

Appendix D

CORRESPONDENCE WITH ARUN DC

Bomba, Gosia

From: Paul Cann [REDACTED]
Sent: 25 April 2016 10:02
To: Bomba, Gosia; Thomas Callaway
Cc: Gail Pilkington; Isnenghi, Enrico
Subject: RE: Angels Nursery Barnham, FRA
Attachments: 20160425100341499.pdf

Hi Gosia

In terms of historical flooding, there is flooding downstream of the development in Hill Lane. I have marked the approximate location on the enclosed plan.

There is a possible solution to the issue and that is to lay a new 300mm diameter pipe parallel to the existing 225mm pipe, between points A and B.

Our requirements in terms of drainage have not changed since our previous correspondence.

Regards

Paul Cann
Senior Engineer (Drainage & Coastal)

Paul Cann | Senior Engineer (Drainage & Coastal), Engineering Services, [Arun District Council](#) | Location: Second Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

[REDACTED]
Arun is Working in Partnership with Chichester District Council

Visit Arun's web site at <http://www.arun.gov.uk/> and www.chichester.gov.uk



Save the environment - think before you print.

From: Bomba, Gosia [REDACTED]
Sent: 22 April 2016 18:10
To: Thomas Callaway; Paul Cann
Cc: Gail Pilkington; Isnenghi, Enrico
Subject: Angels Nursery Barnham, FRA

Thomas, Paul,

I will be preparing a Flood Risk for the development of Yapton Road, Barnham and we are investigating the potential flood risk issues at the site. I am aware of the correspondence and agreements between my colleagues Anthony and Gurdeep (in 2013) and Arun DC, please see the attachments. Although the site has a new masterplan and a new FRA is being produced, the drainage principals will stay exactly the same. For the purpose of the FRA, we would welcome any comments (if there are any) with regards to flooding in the area. Also can you please advise on any changes with regards to the local policies on flood risk and drainage which we should be aware of and should inform our studies.

We would welcome your comments on any issues or concerns you may have involving this site.

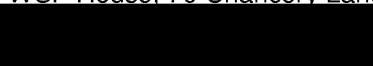
We would appreciate an early response, therefore if you require any further information regarding the site to assist with our queries, please do not hesitate to contact me.

Regards,

Gosia Bomba
Senior Engineer



WSP House, 70 Chancery Lane, London, WC2A 1AF



<http://www.arun.gov.uk>

NLPG UPRN 100062237016

DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.



Bomba, Gosia

From: Thomas Callaway [REDACTED]
Sent: 08 February 2016 17:17
To: Neil Crowther
Cc: 'Andrew.K.Bell@lovell.co.uk'; Paul Cann; 'daryl.roberts@lovell.co.uk'; Jacques, Simon; Cox, Anthony
Subject: RE: Angels Nursery - Planning comments BN/42/15/DOC

Neil

Sufficient detail has been provided to discharge the surface water drainage conditions.

Regards

Tom

Thomas Callaway | Drainage & Coastal Engineer, Engineering Services, Arun District Council | Location: Second Floor, Arun Civic Centre,
Maltravers Road, Littlehampton, BN17 5LF

Arun is Working in Partnership with Chichester District Council

Visit our web site at www.arun.gov.uk and www.chichester.gov.uk



Save the environment - think before you print.

From: Cox, Anthony [REDACTED]
Sent: 05 February 2016 14:34
To: Thomas Callaway
Cc: [REDACTED]; Jacques, Simon
Subject: RE: Angels Nursery - Planning comments BN/42/15/DOC

Tom,

Please see the attached plan, standard detail and calculation.

The plan has essentially has been amended to show the ditch in the south western corner of the site. A note has been added to state that the existing vehicle crossover / culvert will be removed and the ditch reinstated.

A typical section through the pond has been created to demonstrate the construction materials. I have provided a calculation which demonstrates that a 400mm layer of topsoil on top of the geo-membrane is sufficient to counteract the uplift from the groundwater.

Now that you have received this additional information along with our previous correspondence, I trust this will allow you to now discharge the remaining planning condition.

Kind regards,



Anthony Cox TMICE
Senior Engineer

[LinkedIn](#)

Keble House, Southernhay Gardens, Exeter, EX1 1NT

www.wsp-pb.co.uk

Check out our [LinkedIn](#) page
Follow us on [Twitter](#)

Confidential

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited (trading as WSP | Parsons Brinckerhoff), Registered Office, WSP House, 70 Chancery Lane, London, WC2A 1AF. Registered Number 01389511 England

Engineering Consultant of the Year - Building Awards 2015

Winner of the RoSPA President's Award for Occupational Health & Safety 2015

From: Thomas Callaway [REDACTED]
Sent: 03 February 2016 11:13
To: Cox, Anthony
Cc: 'Andrew.K.Bell@lovell.co.uk'; Paul Cann; 'daryl.roberts@lovell.co.uk'; Jacques, Simon
Subject: RE: Angels Nursery - Planning comments BN/42/15/DOC

Anthony

I am happy with your comments below but would just require construction details for the pond liner and for all revised drawings etc to be submitted to planning to discharge the conditions.

Regards

Tom Callaway

[Thomas Callaway](#) | Drainage & Coastal Engineer, Engineering Services, [Arun District Council](#) | Location: Second Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

[REDACTED]
Arun is Working in Partnership with Chichester District Council

Visit our web site at www.arun.gov.uk and www.chichester.gov.uk



Save the environment - think before you print

From: Cox, Anthony [REDACTED]
Sent: 02 February 2016 15:43
To: Thomas Callaway
Cc: 'Andrew.K.Bell@lovell.co.uk'; Paul Cann; [REDACTED] Jacques, Simon
Subject: RE: Angels Nursery - Planning comments BN/42/15/DOC

Tom,

Thank you for your response regarding the drainage comments at Angels Nursery.

I have done some further work to respond to your outstanding comments;

Comment 3

I have supplied the groundwater investigation that was completed for the site in 2014.

The report shows that the pond is in an area with a lower groundwater level in comparison to the rest of the site. It does also show that the groundwater is likely to be approximately 300mm above the invert of our pond. As I mentioned previously, the pond will be permanently wet, which will provide anchorage during lower groundwater conditions, however in extreme events, we can provide a liner anchor as you had mentioned in your response.

Comment 4

As discussed with yourself and Paul, the client has agreed to remove the crossing and culvert, and reinstate the ditch. He has also agreed to allow yourselves to inspect the work once completed.

Comment 7

I have provided a maintenance schedule based on the types of SuDS features we have onsite. I have not included the drainage that will be adopted by Southern Water as they will have their own maintenance regimes. The maintenance strategy has been compiled using the SuDS manual.

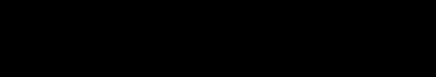
I trust the above allows you to discharge the relevant planning conditions, however if you have any further comments then please let me know.

Kind regards,



Anthony Cox TMICE
Senior Engineer
[LinkedIn](#)

Keble House, Southernhay Gardens, Exeter, EX1 1NT



www.wsp-pb.co.uk

Check out our [LinkedIn](#) page
Follow us on [Twitter](#)

Confidential

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited (trading as WSP | Parsons Brinckerhoff), Registered Office: WSP House, 70 Chancery Lane, London, WC2A 1AF. Registered Number 01383511 England

Engineering Consultant of the Year - Building Awards 2015

Winner of the RoSPA President's Award for Occupational Health & Safety 2015

From: Thomas Callaway
Sent: 28 January 2016 13:29

To: Cox, Anthony
Cc: [REDACTED]
Subject: RE: Angels Nursery - Planning comments BN/42/15/DOC

Anthony

Responses to the points below:

1. Noted, this should be to the hard bed of the ditch, removing all silt.
2. Noted, hopefully the desilted levels give some freeboard.
3. For a similar pond at Brook Nursery the liner is held down by more than just the water, is there a hardcore or concrete solution that could be designed in or would too much storage be lost for the area available? A deeper excavation may allow for a layer of liner retaining material.
4. This should be undertaken as a riparian responsibility, and would benefit the land drainage system.
5. Noted, I was more concerned that if ditch improvements were undertaken it may increase flow and flood risk downstream, are any off-site improvements planned? I understand that the discharge from site is restricted sufficiently.
6. Noted
7. Noted, and a schedule should be provided (similar format to how maintenance schedules are suggested for different SuDS elements in the SuDS Manual would be fine).

The scheme is suitable in principle, I just want to iron out these finer details prior to approving them. Also, how does the application for a further 9 dwellings impact this DOC application? Surely the condition should only be discharged once revised storage requirements and layout are calculated?

Regards

Tom Callaway

Thomas Callaway | Drainage & Coastal Engineer, Engineering Services, Arun District Council | Location: Second Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

Arun is working in Partnership with Chichester District Council

Visit our web site at www.arun.gov.uk and www.chichester.gov.uk



Save the environment - think before you print.

From: Cox, Anthony [REDACTED]
Sent: 25 January 2016 10:49
To: Thomas Callaway
Cc: [REDACTED]
Subject: Angels Nursery - Planning comments BN/42/15/DOC

Good morning Thomas,

I have been passed your comments regarding the drainage proposals for the proposed development at Angels bursary, Barnham.

I have provided a response to each of your comments below;

1. *To what depth and fall are the ditches going to be regarded to?*

The ditches are only proposed to be regraded to a point where they can be considered reinstated. It is not our intention to alter the ditches other than ensure they are maintained prior to discharging from the site.

2. *The invert level at the proposed discharge point into the ditch is very close to the existing ditch bed level, we are keen to avoid this so could a drawing be provided showing the outlet and ditch levels post-regrading?*

Due to the flat topography, the pond is quite limited in depth, it is quite shallow as it is (Approximately 1m deep). The main sewers cannot get any shallower due to restrictions on cover. If the system was to be raised then the entire site would require further rising which the site has already done. Therefore we believe the invert level is fixed.

3. *Are the ponds to be lined (due to high groundwater levels) and how is flotation of the liner being prevented?*

It is proposed to line the pond. This is to restrict ingress of groundwater but to also restrict contamination from the existing ground. The architect has indicated that a permanently wet feature would be desirable, in this case it could be proposed to have a 300mm deep permanent body of water set below the outlet level, this will anchor down the lining. Furthermore, a gravel surround can be proposed to divert groundwater away from the pond.

4. *What are the proposals for the field crossing at the south-west corner of the site, we would be hoping to see the culvert/blockage removed as part of the ditch works.*

If access is possible then we can try and unblock the culvert.

5. *What are the proposals (if any) for ensuring that the improvement works do not increase flood risk downstream? There are issues at Hill Lane that may need addressing as part of the works.*

The peak discharge rate for the site has been reduced significantly; furthermore, permeable paving features have been proposed upstream which will ensure the water is slowed down before entering the pond and ultimately the ditch. The volume runoff will be reduced through restricting to Qbar.

6. *The foul sewerage arrangements must be confirmed with Southern Water due to the potential capacity issues.*

Southern Water have confirmed the work required to resolve the capacity issues (See attached).

7. *Is there sufficient ditch access for maintenance; and is there a maintenance schedule detailing the future frequency and types of maintenance for the surface water drainage system and ditch system? Who is to carry out this maintenance?*

The Site is to be managed by a private management company, I can ask the client for a management schedule if required?

I trust the responses are sufficient to discharge your comments, however if you wish to discuss any of these points then please feel free to give me a call.

Kind regards,



Anthony Cox TMICE
Senior Engineer
[LinkedIn](#)

Keble House, Southernhay Gardens, Exeter, EX1 1NT

www.wspgroup.co.uk
www.pbworld.com

Check out our [LinkedIn](#) page
Follow us on [Twitter](#)

Confidential

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited, Registered Office: WSP House, 70 Chancery Lane, London, WC2A 1AF Registered Number 01383511 England

 If possible, please consider saving paper by not printing your e-mail.

Winner of Highway Agency Supplier Recognition Award 2014 for 'managing down cost'
RoSPA President's Award winners for Occupational Health & Safety 2014

<http://www.arun.gov.uk>

NLPG UPRN 100062237016
DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.

<http://www.arun.gov.uk>

NLPG UPRN 100062237016
DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.

<http://www.arun.gov.uk>

NLPG UPRN 100062237016
DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.

Bansal, Gurdeep

From: Thomas Callaway <[REDACTED]>
Sent: 02 September 2013 14:19
To: Bansal, Gurdeep
Subject: RE: Barnham - Proposed Development Drainage Queries
Attachments: Engineers - Supplementary Guidance Notes For Surface Water Drainage Pro....pdf

Hello Gurdeep

The EA would be responsible for any Main River or Internal Drainage District watercourses. Within the site, the ditches/watercourses are not Main River or IDD and would be the responsibility of the LLFA. Works within or affecting the flow within these watercourses require land drainage consent from the LLFA. West Sussex CC passes these consent requests to Arun DC, who are working as the agents for WSOC. Works that would require consent include the types of work you mention, such as infilling, culverting and increasing the width of ditches.

We generally do not want to see ditches/watercourses filled in or culverted. A minimum of 3 metres width of access should be provided for the length of the ditches for maintenance access. Discharge to the watercourse would also require consent, and we would want to see winter groundwater monitoring (October – March) and percolation testing results to ascertain how much infiltration could be achieved before relying on a controlled discharge of surface water to a watercourse. We often get responses stating that there would be no point as there is limited potential for infiltration due to the soil type in the area. As infiltration is the preferred disposal method for surface water we will insist on testing for infiltration before allowing just attenuation and discharge to a watercourse. If rates are limited we would still expect partial infiltration from SuDS systems to be explored based on the results from the testing. Attached is some guidance on this matter.

I hope this helps.

Regards

Tom Callaway

Thomas Callaway | Drainage & Coastal Engineer, Engineering Services, [Arun District Council](#) | Location: Second Floor, Arun Civic Centre, Maitravers Road, Littlehampton, BN17 5LF

[REDACTED]
Arun is Working in Partnership with Chichester District Council

Visit Arun's web site at www.arun.gov.uk and www.chichester.gov.uk



Save the environment - think before you print

From: Bansal, Gurdeep [REDACTED]
Sent: 02 September 2013 09:37
To: Thomas Callaway
Subject: RE: Barnham - Proposed Development Drainage Queries

Thanks Tom

With regards to the drainage network itself, does this fall under the LLFA responsibility. The attached EA letter suggests so, ultimately I need to understand that if an proposed planning application was to be submitted, who would we need to seek approval from for re-utilising the ditch network.

I note that the ditch network eventually connects onto the main river, the EA's letter suggest that as long as the development restricts flows to the current undeveloped discharge rate they would have no objections. With regards to the onsite drainage, we have been liaising with the architect to ensure that SuDS are included within the development context, once an application is proposed, the associated FRA will detail the proposed strategy.

In terms of culverting, the proposed ditches along the boundary of the site are being retained as part of the development proposal, unfortunately it's likely that the two internal ditches (land drains) which stem from the middle of the site connecting to the southern boundary ditch will need to be culverted/removed in order to allow the development proposal to take shape, we will need to apply for consent at the appropriate time. We asked the architect to increase the width of the boundary ditches, in order to compensate for the loss of these two ditches (land drains) within the site.

Kind Regards

Gurdeep Bansal
Engineer

WSP UK
WSP House, 70 Chancery Lane
London, WC2A 1AF

From: Thomas Callaway [REDACTED]
Sent: 30 August 2013 16:14
To: Bansal, Gurdeep
Subject: RE: Barnham - Proposed Development Drainage Queries

Hello Gurdeep

We have some more information from our land drainage plans, and also some general information about our expectations for drainage of the proposed development.

The ditches around the site will need general maintenance and re-grading, and there is potentially a blockage in the south-western corner of the site that will need particular attention.

Paul has done a lot of work in this particular area, and I attach his annotated records from our land drainage maps. Hopefully these will answer any queries regarding connectivity between the land drainage networks in this area.

The following is our standard pre-application drainage advice. Also attached is further guidance. We require all of the testing to be done so that any opportunities for infiltration may be realised. Total infiltration is unlikely to be achieved at this site but any possible partial infiltration should be taken advantage of.

Any proposed surface water drainage scheme will need to consider the use of sustainable drainage principles (SuDS).

The design will need to follow the hierarchy of preference for different types of surface water drainage systems as set out in Approved Document H of the Building Regulations and the Sustainable Drainage System (SuDS) Manual produced by CIRIA. This means that the developer must first consider the discharge of surface water into an infiltration device (eg. soakaway, basin, swale, permeable paving etc) before considering any other method.

Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period and at the location and depth of the proposed structures. The percolation tests and design must be carried out in accordance with BPE 365, CIRIA R156 or a similar approved method and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway, and the base of the structure. It must also have provision to ensure that there is capacity in the system to contain below ground level the 1 in 100 year event plus 30% on stored volumes, as an allowance for climate change. Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded annual groundwater level identified in that location.

Any SuDS or soakaway design will need to include adequate groundwater monitoring data to determine the highest winter groundwater table in support of the design. Supplementary guidance notes are also enclosed for information.

Please let me know if there is anything else I can help with.

Regards

Tom Callaway

Thomas Callaway | Drainage & Coastal Engineer, Engineering Services, Arun District Council | Location: Second Floor, Arun Civic Centre, Maitravers Road, Littlehampton, BN17 5LF

Arun is Working in Partnership with Chichester District Council

Visit Arun's web site at www.arun.gov.uk and www.chichester.gov.uk



Save the environment - think before you print.

From: Bansal, Gurdeep [REDACTED]
Sent: 27 August 2013 13:07
To: Paul Cann
Subject: Barnham - Proposed Development Drainage Queries
Importance: High

Hi Paul

We are looking at a proposed development in Barnham, site location plan attached. I'm aware you had some previous discussions with my colleagues regarding the a site just north of this one. Would appreciate your thoughts with regards to this development site.

We have carried out a site visit as part of our works to determine how the site currently drains surface water, it is evident from the site visit that there several land drains around the boundary of the site, as well as a two drains running through the middle of the site itself. Please see attached mark-up plan (SK-01).

It is assumed that this network eventually connects on to a wider land drainage network (which tend to carry on south), as highlighted on the attached plan, more investigative work will be carried out to determine the existing connectivity at a later stage. Do you have any information regarding these existing ditches?

Assuming that the site does connect onto the this system, we would aim to utilise this network to discharge surface water from the site (assuming infiltration drainage would not be feasible). The site is mainly undeveloped and therefore we would likely attenuate flows from the development to a greenfield runoff.

I would appreciate your view on this proposal in terms of surface water discharge and the level of information that would need to be submitted to be able to discharge to this existing network as the LLFA (as we believe these watercourses are ordinary).

Due to the early nature of this development proposal, I would appreciate it if this is kept strictly confidential.

Kind Regards

Gurdeep Bansal
Engineer

WSP UK
WSP House, 70 Chancery Lane
London, WC2A 1AF

Website: www.wspgroup.com

We are WSP. United by our differences.

NOE/ ACE International Consultant of the Year 2011
Number 1 Transport Consultancy 2011 (NOE Consultants File)
Environmental Advisor of the Year 2011

WSP is a FTSE4Good company.

WSP is one of the world's fastest-growing design, engineering and management consultancies. Specialising in property, transport and environmental projects, we work with clients to create built and natural environments for the future

Confidential

This e-mail is confidential to the named recipient. If you have received a copy in error, please destroy it. You may not use or disclose the contents of this e-mail to anyone, nor take copies of it. The only copies permitted are (1) by the named recipient and (2) for the purposes of completing successful electronic transmission to the named recipient and then only on the condition that these copies, with this notice attached, are kept confidential until destruction.

WSP UK Limited Registered Office: WSP House, 70 Chancery Lane, London WC2A 1AF Registered Number 01389511 England

If possible, please consider saving paper by not printing your e-mail.

<http://www.arun.gov.uk>

NLPG UPRN 100062237016

DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.

<http://www.arun.gov.uk>

NLPG UPRN 100062237016

DX 57406 Littlehampton

Important Notice This e-mail is intended exclusively for the addressee and may contain information that is confidential and/or privileged. If you are not the intended recipient (or authorised to receive it for the addressee), please notify the sender and delete the e-mail immediately; using, copying, or disclosing it to anyone else, is strictly prohibited and may be unlawful. Any views, opinions or options presented are solely those of the author and do not necessarily represent those of Arun District Council. The information in this e-mail may be subject to public disclosure under the Freedom of Information Act 2000, therefore we cannot guarantee that we will not provide the whole or part of this e-mail to a third party. The Council reserves the right to monitor e-mails in accordance with relevant legislation. Whilst outgoing e-mails are checked for viruses, we cannot guarantee this e-mail is virus-free or has not been intercepted or changed and we do not accept liability for any damage caused. Any reference to "e-mail" in this disclaimer includes any attachments.



Supplementary Requirements for Surface Water Drainage Proposals

Any proposed surface water drainage scheme must consider the use of sustainable drainage principles.

SUDs Selection

The design should follow the hierarchy of preference for different types of surface water drainage systems as set out in Approved Document H of the Building Regulations and the Sustainable Urban Drainage System (SUDS) Manual produced by CIRIA. This means that the developer must first consider the discharge of surface water into an infiltration device (eg. soakaway, basin, swale, permeable paving etc). If this is not achievable then attenuated flows into a watercourse at an agreed run off rate should be considered. If no suitable watercourse is available, then attenuated flows into a surface water sewer at an agreed rate is the third option. Surface water must not in any development, be discharged into the foul sewer system.

Proposals must include a “Surface Water Management Statement”, or a “SUDS Design Statement”. This should detail the design principles used and how the surface water will be conveyed and disposed of. This can be supported by a schematic or indicative layout. In addition, it must show the boundaries of each catchment area and specify into which component of the drainage system these areas connect.

Maintenance and Management

Details of the maintenance and management of the SUDS system is to be set out in writing in a site specific maintenance manual. This manual shall include details of the financial management and arrangements for the replacement of components at the end of the manufacturers recommended design life. This document is then to be submitted as part of the planning process.

Infiltration Drainage Design

Infiltration rates for soakage structures are to be based on percolation tests undertaken in the winter period and at the location and depth of the proposed structures. The percolation tests and design must be carried out in accordance with BRE 365, CIRIA R156 or a similar approved method and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway, and the base of the structure. It must also have provision to ensure that there is capacity in the system to contain below ground level the 1 in 100 year event plus 30% on stored volumes, as an allowance for climate change.. Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded annual groundwater level identified in that location.

Any SUDS or soakaway design must include adequate groundwater monitoring data to determine the highest winter groundwater table in support of the design. Residential developments in excess of five properties will require ground water monitoring to be carried out between October and March inclusive. The extent of monitoring required for smaller developments will be subject to agreement with the Council's Engineers.

Controlled Discharge

Discharge to a watercourse or surface water sewer must be restricted to an agreed rate by means of a controlled outflow. The greenfield runoff can be derived from IH124 or similar, and will be used to estimate the correct flow for the development area. Any storage designs must be submitted with groundwater monitoring data where applicable. Storage areas are preferred to be in an 'open' form ie. ponds, etc, over the use of underground tanks.

Flow Routes and Exceedance Routes

Flow routes through the development must be demonstrated as a first stage in the design process, demonstrating how water will travel at or near the surface for three types of flow:

1. Low flow routes

Once surface water runoff has been collected, cleaned and controlled in source control features it will either be stored where it fell as rain in permeable pavement, or flow onward to local storage structures. The day-to-day flows from these features should travel in low flow channels through the development in a controlled way contributing to landscape quality.

2. Overflows

In the event of local blockages or surcharge a simple overflow arrangement should allow water to bypass the obstruction and return to the management train sequence until conditions return to normal.

3. Exceedance routes

When SUDS are overwhelmed by exceptional rainfall, then exceedance routes are required to protect people and property, by providing unobstructed overland flow routes from the development and should be considered for all drainage schemes. The SUDS design must demonstrate that flow routes have been considered at each design stage to take into account the effect of proposed development on the natural flow pattern for the site. Exceedance routes should also be protected from future changes in land use.

Culverting a Watercourse

Culverting (piping) of a watercourse is not advised unless there is no other alternative, as culverting can lead to an unacceptable loss of habitat, reduced flood storage volume, reduced flow capacity, and increased difficulty in future maintenance. Culverting can only take place with consent from the Lead Local Flood Authority (West Sussex County Council) or its agent (Arun District

Council). If access is required across a watercourse, then a single continuous spanning bridge is preferred, in order to maintain the capacity of the watercourse. Any structure should be as short as reasonably possible in terms of its length along the watercourse, in order to maintain good access for future maintenance.

References:

CIRIA

C697 The SUDs Manual
Woods Ballard B; Kellagher R et al
ISBN: 978-0-86017-697-8, 2007

Centre for Ecology and Hydrology

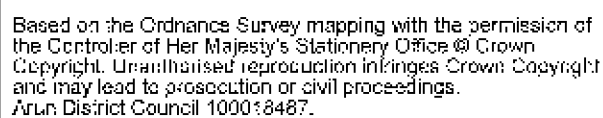
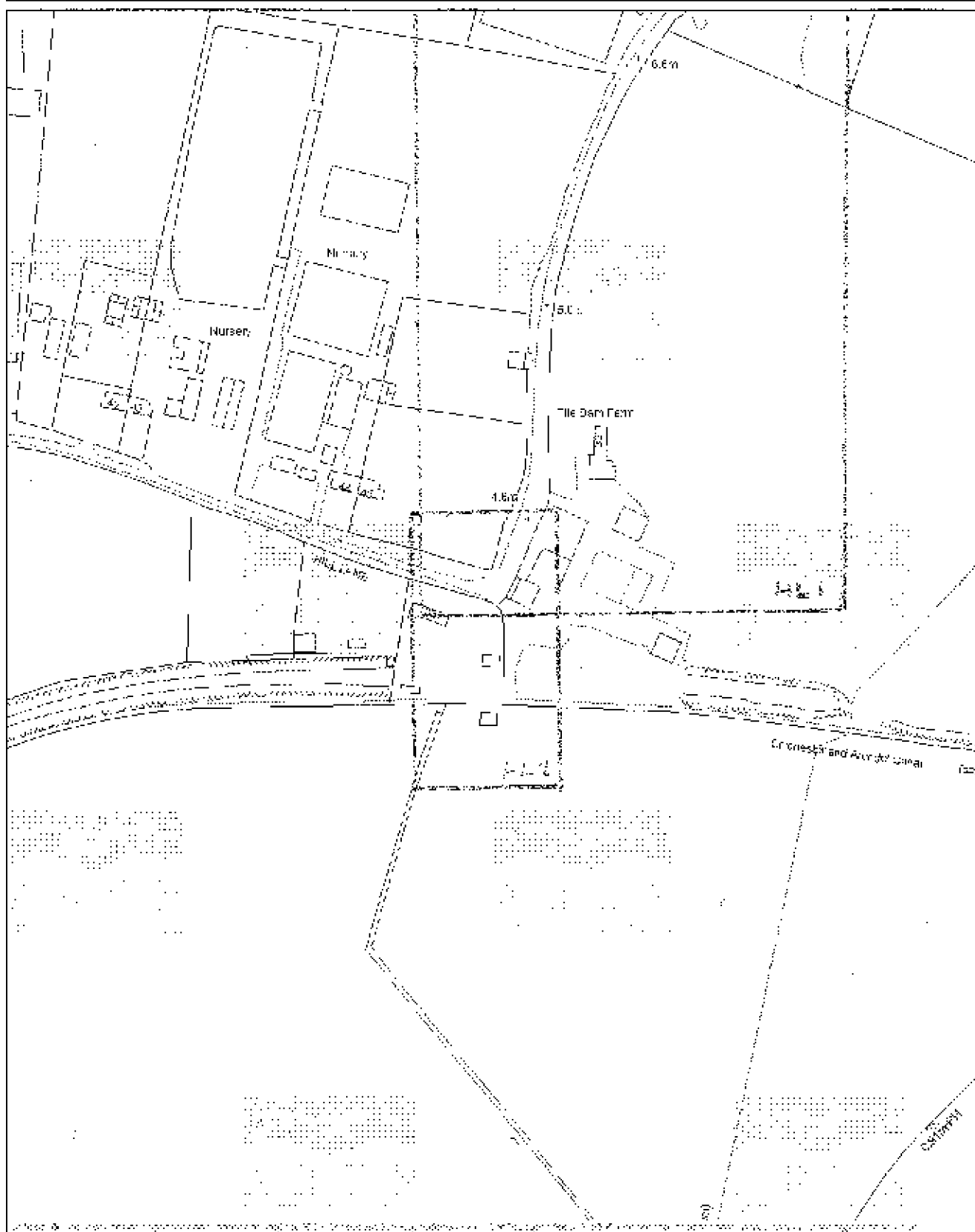
Flood Estimation for Small Catchments - IH Report 124
D C W Marshall & A C Bayliss
ISBN: 0948540621, 1994

Building Research Establishment,
Soakaway Design – Digest 365 (BRE 365)
ISBN: 1 86081 604 5, 1991

The Building Regulations 2000
Drainage and waste disposal
Approved document H
ISBN: 1-859462-08-1

CIRIA

R156 Infiltration Drainage – Manual of Good Practice
Roger Bettess
ISBN: 0 86017 457 3



ARUN DISTRICT COUNCIL BN/43/16/PL

