and typography across the county (city to fen) should be made. Often it is perceived that SuDS cannot be used in fen areas; however this is not the case and therefore a paragraph relating to this should be added;

- Clarification of the role of Internal Drainage Boards;
- Strengthen the document to ensure the maximum benefit of any SuDS schemes, for wildlife and people;
- Include a statement that acknowledges that the Water Framework Directive categorizes water bodies into natural or heavily modified/artificial, which in turn directs the appropriate course of action of ecological status or ecological potential;
- Further clarity regarding the requirement for developers to provide evidence in relation to the sequential test and this should be more explicit within the document;
- Provide more information on the likely impacts on the Historic Environment;
- Emphasis on the need to design biodiversity into the SuDS so these can function in the future to manage flood risk, and hence avoid unnecessary conflict over maintenance and the risk of disturbing protected species;
- Importance of more trees and woodlands in and around our towns and cities where they can safeguard clean water, help manage flood risk or improve biodiversity.

4.2. Annex B records all comments received during the public consultation, together with the Councils' assessment of them, and where appropriate any changes that have been made to the SPD.

5. Issues Raised After the Public Consultation by the Steering Group

5.1. Detailed discussions were undertaken with each of the IDBs after the public consultation in the process of considering the comments made, and changes have been made to the SPD to show a better understanding of the Fen areas and IDB requirements.

5.2. Managing the conflicts between what works in City and what works in the Fens.

5.3. A further change was made to the Sequential Test as set out in Chapter 4 in response to a recent appeal decision which was material to the SPD.

Annex A: List of Organisations Consulted on the Draft Flood and Water SPD

191 Parish Council across Cambridgeshire

2 The Drawing Board

A2 Dominion Housing Group

Abbey Properties (Cambs) Ltd

Abbeygate Properties

Abel Energy

Accent Nene Housing Society Limited

Acorus RPS

Addenbrookes NHS Foundation Trust

Adlington

Admiral Homespace

Aecom

AFA Associates Specialist Planning Services

Affinity Water

Age Concern Cambridgeshire

Age UK Cambridgeshire

AH Building Design

Aldwyck Housing Association

Alexanders

Alison Withers

Alium Design Ltd

Alliance Planning

Allsop

Alsop Verrill Town Planning and Development

Altodale Limited

Alun Design Consultancy

AMEC E&I UK for National Grid

Amec Plc

Andrew Firebrace Partnership

Andrew Fleet

Andrew Martin Associates

Andrew S Campbell Associates Ltd

Anfoss Ltd

Anglia Building Consultancy

Anglia Building Surveyors

Anglia Design LLP

Anglia First

Anglian (Central) Regional Flood and Coastal Committee

Anglian Home Improvements

Anglian Ruskin University

Anglian Water Services Limited

Annington Homes

Appletree Homes Ltd

Archade Architects

Architectural & Surveying Services Ltd

Architectural Design Services

Architectural Services

Architecture & Building Design

Art Architecture Ltd

Ashworth Parkes Associates

Atkins

ATP Group

Authorised Design Ltd

Axiom Housing Association

Ayres

Barford & Co

Barker Storey Matthews

Barratt Eastern Counties

Barton Wilmore Planning

Beam Estates

Beam Estates Ltd

Beacon Planning

Bedford Borough Council

Bedfordshire Pilgrims Housing Association

Bellway Homes

Ben Pulford Architect Ltd

Bendall and Sons Solicitors

Berkeley Group Holdings Plc

Bewick Homes Ltd

BGG Associates Ltd

Bidwells

Bidwells Property Consultants

Bird & Tyler

Birketts LLP

Bloombridge Development Partners

Bloor Homes

Bloor Homes South Midlands

Blue Tree Specific Skills

BMD Architects

Bond Chartered Architects

Borough Council of Kings Lynn & West Norfolk

Bovis Homes Ltd

Bramley Line Heritage Railway Trust

Braintree District Council

Brampton Bridleway Group

Brampton Little Theatre

Brampton Park Theatre Co

Brampton Youth Forum

Brand Associates

Breathe Architecture Ltd

Brian Barber Associates

British Horse Society

British Marine Federation

British Wind Energy Association

Broadview Energy Ltd

Brookgate

Brown & Co

Brown & Scarlett Architects

BRP Architects

BS Initiative

BS Services

Buckden Marina

Buckles Solicitors

Building Research Establishment

Burgess Group PLC

Caldecotte Consultants

Cam Valley Forum

Camal Architects

Cambourne Crier

Cambria Project Management Ltd

Cambridge and County Developments (formerly Cambridge Housing Society)

Cambridge Biomedical Campus

Cambridge Cleantech Limited

Cambridge Council for Voluntary Service

Cambridge Ethnic Community Forum

Cambridge Forum of Disabled People

Cambridge GET Group

Cambridge Housing Society

Cambridge Inter-Faith Group

Cambridge Past Present and Future

Cambridge Piped Services Limited

Cambridge Sub-Regional Housing Board

Cambridge University Hospitals NHS Foundation Trust

Cambridge Water

Cambridgeshire & Peterborough Association of Local Councils

Cambridgeshire & Peterborough Environmental Records Centre

Cambridgeshire & Peterborough NHS Foundation Trust

Cambridgeshire ACRE

Cambridgeshire Bat Group

Cambridgeshire Chamber of Commerce

Cambridgeshire Constabulary

Cambridgeshire Diversity and Equality Service

Cambridgeshire Ecumenical Council

Cambridgeshire Fire and Rescue

Cambridgeshire Fire & Rescue Service

Cambridgeshire Local Access Forum

Cambridgeshire Older Peoples Enterprise

Cambridgeshire Police Authority

Cambridgeshire Race Equality and Diversity Service

Cambridgeshire Travellers Initiative

Cambridgeshire Wildlife Trust

Cambs Homes Improvement Agency

Cambs LTA

Cam-Mind

Campaign for Real Ale

Campaign for Real Ale (Huntingdonshire branch)

Campaign to Protect Rural England (CPRE)

Camstead Homes

Cannon Kirk UK ltd

Cantab Design Ltd

Care Network Cambridgeshire

Carlton cum Willingham

Carter Jonas

CB Design

CE Building Designs

CeGe Design

Central Association of Agricultural Valuers

Central Beds Council

Centre for Sustainable Construction

CgMS Consulting

Chase Construction

Chancellor, Masters and Scholars of the Univ. of Cambridge

Chatteris Town Council

Cheffins

Chesterton Parish Meeting

Chorlton Planning Ltd

Churches Together

Churchgate Property

Circle Anglia Housing Trust

Circle Housing Group

Cirrus Planning & Development

City of Ely Council

City of Providence

Civic Society of St Ives

Civic Trust

Clark-Drain

Classic Design Partnership

Cluttons LLP

Cocksedge Building Contractors

CODE Development Planners Ltd

Coldham Residents Action Group

Colin Smith Planning

Colliers CRE

Commercial Estates Group

Commissions East

Common Barn [Southoe] Action Group

Concorde BGW Ltd

Connecting Cambridgeshire

Connington Parish Meeting

Connolly Homes plc

Confederation of British Industry - East of England

Conservators of the River Cam

Construct Reason Ltd

Contour Planning Services Ltd

Coppice Avenue Residents Association

Corpus Christi Group

Cotton Windfarm Action Group

Council for British Archaeology

Councillors – Cambridgeshire County Council

Councillors – Cambridge City Council

Councillors – East Cambridgeshire District Council

Councillors – Fenland District Council

Councillors – Huntingdonshire District Council

Councillors – South Cambridgeshire District Council

Country Land and Business Association

Countryside Properties (Special Projects) Ltd

Countryside Properties Plc

CPRE

CPRE Cambridgeshire

Cromwell Park Primary School

Cross Keys Homes

Croudace

Cruso & Wilkin

CS Planning Ltd

Cyclists Touring Club for Huntingdonshire

Dalkin Scotton Partnership Ltd

David Broker Design Services

David lightfoot Design

David Lock Associates (on behalf of O&H Properties)

David Russell Associates

David Shaw Planning

David Taylor Associates (UK) Ltd

David Walker Chartered Surveyors

David Wilson Homes and Kler Developments Ltd

Dawbarn and Sons Ltd

DC Blaney Associates Ltd

DCN Architectural Design Services

Dean Jay Pearce Architectural Design

Defence Estates (MoD)

Defence Estates Operations

Defence Estates Operations North

Defence Infrastructure Organisation

Defence Lands Ops North

Delamore

Denley Draughting Ltd

Denton and Caldecote Parish Meeting

Department of Environment, Food and Rural Affairs

Derbyshire Gypsy Liaison Group

Design & Planning

Design ID

Dev Plan UK

Development Land and Planning Consultants

DGA Architecture

DGM Properties Ltd

Dickens Watts and Dade

Diocese of Ely

Disability Cambridgeshire

Disability Information Service Huntingdonshire

Distinct Designs UK Ltd

DLP Consultants Ltd

DLP Planning Ltd

DPA Architects

DPDS Consulting Group

Drake Towage Ltd

DTZ

E & P Building Design

E.ON UK

Eagle Home Interiors

Earith Plant Ltd

Earith Primary School

Earith Timber Products Ltd

East Northamptonshire District Council

East of England Black and Minority Ethnic Network

East of England Strategic Health Authority

Ecoexcel Ltd

ECS Ltd

Elmside Ltd

Ely Design Group

Ely Diocese/HS&P

Ely Group of Internal Drainage Boards

Empowering Wind Group

Energiekontor UK Ltd
Engena Ltd
Engineering Support Practice Ltd
English Brothers Ltd
Entec on behalf of National Grid
Environment Agency
ESCA Eatons Community Association
Essex County Council
Estover Playing Field Association
Eversheds LLP
Evolvegroup Ltd
FACT
Fairhurst
Farcet Farms
Farcet Nurseries
Federation of Small Businesses
Fen Ditching Company
Fenland Chamber of Commerce
Fenland Citizen
Fenland Citizen Advice Bureau
Fenland Leisure Products Ltd
Fenpower/Ecogen
Fenstanton Village Hall Trust
FFT Planning
Fields In Trust
First Capital Connect
Firstplan
Fisher Parkinson Trust
Fitch Butterfield Associates
Flagship Housing Group
FOB Design
Ford and Slater
Forest Heath District Council
Forestry Commission
Foster Property Developments Ltd
Fountain Foods
Foxley Tagg Planning Ltd
Framptons
Francis Johnson & Partners
Francis Jackson Estates Ltd
Freeland Rees Roberts
Freeman Brear Architects
Freight Transport Association
Friends Families Travellers
Friends of the Earth
Friends of Hinchingbrooke Park
Friends of Holt Island Nature Reserve
Friends of Paxton Pits Nature Reserve
Friends of Priory Park
Friends of the Earth
FSB Huntingdonshire
Fuse 3
Fusion On-Line Limited
G K Partnership
G1 Architects
G.H. Taylor Design
G.R.Merchant Ltd
Gallagher Estates Ltd
Galliford Try Strategic Land
GamPlan Associates

Gary John Architects

Gatehouse Estates

Gavin Langford Architects Ltd

GC Planning Partnership

GCE Hire Fleet Ltd

Gerald Eve

Geo Networks Limited

Geoff Beel Consultancy

Geoffrey Collings and Company

George Laurel & Partners

Gillespies Ltd

GL Hearn

Gladman Developments Ltd

GML Architects Ltd

Godmanchester in Bloom

Godmanchester Rovers Youth Football Club

Godmanchester Town Council

Good-Designing Ltd

Gooding Holdings Ltd

Goose Architects Ltd

Govia plc

Govia Thameslink Railway

Graham Handley Architects

Grahame Seaton Design Ltd

Granta Housing Society

Great Ouse AONB Working Group

Great Ouse Boating Association

Great Shelford Parochial Charities

Greater Cambridge Greater Peterborough Local Enterprise Partnership

Greater Cambridgeshire Local Nature Partnership

Greater London Authority

Green Power Solutions UK Ltd

Greg Saberton Design

Gregory Gray Associates

Grosvenor USS

Gs Designs

Guinness Trust

GVA

H L Hutchinson Ltd

Haddenham BDC

Haddon Parish Meeting

Hallam Land Management

Hallmark Power Ltd

Hamerton and Steeple Gidding Parish Meeting

Hanover Housing Association

Hargrave Conservation Society

Harlequin Ltd

Harris Lamb Chartered Surveyors

Harris Partnership

Hartford Conservation Group

Hartford Marina

Hastoe Housing Association

Haysom Ward Miller Architects

Heaton Planning Ltd

Hemingford Abbots Golf Club

Henry H Bletsoe & Son

Hertfordshire County Council

Hewitsons

HFT Gough & Co

Highways England

Hill

Hill Construction

Hinchingbrooke Health Care NHS Trust

Hinchingbrooke Water Tower Ltd & Landro Ltd

Historic England

Hobson's Conduit Trust

Hodplan Ltd

Hodsons

Hollins Architects, Surveyors and Planning Consultants

Home Builders Federation

Homes & Communities Agency

Houghton and Wyton Neighbourhood Plan Working Party

Housing 21

Howard Sharp and Partners

HPN Ltd

HTA

Humberts

Hundred Houses Society

Huntingdon and Godmanchester Civic Society

Huntingdon CAB

Huntingdon Freemen's Charity

Huntingdon Mencap

Huntingdon Timber

Huntingdon Town Council

Huntingdon Youth Town Council

Hunts Cricket Board

Hunts Health - Local Commissioning Group

Hunts Forum for Voluntary Organisations

Hunts Society for the Blind

Hutchinsons

Hutchinsons Planning and Development Consultants

Hyde Housing

Ian H Bix Associates Ltd

ICE Renewables

Iceni Homes

Iceni Projects Ltd

In-site Design

Inigo Architecture

Indigo Planning Limited

Infinity Architects

Insight Town Planning

Iplan Ltd

Institute of Directors - Eastern Branch

Irish Travellers Movement in Britain

ISOFAST

Ivy House Trust

J & J Design on behalf of Chatteris Airfield

J & J Design on behalf of Defence Estates

J Brown and Sons

James Development Co Ltd

James England Ltd

James Mann Architectural Services

Januarys

Januarys Consultant Surveyors

Jehovah's Witnesses

Jephson Housing Association Group

John Martin & Associates

John Stebbing Architects

Johnson Design Practice

Joint Strategic Planning Unit

JK Architecture

John Rowan & Partners

Jones Day Solicitors

Jones Developments Ltd

JRK & Partners Ltd

JS Bloor Services Ltd

K L Elener Architectural Design

Kevin Burton MCIAT

Kier Group plc

Kier Partnership Homes Limited

Kier Residential (part of Twigden)

Kimbolton School

King Street Housing Society

Kinnaird Hill

KWA Architects Ltd

L Bevens Associates Ltd

Lafarge Aggregates & Concrete UK

Lakeside Lodge Golf Centre

Lambert Smith Hampton Property Solutions

Lancashire Industrial & Commercial Services

Landmark Landscape Planning

Landro Ltd

Landscape Institute

Langley Associates

LANPRO SERVICES

Larkfleet Homes

Laurence Gould Partnerships Limited

Leach Homes

Les Stephan Planning

Levvel

Lewis & Hickey

Lidl UK

LIghtfoot Design

Linden Homes

Linconshire County Council

Living Sport

Local Generation Ltd

Local Nature Partnership

London Gypsy and Traveller Unit

Longhurst & Havelok Homes Ltd

Longsands Academy

Loves Farm Community Association

Luminus Group

Lynwood Associates Ltd

Lyster Grillet & Harding

M R Designs

M T Consulting

Mair & Sons (Farmers) Ltd

March Chamber of Commerce

March Town Council

Marine Management Organisation

Mark Reeves Architects

Marlborough Properties UK Ltd

Marshalls of Cambridge

Mart Barrass Architect Ltd

Martineau

Matrix Planning Ltd.

Maxey Grounds & Co

Maxey Grounds LLP

Mayfair Investments

McCann Homes

Melbourn Dental Practice

Melbourn Housing Development Awareness Campaign

Melling Ridgeway & Partners

Meridian

Meridian Architectural LLP

Michael Bullivant Associates

Michael Ingham Associates

Middle Level Commissioners

Mike Hastings Building Design

Mike Sibthorp Planning

Miller Homes

Milton (Peterborough) Estates Co

Minster Housing Association

MLT Architects

Mobile Operators Association

Molesworth Action Group

Morbone Parish Meeting

Morton & Hall Consulting Ltd

Mosscliff Environmental Ltd

MP North West Cambridgeshire

MRPP

Mrs P Wilderspin

Muir Housing Group

Murray Planning Associates Ltd

N & C Glass Ltd

National Farmers Union

National Federation of Gypsy Liaison Groups

National Grid

National House Building Council

National Housing Federation

National Trust

Natural England

NDC Architects Ltd

Neale Associates

Neil Cutforth & Associates

Nene Valley Gliding Club

Nene Valley Nature Improvement Area

Network Rail

New Homes

New World Architectural

NHS Cambridgeshire and Peterborough

NHS England (Midlands & East)

NHS Property Services

NKW Design

NJL Consulting

Nobles Field Committee

Noble's Field Trust Committee

Norfolk County Council

Norfolk Street Traders

Norman Cross Action Group

North Hertfordshire District Council

North Northamptonshire Joint Planning Unit

Northamptonshire County Council

Northern Trust

Notcutts Limited

NRAP Architects

Nupremis

MWS Design

N'worth Hous.Consort

Office of Rail and Road

Oglesby & Limb Ltd

Oliver Russell Property Consultants

Omega Signs Ltd

Once Architecture Ltd

Optical Activity Ltd

Orchard Park Community Council

Ormiston Children's and Family Trust

Ove Arup & Partners

Over and Willingham Internal Drainage Board

Oxmoor in Bloom

P Grisbrook Building Design Service

Papworth Hospital NHS Foundation Trust

Papworth St Agnes Parish Meeting

Paradigm Housing Group

Parkin Planning Services

Parson Drove Amenities Group 95

Partners in Planning & Architecture Ltd

Paul & Company

Paul Mitchell & Co

Paul Owen Associates

PDE Construction Ltd

PDG Architects

Peacock & Smith

Pegasus Planning

Pegasus Planning Group

Pendimo

Persimmon Homes (East Midlands) Ltd

Peterborough City Council

Peterborough Environment City Trust

Peter Brett Associates

Peter Cutmore Architect

Peter Humphrey Associates

Peter Rawlings Architects Ltd

Peter Smith Associates

Phase 2 Planning & Development Ltd

Philip Bailey Architects Ltd

Phillips Planning Services Ltd

Pick Everard

Pidley Cum Fenton PC

Plainview Planning Ltd

Plan B Drawing Service

Planning Aid

Planning Places for People

Planning Potential

PlanSurv Ltd

Planware Ltd

PMA

Pocock & Shaw

Poors Allotments Charities

Poppyfields Investments

Powis-Hughes

Premier Choice Ltd

Prime Oak Buildings Ltd

Property Revolutions Ltd

Preserving Upwood

Project Support Services

Purcell UK

R B Organic

Quay Plumbing Centre

Railfuture East Anglia

Ramblers' Association [Cambridge Group]

Ramblers/Local Access Forum

Ramboll UK

Ramsey Club Co Ltd

Ramsey Estate

Ramsey Fourth (Middlemoor) IDB

Ramsey Million

Ramsey Town Centre Partnership

Rapleys Planning Consultants

RAVE

Raymond Stemp Associates

RB Organic

Redmayne Arnold & Harris

Redrow Homes (South Midlands) Ltd

Renewables East

RES UK and Ireland Ltd

Residential

Residential Development Land Agent Ltd

RFU

RHH Associates Ltd

Richard Brown Planning

Richard Raper Planning Ltd

Richmond Fellowship Employment and Training

Robert Doughty Consultancy

Robinson & Hall LLP

Robinson and Hall

Roddons Housing Association

Roger Driver Partnership

Roger Tym and Partners

Rose Homes Ltd

Rotary Club of Wisbech

Royal Air Force

Royal Society for the Protection of Birds (RSPB)

Roythorne and Co

RPS Planning

Rutland County Council

S B Components (International) Ltd

Sampson Associates

Santon Retail Ltd

Sanctuary Housing Association

Saunders Boston Ltd

Savills

Savills Incorporating Smiths Gore

Selling Solutions Cambridge Ltd

Scotfield Ltd

SEARCH Architects

Seagate Homes

Sentry Ltd

Sharman Architecture

SHED

Shelter

Shrimplin Brown Planning & Development

Showmen's Guild of Great Britain

Signet Design

Skanska UK Plc

Ski Property Management

Simon J Wilson Architect

Smart Planning Ltd

Smarter Planning Champion

Smith Farrer Holdings

Smiths Gore

Soham Town Council

Somersham and District Day Centre

South Cambridgeshire Youth Council

Spacelab

Sport England

Sport England (East Region)

Sports and Fashions

Solo Designs

South Holland District Council

South Kesteven District Council

Springfields Planning & Development

SSA Planning

St Edmundsbury Borough Council

St Ives Chamber of Commerce and Industry

St Ives Town Initiative

St Ives Town Team

St Ivo School

St John's College

St Neots and District Chamber of Commerce

St Neots Town Centre Manager

St Neots Town Council

St Neots Youth Town Council

Stecen Abbott Associates

Stewart Ross Associates

Stilton Community Association

Stop Molesworth Wind Farm Action Group

Strawsons Holdings Ltd

Strutt and Parker LLP

Studio 11 Architecture

Suffolk County Council

Sustrans

Swann Edwards Architects

Swavesey District Bridleways Association

Swavesey Internal Drainage Board

T A M Engineering

T C Harrison Ford

Tadlow Parish Meeting

Taylor Vinters - Solicitors

Taylor Wimpey

TCI Renewables Ltd

TCS Design

TE&AS

Technical Signs

Terence O'Rourke Ltd

Terry Stoodley Partnership

The Abbey Group Cambridgeshire Ltd

The British Wind Energy Association

The Bursars Committee

The Cambridge Conservatory Centre Ltd

The Cambridgeshire Cottage Housing Society

The Card Gallery

The Civic Society of St Ives

The Church of England Ely Diocese

The Churches Conservation Trust

The Clarke Smith Partnership

The Coal Authority

The Crown Estate

The Design Partnership (Ely) Ltd

The Ely Planning Company

The Environment Agency

The Environmental Protection Group Ltd

The Equality and Human Rights Commission

The Fairfield Partnership

The Fisher Parkinson Trust Ltd

The Foyer

The Garden Office Company

The Gypsy Council (GCECWCR)

The Inland Waterways Association

The Landmark Practice

The Landscape Partnership

The National Federation of Gypsy Liaison Groups

The National Trust (East of England Office)

The Papworth Trust

The Planning Law Practice

The Redhouse Trust

The Robert Partnership

The Showmen's Guild of Great Britain

The Solar Cloth Company Limited

The Theatres Trust

The Traveller Movement

The Varrier Jones Foundation

The Wellcome Trust

The Whitworth Co-Parrnership

The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire

The Woodland Trust - Public Affairs

Thornburrow Thompson Ltd

Thurlow Nunn Standen Ltd

Tibbalds Planning and Urban Design

Tibbet Architectural Services

Tim Marshall Design

Tim Moll Architecture

Timothy Smith & Jonathan Taylor LLP

Tingdene Developments Ltd

TNEI Services Ltd

Tony Walton Design

Town Planning Services

Traer Clark Chartered Architects

Travel for Cambridgeshire

Traveller Law Reform Project

Travellers Times Online

Travis Perkins

Truckmasters Ltd

Trumpington Residents Association

Turner Contracting

Twitchett Architects

UK Power Networks

University of Cambridge Estate Management and Building Service

University of Cambridge - Vice Chancellor's Office

Urban and Civic

Uttlesford District Council

V G Energy

Various Leverington Groups

Vawser and Co

Vergettes

Verity & Beverley Ltd

Vincent and Gorbing Chartered Town Planners

Visual Creations

W A Fairhurst & Partners

Wagstaffe & Ablett

Warboys Sports Ground Trust

Ward Gethin Archer

Wardell Armstrong LLP

Warden Housing Association Ltd

Warren Boyes & Archer Solicitors

Wellsfield Associates

Wenman Design Solutions Ltd

West End Preservation Society

Westbury Garden Rooms Ltd

White and Eddy

White Young Green

Whiting & Partners

Whittlesey & District Tenants' Association

Whittlesey Town Council

Whittome Farms

Wildfowl and Wetlands Trust Centre

William H Brown

Wind Direct

Wind Energy Direct Ltd

Wind Prospect Developments

Windcrop Ltd

WindEco Ltd

Winwick Parish Meeting

WisARD

Wisbech and District Chamber of Commerce

Wisbech Chamber of Commerce

Wisbech Electrical

Wisbech Roadways

Wisbech Round Table

Wisbech Town Council

Wm Morrison Supermarkets plc

Wood Hardwick Ltd

Woodard Builders & Developers

Woodland Trust

Woods Hardwick Planning Ltd

Woolley Hill Action Group

Workshop 76 Ltd

Wynnstay Properties

WYG

Wythe Holland Partnership LLP

XCelld Ltd- Renewable Energy

Yaxley Ammenity Centre

York Green Renewables

Annex B: Record of Issues Raised and Action Taken

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
Overall Document						
Dr Roger Sewell	Overall doc	F+W SPD:3	Support	I thought this was a good and carefully written document which I support.	Support noted	No change
Mrs Hattie Emerson	Overall doc	F+W SPD:7	Support	I stongly agree that SuDs should be conisdered by developers and adopted where appropriate for flood attenuation. This should also be rigorously enforced	Support noted	No change
Mr Brian Williams	Overall doc	F+W SPD:8	Have observations	I have an issue I would like to be considered. Around the junction of Bannold rd and Bannold Drove Waterbeach near Mid Load Farm 2/3 times per year after heavy rains we experience effluent backing up the sewer drain into the gardens and surrounding a dozen or so properties. We are concerned that Aglian Water and the Planning Authority do not take any account of the invasion of surface water into the sewer when they calculate the capacity of the sewer. Our great concern is that around 300 houses are to be built in the area and Aglian Water will respond to the question of capacity solely on the estimate of foul water entering the drain despite their knowledge of the sewer being overwhelmed by surface water on a regular basis. I would like the document to reflect the fact of non sustainability and be rectified by increasing capacity or restricting surface water from the foul drain before any additional housing is connected.	This is acknowledged; however the issue is out of the scope of the SPD	No change

Annex B: Record of Issues Raised and Action Taken

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
Parish Clerk Burwell Parish Council	Overall doc	F+W SPD:17	Have observations	Burwell Parish Council is concerned that with lack of maintenance and dredging of the Burwell Lode, that flood issues could arise in Burwell in furture years	This is acknowledged; however the issue is out of the scope of the SPD	No change
Mr Michael Wollaston	Overall doc	F+W SPD:18	Have observations	The Suds in principal can only work when all other contributing factors are considered . The example I will give is land to the north of Whittlesey . This area of land is adjacent to a functional floodplain . Flood zone 3(b) , Whittlesey washes . Despite not being an area of land identified in the local plan , two sites still managed to get approval via the windfall loop hole which is being exploited by developers . The areas that have been earmarked for developement need to have robust drainage systems incorporated to mitigate against flood lock , which can last for weeks and sometimes months . overland flow routes for surface water , to and from existing dwellings and infra structure should be included In all sud designs and include capture and hence additional capacity . Sud viability should take into consideration existing soil structure pre -development . placing suds on secondary aquifers with fluctuating water bodies dependant on rainfall inundation , has the potential to increase flood risk elsewhere , putting suds on Mudstone overlaine by March gravels at various levels needs careful consideration in the design process as this has the potential	This is acknowledged; however the issue is out of the scope of the SPD. It should be noted that the consideration of site conditions and SuDS suitability is covered in Section 6.2 of this SPD.	No change

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				to create spring points . This would go against the NPPF and NPG for flood risk For both pluvial and fluvial flooding . In summary Developing land on and adjacent to the north of Whittlesey adjacent to Whittlesey washes is not a viable option , due to the lifetime sustainability of the Suds which Cannot be guaranteed .Both existing and new residents need to be safeguarded from flooding from ALL SOURCES.		
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	Overall doc	F+W SPD:28	Have observations	The images used within the document are not clear and often distorted.	This is agreed and relates to the space available on the host website for the draft SPD. Full resolution images are to be used for final document.	Full resolution images/plans added to final SPD
Mr Richard Whelan	Overall doc	F+W SPD:39	Have observations	The document does not seem to be conducive to encouraging developers compliance with changes in recent legislation, it seems rather cumbersome in places and would be quite an animal to tackle for anyone who may have to deal with more than one authority. Document appears to focus on the requirements of the MLC more than those of all water level management bodies/ Internal Drainage Boards. Would definitely support a document that can be adopted across the whole of the county area and have buy in of all planning authorities Some of the document appears to be rather	Several comments relating to cumbersome nature of document have been received as part of consultation; however content and length were agreed by the steering group prior to publication of the draft. Chapter 4 which received most comments needs to be rearranged to enhance readability. It is a fair comment that Middle Level Commissioners (MLC) have far more IDB specific information contained within the SPD than other IDBs and much of it is indeed relevant to all IDBs. References to MLC requirements that also relate to other IDBs should be replaced with	Chapter 4 rearranged to make it more reader friendly. Agreed by steering group Step 4 of Section 4.3 reworded from '*meets the criteria of the Middle Level Commissioners'* to '*may have an impact on an IDBs system'.* Document amended so titles are on new pages and boxes/tables amended to fit on one page wherever possible

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				wordy and overly complicated, would be concerned over how easy it would be to navigate and pick out the areas that are needed, for example chapter 4 could be easier to follow and the wording for step 6 (a) on page 31 Make it more visually appealing to have titles starting new pages and boxes on one page where possible, e.g 4.6 and the blue box for step 4 spans two pages	general IDB requirements. As MLC is also a navigation authority, some references that single out MLC have to remain as they are slightly different to other IDBs in this respect. Acknowledged that some tables and their associated text have split between pages; this should amended for final draft	
Mr George Dann King's Lynn Drainage Board	Overall doc	F+W SPD:112	Have observations	While generally a good document, and certainly a significant step in the right direction, along with various spelling and grammar issues at points throughout the document, I'd wish to note a few other issues which I feel merit amendment prior to publication of the final version. Section numbers refer to those in your draft SPD.	Acknowledged and a full spelling/grammar check should be undertaken prior to publication of final version	Spelling/grammar check undertaken
Allan Simpson Anglian Water Services Ltd	Overall doc	F+W SPD:126	Support	<u>Para 3.2.20</u> The final sentence of this paragraph states that it is responsibility of applicants to consult relevant WMAs. It is unclear what is intended as the Local Planning Authority (LPA) is responsible for consulting statutory and non-statutory consultees as part of the planning application process. Applicants should be encourage to consult relevant bodies including Anglian Water as part of the pre-application process. It would also be helpful if it was made clear that LPAs are required	Acknowledged – this should be made clearer in the final document. As part of the planning consultation process it is the responsibility of the LPAs to consult statutory consultees and not the applicant. Pre-application discussions are however always encouraged.	Amend paragraph 3.2.20 to, '*The LPA will consult the relevant statutory consultees as part of the planning application assessment and they may, in some cases also contact non-statutory consultees (e.g. Anglian Water or IDBs) that have an interest in the planning application'* Due to other alterations throughout the document this is now paragraph 3.2.22

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				to consult statutory consultees as but they also consult relevant bodies including Anglian Water who have interest in a planning application and managing flood risk.		
Scott Hardy RSPB	Overall doc	F+W SPD:134	Have observations	Thank you for providing the RSPB with the opportunity to comment on the above consultation. The RSPB is supportive of the overall objective of the Cambridgeshire Flood and Water Supplementary Planning Document (SPD) and its role in supporting sustainable policies for managing increased flood risk in Cambridgeshire. However, there are areas that we consider the document should be strengthened to ensure the maximum benefit of any SuDS schemes, for wildlife and people, will be delivered. Our recommendations are detailed below. 1. RSPB concerns regarding Cambridgeshire watercourses The RSPB has serious concerns about the current impact of flooding and poor water management on wildlife within Cambridgeshire. For example, the Ouse Washes since the 1970s has seen increased incidence and severity of late spring/summer flooding, longer deeper winter flooding, and poor water quality resulting in demonstrable ecological deterioration. Our key interest in the Flood and Water SPD relates to its role in ensuring new developments do not pose a risk to protected sites designated for their national and international importance for	Support acknowledged.	Added additional section titled '*Design for Wildlife and Biodiversity'* (6.3.30 – 6.3.32). *6.3.30 SuDS can provide the ideal opportunity to bring urban wetlands and other wildlife-friendly green spaces into towns and cities. They can be linked with existing habitats to create blue and green corridors whilst providing an amenity and education resource for the community.* *6.3.31 Where possible, existing habitats should be retained and incorporated into the landscape design. SuDS features are likely to have greater species diversity if existing habitats are within dispersal distance for plants, invertebrates and amphibians. It should however be noted that existing wetlands should not be incorporated into SuDS unless there is a guaranteed supply of clean water.* *6.3.32 An aim should be to create new habitats based on the ecological context and conditions of the site. Habitats and species objectives that contribute to local, regional and national biodiversity targets should be prioritised. Further information on local objectives can be found in local (BAPs). Guidance on maximising the biodiversity potential of SuDS can be found in the Royal Society for the Protection of Birds (RSPB) publication - Maximising the Potential for People and Wildlife*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				nature conservation, and that they maximise the opportunities for wildlife and people through sustainable water management. Strong policy and guidance is required to ensure that new development does not negatively impact on already strained systems, and wherever possible helps contribute to improving upstream storage. 2. RSPB position on Sustainable Drainage Systems (SuDS) Many existing drainage systems cause problems of flooding and/or pollution. Traditionally, underground pipe systems drain surface water and prevent flooding locally by quickly conveying away water. Such alterations to natural flow patterns can lead to flooding downstream and reduced water quality. The impact of climate change could see even greater pressure placed upon our drainage systems. SuDS provide a solution to mitigate and manage this challenge. They can provide cost effective and resilient drainage without causing the problems associated with traditional piped drainage. They also provide the ideal opportunity to bring urban wetlands and other wildlife-friendly green spaces into our towns and cities and link these with existing habitats creating blue and green corridors. Well-designed SuDS should also be an amenity and education resource for the community, providing high-quality public green space in which to relax, play and enjoy wildlife. If designed innovatively and correctly they can provide the community		

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				with a healthy and aesthetic environment, which they feel proud to live in and the wildlife will colonise naturally. 3. Opportunities to improve SuDS guidance within SPD Having reviewed the Cambridgeshire Flood and Water SPD we are pleased to see it provides sound guidance on selecting appropriate sites through Flood Risk Assessment, and the incorporation of Sustainable Urban Drainage Systems (SuDS) into development proposals. However, the RSPB strongly recommends that the following points be taken in to account in order to strengthen and improve the guidance. The RSPB supports the development of the SPD as a useful tool for Local Planning Authorities (LPAs) to engage with developers about flood and water management from the earliest proposal stage. However, the document should be strengthened to ensure that the maximum benefits of SuDS scheme are delivered. Given concerns regarding increased flooding and water quality issues in Cambridgeshire currently, and the potential increased pressures from climate change, the RSPB recommends the SPD be used as a catalyst to adopt stronger flood and water management requirements within future LPA Local Plans within Cambridgeshire's		
Mr Graham Moore	Overall	F+W	Have	The Commissioners and associated Boards are pleased to have been invited to assist in	Comment acknowledged – it is appreciated that there are differing	Paragraph 3.2.7 reworded to, '*IDBs are local public authorities that manage water levels.*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
Middle Level Commissioners	doc	SPD:140	observations	the preparation of this document which has involved considerable discussion being undertaken with yourselves and other stakeholders. While it is acknowledged that the SPD is written by the County Council as LLFA and is intended to cover the whole County it needs to be appreciated that this involves a number of differing risk management authorities and water level/flood risk management scenarios. Both the NPPF and PPS/G25, together with the associated guidance, are generic documents and do not appreciate the special circumstances of water level/flood risk management within The Fens. Therefore, it is considered that further guidance is required to assist all parties involved within the planning process of the specific issues that are different to other parts of the Country, and must be considered. However, in order to be fully utilised the approved document needs to provide better, succinct and detailed guidance to aid Council Officers, developers, agents and other parties involved in the wider development management decision making process. It is considered that the current document is "wordy" and is likely to become ineffective. A set of guidance notes for the target audience could assist and provide a more effective "journey" for users of the document. Whilst it is accepted that there is a production cost, the notes could speed up the planning process, reduce wasted time by all parties, including the Commissioners, in	landscapes across Cambridgeshire and these should be fully acknowledged in the SPD. Some of the policy documents including PPS/G25 are now superseded. Comment on length of document acknowledged; however this was agreed by the steering group prior to the draft being published. Each LPA or the LLFA may wish to provide a supporting note for the SPD; however this isn't directly related to publication of the final SPD. Descriptions of each water management authority are provided throughout the document; however it is acknowledged that additional information regarding the role of IDBs could be included.	*They are an integral part of managing flood risk and land drainage within areas of special drainage need in England and Wales. IDBs have permissive powers to undertake work to provide water level management within their Internal Drainage District. They undertake works to reduce flood risk to people and property and manage water levels for local needs. Much of their work involves the maintenance of rivers, drainage channels, outfalls and pumping stations, facilitating drainage of new developments and advising on planning applications. They also have statutory duties with regard to the environment and recreation when exercising their permissive powers'* Due to other changes this is now paragraph 3.2.6. New paragraph (3.2.7) added in, *'IDBs input into the planning system by facilitating the drainage of new and existing developments within their districts and advising on planning applications; however they are not a statutory consultee to the planning process'* New paragraph (3.2.9) added in, '*Some IDBs also have other duties, powers and responsibilities under specific legislation. For example the Middle Level Commissioners (MLC) is also a navigation authority. Although technically the MLC are not an IDB, for ease of reference within this document it has been agreed that the term IDB can be used broadly to refer to all*

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				responding to basic and fundamental queries and thus reduce costs in the long term.		*relevant IDBs under its jurisdiction. A list of the IDBs can be found in Appendix 3'*
				The document fails to readily identify the difference between the Environment Agency and the IDBs and our differing concerns and requirements and even differences between individual IDBs. The overriding impression given is one where the role, function and governance of the IDBs appears not to be clearly understood. IDBs are set up because their area/District is at flood risk and therefore requires special local measures to be undertaken and maintained to reduce/alleviate that flood risk. The IDBs have therefore, been established with that purpose and have already established policies and governance indicating how their statutory functions will be undertaken. They already, through their local nature and funding arrangements, have very close connections and liaison with their communities and their members are, or represent, those who are required to fund their operations. They, therefore, as a matter of routine, will address the need for capital and maintenance works to be undertaken. They are therefore well versed in the needs of their Districts and answerable to their rate/special levy payers if the reasonable needs or expectations of such payers are		Paragraph 3.2.2 already encourages applicants to seek pre-application advice therefore no further action on this is required.

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				not met. The IDBs may therefore not be able to accept principles and policies which accommodate a County wide "broad brush'' basis but which are not consistent with the more detailed requirements of their local areas. In the flood risk areas managed by IDBs, development proposals are too often granted subject to conditions to allow LPAs to reach their targets, without sufficient regard to IDB comments on flood risk. It should also be appreciated that while LPAs receive fees for dealing with planning applications, IDBs do not, unless the developer chooses to follow an IDB pre-application procedure. Too often our advice is ignored and we are expected to provide a subsidised service for planning authorities to enable them to meet their targets, which the Boards are not prepared to do. Therefore, we wish to encourage LPAs to, in turn, encourage developers to adopt this procedure. In the absence of the developer doing so, we can give no guarantee that, under the present arrangements, we will be able to respond to the Council's request for advice on flood risk.		
Janet Nuttall Natural England	Overall doc	F+W SPD:151	Support	Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable	Support acknowledged.	No change

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				development. We note the aim of the SPD is to provide guidance to applicants on managing flood risk through development. We support guidance to ensure that drainage schemes will protect and enhance the natural environment where possible, including contribution to local Biodiversity Action Plan targets and the objectives of the Cambridgeshire Green Infrastructure Strategy. We particularly welcome the promotion of multi-functional SUDS, taking a landscape-led approach to provide biodiversity, landscape and green infrastructure enhancements. We agree that drainage should mimic the natural drainage systems and processes as far as possible and that SUDS can be designed to provide valuable amenity and ecological features. We believe developers should be encouraged to maximise biodiversity benefits through SUDS wherever possible. Natural England is fully supportive of the requirement for a drainage strategy to accompany planning applications and for consideration of long-term management of SUDS; this will be critical to the maintenance of long-term benefits for the natural environment. We support recognition of Natural England's Impact Risk Zones to help developers and LPAs identify potential implications for designated sites and the need for consultation. Consideration of the effects of development on the quality of the water environment, and implications for water-		

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				dependent sites and compliance with the requirements of the Water Framework Directive (WFD) is also welcomed. Natural England has advised through previous correspondence that it is generally satisfied with the conclusions of the Habitats Regulations Assessment that the SPD is unlikely to have a significant effect on European sites.		
Adam Ireland Environment Agency	Note to the reader	F+W SPD:71	Support	The Environment Agency welcomes the SPD and subsequent consultation. We support the SPD in a county which, from a national perspective, has high growth pressures coupled with widespread areas at risk of flooding. The SPD is a necessary means of guiding developers, infrastructure providers and decision makers with a clear illustration of how 'high level' local plan policy is translated and adopted in Cambridgeshire's unique catchments. **Summary** Overall we commend this is a helpful and progressive Flood Risk Guidance Document. We believe that it chimes with NPPF and accompanying practice guide, adding both detail and process guidance where the NPPF policies [and Practice Guidance] are succinct or do not provide contextual focus for a generally low lying terrain and fenland catchment. We are of the view that the SPD is consistent with and compliments the adopted Development Plan Documents for	Support acknowledged. Chapter 4 which received most comments needs to be rearranged to enhance readability. Some sections include detail from other policy/guidance documents and this was agreed with the steering group as it provides users of the document with easy reference guidance to support the content of the SPD.	Layout of Chapter 4 revised for improved readability

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				Huntingdonshire, East Cambridgeshire, Fenland and South Cambridgeshire. We also believe it to be consistent with the flood risk policy in the Cambridge City Local Plan and South Cambridgeshire Local Plan currently in examination. We consider that the SPD is a necessary means of ensuring that the flood risk policies in these higher tier plans can be implemented effectively and efficiently. We suggest some minor changes for accuracy, completeness and by way of update, particularly in respect of chapters 4, 5 and 7 where we did not have resources for detailed 'editing level' comments during formative draft stages. In Chapter 4 the headings hierarchy may need some re-planning to read the structure more clearly and see where the Stages fit into the Steps and where the sequential test and exception test fit into that. We make some recommendations. There may be further scope not to repeat verbatim other documents (flood resistance and SuDS sections). Perhaps use links if base documents have a stable web location. There are some sections that can be reworded to ensure a wider audience can understand them. We make some		

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				suggestions. Similarly, some sections needing more clarity in definition i.e. risk, residual risk, breach mechanisms, 'safe' access, and flood probability. We suggest text.		
Adam Ireland Environment Agency	1.1 Backgro und	F+W SPD:72	Have observations	1.1.5. – It would be illustrative to add current growth figures/ranges from the local plans if known. 1.1.5 - minor phrasing changes needed i.e. the 'impacts' of climate change. 1.2.3 – is there a place that acts as a road map to other documents on these issues?	These figures are already contained within the Local Plans and there would be a direct repeat of information. Additionally, some LPAs have not yet finalised their local plans. Throughout the SPD, hyperlinks to other documents are used and the number of these hyperlinks may be increased as part of the final document.	Paragraph 1.1.5 amended to read, *'A significant amount of new development will occur in Cambridgeshire in the next 20 years and beyond. In order to reduce the impact upon the water environment, development must be appropriately located, well designed, managed and take account of the impacts of climate change.* Due to other changes this is now paragraph 1.2.2 Hyperlinks to external documents included throughout SPD
Mr George Dann King's Lynn Drainage Board	2 Setting the scene	F+W SPD:114	Have observations	In section 2 "Setting the scene", I feel mention should be made of Eric Pickles's Ministerial Statement of 18 December 2014 regarding the use of SuDS within major developments.	Acknowledged and agreed – this should be added	New paragraph added in (2.3.7) titled '*Sustainable Drainage Systems: Written Ministerial Statement'.* *'On 18 December 2014, a Ministerial Statement was made by the Secretary of State for Communities and Local Government (Mr Eric Pickles). The statement has placed an expectation on local planning policies and decisions on planning applications relating to major development to ensure that SuDS are put in place for the management of run-off, unless demonstrated to be inappropriate. The statement made reference to revised planning guidance to support local authorities in implementing the changes and*

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						on 23 March 2015, the Department for Environment, Food and Rural Affairs (Defra) published the 'Non-Statutory Technical Standards for Sustainable Drainage Systems'. Further detail on how SuDS can be delivered in the Cambridgeshire context can be found in Chapter 6'
Mr John Oldfield Bedford Group of IDBs	2.2.1	F+W SPD:52	Have observations	This section should include a statement that acknowledges that WFD categorizes waterbodies into natural or heavily modified/artificial, which in turn directs the appropriate course of action of ecological status or ecological potential. This is of fundemental importance in Cambridgeshire given its waterbody systems that are heavily modifed and artifical in nature.	It is acknowledged that many watercourses throughout Cambridgeshire are artificial or heavily modified in nature' and this has a direct impact on WFD requirements. This should therefore be highlighted within the SPD. The WFD however has many requirements and if the HMWB etc. are discussed here in a lot of detail other elements of the WFD will need to be too and this section will become much larger than the other policy sections.	Added in new paragraph (2.2.2), '*To achieve the purpose of the WFD of protecting all water bodies, environmental objectives have been set. These are reported for each water body in the River Basin Management Plan. Progress towards delivery of the objectives is reported on by the relevant authorities at the end of each six-year river basin planning cycle. Objectives vary according to the type of water body; across Cambridgeshire and the Fens there is a significant network of heavily modified and artificial watercourses'* The following 2 paragraphs (7.1.3 and 7.1.4) have been added to Chapter 7, *7.1.3 In order to be able to calculate a baseline and monitor changes in ecological status/potential water bodies have been classified by their biology, their chemistry and their physical characteristics such as shape, depth, width and flow. The highest status that can be achieved, "high" is defined as the conditions associated with no or very low human pressure on the water body.* *7.1.4 It is, however, recognised in the WFD that physical alterations have taken place historically to support the socio-economic use of a water body for a particular purpose*

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						(e.g. water storage, flood defence or navigation). In this case the water body may be designated as a Heavily Modified Water Body (HMWB). Artificial Water Bodies (AWBs) are also identified in the WFD as those water bodies that have been constructed for a specific use. HMWBs and AWBs are subject to alternative environmental objectives and hence they have been clearly identified in each river basin district. This is of fundamental importance across Cambridgeshire given that many of its water body systems are heavily modified and artificial'
Mr John Oldfield Bedford Group of IDBs	2.3.1	F+W SPD:51	Have observations	It should be noted that LLFA only have responsibility for Ordinary Watercourses outside an IDB Drainage District, which isn't clear from the text.	Acknowledged – greater distinction should be made in final version	Added footnote to read, '*IDBs manage ordinary watercourses within their districts'*.
Allan Simpson Anglian Water Services Ltd	2.3.4	F+W SPD:127	Have observations	Para 3.2.4 This paragraph states that applicants for sites which require masterplans should consult relevant WMAs ***prior***to the pre-application stage. Large developments sites should use the Anglian Water pre-planning service, available on our website - http://www.anglianwater.co.uk/developers/pre-planning-service-.aspx	Due to the large number of water management authorities and local planning authorities referenced within the document it would be in appropriate to provide direct links to each of their websites throughout the text. It is however acknowledged that it could be made clearer that a pre-application service is offered by most WMAs	Column 2 refers to 2.3.4 but comment relates to 3.2.4. Action relates to 3.2.4 rather than 2.3.4. Paragraph 3.2.1 amended to, '*Many of Cambridgeshire's LPAs and WMAs provide a pre-application advice service. There may be a charge for this service. Further advice can be found on each LPAs or WMAs website'.* Paragraph 3.2.4 removed as this would still be considered 'pre-app' and is therefore covered in preceding paragraph.
Mr Graham Moore	2.3.4	F+W	Have	It should be noted that the Commissioners and associated Boards do not support the following aspects of the SPD. Our position is	(i) Changes to national legislation are beyond the control of the	No change

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Middle Level Commissioners		SPD:143	observations	as follows: (i) The Government has published the NPPF which condenses the contents of all of the former PPS documents into a general framework document which, it is proposed, will simplify the planning process. The areas of the Middle Level Commissioners and our associated/administered IDBs are a defended flood plain in which detailed day to day management of water levels is required to reduce flood risk. This must clearly influence the consideration given to development proposals and their effects. Given therefore the importance and sensitivity of water level/flood risk management within The Fens, the Commissioners and associated/administered Boards consider the NPPF to be a significantly retrograde step that will increase the risk of flooding in their area by appearing to dilute a proper consideration of the flood risk both to and caused by development in this area. In consequence, therefore, when dealing with issues related to our byelaws and consent procedures the Commissioners and associated/administered Boards will promote and require continued adoption of and compliance with the relevant principles contained within PPS25 and the associated Practice Guide together with the provision of a FRA that meets their own requirements ie detailed assessments on the impacts on the respective water level/flood risk management systems and the provision of adequate evidence to prove that a viable	LLFA and District Councils. It is the choice of the MLC if they request a FRA to be submitted meeting their own criteria (ii) Due to national policy it is a requirement that developers must demonstrate the use of SuDS across a site and if not there must be clearly demonstrable reasons why this is the case. It is also the case that the rate and volume of surface water leaving a site must not be any greater than existing; therefore it is unlikely that direct, unattenuated discharge will be acceptable to the LLFA or LPA	

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				scheme for appropriate water level/flood risk management exists, and that it could be constructed and maintained for the lifetime of the development. We will also be urging the LPAs within our areas to adopt a similar approach to ensure that proper consideration is given to flood risk issues arising from development until a suitable detailed replacement is in force. (ii) Whilst the emphasis placed on SuDS is noted, and the Commissioners and associated Boards appreciate that the use of SuDS does have a place within water level/flood risk management, particularly the discharge into managed watercourses, but it is considered that, despite the significant emphasis placed on such facilities, the use of attenuation devices in this area is not always the correct or most appropriate solution. Therefore, care needs to be taken to ensure that resources and funds are not wasted by seeking to impose attenuation solutions when a direct discharge is acceptable to the local drainage authorities.		
Mr George Dann King's Lynn Drainage Board	2.3.5	F+W SPD:115	Have observations	2.3.5 - the aim is not only to ensure that flood risk is not increased, but that it's reduced if possible.	Comment acknowledged and this should be incorporated into the final document	Amended paragraph to read '*The NPPF states that both Local Plans and planning application decisions should ensure that flood risk is not increased and where possible is reduced. Development should only be considered appropriate in flood risk areas where it can be demonstrated that*' • *A site specific flood risk assessment has been undertaken which follows the Sequential Test, and if required,*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
						the Exception Test; • *Within the site, the most vulnerable uses are located in areas of lowest flood risk unless there are overriding reasons to prefer a different location;* • *Development is appropriately flood resilient and resistant, including safe access and escape routes where required (Please see the Defra/EA publication 'Flood Risks to People' for further information on what is considered 'safe');* • *That any residual risk can be safely managed, including by emergency planning; and* • *The site gives priority to the use of SuDS.*
Adam Ireland Environment Agency	2.4 Local context	F+W SPD:73	Have observations	2.4 - should be referencing the Flood Risk Management Plan as well as/rather than the CFMP. Great Ouse FRMP is now out of consultation and due for adoption December 2015.	Comment acknowledged and this should be incorporated into the final document	Added section (2 paragraphs – 2.4.3 and 2.4.4) titled, '*River Basin Management Plans'* and the following text. '*2.4.3 In addition, the EA have developed an Anglian District River Basin Management Plan (ARBMP) this document identifies the state of, and pressures on, the water environment. This document implements the Water Framework Directive in the region and supports Defra's Catchment Based Approach.* *2.4.4 The CFMPs, FRMPs and the RBMPs together, highlight the direction of considerable investment in Cambridgeshire and how to deliver significant benefits to society and the environment'*

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Adam Ireland Environment Agency	2.4.6	F+W SPD:74	Have observations	2.4.6 – should this section also include a paragraph on where the watercourse discharge to when leaving Cambridgeshire. It needs to be acknowledged that any FRM work carried out will have an impact on other LPAs/LLFAs. Suggest: "From Cambridgeshire the watercourses flow down to the Ouse Washes and eventually discharge to the sea via the North Norfolk coast line. Changes in flood regimes in Cambridgeshire can therefore have consequences downstream within the Ouse Washes catchment beyond Cambridgeshire."	Acknowledged and this should be incorporated into the final document. Suggested wording to be added to SPD	Added following text to end of 2.4.6, '*From Cambridgeshire the watercourses eventually flow to the River Nene and River Great Ouse and subsequently discharge to The Wash and the North Sea. Changes in flood regimes in Cambridgeshire can therefore have consequences downstream within the Nene and Ouse Washes catchment, beyond Cambridgeshire'* Due to other changes this is now 2.4.9
Mr George Dann King's Lynn Drainage Board	3.1.2	F+W SPD:116	Have observations	3.1.2 - the second half of this section includes a lot of duplication of content.	Acknowledged – Multiple references made to table 3.2 This should be amended for better readability.	Paragraph 3.1.2 amended to read, '*The National Planning Practice Guidance (NPPG) lists the statutory consultees to the planning process. Within Cambridgeshire, although the local water and sewerage companies (Anglian Water and Cambridge Water) and the IDBs are not statutory consultees, they are consulted by the LPAs as part of the planning application process. Table 3.1 lists all the key WMAs across Cambridgeshire (some of which are statutory consultees) and it is important that those proposing new developments actively engage with the relevant WMAs at the earliest possible stage'*
Allan Simpson Anglian Water Services Ltd	3.2 Pre-application advice	F+W SPD:130	Have observations	<u>Para 3.2.13</u> Reference is made to Anglian Water assessing the capacity of the public system to accept flows when an application is	Acknowledged and this should be incorporated into the final document. Suggested wording to be added to SPD	Paragraph 3.2.13 amended to '*Anglian Water is also the sewerage undertaker for the whole of Cambridgeshire and has the responsibility to maintain foul, surface and*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				received for a sewer connection (section 106 of the Water Industry Act 1991). However, applications for sewer connections are made to Anglian Water once a site has the benefit of planning permission and the details of the site have been approved. Anglian Water assesses the capacity of public sewers as part of our pre-application service and when responding to planning application consultations from Local Planning Authorities. Anglian Water is normally referred to as sewerage undertaker. It is therefore proposed that paragraph 3.2.13 should be amended as follows: 'Anglian Water is also the sewer **age** undertaker….. Anglian Water needs to ensure that the public system has the capacity to accept these flows ~~. This is assessed when an applicant applies for a sewer connection~~ **as part of the pre-application service provided by Anglian Water** . Information about Anglian Water's development service is available on their website. **Anglian Water also comments on the available capacity of foul and surface water sewers as part of the planning application process'** It is also important to note that our response to the planning application will be based on the details completed in the application form and supporting details. We will not assess capacity if the proposed method of drainage does not interact with an Anglian Water		*combined public sewers so that it can effectively drain the area. When flows (foul or surface water) are proposed to enter public sewers, Anglian Water will assess whether the public system has the capacity to accept these flows as part of their pre-application service. If there is not available capacity, they will provide a solution that identifies the necessary mitigation. Information about Anglian Water's development service is available on their website. Anglian Water also comments on the available capacity of foul and surface water sewers as part of the planning application process'.* Due to other changes this is now paragraph 3.2.14.

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				operated system.		
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	3.2.6	F+W SPD:19	Have observations	It is imperative that all IDB's are involved within and buy-in to this document. It appears that some discussion has taken place with MLC. Without IDB buy-in the document will be less effective and result in continued tensions.	Comment acknowledged. Other IDBs have also bene consulted on the document	No change
Mr John Oldfield Bedford Group of IDBs	3.2.7	F+W SPD:53	Have observations	It would be worth referencing other roles undertaken by IDBs for clarity, such as Consenting on Ordinary Watercourses in Drainage Districts and IDB Byelaws that protect the watercourse corridor.	Comment acknowledged	Changes made as part of comment F+W SPD:140 cover this comment so no additional changes made
Mr John Oldfield Bedford Group of IDBs	3.2.9	F+W SPD:54	Object	IDBs have the same powers and duties for the benefit of their Drainage District that is governed by the Land Drainage Act and Byelaws, and not dictated by drainage rates. It is correct that there may be different rates in different districts. I'd support the 2nd sentenace, that advises interested parties to contact an IDB if development/works are to be undertaken in or adjacent to an IDB Drainage District	Comment acknowledged	Paragraph 3.2.9 amended to read, '*IDBs may have rateable and non-rateable areas within their catchments. It is recommended that applicants contact the relevant IDB to clarify which area proposed development falls into, and if there is an associated charge'.* Due to other changes this is now paragraph 3.2.10
Mr George Dann King's Lynn Drainage Board	3.2.10	F+W SPD:113	Have observations	Although King's Lynn IDB only covers a small part of Cambridgeshire, I would primarily note my extreme dissapointment that we are not mentioned anywhere within de document, despite other IDBs appearing many times, and the fact the Board was only informed of this draft publication by a consultant who had received your email. In particular, this Board should be listed in sections 3.2.10, table 3.2 (with ticks against	Comment acknowledged and it needs to be ensured that appropriate reference is made to Kings Lynn IDB throughout the document. Maps will also need to be updated to include boundaries of the IDBs within Cambridgeshire	Paragraph 3.2.10 amended to add in Kings Lynn IDB. '*There are 53 IDBs within Cambridgeshire. Map 3.1 highlights the area of Cambridgeshire that is covered by IDBs. Some of the IDBs are represented or managed by Haddenham Level Drainage Commissioners, Whittlesey Consortium of IDBs, North Level District IDB, Ely Group of IDBs, Bedford Group of IDBs, Kings Lynn IDB and MLC. The names of the IDB groups*

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				CCC and FDC) Appendix 2 and map 2.2.		*covering each district are stated in Appendix 3*. Due to other changes this is now paragraph 3.2.11
Mr Richard Whelan	Map 3.1: IDBs within Cambridgeshire	F+W SPD:36	Have observations	Map 3.1 IDBs within Cambridgeshire; is not the clearest map; a few of the town names are chopped; an alternate road map or some editing of map may make this clearer	Comment acknowledged. Clearer maps need to be provided in final document. Due to space allocated when uploading the draft document there was a restriction on the size of images that could be used.	Map 3.1 updated
Mr Graham Moore Middle Level Commissioners	Map 3.1: IDBs within Cambridgeshire	F+W SPD:141	Have observations	Whilst many of the issues previously raised by us during the preparation of the document have been included many important items appear to have been ignored and/or have not been included. There are also many items which are incorrect or contain errors, for example, Fig 3.1 remains a mix of rateable and catchment areas, Drysides IDB amalgamated with Whittlesey IDB to form Whittlesey and District IDB in April 2011 – Appendix 3, Nordelph IDB – Appendix 2 – is in Norfolk etc	Without further detail it is unclear what items are perceived to have been missed out. Figure 3.1 needs to be amended to ensure any incorrect boundaries are removed.	Map 3.1 updated and checked with IDBs
Allan Simpson Anglian Water Services Ltd	3.2.13	F+W SPD:128	Have observations	Para 3.2.13 Reference is made to Anglian Water assessing the capacity of the public system to accept flows when an application is received for a sewer connection (section 106 of the Water Industry Act 1991). However, applications for sewer connections are made to Anglian Water once a site has the benefit of planning permission and the details of the site have been approved. Anglian Water assesses the capacity of public sewers as part of our pre-application service and when	This comment has been made previously (appears to be a duplicate) under F+W SPD:130 and therefore no additional changes are required	No change

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				responding to planning application consultations from Local Planning Authorities. Anglian Water is normally referred to as sewerage undertaker. It is therefore proposed that paragraph 3.2.13 should be amended as follows: 'Anglian Water is also the sewer **age** undertaker….. Anglian Water needs to ensure that the public system has the capacity to accept these flows ~~. This is assessed when an applicant applies for a sewer connection~~ **as part of the pre-application service provided by Anglian Water** . Information about Anglian Water's development service is available on their website. **Anglian Water also comments on the available capacity of foul and surface water sewers as part of the planning application process'** It is also important to note that our response to the planning application will be based on the details completed in the application form and supporting details. We will not assess capacity if the proposed method of drainage does not interact with an Anglian Water operated system.		
Mr Richard Whelan	Map 3.2: Cambridge Water and	F+W SPD:40	Have observations	Map 3.2 Camb Water and AW coverage; is it worth having two maps? One for clean and one for waste? 3.2 may seem confusing; whilst it is described in 3.2.13 it is not overly clear	It may be possible to have two maps; however the document is already lengthy and this would add another page. A note should be added to this page to reiterate that	Note added to Map 3.2 to reiterate 3.2.13

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	Anglian Water coverage				foul water is dealt with solely by Anglian Water	
Mr George Dann King's Lynn Drainage Board	Map 3.2: Cambridge Water and Anglian Water coverage	F+W SPD:118	Have observations	Map 3.2 - the note to this is shown on page 14, but needs to appear on page 13 with the map.	Acknowledged that some tables and their associated text have split between pages; this should amended for final draft	Note now shifted to same page as map 3.2
Mr Richard Whelan	3.2.16	F+W SPD:41	Have observations	Possibly revisit; seems to give the impression the LLFA have a maintenance or operational responsibility to ordinary watercourses. Believe this is a power rather than a duty.	Acknowledged that there is no responsibility of the LLFA to maintain ordinary watercourses therefore this needs to be made clearer	Paragraph 3.2.16 amended to, '*The LLFA has powers to require works to be undertaken to maintain the flow in ordinary watercourses that fall outside of an IDB districts'.* Due to other changes this is now 3.2.17
Mr George Dann King's Lynn Drainage Board	3.2.16	F+W SPD:120	Have observations	3.2.16 - the LLFA can also delegate the responsability to a different RMA, such as IDBs, as happens elswhere in the country.	Comment noted and this is correct, but the paragraph is not applicable to planning and could be confusing (section 13 of the FWMA does not apply to LLFA's planning function). Rather than introduce more text to explain all the LLFA's other functions under the FWMA this paragraph should be amended to remove reference to other RMAs as it would not be possible to list all here due to their different requirements	Paragraph 3.2.16 amended to '*The LLFA has powers to require works to be undertaken to maintain the flow in ordinary watercourses that fall outside of an IDB districts'* Due to other changes this is now 3.2.17

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Mr George Dann King's Lynn Drainage Board	3.2.17	F+W SPD:121	Have observations	3.2.17 - should mention not to be made of the Highways Agency?	Acknowledged and this should be added to the document	Addition made to end of paragraph 3.2.17 – *'In addition, Highways England operates, maintains and improves a number of motorways and major A roads across the County'*
Mr George Dann King's Lynn Drainage Board	3.2.19	F+W SPD:122	Have observations	3.2.19 - I think "in the majority of instances" should be deleted at the end of this section - the intention is to make sure that flooding and other similar risk are always effectively managed	Acknowledged - the phrase adds a level of ambiguity so should be amended	Paragraph 3.2.19 amended to '*Each of the five City and District Councils within Cambridgeshire are LPAs and assess, consult on and determine whether or not development proposals are acceptable, ensuring that flooding and other similar risks are effectively managed'* Due to other changes this is now 3.2.21
Mr George Dann King's Lynn Drainage	3.2.20	F+W SPD:123	Have observations	3.2.20 - I disagree. While this document should help to improve consultation with relevant WMAs, with planning application decisions it is, of course, the LPA that has to be satisfied that the surface water disposal and flood risk aspects have been appropriately dealt with. A key part of this is likely to be consulting with WMAs, so I do not consider it appropriate for any attempt to be made to pass this responsability entirely on to the developer. Doing so can only lead to more disputes and problems in the future.	Acknowledged – this should be made clearer in the final document. As part of the planning consultation process it is the responsibility of the LPAs to consult statutory consultees and not the applicant. Pre-application discussions are however always encouraged.	Paragraph 3.2.20 amended to '*The LPA will consult the relevant statutory consultees as part of the planning application assessment and they may, in some cases also contact non-statutory consultees (e.g. Anglian Water or IDBs) that have an interest in the planning application'* Due to other changes this is now 3.2.22
Allan Simpson Anglian Water Services Ltd	3.2.20	F+W SPD:129	Have observations	<u>Para 3.2.20</u> The final sentence of this paragraph states that it is responsibility of applicants to consult relevant WMAs. It is unclear what is intended as the Local	Acknowledged – this should be made clearer in the final document. As part of the planning consultation process it is the responsibility of the LPAs to consult statutory consultees and not the applicant. Pre-	Paragraph 3.2.20 amended as part of F+W SPD:123 and also covers F+W SPD:129. '*The LPA will consult the relevant statutory consultees as part of the planning application assessment and they may, in some cases also contact non-statutory*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				Planning Authority (LPA) is responsible for consulting statutory and non-statutory consultees as part of the planning application process. Applicants should be encourage to consult relevant bodies including Anglian Water as part of the pre-application process. It would also be helpful if it was made clear that LPAs are required to consult statutory consultees as but they also consult relevant bodies including Anglian Water who have interest in a planning application and managing flood risk.	application discussions are however always encouraged.	*consultees (e.g. Anglian Water or IDBs) that have an interest in the planning application'* Due to other changes this is now 3.2.22
Miss Kayleigh Wood Historic England	3.2.21	F+W SPD:9	Have observations	We would advise that the words 'and their setting' are included after 'Whilst Historic England are not a WMA, they should be consulted where proposals may affect heritage assets'. We would advise this wording is included for clarity and to ensure the significance of Heritage Assets is not damaged due to inappropriate development within their setting.	Acknowledged – this should be included in final document	Wording amended to, '*Whilst Historic England is not a WMA, it should be consulted where proposals may affect heritage assets and their setting*'
Mr Richard Whelan	3.2.21	F+W SPD:42	Support	Table 3.2 very good way of displaying this information	Support acknowledged	No change
Allan Simpson Anglian Water Services Ltd	Table 3.2: Simplified table of key water management authoriti	F+W SPD:133	Have observations	<u>Drainage Proforma for Consideration and Submission at Outline, Full or Reserved Matters</u> Section 3 asks applicants to identify the proposed method of surface water disposal. It is important that other methods of surface water disposal are investigated prior to	Acknowledged – on occasion there are times when it is unclear to the LLFA/water company whether the other has been consulted and what their response was. This amendment should help reduce any confusion and make it clearer for the LPAs when reviewing applications	Amended text to '*Evidence should be provided to the LPA and sewerage undertaker to demonstrate that it is not possible to discharge surface water via infiltration or to a watercourse in accordance with Part H of Building Regulations'*

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	es that may need to be consulted during the planning application process on flood and water matters			applicants proposing to connect to surface water sewers (where available). It is therefore proposed that the row entitled 'To Surface Water Sewer' should be amended as follows: '**Evidence should be provided to the LPA and sewerage undertaker to demonstrate that it is not possible to discharge surface water via infiltration or to a watercourse in accordance with Part H of Building Regulations.**The confirmation from sewerage provider undertaker that sufficient capacity exists for this connection'		
Adam Ireland Environment Agency	4 Guidance on managing flood risk to developments and site selection	F+W SPD:75	Support	Section 4: We generally support this section and the guidance it provides on sequential approach process and how the various tests and evidence bases inform it. In the case of *The Environment Agency vs Tonbridge and Malling*, the process of the sequential test was confirmed as being a vital part of the decision making process. The lack of understanding and process structure of these tests, in EAs experience, is the single most significant factor leading to flood risk being 'expedited' and overridden at the planning application stage. The SPD reduces the risk of challenge by helping to make this process clearer.	Support acknowledged	No change

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Adam Ireland Environment Agency	4.1.2	F+W SPD:76	Have observations	4.1.2 – look up definition of risk – it is based on probability of occurrence and the impact. Low impact but high frequency events can equal low risk and vice versa. Suggest wording for 4.1.2 replaced with: "Flood risk is an expression of the combination of the flood probability (how likely the event will happen) and the magnitude of the potential consequences (the impact such as economic, social or environmental damage) of the flood event."	Acknowledged and to be incorporated into final document	Paragraph 4.1.2 has been amended to '*Flood risk is an expression of the combination of the flood probability (how likely the event will happen) and the magnitude of the potential consequences (the impact such as economic, social or environmental damage) of the flood event*'
Adam Ireland Environment Agency	4.1.3	F+W SPD:77	Have observations	4.1.3 We think this section needs to be looked at in greater detail or we suggest the following wording: "The likelihood or risk of flooding can be expressed in two ways: - Chance of flooding: As a percentage of flooding each year, for example for flood zone 3a there is a 1% annual probability of this area flooding. - As a return period: return period is a term used to express the frequency of flood events. It refers to the estimated average time interval between events of a given magnitude. However it is misleading to say that a 1% annual probability flood will only occur once in every hundred years. This suggests that if it occurs in one year then it should not be expected to reoccur again for another 100 years. This is not the case. It simple means it is such an extreme 'rare event that we would not expect it to occur often but an area could be affected by a 1% flood event over several years. It is important to recognise that a 1% flood event has a	Acknowledged and to be incorporated into final document	Paragraph 4.1.3 amended to '*The likelihood or risk of flooding can be expressed in two ways:* ▪ *Chance of flooding: As a percentage chance of flooding each year. For example, for Flood Zone 3a there is a 1% annual probability of this area flooding* ▪ *Return period: This term is used to express the frequency of flood events. It refers to the estimated average time interval between events of a given magnitude. For example, for Flood Zone 3a the return period would be expressed as 1 in 100 year* '

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				26% probability of being equalled or exceeded at least once in every 30 years (the duration of a typical mortgage and a 49% probability of being equalled or exceeded at least once in 70 years (a typical human lifetime)."		
Adam Ireland Environment Agency	4.1.6	F+W SPD:78	Have observations	4.1.6 - update to Gov.uk. NB the EA website does not exist anymore	Acknowledged and to be incorporated into final document	Paragraph 4.1.6 amended to, '*Maps showing Flood Zones are available on the .GOV website. The Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. Table 4-1 details the Flood Zones and their definitions taken from the NPPG'*
Adam Ireland Environment Agency	4.1.7	F+W SPD:79	Have observations	4.1.7 – we believe it's worth referencing that developments have to be safe for its life time so climate change is a key consideration in planning.	Acknowledged and to be incorporated into final document	Paragraph 4.1.7 amended to *'To cope with the potential risks and forecasts of climate change (predicted 1.05m rise in sea levels in the East of England, warmer summers, wetter winters and increased river flows by 2115) and to ensure that new development is safe for its lifetime, the Government has emphasised that development in areas at risk of flooding should be avoided by directing development away from the highest risk areas. Where development is necessary it should be made safe without increasing flood risk elsewhere'*
Mr John Oldfield Bedford Group of IDBs	4.3.1	F+W SPD:55	Have observations	This section should highlight that there is also a requirement to obtain Consent from EA/IDB/LLFA if the discharge is into a surface water system (River/Watercourse) or the Sewage Undertaker if connecting to a public sewer. Early consultation with the relevant authority is recommended.	Although this is not a direct planning issue it is acknowledged that it would be useful to include it for developers as it still facilitates development.	Addition made to step 3 (after paragraph 4.5.10) – (i) – *'Are any consents required from the EA/IDB/LLFA/Anglian Water'.* Due to other changes this is now after paragraph 4.3.9

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Adam Ireland Environment Agency	4.3.1	F+W SPD:80	Have observations	4.3 - for those sites that are shown to be at risk of other sources of flooding – do they need to show that they have passed the sequential test as well? This has been raised later in the document but would be beneficial to introduced first here. In section 4.3 we agree with the steps and stages. However, the heading hierarchy needs reworking so its clearer which step/stage/process is which. In section 4.3 need to rethink where the ST and ET sit within the These test and key steps should be named in the 4.3.1 section. 4.3 Steps - can the steps be named? It makes it clear what each step involves. Step 1 – Site Allocation etc. Consider 4.3.1 as a flow diagram or somehow emphasizing that this is a summary of the steps, and where the Stages A-E slot in.	Acknowledged and agree – all sources of flooding should be considered.	Chapter 4 amended to make it more reader friendly (see action on comments F+W SPD:39). Steps have now been named within each box. Step 1 – *Consider allocations* *Step 2 – Consider flood risk* *Step 3 – undertake pre-application consultation* *Step 4 – Site specific flood risk assessment (FRA)* *Step 5 – Surface water drainage strategy* *Step 6 – Submission of planning application*
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.3.2	F+W SPD:20	Object	I am uneasy regarding this point as PPG paragraph Paragraph: 033Reference ID: 7-033-20140306 is at odds with this. The development plan is intended to give certainty to developers and the latter sentences in this paragraph erode this. If the change in the flood risk zone is so fundamental then the Local Plan should be reviewed and amended. It is inappropriate and at odds with national policy to do otherwise. Criteria b. of Step 1 should be deleted.	Acknowledged – part b) can be amended to reflect this point	Part b) amended to: *b) Can it be demonstrated that the flood risk information contained within the SFRA and associated Sequential Test assessment accompanying the Local Plan/development plan (where applicable) is still appropriate for use*

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Adam Ireland Environment Agency	4.3.3	F+W SPD:81	Have observations	4.3.3 'land use type wording in first sentence' perhaps the words could include: "land use type considering the vulnerability classification." Step 2 last sentence in box – It would be useful to make it clear that at this stage discussions on Exception Test should not be taking place until the ST is undertaken and passed. General – use of acronyms – perhaps chance to use more acronyms in view of glossary in the back. The use of long terms (Strategic Flood Risk Assessment to name one specific example) makes some sections hard to read. Step 2 b) really hard to get what this means – we recommend rewording this to bring clarity. Step 2 c) what is deemed 'significant flood risk' could leave out the term significant – the exception test may determine this.	Acknowledged – important to include vulnerability classification as this is key within the NPPF. Agree Exception Test should not commence until ST passed as this needs to be reinforced through the SPD. Acronyms should be used as much as possible throughout the report. Agree wording of step 2b) may be confusing and this should be amended appropriately. Agree the word 'significant' is subjective and should be reworded appropriately	Paragraph 4.3.3 amended to '*Applicants must consider allocations within the relevant local development plan. If the site has been allocated in the relevant Local Plan/development plan for the same land use type/vulnerability classification that is now being proposed, then an assessment of flood risk, at a strategic level, has already been undertaken. This will have included assessing the site, against other alternative sites, as part of a Sequential Approach to flood risk*'. Due to other changes this is now paragraph 4.3.4 In Step 2 box added, *'Note: Discussions on the Exception Test should not be taking place until the Sequential Test is undertaken and passed. Further information on the Sequential and Exception Tests can be found in Sections 4.4 and 4.5 respectively'* Acronyms updated throughout document Amended part b) of Step 2 to *'In Flood Zone 1 and within an area that has been identified in the relevant SFRA (or any updated available information) as having flooding issues now or in the future (for example, through the impacts of climate change)?* Amended part c) of Step 2 to '*In an area of flood risk from sources other than fluvial or tidal such as surface water, ground water, reservoirs, sewers, etc? (See Stage C of the Sequential Test for details).'*

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Adam Ireland Environment Agency	4.4.2	F+W SPD:82	Have observations	4.4.2 - Sequential test is hard to apply for small scale developments i.e. 1-10 dwellings. Is this SPD to provide any specific guidance for this scale of development?	The SPD does not provide specific guidance on small scale developments	No change
Harry Jones of David Lock Associates for Tim Leathes Urban and Civic	4.4.2	F+W SPD:147	Have observations	Requirement for the Sequential Test U&C is concerned that the document lacks clarity regarding the requirement for developers to provide evidence in relation to the sequential test and this should be more explicit within the document. For example, text could be added to paragraph 4.4.2 to indicate that the sequential test does not need to be applied for sites located in flood zone 1 and this would reflect the National Planning Policy Framework (NPPF) - paragraph 100 and 101.	Detail on the requirements of the Sequential test is provided within the NPPF and PPG – we don't to lift large sections of national policy and repeat within the PPG. Additional bullet point to be added to reiterate ST not required for sites in FZ1	Added additional bullet point to Paragraph 4.4.2. *'iii) Sites location wholly in Flood Zone 1'*
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.4.6	F+W SPD:21	Object	The text below the bullet points in Stage D implies that, as the existing defences are not to be taken into account, the SFRA is not to be used for the purposes of the sequential test. PPG para Paragraph: 010Reference ID: 7-010-20140306 confirsm that the SFRA is to be used so this wording needs amendment to be consistent with national policy. The bold text at the end of Stage E is also confusing and requires amendment.	Disagree that this suggests the SFRA should not be used as these documents provide a large amount of other detail as well that will be useful for the ST. Bold text appears to contain a number of typos which have caused it to lose its meaning. Wording needs to be amended.	Wording of bold text in Stage E amended to *'If no, this still does not mean that the proposed development is acceptable in terms of flood risk as it may be necessary to undertake the Exception Test and a site specific FRA'*
Adam Ireland Environment	4.5.1	F+W SPD:83	Have observations	4.5.1 Is this sentence suggesting the ST has been passed, if so perhaps it should be	Yes – ET should only be undertaken upon passing of the ST as	Paragraph 4.5.1 amended to *'As explained within paragraph 102 of the NPPF, the*

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Agenc				stated here?	highlighted by other representations.	*Exception Test is applied to the proposal by the developer where, following application of the Sequential Test it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower risk of flooding'*
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.5.5	F+W SPD:23	Have observations	Typographical error on the fourth line.	The tick included within the Word document has transferred incorrectly into the publishing programme. This needs to be amended in final document.	Paragraph 4.5.5 amended to replace typographical error with a 'tick'
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.5.6	F+W SPD:22	Have observations	This text confirms that the SFRA is to be used for the sequential test - the previous text (see my other comments on page 24 of the Draft SPD) requires revision to reflect this.	Agree this paragraph could be amended to reinforce point made previously relating to ignoring presence of defences. Add footnote in.	Footnote added to text in Exception test box (below paragraph 4.5.6). '*Ignoring the presence of defences'*
Miss Kayleigh Wood Historic England	4.5.8	F+W SPD:10	Object	We would advise the replacement of the words 'cultural heritage' with 'the Historic Environment'. The 'Historic Environment' is an all-encompassing term which takes into account the physical built heritage and archaeology for example, but also the less tangible elements such as the sense of place and time depth and cultural heritage	Acknowledge - this can be replaced	Third bullet point of Paragraph 4.5.8 amended to '*Landscape, townscape and historic environment*
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.5.9	F+W SPD:24	Object	The suggestion that new housing may not be sufficient by itself in order to outweigh flood risk is a general assertion and may not be applicable to individual circumstances. If this is the view of the Councils then it should be tested properly through the Local Plan	The words 'not normally' provides caveat for times where this will change; however it can be added in that applicants should check with the LPA each time.	Amended paragraph 4.5.9 to '*Any development undertaking the Exception Test should demonstrate the sustainability issues that the proposal is seeking to address. The general provision of housing by itself would not normally be considered as a wider sustainability benefit to the community which*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
				examination.		*would outweigh flood risk; however confirmation should be sought from the LPA'*
Mrs Ellie Henderson	4.5.10	F+W SPD:29	Object	We would ask that you amend the sentence as follows: new community facilities such as a park, woodland, community centre, cycle ways/ footways or other infrastructure which allow the community to function in a sustainable way. Rationale: The Woodland Trust believes that woodland creation is especially important because of the unique ability of woodland to deliver across a wide range of benefits – see our publication ***Woodland Creation – why it matters*** (http://www.woodlandtrust.org.uk/en/about-us/publications/Pages/ours.aspx). These include for both landscape and biodiversity (helping habitats become more robust to adapt to climate change, buffering and extending fragmented ancient woodland), for quality of life and climate change (amenity & recreation, public health, flood amelioration, urban cooling) and for the local economy (timber and woodfuel markets). In terms of 'allowing the community to function in a sustainable way' - trees help to improve air quality, reduce the heat island effect and provide a local source of fuel. In terms of water management:	Acknowledge – add woodland into text here.	Paragraph 4.5.10 amended to *'Examples of wider sustainability benefit to the community that would be considered could include the regeneration of an area, or the provision of new community facilities such as green infrastructure, woodland community centres, cycle ways/footways or other infrastructure which allow the community to function in a sustainable way'*

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				Woods, trees and hedgerows can play a key role in water management whether reducing flood risk, improving water quality or helping freshwater wildlife thrive and survive - see the Woodland Trust publication ***Woodland actions for biodiversity and their role in water management*** (pdf) - https://www.woodlandtrust.org.uk/publications/2008/03/woodland-actions-for-biodiversity-and-their-role-in-water-management/		
Mr John Oldfield Bedford Group of IDBs	4.6.2	F+W SPD:56	Support	Pleased the guidance refers to Byelaws, as these can often be overlooked at an early stage, and then later can compromise the developable areas.	Bylaws already referred to throughout document (3.2.8, 6.3.34, 7.5.3) and as it doesn't strictly relate to planning we don't need to also add it in here	No change
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.6.3	F+W SPD:25	Have observations	This reads as if the FRA is to be submitted to MLC only whereas it would normally be submitted to the LPA.	Although it is acknowledged the MLC have their own requirements for FRAs these do not strictly relate to the planning application process. In addition, if we are to list the requirements of the MLC then the requirements of all other WMAs should also be listed. The section relating to MLCs requirements should therefore be removed and replaced with reference to IDBs in general	Paragraph 4.6.3 amended to '*In some cases, a development meeting the criteria listed below may need to submit a FRA to the IDBs to inform any consent applications. This relates to the IDBs' by-laws under the Land Drainage Act 1991*[1] *(further information on the preparation of site specific FRAs can be found in Chapter 4).* ▪ *Development being either within or adjacent to a drain/watercourse, and/or other flood defence structure within the area of an IDB;* ▪ *Development being within the channel of any ordinary watercourse within an IDB area;*

[1] Land Drainage Act 1991 stipulates the relevant drainage districts powers and duties.

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						▪ *Where a direct discharge of surface water or treated effluent is proposed into an IDBs catchment;* ▪ *For any development proposal affecting more than one watercourse in an IDBs area and having possible strategic implications;* ▪ *In an area of an IDB that is in an area of known flood risk;* ▪ *Development being within the maintenance access strips provided under the IDBs byelaws;* ▪ *Any other application that may have material drainage implications'* Due to other changes this has been moved to paragraph 3.2.8
Mr Richard Whelan	4.6.3	F+W SPD:35	Have observations	Not very easy to follow 4.6.3 Should this read submit an FRA to the LPA who will in turn consult the MLC?	Acknowledge – this relates directly to comment F+W SPD:25 (see comments/actions)	Same action as for comment F+W SPD:25
Adam Ireland Environment Agency	4.6.3	F+W SPD:84	Have observations	4.6 Box last section page 29 would it not be useful for all LPAs to add an additional no 5 bullet point: Where evidence of historical or recent flood events have been passed to the LPA, then a FRA may be requested. 4.6.3 – 'A development proposal meeting the following criteria is required by...' [say whom] "in an area of known actual flood risk within the Middle Level Commissioner's area" – how is this flood risk mapped? It is not possible to separate out the fluvial risk form the MLC network from the Ouse/Nene flood zones. Last bullet point on section 4.6.3 at top of	Acknowledge – where a development site is located within FZ1 but there is history of flooding the LPA may ask for a FRA – additional point should be added to this list. Comments on 4.6.3 relates directly to comment F+W SPD:25 (see comments/actions)	Box in Section 4.6 – Additional 5th bullet point added in '*where evidence of historical or recent flood events have been passed to the LPA'* Due to other changes this is now 4.3.11

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				page 30 may over assume MLC powers. How can MLC set such a wide ranging demand?		
Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	4.6.4	F+W SPD:26	Have observations	To whom must it be demonstrated?	Comments on 4.6.3 relates directly to comment F+W SPD:25 (see comments/actions)	Entire paragraph removed
Miss Kayleigh Wood Historic England	4.7.2	F+W SPD:11	Support	We welcome the inclusion of the consideration of the effects of a range of flood events on the Historic Environment.	Acknowledged – no actions required	No change
Mr John Oldfield Bedford Group of IDBs	4.7.2	F+W SPD:57	Have observations	This section should include reference to consultation with the IDB if the site is in a Drainage District.	This is also applicable for all other WMAs – a line should be added in to this effect.	Text added to Paragraph 4.7.2 *'In the preparation of FRAs, applicants are advised to consult the relevant WMAs'.* Due to other changes this is now 4.3.13. Box updated as action to F&W SPD:55. First sentence of Step 3 (now 4.3.9) updated to '*Meaningful, on-going and iterative discussions with the LPAs and relevant WMAs can resolve issues prior to the submission of a planning application and can result in a more efficient planning application process'*
Adam Ireland Environment Agency	4.7.2	F+W SPD:85	Have observations	4.7.2 – 'FRA should' box –is this ordered in a logical way? If not can it? Bullet point (d) ' take the impacts of climate change into account', then add "for the lifetime of the development."	On reflection the order could be improved here. The order should reflect the order in which activities are undertaken as part of a FRA.	List updated to following order, *a) **Be proportionate** to the risk and appropriate to the scale, nature and location of the development;* *b) Be undertaken **as early as possible** in the particular planning process, by a*

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						competent person, to avoid abortive work raising landowner expectations where land is unsuitable for development; *c) Consider and quantify the **different types of flooding** (whether from natural or human sources and including joint and cumulative effects). The LPA will expect links to be made to the management of surface water as described in Chapter 6. Information to assist with the identification of surface water and groundwater flood risk is available from the LLFA (CCC), the EA and the LPA. Applicants should also assess the risk of foul sewage flooding as part of the FRA. Anglian Water as sewerage undertaker can provide relevant information to the applicant to inform preparation of FRAs* *d) Consider the effects of a range of flooding events including the **impacts of extreme events** on people, property, the natural and historic environments and river processes;* *e) Consider the **vulnerability of occupiers and users** of the development, taking account of the Sequential and Exception Tests and the vulnerability classification, and include arrangements for safe access;* *f) Identify relevant **flood risk reduction measures** for all sources of flood risk;* *g) Consider both the potential adverse and beneficial **effects of flood risk management infrastructure** including raised defences, flow channels, flood storage areas and other artificial features*

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						together with the consequences of their failure; *h) Include assessment of the **'residual' (remaining) risk** after risk reduction measures have been taken into account and demonstrate that this risk is acceptable for the particular development or land use. Further guidance on this is given in Chapter 5;* *i) Be supported by appropriate **evidence data** and information, including historical information on previous events.* *j) Consider the risk of **flooding arising from the proposed development** in addition to the **risk of flooding to development on the site**. This includes considering how the ability of water to soak into the ground may change after development. This would mean the preparation of surface water drainage proposals;* *k) Take a **'whole system**' approach to drainage to ensure site discharge does not cause problems further along in the drainage sub-catchment/can be safely catered for downstream and upstream of the site;* *l) Take the impacts of **climate change** into account for the lifetime of the development including the proposed vulnerability classification. Guidance is available on the .gov.uk website.*

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Allan Simpson Anglian Water Services Ltd	4.7.2	F+W SPD:131	Have observations	Para 4.7.2 The text box which follows para 4.7.2 refers to all sources of flooding but does not include a specific reference to the risk of foul sewage flooding. Flood Risk Assessments which are submitted with planning applications should consider the risk of flooding from foul sewage together with other potential sources of flooding. It is therefore suggested that the text should be amended as follows: 'consider and quantify....and the LPA. **Applicants should also assess the risk of foul sewage flooding as part of the FRA. Anglian Water as sewerage undertaker can provide relevant information to applicant to inform preparation of FRAs**'	Acknowledged and this should be added in.	Amended point h) of box to *Applicants should also assess the risk of foul sewage flooding as part of the FRA. Anglian Water as sewerage undertaker can provide relevant information to the applicant to inform preparation of FRAs'.* Due to other changes this is now point c).
Adam Ireland Environment Agency	4.8.1	F+W SPD:86	Have observations	4.8.1 - is it essential that the drainage strategy has to be within the FRA? There are benefits of having a separate drainage strategy document to the FRA as there are more issues to drainage than just flood risk. By always having it in the FRA, other considerations are often ignored. The findings of the drainage strategy should definitely be within the FRA.	It is not essential and can be provided in a separate document. The section should be updated to reflect this.	Paragraph 4.8.1 amended to '*A surface water drainage strategy contains the proposals for the surface water drainage of the development. Such a strategy should include initial proposals that are sufficient to demonstrate a scheme can be delivered that will adequately drain the proposed development whilst not increasing flood risk elsewhere'* Due to other changes this is now 4.3.14

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Adam Ireland Environment Agency	4.8.2	F+W SPD:87	Have observations	4.8.2 add the word 'outline' rather than 'conceptual' for accuracy.	Acknowledged and will change	Paragraph 4.8.2 amended to '*If an outline application is to be submitted for a major development then an outline surface water drainage strategy should be submitted outlining initial proposals and quantifying the conceptual surface water management for the site as a whole. This should detail any strategic features, including their size and location. A detailed surface water drainage strategy should subsequently be submitted with each reserved matters application that comes forward and demonstrate how it complies with the outline surface water drainage strategy*'
Adam Ireland Environment Agency	4.8.2	F+W SPD:88	Have observations	Step 6) B) should maintenance be included in the list?	This is already included in point c); therefore no changes required	No change
Miss Kayleigh Wood Historic England	5 Managing and mitigating risk	F+W SPD:12	Object	Whilst it is appreciated that the SPD will centre upon issues directly surrounding flood and water within the district it is considered that the document should provide more information on the likely impacts on the Historic Environment, more specifically, as examples: • The opportunities for conserving and enhancing heritage assets as part of an integrated approach for catchment based flooding initiatives, this including sustaining and enhancing the local character and distinctiveness of historic townscapes and landscapes. • The potential impact of changes in groundwater flows and chemistry	Acknowledged – happy to add additional references to historic environment where appropriate	'*historic environment'* added into 3rd bullet point of 4.5.8 '*historic environment'* added into overview of Chapter 6

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				on preserved organic and palaeo-environmental remains. Where groundwater levels are lowered as a result of measures to reduce flood risk, this may result in the possible degradation of remains through de-watering, whilst increasing groundwater levels and the effects of re-wetting could also be harmful. • The potential impact on heritage assets of hydromorphological adaptations. This can include the modification/removal of historic in-channel structures, such as weirs, as well as physical changes to rivers with the potential to impact on archaeological and palaeo-environmental remains. • The potential implications of flood risk on securing a sustainable use for heritage assets, including their repair and maintenance. • Acknowledgment that Historic Buildings, for example, can be damaged by standard Flood Risk Management and Mitigation and often need a tailored approach. • The opportunities for improving access, understanding or enjoyment of the Historic Environment and heritage assets as part of the design and implementation of flood and water management proposals. • The vulnerability of most heritage assets (designated and non-designated) to flooding, including occasional flooding, and the potential harm to or loss of their significance. • The opportunity for increasing		

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				public awareness and understanding of appropriate responses for heritage assets in dealing with the effects of flooding and improving resilience. For further information please see link to our guidance on Flooding and Historic Buildings: http://historicengland.org.uk/images-books/publications/flooding-and-historic-buildings-2ednrev/ It is considered that specific paragraphs on the Historic Environment could be provided within Section 5 Managing and Mitigating Risk.		
Adam Ireland Environment Agency	5.1.4	F+W SPD:89	Have observations	5.1.4 - Breach mapping – reference should be given to methods outlined in FD2320/1: flood risk to people. 5.1.4 – Instantaneous breaches – this does define what an Instantaneous breach is i.e. opens to the full extent within a very short time frame (seconds). This replicates a sudden failure. This could be expanded to explain when each type should be used. Note a recent study by the EA demonstrates that there is little difference in the flood extents etc depending upon what method is used.	Rather than repeat long sections of the document a link to the FD2320/1 should be provided within the SPD. Similarly, the above document provides detail on breaches that readers of the SPD may refer to as appropriate	Added *'(see the Environment Agency's publication – Flood Risk Assessment Guidance for New Development for further information)'* to Paragraph 5.1.4
Adam Ireland Environment Agency	5.1.5	F+W SPD:90	Have observations	5.1.5 – this doesn't refer to what type of breach model was used. It would be worth adding this in.	We have not received any detail from the EA as to what type of model was used therefore no changes proposed to the SPD	No change

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Mr Andy Brand The Abbey Group (Cambridgeshire) Ltd	5.1.9	F+W SPD:27	Object	Please see my previous comments which are applicable here also. If the flood zone changes then the Local Plan should be reviewed. The development plan is integral to providing certainty to the development industry.	Discussed with steering group- EA flood maps may be updated every quarter; therefore it would be inappropriate to update Local Plans every time.	No change
Adam Ireland Environment Agency	5.1.9	F+W SPD:91	Have observations	5.1.9 – the Environment Agency also hold data on climate change impacts of flood levels for the areas covered by recent models. This data is going to be released before the end of the year so it would be worthwhile the climate change scenarios referring to the 'latest guidance'.	Acknowledged – paragraph reworded in the SPD	Paragraph reworded anyway due to changes to climate change allowances issued in March 2016
Harry Jones of David Lock Associates for Tim Leathes Urban and Civic	5.1.10	F+W SPD:146	Have observations	The Master Planning Process Flood risk, management of the water environment and the design of SuDS are best considered as part of a holistic master planning process. Flood and water issues are not a singular topic but one of a range of issues and constraints that are taken into account in planning and design. In this context U&C suggest that the draft SPD should highlight the importance of ensuring that the draft SPD recognises that these issues including the design of SuDS are one of a number of influences on the preparation of a master plan. Specifically, it is considered vital that the guidance recognises the applicability of the different tiers of SuDS design at each stage of the planning process. A proportionate approach to SuDS, tailored to the planning process, is essential to ensure the correct	Chapter 6 already includes steps in the planning process to ensure SuDS are considered as early as possible and paragraph 5.1.10 already directs readers to Chapter 6 therefore no changes proposed.	No change

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				level of detail is provided at the right time. For example only limited detail should be expected at strategic stages of allocation and outline consent compared to requirements for the detailed stages of Design Codes and Detailed/Reserved Matters consents. Therefore there should be flexibility to enable SuDS design to evolve with the wider development. U&C suggest that text acknowledging the above could be added to section 5 – paragraphs 5.1.10 to 5.1.16 which relate to site layout		
Mrs Ellie Henderson	5.1.11	F+W SPD:30	Object	We would like to see trees mentioned as a key part of GI. See suggested ammendment below: The inclusion of good quality green infrastructure (in particular trees) within a development master plan has the potential to significantly increase the profile and profitability of developments. Low lying ground can be designed to maximise benefits by providing flood conveyance and storage as well as recreation, amenity and environmental purposes. Where public areas are subject to flooding easy access to higher ground should be provided. Structures, such as street furniture and play equipment, provided within the low lying areas should be flood resistant in design and firmly attached to the ground. The Woodland Trust believes that woodland creation is especially important for green infrastructure provision because of the unique ability of woodland to deliver across a wide range of benefits – see our publication	Acknowledge – can include trees here; however rather than the use of 'in particular' which implies trees are always important, the word 'including' should be used.	Paragraph 5.1.11 amended to '*The inclusion of good quality green infrastructure (including trees and other vegetation) within a development master plan has the potential to significantly increase the profile and profitability of developments. Low lying ground can be designed to maximise benefits by providing flood conveyance and storage as well as recreation, amenity and environmental purposes. Where public areas are subject to flooding easy access to higher ground should be provided. Structures, such as street furniture and play equipment, provided within the low lying areas should be flood resistant in design and firmly attached to the ground'.* Due to other changes this is now paragraph 5.1.14

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				Woodland Creation – why it matters (http://www.woodlandtrust.org.uk/en/about-us/publications/Pages/ours.aspx). **The Case for Trees (Forestry Commission, July 2010)** states: 'There is no doubt that we need to encourage increased planting across the country – to help meet carbon targets – and every tree can count towards those targets as part of a renewed national effort to increase the country's overall woodland canopy. But it's not all about carbon; there is a growing realisation among academics about the important role trees play in our urban as well as the rural environment. It has long been accepted and confirmed by numerous studies that trees absorb pollutants in our cities with measurable benefits to people's health – such as reducing asthma levels. Yet trees also deliver a whole host of other extraordinary economic, environmental and social benefits.' The report goes on to say: 'The development of the space in which we live and work represents an opportunity for change that may not be repeated for many years. Making the right decisions at these pivotal moments can influence peoples' sense of place, health and wellbeing for generations.'		

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Mr John Oldfield Bedford Group of IDBs	5.1.12	F+W SPD:58	Have observations	The opportunity to strengthen the need for reducing flood risk should be taken whenever possible. 'should' will give officers more room to negotiate betterment in the future than saying 'can' ".....the proposed development should ~~can~~ offer flood risk betterment by holding back flood flow peaks....."	Acknowledge and agree – change can to should.	Amended wording of paragraph 5.1.12 to *Site layout does not only have to cater for the flood risk on the site but can also accommodate flood water that may contribute to a problem downstream. For example, where a proposal has a watercourse flowing through which contributes to flooding downstream in the existing community or further downstream within an adjacent community, the proposed development should offer flood risk betterment by holding back flood flow peaks within the site in a green corridor and by making space for this water. This is a proactive approach to flood risk management in Cambridgeshire where new developments offers enhancements to the surrounding area. All developments with watercourses identified within their site must consider this approach.* Due to other changes this is now 5.1.15
Mr John Oldfield Bedford Group of IDBs	Figure 5.1: Upper river catchment development ©BACA Architects	F+W SPD:60	Have observations	the figure should include reference to the Byelaw zone adjacent to the watercourse/river and show a clear working bank for maintenance access	Unable to change layout as this is a fixed layout	No change
Mr John Oldfield Bedford Group	Figure 5.2: Middle	F+W SPD:59	Have observations	Figure should refer to Byelaw zone adjacent to watercourse/river and show clear working	Unable to change layout as this is a fixed layout	No change

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
of IDBs	river catchment development ©BACA Architects			bank		
Mr John Oldfield Bedford Group of IDBs	Figure 5.3: Lower river catchment development ©BACA Architects	F+W SPD:61	Have observations	The figure should show Byelaws relating to river and also to flood defences.	Unable to change layout as this is a fixed layout	No change
Adam Ireland Environment Agency	5.1.15	F+W SPD:92	Have observations	5.1.15 perhaps signpost in this section to FD2320 an excellent government research document on the hazards of flooding.	Acknowledge – provide link to this document here	Added *'A guidance document titled 'Flood Risks to People' was published by Defra/EA in 2006 which developed a method for estimating risks to people, both during and immediately after a flood event. This document contains useful information on the hazards of flooding'* added to paragraph 5.1.15. Due to other changes this is now 5.1.21
Adam Ireland Environment	5.1.17	F+W SPD:93	Have observations	5.1.17 "Where it is not possible to avoid flood risk or minimise it through site layout, raising floor levels above the predicted flood	Acknowledge – change exit to egress. 'Safe' is referred to with no definition	Paragraph 5.1.17 reworded to '*Where it is not possible to avoid flood risk or minimise it through site layout, raising floor levels above*

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Agency				level with an allowance for the life time of the development (climate change allowance)" – doesn't make much sense in the context - allowance for the impacts of climate change over the life time of the development maybe. 5.1.17 – Consider changing 'exit' to 'egress' Safe access and egress – this mentioned numerous times in the SPD but is never classified – what is classed as 'safe'. The Environment Agency will object to any application that has a greater hazard rating the 0.75 (FD2320) but makes no comments on the wider issue of safety. This should be expanded upon. The subsequent section on resilience planning could be sign posted.	and therefore reference should be made to the Flood Risks to People document throughout (wherever safe is mentioned). Reference to the Flood Risks to People document should be made throughout the SPD whenever 'safe access' is referred to.	*the predicted flood level (including an appropriate allowance for climate change) is a possible option in some circumstances to manage flood risk to new developments however this can increase flood risk elsewhere; it can create an 'island effect' with surrounding areas inundated during a flood, makes access and egress difficult; can affect river geomorphology; can have further potential impacts, such as erosion on site and changes to erosion and sedimentation elsewhere and can also have an impact on the landscape value and amenity of the river flood plain'.* Due to other changes this is now 5.1.23 *'Please see the Defra/EA publication 'Flood Risks to People' for further information on what is considered 'safe'.'* Added in to 4.1.7, 4.5.6 and 5.1.26
Adam Ireland Environment Agency	5.1.19	F+W SPD:94	Have observations	5.1.19 Access ramps can also take up flood storage so these also need to be considered within the overall loss of flood plain.	Acknowledged and this should be added in to section 5.1.19	Amended paragraph 5.1.19 to '*Raising floor levels can have an adverse impact on the street scene as building and feature heights will increase. In addition there may be implications for access ramps for wheelchairs which in turn can also take up flood storage leading to an overall loss of floodplain. Raising floor levels may also be significantly more difficult to achieve privacy standards with higher windows and this may also create the need for significantly higher boundary treatments or screens'.* Due to other changes this is now 5.1.25
Adam Ireland Environment	5.1.22	F+W	Have observations	5.1.22 – can ground floor flats be referenced in this section as well. Is it deemed	Acknowledged – important to include	Amended paragraph 5.1.22 to '*Single storey residential development and ground floor*

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Agency		SPD:95		acceptable to provide safe refuge in non-habitable areas like corridors?	ground floor flats here	*flats are generally more vulnerable to flood damage as occupants do not have the opportunity to retreat to higher floor levels and salvage belongings to higher ground. For this reason single storey housing and ground floor flats in flood risk areas should not be allowed unless finished floor levels are set above the appropriate flood level for the lifetime of the property (taking into account the appropriate climate change allowance), and there is safe access and escape. In areas of extensive floodplain (e.g. Wisbech), single storey housing could be supported where a purpose built stairway is provided to the roof area and escape from this area is in the form of easily accessible and easy to open roof light windows or similar (this must be as agreed by the relevant LPA in advance'.* Due to other changes this is now 5.1.28
Adam Ireland Environment Agency	5.1.23	F+W SPD:96	Have observations	5.1.23 – unless FFLs are raised or can be raised?	Acknowledged – this should be updated in the SPD	Amended paragraph 5.1.23 to '*Sleeping accommodation on the ground floor that relies on flood warnings and the implementation of flood proofing measures is hazardous. Change of use from commercial to residential that results in proposed ground floor flats in Flood Zone 3 is unlikely to be acceptable (even with the use of flood proofing measures to mitigate the flood risk) unless finished floor levels are or can be raised above the predicted flood level (with an appropriate allowance for climate change), and there is safe access to and escape from higher storeys of the building'.* Due to other changes this is now 5.1.29

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Mr John Oldfield Bedford Group of IDBs	5.1.27	F+W SPD:62	Have observations	IDBs may also adopted new flood defences under Agreement and with funding	Acknowledged – this should be updated in the SPD	Added '*In addition, IDBs may also adopt new flood defences if appropriate agreements and funding are in place.'* To end of paragraph 5.1.27. Due to other changes this is now 5.1.33
Adam Ireland Environment Agency	5.1.27	F+W SPD:97	Have observations	5.1.27 – Defences are not there to allow for further development and therefore should not be agreed unless there is wider sustainability benefits. We would prefer that this position is made clear within this paragraph. This section should also look into designations under the FWM Act. Where a defence was being built to protect a development or area, this could be designated a 'flood asset' by the LLFA.	Acknowledge – this should be updated in the SPD	Paragraph 5.1.27 amended to '*The construction of new flood risk defences may enable development to take place provided that there are wider sustainability benefits associated with their construction (this could be demonstrated through a sustainability appraisal for example). Their construction needs to be very carefully considered with the LPA, the EA and the relevant IDB. New defences create new residual risks that can take significant investment to fully understand and plan. WMAs who maintain defences (such as the EA or IDBs) are not obliged to maintain defences and could potentially reprioritise or reduce expenditure in this area. Where defences are required, maintenance agreements will need to be reached through Section 106 of the Town and Country Planning Act 1990 or Section 30 of the Anglian Water Authority Act 1977. The latter can be used by the EA to adopt flood defences directly. In addition, IDBs may also adopt new flood defences if appropriate agreements and funding are in place'.* Due to other changes this is now 5.1.33 Additional paragraph (5.1.34) added in – *'Under the FWMA 2010, the EA, LLFA, District Councils and IDBs have legal powers to designate structures and features that affect flood risk and are not directly*

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						maintained by these organisations. Where a defence is being built to protect a development or area, it may be designated as a 'flood asset' by the relevant body. Further information on the designation of structures can be found in Defra's Designation of Structures and Features for Flood and Coastal Erosion Risk Management Purposes – Information Note.'
Adam Ireland Environment Agency	5.2.9	F+W SPD:110	Have observations	5.2.9 – Contradictory – what is best for flood depths between 0.3-0.6m? General – There are numerous illustrations sourced from other documents that aren't directly referenced. Check permissions to use these illustrations.	Acknowledged – the difference between 0.3 and 0.6 has been unintentionally missed out. This should be updated to include all depths up to 0.6 m (based on DCLG document).	Updated water exclusion strategy to '*Water exclusion strategy – where emphasis is placed on minimising water entry whilst maintaining structural integrity, and on using materials and construction techniques to facilitate drying and cleaning. This strategy is favoured when low flood water depths are involved (not more than 0.6m). It should be noted that even with this strategy, water is still likely to enter the property*' All illustrations now referenced appropriately
Adam Ireland Environment Agency	5.2.10	F+W SPD:111	Have observations	5.2.10 – if the text is taken directly from the guidance then why include it?	The text is not directly lifted and therefore the wording should be amended here to say 'further information can be found…'	Amended wording of paragraph 5.2.10 to '*Further details can be found in improving the Flood Performance of New Buildings (CLG, 2007)'*
Miss Kayleigh Wood Historic England	6 Surface Water and Sustainable Drainage Systems	F+W SPD:13	Object	Within the red summary box it states that Sustainable Drainage Systems will: 'Conserve, accommodate and enhance biodiversity'. However, it does not highlight the need to conserve or enhance the Historic Environment (which is covered within the Section at 6.2.8, 6.2.9, 6.3.18 and 6.3.19) and we would therefore advise that this is included within the red summary box.	Acknowledge – historic environment should be added in here	Third bullet point within box amended to '*Conserves, accommodates and enhances biodiversity and the historic environment; and'*

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Mr John Oldfield Bedford Group of IDBs	6 Surface Water and Sustainable Drainage Systems	F+W SPD:63	Have observations	An essential element of a SuDS is maintainability to ensure it continues to function effectively in the future.	No specific changes required; however additional detail on maintenance has been added throughout chapter due to changes made by newly published SuDS Manual	No change
Mr Graham Moore Middle Level Commissioners	6 Surface Water and Sustainable Drainage Systems	F+W SPD:144	Have observations	Our position on the use of SuDS is as follows: "National guidance promotes the management of water in a sustainable way to mimic the surface water flows from the site prior to development, thus discouraging the discharge of unregulated flows of surface water to sewers and watercourses. This, however, primarily refers to and presupposes the use of gravity systems which serve most of the country. Whilst the Commissioners and associated Boards generally support adherence to national guidance where appropriate this must, to a certain extent, depend on the individual circumstances of the site or receiving watercourse system. Unlike most of the country, the majority of Fenland is served by pumped, artificial drainage systems with low hydraulic gradients with any run-off generally being stored within them, often for a great length of time, before being discharged into the river system and thus reducing any impact on the peak flow within the river system.	Acknowledged – as outlined in previous comments, some acknowledgment of the differences in land types across the county (city to fen) should be made. Often it is perceived that SuDS cannot be used in fen areas; however this is not the case and therefore a paragraph relating to this should be added.	New paragraph (6.1.4) added in to represent different landscape of the Fens '*Even across man-made areas such as the Fens there is the potential to make use of many different SuDS components as they can reduce the immediate impact of intense rainfall ultimately having a cumulative beneficial effect on flood risk from main rivers. Together SuDS and IDB systems can be a strong combination providing significant benefits for future development*'

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				A major concern regarding the use of grey water recycling, infiltration devices, attenuation storage systems and other SuDS, although not necessarily our problem at this time, is the future funding and maintenance of such devices which, if unmaintained, can become a liability resulting in drainage/flooding problems which have to be resolved at a cost to the owner and possibly the public purse. The resolution of this issue, which was considered as part of the Pitt Review, is still awaited. It is considered that, in some circumstances, an unregulated flow in to the Board's managed system is the most appropriate long term solution. The associated contribution for making an unregulated direct discharge to the Board's system will ensure that it is maintained and continues to perform its function and provides the appropriate Standard of Protection (SoP) at relatively small cost and with minimal environmental impact reducing the need to utilise natural resources and the impact of climate change by reducing greenhouse gas emissions."		
Mr Richard Whelan	6.1.5	F+W SPD:37	Have observations	6.1.5 Mentions the NPPF, it would be worth making reference to the Planning Practice Guidance and the Non-Statutory Technical Standards at this stage as they are a good guide for LLFAs and developers, out in 6.8.1 later in the document.	Acknowledge – these need to be added in alongside local planning policies	Amended paragraph 6.1.5 to '*Please note that reference is made to 'SuDS' throughout this chapter, rather than 'surface water drainage' as the NPPF, NPPG, Non-Statutory Technical Standards for Sustainable Drainage and adopted and emerging Local Planning policies require a SuDS solution to surface water management*

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						for new development. Many of the general principles within this chapter can also be applied to traditional surface water drainage and so this chapter needs to be complied with on all development sites and the provision of SuDS maximised. Even on very constrained sites SuDS can be implemented in one form or another'. Due to other changes this is now 6.1.6
Mrs Ellie Henderson	6.2.2	F+W SPD:31	Object	We would wish to note the following point: Trees can reduce the impact of drought as, under the right conditions, shelterbelts can enable crops to use water more efficiently which could reduce the need for irrigation and lead to less abstraction. A joint Environment Agency/Forestry Commission publication ***Woodland for Water: Woodland measures for meeting Water Framework objectives*** states clearly that: *'There is strong evidence to support woodland creation in appropriate locations to achieve water management and water quality objectives'* (Environment Agency, July 2011- http://www.forestry.gov.uk/fr/woodlandforwater). Therefore we would like to see mention here of the value of trees and woodlands in this regard.	Acknowledge – add into SPD	Added '*Equally, trees and woodland, where used appropriately can reduce the impact of drought as, under the right conditions, shelterbelts can enable crops to use water more efficiently (by reducing evapotranspiration losses) which could reduce the need for irrigation and lead to less abstraction'* to paragraph 6.2.2.
Mr John Oldfield Bedford Group	6.2.6	F+W SPD:64	Have observations	The section should emphasize the need to design biodiversity into the SuDS so that the SuDS can function in the future to manage flood risk, and hence avoid unnecessary	Acknowledge – add into SPD	Amended wording of paragraph 6.2.6 to '*Many of Cambridgeshire's nationally and locally designated nature conservation areas are designated because of their water*

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of IDBs				conflict over maintenance and the risk of disturbing protected species.		*environment. The integration of SuDS into the landscape needs to be sensitive to the local biodiversity and equally, biodiversity needs to be designed into SuDS. At present one of the main risks to biodiversity in Cambridgeshire is the extent of fragmentation of habitats and loss of species due to historical farming practices and more recently increased pressures from development. Inclusion of SuDS networks could help to re-connect existing habitats and re-create new areas. Cambridgeshire's Habitat Action Plans and Species Action Plans provide specific information on desirable habitat design in the county. Biodiversity should be integrated into SuDS at the early design stage to avoid unnecessary conflict over maintenance and the disturbance of protected species. Additionally if protected species are likely to be attracted to SuDS features, the protection of these habitats during maintenance and operation should be considered in the design'*
Mrs Ellie Henderson	6.2.7	F+W SPD:32	Object	We would wish to see mention of woodland creation here. We believe that woodland creation is especially important because of the unique ability of woodland to deliver across a wide range of benefits – see our publication ***Woodland Creation – why it matters*** (http://www.woodlandtrust.org.uk/en/about-us/publications/Pages/ours.aspx). These include for both landscape and biodiversity (helping habitats become more robust to adapt to climate change, buffering and extending fragmented ancient woodland), for	Acknowledge – add into SPD	Amended wording of paragraph 6.2.7 to '*A UK government objective is, "connecting people with nature" (Defra 2011) and the use of SuDS can help deliver this objective. Through careful design, SuDS can respect, enhance and connect local habitats and support biodiversity and green infrastructure in Cambridgeshire. As recognised in the CIRIA SuDS Manual (C753), water within a SuDS system is essential for the growth and development of plants and animals and biodiversity value can be delivered on any scheme from small, isolated systems to*

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				quality of life and climate change (amenity & recreation, public health, flood amelioration, urban cooling) and for the local economy (timber and woodfuel markets). **Government response to Independent Panel on Forestry Report (January 2013):** We want to see significantly more woodland in England. We believe that in many, although not all, landscapes more trees will deliver increased environmental, social and economic benefits. We particularly want to see more trees and woodlands in and around our towns and cities and where they can safeguard clean water, help manage flood risk or improve biodiversity.		*large strategic developments where SuDS are planes as part of the wider green landscapes. The creation of rough grasslands, woodland, wetland meadows, aquatic planting and open water can provide shelter, food and foraging and breeding opportunities for a wide variety of wildlife'*
Miss Kayleigh Wood Historic England	6.2.8	F+W SPD:14	Support	Accommodating measures such as Sustainable Drainage Systems, whilst sustaining and enhancing the character of historic townscapes and landscapes, is an area which should be explored and it is appreciated that this is covered at points 6.2.8 and 6.2.9 and this is welcomed.	Support noted	No change
Mrs Ellie Henderson	6.2.13	F+W SPD:33	Object	We would like to see mention of trees here. The Forestry Commission's publication, *The **Case for Trees in development and the urban environment*** (Forestry Commission, July 2010), explains how: *'the capacity of trees to attenuate water flow reduces the impact of heavy rain and floods and can improve the effectiveness of Sustainable Urban Drainage Systems'.* Trees can help reduce mitigate surface	Acknowledge – reference to trees should be made where possible throughout document	Trees additionally referred to elsewhere throughout document (paragraph 5.1.14 and 6.2.2)

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				water flooding in urban situations too, when rain water overwhelms the local drainage system, by regulating the rate at which rainfall reaches the ground and contributes to run off. Slowing the flow increases the possibility of infiltration and the ability of engineered drains to take away any excess water. This is particularly the case with large crowned trees. Research by the University of Manchester suggests that increasing tree cover in urban areas by 10% can reduce surface water run-off by almost 6%. Trees are therefore a useful component of Sustainable Urban Drainage Systems (SuDS). The Woodland Trust has produced a policy paper illustrating the benefits of trees for urban flooding – ***Trees in Our Towns – the role of trees and woods in managing urban water quality and quantity*** - https://www.woodlandtrust.org.uk/publications/2012/12/trees-in-our-towns/ .		
Scott Hardy RSPB	6.2.13	F+W SPD:136	Have observations	The SPD introduces the potential of SuDS to provide valuable habitat and to contribute to strong green infrastructure networks with increased benefits for biodiversity. It advises ' *that there are several Biodiversity Action Plan species and habitats that can be supported by well designed SuDS'*, and that SuDs can '*enhance and connect local habitats*' and '*provide an opportunity to replace some of* [Cambridgeshire's] *lost*		Added paragraph (6.2.8) to Biodiversity and Green Infrastructure section (moved to remove duplication throughout chapter). '*There are several Biodiversity Action Plan (BAP) species and habitats*[2] *that can be supported by well-designed SuDS. In appropriate locations, design of retention ponds and wetlands should consider the integration of well-designed sanctuary areas wherever possible, to give spaces for the more sensitive wildlife species. To make sure SuDS can provide the best benefits to*

[2] Updates to Biodiversity Action Plans can be found here: www.cpbiodiversity.org.uk

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				landscape and habitats'. The RSPB strongly supports the adoption of a landscape-led approach to SuDS planning and the creation of locally appropriate habitats through SuDS, and are pleased to see this promoted within the SPD. However, in order to fully achieve this through SuDS, appropriate ecological expertise and engagement with local stakeholders is required. Currently the SPD states in point 6.2.13 that ' *designing SuDS effectively requires the right team with the relevant skills'*. The RSPB strongly recommends the SPD expands on this statement to ensure the importance of ecological expertise and stakeholder input is fully understood. Expert ecological advice will also allow SuDS to provide maximum benefit for protected species and other species of conservation concern which may already be present on site. A list of useful contacts is contained within the RSPB and WWT SuDS guidance booklet1, and could help inform developers of the potential stakeholders and experts to engage with. For example, paragraph 6.2.13 could be expanded to describe: "*designing SuDS effectively requires the right team with the relevant skills. To make sure SuDS can provide the best benefits to wildlife ecological expertise is strongly advised. Consultation with nature conservation groups can also help access such expertise. Further information and a list*		*wildlife, ecological expertise is strongly advised. Consultation with nature conservation groups can also help access such expertise. Further information and a list of useful contacts can be found in the RSBP and WWT publication 'Sustainable Drainage Systems: Maximising the Potential for People and Wildlife'*

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				of useful contacts is contained within the RSPB and WWT SuDS guidance booklet1"		
Mr Richard Whelan	Figure 6.1: Stage 1	F+W SPD:45	Support	This is a good representation of SuDS design, illustrating how early consideration of the drainage avoids expensive retrofit solutions on established plans	Support noted	No change
Mr Richard Whelan	6.3.4	F+W SPD:44	Have observations	Where the receiving water body allows reduced attenuation onsite it could be worth adding a design requirement that it must be demonstrated that the site is able to drain when the receiving waterbody is already in a 1% flow event. This helps to ensure that the experiences of 1998 are not revisited (where flooding was experienced when watercourses and sewers had difficulty in discharging due to an already high water level in the receiving watercourse)	Acknowledge – it is important to look at how the site will drain in flood conditions and an appropriate wording should be added in to reflect this.	Amended wording of paragraph 6.3.4 to '*The LPA may allow a reduced level of attenuation prior to discharge to a watercourse where a strategy or study undertaken by or in partnership with an IDB or other WMA demonstrates that no increase in flood risk would occur to the site or elsewhere. It must however be demonstrated by the applicant that the site can continue to drain when receiving water bodies are in flood conditions. Irrespective of any agreed runoff rates, source control methods must be implemented across sites to provide effective pre-treatment of surface water. This must be demonstrated as part of the proposal*'
Mr John Oldfield Bedford Group of IDBs	6.3.6	F+W SPD:65	Have observations	The section should include a figure to represent bespoke areas of Cambridgeshire, namely the heavily modified and artificial watercourses, which are equally as important as natural and urban examples.	Although Heavily Modified Waterbodies relate to the WFD it would be useful to include maps of these watercourses across the county. These need to be obtained from the EA's geostore and included as a figure within the text.	Added new paragraph (6.3.10), *'In addition to natural and urban catchments, as already detailed, the Fen area of Cambridgeshire has an extensive network of artificial drainage channels that are mostly pump drained. The majority of these are under the control and management of IDBs.* Map 6.1 *shows those areas of Cambridgeshire where the watercourse are designated by the EA as 'Heavily Modified Waterbodies' and 'Artificial Waterbodies'. Such designation relates to the Water Framework Directive*

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						(see Chapter 7 for further information); however it provides a useful visualisation of the artificial drainage network across Cambridgeshire' Also added plan of HMWB across Cambridgeshire (Figure 6-1)
Scott Hardy RSPB	6.3.10	F+W SPD:137	Have observations	Point 6.3.10 of the SPD advises '*When designing SuDS networks on land that has low permeability, SuDS should be designed accordingly. Soakaways and other infiltration methods may not be suitable but there are many other methods that can be used on clay type soils*'. The RSPB are aware that clay type soils have previously been cited as a barrier to SuDS inclusion within development plans. We are pleased to see the SPD advise that there are '*many other* [SuDS] *methods that can be used on clay type soils*'. However, we would like to see this point strengthened given that clay soils have been viewed as a barrier to SuDS previously. It is our view that where clay soils are present there should be potential to provide even greater scope and opportunity for wildlife over free draining sites through SuDS. Clay soils have great potential for nature rich surface features such as swales, rills, retention basins, ponds, and wetlands	Acknowledged – impermeable soils often cited as a barrier and appropriate wording should be added in to reinforce this will not be acceptable as a reason across Cambridgeshire	Following sentence added into 'keep water on the surface' '*Low permeability soils are often cited as a reason for not including SuDS; however this is not acceptable in Cambridgeshire as solutions do exist. Although soakaways and other infiltration methods may not be suitable, many other methods such as swales, ponds and wetlands should be prioritised,*' Due to other changes this is now 6.3.22
Mr Richard Whelan	6.3.11	F+W SPD:46	Have observations	This paragraph seems to aimed at setting out the consideration of infiltration but hints at SuDS as being primarily infiltration devices which is in conflict with what is described in 6.3.10. SuDS mimic natural	This is already covered throughout the SPD and 6.3.22	No change

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				drainage as described earlier in the document and with less permeable soils natural drainage would be a process of limited infiltration and overland flow through streams and rivers etc. Might I suggest amending this to say that ground conditions will influence the type of SuDS system being considered or remove the reference from SuDS from this paragraph and focus purely on infiltration, regardless of how that is achieved?		
Miss Kayleigh Wood Historic England	6.3.18	F+W SPD:15	Support	Accommodating measures such as Sustainable Drainage Systems, whilst sustaining and enhancing the significance of areas of archaeological interest and or potential interest, is an area which should be explored and it is appreciated that this is covered at points 6.3.18 and 6.3.19 and this is welcomed.	Support noted	No change
Mr John Oldfield Bedford Group of IDB	6.3.24	F+W SPD:66	Have observations	These areas may be subject Byelaws and specific restrictions, such as no development or obstruction.	Reference can be added in to byelaws	Amended paragraph 6.3.24 to '*Consideration should be given to access to, and maintenance of, existing infrastructure which includes existing watercourses. Many IDBs, Local Authorities and the EA have requirements and/or byelaws requiring maintenance strips adjacent to a watercourse and should be contacted for exact requirements in their area*'. Due to other changes this is now 6.3.34
Mr Richard Whelan	6.3.25	F+W SPD:43	Have observations	Pleased to see mention of how SuDS does not always mean infiltration. The document almost requires a myth busting page as a pre-emptive approach to standard rejections of Sustainable Drainage Systems. There	This is acknowledged and has been covered by additions made in response to other representations.	No change

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				are still some strange widely held opinions that a SuDS system can only be used on certain sites. As you will know, ultimately any system that is not inspected, maintained or designed with site constraints and long term flood risk in mind will be unsustainable. Hence moving the focus onto ownership and adoption		
Mrs Ellie Henderson	6.3.27	F+W SPD:34	Object	We would like to see woodland mentioned here as it is mulit-functional, delivering a wide range of benefits including - helping habitats become more robust to adapt to climate change, amenity & recreation, improving air quality, flood amelioration, urban cooling and for the local economy (timber and woodfuel markets).	Acknowledged – can add woodland in	Wording amended to '*Open spaces are an asset to the community and to the environment and form an important component of a wider green infrastructure network. A network of woodland, recreational and open spaces, whether green or paved will be essential for well-designed developments. Open spaces can provide space for SuDS features to provide attenuation and treatment of surface water runoff. Good design will seek ways to integrate SuDS with the rest of the open space and to make SuDS features multifunctional. In these areas there is a need to concentrate on design and amenity value, recreational use, and fit with surrounding landscape (see figure 6-9) Examples of multi-functional uses in open spaces include; temporary storage areas doubling as playing fields or recreation areas, hardscape attenuation doubling as water features and public art, bioretention areas doubling as landscaped garden areas, wetlands and ponds doubling as amenity and habitat areas, and bioretention planters linking with open space divisions or seating areas'.* Due to other changes this is now

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						6.3.38
Scott Hardy RSPB	6.3.27	F+W SPD:138	Have observations	The RSPB is pleased that the SPD promotes the use of SuDS in multi-functional landscapes to enhance urban, recreational, and open spaces. As recognised in the SPD this provides benefits for the local communities, including access to nature. However the RSPB does not consider the SPD provides sufficient guidance on encouraging community engagement and ownership of SuDS. The RSPB strongly recommend including additional information on community engagement and partnership working. With good design and an effective participation strategy, as well as expert ecological guidance, SuDS (particularly those that provide wildlife habitat and so an attractive feature) can readily become a focus of community life, where people are willing to get involved with local activities. The appropriate management of SuDS can provide many opportunities for learning, informal recreation, supported play and other community programmes. This has many social and health benefits and gives people a sense of pride, responsibility and ownership of their environment. Active interpretation, volunteering opportunities, guided walks and other forms of engagement provide ways in which people can become involved in decision-making and management of SuDS. This in turn can engender public support for SuDS, leading to increased awareness of wetlands and the natural environment and community	Detail on pre-app working with relevant WMAs etc has been included throughout and there is a lot of information in Section 6 on how to most appropriate include SuDS therefore no additional changes proposed in response to this comment.	No change

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				cohesion.		
Mrs Helen Lack Huntingdonshire District Council	6.3.28	F+W SPD:5	Have observations	Please note that HDC's Design Guide states at 3.4.3 page17, "It is not acceptable for areas intended as informal open space to : 1)be comprised mainly or wholly of land which doubles as a balancing area (which is likely to be unusable for at least part of the year...." 6.3.28 seems to conflict with this approach	Acknowledge that different LPAs will have different approaches. Appropriate wording should be used to ensure differences between LPAs are made clear	Paragraph 6.3.28 amended to '*Where the local authority will adopt SuDS in public open spaces, they must still be able to function and be accessible as useable open space for the majority of the time for them to be included within the open space calculations*'. Due to other changes this is now 6.3.39
Mr Richard Whelan	Figure 6.7 Street design to drain to adjoining lower ground SuDS feature (courtesy of CIRIA)	F+W SPD:50	Have observations	seems to show a traditional road and gully system when the water could be conveyed across the land illustrated, to the untrained eye this may appear fairly similar to the undesirable image in figure 6.12.	Updated images now obtained from Ciria which will be used throughout document	Updated
Mr Richard Whelan	6.3.31	F+W SPD:47	Have observations	It may be worth mentioning why the deep end of pipe assets are less desirable; increased excavation, potential need for unnecessary pumping or increased health and safety risk and mitigation requirements	Acknowledge – add in	Added '*Deep features are undesirable due to increased excavation, the potential need for unnecessary pumping and the requirement for mitigation measures'* to paragraph 6.3..31. Due to other changes this is now 6.3.43
Mr Richard Whelan	6.5.2	F+W SPD:48	Have observations	seems slightly simplistic, it could benefit from reference to Building Regulation requirements relating to separators/	Acknowledge. In addition, the Ciria SuDS manual has been updated and this section should therefore be	Section 6.5 now amended in relation to this comment and updates to the Ciria SuDS

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				interceptors and from a link to EA Pollution Prevention Guidance (https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg). Also there should be consideration of the type of water quality risk and the type of treatment stages, for example trapped gullies, catch pit manholes and separators/ vortex devices are relatively ineffective against soluble or fine suspended pollutants such as milk or detergents.	updated to reflect both this comment and manual changes.	manual. 6.5.1 *'SuDS have a considerable advantage over traditional drainage as a well-designed system will provide a level of treatment to surface water runoff before it is discharged into the receiving water body. It does this through a number of processes including filtration, settlement, and uptake by plants.* *6.5.2The size and number of treatment stages required is based on the level of pollution entering into the system. For example, industrial sites will contain a higher level of pollutants within surface water runoff than from a small residential road.* Table 6-3 *indicates the water quality management design method/approach required to determine the appropriate level of treatment for a number of land uses.* *6.5.3Each treatment stage must be designed to be effective in pollutant removal as stipulated in The SuDS Manual C753). This needs to be quantified at the application stage. Different features have different levels of effectiveness and the system should be designed as a whole to ensure there is no detriment in water quality.* *6.5.4 Guidance on the effectiveness and design of each potential feature can be found in* Table 6-3 *Guidance notes for* Table 6-3 *can be found in Appendix 5.'*
Mr Richard Whelan	6.5.4	F+W SPD:49	Have observations	The CIRIA SuDS Manual is due to be re-released this year under a different reference (i.e. not C697) would suggest making reference to the latest CIRIA guidance to avoid references to out dated documents (this is repeated in the	See comments and action above (F&W SPD:48)	No change

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				document)		
Harry Jones of David Lock Associates for Tim Leathes Urban and Civic	6.6 Designing a safe environment	F+W SPD:148	Have observations	Detailed SuDS Design Section 6.6 of the draft SPD outlines that all SuDS schemes should be designed as a safe environment that can be accessed and enjoyed by residents and visitors. Paragraph 6.6.1 is clear that the use of fencing and barriers should not be the approach to making SuDS features safe. Whilst U&C agrees that it is not appropriate to include the fencing and barriers as part of the design of SuDS features in residential areas, the use of such features and steeper earthworks slopes may be acceptable in less sensitive environments such as for employment sites. In this context, it is suggested that paragraph 6.6.1 is amended to introduce more flexibility to allow the use of fencing, barriers and steeper earthworks slopes where appropriate within the landscape of less sensitive developments. U&C welcome the clarification within section 6 of the draft SPD that the provision of SuDS within development projects is the preferred approach for the design of water drainage systems in Cambridgeshire rather than traditional surface water drainage systems. This clarity will ensure that SuDS can be incorporated into the design of development proposals at the outset in order to maximise their efficiency and amenity value. The approach to SuDS design outlined within paragraph 6.6.1 highlights the opportunity to incorporate SuDS within	Acknowledge – wording relating to the safety/use of fencing for SuDS should be added to this section.	Paragraph 6.6.1 amended to '*All SuDS schemes should be designed as a safe environment that can be accessed and enjoyed by residents and visitors. The use of fencing and barriers should not be the approach to making SuDS features safe, particularly in residential developments. It is however recognised that there may be cases in less sensitive environments (such as industrial areas) where steeper earthworks and safety measures are appropriate'*

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				formal public open space within development sites. U&C agree that well designed SuDS within safe environment can be a valuable amenity asset for local communities.		
Mr John Oldfield Bedford Group of IDBs	6.7 Developing a surface water drainage strategy	F+W SPD:67	Have observations	This whole section should have an overarching message that it is essential to consider maintenance at each stage of master planning.	Acknowledge – this is also reinforced by the NPPF which requires maintenance to be considered as part of a planning application. Appropriate wording should be added in.	Paragraph 6.7.1 amended to '*For larger developments a masterplan will be necessary. It is at this stage the SuDS layout (taking into account flow routes, topography, geology and green space) and proposed maintenance of the system should be determined whilst, ensuring a safe design and mitigation of flood risk (see* Figure 6.1*). Seeking advice at the earliest opportunity from the relevant WMAs will help avoid any costly issues or redesigns at a later stage. Effective master planning should ensure a robust, viable and cost-effective scheme from the outset, where objectives of the development are informed by the SuDS scheme and vice versa'.* 7th bullet point of paragraph 6.7.5 amended to, '*Maintenance and management plan of surface water drainage system (for the lifetime of the development) including details of future adoption*'
Mr and Mrs P Boon	6.9 Adoption and Maintenance of SuDS	F+W SPD:4	Have observations	I have read the document and think if it is enforced it could be a very good framework for agencies and developers to follow. Paragraph 6.9 Adoption and Maintenance of SuDS. This section covers the maintenance and adoption of SuDS. In my experience of local developments this is not sorted out, this should be a precondition and enforced. If the	Support noted	No change

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				SuDS for a development is not maintained then this could either cause flooding on the site or surrounding properties or the local authorities becoming responsible for maintenance and funding.		
Mr John Oldfield Bedford Group of IDBs	6.9.1	F+W SPD:68	Support	We support the benefits of the SuDS being adopted by a statutory body for the future maintenance, as this ensures there is an accountable body in the future to undertake maintenance. It also enables the developers to concentrate on their main priority of building houses and buildings.	Support noted	No change
Harry Jones of David Lock Associates for Tim Leathes Urban and Civic	6.9.1	F+W SPD:149	Have observations	Adoption and Maintenance of SuDS U&C agrees with the recommendation outlined at paragraph 6.9.1 that it would be preferable for a statutory organisation to take on the role of maintaining SuDS within developments. However, clarification is required to confirm that this is not the only approach which could be acceptable depending upon the circumstances of specific developments. For example, in some circumstances, it may be more appropriate that the long-term management of SuDS is undertaken by a management company or private owner.	Acknowledged – appropriate maintenance/adoption of SuDS will be considered by the LLFA. Amendment should be made to this effect.	Paragraph 6.9.1 amended to '*The LPA may seek advice for developers looking to source an appropriate body for SuDS adoption and maintenance. It is recommended that a statutory organisation takes on the role of maintaining the SuDS as this will guarantee maintenance of the drainage system in perpetuity; however where this is not possible ,alternative bodies may also be able to maintain SuDS, provided that a suitable maintenance plan has been submitted to and agreed with the LPA. Statutory organisations in Cambridgeshire may include organisations such as the local authorities, Anglian Water and IDBs. For SuDS serving the highway these should be discussed with the Highways Authority at CCC to ensure suitability for adoption*.'
Scott Hardy RSPB	6.9.3	F+W SPD:139	Have observations	The SPD advises under point 6.9.3 that '*there is a need to ensure that a long-term, effective maintenance regime is in place*'. However, whilst the SPD states under 6.3.20	Acknowledged – appropriate wording relating to habitat management plans should be added	Third bullet point of 6.9.3 amended to '*There is a need to ensure that a long-term, effective maintenance regime is in place along with a long term habitat management*

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				that '*if protected species are likely to be attracted to SuDS features, the protection of these habitats during maintenance and operation should be considered in the design*', it does not specify the need for a long term habitat management plan. The RSPB strongly recommends that the SPD confirms the need for a long term habitat management plan to be developed to inform any maintenance regime put in place to ensure the system functions effectively over time and continues to provide benefits to wildlife. Any habitat management plan should ensure key species continue to benefit from a SuDS scheme, as well as ensuring water storage and water filtration (to improve discharge quality) functions do not diminish. The RSPB strongly recommend that the role of source control within SuDS systems be expanded upon within the SPD to highlight the importance of adequate source control (e.g. green roofs, living walls, rain gardens, permeable surfaces, filter strips and bio-retention areas) for delivering SuDS with high wildlife and amenity value. The most important component of SuDS if they are to deliver for wildlife is source control. Poor water quality reduces the likelihood of creating valuable wildlife habitats. The more effort invested in features at the point at which rain lands the better the regional control of detention and retention basins will be for wildlife. Further information on this can be found on pages 15-21 of the	in	*plan where appropriate*'. Amended paragraph 6.3.11 to '*The SuDS management train is a central design concept for SuDS. It describes the use of a, "sequence of components that collectively provide the necessary processes to control the frequency of runoff, the flow rates and the volumes of runoff, and to reduce the concentrations of contaminants to acceptable levels" (CIRIA 2015). The management train begins with land use decisions and prevention measures, followed by interventions at the property scale and street scale (source control), through to considerations for downstream run-off controls within the overall site boundary, and wider initiatives downstream that are designed to manage the overall catchment. Source control includes features such as permeable paving, rainwater harvesting, living walls, rain gardens, filter strips, green roofs and bio retention areas. These allow water to penetrate the feature thereby reducing the proportion of surface water runoff that is conveyed into the drainage system*'

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				aforementioned guidance 1, which we consider would provide helpful guidance if referenced and/or quoted in this section. SuDS often have cost benefits in comparison to traditional pipe drainage systems. These benefits have been widely reported, including in the 'Lamb Drove Sustainable Drainage Systems (SuDS) Monitoring Project' report commissioned by Cambridgeshire County Council. This report states that the capital costs of the SuDS scheme were £314 per property cheaper than the alternative pipe drainage system. It is the RSPB's view that the SPD does not adequately promote the potential cost benefits of multi-functional SuDS compared to traditional piped drainage systems. The RSPB recommends that the SPD strongly emphasises the potential cost benefits as this is likely to be a major consideration for developers. The RSPB's has previously worked with Exeter City Council on their 'Residential Design' SPD by providing biodiversity advice which is incorporated into the SPD. The RSPB is also cited as an additional source of information within this document. The RSPB recommends including a link within the Flood and Water SPD to our 'Sustainable Drainage Systems - maximising the potential for people and wildlife' guidance booklet,		

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				produced in partnership with the WWT1. The RSPB recommends the inclusion of a link to this SuDS guidance in the SPD to complete the portfolio of best practice guidance documents. It is our view that this will provide useful additional information and guidance for LPAs and developers regarding maximising the benefits of SuDS systems for people and wildlife. 1RSPB/WWT (2014). Sustainable Drainage Systems - maximising the potential for people and wildlife. At: www.rspb.org.uk/forprofessionals/policy/sustainabledevelopment		
Allan Simpson Anglian Water Services Ltd	6.9.5	F+W SPD:132	Have observations	Para 6.9.5 We recommend that this paragraph is amended to: "If the applicant is minded to choose Anglian Water as the appropriate body for SuDS adoption they should ensure the proposed design meets Anglian Water's adoption criteria, referencing relevant guidance and advice where appropriate. Further information on Anglian Water SuDS adoption, including the SuDS adoption manual, is available on the Anglian Water website."	Acknowledged – to be added to SPD	Amended paragraph 6.9.5 to '*If the applicant is minded to choose Anglian Water as the appropriate body for SuDS adoption they should ensure the proposed design meets Anglian Water's adoption criteria, referencing relevant guidance and advice where appropriate. Further guidance on Anglian Water SuDS adoption (including their Sustainable Drainage Systems Adoption Manual) is available on the Anglian Water website*'
Mrs Helen Lack	6.9.6	F+W	Have	Is it the intention that the document will include a schedule of adoption rates,	No this will not be included within the SPD, particularly as they would be	No change

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Huntingdonshire District Council		SPD:6	observations	supported by all Councils?	subject to change on a potentially frequent basis	
Mr Richard Whelan	7 Water Environment	F+W SPD:38	Have observations	Pleased to see the inclusion of compliance with the Water Framework Directive within the document (step 6 page 32 etc), however it should be noted that virtually all developments will have some level of WFD impact if the water eventually ends up in a WFD assessed waterbody (via a sewer or ground water flow), this may not cause the rivers to fail to meet WFD requirements instantly but the accumulative impact of development will increase the baseline contaminants within the water network and lead to a deterioration in the environment or a failure of compliance through accumulative inputs. Hence the need to ensure appropriate treatment stages are in place.	Support noted	No change
Adam Ireland Environment Agency	7 Water Environment	F+W SPD:98	Support	**Chapter 7: Summary** We generally support this section as capturing the general thrust of the WFD and how it relates to the planning system with planning applications. We realize that we did not provide detailed comments during previous formative drafts due to time and resource constraints at that time, so as agreed we include these now as mainly 'editing' suggestions for accuracy and by way of update.	Support noted	No change
Mr John Oldfield Bedford Group	7.1.1	F+W SPD:69	Object	This statement is incorrect in East of England, as a large proportion of our	Acknowledged – wording needs to be appropriately changed to reflect	Paragraph 7.1.1 amended to '*The European WFD is an established legal framework for*

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of IDBs				waterbodies are artificial or heavily modified for agriculture, development, milling, navigation, infrastruture..... Hence, any WFD statement should refer to **good ecological potential**	natural and modified water bodies.	*managing the water environment. Under the WFD the United Kingdom must aim to achieve 'good ecological status/potential' (depending on the designation of the water body) by 2015 in all surface freshwater bodies, including rivers, lakes, groundwater, transitional and coastal waters regardless of size and characteristics. Other objectives of the WFD include preventing deterioration of the status of all bodies of surface water, including groundwater*'.
Adam Ireland Environment Agency	7.2.1	F+W SPD:99	Have observations	7.2.1 the second ARBMP will be adopted December 2015 by the time the SPD is adopted. There EU legislation allows no scope for this to slip.	Acknowledge – amend wording of SPD appropriately	Paragraph 7.2.1 amended to '*River Basin Management Plans produced by the EA, in consultation with the LPA, detail the pressures facing the water environment and what actions need to be taken in order for the WFD to be met in each area. The Anglian River Basin Management Plan (December 2015) covers Cambridgeshire'*
Adam Ireland Environment Agency	7.3.2	F+W SPD:100	Have observations	7.3.2 Should submit a preliminary Water Framework Assessment and also consult the LLFA or LA depending on the waterbody, or if SuDS is a factor. 7.3.2 In most case the EA can "inform/advise" is more accurate than "confirm".	Wording currently states that a separate assessment may be required therefore this is already covered	No change
Adam Ireland Environment Agency	7.3.3	F+W SPD:101	Have observations	7.3.3 Last sentence accuracy :" In most cases EA can confirm <u>which process regulation</u> WFD assessment might be most appropriate to be undertaken <u>and whether there may be any in principle planning implications from WFD water body</u>	Acknowledge – amend wording of SPD appropriately.	Paragraph 7.3.3 amended to '*There may be proposals that do not need EIA but have potential WFD-related impacts for example marinas, development in close proximity to a river bank, channel diversions, new culverts on main rivers, mineral extraction close to watercourses or intensive agriculture. In*

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				objectives being met."		*most cases the EA can advise which process regulation WFD assessment might be most appropriate to be undertaken and whether there may be any in principle planning implications from WFD water body objectives being met'*.
Adam Ireland Environment Agency	7.3.4	F+W SPD:102	Have observations	7.3.4 EA deals with permits under a much wider range of legislation. Suggest we omit 'Water resources Act' and replace with: "a breadth of Environmental Permitting, Land Drainage, Water Resources and Pollution Prevention acts and regulations. Developers should seek to ascertain through pre-application discussions with EA what regulations are involved and whether these might involve controls that would mean a planning permission could not be implemented. The risk of not doing so is that it may make planning process an abortive one for all concerned and is likely in any event to involve a detailed water framework assessment at the planning stage."	Acknowledge – amend wording of SPD appropriately	Paragraph amended to '*WFD Assessments are sometimes required by the EA for developments where permissions are required for works near/on main rivers under the breadth of Environmental Permitting, Land Drainage, Water Resources and Pollution Prevention Acts and Regulations. Developers should seek to ascertain through pre-application discussions with the EA what regulations are involved and whether these might involve controls that would mean a planning permission could not be implemented. The risk of not doing so is that it may make the planning process an abortive one for all concerned and is likely in any event to involve a detailed WFD assessment at the planning stage'*.
Adam Ireland Environment Agency	7.3.7	F+W SPD:103	Have observations	7.3.7. Add 'Water companies can also provide up to date information and guidance' for completeness and getting up to date information.	Acknowledge – amend wording of SPD appropriately	Amended paragraph 7.3.7 to '*Another source of information leading on from the WFD is Water Cycle Studies (WCS). The WCS assesses the capacities of water bodies and water related infrastructure to accommodate future development and growth throughout Cambridgeshire, for each of the City and District Councils, and is intended to support the evidence base for their relevant Local Plans. Water companies can also provide up to date information and guidance relating to the available capacity of water and water recycling infrastructure as*

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						part of their pre-planning services'
Mr Graham Moore Middle Level Commissioners	7.4 Water resources and waste water	F+W SPD:145	Have observations	We are disappointed that given the title of the document that all water cycle issues such as water resources were not more fully considered. Within the document water resource issues predominantly refer solely to potable water supply but other water resource issues which exist within the study area, for example, agricultural use, navigation, amenity, biodiversity should also be considered, particularly if drought conditions, like those recently experienced, become more regular, if the impact of climate change becomes a reality. The largest development within the County during the current plan period and beyond is the Great Fen Project. The impact on the water cycle within the Commissioners' area may be beneficial, by providing flood protection, amenity, biodiversity benefits and/or detrimental by requiring high levels of abstraction when water is scarce. It should be remembered that with the exception of rain falling on the catchment, the Commissioners only source of water is the abstraction from the Back River, a tributary of the River Nene, through Stanground Lock. During periods of dry weather this abstraction from the Nene is reduced or ceases and this can detrimentally affect the Commissioners' system. The Nene system also serves Anglian Water's potable water storage reservoirs. Due to the statutory requirement within the	Previous actions have added in additional references to Fenland and differences between landscapes across the county. However additional wording could be added in. This would be more appropriate in Section 6 where the Cambridgeshire context is discussed	Previous actions have added in additional references to Fenland. Paragraph 6.2.2 amended to included reference to irrigation. *'Cambridgeshire is one of the driest counties in the UK. On average, the county receives less than 600 mm of rainfall per annum; however, this can drop below 500mm in particularly dry years. This is less than half the national average of 1,176mm. Accordingly, water management is an important issue and source control measures like rainwater harvesting that enable water use reduction locally are important along with retention of water for irrigation purposes. Equally, in some areas infiltration to re-charge local groundwater supplies is important due to the low rainfall conditions in Cambridgeshire and SuDS such as soakaways can help by encouraging infiltration wherever it is achievable and acceptable. In Fen areas where water levels are closely managed to sustain development and agriculture, the IDBs can use their systems to manage water supplies for agriculture. Equally, trees and woodland, where used appropriately can reduce the impact of drought as, under the right conditions, shelterbelts can enable crops to use water more efficiently (by reducing evapotranspiration losses) which could reduce the need for irrigation and lead to less abstraction'*

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				Middle Level System to maintain the navigation level which takes precedence over water abstraction if, during a long hot summer, there is any risk of dropping below the minimum navigation level, then all abstraction from our system will be curtailed or has to cease. This can last for potentially 4 – 6 weeks, which obviously has an impact on crop yields and could have an adverse impact on the Great Fen and other amenity, biodiversity sites. Whilst it is appreciated that agriculture, navigation and tourism are not likely to significantly impact on the larger "growth" issues, the study area is likely to remain primarily agriculturally based for the foreseeable future, and will therefore, create employment and contribute to the economy. Similarly, navigation and tourism do the same but on a much smaller scale and have sustainability and biodiversity benefits. The Middle Level Commissioners have to balance these against the need to retain both flows and a navigation level. Therefore, it is important that public water supply is balanced against these requirements; for example the supply of water from the River Nene to the Middle Level. These issues need to be taken into account including changes in upstream demand for waterbeyond the study area. The failure to consider this could have severe economic and environmental effects on the area that any growth in the Council's area may be affected.		

Annex B: Record of Issues Raised and Action Taken

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
Adam Ireland Environment Agency	7.4.1	F+W SPD:104	Have observations	7.4.1 For accuracy and completeness: future development 'have the potential to cause deterioration to the WFD status, the LPA and applicant will need to assess this and manage impacts accordingly to avoid any deterioration in line with Article 4.7 of the Directive. (NB we would not know if deterioration were likely until an assessment were carried out)	Acknowledged – amend wording of SPD appropriately	Paragraph 7.4.1 amended to *'If the water supply or wastewater discharge needs of any future development have the potential to cause deterioration to the WFD status, the LPA and applicant will need to assess this and manage the impacts accordingly to avoid any deterioration in line with Article 4.7 of the WFD'*
HarryJones of David Lock Associates for Tim Leathes Urban and Civic	7.4.1	F+W SPD:150	Have observations	Water Framework Directive Paragraph 7.4.1 confirms that where it is likely that water supply or wastewater discharge needs have potential to cause deterioration of the Water Framework Directive (WFD) status, this must be taken into consideration by applicants and local planning authorities. U&C suggests that this paragraph could be clarified to also include that consideration of the WFD is required to be considered in circumstances where the sewerage undertaker has confirmed that there is capacity in both the foul sewer network and at water recycling centres	This is not necessarily the case and could confuse matters if included	No change
Adam Ireland Environment Agency	7.4.2	F+W SPD:105	Have observations	7.4.2 at the end, for accuracy and update, add …water consumption "from all water resources in Cambridgeshire" in place of 'water stressed areas' which are anomalous for planning purposes.	Acknowledged – amend wording of SPD appropriately	Paragraph 7.4.2 amended to '*The supply of drinking water to Cambridgeshire involves abstraction from Water Resource Zones (WRZ) across the County and the wider area (*Table 7-1*). The resilience of the supply systems have the potential to be affected by the impact of climate change and severe*

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						weather related events. Both Cambridge Water and Anglian Water have encompassed the potential effects of climate change within their Water Resource Management Plans, which have determined the need for investment in both mitigation and adaptation, specifically to reduce water consumption from all water resources in Cambridgeshire'
Adam Ireland Environment Agency	7.4.3	F+W SPD:106	Have observations	7.4.3 Suggest moving this to before 7.5.1. Last line, update for accuracy and to accord with the ARBMP: Replace with "Increases to year round abstraction are unlikely to be permitted by the EA."	Acknowledged – amend wording of SPD appropriately	Change made and additional text added to paragraph 7.5.1 – amended to '*When water is removed from a river it can reduce water quality due to reduced dilution of pollutants. Standards are in place between the EA and the relevant water company to ensure that most of the time water levels within the river are maintained at an appropriate level for fish and other wildlife. However, in drought periods or with increasing demand water companies may need to apply for a permit to increase abstraction, and hence reduce river levels. Queries regarding increases to year round abstraction are unlikely to be permitted by the EA.*'
Adam Ireland Environment Agency	7.4.4	F+W SPD:107	Have observations	7.4.4 Update for accuracy and clarity of the process to avoid delays/uncertainty: delete 'it is likely that'. Last line "Details of works infrastructure in planned development locations can be found in the LPAs WCS and their update reviews. Proposal not accounted for in WCSs should be assessed in pre-application consultation with EA, AW/CWW. Proposals submitted without such info may experience delay or be determined as submitted."	Acknowledged – amend wording of SPD appropriately	Paragraph 7.4.4 amended to '*If the local water and sewerage company reaches a point where it needs to apply for a permit for increased discharge flows from a sewage treatment work (STW), water quality limits will be tightened. This is intended to aid achievement of the water quality objectives of the receiving water body under the WFD. Details of works infrastructure in planned development locations can be found in the LPA's WCS and their update reviews. Proposals not accounted for in WCSs should be assessed in pre-application consultation*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
						with the EA, Anglian Water/Cambridge Water'. Due to other changes this is now 7.4.3.
Mr George Dann King's Lynn Drainage Board	7.4.5	F+W SPD:124	Have observations	7.4.5 - this section is not particularly clear, and may benefit from being re-writtern. The requirement to obtain prior written consent for increases in the rate and/or volume of discharge in a watercourse in an IDB district, and to pay a fee for this, applies with most IDBs throughout the country, and certainly the vast majority, if not all, of the ones mentioned in your document, not just MLC.	Acknowledged and as previous comments have discussed, reference to MLC specific requirements have been removed throughout the report and have been generalised to all IDBs.	Paragraph 7.4.5 amended to *'Within most IDB areas, any additional discharges beyond those permitted into the IDBs systems will require their prior written consent together with the payment of the relevant fee'*
Mr John Oldfield Bedford Group of IDBs	7.5 Development location in relation to catchment or watercourse	F+W SPD:70	Have observations	For clarity, this section should refer to Byelaws and Consents.	Acknowledge – reference to byelaws should be added to paragraph 7.5.4	Amended paragraph 7.5.4 to '*Special consent may be required from Cambridgeshire's WMAs for development that takes place inside or within a certain distance of a non-main river watercourse. Developers should contact CCC (the LLFA) or IDB (If within an IDB's rateable area) for further details. Byelaws may also be applicable in some areas throughout Cambridgeshire. Check with the LPA/IDB if this is the case'.*
Adam Ireland Environment Agency	7.5.1	F+W SPD:108	Have observations	7.5.1 at the end add for accuracy and completeness environments..."or any modifications needed to facilitate improvement and not compromise the river's form and function".	Acknowledged – amend wording of SPD appropriately	Paragraph 7.5.2 amended to *'Under the WFD, a development's location within a catchment or its proximity to a watercourse is relevant. Proximity to a watercourse is relevant where, for example, development or engineering works could affect the ability of the body responsible for maintaining the watercourse to access, maintain or improve the water body, or where it could affect the flow in a watercourse. Riverside development must therefore be set back a reasonable distance from the water's edge,*

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
						allowing a corridor between the two environments or any modifications needed to facilitate improvement and not compromise the river's form and function'.
Mr Graham Moore Middle Level Commissioners	Map 2.1: IDBs within East Cambridgeshire District Council (ECDC) Area	F+W SPD:142	Have observations	Unlike Maps 1.1, 3.1 and 3.2, the maps 2.1–2.4 included in Appendix 2 are of extremely poor quality. This is particularly disappointing given that a detailed plan showing both the Middle Level Commissioners' catchment, rivers and our pumping station at St Germans together with the drainage districts to whom we provide administrative, engineering and/or planning services and the LPA boundaries was sent to you in April.	This is agreed and relates to the space available on the host website for the draft SPD. Full resolution maps are to be used for final document.	Amended for final document
Miss Kayleigh Wood Historic England	Appendix 4: Building materials guidance	F+W SPD:16	Object	It should be acknowledged that the Building Material Guidance will not always be appropriate for Historic Buildings.	Acknowledged – a footnote to this effect should be added in	Included footnote '*Please note: Building Material Guidance will not always be appropriate for historic buildings*'
Adam Ireland Environment Agency	Glossary of terms	F+W SPD:109	Have observations	**Glossary:** Include 'ambient risk' in the glossary (from sequential test Stage D page 24). Suggest: "Ambient Risks: The pre-development risks of all forms of flooding with the presence of existing defences, including risks from defences being overwhelmed, or defence asset failure. Ambient risk does not include proposed site mitigation measures.	Unsure why this is required as ambient risk is not referred to in the SPD?	No change

Annex B: Record of Issues Raised and Action Taken

Consultee Name	Chapter or Para No.	Comment ID	Support/ Observations / Object	Comment	Councils' assessment	Action
	Glossary of terms	F+W SPD:125	Have observations	Glossary - the definition of a "Hydrological Model" is much broader than this, and can apply to any watercourse, not just rivers.	Acknowledged and this should be changed	Amended to '*Estimates the flow in a river/watercourse from a given amount of rainfall falling into the catchment*'

Appendix B: Cambridgeshire Flood and Water Supplementary Planning Document

Cambridgeshire Flood and Water Supplementary Planning Document

Cambridgeshire County Council

Fenland
CAMBRIDGESHIRE
Fenland District Council

EAST CAMBRIDGESHIRE DISTRICT COUNCIL

Huntingdonshire
DISTRICT COUNCIL

South Cambridgeshire District Council

CAMBRIDGE CITY COUNCIL

Note to the reader

As the emerging Cambridge Local Plan is still at the examination stage, this document will be carried forward for adoption as an SPD at the same time as the Local Plan, as agreed at Development Plan Scrutiny Sub Committee on 6 December 2016. In the interim period, prior to adoption of the SPD, the Cambridgeshire Flood and Water document provides context and guidance as material consideration in the planning process. It does not introduce new policy but rather it elaborates on, and is consistent with Local Plan policies.

Contents

Contents

1 Introduction

1.1 Background

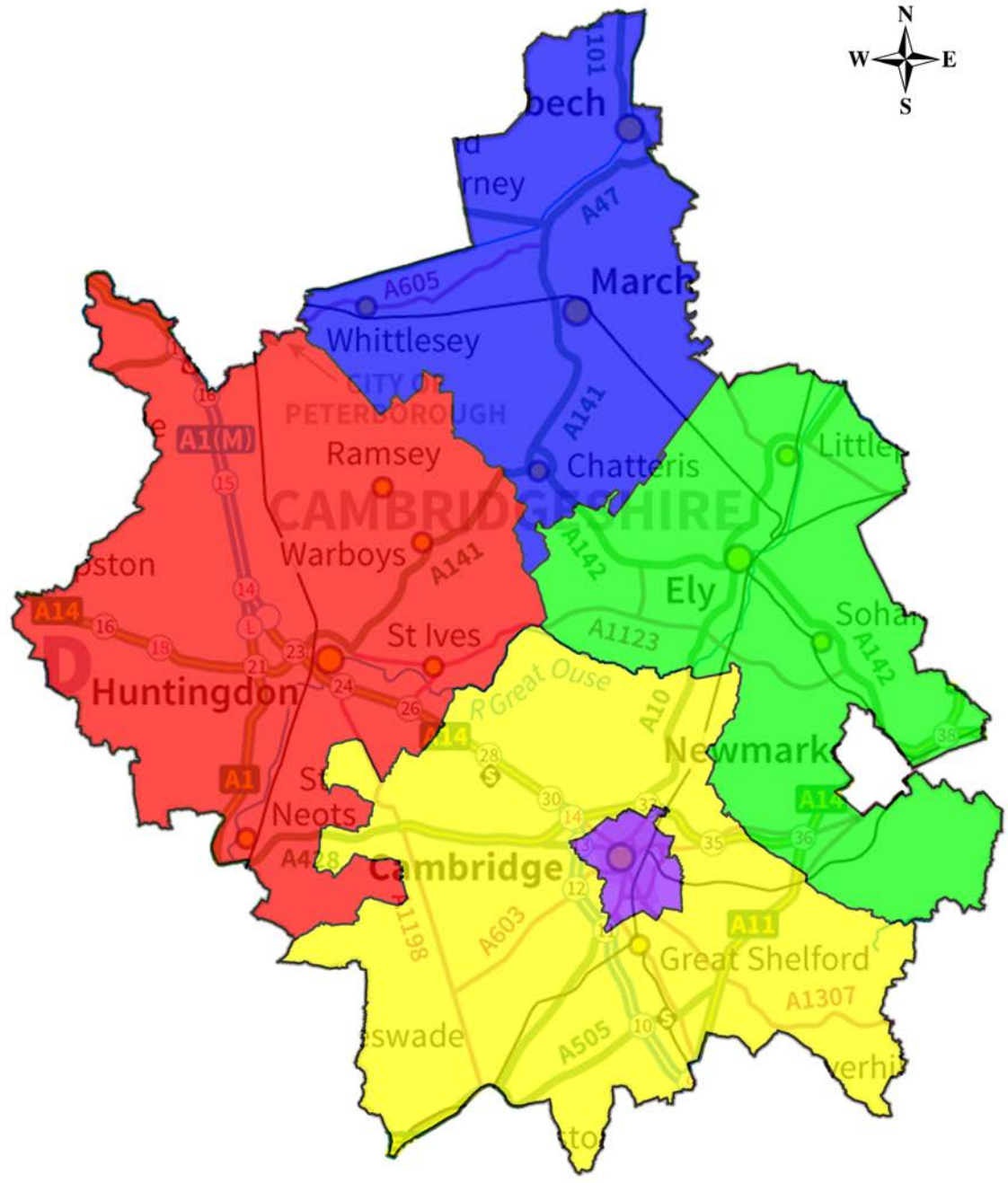
1.1.1 This Supplementary Planning Document (SPD) forms part of each of the Cambridgeshire Local Planning Authority's (LPAs) suite of planning documents. This SPD has been developed by Cambridgeshire County Council (as Lead Local Flood Authority (LLFA)) in conjunction with LPAs within Cambridgeshire, and other relevant stakeholders, to support the implementation of flood risk and water related policies in the Local Plans. It provides guidance on the implementation of flood and water related policies in each authority's respective local plan. Further details on these policies are contained within Appendix A. This section summarises the main issues addressed by the SPD. This SPD supplements policies found in:

- The Cambridgeshire and Peterborough Minerals and Waste Development Plan;
- The Cambridge Local Plan;
- The East Cambridgeshire Local Plan;
- The Fenland Local Plan;
- The Huntingdonshire Core Strategy 2009 and the emerging local plan; and
- The South Cambridgeshire Development Control Policies DPD 2007 and the emerging local plan.

1.1.2 This document is a material consideration when considering planning applications. It does not introduce new policy but rather it is intended to elaborate on, and be consistent with, existing and emerging local plan policies.

1.1.3 As the Lead Local Flood Authority, Cambridgeshire County Council has endorsed the SPD and as part of its role as the statutory consultee for surface water management, will follow the guidance in this SPD.

Map 1.1 : City and District Councils' Areas



1 Introduction

1.2 Why guidance is needed

1.2.1 The aim of this SPD is to provide guidance on the approach that should be taken to manage flood risk and the water environment as part of new development proposals. The SPD will highlight the documents that will be required to accompany planning applications, including:

- Sequential Test, and where appropriate Exception Test, reports
- Site specific Flood Risk Assessments (FRAs) and Drainage Strategies (incorporating the approach to surface water drainage)

1.2.2 A significant amount of new development will occur in Cambridgeshire in the next 20 years and beyond. In order to reduce the impact upon the water environment, development must be appropriately located, well designed, managed and take account of the impacts of climate change.

1.2.3 Each of the chapters contained within the SPD details guidance for applicants on managing flood risk and the water environment in and around new developments within Cambridgeshire. The following paragraphs provide a summary of the details of the guidance contained in each of the chapters:

Chapter 1 Introduction

This chapter provides an introduction into the background of the SPD and how it should be used by applicants, consultants, design teams, development management officers and other interested parties.

Chapter 2 Setting the Scene

This chapter provides an overview of the European and national context on flood risk and water management, as well as providing further details on the local plans and policies associated with Cambridgeshire.

Chapter 3 Working together with Water Management Authorities

Within this chapter details are given as to the key water management authorities that may need to be consulted by the applicant during the planning application, including pre-application and planning application stages.

Chapter 4 Guidance on managing flood risk

The aim of this chapter is to provide specific advice on how to address flood risk issues within the planning process, including the application of the 'sequential approach' to flood risk and producing site specific flood risk assessments.

Chapter 5 Managing and mitigating risk

An integral part of managing and mitigating risk associated with flooding is good site design. This chapter covers ways in which those risks can be appropriately addressed.

Chapter 6 Surface water and Sustainable Drainage Systems

This chapter specifically looks at a number of different design methods and how they can be incorporated into SuDS that form part of a proposed development. In addition, further guidance is given on the adoption and maintenance of SuDS.

Chapter 7 Water Environment

Under the Water Framework Directive (WFD) water environments must also be protected and improved with regards to water quality, water habitats, geomorphology and biodiversity. This chapter discusses the water environment in more detail.

1.3 How to use this Supplementary Planning Document

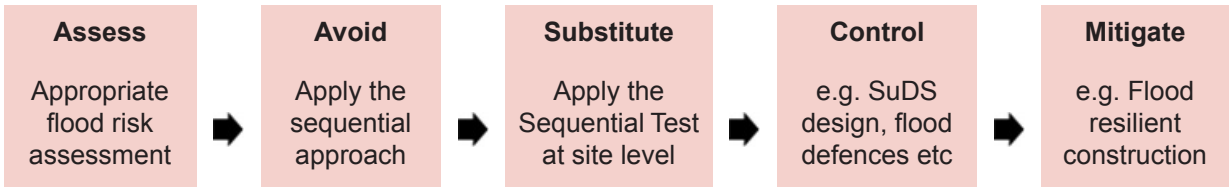
1.3.1 To ensure that Cambridgeshire has a consistent, locally appropriate approach to flood risk and water management, this SPD should be used by:

- Applicants when considering new sites for development
- Applicants when preparing the brief for their design team to ensure drainage and water management schemes are sustainably designed
- Consultants when carrying out site specific flood risk assessments
- Design teams preparing masterplans, landscape and surface water drainage schemes
- Development management officers and their specialist consultees when determining delegated planning applications, selecting appropriate planning conditions, making recommendations to committees and drawing up S106 obligations that include contributions for SuDS
- Other interested parties (e.g. Local Members) who wish to better understand the interaction between development, flooding and drainage issues

1.3.2 A checklist of information which may need to be considered in support of an application, demonstrating how it has met all the requirements set out in Chapters 2 – 7, can be found in Appendix B.

1.3.3 This SPD is set within the context of a water and flood risk management hierarchy to help developers and decision makers understand flood and water management and to embed it in decision making at all levels of the planning process.

Figure 1.1 : The Flood Risk Management Hierarchy



1.3.4 The SPD addresses all the flood and water issues associated with developments within the Cambridgeshire context. It should however be considered that the design of water features and drainage systems is dependent on a number of constraints such as existing site contamination levels, for example. This SPD does not provide detailed information on land and groundwater contamination remediation measures.

1.3.5 The SPD does not provide a comprehensive guide on all other development related issues. There is a wide range of other guidance available as part of national planning policy and from various sources for other matters.

2 Setting the scene

The aim of this chapter is to provide an overview of the European (e.g. The Water Framework Directive and The Floods Directive) and national context (e.g. Flood and Water Management Act 2010, National Planning Policy Framework, National Planning Practice Guidance and DEFRA Non-statutory Technical Standards for SuDS) on flood risk and water management, as well as providing further details on the local plans and policies associated with Cambridgeshire.

2.1 Legislation, policy and guidance

2.1.1 Flood and water management in Cambridgeshire is influenced by European and national legislation, national and local policy, technical studies and local knowledge. These themes are considered further within this chapter.

2.2 European context

The Water Framework Directive

2.2.1 The Water Framework Directive – 2000/60/EC (WFD) came into force in England in 2003 via The Water Environment (Water Framework Directive) (England and Wales) Regulations. There are four main aims of the WFD:

- To improve and protect inland and coastal waters
- To promote sustainable use of water as a natural resource
- To create better habitats for wildlife that lives in and around water
- To create a better quality of life for everyone

2.2.2 To achieve the purpose of the WFD of protecting all water bodies, environmental objectives have been set. These are reported for each water body in the River Basin Management Plan (RBMP). Progress towards delivery of the objectives is reported on by the relevant authorities at the end of each six-year river basin planning cycle. Objectives vary according to the type of water body; across Cambridgeshire and the Fens there is a significant network of heavily modified and artificial watercourses.

2.2.3 Further details on the WFD can be found under Chapter 7.

The Floods Directive

2.2.4 The aim of the EU Floods Directive - 2007/60/EC is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive came into force in the UK through the Flood Risk Regulations 2009 which in turn sets the requirement for Preliminary Flood Risk Assessments (PFRA) to be produced by all unitary and county councils. The PFRA process is aimed at providing a high level overview of flood risk from local flood sources, including surface runoff, groundwater and ordinary watercourses. It is not concerned with flooding from main rivers or the sea. The Cambridgeshire PFRA report 2011 concludes (based on the evidence collected) that there are no 'Flood Risk Areas' of 'national significance' within Cambridgeshire.

2 Setting the scene

2.3 National context

Flood and Water Management Act 2010

2.3.1 The Flood and Water Management Act 2010 (FWMA) places the responsibility for co-ordinating 'local flood risk' management on the relevant county or unitary authority, making them a Lead Local Flood Authority (LLFA). In this context, the Act uses the term 'local flood risk' to mean flood risk from:

- Surface runoff
- Groundwater and
- Ordinary watercourses

2.3.2 Cambridgeshire County Council (CCC) is the LLFA for Cambridgeshire. The FWMA contains a range of different duties for LLFAs, including the need to prepare a Local Flood Risk Management Strategy (LFRMS) and to maintain a register of significant flood prevention assets.

2.3.3 The FWMA also seeks to encourage the uptake of Sustainable Drainage Systems (SuDS) by agreeing new approaches to the management of drainage systems.

National Planning Policy Framework and Practice Guidance

2.3.4 Section 10 of the National Planning Policy Framework (NPPF) sets out the government's aim that spatial planning should proactively help the mitigation of, and adaption to, climate change including management of water and flood risk.

2.3.5 The NPPF states that both Local Plans and planning application decisions should ensure that flood risk is not increased and where possible is reduced. Development should only be considered appropriate in flood risk areas where it can be demonstrated that:

- A site specific flood risk assessment has been undertaken which follows the Sequential Test, and if required, the Exception Test;
- Within the site, the most vulnerable uses are located in areas of lowest flood risk unless there are overriding reasons to prefer a different location;
- Development is appropriately flood resilient and resistant, including safe access and escape routes where required (Please see DEFRA/ EA publication 'Flood Risks to People' for further information on what is considered 'safe');
- That any residual risk can be safely managed, including by emergency planning; and
- The site gives priority to the use of sustainable drainage systems (SuDS).

2.3.6 The Government has also produced the national Planning Practice Guidance (PPG) to support the NPPF. Relevant sections of the NPPG advise on how spatial planning can ensure water quality and the delivery of adequate water and wastewater infrastructure can take account of the risks associated with flooding and coastal change in plan-making and the planning application process.

Sustainable Drainage Systems: Written Ministerial Statement

2.3.7 On 18 December 2014, a ministerial statement was made by the Secretary of State for Communities and Local Government (Mr Eric Pickles). The statement has placed an expectation on local planning policies and decisions on planning applications relating to major development to ensure that SuDS are put in place for the management of run-off, unless demonstrated to be inappropriate. The statement made reference to revised planning guidance to support local authorities in implementing the changes and on 23 March 2015, the Department for Environment, Food and Rural Affairs (Defra) published the 'Non-Statutory Technical Standards for Sustainable Drainage Systems'. Further detail on how SuDS can be delivered in the Cambridgeshire context can be found in Chapter 6.

2.4 Local context

Catchment Flood Management Plans and Flood Risk Management Plans

2.4.1 The Environment Agency (EA) has prepared catchment based guidance to ensure that main rivers and their respective flood risk have been considered as part of the wider river system in which they function. Catchment Flood Management Plans (CFMPs) discuss the management of flood risk for up to 100 years in the future by taking into account factors such as climate change, future development and changes in land management. As well as informing Councils' planning policy and local flood management practises, the CFMPs will be part of the mechanism for reporting into the EU Floods Directive. The relevant CFMPs that impact on Cambridgeshire are the 'Great Ouse' and the 'Nene', these can all be accessed on 'gov.uk' - Catchment Flood Management Plan.

2.4.2 In addition under the Flood Directive, the EA is responsible for preparing Flood Risk Management Plans (FRMPs) to highlight the hazards and risks of flooding from rivers, the sea, and reservoirs and set out how Risk Management Authorities (RMAs) work together with communities to manage flood risk. The Anglian FRMP is a river basin district level plan which will draw on the relevant CFMPs covering Cambridgeshire. The plan highlights flood risk across the district and identifies the types of measures which need to be undertaken. The Anglian FRMP will enable effective co-ordination across catchments and will inform investment in flood risk management.

River Basin Management Plans

2.4.3 In addition, the EA has developed an Anglian District River Basin Management Plan (ARBMP) that identifies the state of, and pressures on, the water environment.

2.4.4 The CFMPs, FRMPs and the RBMPs together, highlight the direction of considerable investment in Cambridgeshire and how to deliver significant benefits to society and the environment.

Cambridgeshire Local Flood Risk Management Strategy

2.4.5 The LFRMS has been developed with members of the Cambridgeshire Flood Risk Management Partnership (CFRMP), for the years 2015 – 2020. The partnership is made up of representatives from the county, city and district councils, the EA, Anglian Water Services Ltd, Cambridgeshire's Internal Drainage Boards (IDBs) and Cambridgeshire Constabulary. The strategy aims to coordinate, minimise and manage the impact of flood risk within Cambridgeshire by addressing the five key objectives:

- Understanding flood risk in Cambridgeshire
- Managing the likelihood and impact of flooding
- Helping Cambridgeshire's citizens to understand and manage their own risk
- Ensuring appropriate development in Cambridgeshire
- Improving flood prediction, warning and post flood recovery

Cambridgeshire Strategic Flood Risk Assessments

2.4.6 A Strategic Flood Risk Assessment (SFRA) provides essential information on flood risk, allowing local planning authorities (LPAs) to understand the risk across the authority area. This allows for the Sequential Test (see Chapter 4) to be properly applied. Level 1 SFRAs have been undertaken for all LPAs in Cambridgeshire. Level 2 SFRAs are sometimes also required in order to facilitate the application of the Sequential and Exception Tests in areas that are at medium or high risk of flooding and where there are no suitable areas for development after applying the Sequential Test. Level 2 SFRAs provide breach and hazard mapping information that may be useful to developers in undertaking site specific flood risk assessments (FRAs). To date, a Level 2 SFRA has been undertaken for Wisbech, in Fenland.

2 Setting the scene

Cambridgeshire Surface Water Management Plans

2.4.7 The Surface Water Management Plan (SWMP) outline the preferred strategy for the management of surface water in a given location. The SWMP aims to establish a long term action plan and to influence future strategy development for maintenance, investment, planning and engagement.

Local Plans

2.4.8 Each LPA within Cambridgeshire has, or is working towards, adopted its own local plan. Local plans set out a vision for their administrative area and the planning policies necessary to deliver the vision, with relevant policies on water and flood risk issues. The relevant LPAs and their adopted and draft Local Plans are identified in Appendix A.

Landscape and flood characteristics in Cambridgeshire

2.4.9 Landscape and flood risk characteristics vary across Cambridgeshire. Notably the area known as the Fen area to the north and east varies from the rest of Cambridgeshire due to its flat and low lying landscape (close to or below sea level) with extensive parts within the fluvial and/or tidal flood zone, although many settlements are predominantly located on 'islands' of higher ground e.g. Ely. As the drainage of developments on higher ground can impact on lower areas, flood risk is an important issue that needs to be considered at a local as well as strategic level. From Cambridgeshire the watercourses eventually flow to the River Nene and River Great Ouse and subsequently discharge to The Wash and the North Sea. Changes in flood regimes in Cambridgeshire can therefore have consequences downstream within the Nene and Ouse Washes catchment, beyond Cambridgeshire.

2.4.10 The Fen area has an extensive network of artificial drainage channels which are mostly pump-drained and are predominantly under the control and management of IDBs. The area is therefore reliant on flood defence infrastructure to minimise flood risk to existing development and agricultural land. Due to the historical drainage of the area, the majority of land lies below embanked higher level drainage channels representing a residual risk of defences being breached or overtopped.

2.4.11 The southern part of the county includes some significant topographical variation. Undulating hills define much of the land to the northeast of the River Cam, while the topography to the southwest of the river is more varied. Other main rivers, which flow through Cambridgeshire, include the Nene, Kym and Great Ouse. The Great Ouse flows through market towns across Huntingdonshire and East Cambridgeshire and its floodplains are prominent features in the landscape.

3 Working together with Water Management Authorities

This chapter provides specific details in relation to the key water management authorities that may need to be consulted during the pre-application and planning application stages, when considering water management and flood risk matters that may be associated with a proposal.

3.1 Water Management Authorities

3.1.1 This chapter highlights the key Water Management Authorities (WMAs) that may need to be consulted during the planning application process. Applicants are advised to seek advice at the earliest opportunity (e.g. pre-application stage) in order to ensure all relevant flood and water requirements are appropriately addressed and met.

3.1.2 The national Planning Practice Guidance (PPG) lists the statutory consultees to the planning process. Within Cambridgeshire, although the local water and sewerage companies (Anglian Water and Cambridge Water) and the IDBs are not statutory consultees, they are consulted by LPAs as part of the planning application process. Table 3.1 lists all the key WMAs across Cambridgeshire (some of which are statutory consultees) and it is important that those proposing new developments actively engage with the relevant WMAs at the earliest possible stage.

3.1.3 Some of the WMAs listed in Table 3.1, are defined as Risk Management Authorities (RMAs) under the Flood and Water Management Act (FWMA). Details of the RMAs in Cambridgeshire are shown in Table 3.2. RMAs have responsibilities and powers that they can use in order to manage flood risk (refer to Section 3.2.16 for further information).

3.2 Pre-application advice

3.2.1 Many of Cambridgeshire's LPAs and WMAs provide a pre-application advice service. There may be a charge for this service. Further advice can be found on each LPA's or WMA's website.

3.2.2 The LPAs encourage all applicants to seek pre-application advice to help make sure that the proposed development is of a high quality. LPAs can provide useful guidance and advice to help ensure that applications that are submitted contain the correct information and comply with the relevant planning policies. All proposed development, regardless of size, can benefit from pre-application advice. In the case of larger development proposals, Planning Performance Agreements (PPAs) may be appropriate. The relevant LPA should be consulted for further information.

3.2.3 It is recommended that alongside contacting LPAs, developers directly contact relevant WMAs to receive in depth comments and feedback, to strengthen their final application. The more detailed the information provided to the authority about the site, its location and the proposed discharge points and drainage system, the better its advice can be. Some of these authorities have a specific form that needs to be completed as part of this process. It is the responsibility of developers to ensure that they engage with the appropriate WMAs at the earliest stages of the planning process in advance of an application being made to the LPA.

Table 3.1 : Key Water Management Authorities

Key Authorities	When to consult (not exhaustive)	Applicable to relevant district area/countywide					
		CCC	CCiC	ECDC	FDC	HDC	SCDC
Environment Agency (EA)	The EA should be consulted on development, other than minor or as defined in the EA's Flood Risk Standing Advice document within Flood Zone 2 or 3, or in Flood Zone 1 where critical drainage problems have been notified to the LPA. Consultation will also be required for any development projects within 20m of a Main River or flood defence, and other water management matters.	✓	✓	✓	✓	✓	✓
Historic England	Whilst Historic England are not a WMA, they should be consulted where proposals may affect heritage assets and their settings.	✓	✓	✓	✓	✓	✓
Highways England	When the quality and capacity of the Highways England (strategic) road network could be affected.	✓	✓	✓	✓	✓	✓
Lead Local Flood Authority (CCC)	Where the proposed work will either affect or use an ordinary watercourse or require consent permission, outside of an IDB's rateable area. As of the 15th April 2015 the LLFA should be consulted on surface water drainage proposal for all major developments (as defined in Town & Country Planning DMPO 2015)	✓	✓	✓	✓	✓	✓
Local Highway Authority(CCC)	Where the proposed development will either involve a new access to the local highway network or increase or change traffic movements.	✓	✓	✓	✓	✓	✓
City and District Councils	Refer to the guidance in Chapter 4. Additionally, where an awarded watercourse runs within or adjacent to a proposed development consultation is required with the relevant section of a district council.	✓	✓	✓	✓	✓	✓
Natural England	Natural England has mapped 'risk zones' to help developers and LPAs determine whether consultation is required. This is likely where water bodies with special local or European designations (e.g. SSSI or Ramsar) exist.	✓	✓	✓	✓	✓	✓

3 Working together with Water Management Authorities

Key Authorities	When to consult (not exhaustive)	Applicable to relevant district area/countywide					
		CCC	CCiC	ECDC	FDC	HDC	SCDC
Anglian Water	Anglian Water should be consulted where connection to surface water sewers is required or where the flow to public sewerage system may be affected. They should also be consulted where either new connections to the water supply network are required or if any alterations are made to existing connections.	✓	✓	✓	✓	✓	✓
Cambridge Water	Where either an installation of water systems is required or if any alterations are made to existing connections.	✓	✓			✓	✓
North Level Drainage Board	Proposed development in or in close proximity to an IDB district (refer to Appendix C)	✓			✓		
Haddenham Level Drainage Commissioners		✓		✓			✓
Ramsey IDB		✓				✓	
Whittlesey Consortium of IDBs		✓			✓	✓	
Bedford Group of IDBs		✓				✓	
Ely Group of IDBS		✓		✓			✓
IDBs represented by Middle Level Commissioners		✓		✓	✓	✓	✓

Environment Agency

3.2.4 The EA is a non-departmental public body responsible for protecting and enhancing the environment as a whole and contributing to the government's aim of achieving sustainable development in England and Wales. The EA has powers to work on main rivers to manage flood risk. These powers are permissive, this means they are not a duty, and they allow the EA to carry out flood and coastal risk management work and to regulate the actions of other flood risk management authorities on main rivers and the coast. The EA also has powers to regulate and consent works to main rivers. Prior written consent is required from the EA for any work in, under, over or within 9 metres of a main river or between the high water line and the secondary line of defence e.g. earth embankment. This should be sought in conjunction with any pre-planning discussions as set out in section 3.2. The EA also has a strategic overview role across all types of flooding as well as other types of water management matters. Guidance on when to consult the EA can be found in Chapter 4. For further information on the EA's roles and responsibilities see the gov.uk website.

Internal Drainage Boards

3.2.5 A large proportion of Cambridgeshire is specially managed by IDBs to ensure that the area retains its significant agricultural, industrial, leisure and residential functions. IDBs are predominantly associated with the Fen area however they do exist in other landscapes extending into The Fens, the Fen Margin and the Central Claylands.

3.2.6 IDBs are local public authorities that manage water levels. They are an integral part of managing flood risk and land drainage within areas of special drainage need in England and Wales. IDBs have permissive powers to undertake work to provide water level management within their Internal Drainage District. They undertake works to reduce flood risk to people and property and manage water levels for local needs. Much of their work involves the maintenance of rivers, drainage channels, outfalls and pumping stations, facilitating drainage of new developments and advising on planning applications. They also have statutory duties with regard to the environment and recreation when exercising their permissive powers.

3.2.7 IDBs input into the planning system by facilitating the drainage of new and existing developments within their districts and advising on planning applications; however they are not a statutory consultee to the planning process.

3.2.8 In some cases, a development meeting the criteria listed below may need to submit a FRA to the IDBs to inform any consent applications. This relates to the IDBs' by-laws under the Land Drainage Act 1991 (further information on the preparation of site specific FRAs can be found in Chapter 4).

- Development being either within or adjacent to a drain/ watercourse, and/ or other flood defence structure within the area of an IDB;
- Development being within the channel of any ordinary watercourse within an IDB area;
- Where a direct discharge of surface water or treated effluent is proposed into an IDBs catchment;
- For any development proposal affecting more than one watercourse in an IDBs area and having possible strategic implications;
- In an area of an IDB that is in an area of known flood risk;
- Development being within the maintenance access strips provided under the IDBs byelaws;
- Any other application that may have material drainage implications.

3.2.9 Some IDBs also have other duties, powers and responsibilities under specific legislation. For example the Middle Level Commissioners (MLC) is also a navigation authority. Although technically the MLC are not an IDB, for ease of reference within this document it has been agreed that the term IDB can be used broadly to refer to all relevant IDBs under its jurisdiction. A list of the IDBs can be found in Appendix C.

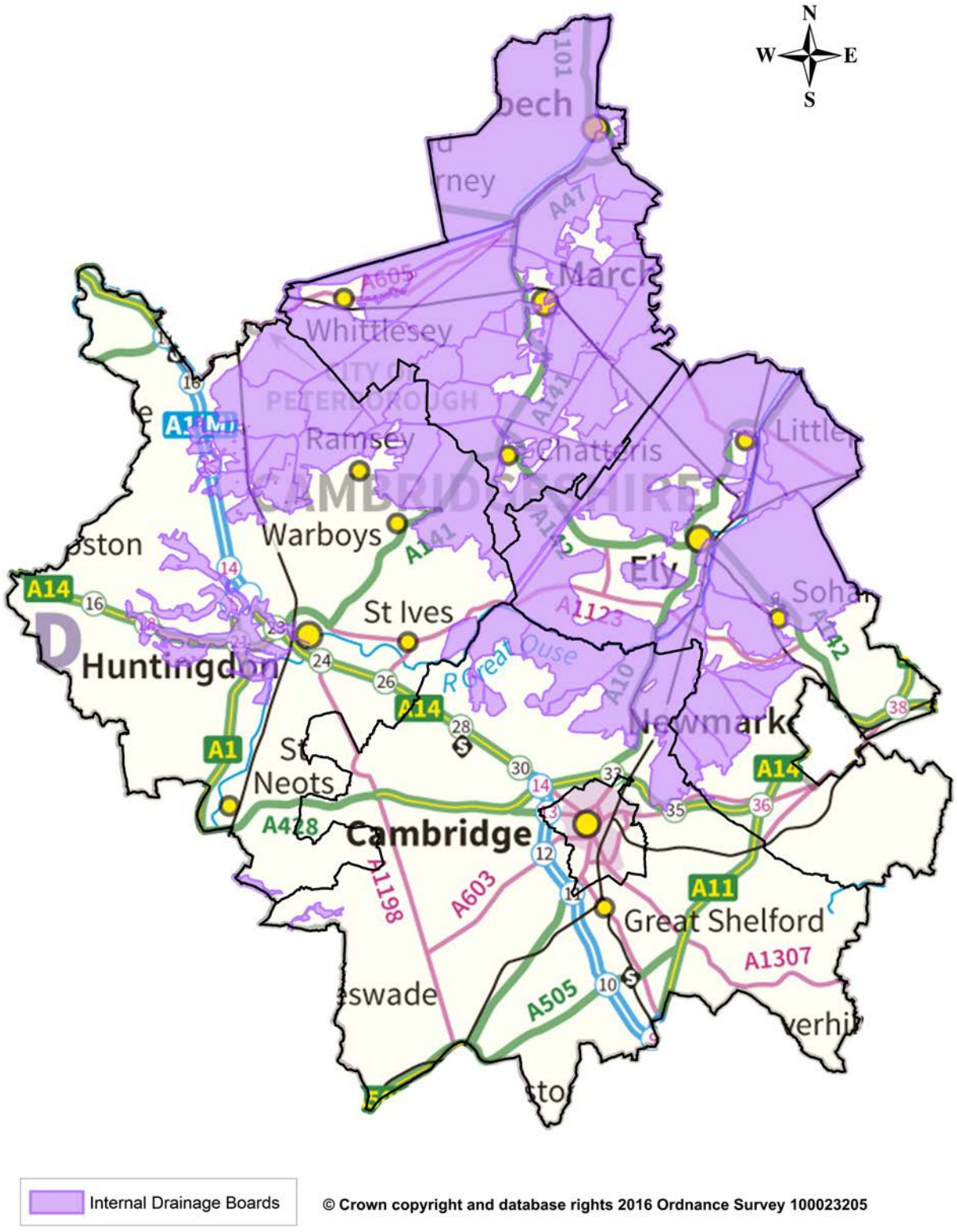
3.2.10 IDBs may have rateable and non-rateable areas within their catchments. It is recommended that applicants contact the relevant IDB to clarify which area proposed development falls into, and if there is an associated charge.

3.2.11 There are 53 IDBs within Cambridgeshire, Map 3.1 highlights the area of Cambridgeshire that is covered by IDBs. Some of the IDBs are represented or managed by Haddenham Level Drainage Commissioners**,** Whittlesey Consortium of IDBs, North Level District IDB, Ely Group of IDBs, Bedford Group of IDBs, Kings Lynn IDB and MLC. The names of the IDB groups covering each district are stated in Appendix C.

3.2.12 The maps in Appendix C show the IDB groups for the relevant City and District Councils. Detailed information on IDBs' boundaries can be found on their individual websites.

3 Working together with Water Management Authorities

Map 3.1 : IDBs within Cambridgeshire



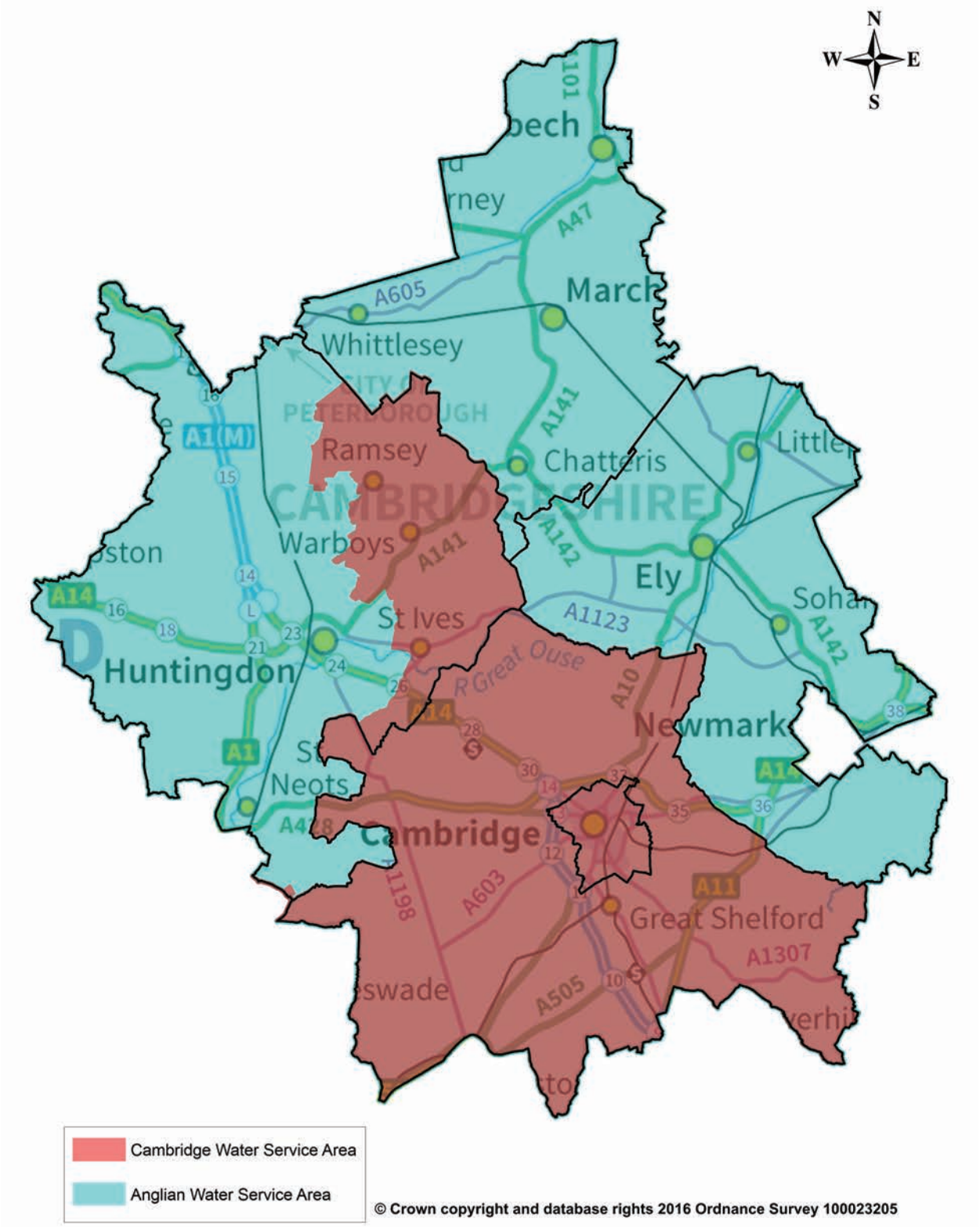
Water and wastewater providers

3.2.13 Two separate water service providers in Cambridgeshire provide potable water; Cambridge Water and Anglian Water. Cambridge Water supplies potable water to areas around Cambridge, South Cambridgeshire and parts of Huntingdonshire. Anglian Water supplies potable water to areas around Fenland, East Cambridgeshire and parts of Huntingdonshire. It is a statutory requirement to gain consent from the relevant service provider if you are intending to install water systems or make an alteration to existing connections, prior to the commencement of work. Map 3.2 identifies the water service areas covered by Anglian Water and Cambridge Water.

3.2.14 Anglian Water is also the sewerage undertaker for the whole of Cambridgeshire and has the responsibility to maintain foul, surface and combined public sewers so that it can effectively drain the area. When flows (foul or surface water) are proposed to enter public sewers, Anglian Water will assess whether the public system has the capacity to accept these flows as part of their pre-application service. If there is not available capacity, they will provide a solution that identifies the necessary mitigation. Information about Anglian Water's development service is available on their website. Anglian Water also comments on the available capacity of foul and surface water sewers as part of the planning application process.

3 Working together with Water Management Authorities

Map 3.2 : Cambridge Water and Anglian Water Coverage



Note: Anglian Water is the sewerage undertaker for the entire Cambridgeshire area

Cambridgeshire County Council

3.2.15 One of its key priorities as the LLFA is to coordinate the management of flood risk from groundwater, surface water and ordinary watercourses. This includes the development and implementation of a Cambridgeshire Local Flood Risk Management Strategy (LFRMS).

3.2.16 The RMAs have a duty to carry out flood risk management functions in a manner consistent with the national and local strategies. The RMAs in Cambridgeshire are highlighted below in Table 3.2.

Table 3.2 : Relevant Flood Risk Management Authorities

Flood Sources	EA	LLFA	City and District Councils	Anglian Water	Highway Authorities	IDBs
Rivers						
Main River	✓					
Ordinary Watercourse		✓				✓
Awarded Watercourse			✓			
Ground Water		✓				
Surface Runoff						
Surface water		✓				
Surface water originating on the highway					✓	
Other						
Sewer flooding				✓		
The Sea, Reservoirs	✓					

3.2.17 The LLFA has powers to require works to be undertaken to maintain the flow in ordinary watercourses that fall outside of an IDB districts.

3.2.18 The LLFA provides technical advice on surface water drainage proposals for 'major' applications to the City and District Councils.

3.2.19 Cambridgeshire County Council (CCC) is the Local Highway Authority and manages highway drainage, carrying out maintenance and improvement works on an on-going basis as necessary to maintain existing standards of flood protection for highways, making appropriate allowances for climate change. It has the responsibility to ensure that road projects do not increase flood risk. In addition, Highways England operates, maintains and improves a number of motorways and major A roads across the County.

3.2.20 In addition, CCC is the Minerals and Waste Planning Authority and has the role of planning authority for County matters such as schools and therefore has the same responsibilities as LPAs (refer to Section 3.2.21 to 3.2.23).

3 Working together with Water Management Authorities

City and District Councils

3.2.21 Each of the five city and district councils within Cambridgeshire are LPAs and assess, consult on and determine whether or not development proposals are acceptable, ensuring that flooding and other similar risks are effectively managed.

3.2.22 The LPA will consult the relevant statutory consultees as part of the planning application assessment and they may, in some cases also contact non-statutory consultees (e.g. Anglian Water or IDBs) that have an interest in the planning application.

3.2.23 The City and District Councils have a responsibility to maintain 'awarded' watercourses. They also have statutory powers to modify or remove inappropriate structures within channels on ordinary watercourses, along with other flood protection responsibilities. They have the powers to take the appropriate action against those whose actions increase flood risk or make management of that risk more difficult and are therefore an important consultee for flood risk matters.

4 Site selection and managing flood risk to developments

The aim of this chapter is to give advice to applicants on how to address flood risk in the planning process. It provides specific guidance on the principles of managing flood risk and emphasises how it should be considered at all stages of planning. There is guidance on the application of the sequential approach to flooding including the Sequential and Exception Tests and the production of site specific flood risk assessments to accompany planning applications. This chapter is also particularly important for assessing proposed developments on windfall and non-allocated sites.

4.1 Introduction

4.1.1 Developments can be affected by flooding from a number of 'sources' including:

- River flooding (fluvial)
- Surface water flooding (pluvial)
- Coastal and tidal flooding
- Reservoir flooding
- Sewer flooding
- Groundwater

4.1.2 Flood risk is an expression of the combination of the flood probability (how likely the event will happen) and the magnitude of the potential consequences (the impact such as economic, social or environmental damage) of the flood event.

4.1.3 The likelihood or risk of flooding can be expressed in two ways:

- **Chance of flooding:** As a percentage chance of flooding each year. For example, for Flood Zone 3a there is a 5% annual probability of this area flooding
- **Return period:** This term is used to express the frequency of flood events. It refers to the estimated average time interval between events of a given magnitude. For example, for Flood Zone 3a the return period would be expressed as 1 in 20 year

4.1.4 There is however a move away from using return periods as an expression of flood risk as this approach does not accurately express the risk of flooding. For example it is misleading to say that a 1 in 100 year flood will only occur once in every hundred years. This suggests that if it occurs in one year then it should not be expected to reoccur again for another 100 years; however this is not the case. The percentage chance of flooding each year, often referred to as **annual probability**, is now the preferred method of expressing flood risk.

4.1.5 Fluvial flooding is divided into flood zones based on the risk of flooding:

Figure 4.1 : Fluvial Flood Risk Zones

Functional flood plain	High probability/risk	Medium probability/risk	Low probability/risk	
3b	**3a**	**2**	**1**	**Flood Zones**
1 in 1	1 in 20	1 in 100	1 in 1000	Return period
100%	5%	1%	0.1%	Annual Exceedance Probability

High risk <----------> Low Risk

4.1.6 Maps showing Flood Zones are available on the gov.uk website. The Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. Table 4.1 details the Flood Zones and their definitions taken from the PPG.

Table 4.1 : Flood Zone and Flood Risk[1]

Flood Zone	Definition
Zone 1 – Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 – Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a – High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b – The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. LPAs should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the EA. (Not separately distinguished from Zone 3a on the Flood Map)

1. Source: Table 1: Flood Zones, National Planning Practice Guidance

4.1.7 To cope with the potential risks and forecasts of climate change (predicted 1.05m rise in sea levels in the East of England, warmer summers, wetter winters and increased river flows by 2115) and to ensure that new development is safe for its lifetime, the Government has emphasised that development in areas at risk of flooding should be avoided by directing development away from the highest risk areas. Where development is necessary it should be made safe without increasing flood risk elsewhere. Please see the DEFRA/ EA publication 'Flood Risks to People' for further information on what is considered 'safe'.

4.1.8 All proposals should therefore follow a Sequential Approach to flood risk. This means relevant development will be directed to the areas at the lowest risk of flooding at a strategic, local and site-scale level. It will be necessary to consider flooding from all sources: the sea (tidal), rivers (fluvial), surface water (pluvial) and ground water, and a possible combination of all of these. Further detail on the Sequential Test is provided in 4.4.

4.2 Flood risk and planning

The approach to flood risk in planning

4.2.1 The general approach (i.e. the Sequential Approach) to flood risk and planning is to ensure that, where possible, development is located in the areas of lowest flood risk. This can be applied at a variety of scales, including:

- At a strategic scale, when looking at a number of sites and then choosing the site with the lowest flood risk for development;
- At an individual site scale, where the area of lowest flood risk within the site boundary is the preferred location for the proposed development;
- At a building scale, where the part of the building that is the most vulnerable is located in the area of lowest flood risk.

4.2.2 The **Sequential Approach** should apply to all sources of flood risk and is central to the Government's approach as outlined in the National Planning Policy Framework (NPPF) and the PPG. An example of this is that when considering fluvial flood risk, all developments should be located in Flood Zone 1 unless there are no reasonably available sites. Only then should Flood Zone 2 be considered. Flood Zone 3 should only be considered if there are no reasonably available sites in Flood Zones 1 and 2.

The Sequential Test and Exception Test

4.2.3 The Sequential Test is a method for determining if a site is suitable for development because it is at the lowest risk of flooding, and there are no other reasonably available sites at a lower risk (refer to section 4.4 below). If this is not the case then the Exception Test may be required which will mean some further considerations are taken into account (refer to 4.5 below). Table 4.2 (within 4.5) identifies the 'flood risk vulnerability and flood zone compatibility' table taken from the NPPG, which assists in classifying your site against the exception test. These 'classifications' are under the following headings:

- Essential Infrastructure
- Highly Vulnerable
- More Vulnerable
- Less Vulnerable
- Water-Compatible Development

Strategic Flood Risk Assessments

4.2.4 SFRAs should be used by developers to inform site selection (see section 4.3, Step 1) and provide high level information for the site specific Flood Risk Assessments (FRAs) (see section 4.3, Step 4).

4.3 Site suitability and flood risk considerations for planning applications

4.3.1 Those proposing development in areas of flood risk are responsible for:

- Demonstrating that the proposed development is consistent with national and local planning policy (Chapter 2);
- Undertaking appropriate consultation with the water management authorities (Chapter 3);
- Providing a site specific flood risk assessment (FRA), as part of the planning process, which meets the requirements of this chapter and those set by the relevant WMAs;
- Integrating into proposals designs that reduce flood risk to the development and elsewhere by incorporating appropriate flood risk management measures (Chapter 5), including the use of sustainable drainage systems (SuDS) (Chapter 6);
- Ensuring that any necessary flood risk management measures are sufficiently funded to ensure that the site can be developed and occupied safely throughout its proposed lifetime.

4.3.2 Applications for sites in Flood Zones 2 and 3 where there is no Sequential Test information submitted will be deemed to have failed the Sequential Test (See Section 4.4).

4.3.3 The following sections set out the steps (1 – 6) that should be taken when determining if a site is suitable for development when considering flood risk. All requirements are consistent with the NPPF and PPG, with local requirements explained further. Reference should also be made to the developer checklist provided in Appendix B, which should be submitted with planning applications alongside other relevant and up to date information related to flood risk and the water environment.

Note that each of these steps applies to <u>all</u> scales of development.

Step 1 – Allocation within Local Development Plan

4.3.4 Applicants must consider allocations within the relevant local development plan. If the site has been allocated in the relevant Local Plan/development plan for the same land use type/vulnerability classification that is now being proposed, then an assessment of flood risk, at a strategic level, has already been undertaken. This will have included assessing the site, against other alternative sites, as part of a Sequential Approach to flood risk.

4.3.5 While the situation is rare it is possible that the flood zoning of a site may change after adoption of the relevant part of the Local Plan (the EA refines Flood Zones on a regular basis to ensure the data is up to date). In this situation the Local Planning Authority (LPA) may require the developer to pass part b) of Step 1.

4.3.6 In general where a site has not been allocated in a Local Plan or the flood zone classification has changed since adoption of the Plan (i.e. it is a windfall or non-allocated site), the Sequential Test and where appropriate the Exception Test will need to be undertaken following the overarching principles of the Sequential Approach. Details of the Sequential and Exception Tests are specified in Sections 4.4 and 4.5.

4.3.7 Applicants should indicate their site boundary on a plan and if applicable the boundary of any allocated site and check to see if there is any updated flood risk information after the preparation of the relevant SFRA.

Step 1

Consider Allocations

a. Can it be demonstrated by the developer that the type and location of the proposed development has been allocated in the relevant Local Plan/development plan?
b. Can it be demonstrated that the flood risk information contained within the SFRA and associated Sequential Test assessment accompanying the Local Plan/development plan (where applicable) is still appropriate for use?

If the answer to both of the above is yes, go to Step 3 (the Sequential and Exception Tests do not need to be completed). If the answer to either of the above is no, go to Step 2.

Step 2

Consider Flood Risk

Is the site:

a. In Flood Zone 2 or 3?
b. In Flood Zone 1 and within an area that has been identified in the relevant SFRA (or any updated available information) as having flooding issues now or in the future (for example, through the impacts of climate change)?
c. In an area of significant flood risk from sources other than fluvial or tidal such as surface water, ground water, reservoirs, sewers, etc. (see Stage C - Developer to obtain flood risk information for all sites for details)?

If the answer to any of the above questions is yes, the Sequential Test is required to be undertaken by the developer and the results submitted to the LPA for assessment. Note: Discussions on the Exception Test should not be taking place until the Sequential Test is undertaken and passed. Further information on the Sequential and Exception Tests can be found in Sections 4.4 and 4.5 respectively.

4.3.8 Following on from Steps 1 and 2, if no pre-application consultation has already been undertaken, it is strongly recommended that such discussions are undertaken with the relevant LPA and the appropriate WMAs. Refer to Chapter 3 for more details.

4.3.9 The purpose of pre-application consultations is to identify the range of issues that may affect the site and, following on from the Sequential Test and if necessary the Exception Test, determine whether the site is suitable for its intended use. A FRA should not be undertaken until Step 1, Step 2 and Step 3 have been carried out.

Step 3

Undertake pre-application consultation

Meaningful, on-going and iterative discussions with the LPAs and relevant WMAs can resolve issues prior to the submission of a planning application and can result in a more efficient planning application process. As a starting point it is recommended to consider the following at this stage:

a. Does the LPA confirm that the proposed development may be acceptable in principle from the perspective of other planning constraints rather than flood risk?
b. Does the LPA confirm that the Sequential Test, and if required the Exception Test, has been undertaken appropriately and that it covers all relevant issues?
c. Is there potential for contamination on site which could affect site design and layout and the types of SuDS components used?
d. How can the site meet national and local SuDS standards?
e. Is a site specific FRA required? If so, what is the scope of an appropriate site specific FRA?
f. Are there any major opportunities or constraints to the site with regards to the management of flood risk, drainage, contamination or the quality of related water environments?
g. Agree the discharge points for site drainage with the LPA and relevant WMA;
h. Obtain any relevant data needed in order to prepare the site specific FRA and drainage strategy.
i. Are any consents required from the EA/Internal Drainage Boards (IDBs)/ Lead Local Flood Authority (LLFA)/ Anglian Water?

Once all these stages have been considered please go to Step 4.

4.3.10 In areas of Cambridgeshire that are defended from flooding the residual risk of breaching of the defence can mean that some locations in Flood Zone 1 could be at risk of flooding. While the EA's recognised flood maps show the areas that would be at risk if there were no defences, the failure of such structures can produce different results. The pressure the water may be under at the time of breach and the pathway that it is forced to take may not be the same as if water were naturally overtopping the river banks. For this reason a FRA may be required for sites proposing people-based uses in defended areas that are actually within Flood Zone 1. If this situation applies, breach modelling is also likely to be required as part of the planning process since this would enable determination of the actual risk to a site (see Section 5.1.5 below). Advice should be sought from the EA if further explanation is required on this point.

4.3.11 A large part of Cambridgeshire is low lying agricultural land and prior to drainage comprised traditional fen. Since flood risk management practices in this area vary, there are some scenarios not listed by the NPPF, where a FRA could be required. FRAs that are acceptable to all parties prior to submission may avoid further amendments being required to the document during determination by the relevant LPA, as well as any post-planning permission variations.

4 Site selection and managing flood risk to developments

Step 4

Site Specific Flood Risk Assessment (FRA)

A site specific FRA is required:

a. For proposals of 1 hectare or greater in Flood Zone 1;
b. For all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3; or
c. In an area within Flood Zone 1 which has critical drainage problems (as notified to LPAs by the EA); or
d. Where proposed development, or a change of use to a more vulnerable class, may be subject to other sources of flooding.

A FRA may also be required for some specific situations:

1. If the site may be at risk from the breach of a local defence (even if the site is actually in Flood Zone 1);
2. Where the site is intended to discharge to the catchment or assets of a WMA which requires a site specific FRA;
3. Where the site's drainage system may have an impact on an IDB's system;
4. Where evidence of historical or recent flood events have been passed to the LPA; or
5. In an area of significant surface water flood risk.

A site specific flood risk assessment must demonstrate that the new development is safe in flood risk terms and does not increase flood risk elsewhere.

4.3.12 Flood risk, site design and emergency access and escape can affect the value of land, the cost of developing it and the cost of its future management and use. Such matters should be considered as part of the site specific FRA as early as possible in preparing the development proposal.

4.3.13 The box below sets out the requirements of a FRA, with the FRA checklist in Appendix B.2 detailing what information should be contained within it. In the preparation of FRAs, applicants are advised to consult the relevant WMAs.

FRAs should:

a. **Be proportionate** to the risk and appropriate to the scale, nature and location of the development;
b. Be undertaken **as early as possible** in the particular planning process, by a competent person, to avoid abortive work raising landowner expectations where land is unsuitable for development. Whilst a FRA must be considered at an early stage this is not to be undertaken until Step 1, Step 2 and Step 4 have been completed;
c. Consider and quantify the **different types of flooding** (whether from natural or human sources and including joint and cumulative effects). The LPA will expect links to be made to the management of surface water as described in Chapter 6. Information to assist with the identification of surface water and groundwater flood risk is available from the LLFA, the EA and the LPA. Applicants should also assess the risk of foul sewage flooding as part of the FRA. Anglian Water as sewerage undertaker can provide relevant information to the applicant to inform preparation of FRAs;
d. Consider the effects of a range of flooding events including the **impacts of extreme events** on people, property, the natural and historic environments and river processes;
e. Consider the **vulnerability of occupiers and users** of the development, taking account of the Sequential and Exception Tests and the vulnerability classification, and include arrangements for safe access (Please see the Defra/EA publication 'Flood Risks to People' for further information on what is considered 'safe');
f. Identify relevant **flood risk reduction measures** for all sources of flood risk not just for the site but elsewhere i.e. downstream existing flooding problems;

g. Consider both the potential adverse and beneficial **effects of flood risk management infrastructure** including raised defences, flow channels, flood storage areas and other artificial features together with the consequences of their failure;
h. Include assessment of **the 'residual' (remaining) risk** after risk reduction measures have been taken into account and demonstrate that this risk is acceptable for the particular development or land use. Further guidance on this is given in Chapter 5;
i. Be supported by appropriate **evidence data** and information, including historical information on previous events;
j. Consider the risk of **flooding arising from the proposed development** in addition to the **risk of flooding to development on the site**. This includes considering how the ability of water to soak into the ground may change after development. This would mean the preparation of surface water drainage proposals. This includes all flow routes including flood flow paths or ordinary watercourses flowing onto the development site and therefore needing to be taken account of;
k. Take a **'whole system'** approach to drainage to ensure site discharge does not cause problems further along in the drainage sub-catchment/can be safely catered for downstream and upstream of the site;
l. Take the appropriate **impacts of climate change** into account for the lifetime of the development including the proposed vulnerability classification. Guidance is available on the .gov.uk website; and
m. The FRA must clearly demonstrate that the **Sequential Test and Exception Test** have been passed.

4.3.14 A surface water drainage strategy contains the proposals for the surface water drainage of the development. Such a strategy should include initial proposals that are sufficient to demonstrate a scheme can be delivered that will adequately drain the proposed development whilst not increasing flood risk elsewhere.

4.3.15 If an outline application is to be submitted for a major development then an outline surface water drainage strategy should be submitted outlining initial proposals and quantifying the conceptual surface water management for the site as a whole. This should detail any strategic features, including their size and location. A detailed surface water drainage strategy should subsequently be submitted with each reserved matters application that comes forward and demonstrate how it complies with the outline surface water drainage strategy.

Step 5

Surface Water Drainage Strategy

Prepare the surface water drainage strategy, ensuring consistency between the surface water flood risk and any initial drainage proposals discussed in the FRA. The surface water drainage strategy should be included within or alongside the FRA as part of your planning application submissions.

a. Check which river catchment the site is in and its specific characteristics. Bear these in mind as site drainage is designed so that any constraints can be mitigated against and advantages can be taken of any opportunities.

b. Work up your drainage strategy in tandem with your site layout and highway designs. This will help avoid abortive work in any one area. Use Chapter 6 to ensure that the following have been considered:

i. The submission requirements, including any supporting investigations

ii. Sustainable drainage design principles

iii. Interception, infiltration, flow rate runoff control, volumetric runoff control, and exceedance flow management

iv. Site discharge location and attenuation provision

v. Water quality treatment, habitat provision and biodiversity

vi. Health and safety, access and amenity

vii. Use the correct climate change allowances for the development based on its lifetime

c. Ensure that the required management and maintenance of all site features has been clearly set out as part of the drainage strategy. Get initial agreements in place to cover management funding for the lifetime of the development.

d. Check that the quality of the water environment and therefore the Water Framework Directive (WFD) impacts have been specifically considered as part of all of the flood and drainage measures proposed. Is development of the site likely to cause detriment to the WFD status of a water body? Have opportunities been taken to enhance the water environment? Use Chapter Water Environment to support this process.

Step 6

Submission of planning application

Once all these issues have been satisfactorily addressed then a planning application supported by where necessary, evidence of the Sequential Test, the Exception Test, a site specific FRA and a surface water drainage strategy, can be submitted. This will be formally reviewed by the LPA in consultation with the relevant WMAs as outlined in Chapter 3. All relevant authorities and consultee comments are taken into consideration in the determination of the planning application.

4.4 The Sequential Test

4.4.1 The Sequential Test was developed to steer developments to areas with the lowest probability of flooding. Generally development will not be permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. This is applicable for all sources of flooding.

4.4.2 The Sequential Test does not need to be applied for:

i. Individual developments on sites which have been allocated in development plans as the Sequential Test process has already been undertaken (unless the Flood Zones for the site have changed);
ii. Minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site); or
iii. Sites located wholly in Flood Zone 1

4.4.3 The definition of minor development for the purposes of the Sequential Test is:

- **Minor non-residential extensions:** industrial/commercial/leisure etc. extensions with a footprint less than 250 square metres;
- **Alterations:** development that does not increase the size of buildings e.g. alterations to external appearance;
- **Householder development:** for example sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.

4.4.4 All sources of flood risk should be considered when assessing the need for the Sequential Test as well as undertaking the test.

4.4.5 It is generally expected that in areas with extensive Flood Zone 1, the Sequential Test will be more effective at steering development away from Flood Zones 2 and 3. However, where there is extensive Flood Zone 3 in the area of search, the development's objectives are less likely to be met in Flood Zone 1. In these cases, developers may need to carry out further flood risk appraisal work to determine which sites are safest and at lowest risk to develop.

4.4.6 The following sets out how **applicants** should undertake the Sequential Test for assessment by the LPA. This would normally take the form of the submission of a report commensurate in size to the scale of development.

Stage A: Applicant to agree with the LPA the geographical area over which the test is to be applied

This is usually over the entire LPA area and may only be reduced in discussion with the LPA because of the functional requirements and objectives of the proposed development (e.g. catchment area for a school, community facilities, a shop, a public house, appropriate land use areas and regeneration zones etc.) and because there is an identified local need for that type of development.

The relevant local plan should be the starting point to understand areas of local need.

For uses that have a sub-regional, regional or national impact it may be appropriate to expand the area beyond the LPA boundary.

Developers should agree the geographical area for the search with the relevant LPA before undertaking the search and state a justification at the start of the report.

Stage B: Developer to identify and list reasonably available sites

These sites will usually be sites that are known to the LPA and that meet the functional requirements of the application in question and are considered to be reasonably available.

Reasonably available sites will be identified from a number of sources, including:

- Local Plan allocations;
- Sites with planning permissions for the same or similar development, but not yet developed;
- Five year Land Supply and/or Annual Monitoring Reports;
- Housing and Economic Land Availability Assessments (HELAAs);
- Local property agents' listings;
- Historic windfall rates, where appropriate.

Additionally, a site is only considered to be reasonably available if **all** of the following apply:

- The site is within the agreed area of search;
- The site is not safeguarded in the relevant Local Plan for another use;
- It does not have any issues (e.g. constraints or designations) that cannot be overcome and that would prevent development on the site.

Reasonably available sites will include a site or a combination of sites capable of accommodating the proposed development. These may be larger, similarly sized or a combination of smaller sites that fall within the agreed area of search.

Developers should list the reasonably available sites considered and where they obtained the information within the report.

Stage C: Developer to obtain flood risk information for all sites

This can be obtained from a number of organisations (see below); the starting point should be the LPAs Strategic Flood Risk Assessment (SFRA) which contains known flood risk information at the date of its publication.

However, flood risk information is updated on a regular basis and there may be more up to date information available, so the content of the SFRA should be checked against the following:

- The EA's Flood Zone Maps for Planning (River and Seas);
- The Updated Flood Map for Surface Water (Cambridgeshire County Council (CCC)/EA);
- Areas Susceptible to Surface Water Flooding (Environment Agency);
- Areas Susceptible to Groundwater Flooding (British Geological Society);
- Surface Water Management Plans (Cambridgeshire County Council);
- The Level 2 SFRA for Wisbech , which is primarily to inform the Exception Test (specific to Fenland District Council);
- Flood Asset Data:
- Any other source of local flood risk known to the WMAs; and
- Hazard Mapping and other information, where available.

Developers should note the flood risk from all sources against each reasonably available site under consideration.

Stage D: Developer to apply the Sequential Test

Compare the flood risk from **all sources** on all of the reasonably available sites to the original site.

Are there any reasonably available sites, including a combination of sites, that have a lower flood risk?

Developments should be located within areas with the lowest flood risk, and if possible in Flood Zone 1. The presence of existing defences should not be taken into consideration when undertaking the Sequential Test. The maintenance of the defences may change over time and climate change will have an impact on the level of protection that they offer, particularly in low-lying areas noted for their organic sub strata. These are generally peaty areas which are prone to desiccation and shrinkage.

The Sequential Approach is required at all stages of the planning process. Only where it is not possible to locate development in Flood Zone 1 and there is a recognised need for the development, it will be necessary to compare alternative sites within the same Flood Zone. In these circumstances the actual risks of flooding can be taken into consideration using available flood hazard information. The aim will be to locate development in the lowest risk areas of that Flood Zone taking into account the ambient probability and consequences of flooding. The Exception Test (see Section The Exception Test) may also still be required depending on the Flood Zone and the development type.

Proposed site mitigation measures should not be taken into consideration when undertaking the Sequential Test - these are assessed through the Exception Test and the site specific FRA.

Developers should list the reasonably available sites considered against the original site, state how they compare regarding flood risk and any reasons why they are unsuitable or not available within the report.

Stage E: Conclusion

If your site is not within Flood Zone 1 are there any reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed?

If no, this still does not mean that the proposed development is acceptable in terms of flood risk as it may be necessary to undertake the Exception Test and a site specific flood risk assessment.

4.5 The Exception Test

4.5.1 As explained within paragraph 102 of the NPPF, the Exception Test is applied to the proposal by the developer where, following application of the Sequential Test it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower risk of flooding.

4.5.2 Development is classified, according to the PPG, depending on the impact of flooding on the development. This is known as its Flood Risk Vulnerability Classification and Table 2 of the PPG is replicated in Table 4.2 below.

Table 4.2 : Flood risk vulnerability and flood zone compatibility(1)

Essential Infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

* Landfill is as defined in Schedule 10 to the Environmental Permitting (England and Wales) Regulations 2010.

Less Vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).

• Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
Water-Compatible Development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence (MoD), defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

1. Source: Table 2: Flood Risk Vulnerability Classification, National Planning Practice Guidance

4.5.3 Using Tables 4.2 and 4.3, developers are required to check whether the vulnerability classification of the proposed land use is appropriate to the Flood Zone in which the site is located and to see if the Exception Test is required.

Table 4.3 : Flood risk vulnerability and flood zone compatibility(1)

Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	×	Exception Test required	✓
Zone 3b 'functional flood plain'	Exception Test required	✓	×	×	×
Key:	✓ : Development may be appropriate		× : Development should not be permitted		

1. Source: Table 3: Flood risk vulnerability and flood zone 'compatibility, PPG

4.5.4 The definition of the functional floodplain is land where water has to be stored in times of flood. It includes the land which would flood with an annual probability of 5% (1 in 20) and the associated water conveyance routes and flood storage areas. The definition of the functional floodplain may differ from 5% annual probability (1 in 20) in some locations. This will be defined in the SFRA for the area.

4.5.5 Table 4.3 cannot however be taken as the final answer to whether or not a development is appropriate; the Sequential Test and the Exception Test, where necessary, must be completed in full for all sources of flood risk. For example, if a 'more vulnerable' development is proposed to be located on a site in Flood Zone 2 (and hence receives a tick in Table 4.3) it will then be necessary for this site to be compared to other reasonably available similar sites within lower risk areas (i.e. for this example in Flood Zone 1). This table is not a justification for not undertaking the Sequential Test.

4.5.6 As shown in Table 4.3, the Exception Test should be applied in a number of instances. Application of the Exception Test ensures that new developments which are needed in medium or high flood risk areas will only occur where flood risk is clearly outweighed by other sustainability benefits and the development will be safe for its lifetime, taking climate change into account.

For the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; **and**
- A site specific flood risk assessment (FRA) must demonstrate that the development will be safe from all sources of flood risk, will not increase flood risk elsewhere, and, where possible, will reduce flood risk overall. Please see the DEFRA/ EA publication 'Flood Risks to People' for further information on what is considered 'safe'

Both elements of the test will have to be passed for development to be permitted.

Source: Paragraph 102, NPPF

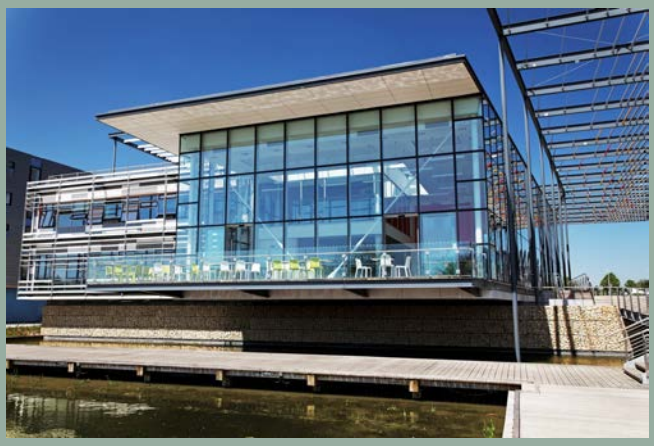
4.5.7 It is **the responsibility of the applicant** to provide evidence that the Exception Test has been carried out, with the LPA being responsible for assessing the evidence provided, in consultation with the EA, and consider whether both parts of the Exception Test have been passed.

4.5.8 The assessment of wider sustainability benefits should refer to the Local Plans' Sustainability Appraisals, which identify key sustainability issues and objectives for each district. All LPAs within Cambridgeshire will have considered the wider sustainability objectives in producing their Local Plans. The sustainability themes and issues are generally:

- Land and water resources
- Biodiversity and green infrastructure
- Landscape, townscape and historic environment
- Climate change mitigation and renewable energy
- Flood risk and climate change adaptation
- Pollution
- Healthy and inclusive and accessible communities
- Economic activity
- Transport

4.5.9 Any development undertaking the Exception Test should demonstrate the sustainability issues that the proposal is seeking to address. The general provision of housing by itself would not normally be considered as a wider sustainability benefit to the community which would outweigh flood risk; however confirmation should be sought from the LPA.

4.5.10 Examples of wider sustainability benefit to the community that would be considered could include the regeneration of an area, or the provision of new community facilities such as green infrastructure, woodland community centres, cycle ways/footways or other infrastructure which allow the community to function in a sustainable way.



5 Managing and mitigating risk

The aim of this chapter is to cover ways of managing risk through site design to ensure that developments will be safe from flooding. The information in this chapter is intended for use only after it has been demonstrated that developing in flood risk areas has been avoided as much as possible and the site and location are appropriate for the chosen type of development. Site specific Flood Risk Assessments must detail how a site will be made safe and this chapter will assist with this requirement.

5.1 Measures to manage flood risk

5.1.1 When undertaking a Flood Risk Assessment (FRA) applicants are strongly encouraged to work closely with Water Management Authorities (see Chapter 3). WMAs must agree that proposed developments are safe and that flood risk management partners (e.g. Emergency Services) would be able to respond quickly and appropriately to any incidents.

Modelling and mapping

5.1.2 The following flood related factors can influence the safe design of new developments and should be considered in the site's FRA (as outlined in of Chapter 4):

- Flood source;
- Flood mechanism;
- Predicted flood level;
- Flood duration;
- Frequency;
- Velocity of floodwaters;
- Debris;
- Flood depth; and
- Amount of warning time.

5.1.3 If developers need to undertake more detailed modelling for their sites to be able to accurately demonstrate the timings, velocity and depth of water inundation to their site, then it is recommended that the scope of works is discussed with the Environment Agency (EA) and the relevant Internal Drainage Board (IDB) (if applicable).

5.1.4 Breach modelling may be appropriate for certain areas of Cambridgeshire. There are two types of breach modelling (see the EA's publication – Flood Risk Assessment Guidance for New Development for further information):

- **Instantaneous breach:** the maximum extent of one or more breaches. This information is required by the EA for specific areas.
- **Progressive breach:** this involves modelling a breach over time, as the breach size increases, the impact on a development site over time can be assessed.

5.1.5 A limited amount of high level breach modelling has already been undertaken within Cambridgeshire. Fenland District Council has produced a Strategic Flood Risk Assessment (SFRA) Level 2 for Wisbech. This focuses on residual risks, such as the rate and depth of flooding in the event that flood defences fail. It also provides some breach and hazard mapping information. For developments within the Wisbech SFRA Level 2 Study Area this should be referred to in the first instant. The EA should be contacted to find out if any more recent data is available for this or other defended locations.

5 Managing and mitigating risk

Climate change information

5.1.6 Climate change is predicted to exacerbate extreme weather patterns; causing more frequent and intense rainfall duration, hence it is likely to heighten the risk of flooding. By implementing sustainable practices as part of new developments, as set out in both national and local planning policies, the associated risk of climate change can be managed and reduced.

5.1.7 The National Planning Policy Framework (NPPF) (Section 10) conveys the Government's plan to proactively help mitigate and adapt to climate change by taking full account of flood risk when developing strategies. Local Plans emphasise the need to take account of climate change and the associated factors e.g. flood risk, as clearly advised in the NPPF.

5.1.8 In making an assessment of the impacts of climate change on flooding from the land, rivers and sea as part of a FRA, the sensitivity ranges in Table 5.1 provide an appropriate precautionary response to the uncertainty about climate change impacts on rainfall intensities, and river flow.

Table 5.1 : Recommended national precautionary sensitivity ranges for peak river flows

Allowance category	Total potential change anticipated for '2020s' (2015-3039)	Total potential change anticipated for '2050s' (2040-2069)	Total potential change anticipated for '2080s' (2070-2115)
Upper end	25%	35%	65%
Higher central	15%	20%	35%
Central	10%	15%	25%

a. *For guidance, residential development should be considered for a minimum of 100 years, unless there is specific justification for considering a shorter period. An example of this would be if the development was controlled by a time limited planning condition.*

b. *For proposals with exceptional vulnerability to flooding (e.g. new settlements, strategic urban extensions or hazardous installations) and/or an expected lifetime of over 100 years, consideration should be given in FRAs to the potential implications of climate change beyond 100 years. This may include an extended climate change horizon for phased developments. Hazardous installations should consider climate change scenarios beyond the upper end as part of sensitivity testing. Pre-application discussions are especially important in these cases.*

c. *For development other than residential, its lifetime will depend on the characteristics of that development. Applicants should justify why they have adopted a given lifetime for the proposed development when they are formulating their FRA. It should be noted that it needs to be the actual lifespan of the building and not the design life; there tends to be a difference in that the actual service life tends to be greater than the design service life. It would need to be demonstrated with a degree of certainty that the building will no longer be present on the site for a lesser amount of climate change allowance to be used in the design calculations.*

5.1.9 Use Table 5.2 to decide which allowances apply to your development or plan. Further detail on when and how to use the climate change allowances in FRAs can be found here.

Table 5.2 : Using Peak River Flow Allowances for Flood Risk Assessments

Use vulnerability	Flood Zone		
	2	3a	3b
Essential infrastructure	Higher central & upper end to assess range of allowances	Upper end	Upper end
Highly vulnerable	Higher central & upper end to assess range of allowances	Development should not be permitted	Development should not be permitted
More vulnerable	Central & higher central to assess range of allowances	Higher central & upper end to assess range of allowances	Development should not be permitted
Less vulnerable	Central	Central & higher central to assess range of allowances	Development should not be permitted
Water compatible	N/A	Central	Central

5.1.10 The EA has produced a sensitivity test for the development of flood maps by using the 20% allowance for peak flows between 2025 and 2115. It suggests that changes in the extent of inundation are negligible in well-defined floodplains, but can be dramatic in very flat areas e.g. the Fens. However, changes in the flood levels under climate change could in time reduce the return period of a given flood. This means that a site currently located within a lower risk zone (for example, for Flood Zone 2 see Table 4.3 in future could be re-classified as lying within a higher risk zone (for example, for Flood Zone 3a see Table 4.1), which could have implications for the type of development being proposed. It is therefore important that applicants refer to the current flood map, the Local Planning Authority's (LPA) SFRA and the EA's latest guidance when preparing and considering proposals.

5.1.11 The sensitivity ranges in Table 5.3 provide an appropriate precautionary response to the uncertainty about climate change impacts on peak rainfall intensity.

Table 5.3 : Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

	Total potential change anticipated for:		
	2010- 2039	2040- 2059	2060- 2115
Upper end	10%	20%	40%
Central	5%	10%	20%

5.1.12 The central estimate should be used for design purposes to assess the impact on surface water drainage networks. The upper end estimate should be used to assess the potential flood risk implications in the critical duration design rainfall event including whether there is any increased flood risk to third parties as a result of the development.

Site layout

5.1.13 The site layout of any proposed development should take into consideration areas of flood risk present on the site and this should influence the choice of where to locate elements of the proposed development including sustainable drainage systems (SuDS) (see Chapter 6). This is in line with the Sequential Approach to flood risk as outlined in Chapter 4. If areas of flood risk cannot be avoided then the least vulnerable

elements of the proposed development should be located to coincide with the highest level of flood risk. For example, locating the open space element of the proposed development where the risk of flooding from surface water is higher (this would be on a case by case basis and advice should be sought from the relevant LPA in terms of its acceptability).

5.1.14 The inclusion of good quality green infrastructure (including trees and other vegetation) within a development master plan has the potential to significantly increase the profile and profitability of developments. Low lying ground can be designed to maximise benefits by providing flood conveyance and storage as well as recreation, amenity and environmental purposes. Where public areas are subject to flooding easy access to higher ground should be provided. Structures, such as street furniture and play equipment, provided within the low lying areas should be flood resistant in design and firmly attached to the ground.

5.1.15 Site layout does not only have to cater for the flood risk on the site but can also accommodate flood water that may contribute to a problem downstream. For example, where a proposal has a watercourse flowing through which contributes to flooding downstream in the existing community or further downstream within an adjacent community, the proposed development should offer flood risk betterment by holding back flood flow peaks within the site in a green corridor and by making space for this water. This is a proactive approach to flood risk management in Cambridgeshire where new developments offers enhancements to the surrounding area. All developments with watercourses identified within their site must consider this approach.

5.1.16 The site layout should also respond to the characteristics of the location and the nature of the risk. In some areas it is more appropriate to make space for water and allow controlled flood water onto areas of the development site. This is particularly relevant to riverside developments where extreme events can be catered for in multi-function open space areas (likely to form part of the green infrastructure provision) that would normally be used for recreation but infrequently can flood. The use of such features in these areas should be appropriate and compatible with the frequency, depth and duration of any flooding. However, signage clearly explaining the use of such areas for flood control and recreation should be fully visible so that infrequent flood inundation does not cause alarm (see section 5.2).

5.1.17 The following three examples are of developments that integrate flood risk management into the development master plan. These measures may not be appropriate in all locations. Further details of each development, including costing can be found in the LifE Project – Long-term Initiatives for Flood-risk Environments publication EP98.

5.1.18 In Figure 5.1 the objective was to develop a medium density suburban development with high quality landscape for suburban living that would provide multi-functional open spaces which adapt for flood mitigation, sports and play, biodiversity enhancements, local food and energy.

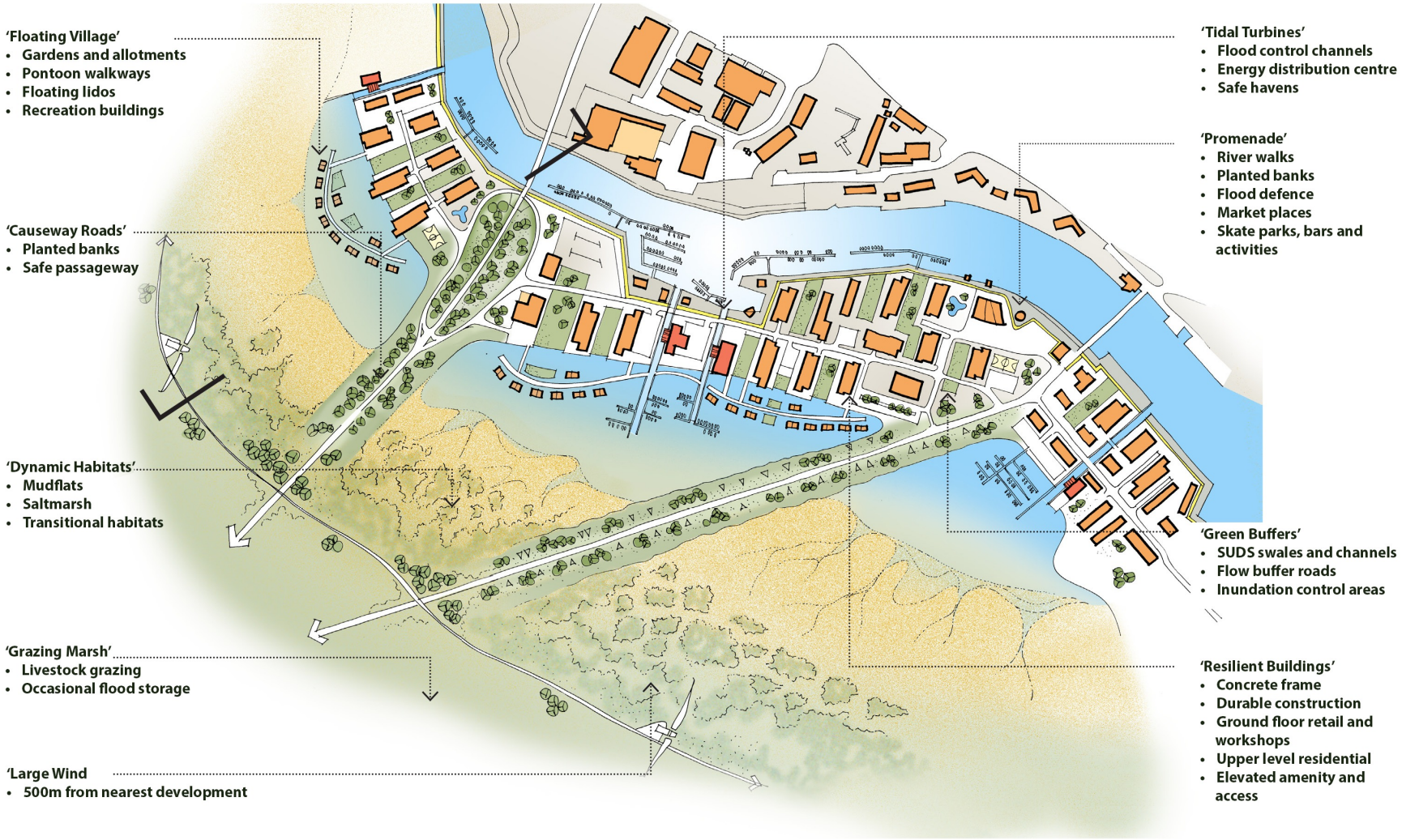
Figure 5.1 : Upper river catchment development ©BACA Architects

5.1.19 In Figure 5.2 the objective was to create a landscape-rich medium density development that has high density clusters to minimise development foot print and preserve land for future adaptation. Enhancement of the river corridor for waterfront and cultural activities allows integration into the existing urban green infrastructure network, provides flood and water management and opportunities for local food and energy to re-connect the town with the river.

Figure 5.2 : Middle river catchment development ©BACA Architects

5.1.20 In Figure 5.3 the main objective is to create a highly diverse landscape to provide multiple benefits to new and existing residents through flood protection, amenity and habitat generations, tourism and economic sustainability. This involved large-scale restoration of the river flood plain which would provide a number of opportunities for improvements to the landscape including improved access, tourism and recreation, provide wetland habitat and land for food and energy crops.

Figure 5.3 : Lower river catchment development ©BACA Architects



5.1.21 Short-term car parking may be appropriate in areas subject to flood risk provided that flood warnings and signs are in place. It is important to consider the need that people should be able to move their cars to a recognised safe area within the warning time (hence the unacceptability of long term and residential car parking where residents may be away from the area for long periods of time). Car parks should ideally not be subject to flood depths in excess of 300mm depth since vehicles can be moved by water of this depth and may cause obstruction and/or injury. A guidance document titled 'Flood Risks to People' was published by DEFRA/ EA in 2006 which developed a method for estimating risks to people, both during and immediately after a flood event. This document contains useful information on the hazards of flooding.

5.1.22 The use of SuDS which are designed to cater for exceedance events should not be sited within the floodplain as they are important in reducing the risk of surface water flooding on site and cannot be utilised if flooded from the river. Additionally the river will want to fully use its floodplain and these systems in the floodplain may compromise this ability. Chapter 6 provides more information on the design of drainage systems and exceedance events.

Raising floor levels

5.1.23 Where it is not possible to avoid flood risk or minimise it through site layout, raising floor levels above the predicted flood level (including an appropriate allowance for climate change) is a possible option in some circumstances to manage flood risk to new developments however this can increase flood risk elsewhere; it can create an 'island effect' with surrounding areas inundated during a flood, makes access and egress difficult; can affect river geomorphology; can have further potential impacts, such as erosion on site and changes to erosion and sedimentation elsewhere and can also have an impact on the landscape value and amenity of the river flood plain.

5.1.24 If floor levels are raised to mitigate flooding to the development, this may not prevent the roads and gardens from flooding which can affect house (flood) insurance and cause concern to the owners of the properties seeing flood water surrounding their property.

5.1.25 Raising floor levels can have an adverse impact on the street scene as building and feature heights will increase. In addition there may be implications for access ramps for wheelchairs which in turn can also take up flood storage leading to an overall loss of floodplain. Raising floor levels may also be significantly more difficult to achieve privacy standards with higher windows and this may also create the need for significantly higher boundary treatments or screens.

5.1.26 Therefore raising the floor level may not be appropriate in all situations and should not be seen as a development wide solution, but may be considered alongside other solutions if acceptable to the LPA and other Water Management Authorities (WMAs). It is important that the design will ensure that safe access and egress will always be available and this will be an essential part of the ongoing maintenance and legal agreements for the development. Please see the Defra/EA publication 'Flood Risks to People' for further information on what is considered 'safe'.

5.1.27 An alternative could include the placing of parking or other flood compatible uses at ground level with more vulnerable uses at higher levels. This is only appropriate for areas of low frequency flood risk and must ensure safe access and escape from the development and that the development is habitable for the duration of the flood, i.e. services to the properties will continue to function. When undertaking this approach no built elements should interrupt flood flow paths or reduce floodplain storage capacity.

5.1.28 Single storey residential development and ground floor flats are generally more vulnerable to flood damage as occupants do not have the opportunity to retreat to higher floor levels and salvage belongings to higher ground. For this reason single storey housing and ground floor flats in flood risk areas should not be allowed unless finished floor levels are set above the appropriate flood level for the lifetime of the property (taking into account the appropriate climate change allowance), and there is safe access and escape. In

areas of extensive floodplain (e.g. Wisbech), single storey housing could be supported where a purpose built stairway is provided to the roof area and escape from this area is in the form of easily accessible and easy to open roof light windows or similar (this must be as agreed by the relevant LPA in advance).

5.1.29 Sleeping accommodation on the ground floor that relies on flood warnings and the implementation of flood proofing measures is hazardous. Change of use from commercial to residential that results in proposed ground floor flats in Flood Zone 3 is unlikely to be acceptable (even with the use of flood proofing measures to mitigate the flood risk) unless finished floor levels are or can be raised above the predicted flood level (with an appropriate allowance for climate change), and there is safe access to and escape from higher storeys of the building.

Flood compensation

5.1.30 Any proposals to modify ground levels will need to demonstrate in the FRA that there is no increase in flood risk to the development itself or to any existing property elsewhere. Where land on site is raised above the level of the floodplain to protect properties, compensatory land must be returned to the floodplain. This is to ensure that new flood risk is not created elsewhere in an unknown or unplanned for location. Land raising would generally only be applicable on smaller development sites or for a small portion of the developable site area.

5.1.31 For undefended sites, floodplain compensation must be both 'level for level' and 'volume for volume'. Direct (onsite or opposite bank) flood compensation is preferable since it is more appropriate, more cost effective and will ensure it functions correctly. If strategic off-site upstream flood compensation is to be considered, developers should liaise with the LPA, the EA and the relevant IDB to understand whether storage sites are available that could protect multiple developments, potentially lead to shared costs, and reduce flood risk overall. CIRIA's report C624 entitled 'Development and Flood Risk - Guidance for the Construction Industry (2004)' provides detailed advice on floodplain compensation.

5.1.32 In defended areas, flood compensation need not normally be provided to the same extent. This applies, for example, in the Fens. Developers should however assess the risks to the site and surroundings and undertake mitigating action if the raising of land has the potential to create additional risk elsewhere. Consultation should be undertaken with WMAs (for example the EA, Lead Local Flood Authority (LLFA) or the relevant IDB) to determine what type of flood compensation or other mitigating actions would be appropriate.

New flood defences

5.1.33 The construction of new flood risk defences may enable development to take place provided that there are wider sustainability benefits associated with their construction (this could be demonstrated through a sustainability appraisal for example). Their construction needs to be very carefully considered with the LPA, the EA and the relevant IDB. New defences create new residual risks that can take significant investment to fully understand and plan. WMAs who maintain defences (such as the EA or IDBs) are not obliged to maintain defences and could potentially reprioritise or reduce expenditure in this area. Where defences are required, maintenance agreements will need to be reached through Section 106 of the Town and Country Planning Act 1990 or Section 30 of the Anglian Water Authority Act 1977. The latter can be used by the EA to adopt flood defences directly. In addition, IDBs may also adopt new flood defences if appropriate agreements and funding are in place.

5.1.34 Under the Flood and Water Management Act 2010 (FWMA), the EA, LLFA, District Councils and IDBs have legal powers to designate structures and features that affect flood risk and are not directly maintained by these organisations. Where a defence is being built to protect a development or area, it may be designated as a 'flood asset' by the relevant body. Further information on the designation of structures can be found in Defra's Designation of Structures and Features for Flood and Costal Erosion Risk Management Purposes - Information Note.

5.2 Managing the residual risk

5.2.1 Residual risks are those remaining after the Sequential Approach has been applied to the layout of the different site uses and after specific measures have been taken to control the flood risk. At this stage management measures are no longer about reducing the risk, but about planning for flooding. Management of the residual risk must therefore be the very last stage of designing and planning a site, where all options for removing and reducing risk have already been addressed.

5.2.2 This document only provides an overview of residual risk related management measures. More detailed information is included in 'C688 - Flood resilience and resistance for critical infrastructure (CIRIA, 2010)', - 'Improving the Flood Performance of New Buildings – Flood Resilient Construction (CLG, 2007)' and 'Flood resilient building (BRE DG523)'.

5.2.3 Where flood defence and drainage infrastructure has been put in place there will be risks associated with both its failure and with the occurrence of flood events more significant than the design level of the defence or system. These are residual risks which can be managed. The costs of managing residual risk may be low compared to the damage avoided. It should be noted that climate change is expected to increase the level of residual risk.

5.2.4 Different types of measures to manage residual risk include:

- Developer contributions towards publically funded flood alleviation schemes;
- Designing sustainable drainage systems so that storm events which exceed the design standard are properly planned for and the exceedance routes are known and appropriate (this requirement is explained in sections 5.1.10 and 6.4);
- Incorporating flood resistance and resilience measures into building design;
- Flood warning and evacuation plans.

5.2.5 There are two main strategies for managing property level flood risk:

- **Water exclusion strategy** – where emphasis is placed on minimising water entry whilst maintaining structural integrity, and on using materials and construction techniques to facilitate drying and cleaning. This strategy is favoured when low flood water depths are involved (not more than 0.6m). It should be noted that even with this strategy, water is still likely to enter the property.
- **Water entry strategy** – where emphasis is placed on allowing water into the building, facilitating draining and consequent drying. Standard masonry buildings are at significant risk of structural damage if there is a water level difference between outside and inside of about 0.6m or more. This strategy is therefore favoured when potentially high flood water depths are involved (greater than 0.6m).

Flood resistance measures

5.2.6 Flood resistance measures reduce the risk of flood water from entering a building and can be referred to as ‘dry proofing’. Measures include exterior water retaining walls and barriers built into building facades, gates that protect basement areas, doorway flood barriers, and airbrick covers (see Figure 5.4).

5.2.7 The effectiveness of flood resistance measures depends upon the occupier understanding the features, utilising them correctly when required and carrying out any needed maintenance. Passive measures such as flood doors and self-closing airbricks are one way of reducing the risk. Water pressure and carried debris can also damage buildings and result in breaching of barriers. As a result these measures should be used with caution and accompanied by flood resilience measures.

5.2.8 Flood resistance measures cannot be used in isolation as the only form of flood mitigation, but they may be useful within a suite of measures including appropriate high finished floor levels and safe access and escape routes. Flood resistance measures can aid recovery from an extreme and rare flood event(s).

Figure 5.4 : Reinforced concrete flood resistant wall faced with local stone

© Robin Stott

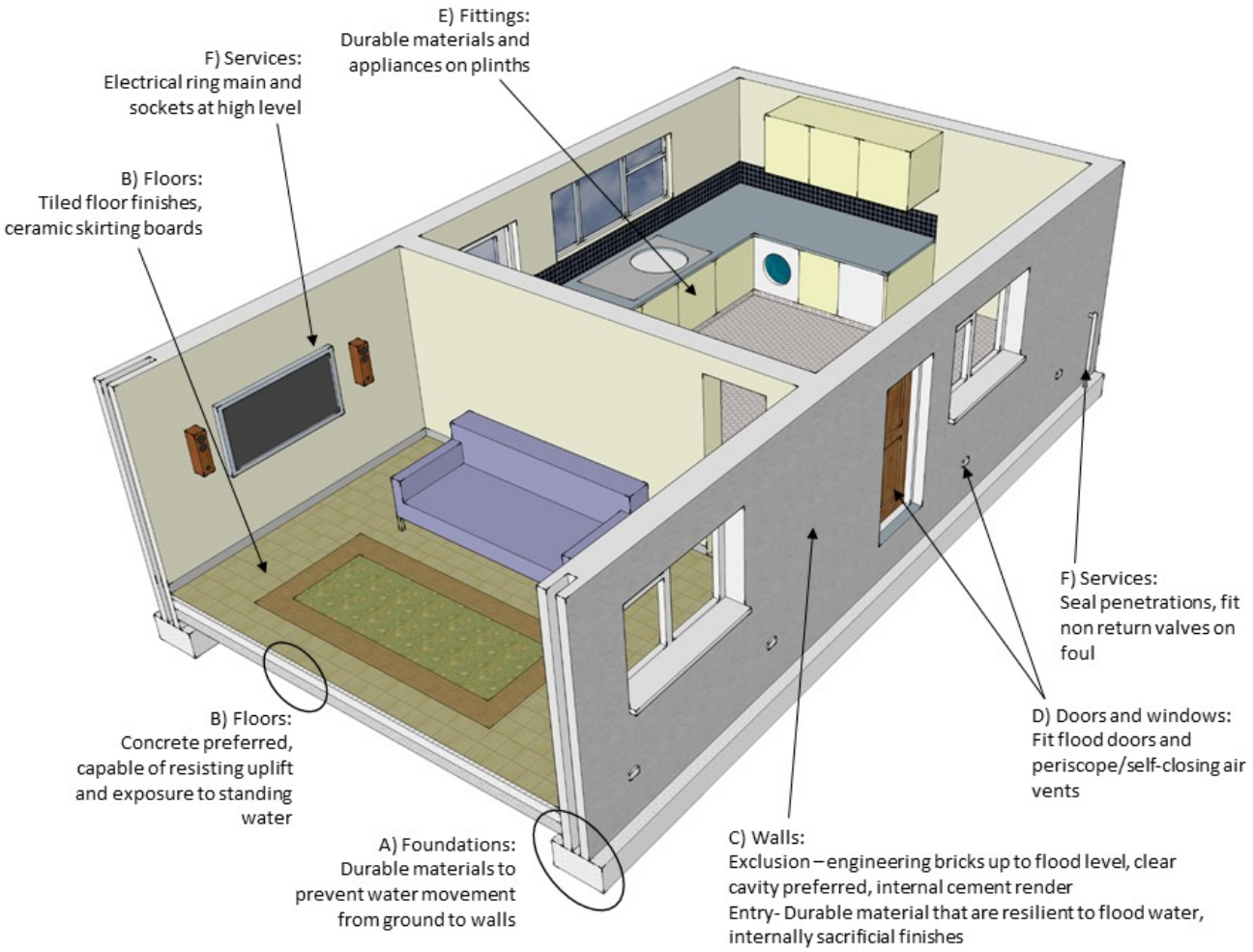
Flood resilient construction

5.2.9 Flood resilient construction accepts that water will enter the building, but with careful design minimises the damage to allow the re-occupancy of the building as soon as possible. This is encouraged in water compatible developments within the functional floodplain e.g. boat club houses. Resilient construction can be achieved more consistently than resistance measures and is less likely to encourage occupiers to remain in buildings that could be inundated by rapidly rising water levels. Total prevention of water entry or 'dry proofing' to a building is very difficult to achieve and flood resilient measures are about reducing the impact caused by flooding (see Figure 5.5).

5.2.10 Further details can be found in Improving the Flood Performance of New Buildings (DCLG, 2007).

Building components and flood resilience

Figure 5.5 : Flood resilience measures



5.2.11 Figure 5.5 provides an example of flood resilient measures that can be used within a development. Further details of each component can be found in Appendix D.

5.2.12 Flood resilience measures also include information based actions and planning such as:

- The use of clear signage within a development to explain the remaining risks or required responses from residents in the event of a flood such as displaying information on access doors and when to use them, in car parks explaining when to move cars, or on riverside walkways (i.e. when car parks are designed to flood), and defined flood conveyance routes and storage areas;
- Evacuation pathways and routes should be clearly signed, and where possible, markers (colour coded) used on bollards/lampposts to define the path and changes in depth from shallow to deep for the users. Any chamber covers should not be designed within access routes as covers can lift during floods and become hazardous to pedestrians;
- Ensuring that appropriate flood insurance is available and is in place for buildings and contents. Further information and links about flood insurance are available on the National Flood Forum website;
- Businesses developing and maintaining business continuity plans. It is encouraged that business continuity planning is undertaken across all risk areas;
- Preparing and acting on flood warning and evacuation plans.

5.2.13 These plans are an essential part of managing the remaining risk. Particular attention should be given to communicating warnings to and the evacuation of vulnerable people.

5.2.14 Evacuation plans must include dry access and escape routes wherever possible. Any variation in this, particularly the consideration of on-site refuge must be agreed by emergency service partners. In this situation the LPA will seek to organise a technical meeting with their Emergency Planner that deals with Evacuation Plans for the district, Cambridgeshire's Fire and Rescue Service, and the Police Force in order to agree whether the development's strategy for access, escape and refuge is appropriate.

5.2.15 The areas of Cambridgeshire covered by the EA's flood warning scheme can be viewed on the EA's online map. While this scheme provides prompt telephone calls and SMS text messages to registered individuals, it is dependent on residents signing up to the scheme. Developers must also bear in mind that warning areas may not be extended to cover new development areas. The EA's scheme only covers flooding from main rivers. Flooding from rainfall, surface runoff and groundwater often occur much more quickly, making warning more difficult. No specific local or national warning system currently exists for these more localised events and developers will need to consider this in ensuring developments will be safe from all sources of flooding.

6 Surface water and sustainable drainage systems

This chapter discusses how effective SuDS can be incorporated into the overall design of a proposal in any area of Cambridgeshire. Within Cambridgeshire the aim is to achieve the design and delivery of high quality sustainable drainage that complements the urban and rural landscapes of the county whether natural or man-made and which:

- **Effectively manages water (quantity and quality – see Chapter 7);**
- **Is aesthetically pleasing;**
- **Conserves, accommodates and enhances biodiversity and the historic environment; and**
- **Provides amenity for local residents (ensuring a safe environment).**

6.1 Introduction

6.1.1 Sustainable Drainage Systems (SuDS) re-create the benefits of natural drainage systems by integrating water management with urban form to create and enhance the public realm, streets and open spaces that we all value. The flexibility of SuDS components means that SuDS can apply in both the urban and rural context and in both natural and man-made environments.

6.1.2 SuDS allow the delivery of high quality surface water drainage whilst at the same time supporting urbanised areas in coping with severe rainfall. SuDS generally replace traditional underground, piped systems that gather runoff using grates or storm water drains. They control flows to prevent deluges during times of high rainfall and reduce the risk of flooding whilst also providing benefits for amenity and biodiversity. The SuDS approach keeps water on the surface as much as possible to avoid concentration and acceleration of flows in piped systems while also taking the opportunity to provide valuable amenity assets for local residents and increase the provision of green infrastructure in urban areas. Keeping water on the surface also means that any problems with the system are quicker and easier to identify than with a conventional system and are generally cheaper and more straightforward to rectify.

6.1.3 SuDS offer a great opportunity to improve and connect habitat in urbanised environments, as well as playing an important role in delivering and reinforcing wider green infrastructure ambitions for Cambridgeshire. SuDS can improve quality of life as well delivering recreation and education opportunities. Additionally, developers benefit from this environmental improvement by constructing highly desirable, affordable and saleable commercial and residential properties.

6.1.4 Even across man-made areas such as the Fens there is the potential to make use of many different SuDS components as they can reduce the immediate impact of intense rainfall ultimately having a cumulative beneficial effect on flood risk from main rivers. Together SuDS and IDB systems can be a strong combination providing significant benefits for future development.

6.1.5 This chapter presents information for designing water sensitive developments providing the first stage for any SuDS designer. It also provides information on the steps a developer must take at the different stages of the development process to ensure SuDS meet their full potential. For further background information on SuDS including the different types are set out in The SuDS Manual (CIRIA, C753).

6.1.6 Please note that reference is made to 'SuDS' throughout this chapter, rather than 'surface water drainage' as the National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG), Non-Statutory Technical Standards for Sustainable Drainage and adopted and emerging Local Planning policies require a SuDS solution to surface water management for new development. Many of the general principles within this chapter can also be applied to traditional surface water drainage and so this chapter needs to be complied with on all development sites and the provision of SuDS maximised. Even on very constrained sites SuDS can be implemented in one form or another.

6.1.7 Organisations such as CIRIA, British Standards and Interpave provide the information that should form the basis of any SuDS design. Responsibility will rest with the designers for ensuring that the scheme is designed to the requirements of the relevant Local Planning Authority (LPA) and the relevant Water Management Authorities (WMAs).

6.2 The Cambridgeshire SuDS design context

Topography and drainage patterns

6.2.1 Cambridgeshire's topography is predominantly flat, with many parts situated below sea level. However, there are some important topographical differences; the Fens area is consistently level and low-lying, while southern and western parts of Cambridgeshire include some significant variations in topography. Undulating hills define much of the land to the northeast of the River Cam, while the topography to the southwest of the river is more varied. Other main rivers, which flow through Cambridgeshire, include the River Nene, River Great Ouse and River Kym. Due to the county's low-lying geography, it is highly sensitive to sea level change; particularly near The Wash. Structured landscapes using a highly organised drainage pattern of overland flow channels are common across the county.

Rainfall and water availability

6.2.2 Cambridgeshire is one of the driest counties in the UK. On average, the county receives less than 600mm of rainfall per annum; however, this can drop below 500mm in particularly dry years. This is less than half the national average of 1,176mm. Accordingly, water management is an important issue and source control measures like rainwater harvesting that enable water use reduction locally are important along with retention of water for irrigation purposes. Equally, in some areas infiltration to re-charge local groundwater supplies is important due to the low rainfall conditions in Cambridgeshire and SuDS such as soakaways can help by encouraging infiltration wherever it is achievable and acceptable. In Fen areas where water levels are closely managed to sustain development and agriculture, the Internal Drainage Boards (IDBs) can use their systems to manage water supplies for agriculture. Equally, trees and woodland, where used appropriately can reduce the impact of drought as, under the right conditions, shelterbelts can enable crops to use water more efficiently (by reducing evapotranspiration losses) which could reduce the need for irrigation and lead to less abstraction.

Flood Risk and Surface Water Management

6.2.3 Fluvial and tidal flooding are the dominant sources of flood risk in Cambridgeshire. There is a strong reliance on pumping stations for water conveyance particularly in the low-lying Fen areas of Cambridgeshire to prevent flooding. Surface water flooding is however also considered a key issue in the county with an estimated 23,100 homes at risk from this type of flooding. New development across the county alters the natural landscape and affects the hydrological processes of the catchment in which it is situated. It often removes natural vegetation and reduces the permeability of the land through the construction of roofs, roads, car parks and other areas of hardstanding, all of which can significant increase the rate of surface water runoff. SuDS are therefore an important component in reducing the quantity surface water runoff. It is important to note that SuDS cannot be used to mitigate for flood risk to the site from fluvial, tidal or other sources of flooding.

Geology

6.2.4 The geology in the north and central areas of Cambridgeshire is relatively impermeable, consisting mainly of soils with properties similar to clay. These soil types are not generally conducive to infiltration, and this will need to be considered in SuDS design but it does not preclude the use of non-infiltrating SuDS. Some of the LPA's water cycle strategies including that for Huntingdonshire identify where geology may affect the use of infiltration SuDS. In some areas there are sand and gravel deposits over the top of clay soils that may be suitable for infiltration. The presence of chalk and greensand in the southern part of the county

means that high infiltration rates may be achievable, and SuDS can be designed to infiltrate water to the ground. A comprehensive investigation should be carried out at the earliest stage of the planning process to establish ground conditions.

6.2.5 A number of factors should be considered when deciding whether to use infiltration SuDS, though where possible, they should be utilised in order to supplement groundwater recharge. The British Geological Society has produced a tool that uses Geographic Information Systems (GIS) to show suitability for infiltration. It is important to note that this information only serves as a high level indication of broad geological areas, and is not to be used as a substitute for a comprehensive site investigation and soakage testing. Infiltration potential is very localised and while suitable sites exist even in the fen areas, in some locations infiltration based systems will not be appropriate.

Biodiversity and green infrastructure

6.2.6 Many of Cambridgeshire's nationally and locally designated nature conservation areas are designated because of their water environment. The integration of SuDS into the landscape needs to be sensitive to the local biodiversity and equally, biodiversity needs to be designed into SuDS. At present one of the main risks to biodiversity in Cambridgeshire is the extent of fragmentation of habitats and loss of species due to historical farming practices and more recently increased pressures from development. Inclusion of SuDS networks could help to re-connect existing habitats and re-create new areas. Cambridgeshire's Habitat Action Plans and Species Action Plans provide specific information on desirable habitat design in the county. Biodiversity should be integrated into SuDS at the early design stage to avoid unnecessary conflict over maintenance and the disturbance of protected species. Additionally if protected species are likely to be attracted to SuDS features, the protection of these habitats during maintenance and operation should be considered in the design.

6.2.7 A UK government objective is, "connecting people with nature" (DEFRA 2011) and the use of SuDS can help deliver this objective. Through careful design, SuDS can respect, enhance and connect local habitats and support biodiversity and green infrastructure in Cambridgeshire. As recognised in the CIRIA SuDS Manual (C753), water within a SuDS system is essential for the growth and development of plants and animals and biodiversity value can be delivered on any scheme from small, isolated systems to large strategic developments where SuDS are planes as part of the wider green landscapes. The creation of rough grasslands, woodland, wetland meadows, aquatic planting and open water can provide shelter, food and foraging and breeding opportunities for a wide variety of wildlife.

6.2.8 There are several Biodiversity Action Plan (BAP) species and habitats that can be supported by well-designed SuDS. In appropriate locations, design of retention ponds and wetlands should consider the integration of well-designed sanctuary areas wherever possible, to give spaces for the more sensitive wildlife species. To make sure SuDS can provide the best benefits to wildlife, ecological expertise is strongly advised. Consultation with nature conservation groups can also help access such expertise. Further information and a list of useful contacts can be found in the RSBP and WWT publication 'Sustainable Drainage Systems: Maximising the Potential for People and Wildlife'.

6.2.9 SuDS can also contribute to a network of functional green corridors. As part of a green infrastructure network, SuDS can be an important asset in supporting the creation of green spaces for local communities' recreational use. The vision for green infrastructure in the county is set out in the Cambridgeshire Green Infrastructure Strategy 2011, which includes connecting habitats, enhancing landscapes and biodiversity and extending access to green spaces as key objectives. The strategy also emphasises the provision of multi-functional landscapes, where SuDS could be integrated with other green infrastructure uses such as recreational space (when dry), landscaping, wildlife habitats, water quality control and flood alleviation.

Character and urban design

6.2.10 Many parts of the Cambridgeshire landscape are typified by flat open landscapes and there is also a strong presence of surface water and water meadows. Water has historically helped define Cambridgeshire, including the man-made Cambridgeshire Lodes, Hobson's Conduit and extensive waterways in the Fens. River valleys play an important role in defining rural landscapes and market towns. In urban areas, undeveloped waterways provide natural relief from the built-up urban form. Above ground SuDS will positively contribute to the county's history and acceptance of water, as well as providing amenity and quality of life value. They will also complement the existing extensive network of waterways, improving the quality of water within them.

6.2.11 The county also has a diverse and distinctive built heritage within its cities, towns, villages and historic buildings. The architectural quality of many buildings within Cambridgeshire's towns and villages, both traditional and modern, is of a high national and international significance. SuDS design will need to reinforce and reflect the quality of the built and natural environment including heritage assets and their settings.

Presence of water features

6.2.12 Historically, Cambridgeshire included large areas of low lying wetlands that have been subsequently drained to allow urban areas and modern farming practices to develop. The use of wetland features in SuDS provides an opportunity to regain some of the benefits of this original landscape, particularly in terms of the varied wildlife value that these sites can bring, without losing touch with the reasons why it was drained in the 17th century.

6.2.13 A famous Cambridgeshire characteristic is its water meadows or floodplains adjacent to the River Cam and the Fens, which in some cases are bounded by residential developments. These water meadows are often grazed and are unique in as much as they extend into urban environments.

6.2.14 Cambridgeshire also has regionally, nationally and internationally important archaeological sites, and the design of SuDS and ground works will need to be sensitive to potential archaeological interests, historic assets and their settings. Where heritage assets are preserved in a waterlogged environment, the recharge of groundwater systems will be extremely important.

Designing a SuDS scheme

6.2.15 Designing SuDS effectively requires an interdisciplinary team with a range of skills such as planning, drainage engineering, landscape design and biodiversity knowledge. SuDS in Cambridgeshire should be designed by a competent design team that works together from the outset to deliver a successful scheme. In many cases, overall costs savings can be realised where multiple benefits such as improved open spaces, recreational areas and surface water drainage function in one area.

6.3 Cambridgeshire SuDS design principles

6.3.1 Principles governing SuDS design in Cambridgeshire are outlined in Table 6.1 and discussed in detail in the following sections.

Table 6.1 : Cambridgeshire SuDS Design Principles

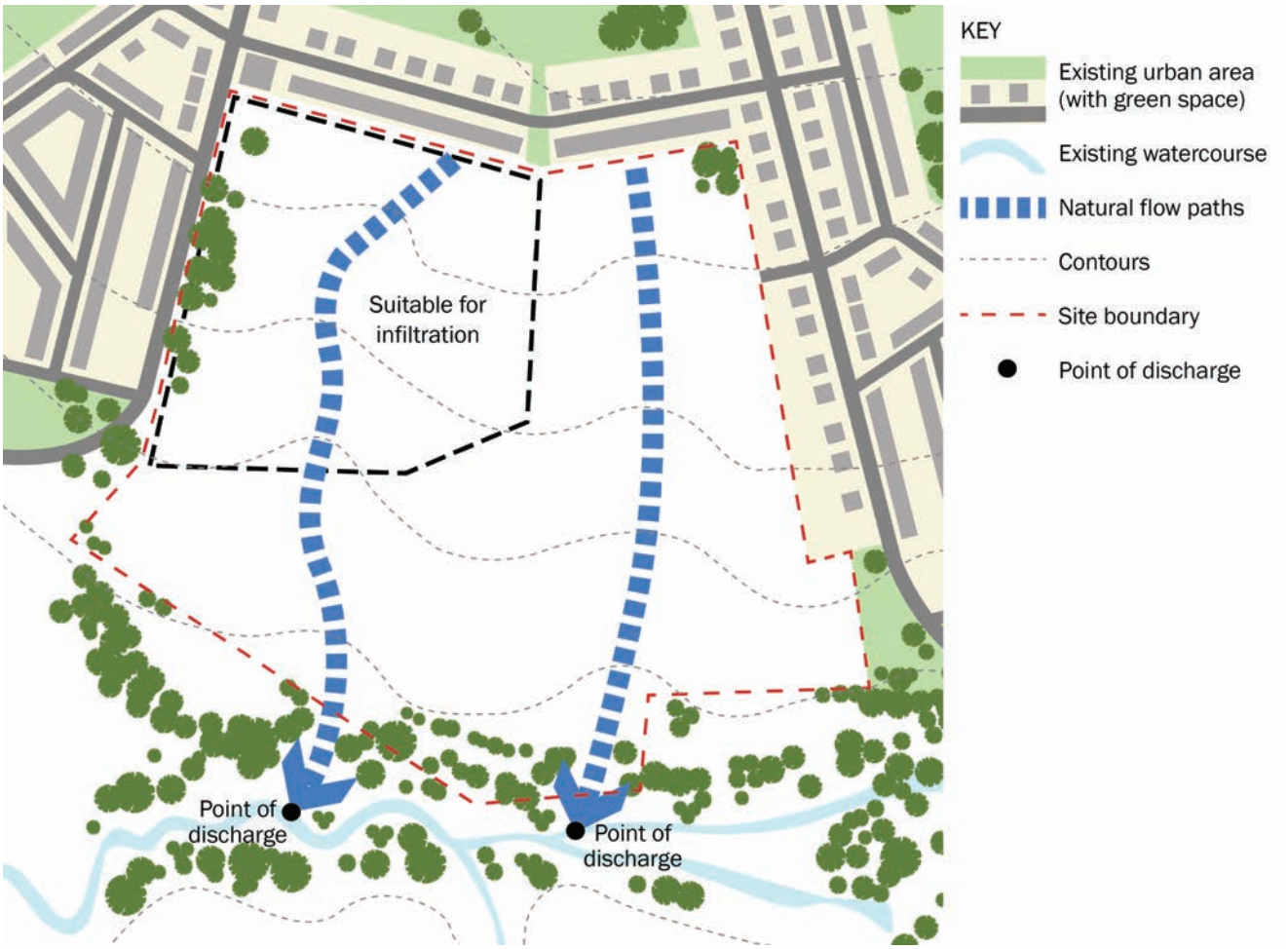
Plan in SuDS from the start

6.3.2 Considering SuDS during the preliminary stages of site design provides the opportunity to incorporate features that are appropriate to the local context and character of an area. Integrated design to achieve multi-functional benefits is inherent to the site master planning and layout process; therefore it is most efficient and cost effective to design SuDS schemes into a site as early as possible. When drainage is accounted for from the beginning of the design process, it provides opportunity for the built up areas to be designed in-line with the topography, rather than to fit the drainage around the site at a later stage which is much less effective.

6.3.3 Land uses that have different pollution potential can also be clustered and phased so that management trains can be designed most effectively. The result of early inclusion of SuDS is a more effective and efficient layout which will avoid the need for abortive work and changes at a later stage which can escalate costs.

6.3.4 The better the SuDS design the more options for adoption that might be available to a development. The stages described in Figure 6.1 to Figure 6.5 show how a design can integrate SuDS spatially through the evolution of a masterplanning exercise.

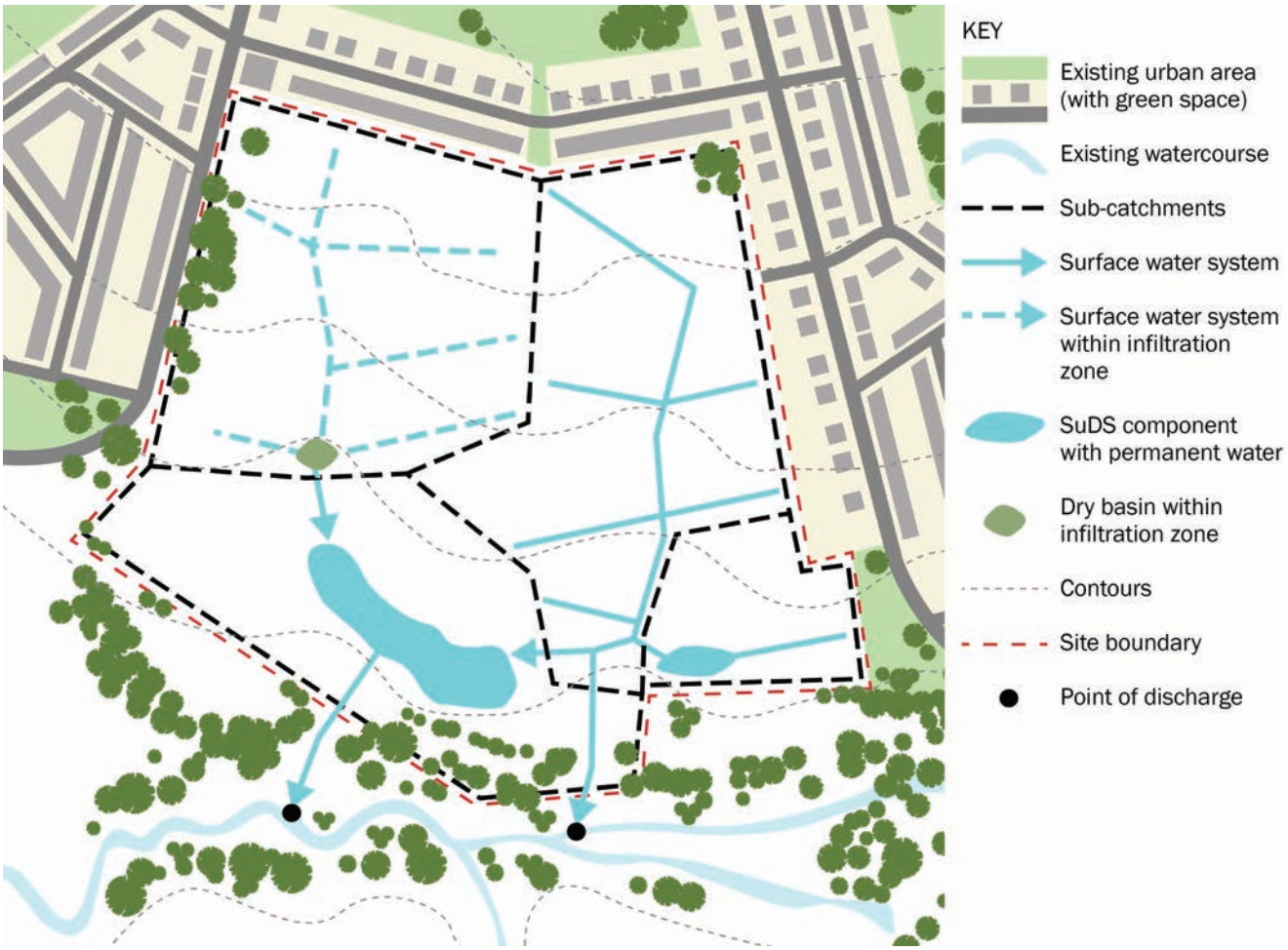
Figure 6.1 : Stage One



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Examine site typography and geology: Aim to mimic the natural drainage systems and processes as far as possible. Identify key natural flow paths, existing water bodies and potential infiltration areas to understand opportunities and constraints.

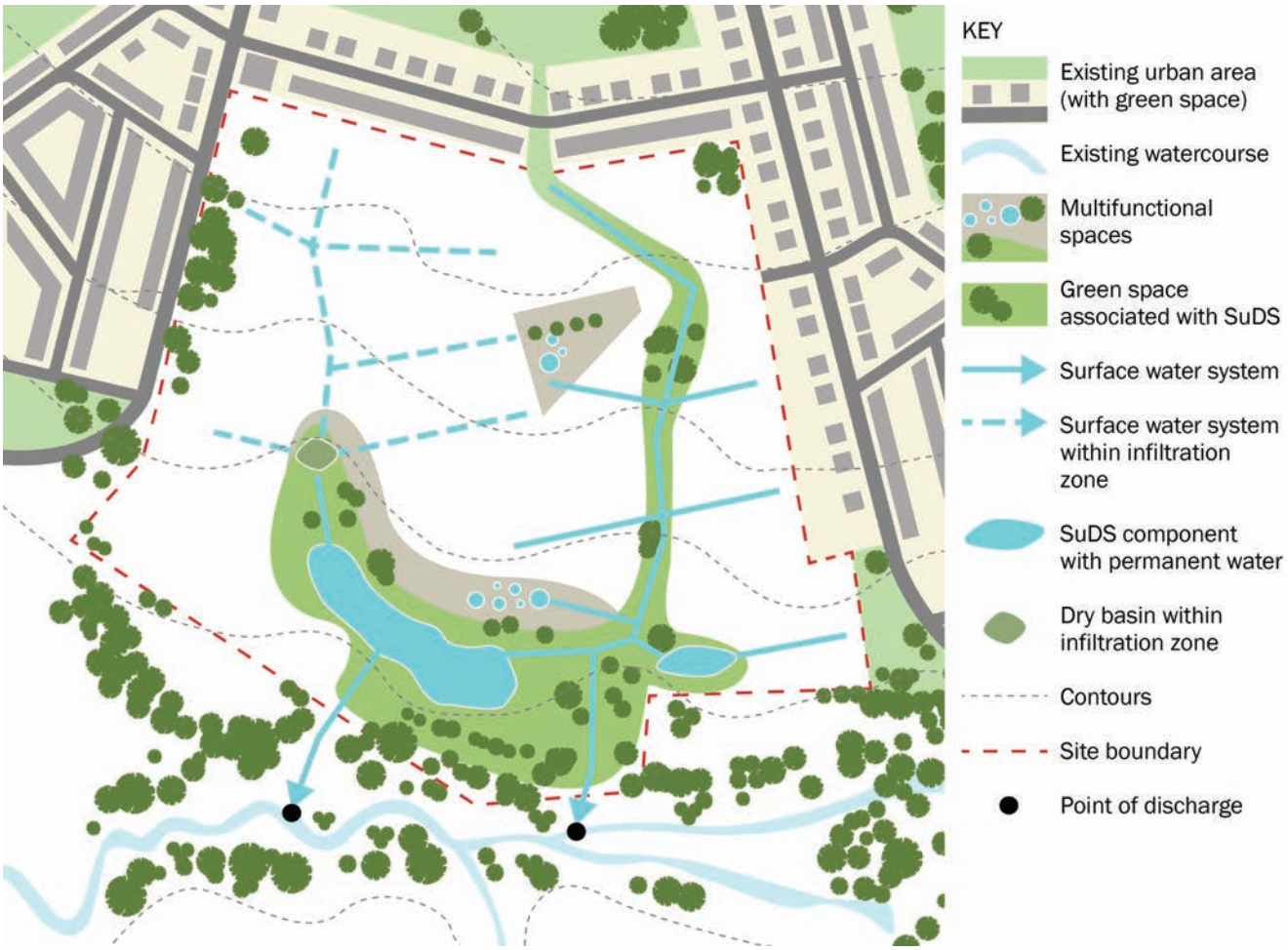
Figure 6.2 : Stage Two



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Create a spatial framework for SuDS: Minimise runoff by rationalising large paved areas and maximising permeable surfaces. Consider likely space needs for site control SuDS based on character of development and the proposed degree of source control. Use flow paths and possible infiltration or storage areas to inform development layout.

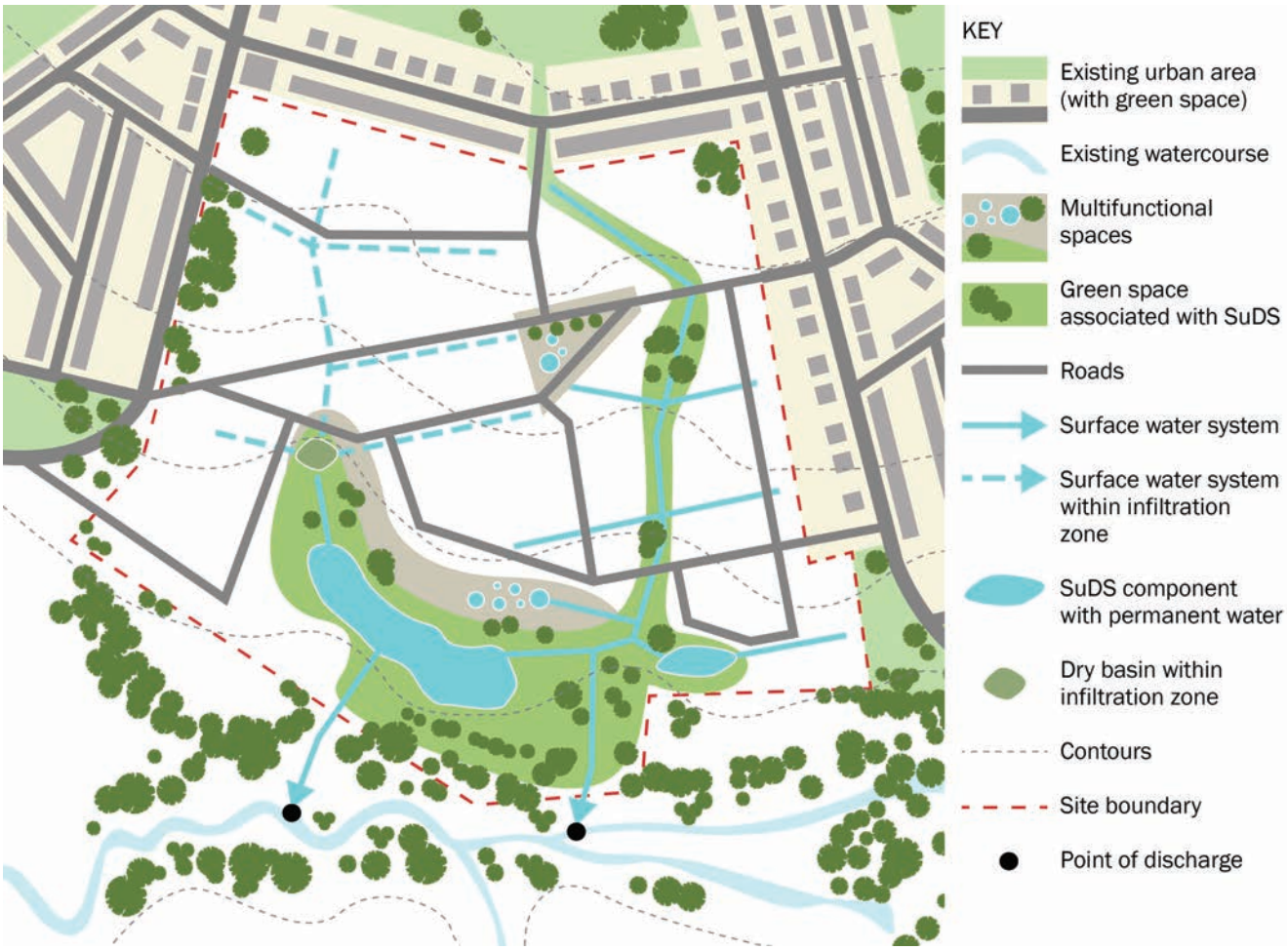
Figure 6.3 : Stage Three



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Look for multi-functional spaces: Consider how SuDS features can be co-located with green infrastructure, open space and public realm areas to create multi-functional spaces. SuDS can be designed to be valuable amenity and ecological features.

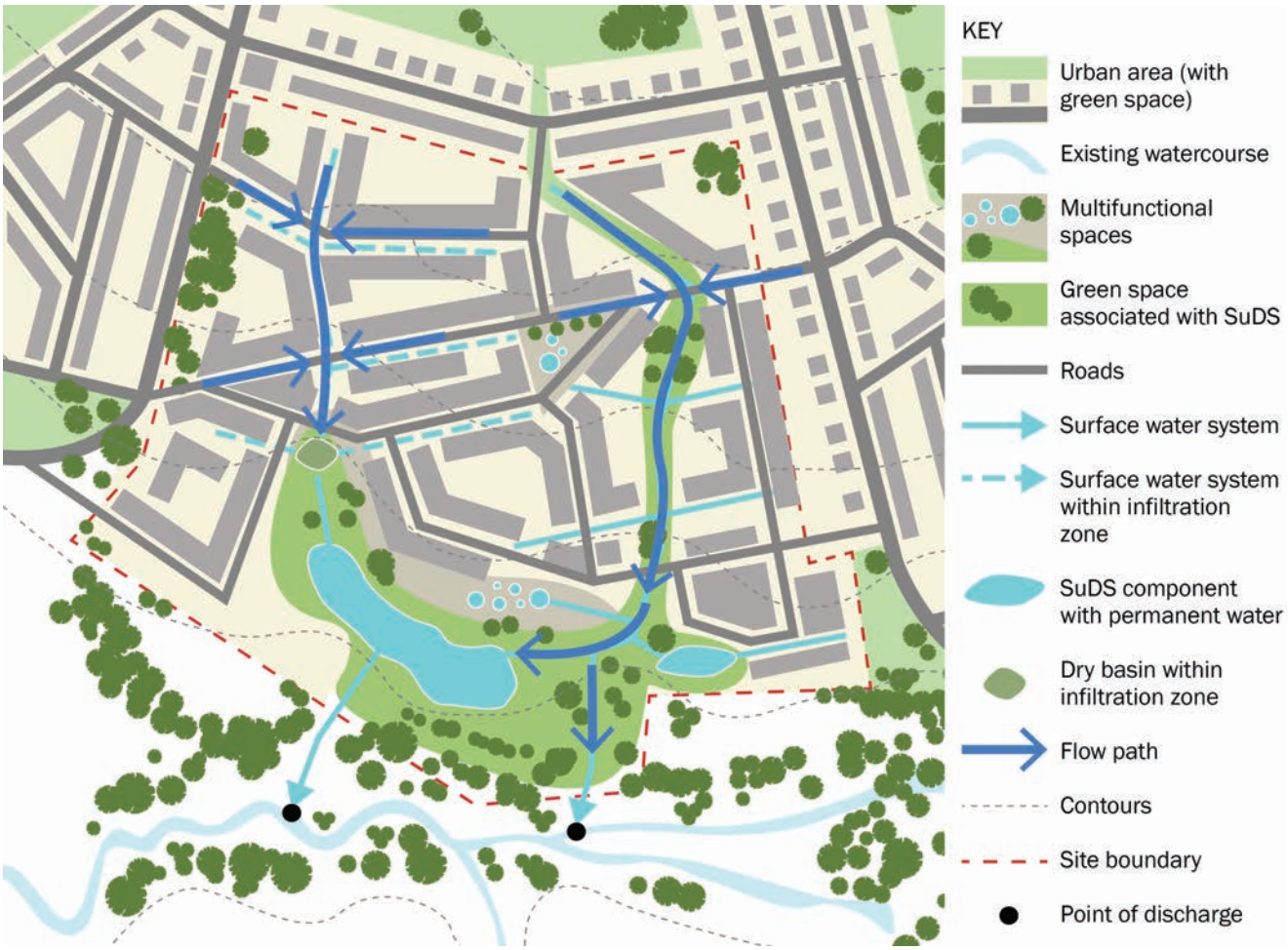
Figure 6.4 : Stage Four



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Integrate the street network with SuDS: Structure the street network to complement and manage flow pathways. Integrate SuDS features into street cross-sections, ensuring street widths are adequate. SuDS should be used to enhance the streetscape providing amenity and multi-functionality by integrating with other street features including tree planting, traffic calming, parking bays, verges and central reservations.

Figure 6.5 : Stage Five



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Cluster land uses to manage pollution: The number, size and type of SuDS selected will be affected by land uses and the corresponding pollution risk. Potential polluters, e.g. industrial development should have their own isolated SuDS network. Integrate a series of SuDS features that will provide water treatment throughout the networks, responding to the level of pollution risk. Clustering should be considered alongside other mixed use ambitions.

Mimic natural drainage

6.3.5 The topography of an undeveloped site provides a good indication of natural flow routes and can therefore assist in defining appropriate and efficient flow routes through a developed site without relying on additional infrastructure. The most effective and cost efficient designs make use of the local topography, increase landscape permeability, and reduce the amount of surface water flowing off site as much as possible. Allowing surface water runoff to follow the natural physical geography requires less soil movement and can eliminate the need for additional underground piping and pumping of water. Where the site is suitable for infiltration, opportunities to discharge water to the ground should be taken to mimic natural infiltration and recharge groundwater aquifers.

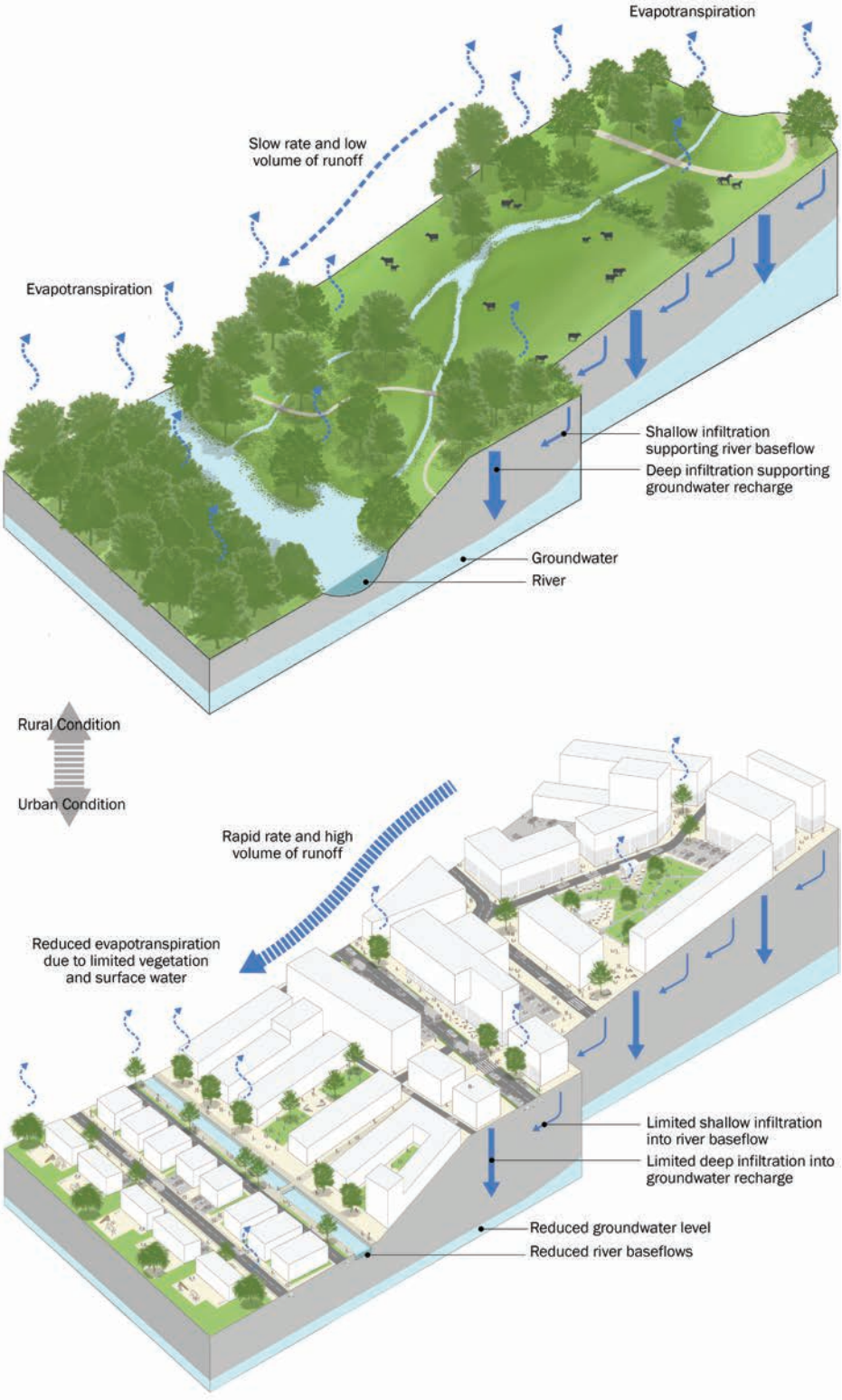
6.3.6 All new developments on greenfield land are required to discharge the runoff from the impermeable areas at the same greenfield runoff rate, or less than, if locally agreed with an appropriate authority or as detailed within the local planning policies of District and City Councils. For example the IDB may stipulate its rates of discharge for developments within its areas and the Lead Local Flood Authority (LLFA) or LPA may stipulate an acceptable discharge rate outside of these areas. Note that in IDB areas, consent will be required for any discharge into an IDB watercourse.

6.3.7 The LPA may allow a reduced level of attenuation prior to discharge to a watercourse where a strategy or study undertaken by or in partnership with an IDB or other WMA demonstrates that no increase in flood risk would occur to the site or elsewhere. It must however be demonstrated by the applicant that the site can continue to drain when receiving water bodies are in flood conditions. Irrespective of any agreed runoff rates, source control methods must be implemented across sites to provide effective pre-treatment of surface water. This must be demonstrated as part of the proposal.

6.3.8 Brownfield (previously developed land) sites must reduce the existing runoff from the site as part of the redevelopment. Where possible, in order to provide betterment, redevelopments should look to reinstate greenfield runoff rates. Note that in some parts of Cambridgeshire there are specific policy requirements related to acceptable runoff rates for brownfield sites set out in Local Plans.

6.3.9 Figure 6.6 shows the differences in drainage patterns between natural landscapes and built-up areas. Mimicking the natural landscapes in urban areas is the best strategy to mitigate flood risk and improve downstream water quality.

Figure 6.6 : Difference between natural landscape and urban drainage



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

6.3.10 In addition to natural and urban catchments, as already detailed, the Fen area of Cambridgeshire has an extensive network of artificial drainage channels that are mostly pump drained. The majority of these are under the control and management of IDBs. Map 6.1 shows those areas of Cambridgeshire where the watercourses are designated by the Environment Agency (EA) as 'Heavily Modified Water bodies'. Such designation relates to the Water Framework Directive (WFD) (see Chapter 7); however it provides a useful visualisation of those watercourse across Cambridgeshire that have been heavily modified.

6 Surface water and sustainable drainage systems

Map 6.1 : Heavily Modified Waterbodies across Cambridgeshire

Use the SuDS management train

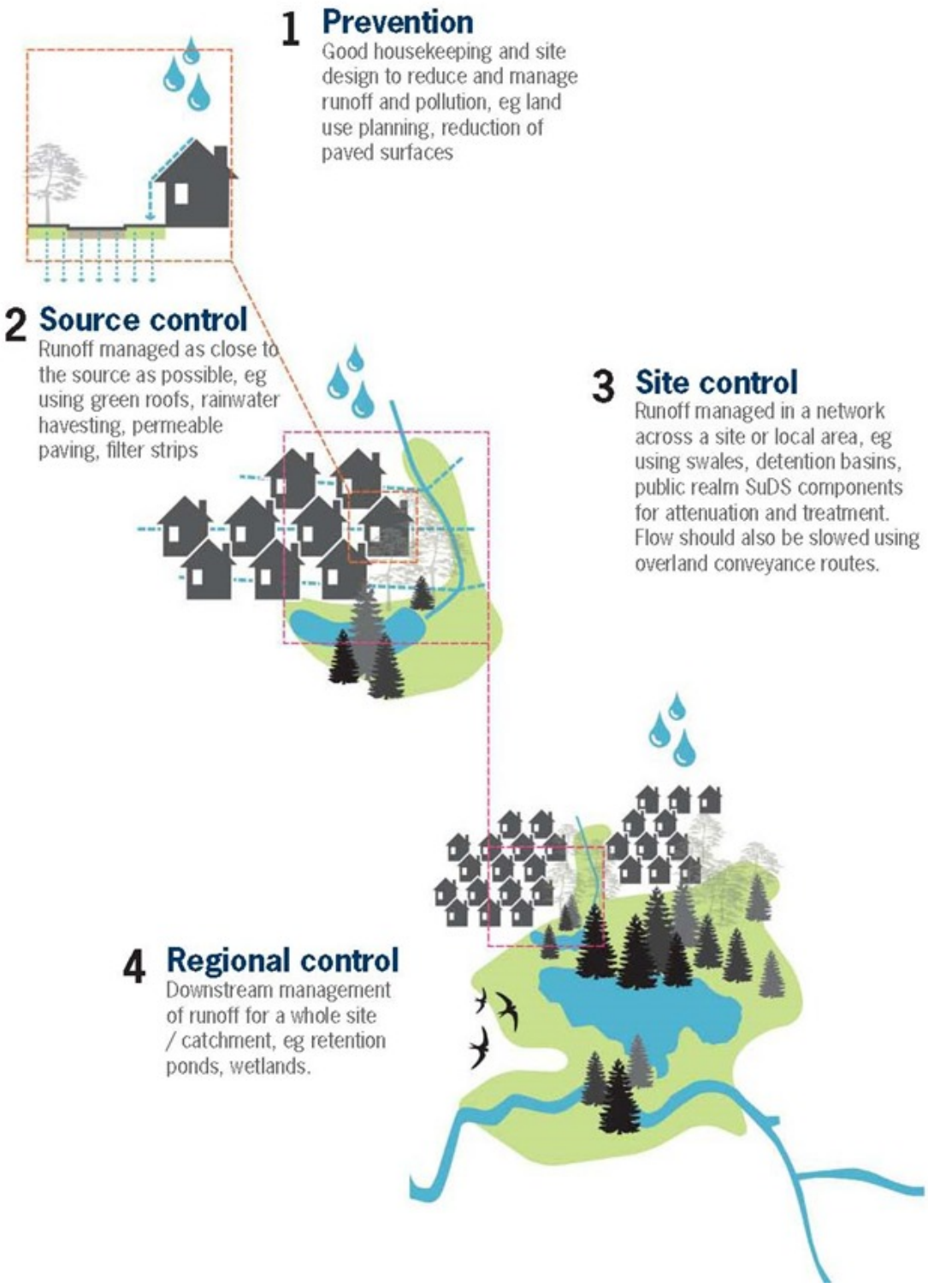
6.3.11 The SuDS management train is a central design concept for SuDS. It describes the use of a, "sequence of components that collectively provide the necessary processes to control the frequency of runoff, the flow rates and the volumes of runoff, and to reduce the concentrations of contaminants to acceptable levels" (CIRIA 2015). The management train begins with land use decisions and prevention measures, followed by interventions at the property scale and street scale (source control), through to considerations for downstream run-off controls within the overall site boundary, and wider initiatives downstream that are designed to manage the overall catchment. Source control includes features such as permeable paving, rainwater harvesting, living walls, rain gardens, filter strips, green roofs and bio retention areas. These allow water to penetrate the feature thereby reducing the proportion of surface water runoff that is conveyed into the drainage system.

6.3.12 Once all measures to minimise surface water runoff at source have been designed into the layout, site control initiatives which collect and treat water for larger areas of the site should be considered. Site control initiatives may include soakaways, ponds and wetlands, which work to slow the conveyance of water off the site and provide secondary stages of treatment. Appropriately planted vegetation can also help to attenuate water flow and provide a stage of treatment.

6.3.13 Regional controls are larger in scale and may be implemented in large sites, or by third parties as part of catchment wide initiatives. Such initiatives may include retention ponds, wetlands and infiltration basins. Figure 6.7 portrays this management train.

6.3.14 Above ground conveyance systems such as swales and rills should be used wherever possible to convey water between SuDS components. It is however acknowledged that for those developments where space is a limiting factor (e.g. redevelopment), the use of below ground pipework may prove more efficient.

Figure 6.7 : SuDS Management Train



Source: The SuDS Manual, CIRIA, C697

Water reuse first

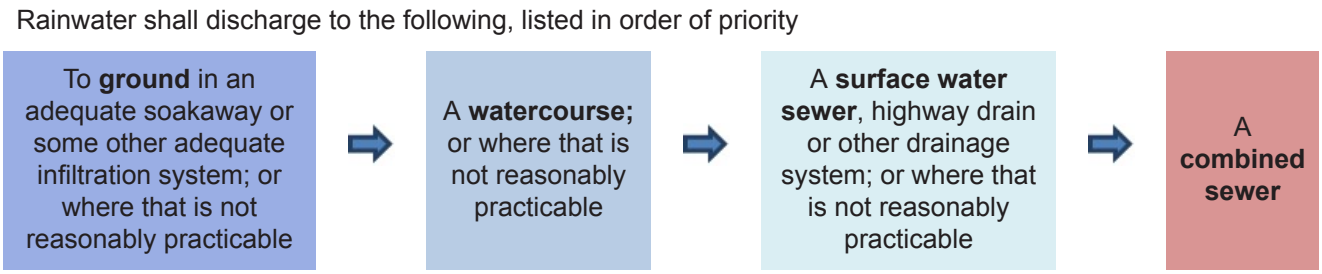
6.3.15 Cambridgeshire is one of the driest areas in England, therefore reusing water whenever possible is important to improving the county's water resilience, and reducing pressures on precious water supplies. Recycled rainwater and surface water runoff can be used for non-potable purposes, such as toilet flushing and irrigation. Water can be collected for reuse from both roofs and/ or paved surfaces and can be stored for reuse using a water butt or rainwater recycling system. Surface water runoff from streets or public areas can also be collected and treated using SuDS features, such as a rain garden, before storing it for surrounding buildings to reuse.

6.3.16 IDBs have a responsibility for overall water level management in their area, which can include the retention and reuse of water to facilitate irrigation during dry periods. Proposed development sites in IDB areas should be discussed with the relevant IDB as a development may provide the opportunity to improve water supply to the surrounding land. Existing and emerging Local Plans provide planning policies in relation to this matter.

Follow the drainage hierarchy

6.3.17 It is a Building Regulations and PPG requirement that the discharge hierarchy in Figure 6.8 is used when considering proposals.

Figure 6.8 : Surface water drainage hierarchy



Note: in all instances adequate stormwater storage will need to be provided in order to meet the relevant infiltration or discharge rates and volumes (see Section 6.4).

Use infiltration where suitable

6.3.18 The potential for infiltration measures on a site should be considered at the outset. Careful consideration of the acceptability of infiltration drainage should be given particularly in relation to potable water sources (e.g. drinking water) or land contamination issues.

6.3.19 The British Geological Survey can provide maps and reports to support decisions with regards to the suitability of the subsurface for the installation of infiltration type SuDS type systems. The suitability for infiltration across an area should be based on:

- Existing constraints prior to planning infiltration SuDS;
- Drainage capacity and rate of infiltration into the ground;
- Potential for ground instability when water is infiltrated;
- Impact on groundwater quality as a result of infiltration;
- Development on contaminated land or Source Protection Zones (SPZ) (vulnerable aquifers).

6.3.20 Infiltration should be assessed on-site using infiltration tests that follow the detailed SuDS design principles covered in BRE365/CIRIA 156 procedure. SPZ's should be taken into account when considering infiltration and guidance provided by the EA should be consulted to determine infiltration constraints and requirements in these areas. Where infiltration drainage is proposed on previously developed land, contamination risk

needs to be considered. This may not rule out the use of infiltrating SuDS but will require site investigations and information on remediation prospects which are outside the scope of this Supplementary Planning Document (SPD).

6.3.21 The maximum acceptable depth for an infiltration device is usually 2.0m below ground level, with a minimum of 1.2m clearance between the base of the feature and peak seasonal groundwater levels. In some areas of the Fens the maximum depth of infiltration (of 2.0m below ground level) is often not viable and in such areas 1.0m below ground level would be the best achievable depth. In these areas however, the possibility of incorporating shallow infiltration features such as trenches should be investigated. Deeper ('deep bore') soakaways pose a serious pollution risk and are not acceptable, and it is expected they will become contrary to the European Union (EU) WFD.

Keep surface water on the surface

6.3.22 It is acknowledged that infiltration will not be possible on all sites. Low permeability soils are often cited as a reason for not including SuDS; however this is not acceptable in Cambridgeshire as solutions do exist. Although soakaways and other infiltration methods may not be suitable, many other methods such as swales, ponds and wetlands should be prioritised, selected and designed accordingly. It is also possible to allow some water to soak into the ground (for example out of the bottom of an unlined swale), even if drainage design calculations do not allow for it.

6.3.23 Design and layout should seek to manage and convey surface water above-ground, avoiding the use of underground piping as far as possible. This is particularly pertinent in Cambridgeshire due to the flat landscape and areas of high groundwater. Managing surface water runoff at the surface has the benefit of:

- Avoiding concentration and acceleration of surface water into waterways which causes downstream erosion;
- Integrating removal of pollutants by filtering water during conveyance;
- Reducing construction and maintenance requirements and costs;
- Creating habitats;
- Contributing to public amenity by better quality urban and landscape design;
- Increasing residents' awareness of water management; and
- Detecting blockages and obstructions more easily.

Place-making through SuDS design

6.3.24 When using conventional surface water management systems, water is hidden in pipes underground. By bringing water management to the surface using SuDS, there is an opportunity to enliven public spaces and streetscapes. The presence of water features within the urban environment can promote a strong sense of place, bring an urban space to life and create unique spaces that can be enjoyed by all. SuDS features such as ponds, wetlands, pools, fountains and planted rills which can be purely aesthetic or interactive in nature, can be integrated into the public realm and open spaces to enrich the area with green infrastructure. Note that interactive SuDS should include an appropriate level of natural pre-treatment upstream before coming into human contact, such as in the case of water play areas. Designing for water quality is discussed further in Section 6.5.

Landscape-led approach

6.3.25 The selection of SuDS types and the creation of the SuDS network should both respond to and contribute to the surrounding built and natural landscape. A landscape-led approach uses SuDS as a mechanism to create strong green infrastructure networks and is important to increase connectivity to the wider ecosystem and landscape. Effective integration will also require carefully researched and selected plants, which work to improve the local green infrastructure and enhance biodiversity. Also selection of hardscape materials used in SuDS construction, such as concrete, brickwork, wood, aggregate and paving, should

consider the surrounding landscape and urban character and be developed alongside the overall urban design vision. Using a landscape led approach will improve the amenity value of SuDS for local residents, and provide water management and design benefits.

Recognise and conserve the significance of Cambridgeshire's historic and archaeological environment

6.3.26 Cambridgeshire has a strong history and tradition of water management, dating back two thousand years. SuDS design should recognise the importance and significance of what has been done before and where possible duplicate or enhance it. Materials used should be sympathetic to the built environment and reflect local design guides or other planning policy documents.

6.3.27 Where proposals will impact on the significance of designated or non-designated heritage assets, appropriate mitigation should take place as part of the SuDS proposal. Buried archaeological deposits can be damaged by changes to the water management regime in an area such as a change in groundwater levels or soil moisture content. The design of SuDS should take the presence of any buried archaeology into consideration and developers should undertake early discussions with Historic England and Cambridgeshire County Council's Historic Environment Team.

Minimise embodied carbon in SuDS

6.3.28 One of the advantages of SuDS is their ability to improve the natural environment. It is important that environment improvements from SuDS are not reduced by incorporating high carbon solutions. The excessive use of concrete and other aggregates with high levels of embodied energy is discouraged. Eliminating energy consuming water pumps whenever possible is also encouraged. Vegetated SuDS components can have a positive impact by storing carbon as they grow, through a process known as carbon sequestration.

Minimise waste in SuDS

6.3.29 When undertaking the maintenance of SuDS, waste will be generated. This will be predominantly grass and other vegetation, and may be managed on site in wildlife piles. There is still a requirement to comply with all relevant waste management legislation and ensure waste is taken to an appropriately licensed site. This is even more pertinent when waste is disposed off-site. Management of SuDS on industrial sites will need to ensure hazardous waste is disposed of separately.

Design for wildlife and biodiversity

6.3.30 SuDS can provide the ideal opportunity to bring urban wetlands and other wildlife-friendly green spaces into towns and cities. They can be linked with existing habitats to create blue and green corridors whilst providing an amenity and education resource for the community.

6.3.31 Where possible, existing habitats should be retained and incorporated into the landscape design. SuDS features are likely to have greater species diversity if existing habitats are within dispersal distance for plants, invertebrates and amphibians. It should however be noted that existing wetlands should not be incorporated into SuDS unless there is a guaranteed supply of clean water.

6.3.32 An aim should be to create new habitats based on the ecological context and conditions of the site. Habitats and species objectives that contribute to local, regional and national biodiversity targets should be prioritised. Further information on local objectives can be found in local (BAPs). Guidance on maximising the biodiversity potential of SuDS can be found in the Royal Society for the Protection of Birds (RSPB) publication, Maximising the Potential for People and Wildlife.

Design for easy maintenance and access

6.3.33 When designing SuDS it is crucial to consider throughout the process how features will be maintained and accessed, who is ultimately responsible for the lifetime of the development, and the likely costs involved. Embedding foresight into every stage of the design process will produce a more effective, better maintained SuDS scheme upon completion. Design should also consider Construction Design and Management (CDM) Regulations from the outset to ensure that access is provided for maintenance and that health and safety measures are adhered to. Those responsible for SuDS across a development should ideally be provided with an operation and maintenance manual by the designer and this could be part of the documentation provided under CDM. Aspects that should be included within the operation and maintenance manual are shown in Table 6.2:

Table 6.2 : What to Include in the Operation and Maintenance Manual

- Location of all SuDS components on site
- Brief summary of the design intent, how the SuDS components work, their purpose and potential performance risks
- Depth of silt that will trigger maintenance
- Visual indicators that will trigger maintenance
- Depth of oil in separators etc. that will trigger maintenance
- Maintenance requirements (i.e. maintenance plan) and a maintenance record proforma
- Explanation of the objectives of the maintenance proposed and potential implications of not meeting those objectives
- Identification of areas where certain activities are prohibited (e.g. stockpiling materials on pervious surfaces)
- An action plan for dealing with accidental spillages of pollutants
- Advice on what to do if alterations are to be made to a development or if service companies need to undertake excavations or similar works that could affects SuDS
- Details of whom to contact in the event that pollution is seen in the system or if it is not working properly

Source: CIRIA 753 (Chapter 32)

6.3.34 Consideration should be given to access to, and maintenance of, existing infrastructure which includes existing watercourses. Many IDBs, Local Authorities and the EA have requirements and/or byelaws requiring maintenance strips adjacent to a watercourse and should be contacted for exact requirements in their area.

Design SuDS for brownfield sites

6.3.35 Previously developed land (brownfield sites) should not be seen as a barrier to using SuDS. When developing on brownfield sites, existing drainage infrastructure should be documented and mapped to determine what can be reused as part of the SuDS scheme.

6.3.36 The use of shallow surface features can often be a benefit in brownfield sites as they limit excavations into contaminated soils. The impact of the proposed SuDS features on any contamination and vice versa needs to be carefully assessed by an experienced professional. The presence of contamination in the ground may limit the use of certain features (e.g. soakaways) or require liners below ponds, basins and permeable pavements; however, it will never prevent the use of all SuDS features and a suitable system can be designed. The separation of surface water drainage and foul drainage should be a priority in these areas.

Consider flood extents in SuDS design

6.3.37 The natural floodplain must be protected and considered in the design of SuDS. Where SuDS are proposed in a fluvial or tidal floodplain (Flood Zones 3a or 3b) the features may fill during a flood event and would therefore not have capacity to hold the rainfall runoff from the site as originally intended. Large areas of Cambridgeshire, where land is low lying, are in the floodplain, and a pragmatic approach to SuDS design needs to be taken where flood risk is carefully considered. However, the presence of a floodplain should not explicitly exclude the integration of SuDS features for day-to-day water management provided the SuDS do not contribute towards stormwater storage requirements. Above ground SuDS should not be included in areas where water regularly flows or is stored.

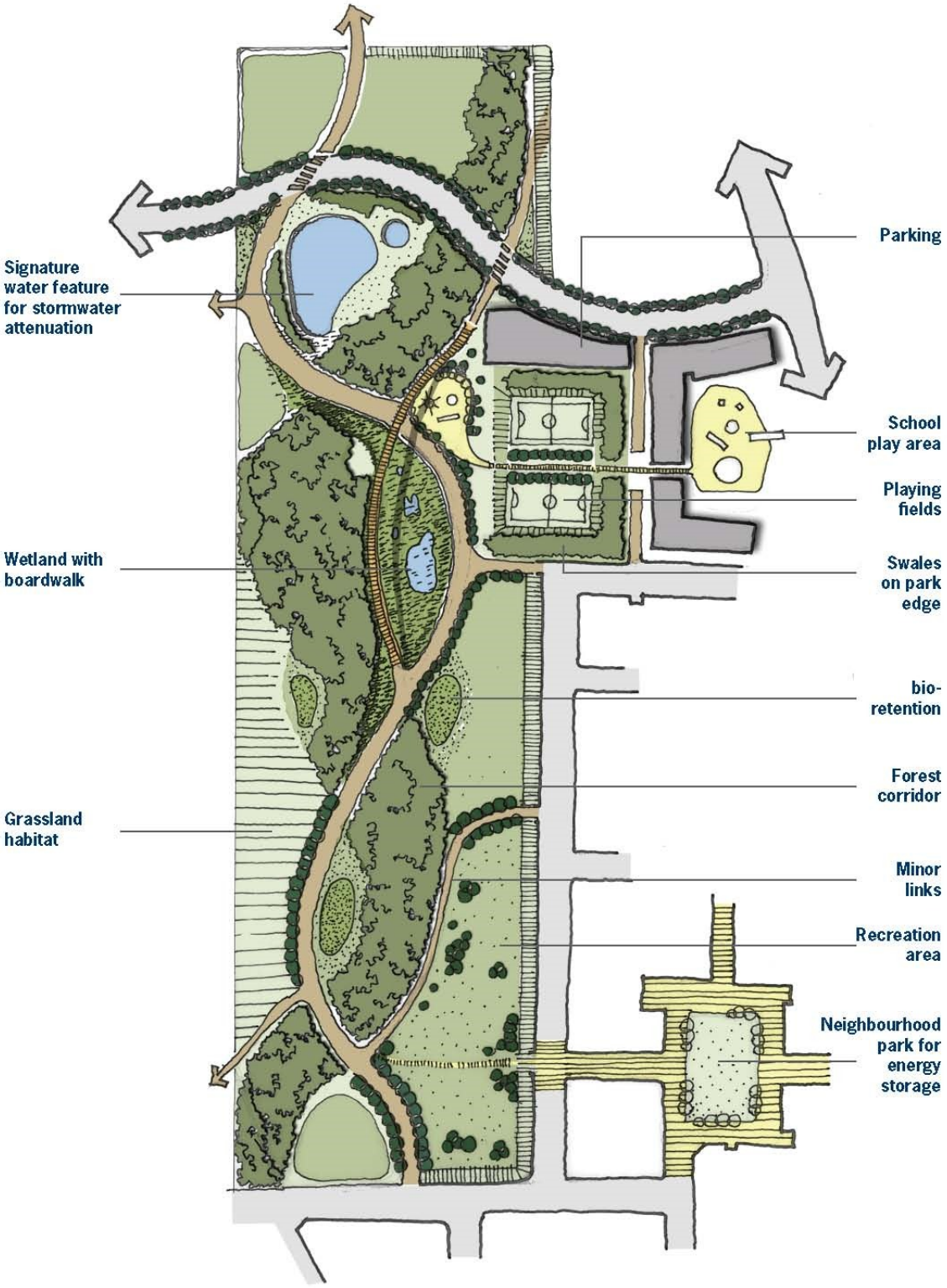
Design open spaces to incorporate SuDS

6.3.38 Open spaces are an asset to the community and to the environment and form an important component of a wider green infrastructure network. A network of woodland, recreational and open spaces, whether green or paved will be essential for well-designed developments . Open spaces can provide space for SuDS features to provide attenuation and treatment of surface water runoff. Good design will seek ways to integrate SuDS with the rest of the open space and to make SuDS features multifunctional. In these areas there is a need to concentrate on design and amenity value, recreational use, and fit with surrounding landscape (see Figure 6.9). Examples of multi-functional uses in open spaces include; temporary storage areas doubling as playing fields or recreation areas, hardscape attenuation doubling as water features and public art, bioretention areas doubling as landscaped garden areas, wetlands and ponds doubling as amenity and habitat areas, and bioretention planters linking with open space divisions or seating areas. Within open spaces, SuDS design will also need to consider:

- The interaction with the public – safety, education, and controlled access via boardwalks or similar structures;
- Areas of the ground that are likely to be seasonally wet should not be used for formal or informal recreation and play space such as sports pitches;
- An appropriate balance between visual amenity and water treatment needs to be achieved – while amenity value is of increased importance, it should not impinge on SuDS treatment and water management;
- Situating SuDS away from floodplains that might impact on SuDS treatment and floodplain storage and conveyance;
- Ecological needs – existing vegetation of biodiversity value should be retained whenever possible, and land stability taken into account.
- Opportunities to reuse recycled surface water for irrigation or other purposes.
- LPA's specific policy regarding water ponding in or near play areas. It is the responsibility of the developer to be aware of relevant local policy.

6.3.39 Where the local authority will adopt SuDS in public open spaces, they must still be able to function and be accessible as useable open space for the majority of the time for them to be included within the open space calculations.

Figure 6.9 : Intergration of SuDS features into open space design



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

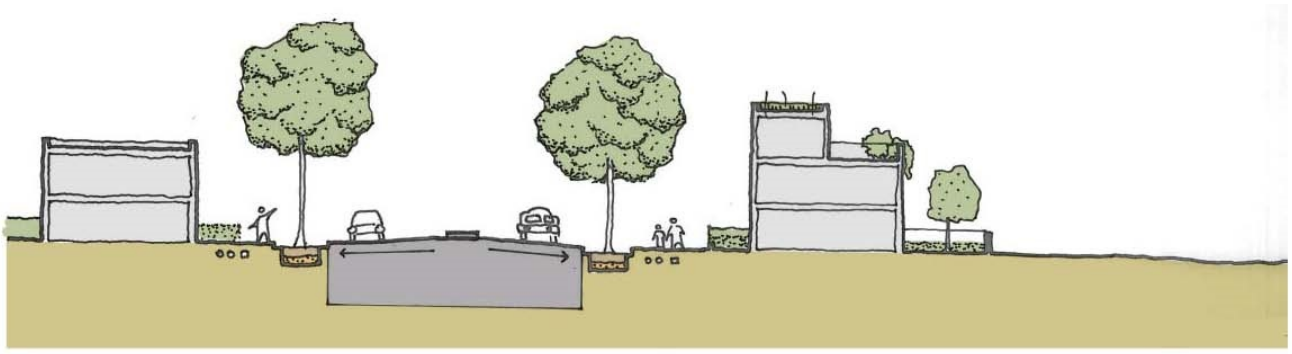
Design streets to incorporate SuDS

6.3.40 Within a catchment, streets and roads are a significant source of surface water runoff and pollutants. Streets are often used as a conveyance of surface water drainage from adjoining sites via underground pipes, and in a SuDS network they are likely to also be key conveyance routes for example through the use of roadside swales. Therefore there is a prime opportunity in streetscapes to integrate SuDS features that capture, treat and attenuate surface runoff. Improving upon traditional drainage, streetscapes can include bioretention technology (rain gardens) with appropriate conveyance such as swales or under-drained SuDS features to minimise the need for conventional piping. A number of standard streetscape features can include SuDS and become multifunctional, including verges, tree pits, traffic calming islands, and parking dividers. To implement SuDS effectively either along or within streets, there is a need to consider:

- Easy and safe access for all highway users, irrespective of mode of travel;
- Easy access to utilities for maintenance workers;
- Improvement to the urban design of streetscapes and contribution to sense of place; and
- Robust design to reduce maintenance and replacement requirements

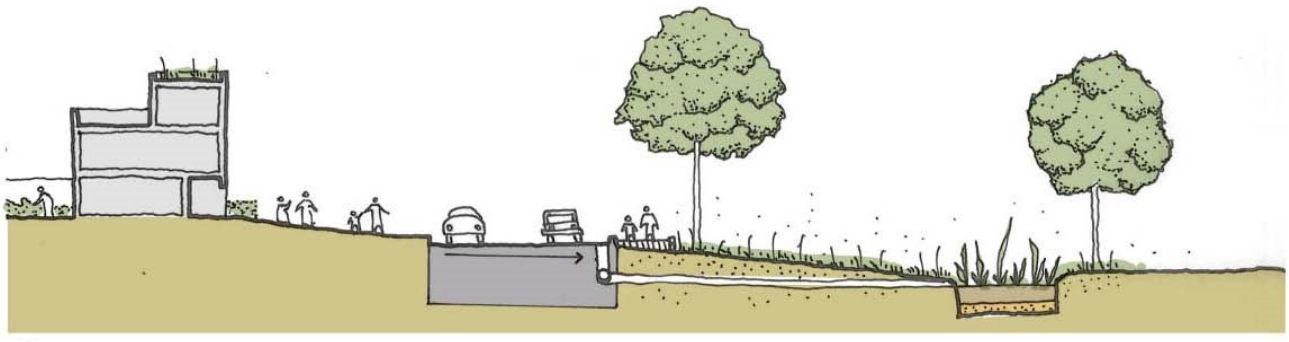
6.3.41 Figure 6.10 to Figure 6.12 demonstrate how SuDS can be incorporated into street design.

Figure 6.10 : Street design to drain SuDS features to either side



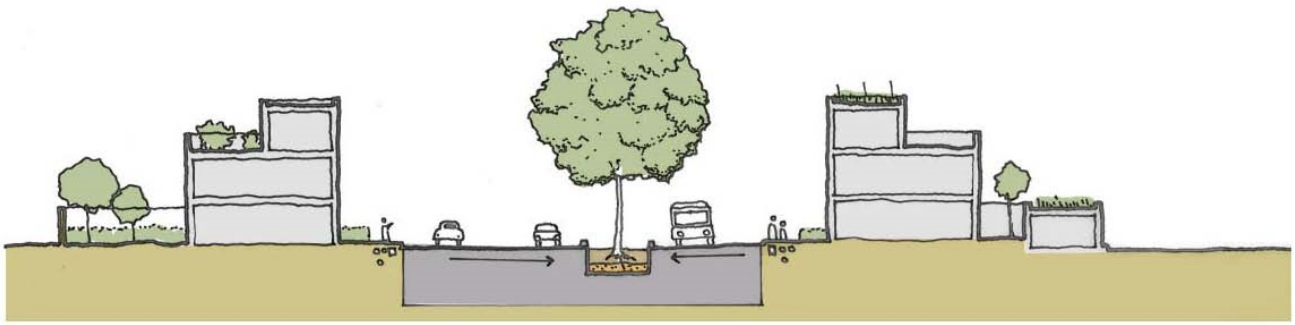
Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Figure 6.11 : Street design to drain to adjoining lower ground SuDS feature



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Figure 6.12 : Street design to drain to central SuDS feature



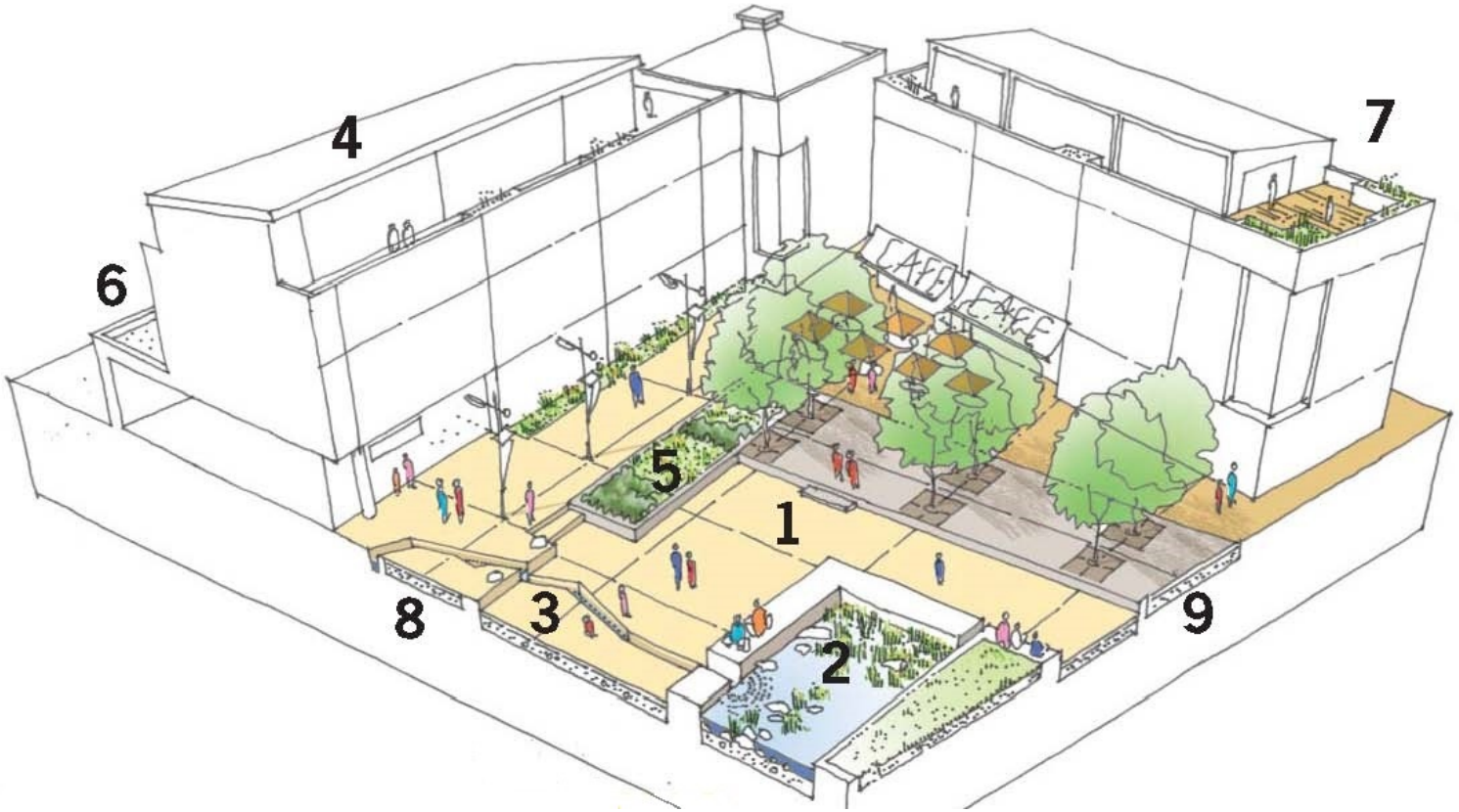
Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Design SuDS to match the density of development

6.3.42 Limited space is often cited as a reason for not including SuDS, which is not acceptable in Cambridgeshire as solutions do exist. Ideally, initial layout should consider how source control and localised SuDS features can be sized and located to provide adequate attenuation and treatment of runoff from high density areas. It is still possible to use SuDS in high density developments, but design needs to be suitable. Source control measures like green roofs and rainwater harvesting are strategies to reduce runoff. Additionally, building downpipes can be altered or disconnected to feed into gardens, soakaways or permeable paving. In high density courtyards and streets there is also potential to incorporate bioretention features and planted rills. Figure 6.13 to Figure 6.15 demonstrate how SuDS can be incorporated into developments of varying densities.

Figure 6.13 : SuDS options in high density developments.

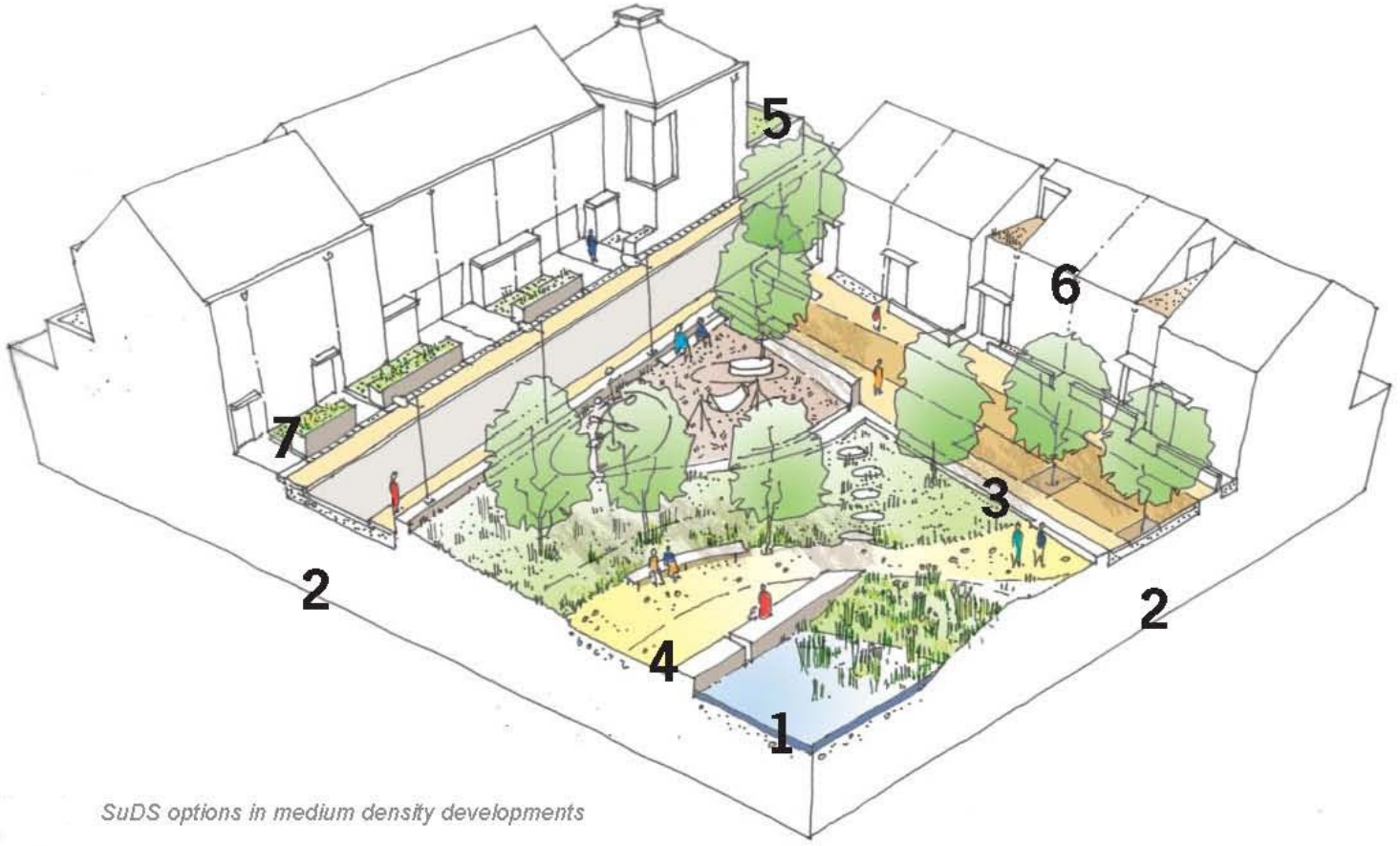
1 Urban square with permeable paving
2 Retention pond with integrated seating
3 Rill within pedestrianised shopping street
4 'Brown' roofs within town centre
5 Rain garden/planted bio-retention element
6 Green roofs
7 Roof gardens
8 Permeable paving within street
9 'Bio-retention tree pits within square



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Figure 6.14 : SuDS options in medium density developments

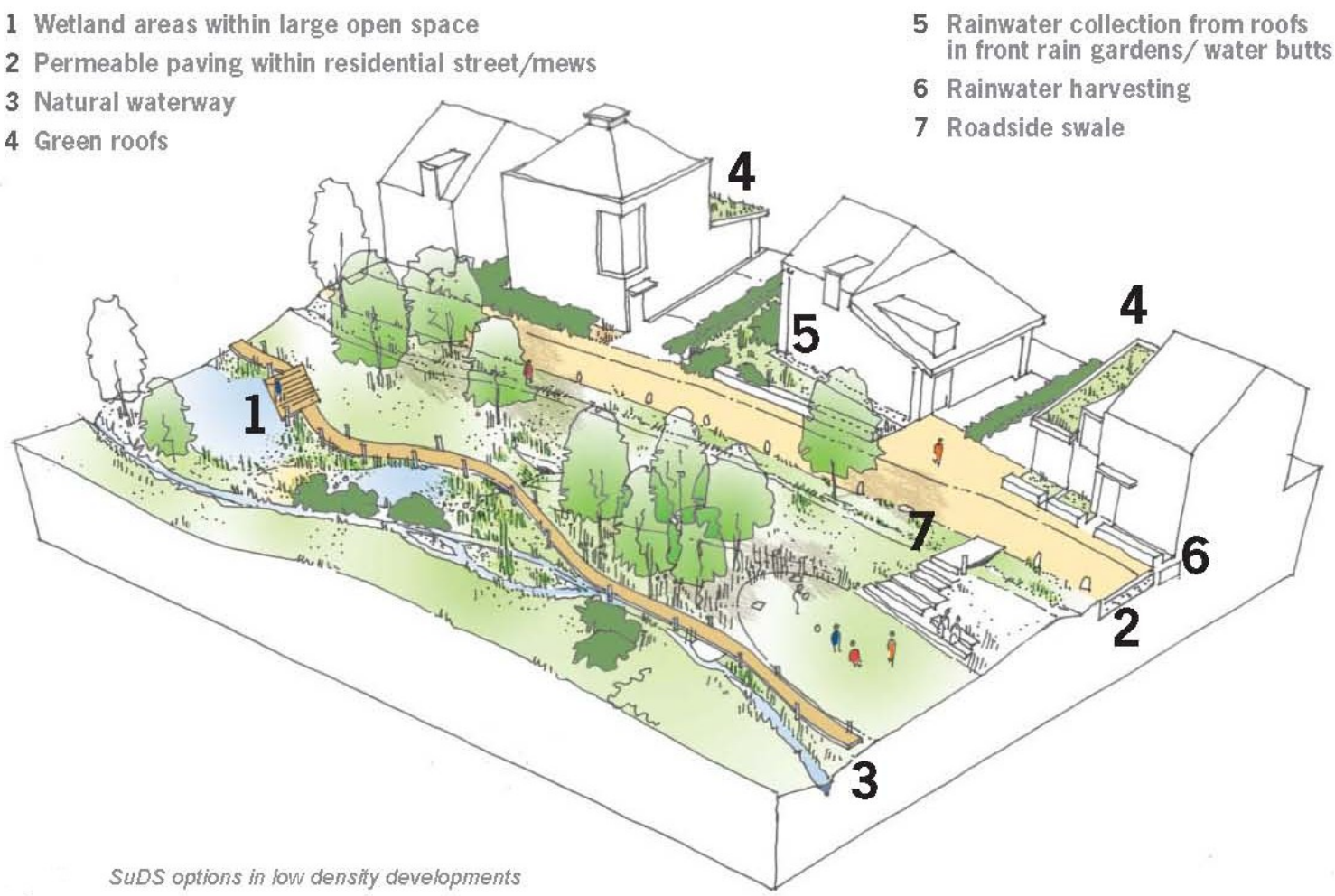
1 Filter strip and retention pond within residential square
2 Permeable paving within residential street/mews
3 Roadside bio-retention tree pits
4 Gravel/permeable surfaces within residential square
5 Green roofs
6 Roof gardens
7 Rainwater collection from roofs in front rain gardens/water butts



SuDS options in medium density developments

Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Figure 6.15 : SuDS options in low density developments

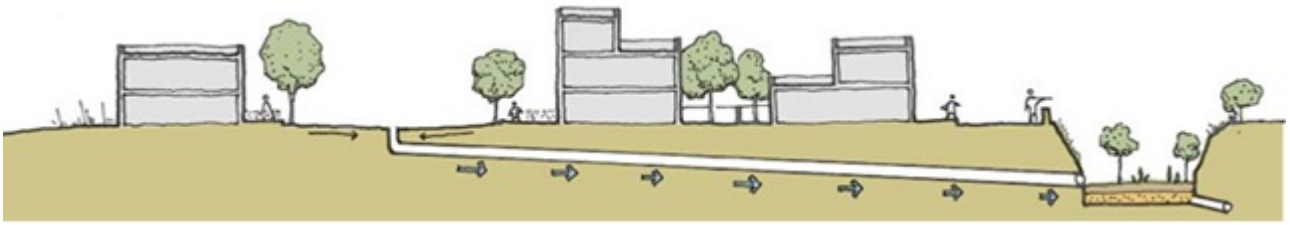


Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Design SuDS for flat sites

6.3.43 Drainage is particularly important on flat sites that do not have the opportunity to take advantage of gravity. Hydraulically efficient kerbs should be designed to channel water directly onto above ground SuDS, before draining to underground storage, or a piped network. Alternatively, roadside swales located within the road verge with flush kerbs can enable surface water to discharge directly into the swale, where it is pre-treated before discharging to a SuDS feature downstream, such as a retention pond, rain garden, or wetland. By keeping water on the surface as much as possible, deep downstream management features can be avoided. Deep features are undesirable due to increased excavation, the potential need for unnecessary pumping and the requirement for mitigation measures. Figure 6.16 demonstrates the negative impact a piped system can have on flat sites.

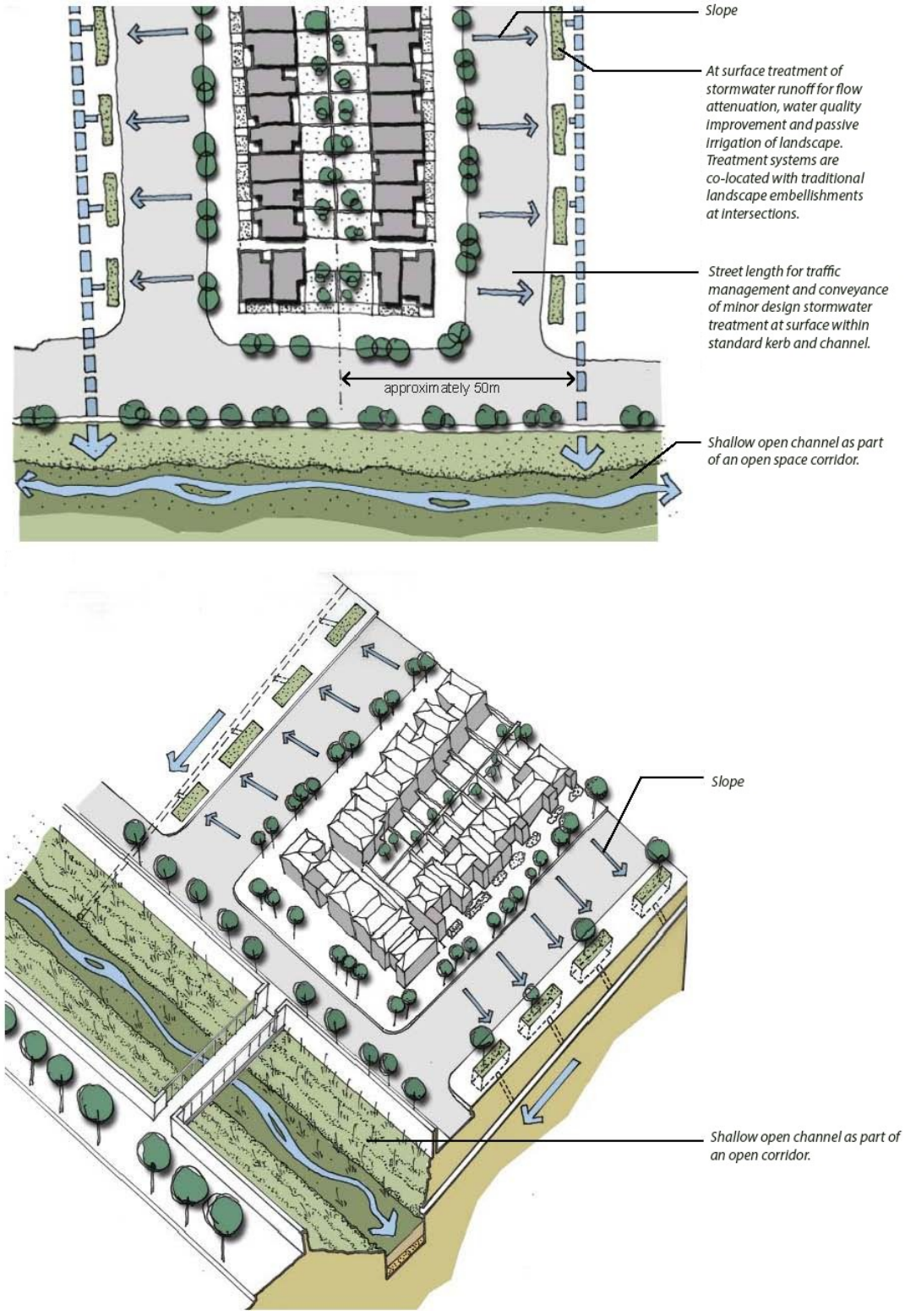
Figure 6.16 : Negative impact of piped drainage on a flat site



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

6.3.44 Figure 6.17 shows how SuDS could possibly be incorporated into a flat, urban site.

Figure 6.17 : Possible urban layout for a flat site



Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

Design industrial and agricultural sites to incorporate SuDS

6.3.45 Industrial and agricultural sites often have larger volumes of water discharge with higher levels of pollutants, and as such they require special attention. The best strategy is to separate water discharging from work areas, car parks and roofs. Water runoff from high-risk work areas should be separated into interceptor tanks and treated as industrial waste. This separation is vital to ensuring the surface water from non-work areas of the site that do not have the same contaminants, can be treated similarly to surface water runoff from residential and commercial properties. Additional treatment stages are required where runoff is being drained from higher contamination risk area, such as car parks. Each site should be designed based on the risk posed. Figure 6.18 demonstrates how SuDS can be incorporated in an industrial setting.

Figure 6.18 : Incorporating SuDS on industrial sites

Source: Woods Ballard, B., et al (2015) The SuDS Manual, CIRIA, C753

6.4 Design standards and designing for exceedance

6.4.1 In a new development there should be no flooding of any properties as a result of that development for a 1 in 100 annual probability (critical) rainfall event plus an appropriate allowance for climate change (refer to Chapter 5 for details of climate change allowances). In line with Sewers for Adoption, there should also be no water outside of the designed system for a 1 in 30 annual probability (critical) rainfall event.

6.4.2 Consideration should also be given as to how the system performs for events that exceed the design capacity of the system or if a part of the system blocks or fails. This is generally referred to as designing for exceedance. Guidance on how to apply this can be found in Designing for Exceedance in Urban Drainage: Good Practice (C635).

6.5 Designing for water quality

6.5.1 SuDS have a considerable advantage over traditional drainage as a well-designed system will provide a level of treatment to surface water runoff before it is discharged into the receiving water body. It does this through a number of processes including filtration, settlement, and uptake by plants.

6.5.2 To protect the water quality of receiving waters, runoff from a site should be of an acceptable water quality to help ensure current and/or future water quality objectives are not compromised. As there can be a wide range and level of contaminants contained within surface water runoff, water quality needs to be managed using a risk-based approach, facilitated by the SuDS management train. The SuDS management train refers to a variety of SuDS components in a series that provide treatment processes to deliver a gradual improvement in water quality as water moves through the system.

6.5.3 The size and number of treatment stages required is based on the level of pollution entering into the system. For example, industrial sites will contain a higher level of pollutants within surface water runoff than from a small residential road. Please refer to Chapter 4 of the Ciria SuDS Manual (C753) for further detail on designing SuDS for water quality.

6.6 Designing a safe environment

6.6.1 All SuDS schemes should be designed as a safe environment that can be accessed and enjoyed by residents and visitors. The use of fencing and barriers should not be the approach to making SuDS features safe, particularly in residential developments. It is however recognised that there may be cases in less sensitive environments (such as industrial areas) where steeper earthworks and safety measures are appropriate. The SuDS features themselves should be designed to be safe through measures such as:

- Following the topography of the site, this will minimise the depth of the features throughout the development.
- Ensuring gently sloping sides and that they are planted with vegetation to act as a barrier to unintended entry into the water.
- Ensure open areas of water are obvious to residents and visitors and any vertical drops are easily identified. The use of safety rings are generally not appropriate for SuDS as they are designed to be dropped vertically and not thrown any distance as they are heavy and awkward to handle. Their use should be limited to areas where they will be effective.
- Use of appropriate signage in the right locations. These should not be used as a replacement for appropriate design.

6.6.2 Further information can be found in the CIRIA publication, The SuDS Manual (C753) and the RoSPA publication Safety at Inland Water Sites.

6.7 Developing a surface water drainage strategy

Masterplanning

6.7.1 For larger developments a masterplan will be necessary. It is at this stage the SuDS layout (taking into account flow routes, topography, geology and green space) and proposed maintenance of the system should be determined whilst, ensuring a safe design and mitigation of flood risk (see Figure 6.1). Seeking advice at the earliest opportunity from the relevant WMAs will help avoid any costly issues or redesigns at a later stage. Effective master planning should ensure a robust, viable and cost-effective scheme from the outset, where objectives of the development are informed by the SuDS scheme and vice versa.

Pre-application

6.7.2 The majority of planning applications do not require a masterplan but all applicants should engage in pre-application discussions with the relevant WMAs before developing a surface water drainage strategy. This is the point at which key documents and information should be reviewed including topographic surveys, Strategic Flood Risk Assessment (SFRAs), geological maps, relevant site surveys and Flood Risk Assessments (FRAs) that have already been undertaken. Again Figure 6.1 can be used as a stage guide for how to integrate SuDS across sites. See Appendix E for details of the matters which should be considered at this stage.

Outline planning application

6.7.3 When an outline planning application is required the applicant should include an outline drainage strategy with the planning application. It should include enough design information that demonstrates the conceptual surface water drainage design across the site. The assessment submitted should outline the existing surface water run-off rates from the site and an indication of post development run-off rates with associated storm water storage requirements. SuDS should have been appropriately considered taking into account site specific drainage requirements and constraints and incorporated effectively into the overall masterplan. Appendix F includes a drainage proforma to be followed to ensure the correct information is included within the drainage strategy.

Full planning application or reserved matters application

6.7.4 Many developments move straight to a full planning application following pre-application discussions with the relevant WMAs. At this stage applicants will also be expected to submit a detailed surface water drainage strategy with the planning application. Whilst most topics will have been covered to some degree in the outline drainage strategy (if applicable) the applicant will be expected to provide more detail at this stage. The strategy should demonstrate that opportunities to integrate SuDS have been maximised and where obstacles to their use do persist this should be fully justified within the report. Where proposing to discharge into a third party asset (such as a watercourse or public sewer), appropriate permissions and required consents should have been discussed with the asset owner.

6.7.5 The key information a surface water drainage strategy must contain includes:

- How the proposed surface water scheme has been determined following the drainage hierarchy;
- Pre-development runoff rates;
- Post development runoff rates with associated storm water storage calculations
- Discharge location(s);
- Drainage calculations to support the design of the system;
- Drawings of the proposed surface water drainage scheme including sub catchment breakdown where applicable;

- Maintenance and management plan of surface water drainage system (for the lifetime of the development) including details of future adoption;
- Completed drainage proforma – the applicant must ensure that the surface water strategy contains the appropriate level of information in relation to the points covered in the proforma.

6.7.6 Note that the size and complexity of the site will determine how much information is included within the surface water drainage strategy however using the pre-application design checklist and drainage proforma in Appendix F will ensure the right matters are covered with the appropriate level of detail.

6.8 Approval of SuDS

6.8.1 SuDS are approved as part of the planning application for a development. It is the LPAs responsibility to ensure that the design submitted as part of either an outline or full planning application is robust and contains adequate detail to ensure that the SuDS are appropriate for the development and will be adequately maintained throughout their lifetime. The LPA may also seek expert advice from the LLFA as part of this process. For major developments national guidance for SuDS can be found in the PPG, additionally the Non-Statutory Technical Standards for Sustainable Drainage Systems provides the high level principles all SuDS designs must follow.

6.8.2 A surface water drainage strategy is required to be submitted with a planning application which should contain details of the SuDS. Its scope should be commensurate with the size of development and can range from a paragraph describing the proposed drainage measures with a discharge location for residential extension, to extensive hydrological modelling accompanied by a full report with drawings for a larger site. Further details on what should be considered or included can be found in Appendix E; this guidance is likely to be updated over time to focus more specifically on different scales of development.

6.9 Adoption and maintenance of SuDS

6.9.1 The LPA may seek advice for developers looking to source an appropriate body for SuDS adoption and maintenance. It is recommended that a statutory organisation takes on the role of maintaining the SuDS as this will guarantee maintenance of the drainage system in perpetuity; however where this is not possible, alternative bodies may also be able to maintain SuDS, provided that a suitable maintenance plan has been submitted to and agreed with the LPA. Statutory organisations in Cambridgeshire may include organisations such as the local authorities, Anglian Water and IDBs. For SuDS serving the highway these should be discussed with the Highways Authority at Cambridgeshire County Council (CCC) to ensure suitability for adoption.

6.9.2 Open space provision within development sites is a normal planning requirement and offers suitable landscaped areas for the inclusion of a wide range of SuDS features (e.g. ponds, basins and swales). These features can enhance the nature conservation and amenity value of the site, although a primary consideration should be the effectiveness and maintenance of the SuDS.

6.9.3 Where local authorities are adopting the open space provision, this could include adoption of the SuDS features within the open space (seek clarification from individual local authorities). In adopting these features, a range of issues will need to be addressed:

- The primary purpose of the SuDS features relate to drainage. If the open space is to be used for other purposes, such as nature conservation or as a play area, this must not conflict with the effective working and maintenance of the SuDS.
- Safety issues will come into play if a body of water is involved.
- There is a need to ensure that a long-term, effective maintenance regime is in place along with a long term habitat management plan where appropriate

6.9.4 Some local authorities may have specific design and adoption standards in place, for example in Cambridge City, and these should be referred to and early consultation undertaken with the relevant LPA.

6.9.5 If the applicant is minded to choose Anglian Water as the appropriate body for SuDS adoption they should ensure the proposed design meets Anglian Water's adoption criteria, referencing relevant guidance and advice where appropriate. Further guidance on Anglian Water SuDS adoption (including their Sustainable Drainage Systems Adoption Manual) is available on the Anglian Water website.

6.9.6 In some situations, IDBs may adopt above ground SuDS features. If this option is pursued, the developer should engage in early stage discussions with the relevant IDB to ensure it meets their criteria. Further guidance is available from the individual IDBs.

6.9.7 Section 106 of the Town and Country Planning Act 1990 provides a suitable mechanism by which properly designed SuDS features can be transferred into the management and maintenance responsibilities of a local authority or other statutory organisation. The local authority should secure a financial mechanism through commuted sums, identified in the adoption agreement, to facilitate maintenance and management requirements. This would allow adoption of the areas within an acceptable timeframe without placing additional burdens on the local authority's resources. Clarification will also need to be sought from the relevant LPA on whether SuDS are delivered through the Community Infrastructure Levy or Section 106.

6.9.8 In certain circumstances where a management company is required to maintain the SuDS, a legal agreement tied to the title of the property will need to be agreed with the LPA (usually via a Section 106 agreement). If this is the case then discussions will need to take place during the pre-application stage of the development so that assurances can be made that this is the correct option for the development. Evidence should be provided by the applicant on the suitability and experience of the management company during this process.

7 Water Environment

The aim of this chapter is to consider the water environment in response to the requirements (e.g. ecological matters) set out within the European Water Framework Directive, and it looks at what supporting plans are in place to support those objectives from a planning perspective. For the majority of planning applications, compliance with the Directive will be dealt with via the Environment Impact Assessment requirements, but for some applications that have a direct impact upon a waterbody, a more detailed assessment may be required.

7.1 Introduction

7.1.1 The European Water Framework Directive (WFD) is an established legal framework for managing the water environment. Under the WFD the UK must aim to achieve 'good ecological status' by 2015 in all surface freshwater bodies, including rivers, lakes, groundwater, transitional and coastal waters regardless of size and characteristics. Other objectives of the WFD include preventative deterioration of the status of all bodies of surface water, including groundwater.

7.1.2 Development proposals may affect the water environment in various ways. Impacts leading either to deterioration in the status of a water body or to the water body being unable to achieve its WFD objectives can only be permitted in wholly exceptional circumstances. New development must be assessed to identify if it will cause deterioration, or lead to failures to achieve ecological objectives. New development also offers the opportunity to enhance the quality of the water environment.

7.2 River basin management plans

7.2.1 River Basin Management Plans produced by the EA, in consultation with the LPA, detail the pressures facing the water environment and what actions need to be taken in order for the WFD to be met in each area. The Anglian District River Basin Management Plan (ARBMP - December 2009) covers Cambridgeshire; an updated 2015 Plan is currently under consultation.

7.2.2 The ecological benefits of improved water quality in Cambridgeshire are significant. High water quality attracts species and encourages habitat creation; improving the biodiversity of the surrounding area. Species such as fish, newts, kingfishers and water voles are dependent on high water quality. The following areas in Cambridgeshire are considered to have habitat importance and maintaining high water quality is required.

- Ouse Washes Ramsar, SAC and SPA
- Fenland SAC
- Portholme SAC
- Devils Dyke SAC
- Breckland SAC and SPA
- Fenland SAC (Woodwalton Fen, Chippenham Fen, Wicken Fen)
- The River Cam - designated wildlife site
- Stourbridge Common Local Nature Reserve
- Sheep's Green and Coe Fen Local Nature Reserve

7.2.3 If sensitively managed, the river and its banks provide opportunities for declining species to recover and disperse.

7.3 Water Framework Directive and the planning process

7.3.1 Where developments require an Environmental Impact Assessment (EIA), applicants should include the impact resulting from development on the water environment in the EIA assessment using information from the ARBMP or directly from the EA. However, there will be instances where an EIA is not required. A screening opinion should be sought from the relevant LPA to determine whether an EIA is required for the particular development.

7.3.2 Where developments do not require an EIA but have the potential to impact on water bodies then applicants should consult the EA as a separate assessment might be required.

7.3.3 There may be proposals that do not need EIA but have potential WFD-related impacts for example marinas, development in close proximity to a river bank, channel diversions, new culverts on main rivers, mineral extraction close to watercourses or intensive agriculture. In most cases the EA can confirm where the WFD assessment might be most appropriate to be undertaken.

7.3.4 WFD Assessments are sometimes required by the EA for developments where permissions are required for works near/on main rivers under the Water Resources Act 1991.

7.3.5 Sustainable Drainage Systems (SuDS) should be utilised in as they support good quality water environments by mimicking the way nature deals with rain water, rather than piping surface water run-off from a development directly to a watercourse, evening out peaks and troughs in the amount of run off and reducing pollutants reaching watercourses.

7.3.6 SuDS can provide water quality improvements by reducing sediment and contaminants from runoff either through settlement or biological breakdown of pollutants. The full potential for the use of SuDS should be reviewed in the initial stages of planning the development (Refer back to Chapter 6 for further guidance on using SuDS).

7.3.7 Another source of information leading on from the WFD are Water Cycle Studies (WCS). The WCS assesses the capacities of water bodies and water related infrastructure to accommodate future development and growth throughout Cambridgeshire, for each of the city and district councils, and is intended to support the evidence base for their relevant local plans.

7.4 Water resources and waste water

7.4.1 If the water supply or wastewater discharge needs of any future development are likely to cause deterioration to the WFD status, the LPA and applicant will need to take this into consideration and determine and manage the impacts accordingly.

7.4.2 The supply of drinking water to Cambridgeshire involves abstraction from water resource zones across the County and the wider area. The resilience of the supply systems have the potential to be affected by the impact of climate change and severe weather related events. Both Cambridge Water and Anglian Water have encompassed the potential effects of climate change within their Water Resource Management Plans, which have determined the need for investment in both mitigation and adaptation, specifically to reduce water consumption particularly in water stress areas.

Table 7.1 : Water resource zones in Cambridgeshire

Council/ Area	Water resource zone
Cambridge Urban Area	Reservoir to the east of the city and boreholes within the network.
East Cambridgeshire	Chalk Aquifer within the Cambridgeshire and West Suffolk Zone (WRZ9)
Fenland	Chalk Aquifer- Fenland WRZ (supplying Wisbech and surrounds), Ruthamford (supplying March, Doddington, Chatteris and Peterborough)
Huntingdonshire	Ruthamford North and Ruthamford South Water Resource Zone
South Cambridgeshire	Ground water Borehole Abstraction within the Cam and Ely Ouse Catchment Area

7.4.3 When water is removed from a river it can reduce water quality due to reduced dilution of pollutants. Standards are in place between the EA and the relevant water company to ensure that most of the time water levels within the river are maintained at an appropriate level for fish and other wildlife. However, in drought periods or with increasing demand water companies may need to apply for a permit to increase abstraction, and hence reduce river levels. Queries regarding increases to abstraction should be directed to the EA in the first instance.

7.4.4 If the local water and sewerage company reaches a point where it needs to apply for a permit for increased discharge flows from a sewage treatment work (STW), it is likely that the water quality limits will be tightened. This is intended to aid achievement of the water quality objectives of the receiving water body under the WFD. Details of treatment work infrastructure can be found with the relevant LPAs WCS and their update reviews.

7.4.5 Any additional discharges beyond those permitted into the Middle Level Commissioners (MLC) and associated Internal Drainage Boards' (IDBs) systems will require their prior written consent together with the payment of the relevant fee.

7.5 Development location in relation to catchment or watercourse

7.5.1 Under the WFD, a development's location within a catchment or its proximity to a watercourse is relevant. Proximity to a watercourse is relevant where, for example, development or engineering works could affect the ability of the body responsible for maintaining the watercourse to access, maintain or improve the water body, or where it could affect the flow in a watercourse. Riverside development must therefore be set back a reasonable distance from the water's edge, allowing a corridor between the two environments.

7.5.2 IDB's and some awarded watercourses have a specific minimum width for a maintenance strip. While this corridor is crucial for access for maintenance, it is also the most effective means of ensuring there is potential for habitat and ecological benefits. Appropriate form and landscaping of the riverbanks can be fulfilled through good design. The width of 'maintenance access strips' may vary depending on the size of the watercourse, the type of maintenance that is required, and the organisation responsible for maintenance. The width will therefore be determined on a case by case basis with developers bearing in mind the need for access and green infrastructure. Queries regarding maintenance should be directed to the IDBs in the first instance.

7.5.3 Special consent may be required from Cambridgeshire's water management authorities (WMAs) for development that takes place inside or within a certain distance of a non-main river watercourse. Developers should contact Cambridgeshire County Council (CCC) (the Lead Local Flood Authority (LLFA)) for further details.

7.6 Aquatic environment

7.6.1 Planning Policies in Local Plans provide guidance to ensure development adjacent to watercourses protects and enhances the physical and natural landscape. Proposals for new development should where possible enhance the natural resources of the river corridor, and offer opportunities where applicable for the re-naturalisation of the river to improve water quality, increase public access to adjacent open spaces and improve the integrity of the built environment in terms of its location, scale, design and form.

7.6.2 Where a watercourse must still serve a function for which it has been modified or was originally created, naturalisation and habitat measures may need to be more subtle or more carefully considered since they must not, for example, increase flood risk. This could be the case in Cambridgeshire where a large number of the watercourses in the north and east of the county are managed by an IDB. Smaller changes such as the installation of fish passes alongside pumping stations or bank-side planting can be particularly valuable to improve the habitat for native species. Reference should be made to the Drainage Channel Biodiversity Manual (NE121). This document has been written for use by IDBs operating in England and looks to tackle the challenge of making space for both flood waters and wildlife through the integrated planning and management of drainage catchments. Examples of some of the measures are set out below:

- Forming marginal ledges in open channels
- Changing the timing of works to accommodate species
- Having maintenance rotation periods
- Using 'softer' erosion control measures such as sedge plugs and coir roll revetments

7.6.3 The EA's online WFD mitigation measures manual provides examples of methods currently used (where appropriate to individual sites) to bring about river naturalisation and improve the WFD status of rivers.

7.7 Highways

7.7.1 Highway developments may result in negative impacts on water bodies. Where this occurs, positive measures must be considered. The following are some examples of how positive measures can be included in highways developments:

- Where a bridge crosses a watercourse or a road runs down towards a river, surface water exceedance flows may lead water to run off these surfaces directly into a water body, taking heavy metals and hydrocarbons with it. Balance and holding ponds should be installed adjacent to bridges and other highways enabling pollutants to collate.
- The design of new bridges may require river edges to be strengthened and hardened on both sides potentially cutting off a wildlife corridor and increasing for example otter mortality on our roads. The installation of an otter crossing, including a mammal ledge and guide fencing, under the A1 at Hail Bridge (near St Neots) has helped to minimise such an impact by providing a safe crossing for mammals when water levels are high.
- Culverting of a watercourse under a carriageway causes a loss of ecological diversity and habitat continuity which may interrupt the migration routes of animals. Using culverts that create the natural river bed morphology and natural invert levels can help reduce such impacts. Retrofitting baffles and/or ripracks to existing culverts can help improve fish passage.

7.8 Land contamination

7.8.1 Groundwater beneath development sites can provide a base flow to surface waters in that the water will find its way to the surface via channels which are often not apparent. Ground conditions on brownfield land potentially affected by contamination should therefore be investigated prior to decisions being made about site layout and design of drainage systems.

7.8.2 If there is potential for land contamination on site then this can affect more areas than just drainage and water environments. Planning policies contained within the Local Plans require that sites with the potential to be affected by contamination undertake a preliminary assessment prior to a planning decision being made (see Appendix A). This will identify if additional measures and investigations need be carried out before development commences. Pre-application advice can be sought from the relevant LPA and the EA to assess the possible contamination of a site to ensure a smoother planning application process.

7.8.3 Planning conditions can control pollution during construction, but this may not be appropriate for land contamination, which should be addressed in principle prior to development decisions. Further information is included in the planning policies and supporting text in each LPAs Local Plan (see Appendix A for further details on relevant planning policies).

7.8.4 Developers seeking further guidance about land contamination should refer to the following documents, or any successor documents, available on the Environmental Agency Website:

- Technical Guidance on the management of contaminated land (2014).
- The risk management framework provided in CLR11: Model Procedures for Management of Land Contamination; and
- Guiding Principles for Land Contamination for the type of information required in order to assess risks to controlled waters from the site.

Appendix A Local plan policies

Each Local Planning Authority (LPA) within Cambridgeshire has its own adopted (or is working towards adoption of its own) Local Plan. Local Plans set out a vision for their administrative area and the planning policies necessary to deliver the vision. The relevant LPAs and their adopted or emerging planning policies that this SPD supports Local Plans are listed below:

A.1 Cambridgeshire County Council

The Cambridgeshire & Peterborough Minerals & Waste Development Plan 'Core Strategy Development Plan Document'(adopted July 2011), sets the type and amount of Minerals and Waste development that will be accommodated in Cambridgeshire up until 2026.The relevant planning policies are as follows:

- CS22 (Climate Change)
- CS35 (Biodiversity and Geodiversity)
- CS39 (Water Resources & Pollution Prevention)

The Cambridgeshire & Peterborough Minerals & Waste Development Plan 'Site Specific Proposals DPD' (adopted February 2012) identifies sites for development to meet the vision of the Core Strategy.

The County Council has also produced a number of (SPDs) to accompany the development plans. The relevant SPDs are as follows:

The Location and Design of Waste Management Facilities SPD (Adopted July 2011)

This SPD provides detailed guidance to help implement policy CS22 (Climate Change) of the Core Strategy DPD, and makes particular references to flood risk and water resources/quality. The document also supports and cross references the following planning policy:

- CS35 (Biodiversity and Geodiversity)

The Block Fen/Langwood Fen Master Plan SPD (Adopted July 2011)

The Master Plan provides a more detailed land use planning framework for mineral and waste activity in the Earith / Mepal area, and builds upon the proposals set out in the Core Strategy. Water storage and flood prevention are a common theme within the SPD. The SPD aims to guide developers on the implementation of proposals for the Block Fen/Langwood Fen area mainly through policies:

- CS3 (Strategic Vision & Objectives for Block Fen/Langwood Fen)
- CS5 (Earith/Mepal)
- CS20 (Inert Landfill)

A.2 Cambridge City Council

The 'Cambridge Local Plan 2014: Proposed Submission' sets out how Cambridge City Council will meet the development needs of Cambridge to 2031. The key policies that are of relevance are as follows:

- Policy 27: Carbon reduction, community energy networks, sustainable design and construction, and water use
- Policy 31: Integrated water management and the water cycle
- Policy 32: Flood risk
- Policy 33: Contaminated Land

The City Council also has a number of SPDs that are of relevance to this Flood & Water SPD, which are as follows:

Draft Planning Obligations Strategy Supplementary Planning Document (June 2014)

This draft SPD has been written to support the emerging Cambridge Local Plan 2014 and the emerging Cambridge Community Infrastructure Levy (CIL), both of which the Council expects to adopt in 2015. This SPD supports Policy 85 (Infrastructure delivery, planning obligations and the Community Infrastructure Levy) of Cambridge's draft Local Plan. Strategic improvements to landscape, habitats, access to the countryside and major green infrastructure projects could be funded by CIL. Environmental mitigation measures will be considered on a site by site basis. Depending on the scale of the development there may be circumstances where schemes require mitigation measures to be included in a Section106 Agreement. Matters which could be included in a S.106 Agreement include:

- Ecological Mitigation/Remediation
- Major contamination issues

Open Space & Recreation Strategy (adopted October 2011)

This document, which forms part of the technical evidence base for the Local Plan, seeks to ensure that open space supports the development of sustainable communities, and the enhancement of the health and well-being of residents and the biodiversity of the city.

The Council is also due to update its Sustainable Design and Construction SPD, which will provide further guidance on policy requirements regarding water conservation measures and water sensitive urban design.

The Council has also adopted the Cambridge Sustainable Drainage Design and Adoption Guide, which sets out the Council's requirements for the design of SuDS in public open spaces.

A.3 East Cambridgeshire District Council

The 'East Cambridgeshire Draft Local Plan (pre-submission version, February 2013)' sets out a blueprint for the future growth of East Cambridgeshire, covering a period up to 2031. Contained within the draft document are planning policies which are relevant to this SPD. The SPD is intended to supplement the following Local Plan policies:

- Policy HOU 9: Gypsies, travellers and travelling show people sites
- Policy ENV 2: Design
- Policy ENV 7: Biodiversity and geology
- Policy ENV 8: Flood risk
- Policy ENV 9: Pollution

East Cambridgeshire District Council have also produced a number of SPDs which are also relevant:

Design Guide SPD (adopted March 2012)

The Design Guide SPD is intended to set out the requirements and aspirations for development within East Cambridgeshire. Developers would need to consider a number of development principles including foul and surface drainage methods.

Developer Contributions SPD (adopted March 2013)

This SPD sets out the Council's approach to seeking developer contributions for infrastructure or environmental improvements required as a result of new development. It is aimed at developers, agents and the general public, and seeks to provide people with a better understanding of when planning contributions will be sought and how they will be used.

East Cambridgeshire District Council may seek planning obligations for certain types of infrastructure and benefits, including flood defence work and SuDS. Financial contributions through planning obligations may be sought towards the maintenance and/or monitoring of SuDS

A.4 Fenland District Council

The 'Fenland Local Plan' (adopted 8 May 2014) contains the policies for the growth and regeneration of Fenland up to 2031. The policies that are of relevance are as follows:

- Policy LP14 – Responding to Climate Change and Managing the Risk of Flooding in Fenland
- Policy LP16 - Delivering and Protecting High Quality Environments across the District

Fenland District Council has also produced two SPDs in support of their adopted Local Plan, with one of the SPDs directly relevant in the context of this SPD.

Delivering and Protecting High Quality Environments in Fenland SPD (adopted July 2014) The Delivering and Protecting High Quality Environments in Fenland SPD has been prepared to provide further guidance on a number of policies in the Fenland Local Plan 2014, in particular Policy LP16, 'Delivering and Protecting High Quality Environments across the District'. The following policies in the SPD are of relevance:

- Policy DM6 – Mitigating Against Harmful Effects
- Policy DM7 – Land Contamination
- Policy DM8 – Riverside Settings

Resource and Renewable Energy SPD (adopted July 2014)

This SPD sets out in detail Fenland District Council's policies in respect of resource use and renewable energy, in order to suitably expand on Part (A) of Policy LP14 in the Fenland Local Plan 2014.

A.5 Huntingdonshire District Council

Huntingdonshire's 'Core Strategy' (adopted September 2009) sets out the Council's strategy for sustainable growth over the plan period up to 2026. The following policies within the draft Local Plan are relevant to this SPD.

- CS 1: Sustainable Development in Huntingdonshire
- CS 10: Contributions to Infrastructure Requirements

The Council is preparing a new Local Plan 'Huntingdonshire's Local Plan 2036' which is intended to replace the Core Strategy once it has been adopted. In line with the NPPF (paragraph 216) policies contained in the emerging Local Plan may be considered to have weight once the plan has been subject to representations at the 'Publication' stage, also known as 'Proposed Submission'. Readers should contact Huntingdonshire District Council for up to date information about the emerging Local Plan and how this SPD supports draft policies.

A.6 South Cambridgeshire District Council

The 'South Cambridgeshire Development Control Policies Development Plan Document' (DPD) (adopted in July 2007) guides decisions on planning applications within South Cambridgeshire and sets out the Council's planning policies on a wide range of topics, including housing, jobs, services and facilities, travel, the natural environment and the Green Belt. The following planning policies are particularly relevant to this SPD:

- Policy DP/1: Sustainable Development
- Policy DP/4: Infrastructure and New Development
- Policy NE/6: Biodiversity
- Policy NE/8: Groundwater
- Policy NE/9: Water and Drainage Infrastructure
- Policy NE/10: Foul Drainage – Alternative Drainage Systems
- Policy NE/11: Flood Risk
- Policy NE/12: Water Conservation

South Cambridgeshire District Council is preparing a new Local Plan which once adopted will replace the Development Control Policies DPD. The 'South Cambridgeshire Local Plan'(submitted in March 2014) sets out how South Cambridgeshire District Council will deliver the levels of employment and housing development that should be provided over the plan period to 2031. The following planning policies are particularly relevant to this SPD:

- Policy CC/1: Mitigation and Adaptation to Climate Change
- Policy CC/7: Water Quality
- Policy CC/8: Sustainable Drainage Systems
- Policy CC/9: Managing Flood Risk
- Policy HO/1: Design Principles
- Policy NH/4: Biodiversity
- Policy NH/6: Green Infrastructure
- Policy SC/12: Contaminated Land
- Policy TI/8: Infrastructure and New Developments

Appendix B Applicant checklists

B.1 Drainage checklist

Development:	
Location:	
Date:	
LPA contact:	
EA contact:	
IDB contact:	
LLFA contact:	
General Notes:	

Recommended actions	Notes	Tick
Managing the risk of flooding (see Chapter 4)		
Establish if your development is at risk of tidal, river flooding or other forms of flooding. Check the flood maps on the EAs website, and the LPAs SFRAs and SWMPs		
Make sure the location of your development meets the Sequential Test (NPPG). Only where there is no other choice, carry out and meet the Exception Test.		
Assess what information is required to be included within your FRA, if one is required. See FRA checklist below for further details.		
Managing surface water (see Chapter 6)		
Before you plan your site, consider how you can manage the rate of surface water run-off so that it is similar to the conditions before the development. Also consider the effect this run-off will have on any receiving watercourse.		
Demonstrate in your FRA that you will deal with surface water by installing the best combination of SuDS techniques for your site (see FRA requirements below).		
Use CIRIA guidance to inform your choice of SUDS design for the development.		

Recommended actions	Notes	Tick
Where infiltration techniques are not possible, or where space is limited, you can still use features such as green roofs to reduce the rate or total amount of run-off.		
Speak to the LLFA about the surface water drainage proposals for your site. They can tell you what consents you will need, which types of SuDS are unsuitable and whether you will have to take special precautions to prevent pollution or reduce infiltration.		
Demonstrate in your FRA that you will deal with surface water by installing the best combination of SuDS techniques for your site.		
Ensure you have an adequate management and maintenance system in place.		
Water Resources (see Chapter 6)		
Design your development to at least meet the minimum level of Building Regulations or Local Planning policies related to water conservation where appropriate.		
Consider water and energy-efficient appliances and fittings in your development such as 'A-rated' washing machines and low or dual-flush toilets.		
If your development is large, consider leak-detection, rainwater-harvesting or even rainwater re-use systems. Information about their management and maintenance should be provided.		
Pollution Prevention (see Chapter 7)		
Talk to the local sewerage company to ensure: • there is sufficient sewage treatment capacity for the lifetime of your development; • there are arrangements for sewage discharges to foul sewer; • what consents you will need.		
Please also check with the Local Planning Authority as to their full Local Validation requirements.		

B.2 Flood risk assessment checklist

FRA requirements	Notes	Tick
1. Development Description and Location		
a. What type of development is proposed (e.g., new development, an extension to existing development, a change of use etc.) and where will it be located.		
b. What is its flood risk vulnerability classification?		
c. Is the proposed development consistent with the Local Plan for the area? (Seek advice from the LPA if you are unsure about this).		
d. What evidence can be provided that the Sequential Test and where necessary the Exception Test has/have been applied in the selection of this site for this development type?		
e. Will your proposal increase overall the number of occupants and/or users of the building/land, or the nature or times of occupation or use, such that it may affect the degree of flood risk to these people? (Particularly relevant to minor developments (alterations and extensions) and changes of use).		
2. Definition of the Flood Hazard		
a. What sources of flooding could affect the site?		
b. For each identified source in box 2a above, can you describe how flooding would occur, with reference to any historic records where these are available?		
c. What are the existing surface water drainage arrangements for the site?		
3. Probability		
a. Which Flood Zone is the site within? (As a first step, check the Flood Map for Planning (Rivers and Sea) on the EA's website).		
b. If there is a SFRA covering this site (check with the LPA), does this show the same or a different Flood Zone compared with the EAs flood map? (If different you should seek advice from the LPA and, if necessary, the EA).		
c. What is the probability of the site flooding, taking account of the maps of flood risk from rivers and the sea and from surface water, on the EA's website, and the SFRA, and of any further flood risk information for the site?		
d. If known, what (approximately) are the existing rates and volumes of surface water run-off generated by the site?		

FRA requirements	Notes	Tick
4. Climate Change		
How is flood risk at the site likely to be affected by climate change? (The LPAs SFRA should have taken this into account). Further information on climate change and development and flood risk is available on the EAs website.		
5. Detailed Development Proposals		
Where appropriate, are you able to demonstrate how land uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding (including providing details of the development layout)?		
6. Flood Risk Management Measures		
How will the site/building be protected from flooding, including the potential impacts of climate change, over the development's lifetime?		
7. Off-site Impacts		
a. How will you ensure that your proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?		
b. How will you prevent run-off from the completed development causing an impact elsewhere?		
c. Are there any opportunities offered by the development to reduce flood risk elsewhere?		
8. Residual Risks		
a. What flood-related risks will remain after you have implemented the measures to protect the site from flooding?		
b. How, and by whom, will these risks be managed over the lifetime of the development? (e.g., flood warning and evacuation procedures).		

Notes:

1. *A site-specific flood risk assessment (FRA) is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the LPA by the EA); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding (NPPF, Footnote 20).*
2. *A step by step guide on how to complete a FRA in support of a planning application is set out in Chapter 4.*
3. *The checklist is taken from the National Planning Practice Guidance (NPPG) on Flood Risk and Coastal Change – Site-Specific Flood Risk Assessment: Checklist.*

Appendix C Internal drainage boards

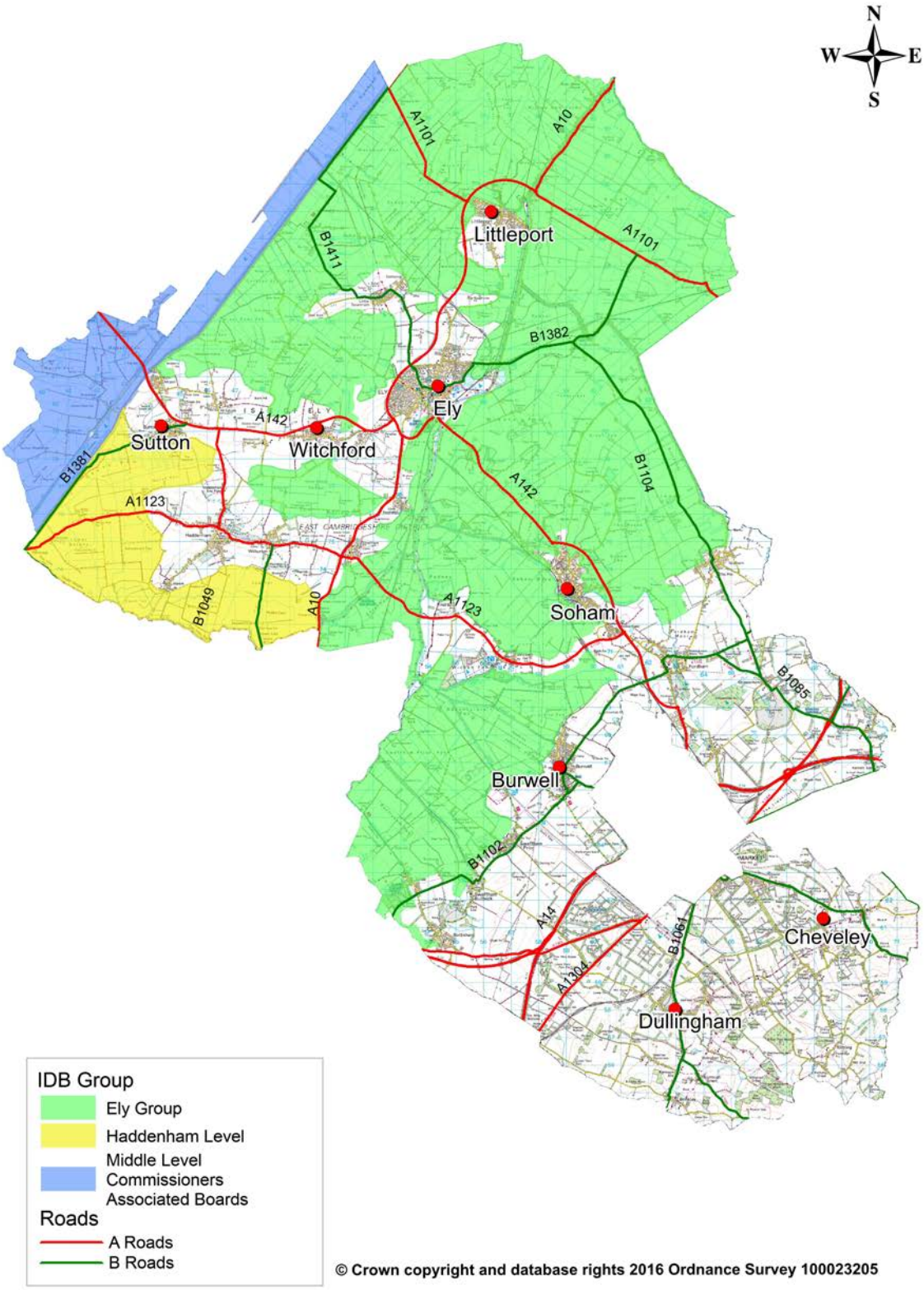
Further details relating to the Internal Drainage Boards and their roles and functions can be found at Chapter 3 and Table 3.2.

IDBs	Applicable to the relevant district council area
North Level Drainage Board	Fenland District Council
Kings Lynn IDB	Fenland District Council
Ramsey IDB[1]	Huntingdonshire District Council
Whittlesey Consortium of IDBs[1]: • Drysides • Feldale IDB • Holmewood and District IDB • Woodwalton Drainage Commissioners • Whittlesey IDB	Huntingdonshire District Council Fenland District Council
Bedford Group of IDBs (in Cambridgeshire): • Alconbury and Ellington IDB • Bedfordshire and River Ivel IDB	Huntingdonshire District Council
IDBs that have been agreed to be represented by Ely Group: • Burnt Fen IDB • Cawdle Fen • Littleport and Downham • Middle Fen and Mere • Old West • Padnal and Waterden • Swaffham • Waterbeach Level	East Cambridgeshire District Council South Cambridgeshire District Council
IDBs presently managed by the Middle Level Commissioners: • Benwick IDB • Bluntisham IDB • Conington and Holme IDB • Churchfield and Plawfield IDB • Curf and Wimblington Combined IDB • Euximoor IDB • Haddenham Level • Hundred Foot Washes IDB • Hundred of Wisbech IDB • Manea and Welney District Drainage Commissioners • March and Whittlesey IDB • March East IDB • March and Whittlesey IDB • March Fifth District Drainage Commissioners • March Sixth District Drainage Commissioners	Fenland District Council East Cambridgeshire District Council South Cambridgeshire District Council Huntingdonshire District Council

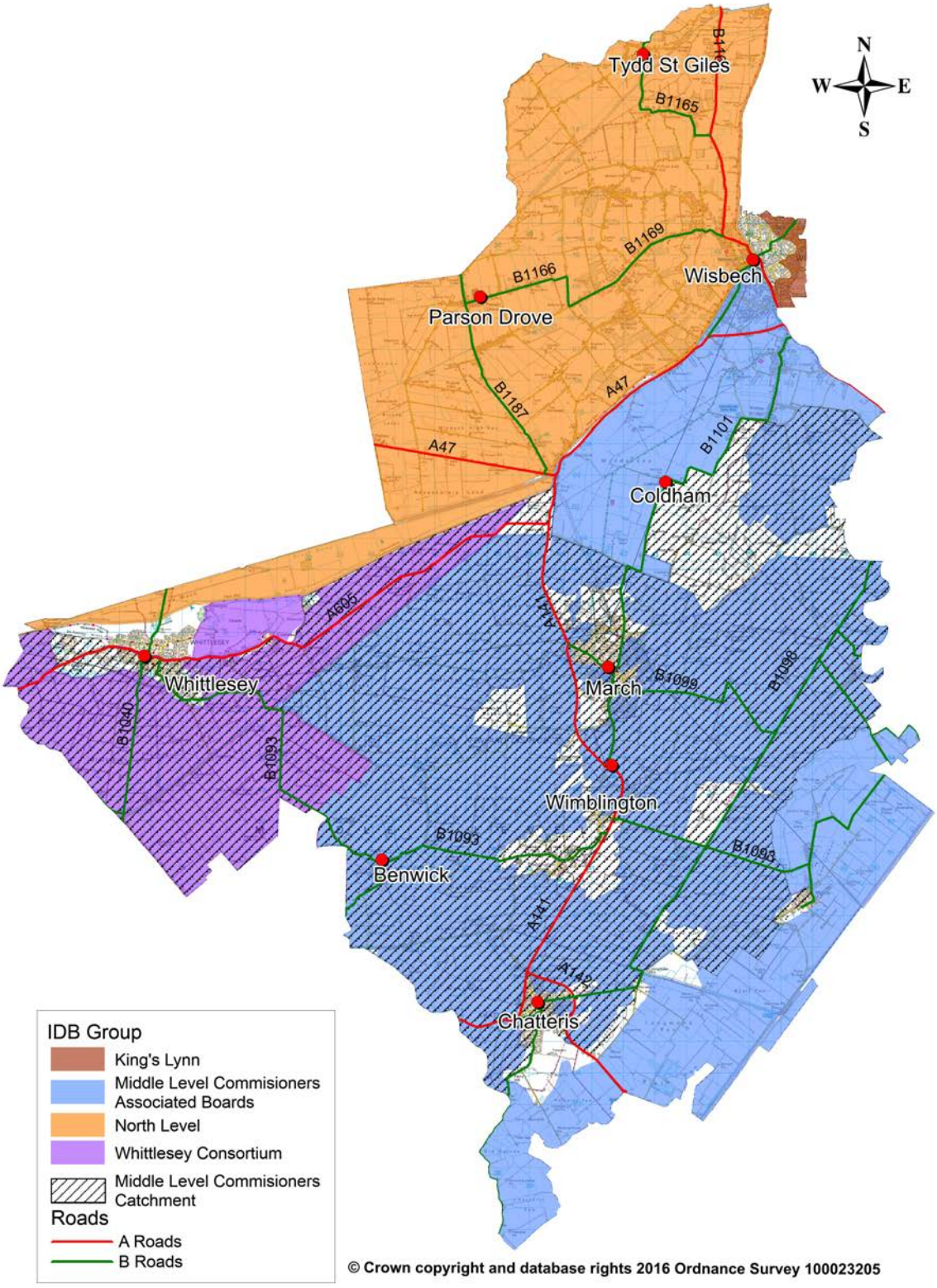
IDBs	Applicable to the relevant district council area
• March Third District Drainage Commissioners • Middle Level Commissioners • Needham and Laddus IDB • Nightlayers IDB • Nordelph IDB • Over and Willingham • Ramsey First (Hollow) IDB • Ramsey Fourth (Middlemoor) IDB • Ramsey Upwood & Great Raveley IDB • Ransonmoor District Drainage Commissioners • Sawtry IDB • Sutton and Mepal IDB • Swavesey IDB • Upwell IDB • Waldersey IDB • Warboys Somersham and Pidley IDB • White Fen District Drainage Commissioners	

1. The MLC provide planning services for Ramsey IDB and the Whittlesey Consortium of IDBs.

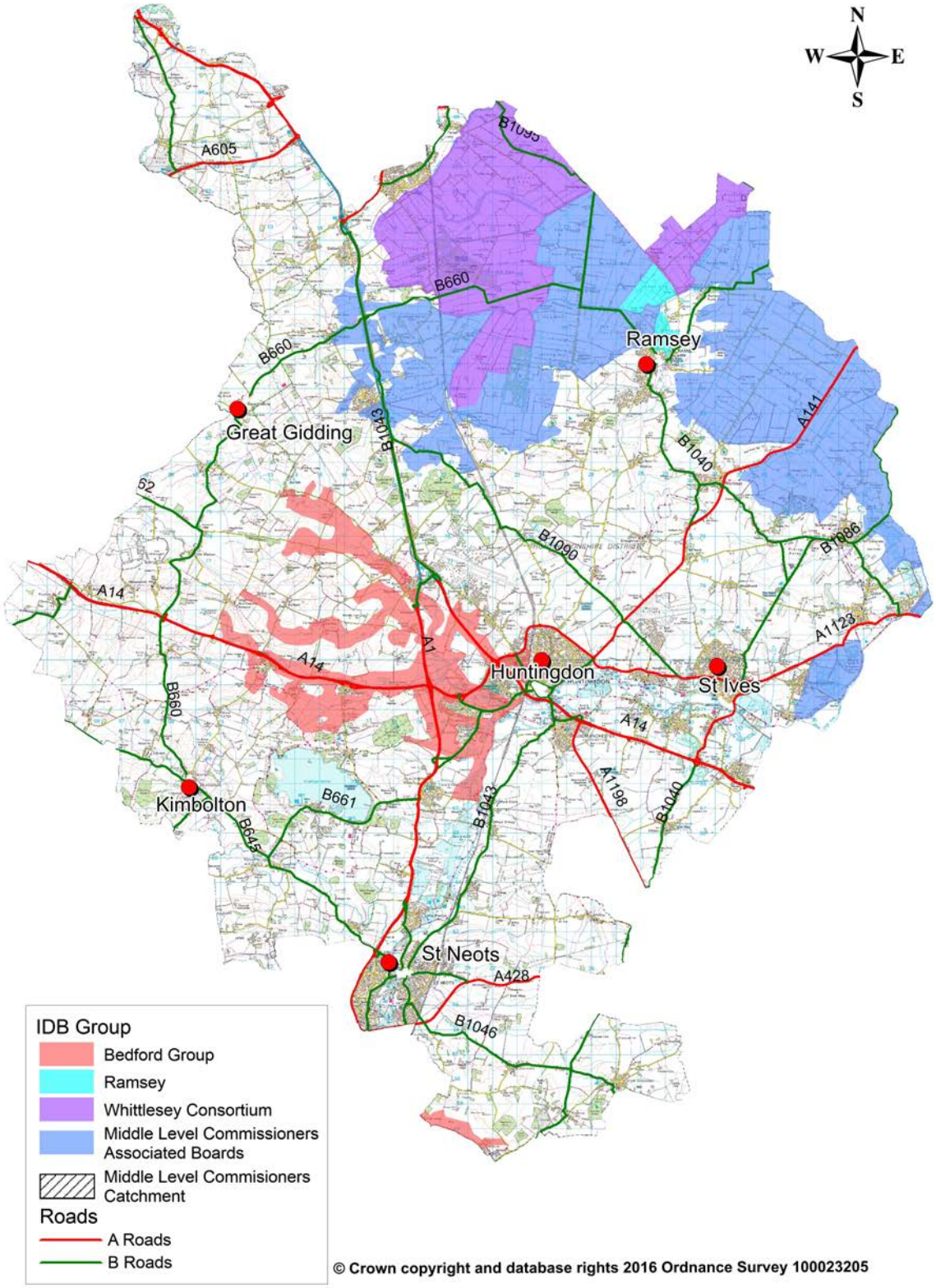
Map C.1 : IDBs within East Cambridgeshire District Council (ECDC) Area



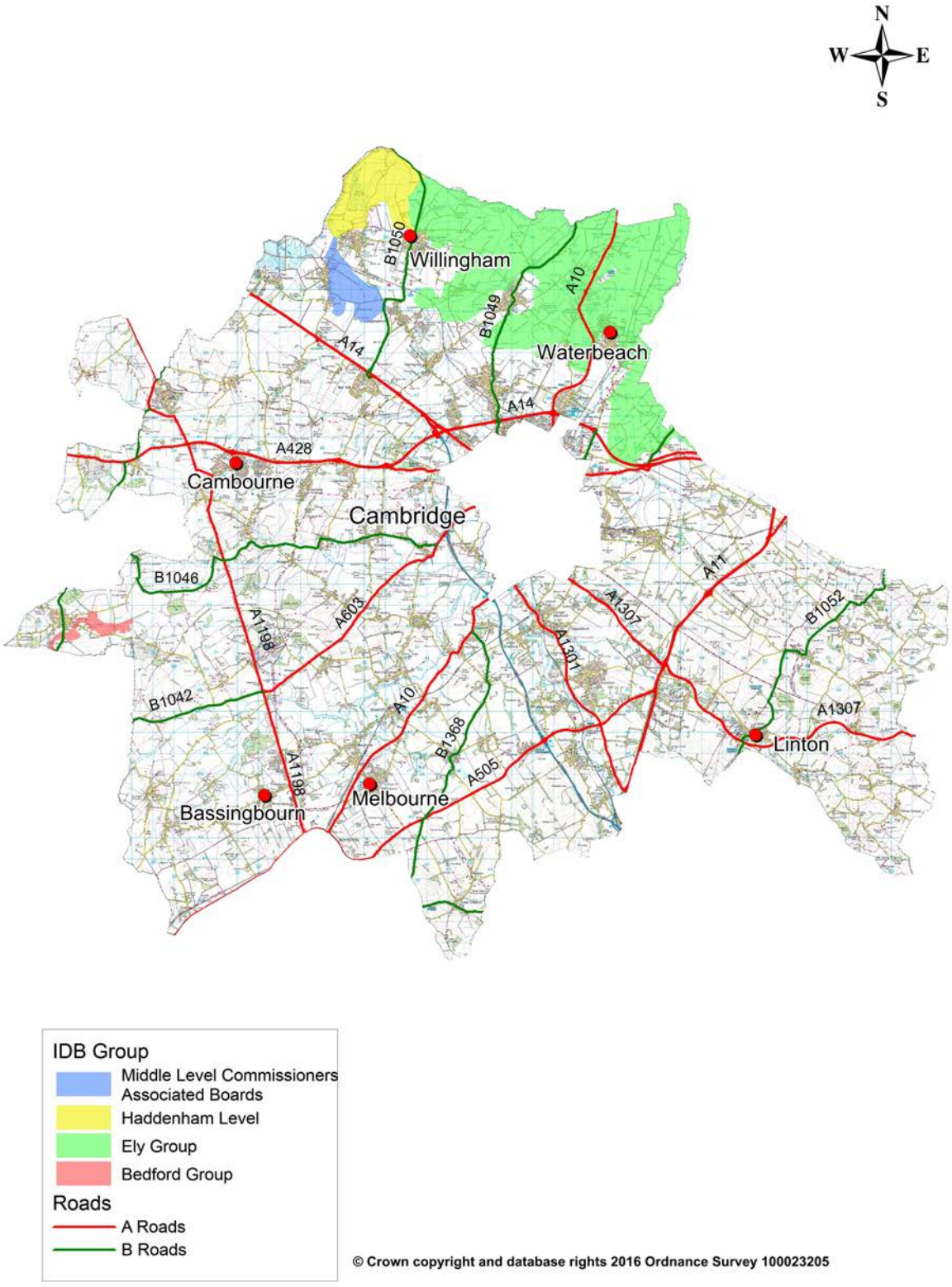
Map C.2 : IDBs within Fenland District Council (FDC) Area



Map C.3 : IDBs within Huntingdonshire District Council (HDC) Area



Map C.4 : IDBs within South Cambridgeshire District Council (SCDC) Area



Appendix D Building materials guidance

Table D.1

A) Foundations
Water exclusion strategy: • Concrete blocks used in foundations should be sealed with an impermeable material or encased in concrete to prevent water movement from the ground to the wall construction. Water entry strategy: • Provide durable materials that will not be affected by water and use construction methods and materials that promote easy draining and drying.

B) Floors
Ground floors can be influenced by two different conditions: • Water entry from the ground which can cause uplift pressures and will require structural checks if a water exclusion strategy is proposed; • Exposure to standing water. Water exclusion and entry strategy: • Materials that retain their structural integrity post flood event or easily replaced materials should be specified along with an engineering report confirming structural integrity for depths anticipated; • Construction should allow for cleaning and drainage; • Concrete ground supported floors are preferable to suspended floors where ground conditions allow; • Suspended floors may require cleaning out of the sub-floor space post flooding so access and falls should be provided; • Suspended steel floors would require anti-corrosion protection; • Suspended timber floors are not recommended; • Insulation should be of the closed cell type, generally insulation placed above the floor slab minimises the effect of flood water but may float if a low mass floor cover and screed is specified; • Floor finishes should generally be ceramic or concrete based floor tiles and sand/cement screed. Water resistant grout and a cement based adhesive/bedding is preferred; • Skirting boards should not be timber but either ceramic tiles or plastic; • If the flooding risk is up to a 1 in 5 year event a floor sump should be specified; • Under floor services should avoid using ferrous materials.

C) Walls
Refer to Figure 5.4 for guidance on appropriate building materials to be specified. **Water exclusion strategy** for depths of water up to 0.3m or where structurally designed, up to 0.6m. Masonry walls: • Joints should be fully filled and bricks should be laid frog upwards; • Perforated bricks should not be used;

C) Walls

- Where possible use engineering bricks up to flood level plus one brick course for freeboard;
- Blocks and dense facing bricks have improved performance when covered with render;
- Do not use highly porous bricks such as handmade bricks;
- For a water exclusion strategy where leakage is expected to be minimal aircrete blocks are recommended but may retain moisture longer than concrete blocks and provide less restraint to uplift forces on flood slabs/edges;
- Solid masonry walls are a good option but will need to have suitable wall insulation to comply with the latest building regulations;
- Clear cavity walls are preferable if sufficient insulation cannot be provided elsewhere.

Timber Frame walls:

- Timber frame walls are not recommended.

Reinforced concrete wall/flood:

- Should be considered where the risk of frequent flooding is high.

External render:

- Effective barriers should be used with blocks or bricks up to predicted flood level plus one brick course for freeboard, to prevent thermal bridge may require additional insulation on inner skin of wall or external insulation;
- External renders with lime content can induce faster surface drying.

Insulation:

- External insulation is better than cavity insulation as it is easily replaced;
- Cavity insulation should be a rigid closed cell type.

Internal linings:

- Internal cement renders (with good bond) are effective at reducing leakage and assist rapid drying;
- Avoid gypsum plasterboard;
- Internal lime plaster/render can be a good solution once full strength has been gained (6 months approximately).

Water entry strategy

Masonry walls:

- Use good quality facing bricks for the external face of cavity walls;
- Do not use highly porous bricks such as handmade bricks;
- For a water entry strategy where water is expected to enter the building concrete blocks are recommended;
- Clear cavity walls are preferable if sufficient insulation cannot be provided elsewhere.

Timber Frame walls:

- Timber frame walls are not recommended.

External render:

C) Walls

- Should not be used as it is a barrier to water penetration and may induce excessive differences with flood water depths internally and externally.

Insulation:

- External insulation is better than cavity insulation as it is easily replaced;
- Cavity insulation should be a rigid closed cell type.

Internal linings:

- Avoid internal cement renders as these can prevent drying;
- Use standard gypsum plasterboard up to the predicted flood level plus a freeboard of 100mm as a sacrificial material;
- Internal lime plaster/render can be a good solution once full strength has been gained (6 months approximately).

D) Doors and windows

Doors:

- Thresholds should be raised as high as possible whilst still complying with level access requirements;
- External PVC doors are preferable. Where an external wooden door is used, all efforts should be made to ensure a good fit and seal to the frames;
- For a flood exclusion strategy the use of flood doors should be specified. This type of door seals and protects from flooding once closed;
- Hollow core timber internal doors should not be used in high flood risk areas;
- Butt hinges can aid in the removal and storage of doors in dry areas;

Windows and patio doors:

- Should employ similar measures to doors. Special care should be taken to ensure adequate sealing of any window/door sills to the fabric of the property.

Air vents:

- There are two types of air vents that could be specified, either a periscope air vent which has a higher external opening than internal opening or a self-closing air vent by means of an internal floatation mechanism. Periscope air vents are generally preferable as there are no moving parts reducing the maintenance requirements.

E) Fittings

- The main principle is to use durable fittings that can be easily cleaned e.g. the use of plastic or stainless steel for kitchen units;
- Domestic appliances such as fridges and ovens on plinths as high as practicable above the floor.

F) Services

- All service penetrations should be sealed with expanding foam or similar closed cell material;
- Where applicable pipework should use closed cell insulation below the predicted flood level;

F) Services

- Non-return valves are recommended to prevent back flow of diluted sewage in situations where there is an identified risk of foul sewer surcharging. There is an ongoing maintenance requirement for these valves. Downstairs bathrooms and sinks are often conduits during flood conditions and careful consideration needs to be given to these;
- Water, electricity and gas meters should be located above the predicted flood level where possible;
- Electric ring mains should be installed at first floor level which drops towards the ground floor where ground floor sockets should be installed at a high level;
- Heating boiler units should be installed above the predicted flood level and preferably on the first floor. Underfloor heating should be avoided on ground floors. Conventional heating pipes are unlikely to be significantly affected by flood water;
- Communication wiring for telephone, TV and internet and other services should be protected by suitable insulation in the distribution ducts to prevent damage;
- Septic tanks are required in some rural parts of Cambridgeshire. Recommended criteria for the design and installation of these systems are given in BS 6297. The septic tank should be appropriate for the ground conditions locally and take into account flood levels.

Appendix E Pre-application checklist

Requirements	Details (or reference documentation)	Agreed?
(a) Any planning and environmental objectives for the site that should influence the surface water drainage strategy. These objectives can be put forward by the developer, LPA or relevant water management authorities and should be agreed by all parties.		
(b) The likely environmental or technical constraints to SuDS design for the site. These should be agreed by all parties.		
(c) The requirements of the local adoption or ongoing maintenance arrangements. The LPA have the overriding decision on the appropriateness of the adoption arrangements.		
(d) The suite of design criteria to be applied to the SuDS scheme (taking account of (a) to (c)).		
(e) Evidence that the initial development design proposals have considered the integration and linkage of the surface water management with street layouts, architectural and landscape proposals.		
(f) An assessment of strategic opportunities for the surface water management system to deliver multiple benefits for the site (see Table 5, British Standard 8582). This should be provided by the developer and should include the strategic use of public open space for SuDS.		
(g) The statutory and recommended non-statutory consultees for the site. This should be provided by the LPA.		
(h) The likely land and infrastructure ownership for drainage routes and points of discharge (including sewerage assets).		
(i) An assessment of statutory consultee responsibilities and requirements, including timescales for any likely required approvals/consents.		
(j) Any potential local community impacts, health and safety issues or specific local community concerns/requirements that should be addressed by the detailed design.		
(k) An assessment of cost implications of stakeholder obligations.		
(l) An agreed approach to the design and maintenance of the surface water management for the proposed site.		

Appendix F Surface water drainage pro-forma

Applicants should complete this form and submit it to the LPA, referencing from where in their submission documents this information is taken. The proforma is supported by the DEFRA/ EA guidance on Rainfall Runoff Management. and uses the storage calculator on www.UKsuds.com. The proforma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. This proforma is based upon current industry standard practice.

1. Site details

Site	
Address & post code or LPA reference	
Grid Reference	
Is the existing site developed or Greenfield?	
Total Site Area served by drainage system (excluding open space) (Ha)[1]	

1. The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers and Local Authorities
Impermeable area (ha)				If proposed > existing, then runoff rates and volumes will be increasing. Section 6 must be filled in. If proposed ≤ existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)			N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

3. Proposing to discharge surface water via

	Yes	No	Evidence that this is possible	Notes for developers and Local Authorities
Infiltration				e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse				e.g. Is there a watercourse nearby?
To surface water sewer				Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above				e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.

4. Peak Discharge Rates[1]

	Existing rates (l/s)	Proposed rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers and Local Authorities
Greenfield QBAR		N/A	N/A	QBAR is approx. 1 in 2 storm event. Provide this if Section 6 (QBAR) is proposed.
1 in 1				Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
1 in 30				
1 in 100				
1 in 100 + climate change	N/A			To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change. 30% should be added to the peak rainfall intensity.

1. This is the maximum flow rate at which storm water runoff leaves the site during a particular storm event.

5. Calculate additional volumes for storage[1]

	Existing volume (m^3)	Proposed volume (m^3)	Difference (m^3) (Proposed-Existing)	Notes for developers and Local Authorities
1 in 1				Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30				
1 in 100				
1 in 100 + climate change				To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

1. The total volume of water leaving the development site. New hard surfaces potentially restrict the amount of storm water that can go to the ground, so this needs to be controlled so not to make flood risk worse to properties downstream.

6. Calculate attenuation storage[1]

		Notes for developers and Local Authorities
Storage Attenuation volume (Flow rate control) required to retain rates as existing (m^3)		Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing

1. Attenuation storage is provided to enable the rate of runoff from the site into the receiving watercourse to be limited to an acceptable rate to protect against erosion and flooding downstream. The attenuation storage volume is a function of the degree of development relative to the greenfield discharge rate.

7. How is Storm Water stored on site?(1)

			Notes for developers and Local Authorities
Infiltration	**State the Site's Geology and known Source Protection Zones (SPZ)**		Avoid infiltrating in made ground. Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ)
	Are infiltration rates suitable?		Infiltration rates should be no lower than $1x10^{-6}$ m/s.
	State the distance between a proposed infiltration device base and the ground water (GW) level		Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.
	Were infiltration rates obtained by desk study or infiltration test?		Infiltration rates can be estimated from desk studies at most stages of the planning system if a backup attenuation scheme is provided.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.		Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
In light of the above, is infiltration feasible?	**Yes/No? If the answer is No, please identify how the storm water will be stored prior to release**		If infiltration is not feasible how will the additional volume be stored? The applicant should then consider the following options in the next section.

1. Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The idea is that the additional volume does not get into the watercourses, or if it does it is at an exceptionally low rate. You can either infiltrate the stored water back to ground, or if this isn't possible hold it back with on-site storage. Firstly, can infiltration work on site?

Storage requirements

The developer must confirm that either of the two methods for dealing with the amount of water that needs to be stored on site.

- **Option 1 Simple:**
  Store both the additional volume and attenuation volume in order to make a final discharge from site at QBAR (Mean annual flow rate). This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.
- **Option 2 Complex:**
  If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

		Notes for developers and Local Authorities
Please confirm what option has been chosen and how much storage is required on site.		The developer at this stage should have an idea of the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Please confirm

		Notes for developers and Local Authorities
Which SuDS measures have been used?		SuDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C697.
Drainage system can contain in the 1 in 30 storm event without flooding		This a requirement for sewers for adoption & is good practice even where drainage system is not adopted.
Any flooding between the 1 in 30 & 1 in 100 plus climate change storm events will be safely contained on site.		Safely: not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths. Flood waters must drain away at section 6 rates. Existing rates can be used where runoff volumes are not increased.
How are rates being restricted (hydrobrake etc)		Hydrobrakes to be used where rates are between 2l/s to 5l/s. Orifices may not work below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage but this can be overcome with careful product selection and SuDS design.

		Notes for developers and Local Authorities
Please confirm the owners/adopters of the SuDS throughout the development. Please list all the owners.		If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma.
How are the entire SuDS to be maintained?		If the features are to be maintained directly by the owners as stated in answer to the above question please answer yes to this question and submit the relevant maintenance schedule for each feature. If it is to be maintained by others than above please give details of each feature and the maintenance schedule. Clear details of the maintenance proposals of all element of the proposed drainage system must be provided. Poorly maintained drainage can lead to increased flooding problems in the future.

9. Evidence

Pro-forma Section	**Document reference where details quoted above are taken from:**	**Page Number**
2		
3		
4		
5		
6		
7		

The above form should be completed using evidence from the Flood Risk Assessment where applicable, surface water drainage strategy and site plans. It should serve as a summary sheet of the drainage proposals and should clearly show that the proposed rate and volume as a result of development will not be increasing. If there is an increase in rate or volume, the rate or volume section should be completed to set out how the additional rate/volume is being dealt with. This form is completed using factual information from the Flood Risk Assessment and Site Plans and can be used as a summary of the surface water drainage strategy on this site.	
Form completed by:	
Qualification of person responsible for signing off this pro-forma:	
Company:	
On behalf of (Client's details):	
Date:	

Glossary of terms

Awarded watercourse	Watercourses who's maintenance responsibility lies with the relevant local authority.
Aircrete blocks	Often known as aerated concrete blocks combining the reliability and strength of concrete blocks with the advantage of using lightweight blocks on site.
Annual exceedance probability (AEP)	AEP is the probability associated with a return period. Thus an event of return period 50 years has an AEP of 1/T or 0.02 (2%).
Aquatic ecosystems	Ecosystem within a body of water. Communities of organisms that depend on each other and their environment living in aquatic ecosystems. Two main types of aquatic ecosystem are marine ecosystems and freshwater ecosystems.
Base flow	The sustained flow in a channel or drainage system.
Bioretention	A depressed landscaping area that is allowed to collect run-off so it percolates through the soil below the area into an underdrain, thereby promoting pollutant removal.
Carbon sequestration	Process of capturing and long term storage of carbon dioxide from the atmosphere.
Catchment	The area contributing surface water flow to a point on a drainage or river system. Can be divided into sub-catchments.
Catchment Flood Management Plan (CFMP)	Catchment Flood Management Plans (CFMPs) are a large-scale strategic planning framework for the integrated management of flood risks to people and the developed and natural environment in a sustainable manner.
Combined Sewer	A sewer designed to carry foul sewage and surface water runoff in the same pipe.
Conveyance	Movement of water from one location to another.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
Exceedance flow	Excess flow that appears on the surface once the conveyance capacity of the drainage system is exceeded.
Exceedance flow route	Design and consideration of above-ground areas that act as pathways permitting water to run safely over land to minimise the adverse effect of flooding on people and property. This is required when the design capacity of the drainage system (SuDS or traditional drainage) has been exceeded.
Filtration	The act of removing sediment or other particles from a fluid by passing it through a filter.
Flood defence	A structure (or system of structures) for the alleviation of flooding from rivers or the sea.
Flood mechanism	A natural or established process by which flooding takes place or is brought about.

Flood risk	The level of flood risk is the product of the frequency or likelihood of the flood events and their potential consequences (such as loss, damage, harm, distress and disruption).
Floodplain	Any area of land over which water flows or is stored during a flood event or would flow but for the presence of flood defences
Fluvial	Landforms created by deposits from processes associated with rivers and streams.
Green infrastructure	Network of green open spaces that help to solve urban and climatic challenges by providing stormwater management, clean water, more biodiversity and healthy soils.
Groundwater	Water that is below the surface of the ground in the saturation zone.
Hardscape	The built environment including paved areas like streets, pavements, structures, walls, street amenities, pools and fountains.
Hydraulic model	A simplified representation of flow within a river system.
Hydromorphology	The subfield of hydrology that deals with the structure and evolution of the Earth's water resources. It also deals with the origins and dynamic morphology of those water resources.
Hydrological model	Estimates the flow in a river arising from a given amount of rainfall falling into the catchment.
Infiltration	The passage of surface water into the ground.
Main river	Main rivers are usually larger streams and rivers, though some of them are smaller watercourses of local significance. The main rivers are marked on an official document called the main river map. Copies of these maps can be located at the local offices of the Environment Agency.
Minor development	For the purposes of assessing flood risk, Minor Development is defined within the NPPG as follows: • **minor non-residential extensions**: industrial/commercial/leisure etc. extensions with a footprint less than 250 square metres. • **alterations**: development that does not increase the size of buildings e.g. alterations to external appearance. • **householder development**: For example; sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.
Non-potable water	Poor quality water that is not safe enough to be consumed by humans
Ordinary watercourses	All watercourses not designated as Main River or IDB watercourses. The operating authority (local authority or IDB) has permissive powers to maintain them but the responsibility to do so rests with the riparian owner.
Planning performance agreements	A planning performance agreement is a project management tool which sets timescales for actions between the LPA and an applicant.

Glossary of terms

Potable water	Water company/utility/authority drinking water supply.
Probability of occurrence	The probability of a flood event being met or exceeded in any one year. For example, a probability of 1 in 100 corresponds to a 1 per cent or 100:1 chance of an event occurring in any one year.
Residual risk	The remaining risks associated with the location of development and the mitigation actions needed to be taken after the sequential approach has been applied.
Raingarden	Planted depression that allows rainwater runoff from impervious urban areas like rooks, driveways, walkways, parking lots and compacted lawn areas to be absorbed.
Riparian owners	Landowners who have rights and responsibilities to maintain the flow of water in a channel.
Septic tank	Small scale sewage treatment system common in areas with no connection to main sewage pipes.
Sewage treatment work (STW)	Process of removing contaminants from wastewater including household sewage and runoff.
Standard of protection	The flood event return period above which significant damage and possible failure of the flood defences could occur.
Sustainable drainage systems **(SuDS)**	Sustainable Drainage Systems; an approach to surface water management that combines a sequence of management practices and control structures designed to drain surface water into a more sustainable fashion than some conventional techniques
Surface water flooding	Surface water flooding is the flooding that occurs from excess water that runs off across the surface of the land and does not come from a watercourse.
Swales	A shallow vegetated channel designed to conduct and retain water, but may also permit infiltration. The vegetation filters particulate matter.
Waste water treatment works (WwTW)	Installation to treat and make less toxic domestic and/or industrial effluent.

Acronyms

CCC	Cambridgeshire County Council
CCiC	Cambridge City Council
CSO	Combined Sewer Outfall
BAP	Biodiversity Action Plan
EA	Environment Agency
ECDC	East Cambridgeshire District Council
FDC	Fenland District Council
FRA	Flood Risk Assessment
HDC	Huntingdonshire District Council
IDB	Internal Drainage Boards
LLFA	Lead Local Flood Authority
LPA	Local Planning Authorities
NPPF	National Planning Policy Framework
PPA	Planning Performance Agreements
PPG	Planning Practice Guidance
RMA	Risk Management Authority
RSPB	Royal Society for the Protection of Birds
SCDC	South Cambridgeshire District Council
SFRA	Strategic Flood Risk Assessment
SPD	Supplementary Planning Document
SPZ	Source Protection Zones
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
SWMP	Surface Water Management Plan
SuDS	Sustainable Drainage System
WCS	Water Cycle Study
WFD	Water Framework Directive
WwTW	Waste Water Treatment Works
WRZ	Water Resource Zone