

Technical Note

Project	Twickenham Riverside				
Reference	J3932-C-TN-0003				
Scope	Response to Flooding comments feedback from Richmond and Wandsworth Council				
Date	25/01/2022	Job number	J3932	Author	Guy Parker-Dennison

This note is designed to respond to comments received from Lucy Thatcher MRTPI Strategic (who is the Applications Manager (Richmond) Serving Richmond and Wandsworth Councils) on November 2021 in relation to the Twickenham Riverside Project planning application. The intent is to provide additional clarity about the justification and constraints which led to the current design and collate information from the FRA and SUDS Report to specifically address each of the points raised. This document should be reviewed along with the Webb Yates updated Flood Risk Assessment and SuDS report (J3932-C-RP-0001_09) and Flood Emergency Evacuation Plan J3932-C-RP-0003_02

1. Recommendation: An addendum to the FRA is provided, which specifically addresses the sequential and exception test requirements, to demonstrate both are passed.

A sequential test of the site as it currently stands has been undertaken on the existing flood zones which show the site failing the sequential test due to the fact it theoretically could have been reconfigured to fall within TAAP 7. However, it has been demonstrated in response to the NPPF paragraph 167 that there are overriding reasons why this is not possible and should be taken into consideration with regards to this development. Please refer to p38 of J3932-C-RP-0001) for further details.

2. Flood Risk

2.1. Justification for only achieving 50% reduction in run off rates, rather than green field rates.

This has already been responded to in the previous Webb Yates Technical Note J3932-C-TN-0002 in response to the LLFA comments. Please see response provided as part of J3932-C-TN-0002 below.

“Response

The LLFA did raise concerns about the 10l/s flow rate with pre-application comments, we believed we had added enough information to the report to justify the flow rate.

We acknowledge in our report that the greenfield runoff rate was not met but that we had exceeded the minimum criteria to reduce flow rate by at least 50%. As noted by the LLFA comment, the results table previously contained a typo which made the results confusing. Below is the correct table of results to match the MicroDrainage Output.

	<i>Existing*</i>	<i>Proposed</i>	<i>Change in flow rate</i>
<i>1:1 yr Max outflow (l/s)</i>	<i>21.7</i>	<i>8.1</i>	<i>-63%</i>
<i>1:30 yr Max outflow (l/s)</i>	<i>47.3</i>	<i>10.0</i>	<i>-79%</i>
<i>1:100 yr + 40%CC Max outflow (l/s)</i>	<i>61.3</i>	<i>10.0</i>	<i>-84%</i>
<i>Maximum flooding 1: 100 yr + 40%CC</i>	<i>NA</i>	<i>0(m³)</i>	

*The existing runoff calculation is conservative as it does not allow for runoff from landscaped areas. The actual reduction in runoff rate is likely to be larger than those stated in the table above.

The justification for not aiming for greenfield run-off rates is that the space available for sub-surface storage on the upper levels is constrained:

- by landscaping (e.g. tree pits and garden beds);
- by obstructions in the ground left over from previous site use i.e. a swimming pool and its associated infrastructure (confirmed by site investigations), these would pose a significant risk to project time and budget as the extent of obstructions is unknown;
- by the Flood Defence wall. No drainage structure or attenuation may be within 4 m of the back of the wall;
- by distance from the existing Thames Water connection since it is proposed to connect by gravity.

Based on the constraints of the site, the space feasibly available for surface water attenuation is very limited. Therefore, to find a balance between:

- feasibility,
- landscaping and planting, and,
- providing a significant betterment to the existing site runoff rate,

a maximum flow rate slightly less than half the existing 1:1 year flow rate (10 l/s) is proposed. We believe this meets the requirements set out in the SFRA and the London Plan. “

2.2. • Para. 6.2: states the site is not in an area with potential for groundwater flooding to occur – this is not in accordance with the SFRA. Aurora (richmond.gov.uk)

The statement that the site is not in an area with potential for groundwater flooding to occur is based on the Envirocheck data provided as part of the Site Investigation Report. Furthermore, the SFRA shows that the site is not situated in an area susceptible to groundwater flooding. The “Area Susceptible To Groundwater Flood © Environment Agency” data does identify the area as at risk of groundwater flooding, however, this data is very coarse and therefore highly inaccurate. The data “Susceptibility to Groundwater Flooding Version 6 © British Geological Survey” is based on smaller assessment grid and therefore is more reliable for the proposed site. The risk of flooding from groundwater is considered **Low**. See section 8.2 on page 33 of the Flood Risk Assessment for further details

2.3. Need to demonstrate how the infrastructure will remain safe and operational for users during flood periods.

Essential infrastructure is located behind the new amended flood defence wall and the building ground floor level will be elevated to 0.5m above the TE2100 future defence level. This provides 0.46 m freeboard above the fluvial flood level for the 1 in 100 year event + 35% climate change which is greater than the minimum freeboard of 300 mm specified by the LBRuT SFRA and the associated levels would slope away from the building. Furthermore any drainage within the basement area will be pumped and hence there is no risk of the foul system backing up into the basement area.

2.4. Need to describe how any residual risk can be safely managed

Residual risk has been managed by lifting the vulnerable buildings and surrounding areas above the fluvial flood level (whilst ensuring no loss in flood storage on the site), providing occupants a safe escape route from the site to higher ground and locating water compatible development on the lower levels. A site specific flood evacuation plan has also been created for the site as well. Refer to section 10 of J3932-C-RP-0001 for further details.

2.5. Need to demonstrate how the development is appropriately flood resistance and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment.

Refer to section 10.5 of J3932-C-RP-0001. The main buildings are to be located 0.46m above the fluvial level for the 1 in 100 year event plus 35% climate change and the boathouse and lower landscaped areas will be constructed using materials that are not affected by water and any services will be located above the fluvial flood level. Where this is not possible (such as lighting and any other power requirements for the lower landscaped areas and boathouse) best practice will be followed to ensure any cabling and fittings are water resistant and can easily be reinstated once the flood waters have subsided. Also the main fuse boards for those mains are to be located above the fluvial level to ensure those circuits can be isolated and turned off easily during a flood event.

2.6. Is table 7.1.2 correct? – refers to no increase in soft landscaping, however, para. 7.2 states a 547m2 increase.

Table 7.1.2 is correct. Its referring to an increase in hardstanding areas which is why it shows no increase as there is no loss in soft landscaping areas (which are in fact increasing by 547m2)

2.7. Figure 16 identifies the site with a low risk to surface water flooding – the SFRA includes areas of medium and high risk (northern ends of Water and Wharf Lane). This needs to be corrected.

Refer to section 8.4.2 on page 35 of the updated Flood Risk Assessment

3. Flood Evacuation Emergency Plan Outstanding Matters

3.1. Confirmation that the evacuation plan considers the impact of climate change.

Refer to section 3.1 of J3932-C-RP-0003

3.2. 2. Mitigation measures**3.2.1. a. Are any measures required for other sources of flooding – surface water, ground water etc**

Refer to section 4.1 of J3932-C-RP-0003

3.2.2. b. Are there any measures required to reduce flood damage

Refer to section 4.1 of J3932-C-RP-0003

3.2.3. c. What about services within the flood zone (electricity for markets / events / lighting etc)

Refer to section 4.1 of J3932-C-RP-0003

3.2.4. d. Explanation that the buildings are within the ‘new’ flood zone I and therefore specific measures are not required.

Refer to section 4.1 of J3932-C-RP-0003

3.3. 3. Section 3: a. States the site is partially within Flood Zone 3b and flood zone I, and the development is water compatible within flood zone 3b and all other proposed buildings within flood zone I. It goes on to state that the development is compliant with the sequential test, NPPF guidance and policy LP21. This is not correct**3.3.1. i. The existing site is within flood zones, I, 23a, and 3b. As outlined previously in Sections 2 and 3, the sequential and exception test need to be passed.**

Please refer to the updated J3932-C-RP-0001

3.4. ii. The FRA needs to identify the correct flood zones, and if these are altered through the development, this needs to be explained.

Please refer to the updated J3932-C-RP-0001

3.5. Section 4.1 – it is recommended that all occupiers sign up to the Flood Alert – not just LBRuT’s property management

Refer to section 4.2 of J3932-C-RP-0003

3.6. Section 6.1 and 6.2 identifies Emergency service numbers and other useful contact numbers, that should be completed by the Building Contractor Manager – should this not be completed by the management company, and all occupiers be issued with?

Refer to section 6 of J3932-C-RP-0003

3.7. 6. Section 6.3 Location of Services is incomplete. It is meant to identify the location of key services cut off switches and valves, however, does not. Again, it refers to the Building Construction Manager to use – should this not be the management company. How does this fit with multi landowners / occupiers?

Refer to section 6.3 of J3932-C-RP-0003. The locations are to be filled in by the Building Contractor on site, and updated by LBRuT’s Property Management Team once construction is complete.

3.8. 7. Section 9 refers to the updates of the Plan, and LBRuT’s Management Team will ensure an up-to-date version of the Plan is available at all times – is the Council the management company for the site?

Refer to section 8 of J3932-C-RP-0003

3.9. 8. Section 7 states that following a flood a reminder of the dangers with flood water should be issued – how will this be done, and to whom will this be issued to?

Refer to section 5.4 of J3932-C-RP-0003

3.10. 9. The plan does not appear to have been drafted in accordance with Richmond's guidance on producing flood emergency plans - Guidance on producing a flood emergency plan (richmond.gov.uk) - whereby the following are not clearly identified:

3.10.1. a) Detail the flood warnings and estimated lead time available

Refer to section 5.1 of J3932-C-RP-0003

3.10.2. b) Detail how the Plan is triggered, by who and when

Refer to section 5.1, table 3, of J3932-C-RP-0003

3.10.3. c) Define any areas of responsibility for those participating in the Plan

Refer to section 5.1, table 3, and section 6, table 4, of J3932-C-RP-0003

3.10.4. d) Describe what actions are required by the people in the development

Refer to section 5.1 of J3932-C-RP-0003

3.10.5. e) Establish procedures for implementing the Plan

Refer to section 5.1 of J3932-C-RP-0003

3.10.6. f) What circumstances will trigger an evacuation?

Refer to section 5.1 of J3932-C-RP-0003

3.10.7. g) How will evacuation be organised?

Refer to section 5.2 of J3932-C-RP-0003

3.10.8. h) Will there be an assembly point?

Refer to section 5.2 of J3932-C-RP-0003

3.10.9. Will excavation routes be signposted?

Refer to section 5.2 of J3932-C-RP-0003

3.10.10. j) Would rescue by emergency services be necessary and feasible?

Refer to section 5.2 of J3932-C-RP-0003

3.10.11. k) During the evacuation, how will the welfare of people be looked after?

Refer to section 5.2.1 of J3932-C-RP-0003

4. LLFA Comments

4.1. **Drainage Hierarchy MORE INFORMATION REQUIRED – the applicant proposes the use of infiltration features but has not provided evidence that the ground conditions are suitable. Additional contamination testing should be carried out.**

This has already been responded to in the previous Webb Yates Technical Note J3932-C-TN-0002. Please see response provided as part of J3932-C-TN-0002 below and section 6.2 of J3932-C-RP-0001

“Response

We do not believe that further ground investigation is required to adopt the proposed infiltration features. The rationale for limiting infiltration as a discharge method in the report was due to ground obstructions which were observed during site inspection which may limit or obstruct infiltration particularly around the old Lido previously located on the site. At low levels of the site, high groundwater levels and regular flood inundation would limit the suitability of infiltration techniques.

The reasons below demonstrate how the proposed design has negligible impact on groundwater quality at low level and improves the existing condition at the level of the gardens.

- The Site is identified as a Throughflow Catchment area and Susceptible to groundwater flooding. This indicates that as ground water is rising and falling through the substrate, and flowing laterally through the ground material, then there is already a pathway for any contaminants within the made ground.*
- The low lying area of the site is submerged in flood events, this means that any proposed infiltration features located on The Embankment or below the flood water levels on Wharf Lane and Water lane cannot reasonably be considered to increase the risk of contaminant migration within the soil.*
- There are existing landscaped areas at the higher level of the site which currently promote infiltration. This is mimicked by the proposed design including retention of some existing garden areas.*
- The proposed design will improve the soil quality by removing significant quantities of existing material and installing clean fill and landscaping materials.*
- The proposed design also provides a retaining structure around most of the site which will have a granular filter drain around the back. This filter material will form the path of least resistance to the base of the wall for groundwater, this will be filtered through the clean granular fill.*

The drainage network has various discharge points;

- 1. New conveyance network discharges into existing TW Manhole 2107 (upstream of 2106)*
- 2. Into existing road gullies*
- 3. Direct into River Thames, similar to the existing condition*

The details of these connections, and the reasons why each is required is outlined below.

For the surface water drainage from the raised garden, Wharf Lane building and Water Lane building there is one proposed connection point to Thames Water sewer. This is into the existing Thames Water manhole upstream of TW manhole 2106.

Road gullies affected by the proposed design shall be relocated to suit new kerb alignments. Since both Water Lane, Wharf Lane and The Embankment are within the flood storage area they must not have overland flow obstructed and must allow water to drain freely into the River Thames. Therefore, there are no significant changes to the proposed runoff rates from these roads. However, there are no reasonable opportunities for improvement as part of this project.

No drainage network is proposed for The Embankment since the area is completely within the floodplain and would be submerged in regular tidal and flood events. This would choke any drainage network installed to drain areas upstream outside of the flooded area and would result in silt and debris entering the network increasing the risk of blockage. Instead water from this area must be allowed to flow freely overground into the River Thames.

In accordance with the EA requirements for the new flood defence structure, no infrastructure may be built within 4m from the top of the wall. Where the structure is a wall, there will be a filter drain and weep holes. Runoff not captured by the filter drain will be drained directly towards the River Thames since there is no opportunity to capture this runoff at high level due to the EA restrictions.

For Foul Water, there are 4 proposed connection points to existing Thames Water network.”

4.2. Runoff Rate: FAIL – the proposed runoff rate is not the greenfield runoff rate, nor is it a maximum of 2 l/s. The proposed runoff rate has not been agreed with the LLFA. MORE INFORMATION REQUIRED – calculations to support the runoff rates given need to be supplied. Proposed runoff rates for 1 in 1 year event are larger than 1 in 30 year event, which is not supported by Microdrainage results.

This has already been responded to in the previous Webb Yates Technical Note J3932-C-TN-0002. Please see response provided as part of J3932-C-TN-0002 below. Microdrainage calculations are provided in Appendix E of J3932-C-RP-0001

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- feasibility,
- landscaping and planting, and,
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a maximum flow rate slightly less than half the existing 1:1 year flow rate (10 l/s) is proposed. We believe this meets the requirements set out in the SFRA and the London Plan. “

4.3. Attenuation Volume: FAIL – the attenuation volumes will need to be recalculated once an acceptable runoff rate restriction has been agreed with the LLFA so as to demonstrate that the site will not flood as a result of the 1 in 30 year rainfall event, that there will be no flooding of buildings as a result of events up to and including the 1 in 100 year rainfall event, and clarify how on-site flow as a result of the 1 in 100 year event with a climate change consideration will be suitably managed.

This has already been responded to in the previous Webb Yates Technical Note J3932-C-TN-0002. Please see response provided as part of J3932-C-TN-0002 below.

“Response

As the attenuation volume required is directly proportional to allowable runoff rates, if the proposed runoff rate of 10 l/s is accepted based on the response to Comment 2 above, then the current design meets the attenuation requirements stated. “

4.4. Maintenance: FAIL – the drainage strategy does not contain the maintenance tasks and frequencies for each drainage component proposed. The maintenance owner should also be provided.

This has already been responded to in the previous Webb Yates Technical Note J3932-C-TN-0002 and is outlined in section 7 of J3932-C-RP-0001. Please see response provided as part of J3932-C-TN-0002 below.

“Response

Our design report provides a maintenance section which refers to drainage design elements and inspection frequencies that can be provided for Stage 3 design. Additional reference is made to maintenance according to manufacturers details which cannot be specified at this stage of the design. This is a standard level of detail to provide for a Sustainable Drainage report and provides a similar level of detail to the previous planning submission in 2017.

The detailed maintenance plans and details will be included in the O&M manuals typically collated by the contractor and will include details associated with specific material and supplier been installed. Ownership and responsibility for the maintenance of each element shall be clarified prior to handover and included as part of the O&M details.”