

**SITE 375: 7 Cairo New Road**

**1) PROPOSED DEVELOPMENT**

<b>Site ID</b>	375
<b>Site Address</b>	7 Cairo New Road
<b>Site Area</b>	0.24 ha
<b>Current Use</b>	Church in former Factory building
<b>Allocated Use</b>	Residential redevelopment above community use
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The closest watercourse to the site is the River Wandle (culverted section), 350m to the south west of the site. The River Wandle is not assumed to pose any fluvial flood risk to the site. The site is located in Flood Zone 1.

**Flood risk from all other sources**

			<b>Limitations</b>
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



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**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

SITE 375: 7 Cairo New Road		
<b>Development Layout and Sequential Approach</b>	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
<b>Finished Floor Level</b>	Although the majority of the site is within Flood Zone 1, it is good practice to set finished floor levels a minimum of 300mm above ground level in order to reduce the risk of flooding from surface water, which is at high risk in this area. It is recommended that consideration is given to the flow of surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	
<b>Flood Resistance</b>	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
<b>Flow Routing</b>	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls under Critical Drainage Area (CDA) Group8_042, which has the highest number of properties at risk from surface water flooding in Croydon. The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment 39, which is located at the west part of the borough. The uFMFSW indicates that the site lies within an area of high risk of surface water flooding to the south west of the site. The majority of the site is at a very low risk of surface water flooding. The surrounding areas of Cairo New Road and Roman Way are shown to be at a high risk of surface water flooding.</p> <p>There is one historic record of surface water flooding held by Croydon Council in this location.</p>	
	<p><b>Indicative existing runoff rate:</b> 1.2 l/s (1 in 1 year), 4.5 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6

**SITE 375: 7 Cairo New Road**

	<b>Indicative Unit Costs</b> Green roofs ~ £90/m <sup>2</sup> . Filter strips £2-4/m <sup>2</sup> . Detention basin £15-50/m <sup>3</sup> . Permeable paving ~ £30-50/m <sup>2</sup> . Concrete storage tank £449-518/m <sup>3</sup> .	Section 10.4
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**SITE 393 : Whitgift Centre, North End**

**1) PROPOSED DEVELOPMENT**

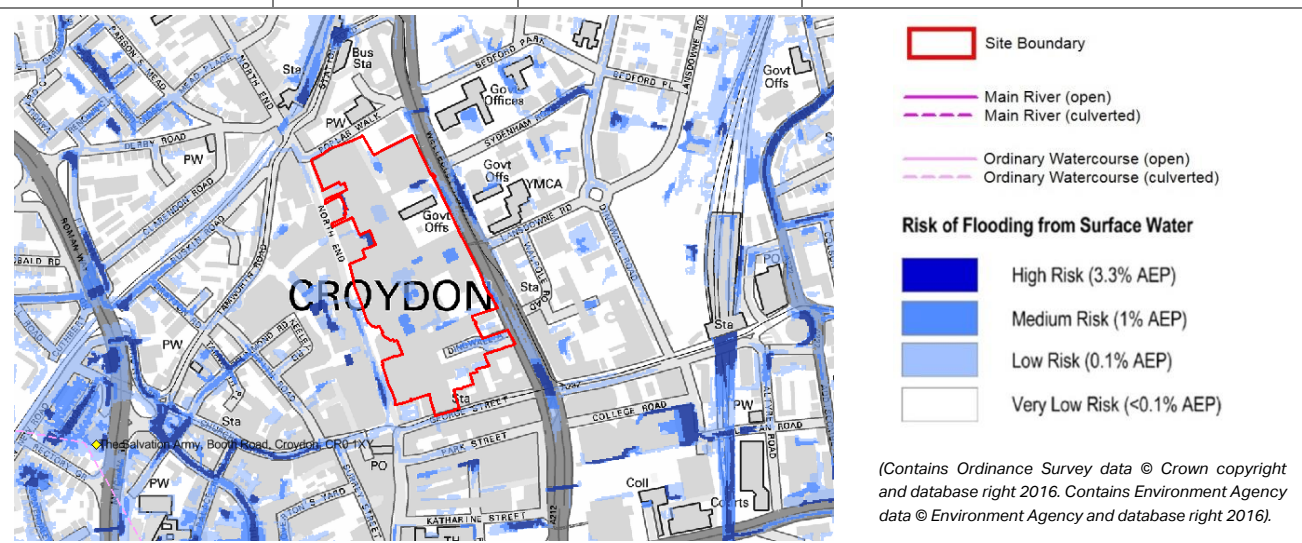
<b>Site ID</b>	393
<b>Site Address</b>	Whitgift Centre, North End
<b>Site Area</b>	6.98 ha
<b>Current Use</b>	Shopping Centre, four office towers and two multi-storey car parks
<b>Allocated Use</b>	Expansion of shopping centre, improved transport infrastructure, public realm and residential development
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located in Flood Zone 1. The site is located approximately 700m north east of the River Wandle (culverted section), which is designated as a Main River. The River Wandle is not assumed to pose any fluvial risk to the site.

Flood risk from all other sources		Limitations	
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.  The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	



**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	3	0	1	0	0

**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

<b>SITE 393 : Whitgift Centre, North End</b>		
<b>Development Layout and Sequential Approach</b>	<p>The proposed development is for mixed use. The More Vulnerable aspects of should be located in areas or lowest risk of surface water flooding, the Less Vulnerable development can be located on ground level. An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible, including setting a 300mm above ground level finished floor level to manage the surface water flood risk.</p>	Section 9.2
<b>Flood Resistance</b>	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
<b>Flood Resilience</b>	<p>Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
<b>Flow Routing</b>	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls under Critical Drainage Area (CDA) Group8_042, which has the highest number of properties at risk from surface water flooding in Croydon. The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment DC39, which is located at the west part of the borough. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding where there are discrete areas of high risk accross the site. The majority of the site is shown to be at a very low risk. There are three historic records of surface water flooding held by Croydon Council in this location and one historic record of sewer flooding.</p>	
	<p><b>Indicative existing runoff rate:</b> 35.9 l/s (1 in 1 year), 134.6l/s (1 in 100 year)  <b>Indicative Greenfield Runoff Rate:</b> 14.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Water attenuation techniques which should be considered include green roofs, as well as detention basins and ponds., as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6

**SITE 393 : Whitgift Centre, North End**

	<b>Indicative Unit Costs</b> Green roofs ~ £90/m <sup>2</sup> . Filter strips £2-4m <sup>2</sup> . Detention basin £15-50m <sup>3</sup> . Permeable paving ~ £30-50/m <sup>2</sup> . Concrete storage tank £449-518/m <sup>3</sup> .	Section 10.4
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**SITE 396 : Praise House, 145-149 London Road**

**1) PROPOSED DEVELOPMENT**

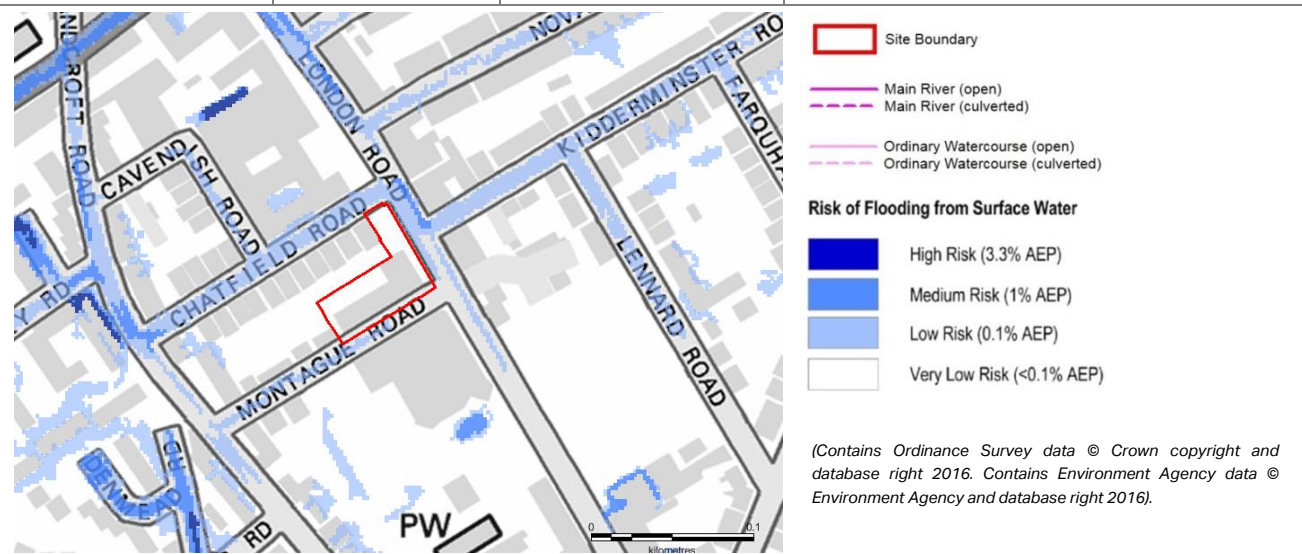
<b>Site ID</b>	396
<b>Site Address</b>	Praise House, 145-149 London Road
<b>Site Area</b>	0.25 ha
<b>Current Use</b>	Former office building of 4 floors currently with a community use with extension at rear last used as garage. Frontage used as tyre fitters.
<b>Allocated Use</b>	Redevelopment for mixed use residential and community use
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located in Flood Zone 1. The site is located approximately 850m north east of the River Wandle, which is designated as a Main River. The River Wandle is not assumed to pose any fluvial risk to the site.

Flood risk from all other sources		Limitations
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>Very Low Risk</b> Less than 1 in 1000 year (<0.1% annual probability)
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>High Risk</b> Potential for groundwater flooding to occur at the surface.
		The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
		The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	1	0	0	1 (TW Internal)

**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of groundwater flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

<b>SITE 396 : Praise House, 145-149 London Road</b>		
<b>Development Layout and Sequential Approach</b>	<p>There is one historic record of groundwater flooding held by Croydon Council within 100m of this site. Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Due to a high risk of groundwater flooding, it is recommended that Low Vulnerable basements are also not permitted at this site.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p>	Section 9.2
<b>Flood Resistance</b>	Where there may be a future risk of groundwater flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage groundwater and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by groundwater floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures.	Section 9.5
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site does not fall within a known Critical Drainage Area (CDA). The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment DC38, which is located at the north west part of the borough. The site is at a very low risk of surface water flooding, the surrounding areas are shown to be at a low risk of flooding such as Chatfield Road and London Road with discrete areas of medium surface water flood risk.</p> <p>There is one historic record of surface water flooding held by Croydon Council in this location.</p>	
	<p><b>Indicative existing runoff rate:</b> 1.2 l/s (1 in 1 year), 4.7 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Water attenuation techniques which should be considered, instead of infiltration techniques, include green roofs, as well as detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Filter strips £2-4m<sup>2</sup>.</p> <p>Detention basin £15-50m<sup>3</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4



**SITE 398 : Coombe Cross, 2-4 South End**

**1) PROPOSED DEVELOPMENT**

<b>Site ID</b>	398
<b>Site Address</b>	Coombe Cross, 2-4 South End
<b>Site Area</b>	0.26 ha
<b>Current Use</b>	4 storey office building
<b>Allocated Use</b>	Residential development
<b>Vulnerability</b>	More Vulnerable

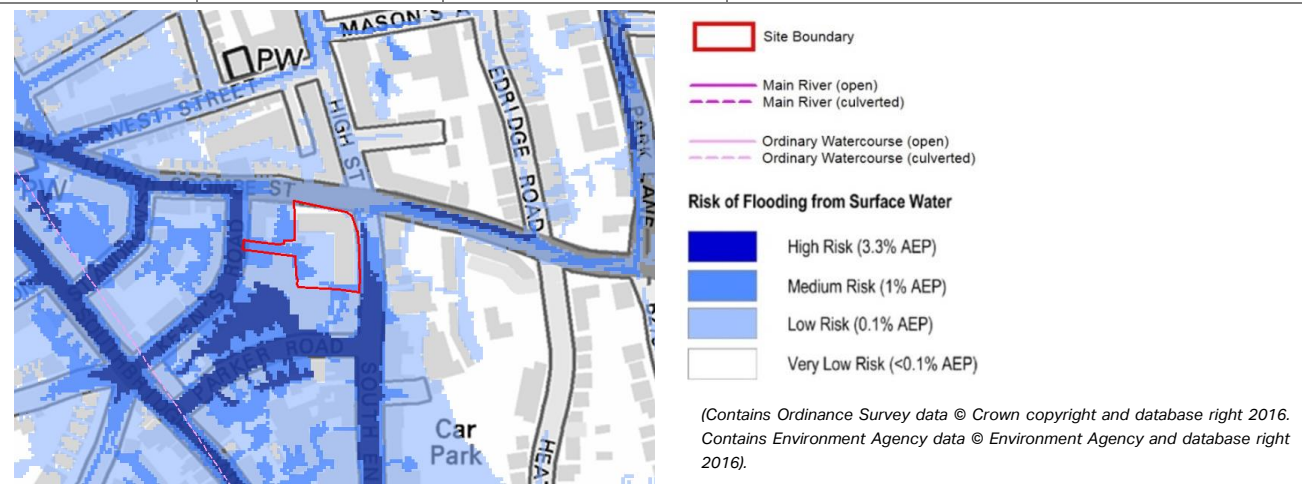
**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located in Flood Zone 1. The site is located approximately 150m to the south and west of an Ordinary Watercourse (culverted section).

It should be noted that ordinary watercourses have not have been included in the fluvial modelling of the River Wandle and therefore a fluvial flood risk from this watercourse may be present. As set out in Section 11.3.2 of the Level 1 SFRA, applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA. This should be carried out in line with industry standards and in agreement with the LLFA.

Flood risk from all other sources			Limitations
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

<b>SITE 398 : Coombe Cross, 2-4 South End</b>		
<b>Development Layout and Sequential Approach</b>	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible including setting a 300mm above ground level finished floor level to manage the surface water flood risk..	Section 9.2
<b>Finished Floor Levels</b>	Although the majority of the site is within Flood Zone 1, it is good practice to set finished floor levels a minimum of 300mm above ground level in order to reduce the risk of flooding from surface water, which is at high risk in this area. It is recommended that consideration is given to the flow of surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.	
<b>Flood Resistance</b>	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
<b>Flow Routing</b>	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls within the Critical Drainage Catchment (CDA) Group8_042, which has the highest number of properties at risk from surface water flooding in Croydon. The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment 39, which is located at the west part of the borough. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding to the western apex of the site. There are further areas of medium risk of surface water flooding to the west of the site. The surrounding area is generally an area of low to medium surface water flood risk. However, there are areas of high risk in regards to surface water flooding in areas such as Parker Road and South End. There are two historic records of surface water flooding held by Croydon Council in this location.</p>	
	<p><b>Indicative existing runoff rate:</b> 1.3 l/s (1 in 1 year), 5.0 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include soakaways, green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration tests should be carried out to confirm SUDS suitability.</p>	Section 10.3 and 10.9

## SITE 398 : Coombe Cross, 2-4 South End

	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Filter strips £2-4m<sup>2</sup>.</p> <p>Detention basin £15-50m<sup>3</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4

**SITE 403 : Roman House, 13-27 Grant Road**

**1) PROPOSED DEVELOPMENT**

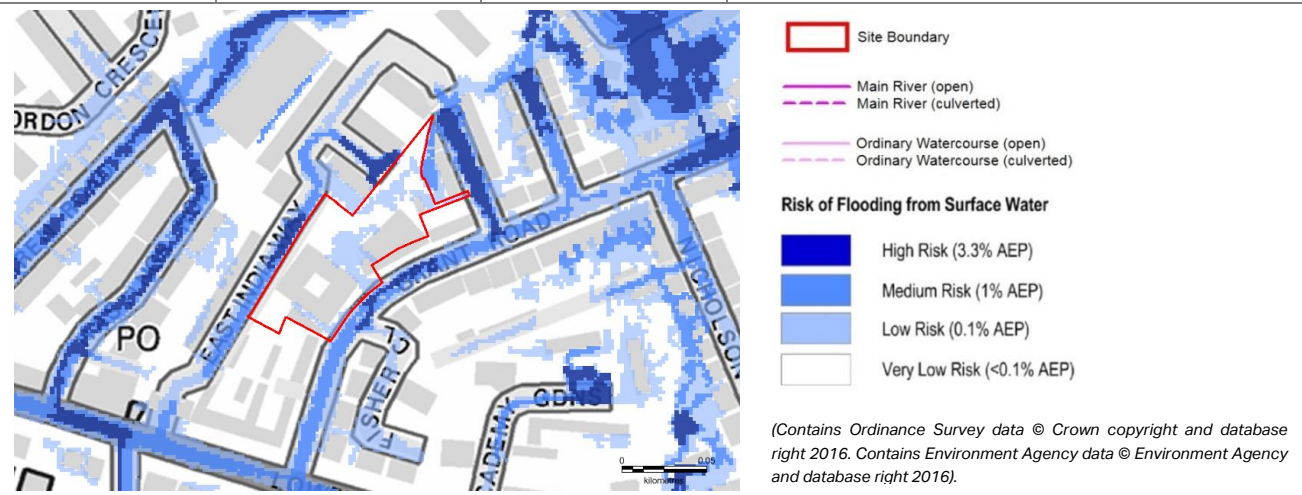
<b>Site ID</b>	403
<b>Site Address</b>	Roman House, 13-27 Grant Road
<b>Site Area</b>	0.56 ha
<b>Current Use</b>	Office building, stores & parking areas
<b>Allocated Use</b>	Redevelopment or change of use to residential
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located in Flood Zone 1 and approximately 1.2km south of an Ordinary Watercourse. It should be noted that ordinary watercourses have not have been included in the fluvial modelling of the River Wandle and therefore a fluvial flood risk from this watercourse may be present. As set out in Section 11.3.2 of the Level 1 SFRA, applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA. This should be carried out in line with industry standards and in agreement with the LLFA.

Flood risk from all other sources			Limitations
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Low Risk</b> Limited potential for groundwater flooding to occur	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	0	1	0	0

**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

<b>SITE 403 : Roman House, 13-27 Grant Road</b>		
<b>Development Layout and Sequential Approach</b>	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible including setting a 300mm above ground level finished floor level to manage the surface water flood risk.	Section 9.2
<b>Flood Resistance</b>	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
<b>Flow Routing</b>	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls within a known Critical Drainage Area (CDA) Group8_046, which is located in the north of the Borough. The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment 22, which is located at the north part of the borough. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding at the site boundaries. The majority of the site is shown as being at very low or low risk of surface water flooding. The surrounding areas such as Grant Road Way and East India Way are shown to be at a high risk of surface water flooding.</p> <p>There is one historic record of surface water flooding held by Croydon Council in this location.</p>	
	<p><b>Indicative existing runoff rate:</b> 2.9 l/s (1 in 1 year), 10.8 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 4 identifies that infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Water attenuation techniques which should be considered include green roofs, as well as detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Filter strips £2-4/m<sup>2</sup>.</p> <p>Detention basin £15-50/m<sup>3</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4



**SITE 405: Capella Court & Royal Oak Centre, 725 Brighton Road**

**1) PROPOSED DEVELOPMENT**

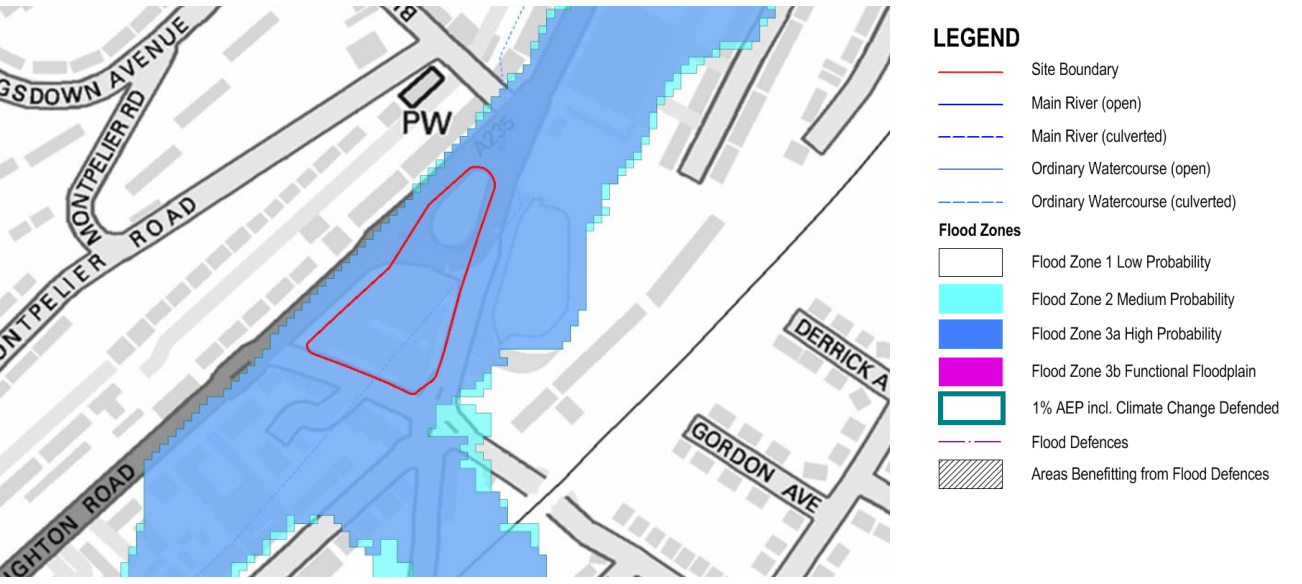
<b>Site ID</b>	405
<b>Site Address</b>	Capella Court & Royal Oak Centre, 725 Brighton Road
<b>Site Area</b>	0.73 ha
<b>Current Use</b>	A 5 storey office in the middle of a roundabout and a single storey block on the south side of the roundabout connected by a footbridge to the main building and group of vacant single storey shops at rear of Capella Court
<b>Allocated Use</b>	Residential development
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is intersected by an Ordinary Watercourse (culverted section). The site is entirely located in Flood Zone 3a.

<i>Proportion of potential development site within Flood Zone</i>	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	<b>0%</b>	<b>100%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>



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<b>Flood risk from all other sources</b>			<b>Limitations</b>
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.  The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	

<b>Historic records of flooding</b>						
<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2 (TW External)</b>



## SITE 405: Capella Court & Royal Oak Centre, 725 Brighton Road

### 3) LEVEL 2 ASSESSMENT

The fluvial hazard, depth and velocity outputs used in the Level 2 SFRA assessment for the River Wandle do not cover the site.

### 4) RECOMMENDATIONS AND POLICIES

<b>Development Layout and Sequential Approach</b>	<p>The site is located entirely within Flood Zone 3a. The proposed development is for residential use. More Vulnerable development should be located in areas of low flood risk; however hazard maps are not available for this site.</p> <p>An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible including setting a 300mm above ground level finished floor level to manage the surface water flood risk..</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
<b>Finished Floor Levels</b>	<p>For More Vulnerable development, a minimum freeboard of 300mm is required above the 1% AEP (1 in 100 year) peak fluvial flood level.</p> <p>In Flood Zone 3, all new sleeping accommodation should be restricted to the first floor or above. Internal ground floors below this level could however be occupied by the Less Vulnerable garages, non-sleeping residential rooms (e.g. kitchen, study, lounge) or car parking.</p> <p>The site is at high risk of surface water flooding and it is considered that the finished floor level requirement for fluvial flood levels would also protect the property from a 3.3% AEP (1 in 30 year) surface water flood event.</p>	Section 9.3
<b>Flood Resistance</b>	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
<b>Safe Access/Egress</b>	<p>Access/Egress to the site is provided via Montpellier Road to the west of the proposed site.</p>	Section 9.7
<b>Flow Routing</b>	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
<b>Flood Warning and Evacuation Plan</b>	<p>A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles.</p> <p><b>Flood Warning Areas</b></p> <p>The local area is not covered by an Environment Agency Flood Warning Area.</p> <p><b>Emergency Rest Centres</b></p> <p>The closest designated emergency rest centre for this site is United Reformed Church on Sanderstead Hill.</p>	Section 9.14
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls under a known Critical Drainage Area (CDA), Group8_041, to the west of the Borough. The potential development must not increase flood risk to other areas in the CDA. The site is within Drainage Catchment 39, which is located at the west part of the borough.</p> <p>The uFMfSW indicates that the site lies within an area of high risk of surface water flooding mainly at the north part of the site, and there are areas of high risk of surface water flooding surrounding the site.</p> <p><b>Indicative existing runoff rate:</b> 4.1l/s (1 in 1 year), 15.4 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Section 10

**SITE 405: Capella Court & Royal Oak Centre, 725 Brighton Road**

	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include soakaways, green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration tests should be carried out to confirm SUDS suitability.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Filter strips £2-4m<sup>2</sup>.</p> <p>Detention basin £15-50m<sup>3</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4

**5) EXCEPTION TEST CONSIDERATIONS**

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The proposed development is for residential use (More Vulnerable). The site is intersected by a culverted Ordinary Watercourse. It should be noted that ordinary watercourses have not have been included in the fluvial modelling of the River Wandle and applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA.

Finished floor levels must be raised accordingly and sleeping accommodation restricted the first floor or above. It is recommended that basements are not considered at this site. Depending on the modelled flood depth, flood resistant and resilient measures should be employed to mitigate the potential impacts of flooding. SuDS should be incorporated into the building design in order to reduce the risk of increasing flood risk elsewhere. There is potential that floodwaters will limit dry routes out of the local area, therefore it is necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding.

Therefore, on the basis that these mitigation measures are in place, it is likely that this site would pass the Exception Test.

**SITE 409: Beech House, 840 Brighton Road**

**1) PROPOSED DEVELOPMENT**

<b>Site ID</b>	409
<b>Site Address</b>	Beech House, 840 Brighton Road
<b>Site Area</b>	0.13 ha
<b>Current Use</b>	4 storey office building
<b>Allocated Use</b>	Conversion of the office building to residential uses.
<b>Vulnerability</b>	More Vulnerable

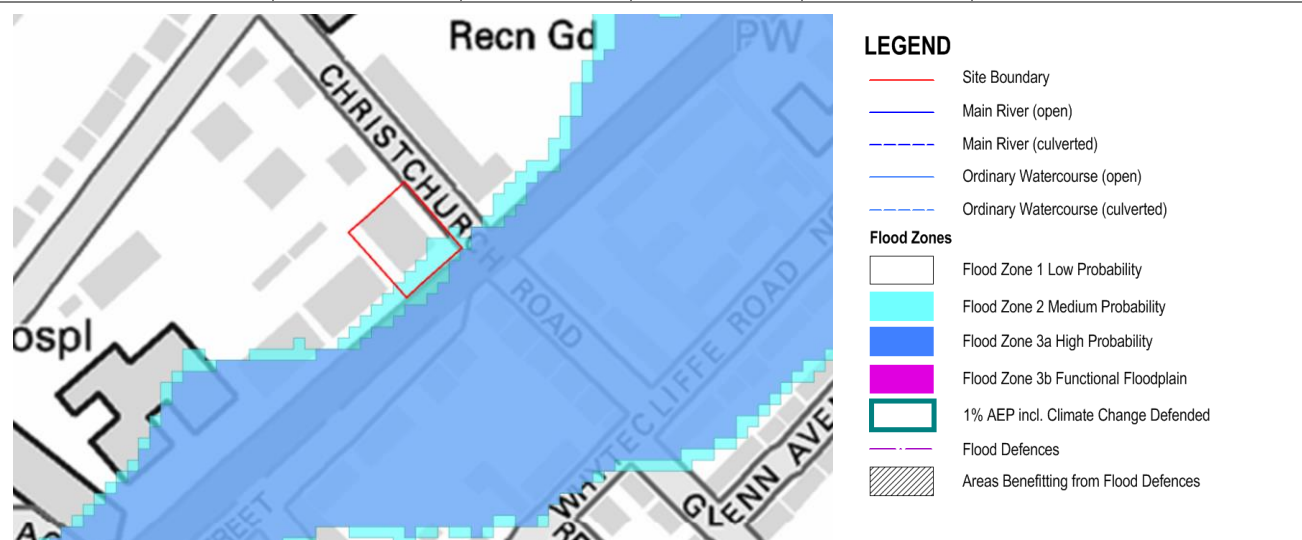
**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located approximately 150m north of an Ordinary Watercourse (culverted section). The site is predominantly located in Flood Zone 2.

It should be noted that ordinary watercourses have not been included in the fluvial modelling of the River Wandle and therefore a fluvial flood risk from this watercourse may be present. As set out in Section 11.3.2 of the Level 1 SFRA, applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA. This should be carried out in line with industry standards and in agreement with the LLFA.

<i>Proportion of potential development site within Flood Zone</i>	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	<b>0%</b>	<b>0%</b>	<b>22%</b>	<b>78%</b>	<b>0%</b>



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**Flood risk from all other sources** | **Limitations**

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	

**Historic records of flooding**

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2 (TW External)</b>

## SITE 409: Beech House, 840 Brighton Road

### 3) RECOMMENDATIONS AND POLICIES

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 2 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

<b>Development Layout and Sequential Approach</b>	<p>The majority of the site lies within Flood Zone 1. A smaller part of the site is located within Flood Zone 2. The proposed development is for residential use. This More Vulnerable development should be preferably located in Flood Zone 1, covering the largest part of the site. If it is essential to build on Flood Zone 2 then all residential uses should incorporate suitable flood mitigation such as raised finished floor levels.</p> <p>An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p>	Section 9.2
<b>Finished Floor Levels</b>	<p>For More Vulnerable development, a minimum freeboard of 300mm is required above the 1% AEP (1 in 100 year) including climate change peak fluvial flood level. The peak flood water level should be derived for the immediate vicinity of the site as part of a site-specific FRA.</p> <p>The site is at high risk of surface water flooding and it is considered that the finished floor level requirement for fluvial flood levels would also protect the property from a 3.3% AEP (1 in 30 year) surface water flood event.</p>	Section 9.3
<b>Flood Resistance</b>	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
<b>Safe Access/Egress</b>	<p>Access/Egress to the site is provided via Edgehill Road to the west of the site.</p>	Section 9.7
<b>Flow Routing</b>	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
<b>Flood Warning and Evacuation Plan</b>	<p>A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles.</p> <p><b>Flood Warning Areas</b></p> <p>The local area is not covered by the Environment Agency Flood Warning Areas.</p> <p><b>Emergency Rest Centres</b></p> <p>The closest designated emergency rest centre for this site is United Reformed Church on Sanderstead Hill.</p>	Section 9.14
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls under Critical Drainage Area (CDA) Group8_041, The site falls under a known Critical Drainage Area (CDA), Group8_041, to the west of the Borough. The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment 39, which is located at the west part of the borough. The uFMFSW indicates that the site lies within an area of high risk of surface water flooding mainly at the eastern part of the site and there are pathways of high risk of surface water flooding surrounding the site from the south, the north and the east.</p> <p>There are two historic surface water flooding records and two Thames Water (External) records of flooding.</p>	
	<p><b>Indicative existing runoff rate:</b> 0.8 l/s (1 in 1 year), 2.8 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Section 10

**SITE 409: Beech House, 840 Brighton Road**

	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ2 (outer protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include soakaways, green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration tests should be carried out to confirm SUDS suitability.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Filter strips £2-4/m<sup>2</sup>.</p> <p>Detention basin £15-50/m<sup>3</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4

**SITE 411: Palmerston House, 814 Brighton Road**

**1) PROPOSED DEVELOPMENT**

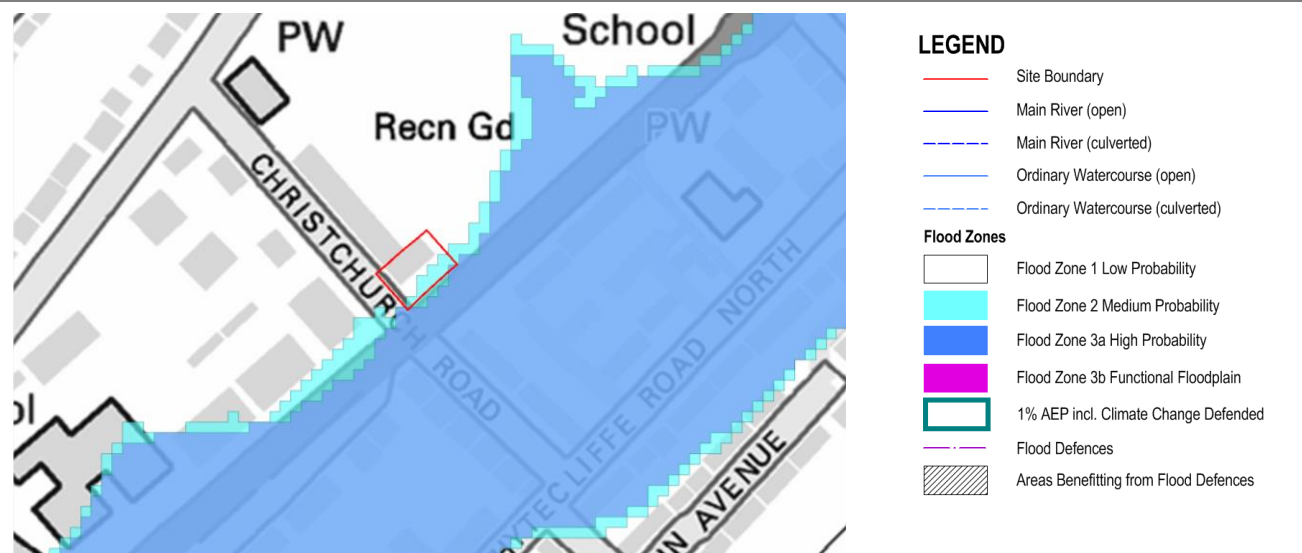
<b>Site ID</b>	411
<b>Site Address</b>	Palmerston House, 814 Brighton Road
<b>Site Area</b>	0.07 ha
<b>Current Use</b>	Office Building
<b>Allocated Use</b>	Residential redevelopment
<b>Vulnerability</b>	More Vulnerable

**2) SUMMARY OF LEVEL 1 FLOOD RISK**

**Flood risk from rivers**

The site is located approximately 150m north of an Ordinary Watercourse (culverted section). The site is predominantly located in Flood Zone 1, however there are areas of the site which are located in Flood Zone 2 and adjacent to the boundary of Flood Zone 3a. It should be noted that ordinary watercourses have not have been included in the fluvial modelling of the River Wandle and therefore a fluvial flood risk from this watercourse may be present. As set out in Section 11.3.2 of the Level 1 SFRA, applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA. This should be carried out in line with industry standards and in agreement with the LLFA.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	<b>0%</b>	<b>0%</b>	<b>27%</b>	<b>73%</b>	<b>0%</b>



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Flood risk from all other sources			Limitations
Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (uFMfSW)	<b>Medium Risk</b> 1 in 100 year (1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

**Historic records of flooding**

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2 (TW External)</b>



## SITE 411: Palmerston House, 814 Brighton Road

### 3) RECOMMENDATIONS AND POLICIES

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 2 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

<b>Development Layout and Sequential Approach</b>	<p>The majority of the site lies within Flood Zone 1. A smaller part of the site is located within Flood Zone 2 and a minor part lies on the boundary of Flood Zone 3a. The proposed development is for residential use. This More Vulnerable development should be preferably located in Flood Zone 1, covering the largest part of the site and avoid the boundary with Flood Zone 3a.</p> <p>An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p>	Section 9.2
<b>Finished Floor Levels</b>	<p>For More Vulnerable development, a minimum freeboard of 300mm is required above the 1% AEP (1 in 100 year) including climate change peak fluvial flood level. The peak flood water level should be derived for the immediate vicinity of the site as part of a site-specific FRA. In Flood Zone 2, all new sleeping accommodation should be restricted to the first floor or above. Internal ground floors below this level could however be occupied by the Less Vulnerable garages, non-sleeping residential rooms (e.g. kitchen, study, lounge) or car parking.</p>	Section 9.3
<b>Flood Resistance</b>	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
<b>Safe Access/Egress</b>	<p>Access/Egress to the site is provided via Edgehill Road to the west of the site</p>	Section 9.7
<b>Flow Routing</b>	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
<b>Flood Warning and Evacuation Plan</b>	<p>A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles.</p> <p><b>Flood Warning Areas</b></p> <p>The local area is not covered by the Environment Agency Flood Warning Areas.</p> <p><b>Emergency Rest Centres</b></p> <p>The closest designated emergency rest centre for this site is United Reformed Church on Sanderstead Hill.</p>	Section 9.14
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site falls under Critical Drainage Area (CDA) Group8_041, which is located in the west of the borough. The potential development must not increase flood risk to other areas in the CDA. The site is within Drainage Catchment 39, which is located at the west part of the borough.</p> <p>The uFMfSW indicates that the site lies within an area of medium risk of surface water flooding. There are pathways of high risk of surface water flooding to the east and north of the site. There are two historic records of surface water flooding held by Croydon Council in this location.</p>	Section 10

**SITE 411: Palmerston House, 814 Brighton Road**

	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p><b>Groundwater Source Protection Zones (SPZs)</b></p> <p>The site is within a SPZ2 (outer protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include soakaways, green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration tests should be carried out on site to confirm SUDS suitability.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Filter strips £2-4/m<sup>2</sup>.</p> <p>Detention basin £15-50/m<sup>3</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4

## SITE 416: Challenge House, 618 Mitcham Road

### 1) PROPOSED DEVELOPMENT

<b>Site ID</b>	416
<b>Site Address</b>	Challenge House, 618 Mitcham Road
<b>Site Area</b>	0.81 ha
<b>Current Use</b>	3-storey office building
<b>Allocated Use</b>	Residential redevelopment or conversion. Conversion would need to adhere to Local Plan and London Plan Standards to improve the sustainability of the development.
<b>Vulnerability</b>	More Vulnerable

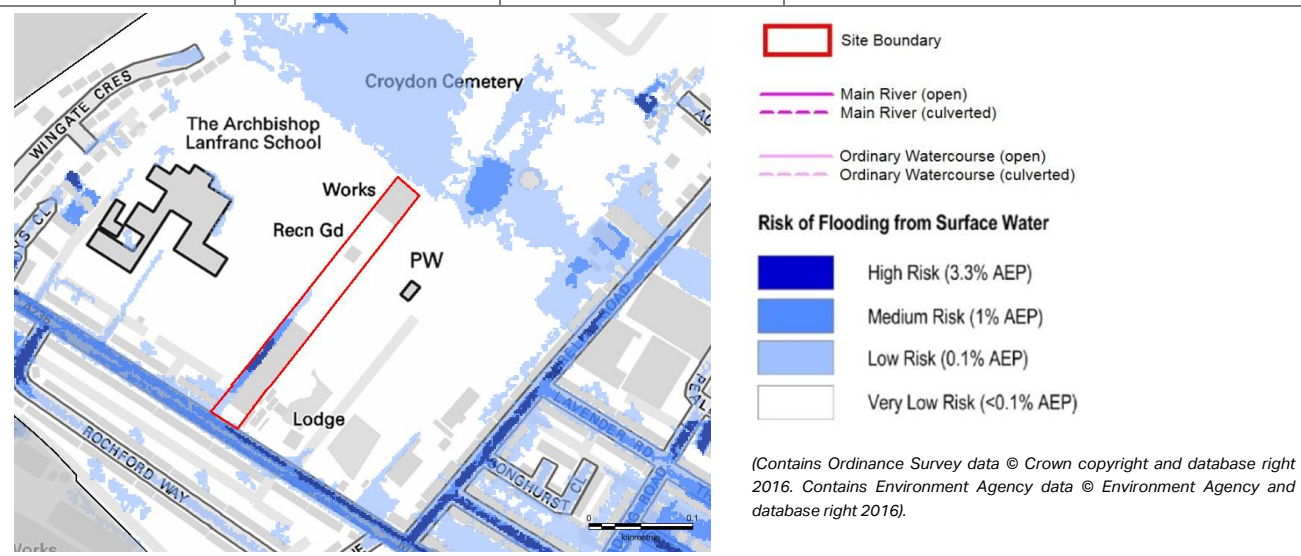
### 2) SUMMARY OF LEVEL 1 FLOOD RISK

#### Flood risk from rivers

The closest watercourse to the site is the River Wandle, 1.8km to the south east of the site. The ordinary watercourse is assumed not to pose any fluvial risk to the site. The site is located in Flood Zone 1.

#### Flood risk from all other sources

			<b>Limitations</b>
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Medium Risk</b> Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



#### Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

<b>SITE 416: Challenge House, 618 Mitcham Road</b>		
<b>Development Layout and Sequential Approach</b>	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
<b>Flood Resistance</b>	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
<b>Flow Routing</b>	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b></p> <p>The site does not fall within a known Critical Drainage Area (CDA). The potential development must not increase flood risk to other areas in the CDA.</p> <p>The site is within Drainage Catchment 38, which is located at the west part of the borough. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding at the south west of the site. The majority of the site is within an area of very low risk from surface water flooding. The road network to the south and west of the site are shown to be at a high risk of surface water flooding (Mitcham Road and Aurelia Road).</p>	
	<p><b>Indicative existing runoff rate:</b> 3.9 l/s (1 in 1 year), 14.8 l/s (1 in 100 year)</p> <p><b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b></p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p>The area in the vicinity of the site has been a landfill site in the past.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b></p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b></p> <p>Green roofs ~ £90/m<sup>2</sup>.</p> <p>Filter strips £2-4m<sup>2</sup>.</p> <p>Detention basin £15-50m<sup>3</sup>.</p> <p>Permeable paving ~ £30-50/m<sup>2</sup>.</p> <p>Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4

## SITE 420: 87-91 Biggin Hill

### 1) PROPOSED DEVELOPMENT

<b>Site ID</b>	420
<b>Site Address</b>	87-91 Biggin Hill
<b>Site Area</b>	0.30 ha
<b>Current Use</b>	Derelict former industrial warehouse units
<b>Allocated Use</b>	Residential development
<b>Vulnerability</b>	More Vulnerable

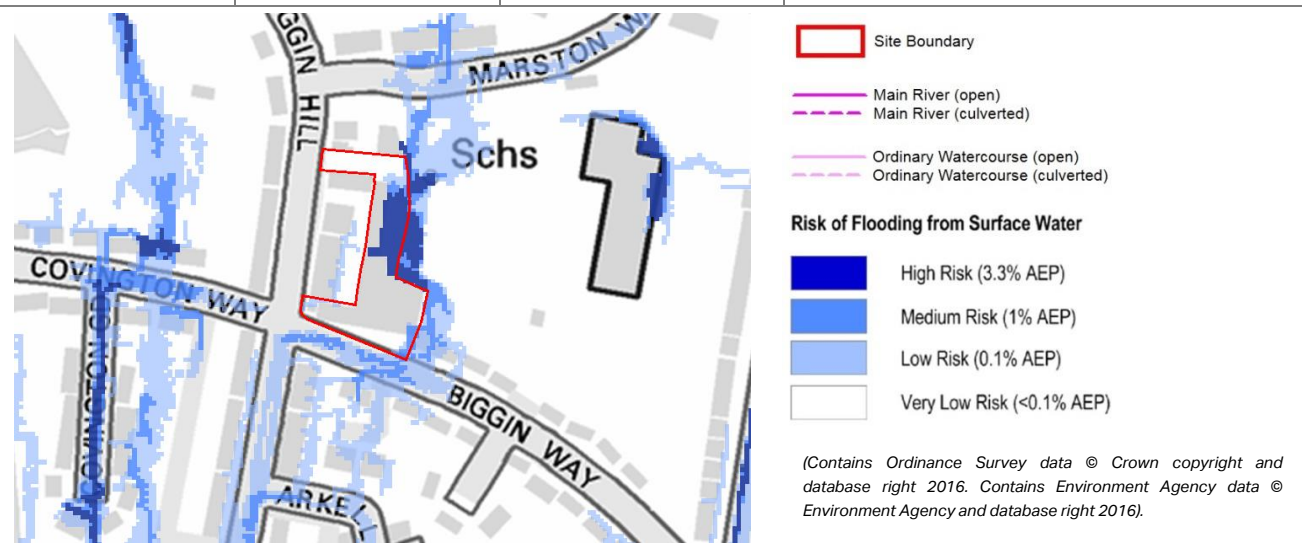
### 2) SUMMARY OF LEVEL 1 FLOOD RISK

#### Flood risk from rivers

The closest watercourse to the site is Norbury Brook approximately 1km to the south west of the site. Norbury Brook is assumed not to pose any fluvial risk to the site. The site is located in Flood Zone 1.

#### Flood risk from all other sources

Flood risk from all other sources		Limitations	
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	<b>High Risk</b> 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	<b>Low Risk</b> Limited potential for groundwater flooding to occur.	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



#### Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	2 (TW External)

### 3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) "it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk" and
- 2) "demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The following information and recommendations are therefore provided for consideration.

SITE 420: 87-91 Biggin Hill		
<b>Development Layout and Sequential Approach</b>	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.	Section 9.2
<b>Flood Resistance</b>	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
<b>Flood Resilience</b>	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
<b>Flow Routing</b>	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
<b>Surface Water Management</b>	<p><b>Current risk of flooding</b> The site does not fall within a known Critical Drainage Area (CDA). The potential development must not increase flood risk to other areas in the CDA. The site is within Drainage Catchment 22, which is located at the west part of the borough. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding to the centre of the site. The majority of the site is at a very low risk of surface water flooding. There is also a surface water flow path to the east of the site.</p>	
	<p><b>Indicative existing runoff rate:</b> 1.4 l/s (1 in 1 year), 5.3 l/s (1 in 100 year) <b>Indicative Greenfield Runoff Rate:</b> 5.0 l/s</p>	Level 2 Appendix B
	<p><b>SuDS Suitability</b> Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially unsuitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Water attenuation techniques which should be considered include green roofs, as well as detention basins and ponds and permeable surfacing with tanked systems..</p>	Section 10.3 and 10.9
	<p><b>Drainage Strategy and Approvals</b> Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p><b>Indicative Unit Costs</b> Green roofs ~ £90/m<sup>2</sup>. Filter strips £2-4m<sup>2</sup>. Detention basin £15-50m<sup>3</sup>. Permeable paving ~ £30-50/m<sup>2</sup>. Concrete storage tank £449-518/m<sup>3</sup>.</p>	Section 10.4