ROYAL ARSENAL RIVERSIDE

THE ROPEYARDS

PLOTS D & K

FLOOD RISK TECHNICAL NOTE

To Support a S.96A NMA Application

MARCH 2024

Berkeley
Designed for life

Flood Risk and Drainage Technical Note:

Royal Arsenal Riverside, The Ropeyards, Plots D & K

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1. Background Information and Scope of Appraisal

1.1. Herrington Consulting Ltd (HCL) has been commissioned by **Berkeley Homes (East Thames) Ltd** to prepare this Flood Risk Technical Note for the site at **Land between Duke of Wellington Avenue and Beresford Street, London, SE18 6NP**. The document has been prepared to support an application submitted under Section 96a of the Town & Country Planning Act 1990 for a non-material amendment in connection with planning permission reference 16/3025/MA, dated 17.03.2017.

1.2. The Site is located on the western edge of the wider Royal Arsenal Riverside masterplan and is approximately 2.3 ha. The Site currently sits on a temporary park and is bound to the south by the A206, the RAR A & B Blocks to the north (and north east) and RAR Phase 3, the Brass Foundry and The Guard House to the west.

1.3. Beyond the immediate site boundaries, to the north of the site is the River Thames and to the south and south east of the site is Woolwich Town Centre including the main shopping area along Powis Street, General Gordon Square, the Woolwich Arsenal Overground Train Station and the Woolwich DLR Station.

1.4. This technical note has been prepared to demonstrate that there are no significant impacts resulting from the amendments to the previously consented scheme in relation to flood risk and drainage.

2. Relevant Planning History

2.1. A revised masterplan, The Warren Masterplan, Land Adjacent to Beresford Street/Woolwich High Street, Woolwich, SE18, was consented in 2013 for the wider area, including Plots D & K (Planning Reference 13/0117/0). The application comprised:

"Outline planning permission for a mixed-use development comprising 2,032 residential units and 2,442 (GEA) sqm of non-residential floor space (A1 / A2 / A3 / A4 / B1 / D1 uses), access, landscaping, publicly accessible open space, car and cycle parking provision and refuse and recycling storage areas."

2.2. Flood risk and drainage were scoped out of the Environmental Statement (ES) for the 2013 outline application, however, a Flood Risk Assessment (FRA) was prepared to support the application. The FRA included a section summarising the drainage principles onsite, outlining that surface water captured onsite will be discharged to the tidal River Thames, with storage

provided onsite for when the outfall is tide-locked. High level calculations were undertaken to indicate likely storage requirements, however, a drainage strategy was not prepared showing how surface water would be managed across the site.

2.3. In 2017, a Section 73 application (Planning References 16/3025/MA) was granted approval to vary the outline planning permission consented in 2013. It is application 16/3025/MA that this Section 96a application now seeks to amend.

2.4. Application 16/3025/MA comprised:

"S73 Variation application in respect of planning permission reference 13/0117/O being an Outline Planning Permission for mixed use development comprising 2,032 units and 2,442 (GEA) sqm of non-residential floor space (A1/A2/A3/A4/B1/D1 Use), access, landscaping, public accessible open space, car and cycle parking provision and refuse and recycling storage areas.."

2.5. As stated in Paragraph 2.2 above, flood risk and drainage were scoped out of the ES application 13/0117/0 and were also not included within the ES Addendum prepared for the Section 73 application. The Section 73 application did include a revised FRA, however, this focusses solely on Plot A.

3. Proposed Development

3.1. This document has been prepared to accompany an application submitted under Section 96a of the Town & Country Planning Act 1990 for a non-material amendment in connection with planning permission reference 16/3025/MA, dated 17.03.2017, to allow changes in relation to Plots D and K for the following:

- Increase height of the zones that contain Buildings 1, 2, 3 and 4 in Plot D and Buildings 3 4 in Plot K by 3m.
- Increase height of the zone that contains Building 5 in Plot K by 3.5m.
- Increase height of the setback along Duke of Wellington Avenue of the zones that contains Buildings 1 and 2 in Plot D by 3 metres.
- Removing the setback along Beresford Street of the zones that contain Buildings 3 4 in Plot K.
- Removal of the link buildings between buildings D1-D2 and D4-D5.
- Minor modifications of the footprint of Plots D and K.

- Update Use Classes to remove A1/A2/A3/A4/B1/D1 and replace with Use Classes E, F.1 and F.2 and drinking establishment (Sui generis), as per the Use Class Order 2020.
- Alterations to the Secondary Road and Service / Maintenance Route.
- The vehicular entrance into Plot D moved from the east to the north side.
- Changes to the parking area in Plot D.

4. Summary of Flood Risk to The Site

4.1. Inspection of the EA's 'Flood Map for Planning' (Figure 1) identifies that the site is located entirely within Flood Zone 1.

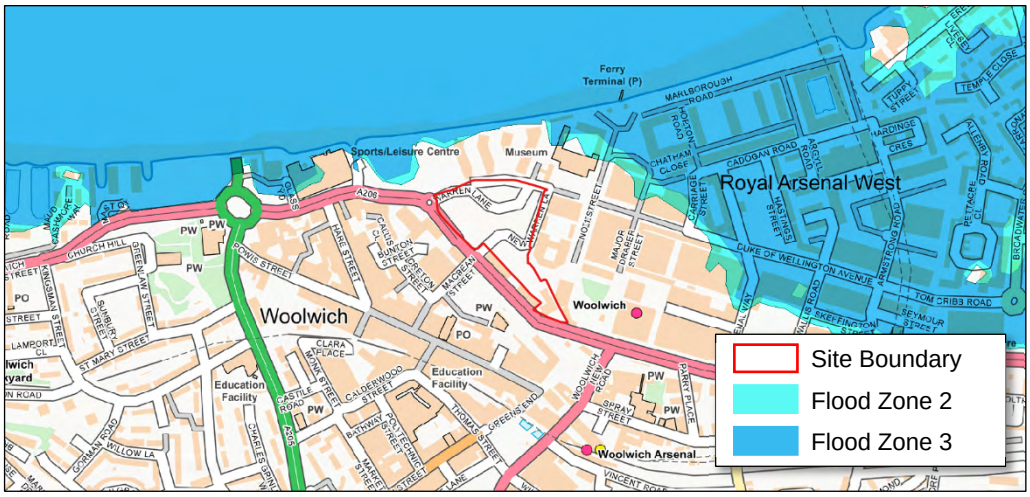

Figure 1 – EA's 'Flood Map for Planning' (contains Ordnance Survey data © Crown copyright and database right – © Environment Agency 2023).

4.2. When considering the risk of flooding from **tidal** sources, it has been identified above that the site is located 100m from the tidal River Thames. However, despite the location of the River Thames near to the site, the EA's 'Flood map for Planning' shows that the site is located in Flood Zone 1 – the lowest flood risk area which is defined as having less than 1 in 1000 annual probability of flooding (0.1% Annual Exceedance Probability AEP).

4.3. As well as being located in Flood Zone 1, the EA have previously provided the results of the Thames Estuary Breach Assessment (2018) which contains detailed numerical flood modelling simulating the impact of the Thames flood defences catastrophically failing during an extreme storm event. The results of this modelling study (Figure 2), show that even during this extreme scenario, the site is elevated above and therefore located outside of the extent of flooding.

4.4. Interrogation of the mapping shows that the maximum flood level within the surrounding area is 6.6m AODN to the northeast and 6.7m AODN to the northwest. Land levels on site are comfortably above these flood levels. Whilst the basement floor level will be below the flood level, land between the site and the flood extent is all elevated above the flood level and therefore water will not be directed towards the basement. The risk of flooding to the site from the River Thames is therefore concluded to be *low.*

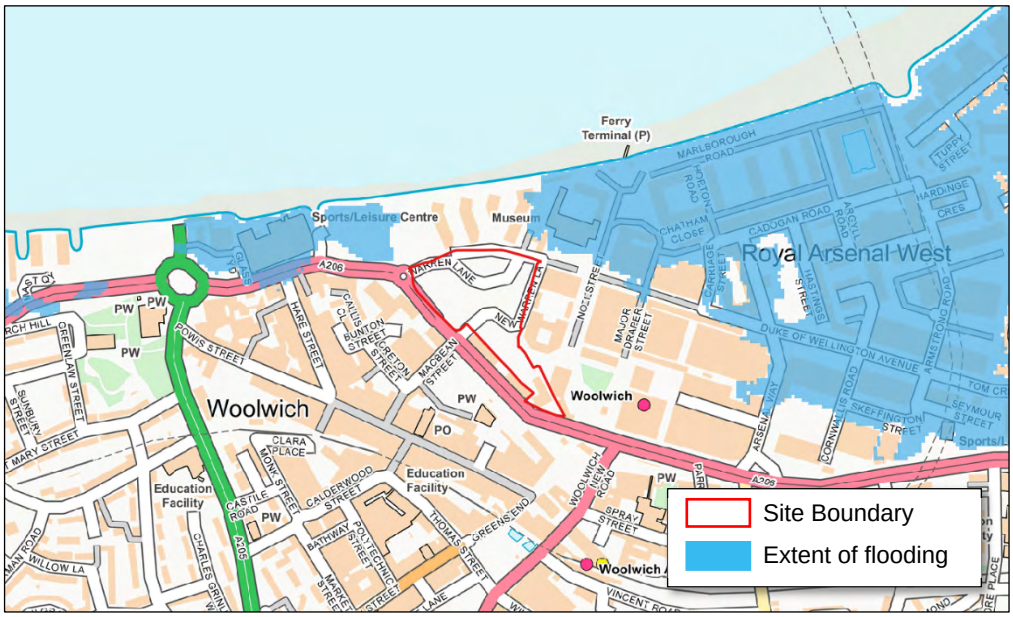

Figure 2 – Extent of flooding following a breach in the flood defence infrastructure during an extreme event. Model results extracted from the Thames Estuary Breach Assessment (2018) (© Environment Agency 2023).

4.5. The risk of flooding from **surface water** has also been assessed. The EA's 'Risk of flooding from Surface Water' mapping identifies that the majority of the site is at 'very low' risk of flooding from surface water. Additionally, the Royal Borough of Greenwich's Strategic Flood Risk Assessment (SFRA) includes surface water modelling which shows the site is not predicted to experience flooding during extreme rainfall events. Furthermore, as discussed in Section 6 of this document, the proposed development will include SuDS aimed to captured rain falling onsite up to and including the design rainfall event. As such, the risk of flooding from this source is considered to be *low*.

4.6. The risk of flooding from **fluvial** watercourses**, artificial sources, sewers** and **groundwater** has been assessed and the risk of flooding from these sources considered to be *low*. Whilst the risk from sewers and groundwater is concluded to be *low*, the development includes the construction of a basement so precautionary mitigation measures are recommended to be

included within the basement, as discussed in section 5 of this document. The previously consented scheme also included a basement and so the flood risk profile has not changed.

4.7. Taking into account the above, the risk of flooding from all sources is considered to be *low*. As such, it is considered that there will be no significant changes in relation to flood risk when comparing the consented scheme to the proposed.

5. Flood Mitigation Measures and Other Considerations

5.1. **Flood Resistance and Resilience Measures**: The proposed development includes subterranean elements in the form of the basement beneath Plot D. Whilst the risk of flooding from all sources has been concluded to be low, as a precautionary approach, the following measures are recommended:

- The basement floor should be tanked and a damp-proof membrane installed to prevent internal flooding in the unlikely event of elevated groundwater levels.
- Non-return valves should be installed on the outfall of drainage systems to prevent backflow of water from the sewer or the River Thames.
- The basement should be constructed using flood resilient construction materials.

5.2. **Flood Warnings:** Owners, managers and/or residents of the future development should sign up to the EA's Flood Warning Service and monitor Met Office Weather Warnings to ensure they are aware of conditions which could result in flooding in the surrounding area.

6. Surface Water and Foul Water Management

6.1. The general requirement for all new development is to ensure that the runoff is managed sustainably, and that the development does not increase the risk of flooding at the site, or within the surrounding area. In the case of brownfield sites, drainage proposals are typically measured against the existing performance of the site, although it is preferable (where practicable) to provide runoff characteristics that are similar to greenfield behaviour. However, in this case, the proposed discharge location will be the tidal River Thames. There is an existing connection to the River Thames via an adjacent phase of the development under the ownership of the applicant. As part of this drainage strategy for the adjacent development, a 90l/s inflow has been accounted for from the development of Plots D & K.

6.2. The Non-statutory Technical Standards for SuDS (NTSS) specify criteria to ensure sustainable drainage is included within development classified as 'major development' as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England)

Order 2015. It is, however, recognised that SuDS should be designed to ensure that the maintenance and operation requirements are economically proportionate.

6.3. As the site covers an area of greater than 1ha, and development would provide over 10 residential dwellings, the proposals would be classified as 'major' development. As a consequence, the NTSS will apply.

6.4. In addition to the NTTS, policy SI 13 of the London Plan states developments should incorporate SuDS wherever possible within schemes unless there is a practical reason for not doing so.

6.5. Policy SI 13 of the London Plan also states that developers should follow the drainage hierarchy by prioritising the discharge of surface water runoff as close to the source as possible. The London Plan Drainage Hierarchy is outlined below:

1) *Rainwater use as a resource (e.g.: rainwater harvesting, blue roofs for irrigation);*

2) *Rainwater infiltration to ground at or close to source;*

3) *Rainwater attenuation in green infrastructure features for gradual release (e.g.: green roofs, rain gardens);*

4) *Rainwater discharge direct to a tidal waterbody or a watercourse (unless not appropriate);*

5) *Controlled rainwater discharge to a surface water sewer or drain; and*

6) *Controlled rainwater discharge to a combined sewer.*

6.6. The proposed development must therefore attempt, where possible, to incorporate SuDS features in accordance with the requirements of the London Plan and any other adopted local planning policies pertaining to drainage.

6.7. Details of the proposed drainage strategy for Plots D & K will be provided as part of a separate application, however, a summary has been provided below. The strategy will follow the principles outlined in the 2013 Outline Application.

6.8. The proposed drainage strategy will be designed to manage rain falling on site up to and including the design rainfall event, which is a 1 in 100 year return period event including a 40% allowance for climate change impacts on increased rainfall intensity.

6.9. To restrict the rate of runoff from the site, a combination of permeable surfacing, geocellular storage tanks, basins and swales will be included across the site. These measures will ensure

that rainfall landing onsite is captured and discharged to the River Thames via the existing outfall.

6.10. ***Foul Water Management***: The construction of residential development within the sites will increase the rate of foul water discharge from the sites. Asset location mapping (Figure 3) shows that there are public foul sewers within the surrounding area and therefore, the proposed development should seek to discharge foul water into the existing sewer network. Further details will be included within the foul water strategy prepared to support a separate application, however, foul water generated onsite will be discharged to the existing Thames Water sewers onsite, in consultation with Thames Water.

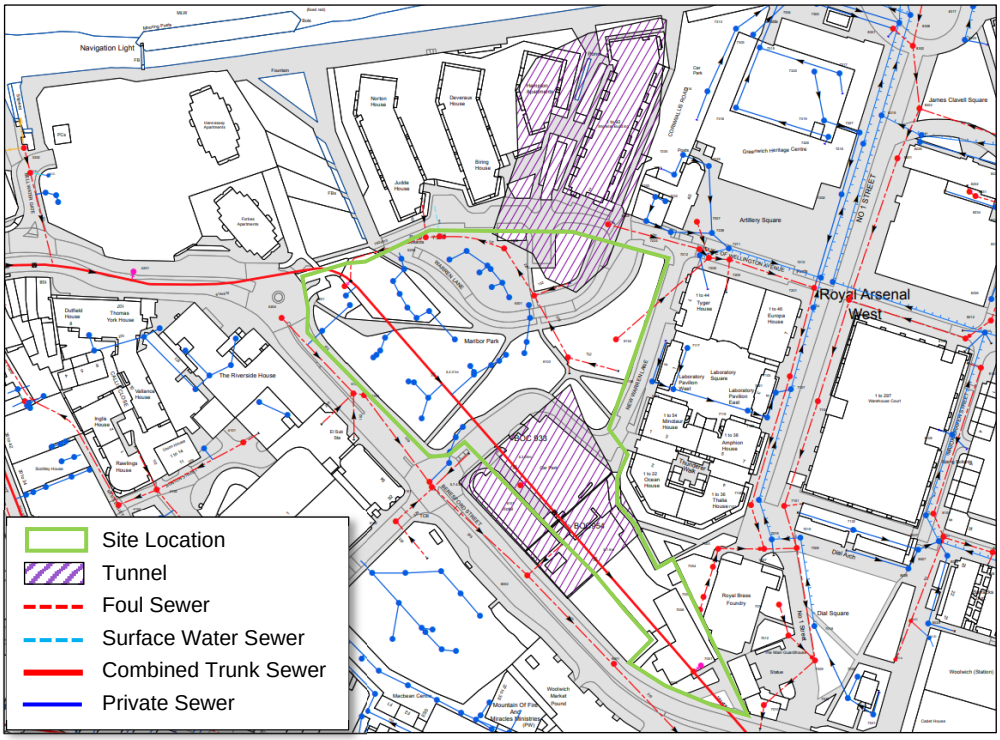

Figure 3 – Extract from Thames Water asset location mapping for the area around the development site.

7. Conclusions

7.1. This document has been prepared to support an application submitted under Section 96a of the Town & Country Planning Act 1990 for a non-material amendment in connection with planning permission reference 16/3025/MA, dated 17.03.2017.

7.2. It is the conclusion of this report, that the site is at *low* risk of flooding from all sources, and therefore, the non-material amendments to the consented scheme will not result in significant impacts onsite or to the surrounding area.

7.3. Surface Water and Foul Water drainage strategies will be produced to support separate applications and will ensure that all surface and foul water generated onsite is managed appropriately, following the principles outlined in the previously consented schemes.