

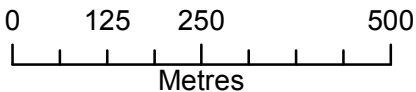


Appendix D – EA Product 4 Flood Data

Flood Map for Planning centred on Victoria Road, South Ruislip, HA4 0LP - 06/02/2018 - HNL 74481 NR



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Bessemer Road,
Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

Main Rivers

Flood Map for Planning

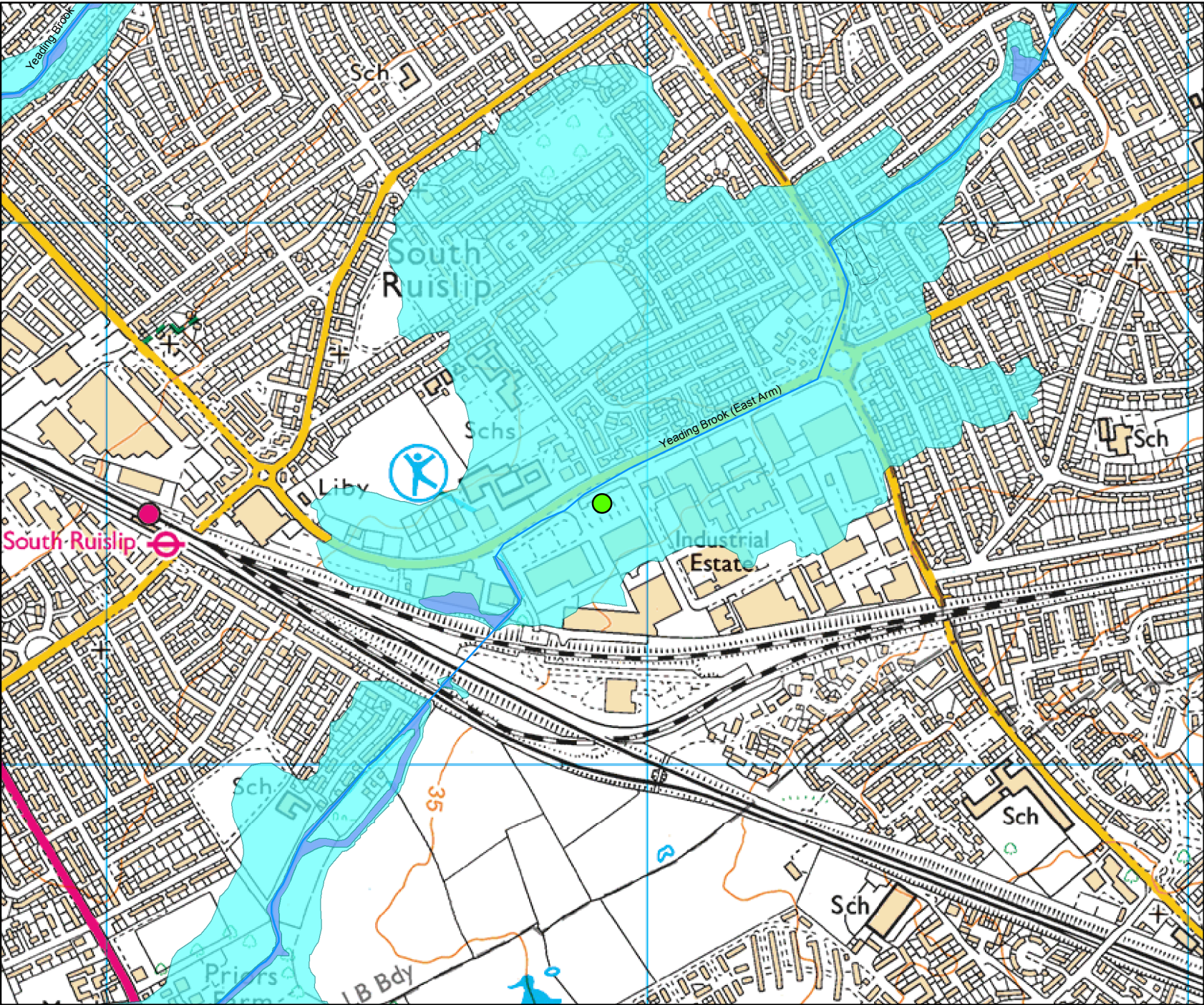
- Flood Storage Area
- Areas Benefiting from Flood Defences
- Flood Zone 3
- Flood Zone 2

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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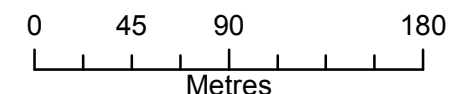


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Detailed FRA centred on Victoria Road, South Ruislip, HA4 0LP - 06/02/2018 - HNL 74481 NR



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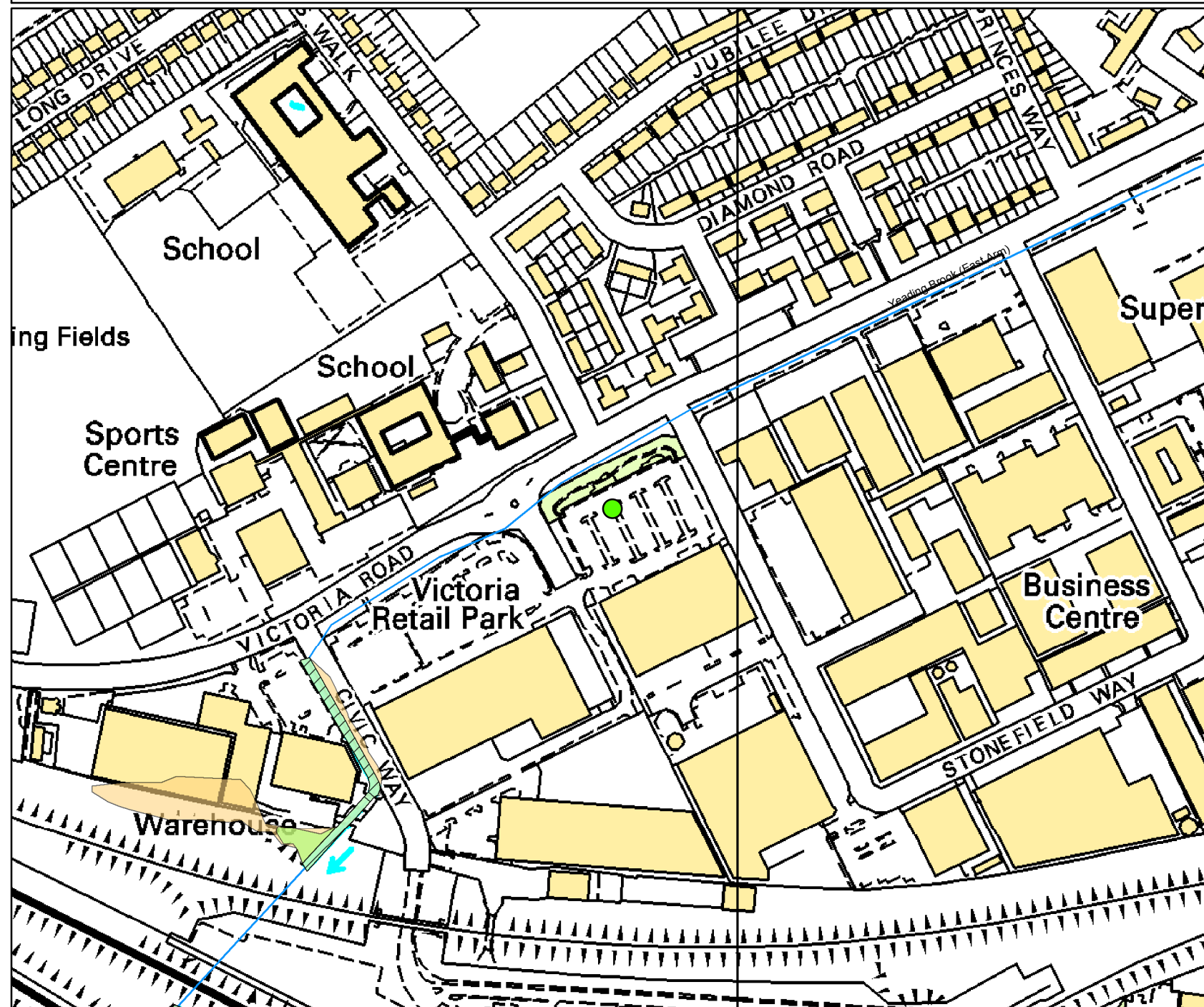
Defended Flood Outlines

- 1 in 5 (20%) Defended
- 1 in 10 (10%) Defended
- 1 in 20 (5%) Defended
- 1 in 50 (2%) Defended

The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

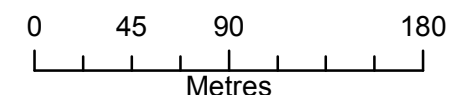
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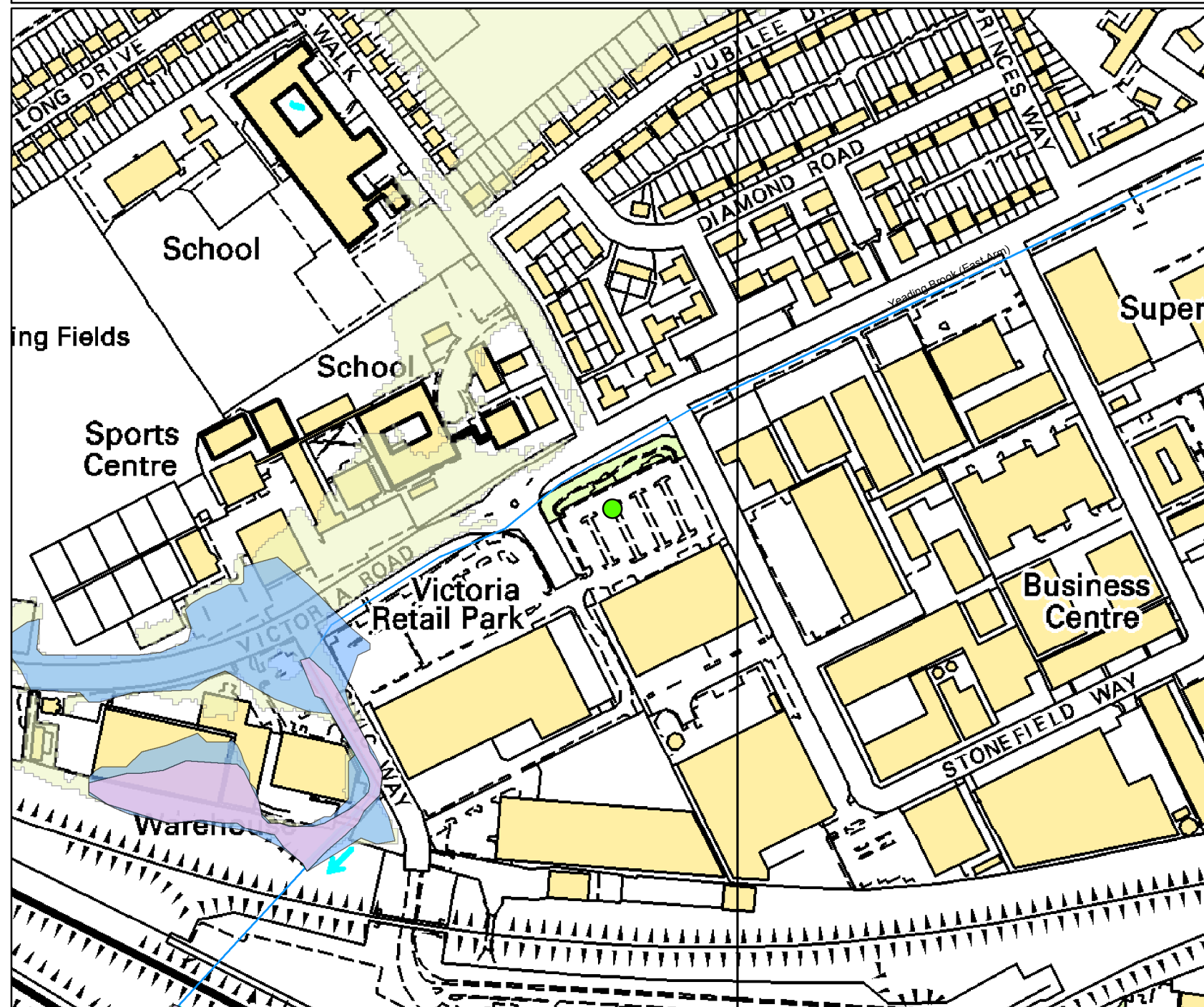
Defended Flood Outlines

- 1 in 100 (1%) Defended
- 1 in 100+20% (*CC) Defended
- 1 in 100+25% (*CC) Defended

The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

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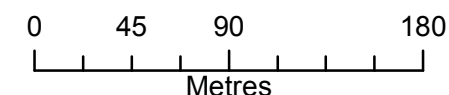
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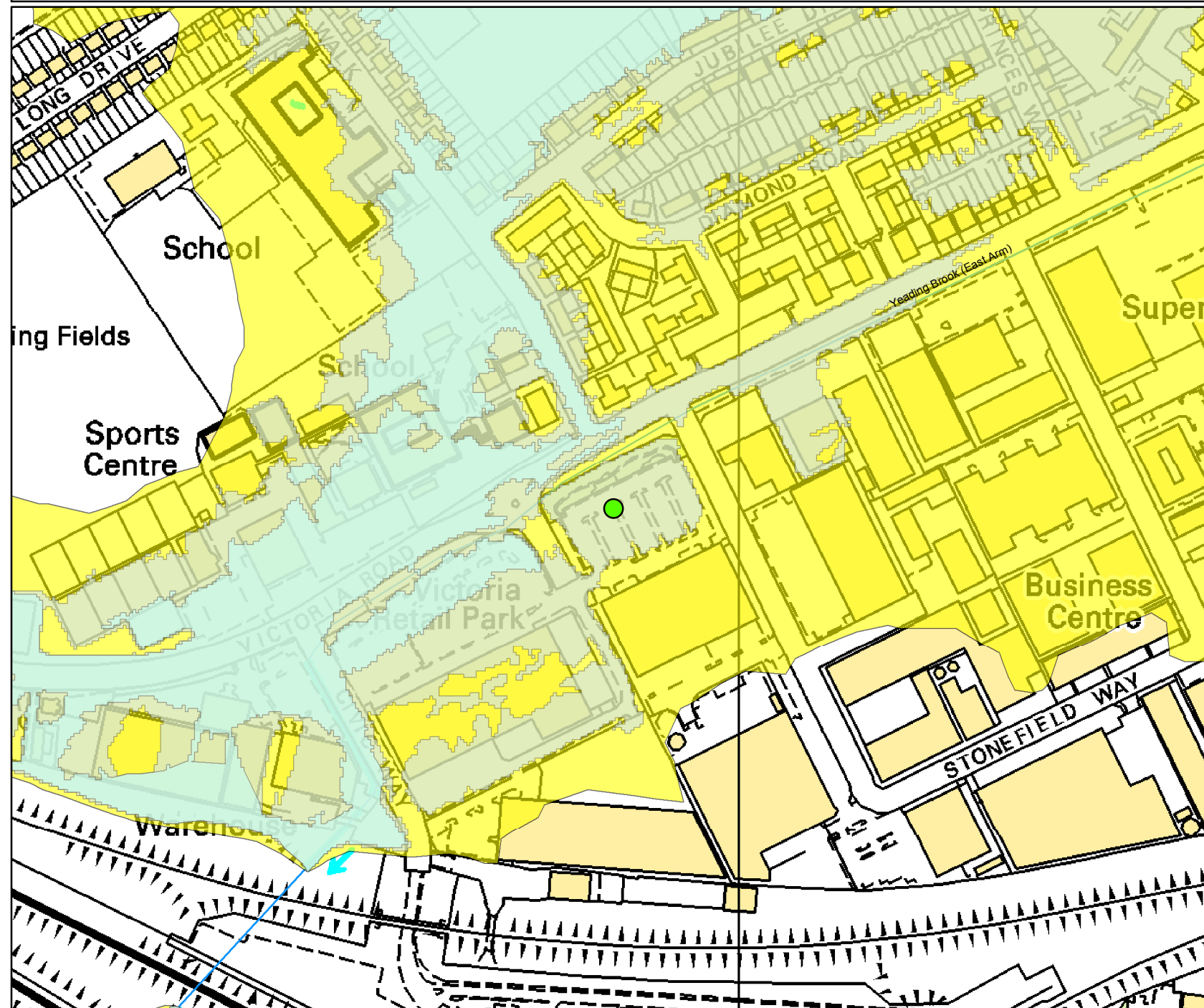
Defended Flood Outlines

- 1 in 100+30% (*CC) Defended
- 1 in 100+70% (*CC) Defended
- 1 in 1000 (0.1%) Defended

The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

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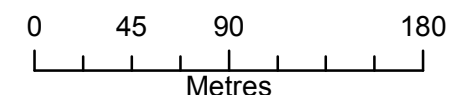
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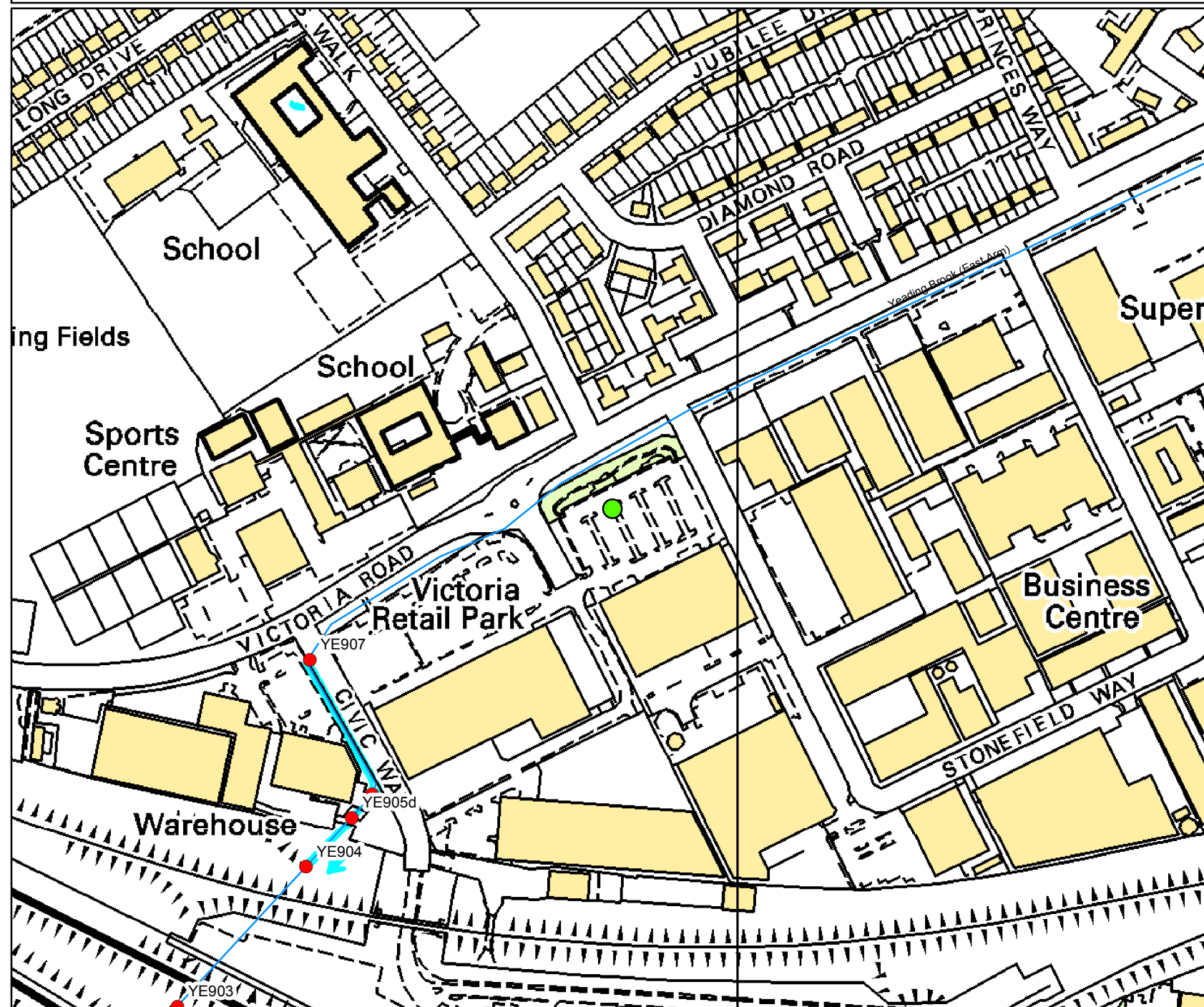
1D Node Results

● Node Results

The data in this map has been extracted from the River Crane Mapping Study (Halcrow 2008). This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences.

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Environment Agency ref: [HNL 74481 NR](#)

The following information has been extracted from the River Crane Mapping Study (Halcrow 2008)

Flood risk data requests including an allowance for climate change will be based on the 1 in 100 flood plus 20% allowance for climate change, unless otherwise stated. You should refer to 'Flood risk assessments: climate change allowances' to check if this allowance is still appropriate for the type of development you are proposing and its location. You may need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Caution:

The modelled flood levels and extents are appropriate for catchment wide strategic flood risk mapping. However, for more detailed flood risk assessment it is recommended that each of the underlying flood mapping, hydraulic modelling and hydrological assumptions are re-evaluated to determine the appropriateness in a more detailed analysis.

All flood levels are given in metres Above Ordnance Datum (mAOD)

All flows are given in cubic metres per second (cumecs)

MODELLED FLOOD LEVEL

			Return Period									
Node Label	Easting	Northing	5 yr	10 yr	20 yr	50 yr	100 yr	100yr + 20%	100yr + 25%	100yr + 35%	100yr + 70%	1000yr
YE907	511723	185385	33.79	33.89	33.96	34.05	34.16	34.33	34.37	10.35	10.40	35.34
YE906u	511762	185296	33.76	33.86	33.93	34.02	34.13	34.30	34.34	10.47	10.66	35.34
YE905d	511749	185282	33.75	33.85	33.92	34.01	34.10	34.29	34.33	10.47	10.66	35.30
YE904	511721	185249	33.63	33.73	33.83	33.97	34.09	34.28	34.32	10.77	11.03	35.30
YE903	511639	185159	33.40	33.48	33.54	33.65	33.73	33.86	33.88	10.78	11.05	34.38

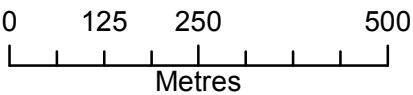
MODELLED FLOWS

			Return Period									
Node Label	Easting	Northing	5 yr	10 yr	20 yr	50 yr	100 yr	100yr + 20%	100yr + 25%	100yr + 35%	100yr + 70%	1000yr
YE907	511723	185385	2.32	2.66	3.02	3.51	3.93	4.69	4.80	5.25	6.52	8.31
YE906u	511762	185296	4.65	5.31	6.01	7.04	7.90	9.30	9.60	10.17	12.24	18.01
YE905d	511749	185282	4.65	5.31	6.01	7.04	7.90	9.30	9.60	10.17	12.24	18.01
YE904	511721	185249	4.65	5.31	6.01	7.03	7.88	9.19	9.50	10.04	12.08	17.14
YE903	511639	185159	4.65	5.31	6.01	7.03	7.88	9.19	9.50	10.04	12.08	17.14

Historic Flood Map centred on Victoria Road, South Ruislip, HA4 0LP - 06/02/2018 - HNL 74481 NR



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Main Rivers

Flood Event Outlines

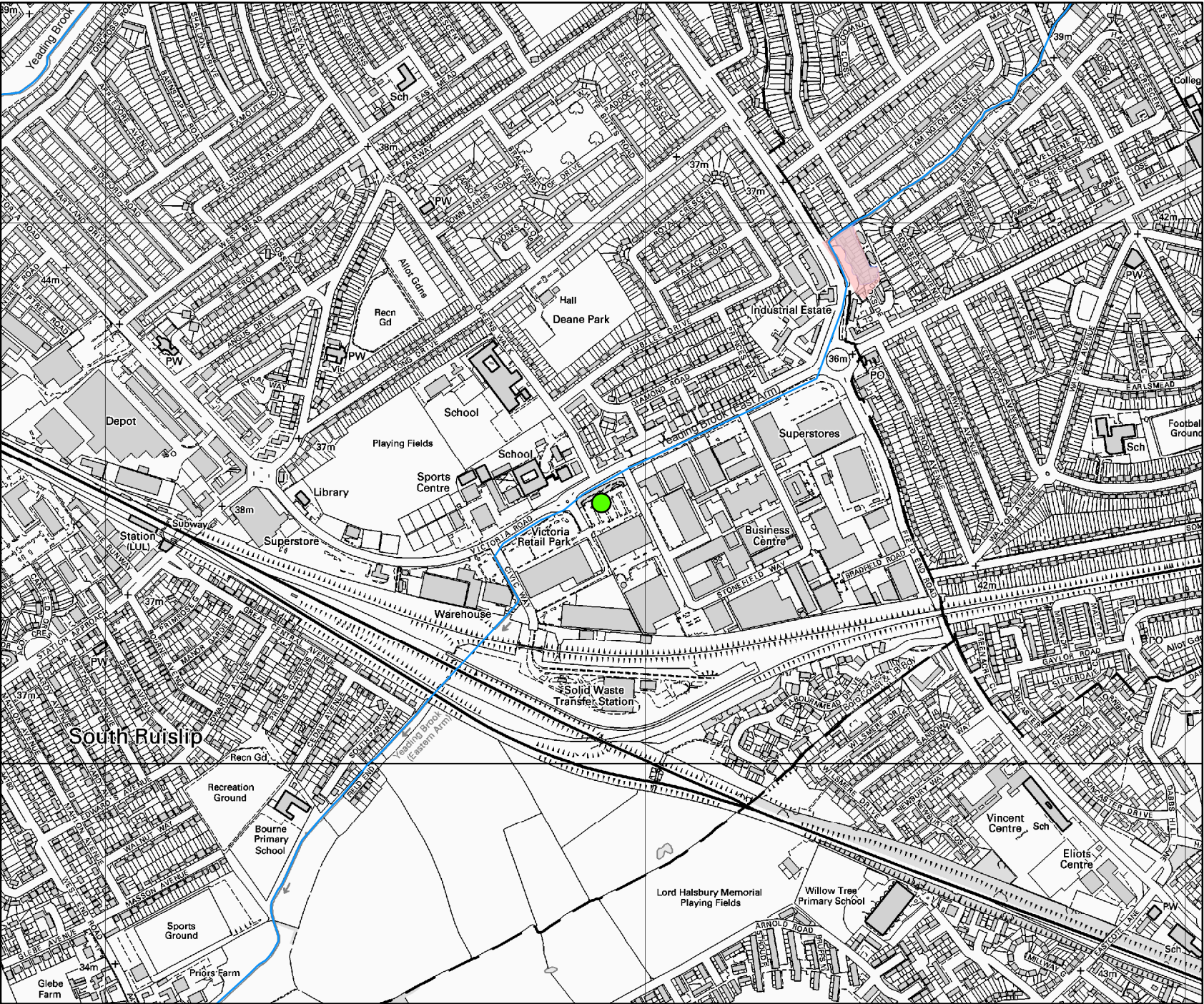
- 2007
- 1999

The historic flood event outlines are based on a combination of anecdotal evidence, Environment Agency staff observations and survey.

Our historic flood event outlines do not provide a definitive record of flooding. It is possible that there will be an absence of data in places where we have not been able to record the extent of flooding.

It is also possible for errors occur in the digitisation of historic records of flooding.

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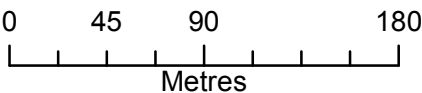


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— Main Rivers

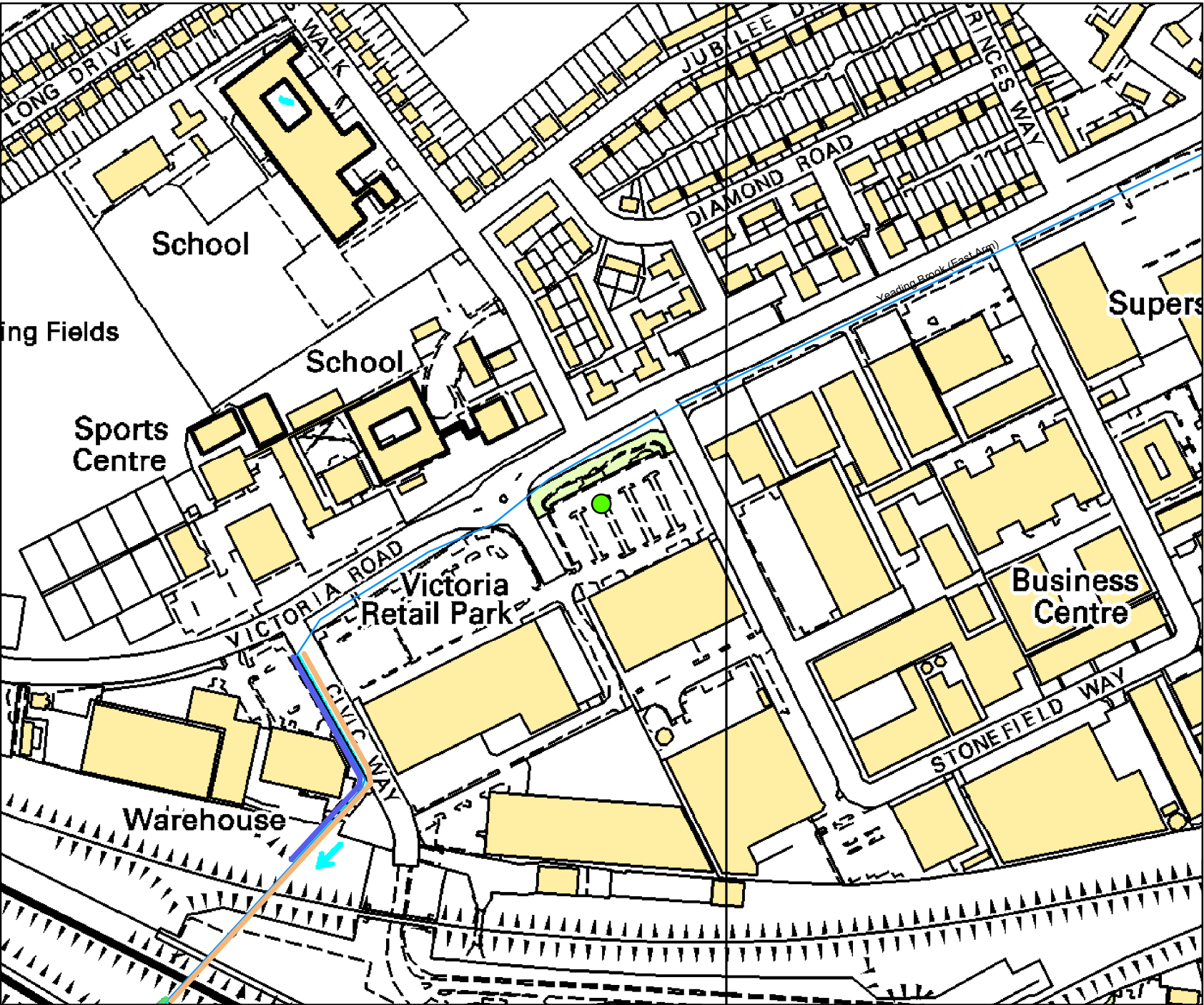
NAFRA_DEFENCE

ASSET_ID

- 154819
- 154820
- 180978

The following information on defences has been extracted from the Asset Information Management System (AIMS)

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Environment Agency ref: [HNL 74481 NR](#)

The following information on defences has been extracted from the Asset Information Management System (AIMS)

Defences

Asset ID	Asset Type	Asset Protection	Asset Comment	Asset Description	Design Standard of protection (years)	Downstream Crest Level	Upstream Crest Level	Condition of Defences (1=Good, 5 = Poor)
32399	high_ground	fluvial	Left bank of Culvert	Left bank of Victoria Road Culvert	100	No Data	No Data	No Data
32400	simple_culvert	fluvial	Concrete box culvert with concrete headwall and wingwalls U/S and D/S. U/S end protected by Field End screen	Victoria Road Culvert	200	No Data	No Data	2
42577	simple_culvert	fluvial	Brick barrel culvert with cast insitu concrete extension to U/S end built to the same dimensions. Concrete headwalls and wingwalls U/S, Brick D/S.	Railway Culvert	100	No Data	No Data	3
154819	high_ground	fluvial	Cast insitu concrete channel walls with railing and Crash barrier to crest.	Lined Channel	2	35.55	34.23	2
154820	high_ground	fluvial	Earth banks, probably backed by retaining wall to protect retail park.	Natural Bank	2	35.98	34.24	3
180978	high_ground	fluvial	Enlargened and deepened rectangular, reinforced concrete channel. Splays provided at each end to reduce head loss at the change in channel cross section. 1 in 100 yrs SoP. O & M Manual 36/7.	Field End Channel lining	1000	35.52	35.86	3



Appendix E – Correspondence with Hillingdon Borough Council

From: francisco.aguilar
Sent: 27 February 2018 16:40
To: 'Flooding. .'; 'vboorman@hillingdon.gov.uk'
Cc: tom.beavis
Subject: RE: Proposed Development in CDA - Victoria Retail Park - South Ruislip

Hi Vicky,

Thank you for your quick response.

The Qbar for the 0.17ha site is 0.74l/s and restricting rates to this figure seems unpracticable. We are proposing 3 l/s instead. We do not have experience recommending lower rates than this and therefore it would be very helpful if you could indicate the required rate if 3 l/s is too high.

I have seen in your website that the S106 may be required. Does the council have more guidance on this? What contribution would be required, how is it calculated? Will this be addressed via a planning condition?

My colleagues in IT have identified that an issue in our end prevents me from downloading the SWMP – we will sort it out

Thank you

Regards

Francisco Aguilar
Flood Risk & Drainage Engineer

For more information about WYG Engineering, please have a look at our [brochure](#)

WYG
Arndale Court, Headingley, Leeds, West Yorkshire, LS6 2UJ
Tel: +44 113 219 2284

www.wyg.com

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Registered Office: Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire LS6 2UJ VAT No: 431-0326-08.



From: vboorman@hillingdon.gov.uk [mailto:vboorman@hillingdon.gov.uk] **On Behalf Of** Flooding. .
Sent: 27 February 2018 14:28
To: francisco.aguilar <francisco.aguilar@wyg.com>
Cc: tom.beavis <tom.beavis@wyg.com>
Subject: Re: Proposed Development in CDA - Victoria Retail Park - South Ruislip

Hi Francisco

The SWMP is held <http://www.hillingdon.gov.uk/article/26402/Surface-water-management-plan> and the links seem to work still for me.

If not the CDA are also shown on the Flooding Pages on the Council website Map.

However it is in a CDA so you will be required to discharge at greenfield run off rates, an assumed 5/l/s is not acceptable, please also see guidance on the SuDs page on the Council website including a proforma to use.

For previous events of flooding please initially refer to the Flood Investigations already undertaken, also published on the Council webpages.

Please note that a S106 contribution will be required to develop flood risk reduction schemes in this area, as you are also in Flood Zone 2.

regards

Vicky

Flood and Water Management
Contact Centre Tel: 01895 556000
flooding@hillingdon.gov.uk

On 27 February 2018 at 14:07, francisco.aguilar <francisco.aguilar@wyg.com> wrote:

Dear Colleague,

We have been commissioned to prepare a flood risk & drainage assessment in support of a planning application for the development of a Mc Donald's drive through restaurant in a 0.17ha area within the Victoria Retail Park in Victoria Rd, South Ruislip, HA4 0LN.

Unfortunately, I have not been able to download most of the SWMP documents available on your website as the links seem to be broken. However, I have been able to download Appendix A that includes a list of the CDAs within the borough. Whilst I have not been able to see a map showing the extent of CDA027, which covers the Victoria Retail Park, I suspect that our site falls within this CDA.

There is an existing car park within the site and therefore the site is approximately 50% impermeable. The existing retail park discharges to the culverted section of Yeading Brook under Victoria Road via two 600mm diameter surface water sewers, at an unrestricted rate.

Whilst we have not been able to read in the SWMP any specific policies that may apply to development within the CDA, we are proposing to reduce discharge rates from the impermeable areas of the site to 5 l/s (as reducing to the greenfield rate would be impractical due to the risk of blockage). We would be grateful if you could indicate if this is acceptable to Hillingdon LLFA.

Finally, I note that the LFRMS indicates that flooding was recorded in this retail park in 2015. Could you provide more details of this event? If flooding has been recorded in this location in more occasions, please let us know.

We would be grateful if you could provide a copy of the SWMP and appendices.

Thank you for your help

Regards

Francisco Aguilar
Flood Risk & Drainage Engineer

For more information about WYG Engineering, please have a look at our [brochure](#)

WYG
Arndale Court, Headingley, Leeds, West Yorkshire, LS6 2UJ
Tel: +44 113 219 2284

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Appendix F – Greenfield Runoff Calculations

Calculated by: Francisco Aguilar

Site name: victoria rd

Site location:

Site coordinates

Latitude: 51.55770° N

Longitude: 0.38415° W

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Reference: 6259219

Date: 2018-02-27T14:12:34

Methodology

IH124

Site characteristics

Total site area (ha) .17

Methodology

Qbar estimation method Calculate from SPR and SAAR

SPR estimation method Calculate from SOIL type

	Default	Edited
SOIL type	4	4
HOST class	---	---
SPR/SPRHOST	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm)	639	639
Hydrological region	6	6
Growth curve factor: 1 year	0.85	0.85
Growth curve factor: 30 year	2.3	2.3
Growth curve factor: 100 year	3.19	3.19

Notes:

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consents are usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements

(3) Is $SPR/SPRHOST \leq 0.3$?

Greenfield runoff rates

	Default	Edited
Qbar (l/s)	0.74	0.74
1 in 1 year (l/s)	0.63	0.63
1 in 30 years (l/s)	1.7	1.7
1 in 100 years (l/s)	2.35	2.35