

Dover Grammar School for Boys and Girls

Melbourne Avenue, Dover, CT16 2EG

Flood Risk Assessment

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Quality Assurance

HSP Consulting confirm that all reasonable efforts have been made to ensure that information contained within this report is accurate. HSP Consulting would further confirm that due care; attention and technical skill were used in creation of this report.

Signed for and on behalf of HSP Consulting:

Doug Mobbs
Principal Civil Engineer
Civil Engineering Division

Executive Summary

This Flood Risk Assessment (FRA) has been produced on behalf of Gleeds to establish the flood risk to the proposed development at Dover Grammar School for Boys and Girls, Melbourne Avenue, Dover.

The site is shown to be in Flood Zone 1 of the Environment Agency (EA) Indicative Flood Plain maps and is therefore deemed as having a low probability of flooding.

The site is currently undeveloped and used for agricultural purposes.

The topography of the surrounding area means the site is not at risk of flooding from overland flow, but may pose a risk of flooding from overland flow to surrounding areas.

There were no development proposals available to HSP at the time of writing this report.

The proposed development is assumed to be classified as more vulnerable and as such, in accordance with Appendix D of PPS 25, development should be appropriate.

Surface water drainage from the proposed development should utilise soakaways primarily. If this is not feasible, discharge to the public sewer network is proposed. Further information regarding the feasibility of soakaways and consultation with Southern Water (SW) is required in order to come up with a proposed surface water drainage strategy for the site.

The surface water system must be designed not to flood in a 1 in 30 year storm and so that all runoff generated in a 1 in 100 year storm plus 20% for climate change is contained within the site during times of flood.

Introduction

HSP Consulting were instructed on behalf of Gleeds to prepare a FRA for a proposed development at Dover Grammar School for Boys and Girls, Melbourne Avenue, Dover.

The FRA reported in this document has been produced in accordance with the requirements of Planning Policy Statement 25 (PPS 25): Development and Flood Risk published by the Department of Communities and Local Government, in December 2006.

The report is based on the following:-

- A site inspection.
- Consultations with Southern Water (SW)
- Indicative Flood Zone maps available on the Environment Agency (EA) website
- A Phase 1 Desktop Study carried out by HSP Consulting

The report is based on information available to HSP during the investigation. HSP accepts no liability if the information used is found to be inaccurate or incomplete or if additional information exists or becomes available at a later date.

HSP disclaim any duty to up date the report for events taking place after the date on which the final report is delivered.

This report is for guidance purposes only and provides no guarantee against flooding. HSP accepts no liability for the accuracy of water levels, flow rates and associated probabilities.

This report has been produced for Gleeds for the sole purpose described above and no extended duty of care to any third party is implied or offered.

Third parties making reference to this report should consult Gleeds and HSP as to the extent to which findings may be appropriate for their use.

Development Description and Location

The site is located within a predominantly residential area of Whitfield, Dover. At the time of the site walkover no work had commenced and the site was still used for agricultural purposes. The site address is Melbourne Avenue, Dover.

The centre of site is given as National Grid Reference 631026, 144075.

A Location Plan is provided in Appendix I.

The site is bounded by:-

- Archers Court School to the west
- Melbourne Avenue to the south
- Agricultural land to the north and east

The site is located on top of a hill. Land to the north and west of the site is generally quite flat. There is a significant fall on land to the south and east.

Site description

This site covers an area of approximately 9.2 ha.

The site is currently undeveloped and HSP understands that the site is currently used for agricultural purposes.

There is no topographical information for the existing site. However, a site walkover revealed that there is a general fall on the land from north east to south west.

A footpath runs along the southwest boundary of the site. The site southeast corner of the site backs onto houses off Melbourne Avenue and Durban Crescent.

Existing Surfacing and Drainage

The existing site consists entirely of permeable area at present.

During the site walkover it was noted that there is some form of surface water drainage, which appears to be dealing with overland flow, present on the site. This is discussed further in the Site Walkover section of this report.

Site Walkover

HSP conducted a site walkover on the 20th of October 2009.

Photographs taken during the site walkover are included in Appendix 2.

The site was found to be agricultural land, with a small footpath and vegetation along the southeast boundary of the site.

The site was found to have a general slope from north east to south west. There are also two low points on the site near the south east boundary. This is illustrated in photographs 1, 2 and 3 in Appendix 2.

There were no impermeable areas present on the site and there did not appear to be any below ground drainage.

Along the southeast boundary of the site, for approximately a third of the distance of the site boundary, there appears to be a small, heavily vegetated ditch running to one of the low points in the site. At times the ditch is barely defined. The bank widens out at the low point into a shallow basin. A 100mm diameter pipe also enters the basin at this point. It is not known what purpose this is serving, but it may be a form of land drainage. A 225mm diameter pipe, the exposed part of which is protected by a brick surround and a metal grill, is located in the basin and appears to flow in the direction of Melbourne Avenue. It is assumed that this is used for disposing excess surface water flows from the site, which may otherwise have posed a flood risk to houses along Melbourne Avenue and Durban Crescent near the south east corner of the site. The outfall of the pipe is not known. Photographs 4, 5 and 6 in Appendix 2 show this area of the site.

A manhole, assumed to be privately owned, is located on the western boundary of the site, adjacent to Archers Court School. HSP were unable to lift the manhole cover to determine what flows the drain was taken and in which direction the drain was flowing.

Current Surface Water Flood Risk

The site lies outside the indicative floodplain as indicated on the EA indicative Flood Zone Maps, recreated in Appendix 3, therefore making it Flood Zone 1. The probability of fluvial flooding is deemed to be low, less than 1 in 1000 annual probability. The site is not considered to be at risk of coastal flooding.

Information was requested from SW with regards to any recorded flooding or surcharging occurrences in their sewers within the vicinity of the site. None have been recorded.

There is not known to be any flood risk associated with groundwater in this area. Groundwater levels are not available for the site.

The site is not considered to be at risk of flooding from overland flow entering the site from surrounding areas.

Due to the topography of the surrounding land, the site may pose a flood risk to the surrounding area due to overland flow from the site, particularly to properties on Melbourne Avenue and Durban Crescent in the southeast corner.

Proposed Development

At the time of writing this report, no development proposals were available to HSP consulting. Further information on the development proposals are required to accurately assess the potential flood risk to the school and the surrounding area.

Sequential Test and Vulnerability Classification

As it is assumed any development proposals will show further school buildings on the site. Table D.2 in PPS 25 states that this development would be classed as 'more vulnerable', as it is to be used as an educational establishment.

Indicative Flood Zone Maps available from the EA website show the overall site is located in Flood Zone 1, low probability, meaning there is a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

Table D.3 in PPS25 shows that a development of this nature is appropriate in this area.

The aim of the risk-based sequential test is to steer development to areas of lower flood risk. As the current proposals are located in Flood Zone 1, it is not deemed necessary to look at alternative locations.

Flood Hazards

The site is located in Flood Zone 1 and as such is not considered to be at risk of river or coastal flooding. However, EA Guidance Note 1 recommends that the FRA for sites greater than 1 ha in Flood Zone 1 should be focused on the management of surface water run-off.

At the time of writing this report development proposals for the site were not available to HSP.

However, any future developments are very likely to increase the amount of impermeable area on the site and, hence, the surface water run-off from the site.

If surface water is not dealt with correctly it could pose a flood risk to the site. Due to the surrounding topography surface water could increase the flood risk adjacent sites by increasing the overland flow from the site.

Any proposals which involve discharging surface water to the public sewer network at an unattenuated rate could increase the risk of sewers downstream of the site surcharging or flooding.

Climate Change

PPS 25 states that climate change is likely to increase rainfall intensity and the risk of fluvial and coastal flooding.

Higher flood levels are not considered to pose a flood risk to the site, due to its location. However, increased rainfall intensity could result in an increase in surface water run-off. For this reason the on-site drainage system should be designed to contain any flows up to the 1 in 100 year plus 20% (Climate Change) on site, in order to minimise impact elsewhere.

Flood Risk Management

As discussed in the section of this report entitled Flood Hazards, discharging surface water at an un-attenuated rate into the public sewer could increase the risk of flooding. The site could also pose a flood risk to surrounding areas if surface water is not contained within the site boundary and discharged correctly.

PPS25 and Building Regulations and state that SUDs should be used to control surface water runoff as close to its origin as possible and avoid increasing flooding and pollution.

Disposal of surface water from a development must be considered using the hierarchical approach set out in Section 3.1 of Building Regulations (Part H). Consideration must be given to the use of soakaways or other infiltration techniques in the first instance. Where soakaways are considered not to be feasible,

communication with a nearby water course should be investigated. Where neither of these approaches are practical surface water may discharge to the public sewer.

The most appropriate type of SUDs for this site is considered to be the use of soakaways. A Phase 1 Desktop study for the site suggests the ground may be chalk overlain with clay. It is recommended that soakaway testing is carried out for the site to determine an accurate infiltration coefficient for the underlying ground. The Phase 1 Desktop study, extracts of which are included in Appendix 4, shows that the site is underlain by a major aquifer. The majority of the site also lies within source protection zone 3, and partly within zone 2. As such, it is recommended that information on contaminated ground in the area is sought in order to assess the feasibility of soakaways. Consultation with the EA is also recommended. Detailed development proposals and the level of the groundwater table are also required in order to properly assess the feasibility of soakaways on the site.

If the use of soakaways is unfeasible, it is proposed that a new connection into the public sewer network is made, as there are not known to be any watercourses in the area. At the time of writing this report, HSP were awaiting sewer record maps from SW for the area. These may show a suitable point of connection for discharging surface water from the site to the public sewer network. As the site is currently not connected to the public sewer network and is currently undeveloped, it is proposed that flow rates from the site should be limited to a Greenfield run-off rate of 5 l/s/ha. As the proposed development is 9.2 ha, a discharge rate of 46 l/s is proposed, with all flow rates in excess of this up to a 1 in 100 year storm event to be attenuated on site. However, detailed design proposals, information on the public sewer network and consultation with SW are required in order to finalise any proposals to discharge surface water to the public sewer network.

There may be potential to utilise the assumed private drain on the western boundary of the site adjacent to Archers Court School, mentioned in the Site Walkover section of this report. However, more information is required on the existing drainage in order to assess the feasibility of this.

The surface water system must be designed not to flood in a 1 in 30 year storm and so that all runoff generated in a 1 in 100 year storm plus 20% for climate change is contained within the site during times of flood.

It is assumed that, due to the size and topography of the site, there will be sufficient space for any storage required. However, detailed development proposals and a finalised surface water drainage strategy for the site will be required in order to finalise the details of any storage required

Off site Impacts

Provided a satisfactory surface water drainage strategy is adhered to, there should be no additional off site impacts from the proposed development.

Care should be taken to ensure that there is no additional overland flow leaving the site. Perimeter land drains may help to mitigate this, if necessary.

Residual Risks

There are not considered to be any residual risks from the development in terms of flood risk.

Conclusions and Further Work

- The site lies within Flood Zone 1 (less than 1 in 1000 annual flood probability) and is classed as having a low probability of fluvial flooding.
- The site is currently undeveloped and has no significant surface water drainage features.
- The site generally falls from northeast to southwest.
- There are no development proposals available at the time of writing this report. Any development proposals are assumed to be school buildings, and therefore will be classed as 'More vulnerable'.
- PPS25 Table D.3 shows that this type of development is appropriate.
- Development proposals are likely to increase the amount of impermeable area on the site.
- Detailed development proposals are required for the school in order to design the surface water drainage for the site and to properly assess the flood risk to, and posed by, the development.
- Soakaways may be a feasible means of discharging surface water. Information on groundwater levels, contaminated ground and infiltration coefficients should be obtained to determine whether or not soakaways can be used on the site.
- If surface water from the site is to be discharged via the public sewer network, it is proposed the flow rate should be attenuated to a maximum of 46 l/s. Consultation with SW is required in order to finalise an allowable discharge rate.



Appendix 1 – Site Location Plan



Appendix 2 – Site Walkover Photographs



Appendix 3 – Indicative EA Flood Map



Appendix 4 – Extracts From Phase 1 Desktop Study