


Transport Planning Associates		Page 4
21 Berkley Square Bristol BS8 1HP	Cotswold BMW Group Grovefield Way, Chelte... Carriageway Infiltrati...	
Date 25.06.13 File C.2 STORAGE CALCS...	Designed by AJH Checked by	
Micro Drainage	Source Control 2013.1.1	

Model Details

Storage is Online Cover Level (m) 32.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	2.2
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	210.0
Safety Factor	2.0	Slope (1:X)	1000.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	31.500	Cap Infiltration Depth (m)	0.000

Hydro-Brake® Outflow Control

Design Head (m)	0.600	Hydro-Brake® Type	Md6 SW Only	Invert Level (m)	31.900
Design Flow (l/s)	1.0	Diameter (mm)			85

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.4	1.200	4.5	3.000	7.1	7.000	10.9
0.200	3.2	1.400	4.9	3.500	7.7	7.500	11.3
0.300	3.0	1.600	5.2	4.000	8.2	8.000	11.7
0.400	2.9	1.800	5.5	4.500	8.7	8.500	12.0
0.500	3.0	2.000	5.8	5.000	9.2	9.000	12.4
0.600	3.2	2.200	6.1	5.500	9.7	9.500	12.7
0.800	3.7	2.400	6.4	6.000	10.1		
1.000	4.1	2.600	6.6	6.500	10.5		

APPENDIX D

FLOODING CONSULTATION

Gloucestershire
County Council

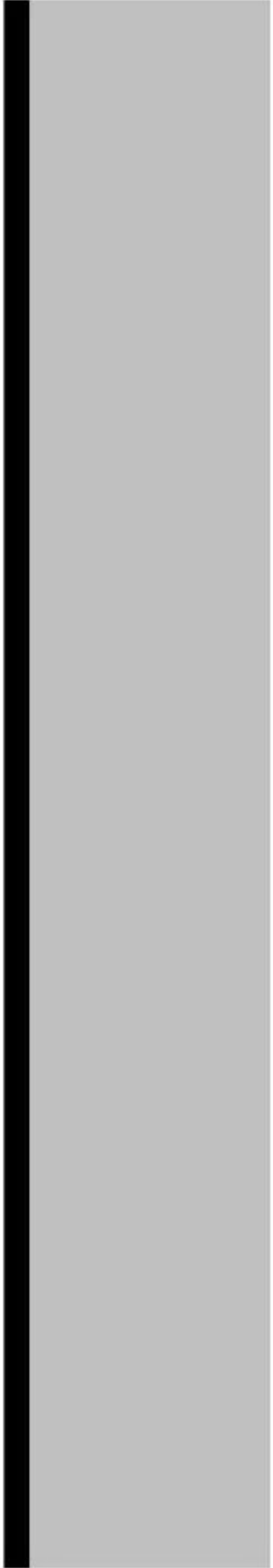
Preliminary Flood
Risk Assessment

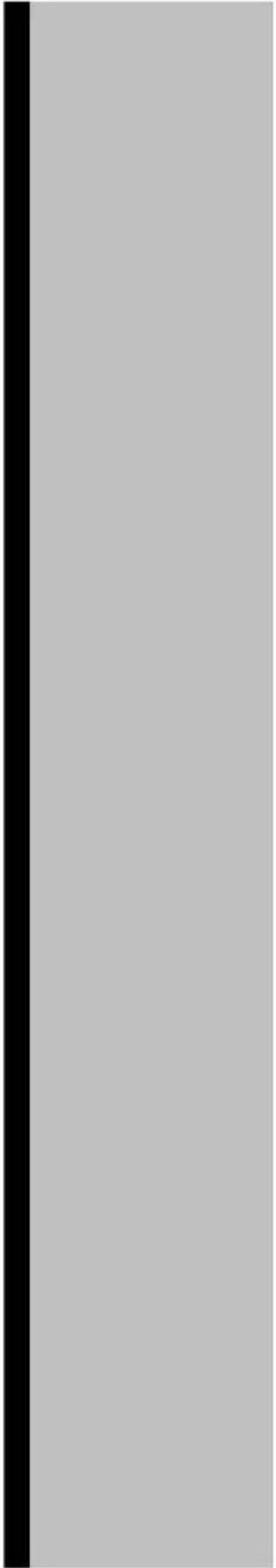
Preliminary
Assessment
Report

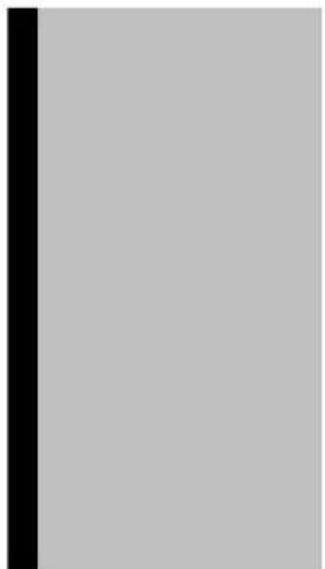
November 2011

Annex 1 Past floods

ANNEX 1: Records of past floods and their significant consequences (preliminary assessment report spreadsheet)						
Field:	Flood ID	Summary description	Name of Location	National Grid Reference	Location Description	Start date
Mandatory / optional: Format:	Mandatory Unique number between 1-9999	Mandatory Max 5,000 characters	Mandatory Max 250 characters	Mandatory 12 characters: 2 letters, 10 numbers	Optional Max 250 characters	Optional for first cycle 'yyyy' or 'yyyy-mm' or 'yyyy-mm-dd'
Notes:	A sequential number starting at 1 and incrementing by 1 for each record.	Description of the flood and its adverse or potentially adverse consequences. Where available, information from other fields (<u>Start date</u> , <u>Days duration</u> , <u>Probability</u> , <u>Main source</u> , <u>Main mechanism</u> , <u>Main characteristics</u> , <u>Significant consequences</u>) should be repeated here.	Name of the locality associated with the flood, using recognised postal address names such as streets, towns, counties. If the flood affected the whole LLFA, then record the name of the LLFA.	National Grid Reference of the centroid (centre point, falls within polygon) of the flood extent, or of the area affected if there is no extent information.	A description of the general location that was flooded.	The date when the flood commenced - when land not normally covered by water became covered by water.
Example:		1 On the 14 April 1998 an intense storm system produced surface water flooding across Essex, concentrated in the west of the county. The flooding lasted about 6 hours, and 23 residential properties were recorded as suffering internal flooding, in Epping and North Weald. The surface runoff exceeded the drainage capacity in several places, and so probably had a 1 in 30 to 1 in 50 chance of occurring in any given year.	Essex	SX1234512345	Several towns and villages across west Essex	1998-04-15
Records begin here:		1 In June and July 2007 severe storm events across Gloucestershire causes widespread flooding throughout the county. . Heavy rainfall at the end of June led to flooding in some areas in Gloucestershire, both from surface water overloading the drainage systems and very high water levels in rivers and brooks. Heavier rain fell in July and on the 20th July the equivalent of two months' rain fell in 14 hours. Flooding came from numerous sources including surface runoff, rivers and watercourses, and exceedance of drainage systems (including highway and surface water drainage). The July 2007 event was estimated to have a 1 in 125 to 1 in 400 chance of occurring in any given year.	Gloucestershire		Communities across Gloucestershire	2007







Annex 1 Past floods

Days duration	Probability	Main source of flooding	Additional source(s) of flooding	Confidence in main source of flooding
Optional for first cycle Number with two decimal places The number of days (duration) of the flood - that land not normally covered by water was covered by water. Values should be within the range 0.01 - 999.99 (permitting records to the nearest quarter of an hour, where appropriate).	Optional for first cycle Max 25 characters The chance of the flood occurring in any given year - record X from "a 1 in X chance of occurring in any given year". Where this is difficult to estimate, a range can be recorded.	Optional for first cycle Pick from drop-down Pick the source from which the majority of flooding occurred. Refer to the PFRA guidance for definitions of sources.	Optional Max 250 characters, same source terms If flooding occurred from, or interacted with, any other sources (other than the <u>Main source of flooding</u>), report the source(s) here, using the same source terms.	Optional Pick from drop-down Pick a broad level of confidence in the <u>Main source of flooding</u> from; 'High' (compelling evidence of source - about 80% confident that source is correct), 'Medium' (some evidence of source but not compelling - about 50% confident that source is correct) 'Low' (source assumed - about 20% confident that source is correct) or 'Unknown'.
	0.25 20-50	Surface runoff		High
	125-400	Surface runoff	Main River, ordinary watercourses, exceedance of drainage systems	High

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Main mechanism of flooding	Main characteristic of flooding	Significant consequences to human health	Human health consequences - residential properties	Property count method	Other human health consequences	Significant economic consequences	Number of non-residential properties flooded	Property count method	Other economic consequences
Optional for first cycle Pick from drop-down	Optional for first cycle Pick from drop-down	Mandatory Pick from drop-down	Optional Number between 1-10,000,000	Optional Pick from drop-down	Optional Max 250 characters	Mandatory Pick from drop-down	Optional Number between 1-10,000,000	Optional Pick from drop-down	Optional Max 250 characters
Pick a mechanism from; 'Natural exceedance' (of capacity), 'Defence exceedance' (floodwater (flooding defences), 'Failure' (of natural or artificial defences or infrastructure, or of pumping), 'Blockage or restriction' (natural or artificial blockage or restriction of a conveyance channel or system), or 'No data'.	Pick a characteristic from; 'Flash flood' (rises and falls quite rapidly with little or no advance warning), 'Natural flood' (due to significant precipitation, at a slower rate than a flash flood), 'Snow melt flood' (due to rapid snow melt), 'Debris flow' (conveying a high degree of debris), or 'No data'. Most UK floods are 'Natural floods'.	Were there any significant consequences to human health when the flood occurred, or would there be if it were to re-occur?	Record the number of residential properties where the building structure was affected either internally or externally by the flood, or that would be so affected if the flood were to re-occur.	Where residential or non-residential properties have been counted, it is important to record the method of counting, to aid comparisons between counts. Choose from; 'Detailed GIS' (using property outlines, as per Environment Agency guidance), 'Simple GIS' (using property points), 'Estimate from map', or 'Observed number'.	If there were other <u>Significant consequences to human health</u> , describe them including information such as the number of critical services flooded.	Were there any significant economic consequences when the flood occurred, or would there be if it were to re-occur?	Record the number of non-residential properties where the building structure was affected either internally or externally by the flood, or that would be so affected if the flood were to re-occur.	Where residential or non-residential properties have been counted, it is important to record the method of counting, to aid comparisons between counts. Choose from; 'Detailed GIS' (using property outlines, as per Environment Agency guidance), 'Simple GIS' (using property points), 'Estimate from map', or 'Observed number'.	If there were other <u>Significant economic consequences</u> , describe them including information such as the area of agricultural land flooded, length of roads and rail flooded.
Natural exceedance	Natural flood	Yes	23	Observed number		No			
Natural exceedance	Natural flood		>5000	Observed number	Mythe treatment works flooded - 135,000 homes without water for up to 17 days. 48,000 homes without electricity for 2 days.	Yes	>500	Observed number	Gloucester and Cheltenham train stations flooded. 10,000 people stranded on M5 overnight.







Annex 1 Past floods

Significant consequences to the environment	Environment consequences	Significant consequences to cultural heritage	Cultural heritage consequences
Mandatory Pick from drop-down	Optional Max 250 characters	Mandatory Pick from drop-down	Optional Max 250 characters
Were there any significant consequences to the environment when the flood occurred, or would there be if it were to re-occur?	If there were <u>Significant consequences to the environment</u> , describe them including information such as national and international designated sites flooded, and pollution sources flooded.	Were there any significant consequences to cultural heritage when the flood occurred, or would there be if it were to re-occur?	If there were <u>Significant consequences to cultural heritage</u> , describe them including information such as the number and type of heritage assets flooded.
No		No	
No		No	

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Comments	Data owner	Area flooded	Flood event outline confidence	Flood event outline source	Survey date	Photo ID	Lineage	Sensitive data	Protective marking descriptor
Optional Max 1,000 characters	Optional Max 250 characters	Optional Number with two decimal places	Optional Pick from drop-down	Optional Pick from drop-down	Optional 'yyyy' or 'yyyy-mm' or 'yyyy-mm-dd'	Optional Max 50 characters	Optional Max 250 characters	Optional Pick from drop-down	Optional Max 50 characters
Any additional comments about the past flood record.		The total area of the land flooded, in km ²	Choose from; 'High' (data includes one of: Aerial video, Aerial photos, Professional survey, Flood level information, EA flood data recording staff notes), 'Medium' (data includes one of: EA/LA ground video, EA/LA ground photos, EA/LA flood event outline map, LA/professional partner officer site records, Public ground video), 'Low' (not confident) or 'Unknown'.			Provide references to relevant specific photographs, or to a set of relevant photographs. It may not be practical to reference all relevant photographs for each flood event.	Lineage is how and what the data is made from. Has this data been created by using data owned or derived from data owned by 3rd party (external) organisations? If yes please give details.	Has the information been classified under the Government's Protective Marking Scheme? Include protective marking time limit where known. Note: If "Approved for Access" then report "Unmarked".	For use where organisations apply the Government's Protective Marking Scheme.
	Epping Forest District Council		Medium	Site survey	1998-04-20		Ordnance Survey AddressPoint; CEH 1:50k River Centreline; NextMap DTM.	Unmarked	Private
	Various authorities. Data from water companies held under confidentiality agreement							Protect	Commercial







Annex 1 Past floods

European Flood Event Code

Auto-populated
Max 42 characters

This field will autopopulate using the LLFA name provided on the "Instructions" tab, and the Flood ID. It is an EU-wide unique identifier and will be used to report the flood information.

Format: UK<ONS Code><P or F><LLFA Flood ID>. "ONS Code" is a unique reference for each LLFA. "P or F" indicates if the event is past or future. "LLFA Flood ID" is a sequential number beginning with 0001.

UKE10000012P0001

UKE10000013P0001





