

SITE ASSESSMENT - John Lewis (North West)

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| Address: Horse Fair, Kingston, KT1 1TE | Area: 0.69 Ha |
| | Site Reference: SA 029 |

| Current Use | Proposed Use |
|-------------|--|
| Commercial | Mixed Use (Residential, Commercial) - 93 residential units |

| Current Vulnerability Classification | Proposed Vulnerability Classification |
|--------------------------------------|---------------------------------------|
| Less Vulnerable | More Vulnerable |

| Current Risk Summary | | | | | |
|----------------------|------|-----------|-------------|-----|-----------|
| Fluvial / Tidal | | | Groundwater | | |
| FZ2 | 81.5 | % of Site | <25 | 0 | % of Site |
| FZ3a | 23.6 | % of Site | 25-50 | 0 | % of Site |
| FZ3b | 3.7 | % of Site | 50-75 | 100 | % of Site |
| Surface Water | | | >75 | 0 | % of Site |
| 1 in 30 | 0 | % of Site | Artificial | | |
| 1 in 100 | 0 | % of Site | Reservoir | Y | At risk? |
| 1 in 1000 | 0.2 | % of Site | Canal | N | At risk? |
| Sewer Flooding | | | Town Centre | | |
| No. Incidents | 65 | | Y/N | | Y |

| Flood Defences |
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| This site is not in an area benefitting from flood defences. |
| Flood Warning Area |
| The EA Flood Warning Service is available at this site. |

FLUVIAL / TIDAL

| Risk Assessment (Defended) | | | | |
|----------------------------|--------|--------|----------|-------|
| Parameter | FZ3b | FZ3a | *FZ3a+CC | Units |
| Speed of inundation | N/D | N/D | N/D | Hrs |
| Min. Depth | 0.241 | 0.0093 | 0.1924 | m |
| Max. Depth | 0.7709 | 1.3963 | 2.6923 | m |
| Max. Velocity | 0 | 0.2463 | 0.7293 | m/s |
| Max Flood Level | 6.1519 | 7.0492 | 9.5366 | m AOD |
| Max Ground Level | 10.67 | 10.67 | 10.67 | m AOD |
| Min Ground Level | 4.96 | 4.96 | 4.96 | m AOD |
| Max Flood Hazard | 1.2043 | 1.8291 | 3.9563 | N/A |
| Duration of Flood | N/D | N/D | N/D | Hrs |

| Description of Flood Mechanism |
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| <ul style="list-style-type: none"> The site is at risk of flooding from the River Thames, immediately west of the site. The predicted flood risk extent for climate change scenario for the River Thames covers most of the site area other than a small area in the south east section of the site. Climate change is predicted to increase the flood extent, as well as the flood depth, hazard, and velocity. In the undefended scenario, flood extent, depth, velocity and hazard is increased in the 1 in 100 year flood event. <p>*Note: EA are due to update River Thames model*</p> |

| Site Access / Egress |
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| <ul style="list-style-type: none"> Safe access / egress routes should be identified (see SW section). Safe refuge areas must be provided on site to account for the predicted impact of climate change on the site. |

| Mitigation / FRA Requirements |
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| <ul style="list-style-type: none"> Only water compatible or essential uses (subject to the Exception Test) are permitted in FZ3b (the western edge of the site). There can be no increase in residential units in FZ3b. Development in this area which is located above the design flood level is still designated as functional floodplain. Self-contained basement dwellings and bedrooms are not permitted in FZ2 (the majority of the site). See SFRA Level 2 Report mitigation requirement number 4.10 for additional basement stipulations. A FRA must be submitted as part of a planning application. Include appropriate flood resistance or resilience measures to address predicted flood depths. See SFRA Level 2 Report mitigation requirement numbers 4.2, 4.3, 4.4, 4.5 and 4.6 for further development stipulations. Develop a Flood Emergency and Evacuation Plan for the site. Site users should be signed up to EA's Flood Warning Service. |

* The +35% Climate Change Allowance event (central allowance) is reviewed

| Risk Assessment (Undefended) | | | |
|------------------------------|--------|----------|-------|
| Parameter | FZ3a | *FZ3a+CC | Units |
| Speed of inundation | N/D | N/D | Hrs |
| Min. Depth | 0.0009 | N/D | m |
| Max. Depth | 1.9359 | N/D | m |
| Max. Velocity | 0.3421 | N/D | m/s |
| Max. Hazard | 2.3159 | N/D | N/A |
| Duration of Flood | N/D | N/D | Hrs |

Figure 1 - Fluvial Flood Depth Map

Figure 2 - Fluvial Flood Hazard Map

SURFACE WATER

| Risk Assessment | | | | |
|-----------------|---------|----------|-----------|-------|
| Parameter | 1 in 30 | 1 in 100 | 1 in 1000 | Units |
| Min. Depth | 0 | 0 | 0.00-0.15 | m |
| Max. Depth | 0 | 0 | 0.60-0.90 | m |
| Max. Velocity | 0 | 0 | 1.00-2.00 | m/s |
| Max. Hazard | 0 | 0 | 1.25-2.00 | N/A |

| Site Access / Egress |
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| Safe egress routes should be directed towards Horse Fair to the south east of the site where there is a lower risk of flooding. |

| Mitigation - Flood Risk Requirements |
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| <ul style="list-style-type: none"> Development should be directed away from the western edge of the site. See SFRA - Level 2 Report mitigation requirement numbers 4.2, 4.4, 4.5 and 4.6 for further development stipulations. |

| Mitigation - Surface Water Drainage |
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| <ul style="list-style-type: none"> A Kingston SuDS Proforma must be submitted with the planning application. Developments should apply the Sustainable Drainage Hierarchy set out in Policy SI13 of the London Plan. Ground investigations are required to confirm whether infiltration based SuDS are suitable. |

*The 1 in 1000 annual probability extent represents the potential climate change adjusted impact of current risk

| Description of Flood Mechanism |
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| <ul style="list-style-type: none"> The site is currently at low risk of surface water flooding. Vicarage Road to the north of the site is predicted to be at risk from surface water flooding in the 1 in 1000 year event. Climate change is predicted to increase the flood extent, velocity, depth, and hazard. |

Figure 3 - RoFSW Flood Depth Map

Figure 4 - RoFSW Flood Hazard Map



SITE ASSESSMENT - John Lewis (North West)

| SEWER | GROUNDWATER | ARTIFICIAL |
|---|--|--|
| Risk Assessment | Risk Assessment | Risk Assessment |
| <ul style="list-style-type: none"> The site falls within a postcode area where there are 65 reported flood incidents from sewer flooding. The site is served by separate surface water and foul sewer networks. | <ul style="list-style-type: none"> The site is classified as having >=50% <75% susceptibility to groundwater flooding. The site is underlain by London Clay bedrock geology. | <ul style="list-style-type: none"> This site is at risk of flooding from a number of reservoirs including the Barwell Court Lake, Bourne Ditch, Chertsey Settling, Hampton (Distributing, Grand Junction, Stain Hill and Sunnyside), Island Barn, King George VI, Queen Elizabeth II, Queen Mother, Staines (North and South), Walton (Bessborough and Knight), and Wraysbury. The reservoir extent map predicts that if any of these reservoirs breach on a wet day, the site will be at high-risk of flooding. |
| Mitigation Requirements | Mitigation Requirements | Mitigation Requirements |
| <p>Figure 5 - Thames Water Sewer Flood Map</p> <ul style="list-style-type: none"> Applicant must consult with TWUL to confirm if the development site has historically flooded. TWUL must agree to any proposed sewer connections. Where historic flooding has occurred, the applicant must show how this risk will be managed for the lifetime of the development. | <p>Figure 6 - Areas Susceptible to Groundwater Flooding Map</p> <ul style="list-style-type: none"> Applicant should carry out a screening study (as a minimum) to establish if there are any subterranean flood risk issues that may require further investigation. If there is a potential level of impact, mitigation actions must be proposed. Must be prepared by a chartered professional or specialist. | <p>Figure 7 - Outline Reservoir Flood Map</p> <ul style="list-style-type: none"> Propose appropriate and proportionate risk management measures. A suitable emergency response plan should be put in place, including an emergency warning system in the event of a reservoir flooding incident. Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan. |

PLANNING CONSIDERATIONS

Safety of Development

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| <p>A. Can the development be future proofed for climate change considerations?</p> <ul style="list-style-type: none"> Yes. See SFRA - Level 2 Report mitigation requirement number 4.3 and 4.4 for the required finished floor levels and flood resistant / resilient building stipulations. <p>B. Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?</p> <ul style="list-style-type: none"> Yes. The development must use surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and / or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological / biodiversity benefits as per London Plan Policy SI 13. See SFRA - Level 2 Report mitigation requirement number 4.5 for compensatory flood storage stipulations, and number 4.6 for voids mitigation specification. <p>C. What is the cumulative impact of the development land use change and will flood risk increase?</p> <ul style="list-style-type: none"> The development land use is changing from the 'Less Vulnerable' to the 'More Vulnerable' classification as residential uses have been proposed as well as commercial use. The site is already covered by impermeable surfaces, therefore flood risk is likely to be similar. <p>D. How can the development reduce risk overall?</p> <ul style="list-style-type: none"> Directing development away from the western edge of the site. Include SuDS to manage surface water runoff and reduce run-off rates to comply with Policy DM 4 in Kingston's Core Strategy. By complying with SFRA - Level 2 Report mitigation requirement numbers 4.2, 4.3, 4.4, 4.5 and 4.6. <p>E. Will development require a flood risk permit/watercourse consent?</p> <ul style="list-style-type: none"> Yes. See SFRA - Level 2 Report mitigation requirement number 4.8 for Main River stipulations. <p>F. Is the Exception Test required?</p> <ul style="list-style-type: none"> No 'Less', 'More' or 'Highly Vulnerable' development is permitted along the western edges in Flood Zone 3b. There can be no increase in residential units in Flood Zone 3b. The Exception Test is required for 'More Vulnerable' development in Flood Zone 3a (the northern and western edges of the site). This can be passed by making the site safe throughout its lifetime without increasing flood risk elsewhere (see questions A, B, and C). The site could also reduce flood risk overall with appropriate SuDS and flood storage compensation measures implemented (see Mitigation - Surface Water Drainage and Mitigation - Flood Risk Requirements boxes). <p>G. What are the delivery challenges in developing at this site in terms of passing the Exception Test?</p> <ul style="list-style-type: none"> The site is within 8m of the River Thames, therefore no encroachment of development towards the main river is allowed as this may lead to a potential increase in flood risk, and the site would not pass the Exception Test (see mitigation requirement 4.8). Given the high flood level expected on the site, significant floodplain compensation and voids will be required. Due to the high flood levels predicted for the 1 in 100 year + CC event, achieving the required finished floor levels may not be feasible (see mitigation requirement 4.3). The site should be explored further to determine whether the proposed use can be delivered on site, given the constraint of functional floodplain. |
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