

8.0 POTENTIAL SOURCE AND IMPACT OF FLOODING

8.1 Potential Sources of Flooding

8.1.1 The flood risk to the proposed Re-Development has been assessed against the following form of flooding:

- Tributary of Wallingford River (fluvial)
- Surface water
- Groundwater
- Existing drainage
- Proposed drainage
- Reservoirs

8.2 Flooding from Tributary of Wallingford River (Fluvial)

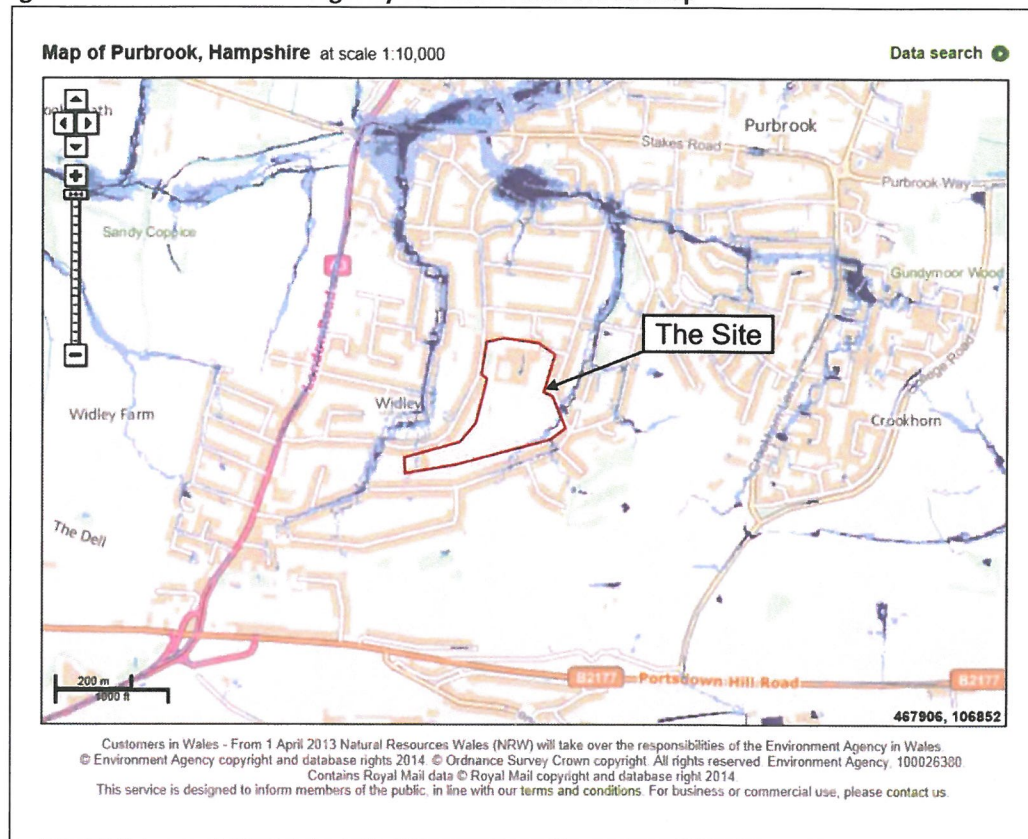
8.2.1 The proposed Re-Development is located within Flood Zone 1, 'Low Probability' of flooding according to the EA's Flood Map, see Figure 2. Hence, there is no risk of fluvial flooding to the proposed Re-Development from the small water course a tributary of Wallingford River.

8.3 Flooding from Surface Water

8.3.1 Flooding from overland flow may occur when intense rainfall exceeds the infiltration capacity of the ground and any surface water drainage systems, both on site and in the surrounding areas. Overland flow may originate from the development area itself or from adjoining land or from blockage or failure of the sewer system at a higher elevation from which flow migrates onto the development area.

8.3.2 The EA developed a Surface Water Flood Map in December 2013, which provides a general indication of areas that may be at risk of surface water flooding, see Figure 3. The map indicates that within the School boundary there is risk of surface water flooding in the southeast corner of the School playing fields and the courtyard located within the main school block.

8.3.3 Notwithstanding, there is virtually no risk of the proposed Re-Development suddenly being inundated with surface water floodwater which could create danger to life.

Figure 3: The Environment Agency Surface Water Flood Map

8.4 Flooding from Groundwater

9.0 There is limited information currently available on groundwater flooding in this area. However, groundwater flooding would result in a shallow depth of water which with the tendency to pond in the lowest areas of site, where the drainage gullies are located, it is unlikely that groundwater flooding will affect the proposed Re-Development

9.1 Flooding from the Existing Drainage

9.1.1 There is residual flood risk when the runoff from intense rainfall exceeds the capacity of the existing drainage soakaways which results in localised shallow flooding. The risk of flooding from the existing drainage system to the proposed Re-Development is considered to be low.

9.2 Flooding from the Proposed Drainage

9.2.1 There is residual flood risk as a result of blockages of the proposed SUDS for the Re-Development, or as a result of high intensity, short duration, localised storms which produce runoff rates which cannot be taken into drains quickly enough. These types of incidents usually only result in shallow flooding. All floor levels to new building should be set above surrounding ground and road levels. The use of SUDS permeable paving SUDS will minimise these effects. Hence, the risk of flooding from proposed drainage system for Re-Development is considered to be low.

9.3 Flooding from Reservoirs

- 9.3.1 The EA has published, on their website, indicative flood outlines in the event of reservoir embankments and structure failure. The maps were created showing how far flood water would spread from the reservoir in a worst case scenario assuming complete failure of the retaining structure and controls. These maps provide emergency services and councils with information they need to put plans in place to protect people.
- 9.3.2 According to the EA's reservoir indicative flood map, there is no risk of flooding from reservoirs.
- 9.3.3 Furthermore, there is no risk of flooding from the existing pond which is located approximately 880m to the north of the School boundary on lower elevation of 49m AOD.

10.0 PLANNING CONTEXT

10.1 Applicable Planning Policy

- 10.1.1 National Planning Policy Framework (NPPF)^(Ref.1) section 10 deals specifically with development planning and flood risk using a sequential characterisation of risk based on planning zones and the EA Flood Map. The main study requirement is to identify the flood zones and vulnerability classification relevant to the proposed development, based on an assessment of current and future conditions.

10.2 NPPF Flood Zones and Land Use Vulnerability

- 10.2.1 Within Technical Guidance^(Ref.2) to the NPPF each flood zone has a list of appropriate land uses dependent on vulnerability to flooding. The flood zones are described in Table 1, flood risk vulnerability classification in Table 2 and flood risk vulnerability and flood zone compatibility in Table 3. These tables are reproduced in Appendix 4.
- 10.2.2 The Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences.

10.3 Sequential and Exception Test

- 10.3.1 The Sequential Test is required to assess flood risk and NPPF Technical Guidance recommends that the test be applied at all stages of the planning process to direct new development to areas with the lowest probability of flooding (i.e. Flood Zone 1).
- 10.3.2 The proposed redevelopment site is located in Flood Zone 1 (Low Probability), according to Table 1 of NPPF Technical Guidance '*all uses of land are appropriate in this zone*' hence the Sequential and Exception Tests are not required.

11.0 CONCLUSIONS

11.1.1 The proposed Re-Development is classified as 'More Vulnerable' according to NPPF. The following table summarises the conclusions and recommendations of this FRA.

1.	Development description and location
1a	What type of development is proposed and where will it be located? A two storey extension at the front of the school (Block A), an infill building (Block B), and a gym store to rear of the existing gym halls (Block C), together with additional parking spaces, external hard/soft landscape enhancements and footpaths
1b	What is its vulnerability classification? More vulnerable
1c	Is the proposed development consistent with the Local Development Documents? Not applicable
1d	Provide evidence that the Sequential Test or Exception Test has been applied in the selection of this site for this type of development? Development is located within Flood Zone 1, the Sequential and Exception Tests are not required
2.	Definition of the flood hazard
2a	What sources of flooding could affect the site? Flooding from the existing drainage system
2b	Describe how flooding would occur? Intense rainfall exceeding the capacity of the existing drainage soakaways
2c	What are the existing surface water drainage arrangements for the site? Surface water runoff is currently discharged into a number of onsite soakaways and an area within the eastern section of the site drain via a gravity system in a southerly direction leaving the site along the southern boundary of the School.
3.	Probability
3a	Which flood zone is the site within? Flood Zone 1.
3b	If there is a Strategic Flood Risk Assessment covering this site, what does it show? The site is not affected by fluvial flooding; hence the site will remain in Flood Zone 1.
3c	What is the probability of the site flooding taking account of the contents of the SFRA and of any further site-specific assessment? Greater than the 1000-year (0.1% AEP) flood events.
3d	What are the existing rate and volume of runoff generated by the site? The 100-year (1% AEP) existing peak runoff is estimated to be 29 l/sec. The 100-year total volume is estimated to be about 50m³ based on 6 hours rainfall duration.
4.	Climate Change
4a	How is flood risk at the site likely to be affected by climate change? No change
5.	Detailed development proposals
5a	Provide details of the development layout. See Appendix 1
5b	Demonstrate, where appropriate, how land uses most sensitive to flood damage have been placed within the site that are at least risk of flooding. The proposed development is located in Flood Zone 1.
6.	Flood risk management measures
6a	How will the site be protected from flooding, including the potential impacts of climate change, over the development's lifetime?

	The proposed development is located in Flood Zone 1 and will not be affected by climate change.
7.	Off site impacts
7a	How will it be ensured that the proposed development and the measures to protect the site from flooding will not increase flood risk elsewhere? The proposed development is located in Flood Zone 1 and using SUDS techniques to control surface runoff from the re-development areas.
7b	How will runoff from the completed development be prevented from causing an impact elsewhere? Using SUDS techniques
8.	Residual risks
8a	What flood related risks will remain after the implementation of measures to protect the site from flooding? Surface water flooding from the existing drainage system
8b	How, and by whom, will these risks be managed over the lifetime of the development? By Purbrook Park School management

11.2 Summary

- 11.2.1 The study has established that the site is situated within Flood Zone 1 (Low Probability) of the EA indicative flood outline.
- 11.2.2 Potential residual surface water flood risk exists as a result of heavy intense rainfall, but the risk is considered to be low.
- 11.2.3 There is residual flood risk as a result of blockages of the proposed SUDS, or as a result of high intensity, short duration, localised storms which produce runoff rates which cannot be taken into drains quickly enough. All floor levels to new building should be set above surrounding ground and road levels. Hence, the risk is considered to be low.
- 11.2.4 Other flood risks considered included, groundwater, proposed drainage and reservoir inundation. These are not considered to pose a flood risk to the proposed development.

12.0 REFERENCES

1. Communities and Local Government (March 2012), *National Planning Policy Framework*
2. Communities and Local Government (March 2012), *Technical Guidance to the National Planning Policy Framework*
3. Hampshire County Council (2011) *Preliminary Flood Risk Assessment Report*
4. Hampshire County Council (July 2013), *Hampshire Local Flood Risk Management Strategy*
5. Environmental Agency (December 2009), *South East Hampshire Catchment Flood Management Plan*
6. Partnership for Urban South Hampshire (December 2007), *Strategic Flood Risk Assessment Final Report*
7. Communities and Local Government (Mar 2010), *Planning Policy Statement 25 – Development and Flood Risk.*
8. *British Geological society (2013), Geology of Britain Viewer*
9. BRE (2003) *Soakaway Design BRE Digest 365*

APPENDIX 1
Proposed Re-Development



Proposed Site Plan 1:500

Purbrook Park School Extensions, Internal Remodeling and External Works Purbrook Park School, Watlingtonville Purbrook Park School Trust

For Illustrative Purposes Only

This drawing is based upon information supplied by the client, the Topographical survey of the site, the Building Survey, the Condition survey, the Services investigation, the Archaeological survey, the Sub-ground Detection survey, the Ecological, Architectural or other technical surveys have been carried out. No consultation with the Planning and other Statutory Authorities has been carried out. Any areas shown will be subject to full design development and verification.



- Key**
- New Build
 - Remodel/ Refurbish
 - Existing
 - External Balcony/ bridge

- Proposed New Build GIAs**
- Block 'A' - 432m2 (Ground Floor) - 830m2 (First Floor and Mezzanine over Dining)
 - Block 'B' - 246m2 (Ground Floor) - 177m2 (First Floor)
 - Block 'C' - 69m2 (Ground Floor)
 - Block 'D' - no new build
 - Total New Build GIA - 1754m2
 - Covered Walkway (linking Entrance Block B) - 52m2
 - External Balcony (linking Maths Classroom) - 69m2
 - External Bridge - (linking Block B to Block D) - 26m2

Proposed Site Plan