



Title: FRA Addendum

Project: Buckmore Farm, Petersfield

Date: 22 May 2019

## 1.0 Introduction

- 1.1.1 This addendum to a previous flood risk assessment has been produced in response to a request from Hampshire County Council, the lead local flood authority (LLFA), to include certain information that will help discharge certain planning conditions for the outline planning application (13/00695/OUT) regarding foul/surface water drainage. Correspondence with the LLFA is included in Appendix A.
- 1.1.2 Outline planning for the proposed site was granted by the local planning authority the South Downs National Park authority on the 3<sup>rd</sup> of February 2016 subject to conditions (Refer to Appendix B). The planning conditions that Jubb seek to discharge through this addendum regard discharge conditions 9, 10 and 22.
- 1.1.3 The addendum should be read in conjunction with the Flood Risk Assessment (FRA) produced by Harray Consulting (2011) on the proposed 1.2ha site that is situated immediately south of Buckmore Farm, Petersfield. The FRA is included in Appendix C.
- 1.1.4 The proposed development is for the construction of a business park comprising buildings with a maximum floorspace of 5,500m<sup>2</sup> for office, research and development, light industrial, or storage and distribution use. The development will be split into two platforms, with the southern phase named platform 1 and the northern platform 2.

## 2.0 Foul Water Disposal

- 2.1.1 The foul water drainage will be collected on site via a new foul drainage network and conveyed via gravity to a package pumping station at the southern end of the development before being pumped south along the public highway to the existing public Southern Water foul sewer located within Princes Road. The proposed drainage strategy is shown in Appendix D.
- 2.1.2 A level 2 capacity check has confirmed that the existing downstream public Southern Water foul sewer network will have capacity to accept a peak flow of 2.3l/s from the development, which was calculated based on Sewers for Adoption Edition 7 guidance. However, it should be noted that Southern Water usually expect a pumped flow rate of 6l/s from new developments and at this rate reinforcement of their network would be required.
- 2.1.3 A Section 106 has been agreed upon by Southern Water regarding this connection point into their existing public foul network. For Southern Water correspondence refer to Appendix E.

### 3.0 Surface Water Disposal

- 3.1.1 The proposed surface water drainage strategy stated in the FRA comprises of a SuDS attenuation solution that aims to restrict offsite discharge into the Petersfield Stream to the greenfield Q100 rate for rainfall events up to the 1 in 100 year event including 20% climate change, which was previously agreed by the local authority. Attenuation storage is proposed to be provided via underground attenuation tanks/ oversized pipes, whilst flow restriction is provided via downstream hydrobrakes.
- 3.1.2 Depending on future infiltration rate testing onsite proving the viability of SuDS infiltration solutions within the site, source control porous pavement may also be utilised as part of the drainage strategy. Porous Pavement placed within car parking areas will reduce the amount of storage required for attenuation and offer further water quality treatment benefits.
- 3.1.3 The Greenfield Rate for the site has been altered since the FRA was conducted due to findings from a ground investigation conducted by M3 Mayer Brown January 2014. From the ground investigation findings, it is evident that the soil factor previously used in the FRA was too low owing to the predominantly clayey strata found underlying the site and the presence of sporadic groundwater regions close to the surface within the southern region of the site.
- 3.1.4 A new appropriate soil factor of 0.45 was used as part of the IH124 greenfield rate method previously utilised. From this method the Q100 greenfield rate was found to be 32.5l/s, which has been utilised as the restricted flow rate for surface water discharging from the site.
- 3.1.5 The restricted rate of 32.5l/s is unchanged from previous drainage strategies presented to the LLFA and formed part of the EA flood risk exemption application that was accepted by the EA.
- 3.1.6 Assuming for assessment purposes an impervious area percentage of 90% of the site, no SuDS infiltration methods present on site, an attenuation tank depth of 1m, and reducing the offsite discharge to the required Greenfield rate, MicroDrainage calculations shows that the proposed development site will require 400m<sup>3</sup> of storage to be able to contain a 1 in 100 year plus 20% climate change event without overtopping. MicroDrainage calculations are provided in Appendix F.
- 3.1.7 This required storage will be suitably spread out across the site as per the previous drainage strategy drawing MRP-1605-500 (T3), which is provided in Appendix D. The required storage for platform 1 and 2 will be provided by below ground attenuation storage tanks, whilst surface water runoff from the access road will be provided by oversized pipes.
- 3.1.8 The exact locations and volumes of the underground attenuation tanks within platform 1 and 2 rely on more information being known regarding the development, which will be provided at reserved matters stage for the development parcels. Therefore, as the scheme is further progressed a more detailed drainage strategy will be provided.
- 3.1.9 The site will be profiled to ensure that In an exceedance flood event overtopping flows will be safely distributed away from the critical infrastructure/buildings and directly into the Petersfield Stream (Refer to Appendix G)
- 3.1.10 An Environmental Permit from the EA has been sort and approved for the proposed construction of a 12m long culvert on the Petersfield Stream for vehicular access and minor realignment of the stream (Refer to Appendix H).



## 4.0 Water Quality

- 4.1.1 The proposed site is not within an Environmental Agency groundwater source protection zone, whilst the receiving waterbody the Petersfield Stream that runs adjacent to the southern boundary of the site is expected to have a low receiver sensitivity due to the size of the streams catchment in comparison to the site. The stream has a catchment area of approximately 6.2km<sup>2</sup>.
- 4.1.2 The ground investigation completed by M3 Mayer identified that the only existing contamination risk to the site is the heavy metal arsenic which were identified at concentrations slightly above the Water Regulations Advisory Scheme material selection threshold levels for buried services. However, as stated in the report this poses only a risk to buried services and can be mitigated through the implementation of appropriate pipe installation standards and thus can be seen to provide a low risk to the site.
- 4.1.3 For the proposed development a greater region of impervious area will be introduced to the site which will lead to slightly raised risks to surface water runoff water quality. This risk will be mitigated using appropriate SuDS or where these are not possible proprietary treatment systems such as petrol interceptors.
- 4.1.4 As a means of analysing whether the SuDS measures utilised for the site will provide adequate water treatment to the surface water runoff the Ciria SuDS manual specifies a simple index approach. This approach gives different land uses certain pollution hazard indices (Table 26.2 Ciria Manual), while SuDS features are given mitigation indices (Table 26.3 Ciria Manual). If the SuDS indices are greater than the pollution hazard indices the water treatment within the system is deemed adequate.
- 4.1.5 Due to the development only being at outline planning stage there is currently scope for change regarding the site layout, building classification types and the viability for infiltration within the site, which are all necessary in utilising the simple index approach. As the scheme progresses and more information is available it will be ensured that the Ciria simple index approach for water quality is appropriately followed.

## 5.0 Drainage Management & Maintenance

- 5.1.1 The proposed drainage development will be served by new separate foul and surface water drainage networks, with the use of SuDS incorporated within the surface water drainage network. Drainage infrastructure for buildings, access roads, car parks, etc in private ownership will be managed and maintained privately, whilst the remaining drainage non-SuDS drainage infrastructure within public owned land (i.e. adopted highway) will be maintained by the statutory drainage undertaker post adoption which will be Southern Water.
- 5.1.2 SuDs features will remain private and be maintained internally or by a chosen external site management company. A contractor will be held on standby for emergency reactive maintenance such as the removal of oil from a petrol interceptor after an oil spill on site.
- 5.1.3 As the scheme is progressed management and maintenance practices for taking care of the SuDS/drainage infrastructure will be constantly reviewed and updated with a final confirmed plan to be detailed at the completion of construction.
- 5.1.4 The anticipated maintenance requirements of each element are considered and frequencies of action recommended below based on Ciria guidance.

### *Gullies*

Inspection and removal of debris from silt trap once a year (preferably in the spring after leaf fall in the autumn).

### *Drainage pipes, manholes & Silt traps*

Inspect manholes & silt traps for build-up of silt and general debris (once a year, preferably in the spring after leaf fall in the autumn). If silt/debris is building up then clean with jetting lorry/gully sucker & inspect pipe – same may be required. If the pipes to be jetted are plastic then a high flow, low pressure setting should be used so that the pipes are not damaged. NOTE: Manhole covers can be heavy and suitable lifting equipment/procedures should be used. Personnel should not enter manholes to carry out maintenance.

CCTV surveys should be carried out every 5 years to confirm the structural integrity of pipes and identify any defects.

#### *Hydrobrake*

Inspect monthly for the first 3 months following commissioning and 6 monthly thereafter (or more frequently as required), hose down as necessary, remove any rags & silt from invert of chamber and especially around Hydrobrake. If a blockage occurs this can usually be overcome by operating the bypass door using the rope provided. This will empty the chamber of water down the level of the outlet allowing further maintenance to be carried out if required.

#### *Underground attenuation storage*

This system is designed to be low maintenance. Silt is captured within the up-stream catchpits. The system should incorporate an inspection shaft to allow the tank to be visually inspected annually along with the pipe system. The tank can be jetted as required to clear of any silt build up that bypasses the catchpit.

#### *Porous Pavement*

The effectiveness of the system relies on the maintaining of voids in the surface, which can be blocked over time. Brushing, vacuuming or even jetting can be used to clean obvious debris such as autumn leaves or less obvious sediment clogging. This should be carried out at least once a year after autumn leaf fall, but could be conducted more frequently depending on the performance of the system.

#### *Reactive Maintenance*

If the drainage system is still holding water following cleaning with a jetter, or the jetting of the system removes excessive amounts of debris this may indicate greater issues within the system. A CCTV survey is likely to be required and further advice should be sought from a civil engineer.

## Appendix A: LLFA Correspondence





*Economy, Transport and Environment Department  
Elizabeth II Court West, The Castle  
Winchester, Hampshire SO23 8UD*

Tel: 0300 555 1375 (General Enquiries)  
0300 555 1388 (Roads and Transport)  
0300 555 1389 (Recycling Waste & Planning)  
Textphone 0300 555 1390  
Fax 01962 847055  
[www.hants.gov.uk](http://www.hants.gov.uk)

<i>Enquiries to</i>	Vicki Westall	<i>My reference</i>	SWM/2018/0657
<i>Direct Line</i>	01962 846730	<i>Your reference</i>	SDNP/18/03472/DCOND
<i>Date</i>	2 August 2018	<i>Email</i>	SWM.consultee@hants.gov.uk

Dear Sir/Madam,

**Discharge conditions 9 10 22 for Planning Permission 13/00695/OUT - Outline - Development of a business park comprising the erection of buildings with a maximum floorspace of 5500 sq.m. for office, research and development, light industrial, or storage and distribution use (including trade counter) (Use Classes B1(a), B1(b), B1(c), and B8). Engineering operations to alter site levels, including formation of new access to Winchester Road and internal site access road, car parking and landscaping - (Revised plans and reduction to total floor space proposed) at Buckmore Farm Beckham Lane Petersfield Hampshire GU32 3BU**

Thank you for consulting us on the above planning application. Hampshire County Council as Lead Local Flood Authority has provided comments in relation to the above application as our statutory consultee role in relation to surface water drainage for major development.

This response is in relation to Condition 9 which states:

No development shall take place until a foul drainage scheme, and a surface water drainage scheme for the site, the latter being based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, have been submitted to and approved in writing by the local planning authority. The surface water drainage strategy should demonstrate the surface water run-off generated from all storms including the 1 in 2, 1 in 30 and 1 in 100 year 20% critical storm will not exceed the run-off from the undeveloped site following the corresponding rainfall events. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed. The scheme shall also include details of how the scheme shall be maintained and managed after completion.

*Director of Economy, Transport and Environment  
Stuart Jarvis BSc DipTP FCIHT MRTPI*

## Surface Water Drainage

We have reviewed the following information in relation to the planning application:

- Proposed Drainage
- Manhole Schedules
- Proposed Headwall Detail
- Proposed Culvert

We would like to highlight that we have not previously been consulted on this application as we believe it pre-dated our Statutory Consultee role and are not therefore aware of any of the information that may have been approved recently. We are unable to comment in relation to foul water as this is beyond our remit.

Given the length of time between the outline planning and this discharge of conditions, we would request that all the relevant information is re-submitted to enable us to comment.

This should include:

- An updated Flood Risk Assessment and Drainage Strategy, to take into account any changes since the previous submission
- Detailed calculations to demonstrate the proposals can function under the different storm events listed in the condition in terms of runoff and volume.
- Information with regards to water quality. This should be undertaken in accordance with the SuDS Manual.
- Exceedance Flow Routing Plan detailing where water would flow and pond in the event of a blockage or storm exceeding design criteria.
- Details on maintenance to include maintenance schedules for the different drainage elements and identification on who will take on the maintenance responsibility.

Please also note that Ordinary Watercourse Consent will be required for the culvert and headwall works.

## Works in relation to ordinary watercourses

PLEASE NOTE: If the proposals include works to an ordinary watercourse, under the Land drainage Act 1991, as amended by the Flood and Water Management Act 2010, prior consent from the Lead Local Flood Authority is required. **This consent is required as a separate permission to planning.**

Information on ordinary watercourse consenting can be found at the following link <http://www3.hants.gov.uk/flooding/hampshireflooding/watercourses.htm>

It is strongly recommended that this information is reviewed before Land Drainage consent application is made.

A Pre-application service for Ordinary Watercourse Consents is available, allowing consents to go through in a smoother, often more timely manor. For full information please visit:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/WatercoursePreApplication>

**Please see below for further general guidance for the application**

It is important to ensure that the long-term maintenance and responsibility for Sustainable Drainage Systems is agreed between the Local Planning Authority and the applicant before planning permission is granted. This should involve discussions with those adopting and/or maintaining the proposed systems, which could include the Highway Authority, Planning Authority, Parish Councils, Water Companies and private management companies.

For SuDS systems to be adopted by Hampshire Highways it is recommended that you visit the website at:

<https://www.hants.gov.uk/transport/developers/constructionstandards> for guidance on which drainage features would be suitable for adoption.

Where the proposals are connecting to an existing drainage system it is likely that the authorities responsible for maintaining those systems will have their own design requirements. These requirements will need to be reviewed and agreed as part of any surface water drainage scheme.

This response has been provided using the best knowledge and information submitted as part of the planning application at the time of responding and is reliant on the accuracy of that information.

Kind Regards

The Flood and Water Management Team  
EII Court West, 1<sup>st</sup> Floor  
Winchester  
Hampshire  
SO23 8UJ

T:  
E:





**Appendix B: Outline Planning Consent**

Mr David Ramsay  
Latimer House  
5-7 Cumberland Place  
Southampton  
Hants  
SO15 2BH

Our Ref: SDNP/16/00328/CND  
Contact Officer: Stephen Wiltshire  
Tel. No.: 01730 266551

14th June 2016

Dear Sir/Madam

**TOWN AND COUNTRY PLANNING ACT 1990**  
**Town and Country Planning (Development Management Procedure)**  
**(England) Order 2015**

**Proposal:** Variation of conditions 2, 3, 4, 5, 10, 15 and 22 of  
SDNP/13/00695/OUT, to allow the implementation of the  
access road

**Site Address:** Land South of Buckmore Farm, Winchester Road,  
Petersfield, Hampshire, ,

Please find enclosed the Decision Notice in relation to the above application. If you are acting as an Agent please ensure that a copy is given to the applicant. **Before proceeding, please read the following important information which affects this Notice.**

Failure to comply with any conditions may invalidate the permission and may result in enforcement action. Some conditions may require further details or samples to be submitted for approval. Other conditions may contain timescales or stages against which compliance should be obtained and before works are commenced. Most categories of permission also require a fee for each request for discharge of condition/s, further details of which are set out in the attached information sheet.

Yours faithfully



**TIM SLANEY**  
Director of Planning  
South Downs National Park Authority

Mr David Ramsay  
Latimer House  
5-7 Cumberland Place  
Southampton  
Hants  
SO15 2BH

**TOWN AND COUNTRY PLANNING ACT 1990  
Town and Country Planning (Development Management Procedure)  
(England) Order 2015**

**Application No:** SDNP/16/00328/CND

**Proposal:** Variation of conditions 2, 3, 4, 5, 10, 15 and 22 of SDNP/13/00695/OUT, to allow the implementation of the access road

**Site Address:** Land South of Buckmore Farm, Winchester Road, Petersfield, Hampshire, ,

**GRANT OF PLANNING PERMISSION**

In pursuance of its powers under the above mentioned Act, the South Downs National Park Authority as the Local Planning Authority hereby **GRANTS** Planning Permission for the above development in accordance with the plans and particulars submitted with your application received on 3rd February 2016 .

**This permission is subject to the following conditions:-**

1. The development hereby permitted shall be carried out in accordance with the following plans:

<b>Plan Type</b>	<b>Reference</b>	<b>Version</b>	<b>Date Received</b>	<b>Status</b>
Application form			25.01.2016	Approved
Planning statement			25.01.2016	Approved
Covering letter			25.01.2016	Approved
Location plan	11036.P01.01		03.02.2016	Approved
Figure 1			25.01.2016	Approved
Figure 2			25.01.2016	Approved
Development parameters plan	1036.P01.02		25.01.2016	Approved
Illustrative landscape masterplan	INCLA_S119.L01		25.01.2016	Approved
Original decision			25.01.2016	Approved

**Reasons:** For the avoidance of doubt and in the interests of proper planning.



2. Applications for the approval of the matters referred to herein shall be made within a period of three years from 29.11.2013. The development to which the permission relates shall be begun not later than whichever is the later of the following dates:-
- (i) three years from 29.11.2013; or
  - (ii) two years from the final approval of the said reserved matters, or, in the case of approval on different dates, the final approval of the last such matter to be approved.

Reason - To comply with the provisions of Section 92(2) of the Town and Country Planning Act, 1990.

3. No development, apart from construction of the access road, shall start until plans and particulars, showing either the detailed proposals for all the following aspects of the development or the individual phase of the development if a phasing plan has first been agreed in writing with the Planning Authority, have been submitted to and approved in writing by the Planning Authority. These details shall comprise the 'reserved matters' and shall be submitted within the time constraints referred to in Condition 1 and comprise:-
- (a) Appearance in respect of the aspects of any building or place within the development which determine the visual impression the building or place makes, including the external built form of the development, its architecture, materials, decoration, lighting, colour and texture;
  - (b) Landscaping in relation to the means the treatment of land (other than buildings) for the purpose of enhancing or protecting the amenities of the site and the area in which it is situated and includes screening by fences, walls or other means, the planting of trees, hedges, shrubs or grass, the formation of banks, terraces or other earthworks, the laying out or soft landscaped areas, courts or squares, water features, sculpture, or public art and the provision of other amenity features;
  - (c) Landscaping details showing the position, type and spread of all existing trees on the site and a schedule detailing the size and physical condition of each tree and where appropriate, the steps to be taken to bring the tree(s) to be retained to a satisfactory condition and also details of any proposals for the felling, lopping, topping or up-rooting of any tree;
  - (d) Arrangements to be made for the future maintenance of landscaped and other open areas;
  - (e) Layout of the development with respect to the way in which buildings, routes and open spaces within the development are provided, situated and orientated in relation to each other and to buildings and spaces outside the development;
  - (f) The provision to be made for the parking, turning, loading and unloading of vehicles;
  - (g) The provision of street lighting, street furniture, lighting (including security lighting), bollards etc;
  - (h) The provision to be made for the storage and removal of refuse from each part of the development;

- (i) Details of the existing and proposed ground levels, proposed external leaf DPC level, proposed finished floor levels, levels of any paths and parking areas and the proposed completed height of the development and any retaining walls have been submitted to and approved in writing by the Planning Authority;
- (j) Scale, including, (insofar as it relates to the) height, width and length of individual buildings presented in the layout and appearance details hereby reserved; and;
- (k) Details of the access road to service the site including; routing, materials, existing and proposed ground levels and the means for the disposal of surface water therefrom.

Each of the above matters shall be implemented in accordance with the approved details before either any part of the development is occupied, or in accordance with an agreed phasing plan, whichever is the later, unless otherwise first agreed in writing by the Planning Authority.

Reason - To comply with Article 5 of the Town and Country Planning (Development Management (England) Procedure) Order 2010 (or any Order revoking and re-enacting that Order).

4. No development shall commence on the site (except for the implementation of the access road), including site clearance works (except for that specifically required for the construction of the access road), until a detailed phasing plan has been submitted to and approved in writing by the Local Planning Authority which stages the development to ensure that any non-B1(a) floor space is brought forward at the appropriate stage having regard to its enabling role in facilitating the comprehensive development of the site. Development on the site shall thereafter be carried out in accordance with the approved plan.

Reasons - (i) To ensure that enabling elements of the development, hitherto limited in scale by condition 2 are delivered in an appropriate, staged, manner and contribute, so far as is reasonable, to development viability and the comprehensive delivery of the approved development. This will maximise the economic and employment benefits from this allocated employment site. For the avoidance of doubt any B8 floorspace will be expected to be phased to maximise the contribution of that use towards development viability.

(ii) To define and control the development and ensure through the use of a phasing plan, that the location and amount of development is brought forward at the appropriate stage and is acceptable having regard to the quality of the development, the goals of the Detailed Design Code and the integration of development within the site and South Downs National Park.

5. Prior to the submission of any application for Reserved Matters approval, apart from details of the access road, a detailed Design Code shall have been prepared for the site and shall have been submitted to, and approved by, the Local Planning Authority. The Design Code shall include the design guidelines for building appearance, the treatment of spaces within the site (including parking areas), surfacing materials, landscaping, lighting and street furniture. The Design Code shall be prepared in accordance with the approved Parameters Plan and the principles contained therein.

Reason - To ensure that development on this site delivers a high quality outcome whereby elements forming the comprehensive development of the site reflect a holistic unified approach, and meet a consistently high design standard in order to reflect the goals of policies IB1, IB2 and HE1 of the East Hampshire Local Plan: Second Review 2006 and the goals of the NPPF, including the aspiration that development contribute to a high quality built environment. The securement of a high quality of development is also essential to the preservation of the special qualities of the South Downs National Park, which this site lies within, and to the amelioration of impacts to the setting of adjacent heritage assets.

6. All applications for Reserved Matters approval (except for the construction of the access road) pursuant to this Outline permission, as required by condition 2, shall be accompanied by a Design Statement which shall explain how the proposal conforms to the requirements of the approved detailed Design Code.

Reason - To ensure that development on this site delivers a high quality outcome whereby elements forming the comprehensive development of the site reflect a holistic unified approach, and meet a consistently high design standard in order to reflect the goals of policies IB1, IB2 and HE1 of the East Hampshire Local Plan: Second Review 2006 and the goals of the NPPF, including the aspiration that development contribute to a high quality built environment. The securement of a high quality of development is also essential to the preservation of the special qualities of the South Downs National Park, which this site lies within, and to the amelioration of impacts to the setting of adjacent heritage assets.

7. That the development shall comprise no more than a total floor space of 5,500sqm (Gross Internal Area). This may include up-to:

5,500sqm of B1(a) floor space, or

Mixture of up to 1,500 of B1(b), and B1(c) or "B8 with trade counters" save that "B8 with trade counters" shall not exceed a maximum of 1,100sqm, or 20% of the total development. The remainder, upto the total development floorspace, shall comprise B1(a) development not exceeding, in combination, the development total of 5,500sqm



Reasons - (i) To define and control the development and ensure that the type of and amount of specific uses is acceptable having regard to the quality of the development, its integration within the site and National Park purposes. (ii) The inclusion of B8 uses within the site falls outside of the purposes for allocation for the site defined by policy IB1 of the East Hampshire Local Plan 2006, and represents a net reduction in overall job creation from the site. In this case a maximum proportion of 20% has been demonstrated to be justified on the basis of providing a flexible and commercially viable mix of uses within the site and necessary to subsidise the delivery of a comprehensive development on the site. No adequate justification has been provided for a larger contingent of B8 floor space.

8. No development hereby permitted shall commence until a Construction Traffic Management Plan, to include details of the access arrangements for construction traffic, the provision to be made on site for contractor's parking, the turning of delivery vehicles and lorry routing as well as provisions for removing mud from vehicles and a programme of works has been submitted to and approved in writing by the Local Planning Authority. The approved details shall be implemented before the development hereby permitted is commenced and retained throughout the duration of construction.

Reason - In the interests of highway safety.

9. No development approved by this planning permission shall take place until such time as a scheme to address the following requirements has been submitted to, and approved in writing by, the Local Planning Authority:
  1. Finished floor levels of the units shall be set no lower than 68.15m above Ordnance Datum (AOD).
  2. Full design details and drawings shall be provided for the river crossing over the Petersfield Stream. The details provided shall show compliance with the hydraulic modelling carried out and included within the submitted FRA produced by Harray Consulting Ltd, (ref P017 v4, dated 01/02/2013).

The scheme shall be fully implemented and subsequently maintained, in accordance with the timing / phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the local planning authority.

Reason - (i) To reduce the risk of flooding to the proposed development and future occupants. (ii) To prevent flooding at the site and elsewhere by ensuring sufficient flow capacity and conveyance is maintained within the Petersfield Stream.

10. No development shall take place until a foul drainage scheme, and a surface water drainage scheme for the site, the latter being based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, have been submitted to and approved in writing by the local planning authority. The surface water drainage strategy should demonstrate the surface water run-off generated from all storms including the 1 in 2, 1 in 30 and 1 in 100 year 20% critical storm will not exceed the run-off from the undeveloped site following the corresponding rainfall events. The scheme shall subsequently be implemented in accordance with the approved details before the development is completed. The scheme shall also include details of how the scheme shall be maintained and managed after completion.

Reason - (i) To prevent the increased risk of flooding, both on and off site  
(ii) To ensure adequate foul drainage is put in place to serve the development.

11. No development shall take place (apart from the construction of the access road) until a landscape management plan, including long-term design objectives, management responsibilities and maintenance schedules for all landscaped areas (except privately owned domestic gardens), shall be submitted to and approved in writing by the local planning authority. The landscape management plan shall be carried out as approved and any subsequent variations shall be agreed in writing by the local planning authority.

The scheme shall include the following elements:

- o detail extent and type of new planting (NB planting to be of native species)
- o details of maintenance regimes
- o details of compensatory habitat i.e. hedgerow
- o details of any new habitat created on site
- o details of treatment of site boundaries and/or buffers around water bodies (8m)
- o details of management responsibilities

Reason - This condition is necessary to ensure the protection of wildlife and supporting habitat and secure opportunities for the enhancement of the nature conservation value of the site in line with national planning policy.

12. Prior to the commencement of development a scheme for the provision and management of an 8 metre wide buffer zone alongside the watercourse shall be submitted to and agreed in writing by the Local Planning Authority. Thereafter the development shall be carried out in accordance with the approved scheme and any subsequent amendments shall be agreed in writing with the local planning authority. The buffer zone scheme shall be free from built development including lighting, domestic gardens and formal landscaping; and could form a vital part of green infrastructure provision. The schemes shall include:

- plans showing the extent and layout of the buffer zone.
- details of any proposed planting scheme (for example, native species).
- details demonstrating how the buffer zone will be protected during development and managed/maintained over the longer term including adequate financial provision and named body responsible for management plus production of detailed management plan.

Reason - To protect valuable habitat and ensure compliance with the NPPF

13. Notwithstanding the submitted Arboricultural Report (RW Green Ltd) no development shall commence until a detailed site specific Arboricultural Method Statement, a tree protection plan (to an appropriate scale), and a timetable of tree protection and development works, has been submitted to and approved in writing by the Local Planning Authority. The development shall thereafter proceed in accordance with the approved details.

Reason - To minimise the effects of the development upon existing trees within and on the boundaries of the site in the interests of visual amenities, the achievement of a high quality development, and to conserve the landscape qualities of the South Downs National Park.

14. The development hereby approved shall be carried out in accordance with the ecological mitigation, compensation and enhancement measures set out in the 'Ecological and Enhancement Strategy' (The Ecological Consultancy, May 2013) and the 'Landscape and Ecology Strategy' (Influence, May 2013), unless otherwise approved in writing by the LPA.

Reason - In order to provide a scheme of ecological mitigation measures in line with NPPF and local planning policy.

15. No development shall take place within the site area, hereby approved, until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Local Planning Authority.

Reason - In the interests of establishing a record of potential archaeological significance of the site.

16. All external lighting to be installed at the site, as approved as part of the requirements of Condition 2 of this Outline permission, shall be of a type and detailed specification to be submitted to, and approved in writing by the Local Planning Authority prior to the commencement of the development (apart from the access road). The lighting shall be installed, maintained and operated in accordance with the approved details unless otherwise approved by the Local Planning Authority. Thereafter no other external lighting shall be installed unless otherwise approved in writing by the Local Planning Authority.

Reason - To protect the amenity of nearby residential occupiers and the dark night sky from unwarranted levels of light pollution within the South Downs National Park.

17. The premises shall not be used and no deliveries shall be received or dispatches made from the site outside the hours of 07:00 to 21:00 hours Monday to Friday, 08:00 to 13:00 hours on Saturday, and not at any time on Sunday or Bank/Public Holidays, unless otherwise agreed in writing by the Local Planning Authority.

Reason - To ensure that the amenities of the adjacent properties are not detrimentally affected by the use of the site outside reasonable working times.

18. No air handling equipment, compressor or generator shall be used at the premises and no cowl or vent shall be fitted to buildings unless otherwise agreed in writing by the Local Planning Authority.

Reason - To ensure that the amenities of the area, and those of adjacent development are not detrimentally affected by noise or odour.

19. No materials shall be stacked, stored or deposited in the open on the site unless otherwise approved in writing by the Local Planning Authority

Reason - To ensure that the visual appearance and amenities of the site and surrounding area, which is sensitively located and within the South Downs National Park, are not adversely affected by the proposals.

20. Trade counters shall only be ancillary to any B8 usage, and shall operate for wholesaleing and shall not be used for retail purposes at any time.

Reason - To prevent the establishment of a retail park in an out-of-centre location to the likely detriment of the vitality and viability of the town centre of Petersfield.

21. No development shall start on site until a construction method statement has been submitted to and approved in writing by the Planning Authority, which shall include:

- a) A programme of and phasing of construction work;
- b) Methods of construction works;
- c) Protection of pedestrian routes during construction;
- d) Location of temporary site buildings, compounds, construction material, and plant storage areas;
- e) Controls over dust, noise, and vibration during the construction period;
- f) Provision for storage, collection, and disposal of rubbish from the development during construction period; and
- g) Re-use of on site material and spoil arising from any site clearance or demolition work.

Construction work shall take place in accordance with the approved method statement.

Reason - In order that the Planning Authority can properly consider the effect of the works on the amenity of the locality as the site lies adjacent to residential developments.

22. All development shall be stopped immediately in the event that contamination not previously identified is found to be present on the development site and details of the contamination shall be reported immediately in writing to the Planning Authority.

Development shall not re-start on site until the following details have been submitted to and approved in writing by the Planning Authority:-

(a) a scheme outlining a site investigation and risk assessments designed to assess the nature and extent of any contamination on the site.

(b) a written report of the findings which includes, a description of the extent, scale and nature of contamination, an assessment of all potential risks to known receptors, an update of the conceptual site model (devised in the desktop study), identification of all pollutant linkages and unless otherwise agreed in writing by the Planning Authority and identified as unnecessary in the written report, an appraisal of remediation options and proposal of the preferred option(s) identified as appropriate for the type of contamination found on site and (unless otherwise first agreed in writing by the Planning Authority)

(c) a detailed remediation scheme designed to bring the site to a condition suitable for the intended use by removing unacceptable risks to human health, buildings and other property and the natural and historical environment. The scheme should include all works to be undertaken, proposed remediation objectives and remediation criteria, timetable of works, site management procedures and a verification plan outlining details of the data to be collected in order to demonstrate the completion of the remediation works and any arrangements for the continued monitoring of identified pollutant linkages;

and before any part of the development is occupied or used (unless otherwise first agreed in writing by the Planning Authority) a verification report demonstrating the effectiveness of the remediation works carried out and a completion certificate confirming that the approved remediation scheme has been implemented in full shall both have been submitted to and approved in writing by the Planning Authority.

The above site works, details and certification submitted shall be in accordance with the approved scheme and undertaken by a competent person in accordance with DEFRA and the Environment Agency's 'Model Procedures for the Management of Land Contamination, CLR 11'.



Reason - To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with policy P7 of the East Hampshire District Local Plan: Second Review.

23. No development shall commence on site, apart from the construction of the access road, until a scheme for protecting the residential properties, to the east of the site, from noise associated with the development, has been submitted to and agreed in writing by the Planning Authority. The agreed scheme shall be fully implemented and validation test results submitted to the Planning Authority before any part of the development is occupied. Any mitigation measures set out in the approved scheme shall be maintained thereafter.

Reason - To ensure that the amenities of the adjacent properties are not detrimentally affected by the use of the site.

### **INFORMATIVE NOTES**

**These are advice notes to the applicant and are not part of the planning conditions:**

- 1 It is considered that this planning application does not raise any crime and disorder implications.
- 2 Due regard, where relevant, has been taken of the National Park Authority's equality duty as contained within the Equalities Act 2010.
- 3 This planning application has been considered in light of statute and case law and any interference with an individual's human rights is considered to be proportionate to the aims sought to be realised.
- 4 In reaching this decision the local planning authority has worked with the applicant in a positive and proactive way, in line with the NPPF.
- 5 You should be aware that this planning permission is subject to a planning obligation, as set out in the Deed of Variation dated \*\*\* to the original legal agreement.



**TIM SLANEY**

Director of Planning  
South Downs National Park Authority  
14th June 2016

## NOTES TO APPLICANTS / AGENTS

### Fees for discharge of planning conditions

Fees apply for the submission for any consent, agreement or approval that are required by a planning condition. The fee chargeable is £97 per request or £28 where the related permission was for extending or altering a dwelling house or other development in the curtilage of a dwelling house. **The fee is payable for each submission made regardless of the number of conditions it is seeking to discharge.**

A fee is payable for conditions related to planning permissions and reserved matter applications only. A fee is not required for conditions attached to listed building consents and conservation area consents. The requirement to make this charge is set out in Government Circular 04/2008.

You may wish to use the standard form to accompany your submission, or set out your requests in writing, clearly identifying the relevant planning application and condition(s) which you seek to discharge or seek approval for. Forms & guidance notes are available on the National Planning Portal website, <http://www.planningportal.gov.uk/planning/applications/>

### Non Material Amendments

There is an application form for the submission of Non Material Amendments to approved plans. Forms & guidance notes are available on the National Planning Portal website, <http://www.planningportal.gov.uk/planning/applications/>

The fee chargeable is currently £195 per request, or £28 where the related permission was for extending or altering a dwelling house or other development in the curtilage of a dwelling house.

## **Appeals to the Secretary of State**

If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.

If you want to appeal against your local planning authority's decision then you must do so within **6 months** of the date of this notice.

Appeals must be made using a form which you can get from the Planning Inspectorate at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN or online at [www.planningportal.gov.uk/pcs](http://www.planningportal.gov.uk/pcs).

The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to him that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.

As from 6 April 2010 if an enforcement notice has been served in the previous 2 years you will have only 28 days in which to lodge the appeal following the refusal. Equally, if an enforcement notice is served after the refusal it will truncate the period for lodging the appeal against the refusal of planning permission to 28 days after the enforcement notice has been served.

## **Purchase Notices**

If either the local planning authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council (District Council, London Borough Council or Common Council of the City of London) in whose area the land is situated. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

**Appendix C: Original FRA**



## **GENTIAN DEVELOPMENT GROUP**

## **BUCKMORE PARK, PETERSFIELD**

## **FLOOD RISK ASSESSMENT**

December 2011

Harrhy Consulting Ltd  
The Pines, Vinegar Hill  
Undy  
Monmouthshire  
NP26 3EJ



# REPORT CONTROL

Document: Flood Risk Assessment  
Project: Buckmore Park, Petersfield  
Client: Gentian Development Group  
Job Number: P017

Document Checking:

Author Carl Collins Initialled:

Review By Rob Harry Initialled:

<b>Issue</b>	<b>Date</b>	<b>Purpose of Issue</b>	<b>Checked for Issue</b>
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V3	25.05.12	Planning Submisison	RH
V4	01.02.13	Minor Edits	RH

## CONTENTS

	<b>PAGE</b>
<b>1.0 INTRODUCTION</b>	<b>2</b>
1.1 Background	
1.2 Brief and Scope	
1.3 Consultation	
<b>2.0 SITE DESCRIPTION</b>	<b>4</b>
2.1 Location and Topography	
2.2 Existing Watercourses	
2.3 Site Access and Land Use	
2.4 Geology	
2.5 Drainage	
<b>3.0 FLOOD RISK TO EXISTING SITE</b>	<b>8</b>
<b>4.0 PROPOSED DEVELOPMENT</b>	<b>10</b>
<b>5.0 HYDRAULIC MODELLING OF PROPOSED RIVER CROSSING</b>	<b>11</b>
<b>6.0 SURFACE WATER DRAINAGE</b>	<b>17</b>
<b>7.0 SUMMARY AND CONCLUSIONS</b>	<b>19</b>

## APPENDICES

A	Environment Agency Correspondence
B	Topographic Survey
C	EA Modelling Report Extracts
D	Proposed Development Layout
E	HECRAS Model Outputs
F	Greenfield Runoff Assessment

## **1.0 INTRODUCTION**

### **1.1 BACKGROUND**

- 1.1.1 Miller Rogers Partnership has been appointed by Gentian Development Group to prepare this Flood Risk Assessment (FRA) in relation to a proposed development on land adjacent to Buckmore Park, Petersfield. It is conducted in support of a planning application and the proposal to construct a new mixed use employment development.
- 1.1.2 The requirements for this FRA are provided in the National Planning Policy Framework (NPPF). This document confirms that the risk of flooding of development, and/or the risk that development will increase the risk of flooding elsewhere, is a material consideration to be taken into account when considering applications for planning permission.
- 1.1.3 NPPF requires that an FRA should normally be submitted with a planning application to determine the risks of flooding at a development site. As such, an FRA is an essential element in the overall assessment of the economic viability of the development as well as its acceptability in planning terms.
- 1.1.4 NPPF Technical Guidance provides direction on the content of FRA's and this has been used to inform the scope and content of this report.
- 1.1.5 NPPF requires all development proposals in Flood Zones 2 and 3 to be accompanied by a FRA. Similarly, the EA requires that an FRA should be requested for planning applications for all sites over 1 hectare in area. Consequently, a detailed FRA is required to support the planning application for this development.

### **1.2 BRIEF AND SCOPE**

- 1.2.1 NPPF sets out the framework for planning decisions made by the local, regional and national government and the Environment Agency (EA). In order that planning authorities can make informed decisions on the development of sites in areas at risk of flood, developers are required to carry out an assessment of flood risk.
- 1.2.2 This report addresses all issues deemed relevant to flood risk. These requirements include an assessment of the following:
- the vulnerability to flooding from all sources including groundwater and sewer as well as from river and sea flooding;
  - the vulnerability to flooding over the lifetime of the development including an assessment of climate change;
  - the potential to increase flood risk elsewhere through the addition of hard surfaces, the effect of the new development on surface water run-off and the effect of the new development on depth and speed of flooding to adjacent and surrounding property;
  - Assessment of the magnitude and severity of flood risk to the site.

- Assess impact of proposed development on flood risk to adjacent developments.
- Determine ability of existing and proposed drainage to accommodate development flows with respect to surface flooding.
- Demonstrate that appropriate mitigation measures can be taken to prevent flooding, if required.
- Demonstrate that appropriate emergency situations have been considered if necessary e.g. overland flow paths, evacuation routes.

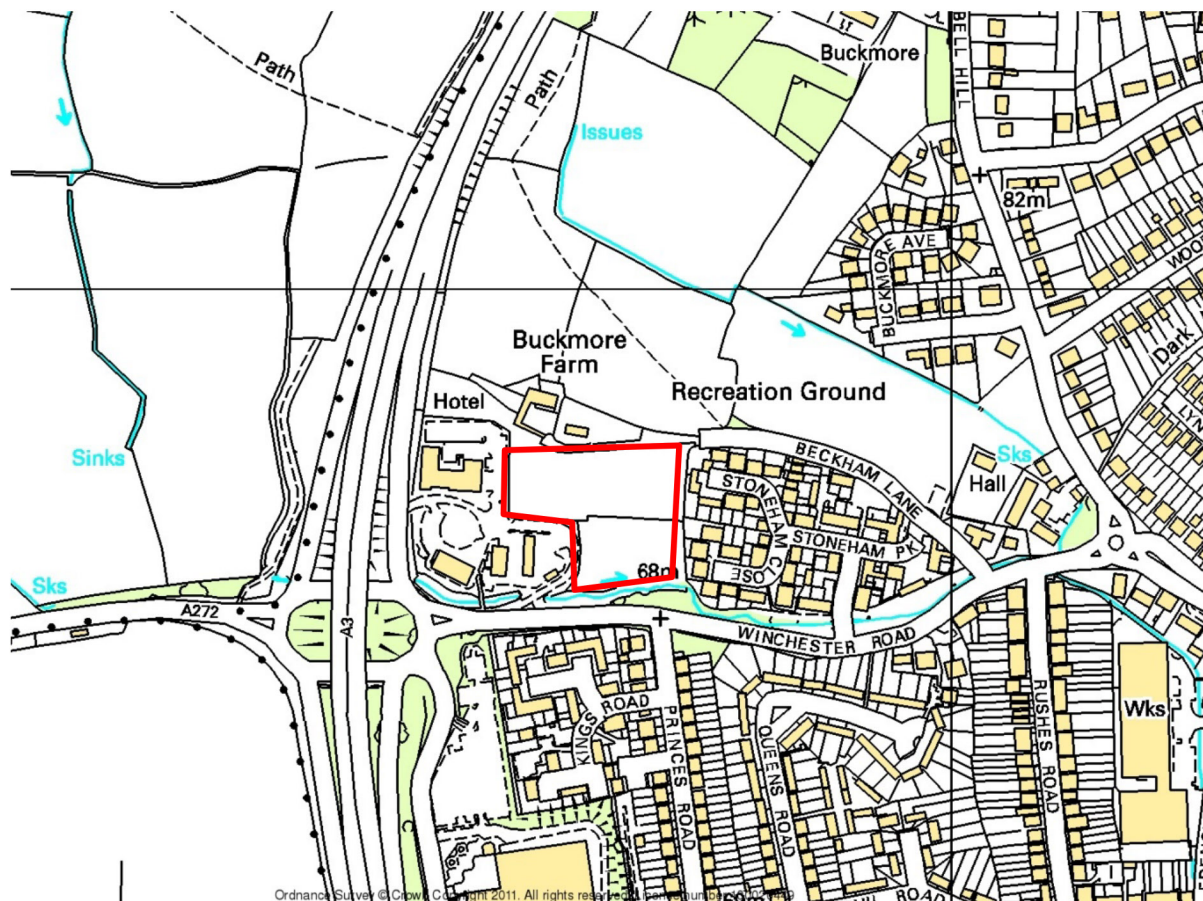
### 1.3 CONSULTATION

- 1.3.1 In preparing this FRA, consultation has been undertaken with the Environment Agency (EA) regarding its requirements and the extent of available information on flood risk at the proposed development site.
- 1.3.2 The EA's views were also sought on the likely mechanisms of flooding, the surface runoff implications of the proposed development and any control measures it considers might be required in accordance with the requirements of NPPF.
- 1.3.3 A copy of the EA's initial response letter can be viewed in Appendix A.

## 2.0 SITE DESCRIPTION

### 2.1 LOCATION AND TOPOGRAPHY

2.1.1 The proposed site is located on farmland immediately south of the Buckmore Farm buildings. The approximate area of the site is 1.2Ha. The site lies on the western boundary of Petersfield town centre, adjacent to the A3, which runs north to south past bounds the west side of the site. The A272 Winchester Road runs east to west and forms the south boundary of the site. The approximate NGR for the centre of the site is 473718, 123826.



**Figure 2.1: Site Location Plan**

2.1.2 The site is situated on a slope with the lower ground to the south and rising fairly steeply to the north. Levels fluctuate from 68.2mAOD south-west and 67.7mAOD south-east, rising to levels around 74mAOD along the north boundary fence line. A topographic survey for the existing site was carried out by Hampshire Land Surveys Ltd. A copy of the plan showing levels can be viewed in Appendix B.

2.1.3 The site is bounded to the east by residential development and to the west by a McDonalds' restaurant/services facility. South of Winchester Road lies more residential development.





**Figure 2.2: Aerial View location plan.**



**Photo 2.1: View facing north-east corner**



**Photo 2.2: View facing east toward Hotel**



**Photo 2.3: View facing south-west corner**



**Photo 2.4: View facing north-west toward farm**



## 2.2 EXISTING WATERCOURSES

- 2.2.1 The Petersfield Stream (known locally as the Drum Stream) is designated as main river which forms the southern boundary of the site. This stream flows through Petersfield and is a tributary of the Upper River Rother in Hampshire.



**Photo 2.5: View facing east at eastern boundary**

**Photo 2.6: View facing west along stream**

- 2.2.2 The stream is approximately 5.7km in length and has a catchment area of 6.2km<sup>2</sup>; the urban area of central Petersfield is situated in the lower catchment of the Petersfield Stream, whilst the upper catchment is largely rural.
- 2.2.3 The main tributary of the Petersfield Stream is the Tilmore Brook which is approximately 2.7km in length. The confluence of the Petersfield Stream and the Tilmore Brook is in central Petersfield near Tor Way.

## 2.3 SITE ACCESS AND CURRENT LAND USE

- 2.3.1 The site is currently farmland with no built development within the site boundary
- 2.3.2 Access to the site is currently via Beckham Lane to the north. No access off public highway is currently available although the allocation of the site within the Local Plan requires that any development of the site is to be served off Winchester Road to the south. This means that a new river crossing will be required and this is assessed later in this report

## 2.4 GEOLOGY

- 2.4.1 The site is situated just on the outskirts of the urban area of Petersfield and the lower catchment of the Petersfield Stream. Here the underlying geology is made up of The Folkstone Beds and Sandgate Beds (sand, silt and clay).

2.4.2 Although no specific ground investigation is currently available, a review of published soil maps indicates likely soil conditions to characterised by

- fine, silty, well drained soils, with slowly permeable subsoils prone to slight seasonal waterlogging in the Upper Catchment
- a band of slowly permeable seasonally waterlogged clayey soils covers in the Middle Catchment
- deep well drained soils in the lower catchment (the urban area of Petersfield).

## 2.5 DRAINAGE

2.5.1 The existing site is made up of naturally sloping agricultural land where surface water would normally infiltrate or runoff towards the river (Petersfield Stream) along the south boundary.

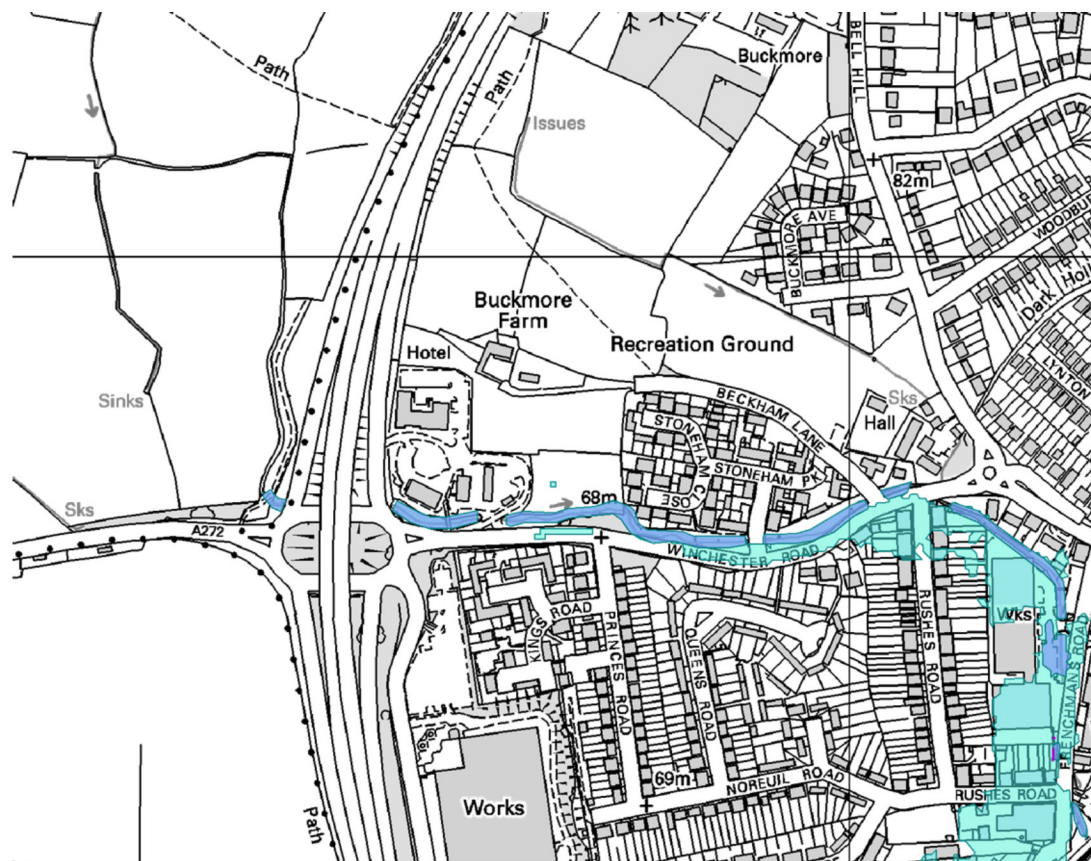
2.5.2 There is no known sewer network within the site boundary but it is likely that there is a system of field drains serving the farmland, possibly discharging to the Stream

### 3.0 FLOOD RISK TO EXISTING SITE

#### 3.1 FLUVIAL FLOODING

3.1.1 Fluvial flooding is potentially the principal flooding mechanism at the site and has therefore been assessed in detail. The EA have recently commissioned Capita Symonds to undertake comprehensive flood modelling of the Petersfield Stream and this detailed modelling data has been procured to inform this study.

3.1.2 Figure 2.3 below represents an extract of the current EA flood map. Further details from the Capita Symonds model report, including maps, flows and levels can be viewed in Appendix C.



**Figure 3.1. Environment Agency Flood Map**

3.1.3 It is clear from Figure 2.3 that the site is not shown to be inundated in the 100 year flood event and is therefore classified as being within Flood Zone 1.

3.1.4 To validate this, a close inspection of the detailed modelling report produced by Capita Symonds has been undertaken which confirms the existing 1000 year flood levels to be:

<b>Node 3.054D - MacDonald's Access road crossing</b>	=	<b>67.702m AOD</b>
<b>Node 3.053i1 - Farthest east corner of the site</b>	=	<b>67.325m AOD</b>



- 3.1.5 A detailed review of the existing ground levels within the site shows them to be higher than these flood levels so it is concluded that no out of bank flow is experienced even at the extreme event and the site is considered to be **wholly located within Flood Zone 1**.

### 3.2 TIDAL FLOODING

- 3.2.1 The site is not in a tidal zone.

### 3.3 FLOODING FROM LAND

- 3.3.1 Flooding from overland flow caused by inadequate drainage in built-up areas is not considered to be a risk in this area. Land to the south, west and east is recently developed and is served by a positive drainage network. The land to the north of the site is situated on higher ground, but is rural. Overland flows are therefore not considered to be a risk since rainfall on the site will be subject to infiltration and evapo-transpiration with residual storm water flows gravitating slowly towards the river corridor.

### 3.4 FLOODING FROM GROUNDWATER

- 3.4.1 There is no history of groundwater flooding at this location. Baseflows are anticipated to feed to the river

### 3.5 FLOODING FROM SEWERS

- 3.5.1 Thames Water Utilities Ltd (TWUL) is the statutory sewerage undertaker for the majority of the district. There are no known public sewers located within the site boundary. Whilst the developments adjacent to the site are served by public sewers, there are no reported flooding incidents from overflowing sewers in the area. Additionally, these areas lie lower than the application site so no overland flow path is available into the site in any event.

### 3.6 FLOODING FROM RESERVOIRS, CANALS AND OTHER ARTIFICIAL WATER SOURCES

- 3.6.1 There are no reservoirs, canals or other artificial water sources within this area and therefore not considered to present a flood risk to the site. The boating lake also, is not considered to present a flood risk to the site.

### 3.7 EXISTING FLOOD ALLEVIATION MEASURES

- 3.7.1 There are no existing flood defences for this section of Petersfield Stream. However, section 3.1 has confirmed the site to lie within Flood Zone 1 so none are required.

### 3.8 FLOODING HISTORY

- 3.8.1 The local Environment Agency office do not hold any information on previous flood history, flood levels and any flood defence / mitigation measures employed.
- 3.8.2 Additional research on the local history from newspapers and Internet sources has provided no evidence of any major flooding in the area.

It is therefore concluded that there is no history of flooding at this site.



## 4.0 PROPOSED DEVELOPMENT

### 4.1 PROPOSED LAND USE

- 4.1.1 The proposal is for a new development comprising commercial offices and small industrial units with an access road and car parking facilities. The proposed site layout plans are located in Appendix D.

### 4.2 FLOOD RISK TO THE PROPOSED SITE

#### PROPOSED BUILDINGS

- 4.2.1 As detailed in section 3.1 of this report the existing site is shown to be within flood zone 1 with little or no flood risk at all. The proposed development also remains within flood zone 1 with finished floor levels for the trade units closest to the stream (the lowest point of the site) being set at 68.15mAOD.

This provides a 750mm clearance (freeboard) above the highest predicted 100-yr +CC flood level (67.38mAOD) at the western extremity of the site.

- 4.2.2 The feasibility site layout sketch plan, detailing proposed floor levels, is also located in Appendix D

#### PROPOSED ACCESS ROAD

- 4.2.3 As shown on the proposed plans access to this site is required via a crossing over the Petersfield Stream in line with the Planning Requirements for the site. Additionally, the location of this crossing has been chosen to best fit the identified constraints on ecology and existing trees, as well as to best fit the highways issues recognised in the Transportation Assessment which accompanies the application.

- 4.2.4 To form this crossing, it is proposed to utilise a large precast concrete box culvert section in a similar detail to that recently consented for the access constructed to the McDonalds' site immediately west of the application boundary. This detail is simple to construct and will minimise the impact on the watercourse and adjacent land.

- 4.2.5 In order to determine the effect of the proposed crossing on water levels in the Petersfield Stream, a simple hydraulic model has been constructed as detailed in the following section.

## 5.0 HYDRAULIC MODEL FOR PETERSFIELD STREAM ACCESS CROSSING

This section forms a summarised Hydraulic Model Report for Petersfield Stream through the Buckmore Farm site, in support of the Flood Risk Assessment for the proposed site.

### 5.1 CRITERIA

- 5.1.1 The main criterion for this part of the flood risk assessment is to determine the extent of any predicted flooding on the site, with the introduction of the proposed box culvert access crossing, as well as the influence of the proposed site drainage on local watercourses and any affects that the proximity of the flood zone may have on construction. A simple 1 dimensional HECRAS model has been produced using flow and cross section data from the EA/Capita Symonds model.
- 5.1.2 All geometry data for cross-sections and input data including n values and flows for the Buckmore Farm section of the stream were replicated from the Petersfield hydraulic model and used to build the HECRAS model.
- 5.1.3 The representative cross-sections (XS's) used are shown on the plans set out at Appendix C and are as follows:

- HECRAS - XS 260 = 3.054U
- HECRAS - XS 240 = 3.054D
- HECRAS - XS 220 = 3.054D\_i1
- HECRAS - XS 210 = 3.053
- HECRAS - XS 200 = 3.053\_i1
- HECRAS - XS 155 = 3.052
- HECRAS - XS 100 = 3.051U

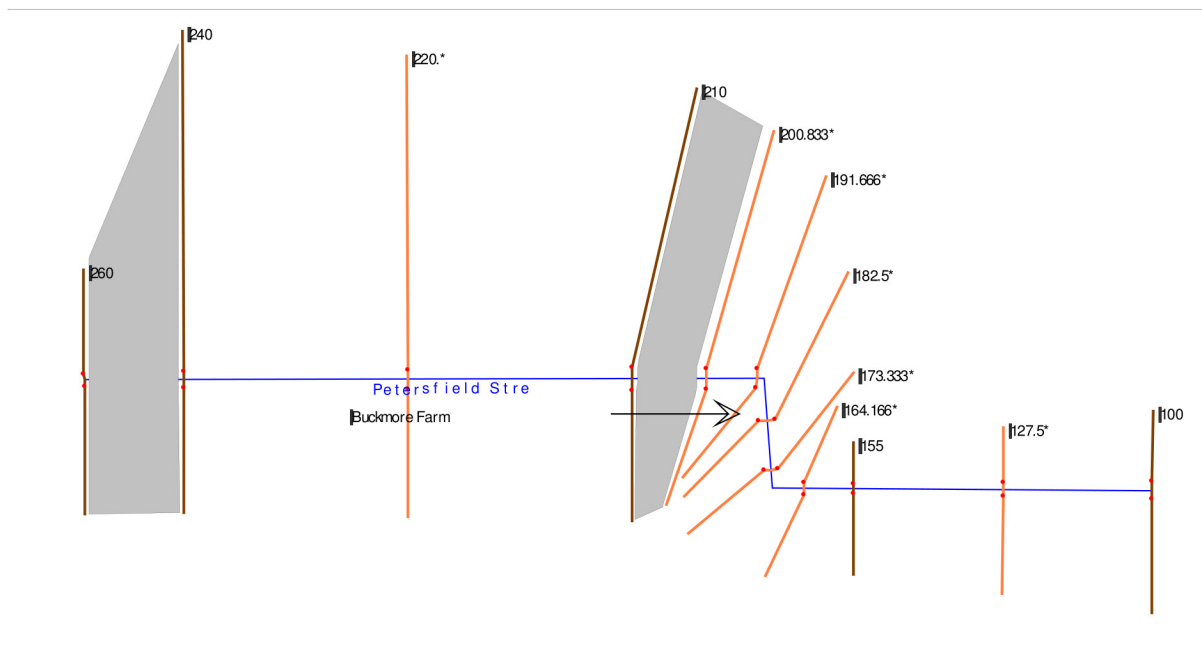


Figure 5.1: HECRAS Schematic Plan for Petersfield Stream at Buckmore Farm

## 5.2 CALCULATION OF PEAK FLOWS

5.2.1 Peak flows were derived from the Petersfield Flood Modelling Study. Peak flows were taken from node-point 3.054D; represented as XS 240 on the HECRAS model.

5-year:	1.065m <sup>3</sup> /s
20-year:	1.573m <sup>3</sup> /s
100-year:	2.429m <sup>3</sup> /s
100-year+CC:	2.913m <sup>3</sup> /s
1000-year:	4.874m <sup>3</sup> /s

## 5.3 HEC-RAS MODEL DEVELOPMENT AND CALIBRATION

5.3.1 A steady flow hydraulic model has been created to simulate the flows through this section of the stream. The objective of the modelling exercise is to estimate the longitudinal water surface profile and the extent of the floodplain during extreme rainfall events for the proposed site and the effects on flood levels up and downstream with the introduction of the proposed box culvert crossing.

## 5.4 RIVER SURVEY

5.4.1 The river survey was carried out and produced by Murphy Global Surveyors, commissioned by the EA. The model contains data at a number of cross sections and includes detailed survey data, to incorporate existing structures, i.e. culverts and bridges. The extent of the survey for the Buckmore Farm section starts at the petrol filling station service access crossing (3.054U) at the upstream boundary of the site to the Stoneham Park crossing. This information has been used directly to construct the hydraulic model.

## 5.5 MODEL DEVELOPMENT

5.5.1 The design flows within the watercourse have been modelled using HEC-RAS software. The program is coded to solve the energy equation using the "Standard Step Method" which compares the energy equation between two cross sections along the watercourse, making estimates of the energy loss between them.

5.5.2 Within HEC-RAS the Manning equation is used to estimate the conveyance at each section. Manning's roughness coefficients are a means of representing the effect of vegetative growth, channel and floodplain material on the conveyance capacity.

5.5.3 The Petersfield Stream at Buckmore Farm is a very small natural stream, clean, winding with stones and weeds. The land either side of the banks of the stream is made up of dense vegetation on the left and right bank. Therefore the following Manning's Coefficients have been used for the watercourse:

Channel	=	<b>0.060</b>
Floodplain	=	<b>0.030</b>

## 5.6 MODEL BOUNDARY CONDITIONS

5.6.1 A number of alternative boundary conditions were used in the model in order to consider different conditions and provide an element of sensitivity. The upstream boundary for the reach is the 'known water surface elevation' analysis. This function allows for a more realistic upstream boundary condition. Critical depth analysis was also used. This action showed very little difference in water surface levels. The downstream boundary for the model is the 'known water surface elevation' analysis. This function allows for a more realistic downstream boundary condition.

## 5.7 SENSITIVITY ANALYSIS

5.7.1 During the running of the design events, further model sensitivity runs were undertaken to test the sensitivity of the model to the variation in key model variables.

- Manning's 'n'  $\pm 20\%$
- 50% blockage of key structures
- Structure coefficient values  $\pm 20\%$
- Downstream boundary conditions
- Design inflows
- The calibrated model was run using the following design events, 1 in 5, 25, and 100 years as well as the 100 + 30%CC to allow for climate change.

5.7.2 Manning's roughness coefficient values (n) were adjusted by +/- 20%, which made minor differences to the output levels, but no affect to the site.

5.7.3 A number of alternative boundary conditions were used for the flow input data; including known water surface level downstream against a 1 in 100-yr return period flow. Critical depth was used as it provided conservative estimates.

5.7.4 Increasing the number of cross-sections by XS interpolation method showed no fluctuations in water levels within the stream.

5.7.5 It is proposed to introduce a gravel base to the base of the box culvert to retain flows and mimic the natural river bed. A Manning's coefficient was applied to the culvert to account for this. This again showed no affect on water levels.

## 5.8 RESULTS FROM HYDRAULIC MODELLING

5.8.1 Longitudinal Water surface level profiles are represented by the hydraulic model cross-sections through the site. Figure 3.2 represents the river cross-section with the proposed culvert and shows the 1 in 100-yr + cc water levels.

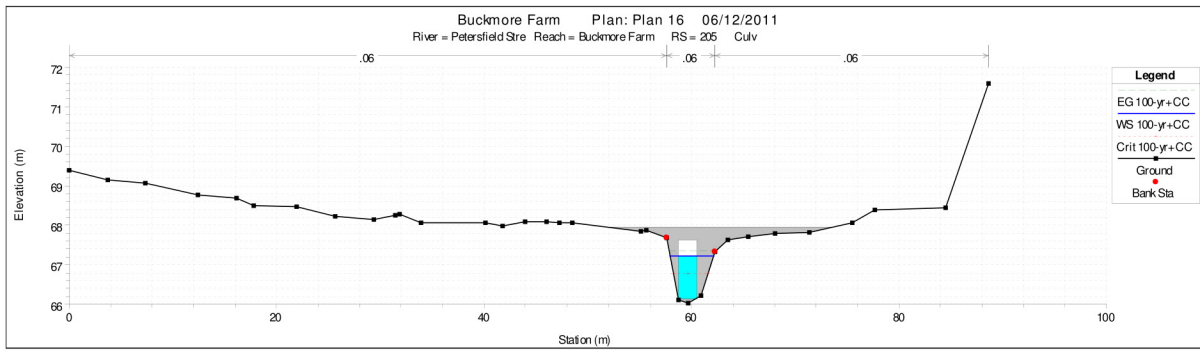


Figure 5.2: RS 205 - Proposed access crossing; box section (1750mm high x2250mm wide)

5.8.2 The HECRAS model was used to apply blocked culvert scenarios. The obstruction tool was used to apply 50% and 100% blockage scenarios (obstructions) at culvert RS205, the proposed access route across the stream.

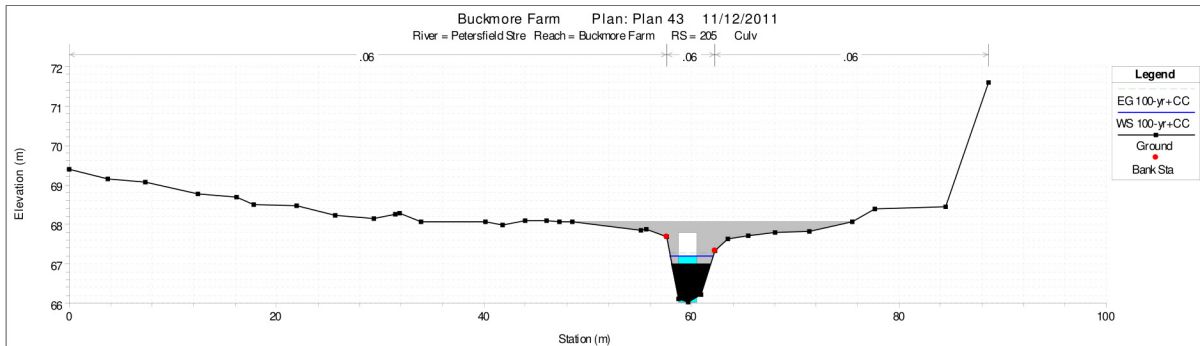


Figure 5.3: RS 205 - Proposed access crossing; box section (1750mm high x2250mm wide) with 50% obstruction. The model indicates an increase in flood water levels immediately upstream of the proposed new culvert.

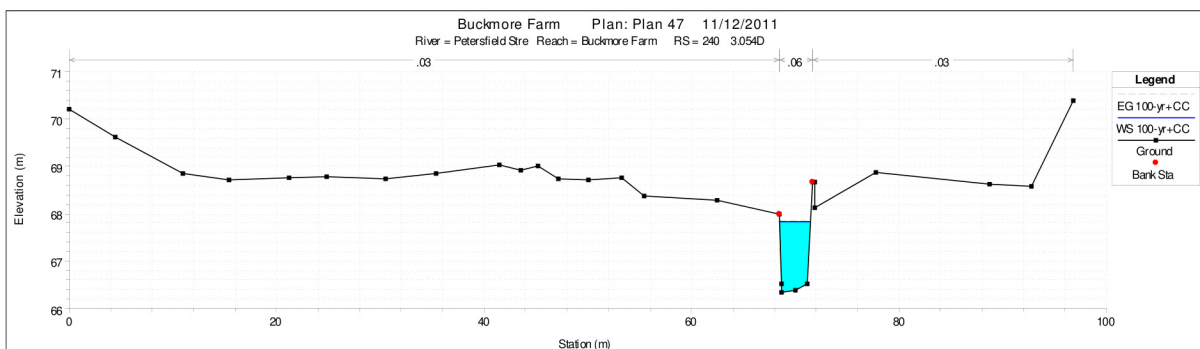


Figure 5.4: XS 240 - Water levels upstream remain in-bank, with 50% obstruction applied to the proposed culvert.



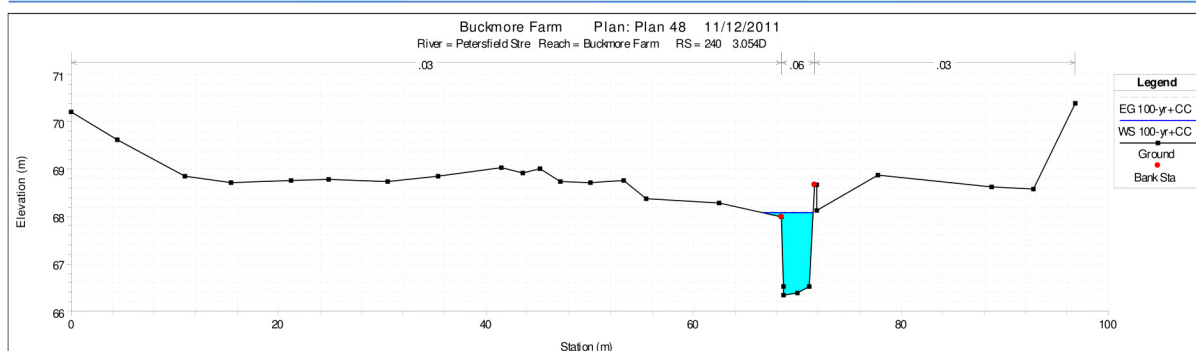


Figure 5.5: XS 240 - with 100% obstruction applied to the proposed culvert, water levels upstream are just overtopping the bank

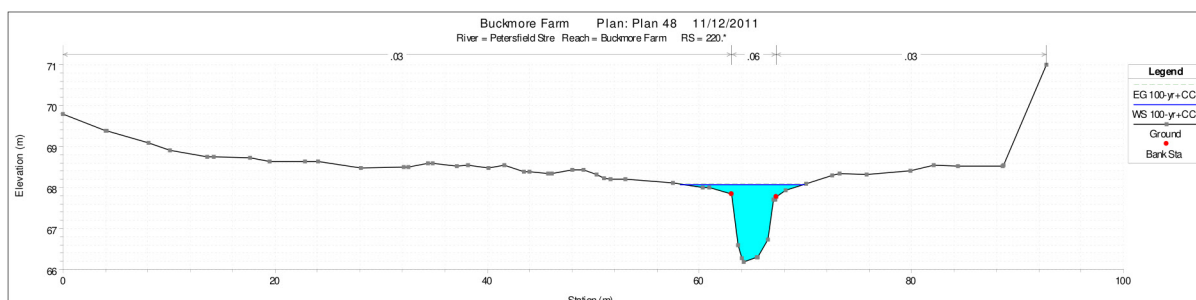


Figure 5.6: XS 220 - with 100% obstruction applied to the proposed culvert, water levels upstream are just overtopping the bank.

5.8.3 The results of all modelling including a comparison with the EA hydraulic model is given in table 4.1 below:

<b>Table 5.1. : HECRAS Model Predicted Water Levels for Petersfield Stream at Buckmore Farm with proposed culvert and applied blockages</b>				
<b>Design Event</b>	<b>XS220 (ISIS-3.054D_i1)</b>	<b>XS 210 (u/s Culvert inlet) (ISIS-3.053)</b>	<b>XS 200 (east boundary) (ISIS-3.053_i1)</b>	<b>XS 155 (3.052)</b>
100-yr + CC ISIS (no access)	67.30	67.17	67.063	66.87
100-yr + CC HECRAS (no access)	67.40	67.17	67.16	66.97
100-yr + CC HECRAS (with access)	67.40	67.17	67.16	66.97
100-yr + CC HECRAS (with 50%blockage )	67.72	67.27	67.16	66.97
100-yr + CC HECRAS (with 100% blockage )	68.08	67.92	67.16	66.97



## 5.9 CONCLUSIONS AND ANALYSIS FROM THE HYDRAULIC MODELLING

- 5.9.1 The HECRAS model was built using data from the ISIS model. The HECRAS model shows higher water levels than the ISIS model; this is due to the inherent differences between the two programmes. However, it is considered to provide an element of safety for the purpose of this project.
- 5.9.2 The longitudinal water surface profiles and the river levels table above, both clearly show that flows and subsequent water levels generated during a 100-yr storm event (including 20% allowance for climate change) remain in-bank and do not flood the proposed site.
- 5.9.3 Ground levels at the proposed site climb sharply from a low point of 67.7mAOD adjacent to the river bank. The predicted flood level for 100-yr + CC, in the stream at the proposed culvert location is 67.17mAOD.
- 5.9.4 The introduction of the box section and access crossing showed very little or no affect on existing flows and flood water levels.
- 5.9.5 A number of dimensions were considered for the box section beneath the access road. The principal concern is to avoid impeding the flow of the stream, particularly during high flows. The EA also advised that the soffit should be a minimum of 600mm above design flood levels for the Petersfield Stream to enable floating debris to pass below the structure. The model was run a number of times to determine the appropriate size.
- 5.9.6 The approximate bed level at the proposed location for the crossing is 66.03m AOD and the flood water level is 67.17m AOD at XS 210 (ISIS-3.053) (the proposed culvert inlet cross-section). Therefore the height of the box section required to provide the required freeboard is 1750mm; this provides a soffit level of 67.78m AOD (610mm clearance). A culvert width of 2250mm has been chosen to match the stream width at this location.
- 5.9.7 The difference in water levels when applying culvert blockages are also represented in Table 4.1. The results show that, whilst a minor increase in water levels against the 100-yr+CC peak flow values occurs, any water backing-up at the blocked culverts remains within the banks and grass verges either side of the stream (Figures 5.3 to 5.6).

The full output tables are located in Appendix E.

- 5.9.8 To achieve the proposed designed levels for the road crossing and development layout, some ground re-profiling will be required. Since river flows stay within bank this does not compromise flood levels but this has been proven by running the model with Levees applied to the north bank.

## 6.0 SURFACE WATER DRAINAGE

### 6.1 GENERAL

- 6.1.1 At the present time no detailed surface water drainage strategy has been prepared. This document can therefore only set out the constraints that must be imposed on any storm water drainage proposals to manage flood risk.
- 6.1.2 In order to ensure that the development does not increase flood risk to land upstream and downstream from the site, it will be necessary to control storm water runoff to mimic the current, natural, catchment response. Since the site is currently undeveloped, this will mean ensuring that surface water flows are throttled to green field rates.
- 6.1.3 Additionally, it will be necessary to ensure that the quality of any storm water discharge is controlled in line with the requirements of CIRIA C609.

### 6.2 GREENFIELD RUNOFF RATES

- 6.2.1 Any proposed positive surface water outfalls to the river will need to be balanced to achieve green field flow rates for a range of events up to the 100 year event (plus a suitable allowance for climate change). A detailed assessment of these allowable flow rates is set out below.
- 6.2.2 The proposed development is 1.2ha in area. Therefore the IOH Report (IH124) "Flood Estimation for small rural catchments" (1994) was used to determine the peak greenfield runoff rate, QBAR. This value of QBAR was then factored by the UK FSR regional growth curves to produce peak flood flows for the required return period storms.

Copies of greenfield runoff calculation sheets, WINDES ICP SUDS and WINDES IH124 are located in Appendix F but the results are summarised in Table 6.1 below:

Return Period	Design Flow (m <sup>3</sup> /sec)	Site Specific Runoff (l/sec/ha)	Unit	Allowable Discharge from Site Area (l/sec)
2yr	0.42	3.47		4.0
5yr	0.61	5.06		6.0
10yr	0.77	6.4		7.5
30yr	1.07	8.95		10.5
100yr	1.51	12.62		15.0

**TABLE 6.1: ALLOWABLE GREEN FIELD DISCHARGE RATES**

### 6.3 DEVELOPMENT DRAINAGE

- 6.3.1 Depending on prevailing ground conditions, it is likely that storm water management for the new development will need to embrace a range of approaches. However, at the present time, no information on ground conditions at the site is available so, to provide certainty in the management of stormwater, it is proposed to discharge rain runoff via new headwalls into the Petersfield Stream.
- 6.3.2 Given the topography of the site, it is envisaged that this will be achieved using a gravity sewer network giving a positive connection to the river. Two separate outfalls are envisaged
- i. Serving the development to the north of the river
  - ii. Serving the access road to the south of the river.
- 6.3.3 It is proposed that the sewer network be designed to deliver the following design parameters:
- Allowable discharges to be set at the agreed Greenfield rate for the whole site at the 100 year runoff figure assessed above
  - No surface flooding within the site allowable under a 30 year return period event
  - No flooding to buildings allowable under a 100 year return period event.
  - No surface flooding under a 100 year return period event to leave the site.
  - Design rainfall under all events to be uplifted by 20% to address climate change impacts over a 100 year design life.
- 6.3.4 Clearly, to achieve these parameters, significant flow balancing will be required and it is envisaged that this will be delivered through a combination of porous paving to car parks and oversized pipework or tanks to accommodate roof and road drainage.
- 6.3.5 Where ground conditions permit, the porous car parking areas could be designed to infiltrate straight to ground. However, regardless of ground conditions, it is considered that the steep topography of the site will preclude the use of point
- 6.3.6 By using porous materials within the car parking areas, water quality targets will be achieved without the use of petrol interceptors.
- 6.3.7 A detailed drainage design will need to be produced post consent for submission to the Local Planning Authority and Environment Agency to give confidence that the proposed storm water management does not compromise flood risk for this, or adjacent, sites

## 7.0 SUMMARY AND CONCLUSIONS

- 7.1 This report appraises the flood risk of a proposed business and trade park on farmland at Buckmore Farm Petersfield. It addresses the requirements given in NPPF and other issues which are deemed relevant to flood risk.
- 7.2 Detailed flood maps and river modelling has been provided by the Environment Agency with fluvial flood levels compared to a detailed topographic survey of the site. This review confirms the site to lie wholly in Flood Zone 1 and is therefore appropriate for development.
- 7.3 Floor levels within the proposed development have been set to provide a minimum of 750mm freeboard above the highest known 100 year +CC flood level of 67.4m AOD at the western boundary of the site.
- 7.4 Access to the site is proposed from Winchester Road in line with planning requirements and the detailed Transportation Assessment which accompanies the application. The location and form of the junction have been chosen to minimise the impact on the river corridor.
- 7.5 Accessing the site off Winchester Road necessitates a new road crossing of the Petersfield Stream and this is proposed to be constructed using a concrete box culvert section, again to minimise the impact on the river corridor and in sympathy with recently consented crossings immediately upstream of the site. The location of the crossing has been chosen to best suit the requirements of ecology and tree surveys carried out.
- 7.6 In designing the culvert section required, account has been taken of the EA requirement to set a soffit level at a minimum of 600mm above the estimated Q100 +CC flood level to allow for any floating debris to pass beneath the structure, which should avoid the risk of blockage.
- 7.7 Bed levels at the culvert location are approximately 66.05m AOD so to meet this criteria, a 1750mm high culvert is required to provide an adequate freeboard above the modelled Q100+CC flood level of 67.2 m AOD. The stream width at this point is approximately 2m wide so a standard 2250mm wide by 1750mm high culvert has been chosen.
- The flow capacity of this size box section is  $9.31\text{m}^3/\text{s}$  which exceeds the 100-yr +CC peak flow of  $2.93\text{m}^3/\text{s}$  by 68%.
- 7.8 To assess the impact of this new crossing on river levels, information derived from the Environment Agency's Petersfield Stream modelling study was used to produce a HECRAS model. This modelling assessed a range of scenarios including blockage tests of the new culvert (50% and 100%) and sensitivity tests to key input parameters.
- This work demonstrates that the new access proposal does not adversely affect river levels and no out of bank flows were generated a result.
- 7.9 Advice is given on the management of surface water runoff which will need to be attenuated to mimic the natural catchment response of this green field site. It is considered likely that a range of SUDs techniques will need to be used to control flows and water quality including infiltration, porous pavements and balancing tanks/pipework.

**APPENDIX A**  
**EA CORRESPONDENCE**



Mr Carl Collins  
Harrhy Consulting Ltd  
17 Gold Tops  
Newport  
Gwent  
NP20 4PH

**Our ref:** HA/2011/112279/01-L01  
**Your ref:** Email 21.10.11  
**Date:** 26 October 2011

Dear Mr Collins

**PROPOSED REDEVELOPMENT OF SITE TO INCLUDE NEW ACCESS ROAD  
ACROSS PETERSFIELD STREAM  
BUCKMORE FARM, BECKHAM LANE, PETERSFIELD, HAMPSHIRE, GU32 3BU**

Thankyou for your enquiries dated 21/10/11 and 23/10/11 regarding the proposed trade unit and office space development at Buckmore Farm, Petersfield.

Flood Risk Assessment

Please refer to our FRA Guidance Notes for general requirements on undertaking a Flood Risk Assessment. Information is available at <http://www.environment-agency.gov.uk/research/planning/93498.aspx>

The FRA should consider how flood risk to the development and to the surrounding area as a result of the development has been managed through locating the development in the areas of the site at least risk of flooding. Looking at the initial plans for the site, it appears that the development is located mostly within flood zone 1 and buildings have been avoided in flood zone 3. It would be helpful if a plan of the development overlaying the flood map could be provided in the FRA to demonstrate that there will be no obstructions within flood zone 3 that could cause flood water to be displaced, increasing flood risk elsewhere.

Surface Water Drainage Strategy

The FRA should also provide details of the surface water drainage strategy. Sustainable Drainage Systems (SUDs) should be utilised wherever possible. The surface water drainage system should be designed in accordance with the guidance in Annex F of PPS25, allowing for an increase in rainfall intensity due to climate change in accordance with Annex B of PPS25.

Access



The Agency's preference for the access crossing would be an open span bridge. The soffit should be a minimum of 600mm above design flood levels for the Petersfield Stream to enable floating debris to pass below the structure.

A short section of culvert would be permitted for access if it could be shown that there was no other practical option. Evidence would need to be provided in the FRA to show that flood risk would not be increased. The culvert should be designed for a 1 in 100 year flood event with an allowance for climate change in accordance with PPS25.

### Highway Widening

Whilst we would prefer a minimum width of 5m to be kept between the highway kerb line and the bank of the Petersfield stream, this distance could be re-considered if there were other constraints that made this difficult to achieve. Maintenance access, bank stability and any effect on flood risk would have to be taken into account.

### Flood Defence Consent

Under the terms of Section 109 of the Water Resources Act 1991, and the Southern Region Land Drainage and Sea Defence Byelaws, the prior written consent of the Environment Agency is required for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of the Petersfield Stream, which is designated a 'main river'. Please be aware that the Environment Agency has up to two months to determine applications for consent made under Section 109 of the Water Resources Act 1991. Consent will only be issued if the works do not pose a flood risk to people and property, and do not conflict with the Environment Agency's other duties

If you have any queries or would like to discuss the development further, please do not hesitate to contact Zoe Randall on 01962 764821.

Yours sincerely

**Zoe Randall**  
**Development & Flood Risk Officer**

Direct dial: [REDACTED]

Direct e-mail: [REDACTED]

On behalf of Planning Liaison

**APPENDIX B**

**TOPOGRAPHIC SURVEY OF EXISTING SITE**



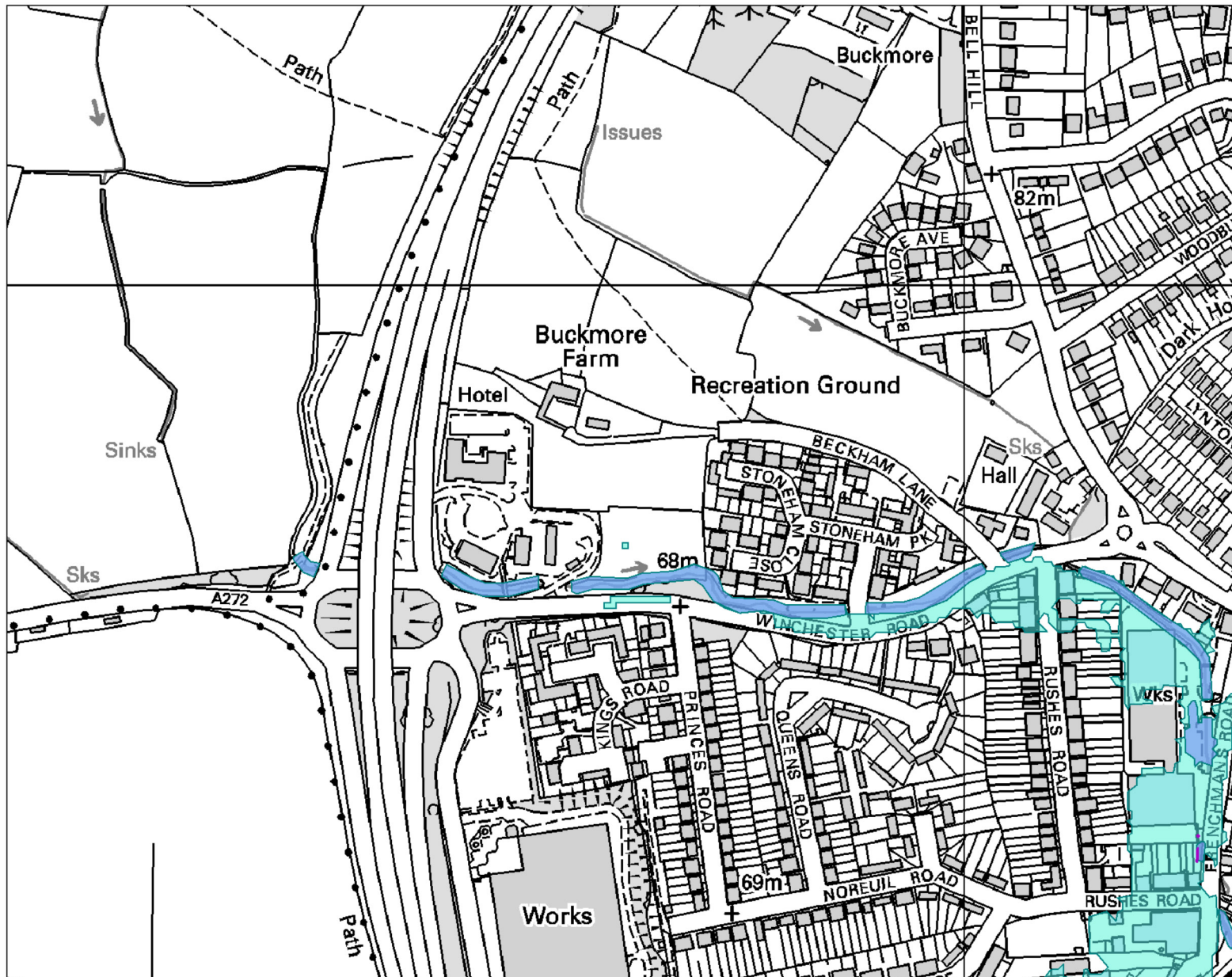




**APPENDIX C**

**EXTRACTS FROM EA PETERSFIELD STREAM MODELLING STUDY REPORT**

# Flood Risk Map - Buckmore Farm, Petersfield



Scale 1:5,000



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

### Flood Map Areas (assuming no defences)

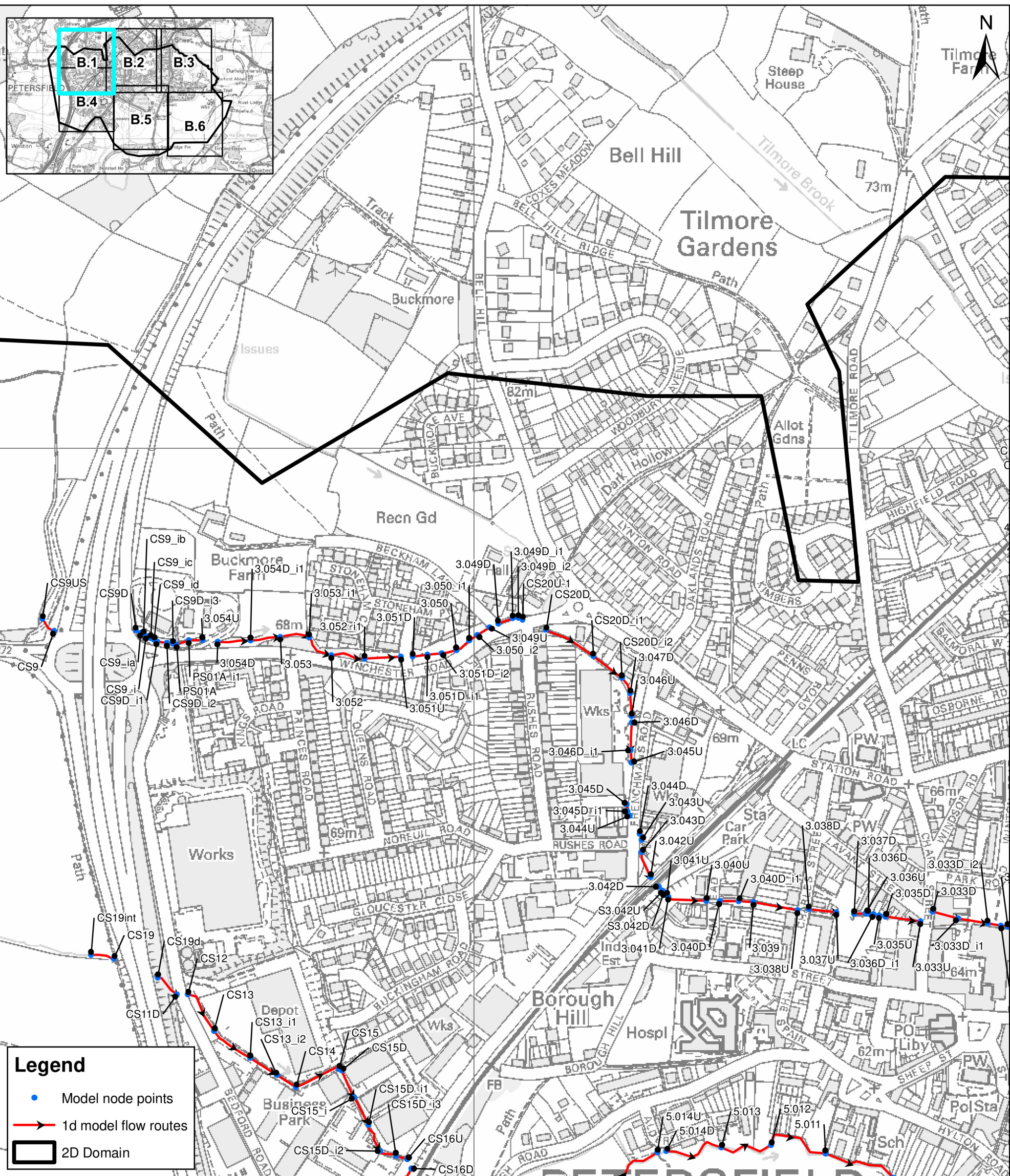
**Flood Zone 3** shows the area that could be affected by flooding:

- 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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# PETERSFIELD FLOOD MODELLING

## Appendix B.1 Model Schematic



DRAWN BY ER	CHECKED BY SC	PASSED BY GJ	DATE 19/07/2011	SCALE @ A3 1:5,000	ISSUING OFFICE E.Grinstead	DRAWING NUMBER CS047025/Appendix B.1	REV -
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Label	Max Stage (m)											
	With Defences								No Defences			
	5yr AEP Event	20yr AEP Event	50yr AEP Event	75yr AEP Event	100yr AEP Event	100yrCC AEP Event	250yr AEP Event	1000yr AEP Event	20yr AEP Event	100yr AEP Event	100yrCC AEP Event	1000yr AEP Event
3.050_i1	65.511	65.742	65.994	66.160	66.315	66.591	66.640	66.792	65.742	66.315	66.591	66.798
3.050_i2	65.500	65.736	65.992	66.158	66.313	66.585	66.636	66.786	65.736	66.313	66.585	66.791
3.051D	66.071	66.182	66.279	66.357	66.449	66.662	66.710	66.860	66.182	66.449	66.662	66.866
3.051D_i1	66.032	66.131	66.223	66.308	66.410	66.633	66.678	66.831	66.131	66.410	66.633	66.838
3.051D_i2	65.989	66.067	66.152	66.251	66.369	66.606	66.652	66.804	66.067	66.369	66.606	66.810
3.051U	66.100	66.225	66.331	66.477	66.574	66.816	66.898	67.085	66.225	66.574	66.816	67.092
3.052_i1	66.194	66.331	66.440	66.558	66.645	66.870	66.952	67.117	66.331	66.645	66.870	67.122
3.053_i1	66.542	66.699	66.805	66.867	66.920	67.063	67.129	67.325	66.699	66.920	67.063	67.332
3.054D	66.903	67.058	67.170	67.227	67.271	67.381	67.439	67.702	67.058	67.271	67.381	67.716
3.054D_i1	66.820	66.979	67.092	67.148	67.193	67.306	67.365	67.615	66.979	67.193	67.306	67.629
3.054U	66.887	67.039	67.149	67.205	67.248	67.356	67.413	67.973	67.039	67.248	67.356	67.996

Label	Max Flow (m³/s) - 1D only											
	With Defences								No Defences			
	5yr AEP Event	20yr AEP Event	50yr AEP Event	75yr AEP Event	100yr AEP Event	100yrCC AEP Event	250yr AEP Event	1000yr AEP Event	20yr AEP Event	100yr AEP Event	100yrCC AEP Event	1000yr AEP Event
3.050_i1	1.063	1.569	1.986	2.191	2.343	2.505	2.558	2.939	1.568	2.343	2.505	2.984
3.050_i2	1.063	1.568	1.983	2.185	2.334	2.597	2.654	3.459	1.568	2.335	2.597	3.507
3.051D	1.062	1.567	1.993	2.215	2.384	2.829	3.108	3.693	1.567	2.384	2.828	3.689
3.051D_i1	1.062	1.568	1.993	2.211	2.378	2.823	3.102	3.678	1.568	2.378	2.823	3.677
3.051D_i2	1.063	1.569	1.992	2.207	2.370	2.815	3.056	3.662	1.569	2.370	2.814	3.678
3.051U	1.062	1.567	1.993	2.215	2.384	2.829	3.108	3.693	1.567	2.384	2.828	3.689
3.052_i1	1.061	1.568	1.995	2.219	2.394	2.846	3.121	4.698	1.568	2.394	2.846	4.790
3.053_i1	1.064	1.570	2.001	2.233	2.418	2.887	3.150	4.861	1.570	2.418	2.888	4.925
3.054D	1.065	1.573	2.005	2.240	2.429	2.913	3.182	4.874	1.573	2.429	2.913	4.953
3.054D_i1	1.065	1.572	2.004	2.238	2.427	2.907	3.174	4.856	1.572	2.426	2.907	4.959
3.054U	1.065	1.573	2.005	2.240	2.429	2.913	3.182	4.874	1.573	2.429	2.913	4.953

**APPENDIX D**

**PROPOSED DEVELOPMENT LAYOUT**



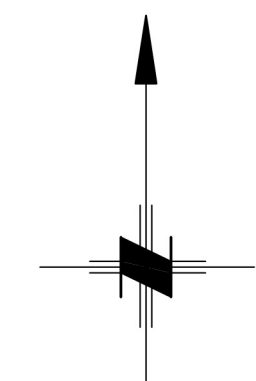


**KEY**

-  Trees to be removed
-  Development landscaping

**AREA SCHEDULE**

Building	GEA Area m <sup>2</sup>
A	850
B	850
C	560
D	560
E	560
F	1,210
<b>TOTAL</b>	<b>4,590</b>



REVISION	DATE	COMMENTS	AUTHOR / CHECKED

**lhc** architecture  
urbanism safety

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EXETER 01392 444334  
PLYMOUTH 01752 669368  
SOUTHAMPTON 08450 714565

**TITLE**  
Buckmore Farm, Winchester  
Petersfield

**DETAIL**  
Outline Masterplan

**DATE**  
March 2012

**SCALE**  
1:500 @ A1

**DRAWING No.**  
11036.L01.02

**REV.**  
-

**AUTHOR / CHECKED**  
TB

**DRAWING STATUS**  
-

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