

Purbeck District Council: Core Strategy  
Examination in Public  
Submission on behalf of ZBV (Winfrith) Ltd

Reference: 4953

**MATTER 17: Flood Risk, Groundwater Protection, and Coastal Erosion (Policies FR, GP and CE)**

**17.1: Can issues of flood risk, groundwater protection and coastal erosion be appropriately overcome?**

17.1.1 According to the Environment Agency's flood zone map (provided within Appendix A: Dorset Green Technology Centre, Flood Risk Briefing Note) the Site lies within Flood Zones 1, 2 and 3, which indicates a low to high risk of flooding from rivers or the sea, excluding the presence of defences (a high risk being defined as a 1 in 100 year or greater probability of river flooding). However, following consultation with the Environment Agency it was established that the data used to determine these Flood Zones was coarse JFLOW data and was not sufficient for the purposes of a site specific Flood Risk Assessment. As such, a detailed flood modelling exercise was undertaken by Waterman on behalf of ZBV to determine more specifically the baseline conditions at the Dorset Green Site.

17.1.2 The detailed flood modelling exercise indicates that flooding is largely confined to the River Win channel and that with the exception of the southern parcels of the Dorset Green Site (as shown in Appendix A – having an area of approximately 0.45ha), the majority of the Dorset Green Site lies outside of the 1 in 100 year plus climate change flood extent. Furthermore, only a small area within the south of the Dorset Green Site lies within the 1 in 1000 year flood outline (refer to Appendix A).

17.1.3 This detailed flood modelling has subsequently been accepted and adopted by the Environmental Agency (and they have confirmed it is their intention to replace their current mapping with Waterman's flood model maps).

17.1.4 The Dorset Green Masterplan excludes new development in the areas of the Site identified at risk of flooding as shown in the revised modelling, and new development is only located within Flood Zone 1. Therefore issues of flood risk and groundwater protection can be appropriately overcome at DGTP, and mitigation would include:

- Excluding all residential development from the 1 in 100 plus climate change floodplain, Flood Zone 2 and Flood Zone 3;
- Commercial development is also excluded from the 1 in 100 plus climate change floodplain, Flood Zone 2 and Flood Zone 3, with the exception of the existing building in the south of the Site. The existing building is utilised for office purposes, and would be refurbished for the purposes of a visitor centre. Therefore the land use classification would remain the same, 'less vulnerable', and the flood risk vulnerability would not be increased. There would be no increase in building footprint or ground raising within this parcel of land;
- Building Finished Floor Levels (FFLs) would be set 300mm above the 1 in 100 year plus climate change design flood level within the southern residential plot which lies adjacent to the floodplain, in line with the Environment Agency's requirements;
- The provision of SuDS throughout the Site including swales, permeable paving, ponds and attenuation tanks where necessary.

**APPENDIX A: Dorset Green Technology Centre, Flood Risk Briefing Note**

# Dorset Green Technology Centre

## Flood Risk Briefing Note

### 1. Introduction

- 1.1. Waterman has been commissioned by ZOG Group to assess flood risk to the proposed Development at Dorset Green Technology Centre and produce a Flood Risk Assessment to be submitted as part of the planning application.
- 1.2. This Briefing Note summarises works undertaken to date in relation to the baseline hydraulic modelling and sustainable drainage strategy for the Site.

### 2. Flood Modelling

- 2.1. The existing Flood Zone Map held by the Environment Agency (EA) and included as Appendix A, denotes two flow paths through the central area of the Site. During consultation with the EA it was established that this modelling was based on coarse JFLOW data and was not sufficient for the purposes of a site specific Flood Risk Assessment. In order to assess the impact of flooding to the Site, the EA advised that detailed modelling would need to be undertaken to confirm baseline conditions.
- 2.2. As a result a detailed flood modelling exercise was undertaken from March to July 2011. The modelling was undertaken using the TUFLOW software package for a 1 in 100 year design event and including for an additional 20% inflow to account for the impacts of climate change over the design life of the Development. Flood flows were estimated using the Flood Estimation Handbook statistical method.
- 2.3. The model outputs and report were sent to the EA and Purbeck District Council, and have been approved by the EA (as seen in Appendix B). The EA have confirmed that they propose to adopt the flood mapping as the best available data and amend their Flood Zone Maps to suit, which is due to happen in July 2012.
- 2.4. The flood mapping outputs have been included in Appendix C and D, as indicated below:
  - Appendix C – 1 in 100 year plus climate change floodplain showing flood depths; and
  - Appendix D – Flood Zone Map showing the extent of the 1 in 100 year and 1000 year floodplains.
- 2.5. The development proposals have been amended to reflect the new flood extents in line with the sequential approach set out in the NPPF. As a result, all residential development has been located outside of the 1 in 100 year plus climate change flood outline, as required by the EA, in addition to lying outside modelled Flood Zones 2 and 3. The small area of floodplain along the southern boundary of the southwest residential plot would not be developed and would be retained at its existing level. Therefore the scheme would not displace or increase flood risk to others.
- 2.6. Commercial development is also excluded from the 1 in 100 year plus climate change floodplain, Flood Zone 2 and Flood Zone 3, with the exception of the development plot in the far southwest of the Site, which comprises an existing building. The existing building is utilised for office purposes, and would be refurbished for the purposes of a visitor centre. Therefore the land use classification would remain the same, 'less vulnerable', and the flood risk vulnerability would not be increased. In addition, flood risk would not be increased to others through either an increase in building footprint or ground raising.

- 2.7. Building Finished Floor Levels (FFLs) would be set 300mm above the 1 in 100 year plus climate change design flood level within the southwest residential plot in line with the EA's requirements; FFLs within the remaining plots would not be raised. Compensatory flood storage would not be required, as no ground raising would occur within the 1 in 100 year plus climate change flood outline.
- 2.8. The new Flood Zone Maps (Appendix D) would be used to inform the sequential test, for which all newly proposed development lies outside.

### **3. Surface Water Runoff**

- 3.1. The surface water drainage strategy would utilise sustainable drainage systems (SuDS) to reduce the rate of surface water runoff and provide amenity and biodiversity benefits.
- 3.2. In line with the CIRIA SuDS Manual an appropriate level of treatment would be afforded depending on the proposed land use, to ensure that there would be no risk of pollution to the River Win, as seen below.
  - 1 treatment train – roofs only.
  - 2 treatment trains – residential roads, parking areas and commercial zones.
  - 3 treatment trains – refuse collection, industrial areas, loading bays, lorry parks and highways.
- 3.3. For example, swales and permeable paving would be provided within the development plots to capture runoff at source as part of an appropriate treatment train, which would include balancing ponds and oil separators where necessary. This would ensure that surface water runoff is treated to an acceptable standard before discharging to the River Win at a controlled rate.
- 3.4. The existing commercial buildings in the north of the Site, and the office in the far southwest would be retained and refurbished. Therefore, no additional infrastructure would be required and these buildings would continue to drain as per the existing situation utilising the same downpipes and connections. Therefore, it would not be possible or appropriate to attenuate surface water runoff from these areas of the Site and the existing infrastructure serving these buildings would be retained, or diverted where necessary.
- 3.5. Taking a precautionary approach for outline design purposes, discharge would be restricted to the 1 in 100 year Greenfield rate for the newly proposed areas of the Development. At the detailed design stage, in line with Purbeck District Council's Strategic Flood Risk Assessment (SFRA), it may be possible to only reduce surface water discharge by 10% from previously developed areas; however this would require further consideration of the complete strategy at the detailed design stage.
- 3.6. Balancing ponds would be proposed outside of the 1 in 100 plus climate change flood extent to ensure that the required volume of attenuation would always be available, even in times of flood. They would also be located outside of the 12m buffer zone required from the banks of the River Win to afford access for maintenance.
- 3.7. The ponds would be designed with an average storage depth of 1m and side slopes at 1 in 4 and 1 in 6 in line with the CIRIA SuDS Manual. As no soakage tests have been undertaken on the site to date, the ponds would be sized assuming no discharge by infiltration. At the reserved matters stage, soakage tests would be undertaken to confirm whether these ponds could be reduced in size.
- 3.8. The SuDS features would be appropriately maintained either through an on-site management team, or could potentially be adopted by the Lead Local Flood Authority under the Flood and Water Management Act published in 2010. This will be subject to agreement and would be confirmed at the detailed design stage.

## **4. Summary**

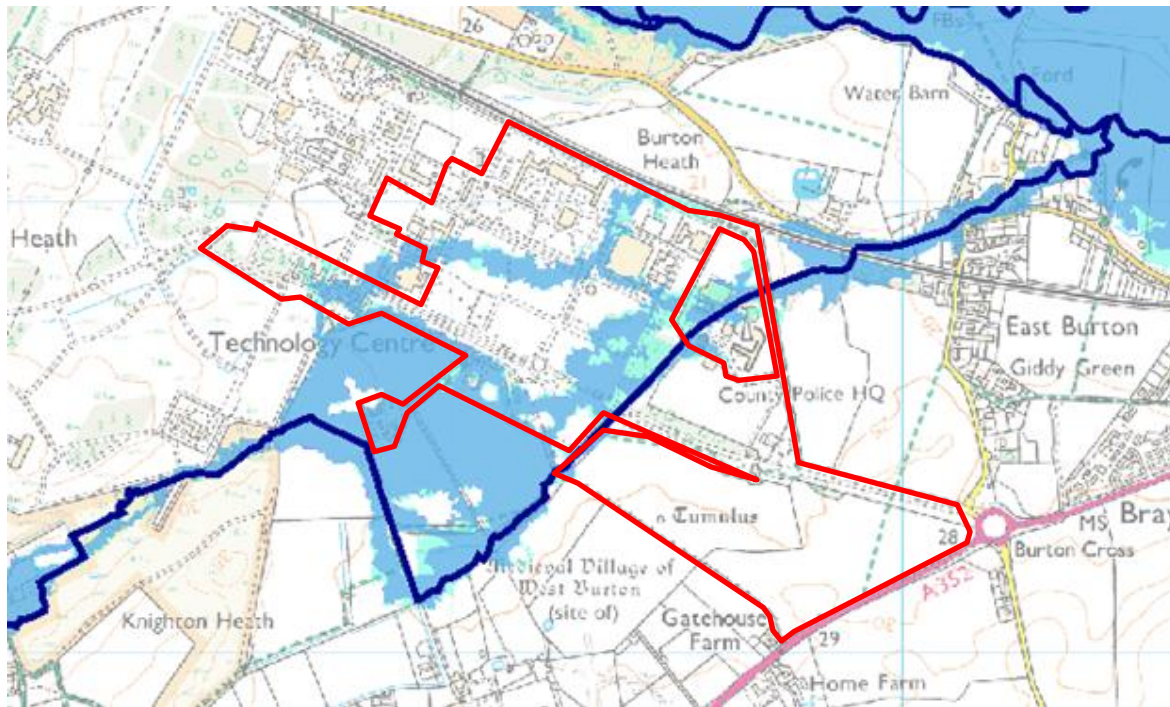
- 4.1. Baseline flood modelling has been undertaken for the site and approved by the EA. Modelling shows that with the exception of the existing plot in the far southwest of the site which would be refurbished, all proposed Development lies outside of the 1 in 100 year plus climate change flood extent, Flood Zone 2 and Flood Zone 3.
- 4.2. As the southwest residential plot lies adjacent to the floodplain, taking a precautionary approach this area would be mitigated as part of the design, to ensure that the Development remained safe during flood conditions and would not increase flood risk elsewhere.
- 4.3. A SuDS strategy would be developed to ensure that water is treated to an appropriate standard before discharging to the River Win.










## **APPENDICES**

### **A. Environment Agency Flood Zone Map**

Environment Agency Flood Zone Map



Key

-  Site Location
-  Flood Zone 3, High Risk of flooding from rivers or the sea, without the presence of defences
-  Flood Zone 2, Medium Risk of flooding from rivers or the sea, without the presence of defences
-  Flood Zone 1, Low Risk of flooding from rivers or the sea
-  Flood defences
-  Areas benefiting from flood defences
-  Main River

Source: <http://maps.environment-agency.gov.uk>





## **B. Environment Agency Correspondence**

## Tarran, Sophie G

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**From:** Coombes, Richard <richard.coombes@environment-agency.gov.uk>  
**Sent:** 15 September 2011 11:14  
**To:** McCarthy, Brendan D  
**Cc:** McLean, Aaron S; Bremford, Andy; Holm, Michael  
**Subject:** FW: Dorset Green Hydraulic Modelling

Dear Brendan,

Many apologies for the delay in getting back to you with the results of our investigations into the Dorset Green modelling and flooding evidence we had to validate the flood levels and extents. In summary our initial observations were that:

- a) The 100 year flood extent in East Burton looked considerably less than what we would expect, based on the photos from 30/05/79 and 15/06/83.
- b) The 1000 year flood extent looked similar to the extent we see in the photos from 1979 and 1983.

Our findings were as follows:

- 1) The e-mail from Watermans (dated 01/09/11) suggest that the Frome was in flood on both occasions causing a backwater effect.
- 2) I have checked the flows at Dorchester on these dates and they were approximately 3 cumecs during the 1983 event and approximately 9 cumecs during the 1979 event. These are not high flows compared to other typical amax's.
- 3) Watermans also suggested a floodplain depth of up to 1.5m producing the backwater effect. I have checked the 100 year depths in the Frome model (just downstream of Dorchester) and it gives an average of 1.7m from bed level. Typical floodplain depths are not much more than 0.4m/0.5m. Thus I think we can dismiss backwater effect.
- 4) I have spoken to Brian Scott (EA Rivers Inspector) and he has suggested that a) there have been improvements to the culvert under the road at the main cross-roads in East Burton since 1979, b) he observed (or was told) that the Win rose quite high after we took it over as a COW, and that this was during the summer when the watercourse was very weedy, and c) he knows that the area does fill with water following intense rainfall.
- 5) The Flood Map for Surface Water shows the extent shown in the photos rather well.

In summary we have accepted that the flood estimation is appropriate for the catchment and will accept the flood extents from the modelling. We will assume that the 1979 and 1983 extents were caused through a choked, weedy channel and considerable surface water flooding.

We do have a few final requests we hope you can help us with. We are intending to update the flood map for the length from the upstream extent of the model to the railway line so would be grateful if you could supply mapping, preferably in the form of a shape file of the 100, 1000 and 100+cc flood extents. We would also appreciate a table of 1-d in-channel levels. I have copied the model across to our system and will send the hard drive back to you at Pickfords Wharf.

Many thanks for yours and in particular Aarons help in carrying out the review of the Dorset Green model.

Regards

Richard Coombes BEng CEnv C.WEM IEng MCIWEM  
Technical Specialist - Flood Risk Mapping and Data Management  
Flood and Coastal Risk Management  
Environment Agency Wessex (Blandford)  
Tel. 01258 483389

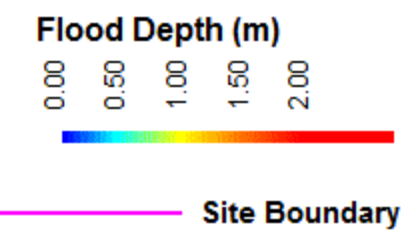
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**From:** Coombes, Richard  
**Sent:** 31 August 2011 17:21  
**To:** 'b.d.mccarthy@waterman-group.co.uk'



## **C. 1 in 100 Year Plus Climate Change Flood Outline**





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A01	25.05.11	FIRST ISSUE	AM
		Amendments	

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**Project**  
DORSET GREEN MASTERPLAN

**Title**  
1 IN 100 YEAR  
(+20% FOR CLIMATE CHANGE)  
FLOOD DEPTHS  
WIDER AREA

**Client**  
ZOG GROUP

<b>PRELIMINARY</b>				
Designed by	PJ	Checked by	BM	Project No
Drawn by	AM	Date	June 2011	C12004
Scale @ A3	1:5,000		Compass File No	
<small>work to figure dimensions only</small>				
Publisher	Zone	Category	Number	Revision
C	SA	92	0004	A02

GENERAL NOTES





**D. Flood Zone Map – 1 in 100 and 1 in 1000 Year Flood Outline**





**Flood Extent**

- Flood Zone 3 (1 in 100 year, without climate change)
- Flood Zone 2 (1 in 1000 year, without climate change)

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**GENERAL NOTES**

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A01	15.08.11	FIRST ISSUE	AM
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Project  
**DORSET GREEN MASTERPLAN**

Title  
**FLOOD MAP**

Client  
**ZOG GROUP**

Drawing status					<b>INFORMATION</b>				
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