

APPENDIX B
RUN-OFF CALCULATIONS

RUN-OFF CALCULATIONS

Using the Rational Equation

$$Q=2.78CiA$$

Where:

Q= Run-off (l/s)

C= run off coefficient

i= rainfall intensity (mm/hr) [75mm/ hr for the purpose of calculation]

A= Area (hectare)

Existing Site	Area (Ha)	C	I	Run-off (l/s)
Impermeable area	0.718	0.95	75	142.22
Permeable area	0.820	0.62	75	106.00
Total	1.538		75	248.22
Proposed Site				
Impermeable area	0.718	0.95	75	142.22
Permeable area (grass)	0.577	0.62	75	74.59
Permeable area (permeable paving)	0.243	0.05	75	2.53 *
Total	1.538			219.34

* The permeable paving is designed to discharge directly to the sub-soil and will not contribute to the run-off that will enter the drainage system. Therefore, it can be discounted for the purpose of assessing the peak run-off from the site. For the purpose of the calculations a run-off coefficient of 0.05 has been adopted for the permeable paving to allow for a nominal amount of rainfall that might run-off the paving due to possible inefficiencies in layout.

The proposals provide a net reduction of discharge to the existing drainage system in the order of approximately 13%.

The manufacturers technical specifications indicate that the permeable paving has a capacity to intercept run-off in the order of 18,750 l/s/Ha. Making an allowance of 75% reduction in capacity due to blocking over a number of years, the capacity would still be 4,687 l/s/Ha, which remains more than adequate to accommodate the anticipated peak run-off.

Capacity of Permeable Paving

Paving capacity	=	18,750 l/s/Ha
Capacity/site area	=	4,556 l/s
75% reduction	=	3,417 l/s

Total area of permeable paving	0.243 HA
100% run-off (rainfall 75mm/hr)	50.7 l/s

Which is more than adequate to accommodate the design rainfall intensity.

APPENDIX C

ENVIRONMENT AGENCY
RECORDS AND CORRESPONDENCE

Subject: Your Enquiry: RFI/2010/13072
From: "Riley, Stacey" <stacey.riley@environment-agency.gov.uk>
Date: Tue, 16 Feb 2010 09:07:44 -0000
To: <davetaylor@cannonhighways.co.uk>

Our Ref: RFI/2010/13072

Dear Dave

RE: Travellers Site at Smithies, Barnsley

Thank you for your enquiry dated 22nd January 2010.

The site as in Flood Zone 2 as defined on our flood zone map.

Surface water Runoff

There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed. Greenfield development sites should balance surface water discharge to the 1 in 100 year greenfield run-off rate, this is considered to be 5 l/sec/ha.

If the existing site is shown to drain to a watercourse, then we would accept surface water from the re-developed site to drain to the watercourse, subject to flows been reduced by a minimum of 30% from the existing rate. There is a small watercourse/drain near to the site and has been classified as an ordinary watercourse, as defined under the terms of the Land Drainage Act 1991. The responsible drainage authority for the watercourse is the Local Authority. I would suggest you contact them for any local information of the watercourses in the area.

SUDs

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the Environment Agency where ground conditions are suitable.

Sustainable Urban Drainage techniques (SUDs) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements. We seek to promote the use of SUDs techniques to this site and expect the developer of the site to submit detailed investigations such that the use of SUD's has been fully explored.

More information on SUDs can be found at: <http://www.ciria.org.uk/suds/>
For information on Green Roofs in particular, please visit: www.thegreenroofcentre.co.uk

The Environment Agency provides the Flood Map (see enclosed extract) which provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences

- For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
- For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.

2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences.

- Indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.

3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods.

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

Flood History

See the attached map showing the flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available.

Please refer to the following table detailing the causes of those past floods.

Assets

Asset Drawings

Please find attached asset drawing(s) showing location of all (Agency and non Agency maintained) flood defences and channels.

Structures

Asset Ref.	Asset Type	Description	Location	Maintainer	Next Inspection	C
1231302560501R01003	non-flood defence structure	Outfall	GASHOLDER	private	01/02/2009	2
1231302560501L03005	non-flood defence structure	1 M OPEN OUTFALL	D/S OLD MILL LANE BRIDGE	private	01/02/2009	2
1231302560501R01004	non-flood defence structure	Outfall	Old Mill Gas Holder	private	01/02/2009	2
1231302560501L03006	non-flood defence structure	ROAD BRIDGE	MILL LANE	private	15/01/2006	2
1231302560501L03001	non-flood defence structure	OUTFALL	OLD MILL	private	01/02/2009	3
1231302560501L03002	non-flood defence structure	Open OUTFALL / Drain	U/S OF OLD MILL LANE BRIDGE	private	14/01/2006	2

1231302560501L03004	non-flood defence structure	6" BRICK OUTFALL	D/s of Smithies Bridge	private	01/02/2009	5
1231302560501L03003	non-flood defence structure	2FT OUTFALL	D/s Smithies Bridge	private	01/02/2009	2
1231302560501L03007	non-flood defence structure	ROAD BRIDGE	Smithies Bridge	private	15/01/2006	2

Defences

Asset Ref.	Asset Type	Description	Location	Bank	Maintainer	As Pr Ty
1231302560601L01	maintained channel	NATURAL GROUND	Dearne Hall Road to Smithies	left	private	flu
1231302560601R02	raised defence (man-made)	EMBANKMENT	U/S OF SMITHY BRIDGE. HONEYWELL	right	private	flu
1231302560601R01	maintained channel	NATURAL GROUND	U/S OF SMITHY BRIDGE. HONEYWELL	right	private	flu
1231302560601B01	non-flood defence structure	WEIR	WEST OF SMITHY GREEN	both	private	flu
1231302560501R01	maintained channel	NATURAL GROUND	Smithies Lane to Cundy Cross A628	right	private	flu
1231302560501L03	maintained channel	Open Channel with some walled sections	Smithies Lane bridge to Old Mill / Gas holder	left	private	flu
1231302560501B01	non-flood defence structure	WEIR	U/s of Old Mill Road Bridge	both	private	flu
1231302560501L02	raised defence (man-made)	DISUSED RAILWAY EMBANKMENT	D/S of Old Mill Lane Road to Dearne Valley Park 1st Footbridge	left	private	flu

Description of Works

See following/attached table with description of the defences and structures shown on the above drawing, including condition ratings. Upstream and downstream crest levels are not available for the defences in this area.

Risk of Flooding – Environment Agency Defences

The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

Risk of Flooding – Privately Maintained Defences

You will see that the Environment Agency does not maintain any of those defences. However we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences or structures.

Asset Condition Ratings

The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.

Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

Modelling

Flood Modelling - River Don

The River Don Catchment Flood Model was completed by Jeremy Benn Associates in May 2004. See enclosed the ISIS Hydraulic Model Summary Sheets showing modelled water levels and flows for 5 different return periods for the River Dearne around Old Mill Bridge. Unfortunately at the moment we have no modelling data for the River Dearne upstream of Old Mill Bridge. A study is currently in however in progress. This will provide modelled outlines and levels for the 5, 10, 25, 50, 75, 100, 100+CC, 1000yr return periods for the Upper Dearne (upstream of Old Mill Bridge). The study is due for completion at the end of April 2010.

This information is based on data that is currently available to the Environment Agency and is subject to our standard notice. The Agency accepts no liability for any loss or damage arising from its use. The interpretation of the information is your responsibility.

If you require any further help, please do not hesitate to contact me.

Yours sincerely,

Stacey Riley
External Relations Officer

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