

## Woolwich OSD East

| Summary Information    |                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------|
| Site Reference         | P4-W8                                                                                                            |
| Address                | Woolwich Elizabeth Line station, bounded by Plumstead, Road, Arsenal Way and Cornwallis Road, Woolwich, SE18 6FZ |
| Area (ha)              | 1.18                                                                                                             |
| Current Use            | Currently used as Crossrail works site and vent shaft to Elizabeth Line.                                         |
| Current Vulnerability  | Less Vulnerable                                                                                                  |
| Proposed Use           | Residential-led mix-use.                                                                                         |
| Proposed Vulnerability | More Vulnerable                                                                                                  |

| Current Risk Summary                                                                                                                            |       |           |                                                         |       |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------|---------------------------------------------------------|-------|-----------|
| Fluvial / Tidal                                                                                                                                 |       |           | Groundwater                                             |       |           |
| FZ2                                                                                                                                             | 1.95  | % of site | Limited potential for flooding to occur                 | 18.72 | % of site |
| FZ3a                                                                                                                                            | 4.43  | % of site | Potential for flooding of properties below ground level | 81.28 | % of site |
| FZ3b                                                                                                                                            | 0.00  | % of site | Potential for flooding to occur at surface              | 0.00  | % of site |
| Surface Water                                                                                                                                   |       |           | Sewer Flooding                                          |       |           |
| High                                                                                                                                            | 3.70  | % of site | Number of incidents within the predominant postcode     | 40+   |           |
| Medium                                                                                                                                          | 5.14  | % of site | Is the site located within the Thamesmead area?         | No    |           |
| Low                                                                                                                                             | 12.48 | % of site |                                                         |       |           |
| Flood Defences                                                                                                                                  |       |           | Flood Warning Area                                      |       |           |
| The site is at risk of flooding from rivers taking into account the presence and condition of flood defences according to the EA's RoFRS layer. |       |           | The EA Flood Warning Service is available at this site. |       |           |

See webmap supporting assessment: [Greenwich - Level 1 and 2 SFRA](#)



## 1.1 Tidal

| Description of Flood Mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <ul style="list-style-type: none"> <li>The site is at risk of tidal breach flooding from the River Thames which is located approximately 360m to the north of the site.</li> <li>The northern areas of the site would be inundated in a Tidal Breach Scenario. The central and southern areas of the site are not at risk of tidal flooding.</li> <li>During the 1 in 200 year (2005) Thames Downriver modelled event, tidal flood risk is concentrated in the northwestern area of the site.</li> <li>During the 1 in 1000 year (2005) Thames Downriver modelled event, tidal flood risk extends slightly further southwards from the 1 in 200 year (2005) scenario.</li> <li>During the 1 in 200 year (2115) Thames Downriver modelled event, tidal flood risk continues to extend further southwards from the 1 in 1000 year (2005) scenario.</li> <li>During the 1 in 1000 year (2115) Thames Downriver modelled event, tidal flood risk continues to extend further southwards from the 1 in 200 year (2115) scenario, and also enters the northeastern corner of the site.</li> </ul> |
| Mitigation / FRA Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>A FRA must be submitted as part of a planning application.</li> <li>Include appropriate flood resistance or resilience measures to address predicted flood depths.</li> <li>See SFRA Level 2 Report mitigation requirement numbers 4.3 and 4.4, Policies E2 and E3 of the existing Greenwich Local Plan, and Policy EN6 of the draft Local Plan for further development stipulations.</li> <li>Site users should be signed up to the EA's Flood Alert and Flood Warning Service.</li> <li>Sea Level Allowances, provided by the EA, should be considered to inform flood resilient construction and design measures.</li> <li>Site users should be signed up to the EA's Flood Alert and Flood Warning Service.</li> </ul>                                                                                                                                                                                                                                                                                                                           |
| Climate Change Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>During the Thames Breach Downriver 1 in 200 year events, climate change is expected to increase the extent slightly southwards from the northwestern area. The maximum depth increases from 0.69m to 1.20m, the maximum velocity increases from 0.49m/s to 0.58m/s, the maximum flood level increases from 5.48mAOD to 5.99mAOD and the maximum hazard increases from 1.35 to 1.62.</p> <p>During the Thames Breach Downriver 1 in 1000 year events, climate change is expected to increase the extent southwards from the northeastern corner, with some extent also in the northeastern corner. The maximum depth increases from 0.92m to 1.35m, the maximum velocity increases from 0.53m/s to 0.59m/s, the maximum flood level increases from 5.71mAOD to 6.14mAOD and the maximum hazard increases from 1.46 to 1.70.</p>                                                                                                                                                                                                                                                           |



| Risk Assessment (Tidal – Thames Breach Downriver 2018) |           |           |           |           |       |
|--------------------------------------------------------|-----------|-----------|-----------|-----------|-------|
| Parameter                                              | 2005_0200 | 2005_1000 | 2115_0200 | 2115_1000 | Units |
| Max. Depth                                             | 0.69      | 0.92      | 1.20      | 1.35      | m     |
| Max. Velocity                                          | 0.49      | 0.53      | 0.58      | 0.59      | m/s   |
| Max Flood Level                                        | 5.48      | 5.71      | 5.99      | 6.14      | m AOD |
| Max Ground Level                                       | 9.07      | 9.07      | 9.07      | 9.07      | m AOD |
| Min Ground Level                                       | 4.86      | 4.86      | 4.86      | 4.86      | m AOD |
| Max Flood Hazard                                       | 1.35      | 1.46      | 1.62      | 1.70      | N/A   |

## 1.2 Surface Water

| Description of Flood Mechanism                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                           |
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| Surface water flood risk is concentrated in the northwestern area of the site along Arsenal Way, and along the western and southwestern boundaries with some extent in the southeastern area. High risk areas are located within the northwestern area of the site.                                            |                                                                                                                                                                                                           |
| Mitigation – Flood Risk Requirements                                                                                                                                                                                                                                                                           | Mitigation – Surface Water Drainage                                                                                                                                                                       |
| Development should be directed away from the northwestern and western areas of the site, and towards the central and eastern areas of the site.                                                                                                                                                                | See SFRA Level 2 Report mitigation requirement 5.0 for further development stipulations.                                                                                                                  |
| Development should comply with SFRA - Level 2 Report Section 4 mitigation requirement numbers 4.3 and 4.9.                                                                                                                                                                                                     | Developments should apply the Sustainable Drainage Hierarchy set out in Policy SI 13 of the London Plan as well as Policy E2 of the existing Greenwich Local Plan and Policy EN6 of the draft Local Plan. |
|                                                                                                                                                                                                                                                                                                                | Ground investigations are required to confirm whether infiltration SuDS are suitable.                                                                                                                     |
| Climate Change Considerations                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                           |
| During the high risk events, the extent increases slightly within the northwestern area of the site. The maximum depth, hazard and velocity remain unchanged.                                                                                                                                                  |                                                                                                                                                                                                           |
| During the medium risk events, the extent increases along with the western boundary of the site, with some small increases in the southeastern areas. The maximum depth increases from 0.3m to 0.9m, the maximum velocity increases from 0.5m/s to 1.0m/s, and the maximum hazard increases from 0.75 to 1.25. |                                                                                                                                                                                                           |
| During the low risk events, the extent increases into the western areas of the site with some small increases in the southeastern areas. The maximum depth and velocity and hazard remain unchanged.                                                                                                           |                                                                                                                                                                                                           |



| Risk Assessment |      |        |     |       |
|-----------------|------|--------|-----|-------|
| Parameter       | High | Medium | Low | Units |
| Max. Depth      | 0.3  | 0.3    | 1.2 | m     |
| Max. Velocity   | 0.5  | 0.5    | 2.0 | m/s   |
| Max. Hazard     | 0.75 | 0.75   | 2.0 | N/A   |

| Risk Assessment – with Climate Change |      |        |     |       |
|---------------------------------------|------|--------|-----|-------|
| Parameter                             | High | Medium | Low | Units |
| Max. Depth                            | 0.3  | 0.9    | 1.2 | m     |
| Max. Velocity                         | 0.5  | 1.0    | 2.0 | m/s   |
| Max. Hazard                           | 0.75 | 1.25   | 2.0 | N/A   |

### 1.3 Sewer

| Risk Assessment                                                                                                                                                                                                                                        | Mitigation Requirements                                                                                                                                                                                                                                                                                   |
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| <p>The site falls within a postcode area where there are 40+ reported flood incidents from sewer flooding.</p> <p>The site is assumed to be served by separate surface water, combined and foul sewer networks, given their proximity to the site.</p> | <p>The applicant must consult with TWUL to confirm if the development site has historically flooded. TWUL must agree to any proposed sewer connections.</p> <p>If historic flooding has occurred, the applicant must demonstrate how this risk will be managed throughout the development's lifetime.</p> |

### 1.4 Groundwater

| Risk Assessment                                                                                                                                                                                                                                                                                                                                 | Mitigation Requirements                                                                                                                                                                                                                                                                                                                                                                                                      |
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| <p>The majority of the site has a potential for groundwater flooding of property situated below ground level. Part of the southern section of the site has a limited potential for groundwater flooding to occur.</p> <p>The site is underlain by the Thanet Formation-Sand bedrock geology. The superficial deposits consists of Alluvium.</p> | <p>For new developments that involve groundworks, especially if basements are planned, the 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.</p> <p>If there is a potential level of impact, mitigation actions must be proposed.</p> <p>This must be prepared by a chartered professional or specialist.</p> |



## 1.5 Artificial

| Risk Assessment                                                                                                                                                                                                                        | Mitigation Requirements                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>This site is at risk of flooding from Lockwood Reservoir.</p> <p>The reservoir extent map predicts that if this reservoir breaches on a wet day, the site will be at risk of flooding. This would affect the north of the site.</p> | <p>Propose appropriate and proportionate risk management measures.</p> <p>A suitable emergency response plan should be put in place, including an emergency warning system in the event of a reservoir flooding incident.</p> <p>Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.</p> |

## 1.6 Planning Considerations – Safety of Development

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| A. | Can the development be future proofed for climate change considerations?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    | <ul style="list-style-type: none"> <li>Surface water flood risk extent is expected to increase during all events due to climate change. The maximum depth, velocity and hazard increase in a medium risk event.</li> <li>Climate change is expected to increase the extent of tidal flood risk in the Thames Tidal Breach Downriver 1 in 200 year and 1 in 1000 year modelled scenarios. The maximum depth, velocity and flood hazard increase in a climate change scenario.</li> <li>See SFRA - Level 2 Report Section 4 mitigation requirement number 4.4 for the required flood resistant / resilient building stipulations.</li> </ul> |
| B. | Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|    | <ul style="list-style-type: none"> <li>The development must use surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and / or below ground attenuation.</li> <li>Green drainage infrastructure should be prioritised to provide wider ecological / biodiversity benefits as per London Plan Policy SI 13.</li> <li>See SFRA Level 2 Report mitigation requirement number 4.3, 4.7, 4.8 and 4.9, Policies E2, E3 of the Greenwich Local Plan and Policy EN6 of the draft Local Plan for further development stipulations.</li> </ul>                                                           |
| C. | What is the cumulative impact of the development land use change and will flood risk increase?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | <ul style="list-style-type: none"> <li>The development land use is changing from 'Less Vulnerable' to 'More Vulnerable'.</li> <li>The site is predominantly impermeable, with a few permeable areas within the site boundary, particularly along the perimeter of the site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                     |



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| <ul style="list-style-type: none"> <li>Development must mitigate any increase in impermeable area to the site with runoff storage to prevent any increase in flood risk. An increase in impermeable area coverage on site will increase surface water runoff and flood risk if not managed properly.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                  |
| D. How can the development reduce risk overall?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>Direct development towards the central and eastern areas of the site where there is less risk of surface water flooding.</li> <li>By complying with Policy E2 of the Greenwich Local Plan and Policy EN6 of the draft Local Plan through demonstrating that the development will avoid or minimise all sources of flood risk to people and property taking climate change into account, and incorporating SuDS measures in order to manage surface water runoff as close to its source as possible and to meet the required SuDS performance standards.</li> <li>By complying with SFRA - Level 2 Report Section 4 mitigation requirement 4.4.</li> </ul> |
| E. Which safe access and egress routes are recommended?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Safe access and egress routes should be directed towards Plumstead Road to the south of the site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| F. Will development require a flood risk permit / watercourse consent?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| No, the site is not within 16m of a tidal River, 8m of a Main River or 5m of an Ordinary Watercourse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| G. Can the site pass the Exception Test?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| The site is partially located within Flood Zone 3a and the proposed vulnerability classification is 'More Vulnerable', therefore the Exception Test is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

