3 Proposed Development

The project comprises of the demolition of the existing structures and infrastructure associated with the Kew Biothane Plant and the construction of a new three to five storey building with associated external ground level car parking area. The new building will provide Specialist Extra Care accommodation offering 89 residential units. The ground floor is dedicated to communal and wellbeing facilities including an open to public cafe with the residential apartments contained at first floor and above. There is no residential accommodation at the ground floor level.

Figure 3.1 shows a ground floor plan.

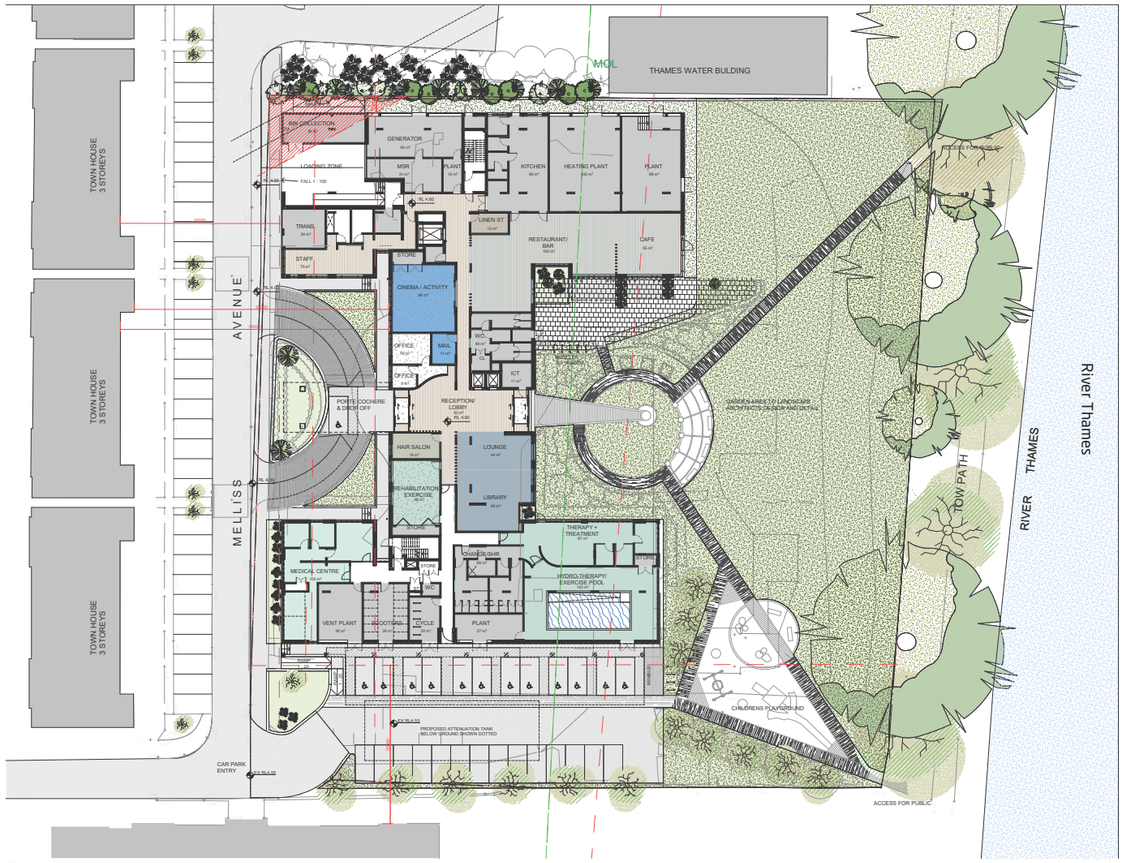


Figure 3.1 Proposed development ground floor plan

4 Requirements of National Planning Policy Framework (NPPF)

4.1 Summary

The National Planning Policy Framework (NPPF) has recently superseded Planning Policy Statement 25 "Development and Flood Risk" (PPS 25) although the requirements and goals remain essentially the same:

- The susceptibility of land to flooding is a material planning consideration;
- The Environment Agency has the lead role in providing advice on flood issues, at a strategic level and in relation to planning applications;
- Planning decisions should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid inappropriate development on undeveloped and undefended flood plains etc;
- Developers should fund flood defences and warning measures required because of the development;
- Planning policies and decisions should recognise that the consideration of flood risk and its management needs to be applied on a whole-catchment basis and not only be restricted to flood plains.

With regard to the NPPF, those proposing particular developments are responsible for:

- Providing an assessment of whether any proposed development is likely to be affected by flooding and whether it will increase flood risk elsewhere and the measures proposed to deal with these effects and risks and;
- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect thus ensuring the safe development and secure future occupancy of the site.

After this has been addressed, it is then the local planning authority's responsibility (advised as necessary by the Environment Agency) to determine an application for planning permission after taking into account all material considerations, including the issue of flood risk and how it might be managed or mitigated. Local planning authorities are required to adopt a risk-based approach to proposals for development in flood risk areas. The assessment of risk should take into account:

- The area liable to flooding;
- The probability of it occurring, both now and over time;
- The extent and standard of existing flood defences and their effectiveness over time;
- The likely depth of flooding;
- The rates of flow likely to be involved; and
- The nature of the development proposed and the extent to which it is designed to deal with flood risk.

Local planning authorities in conjunction with the Environment Agency are responsible for determining that the threat of flooding should be managed. This is to ensure that the development is and remains safe throughout its lifetime (i.e. it has an appropriate degree of protection) and does not increase flood risk elsewhere.

Following flooding in December 2000 the Environment Agency (EA) provided indicative flood plain maps to all authorities and published them on the EA website. In addition to these indicative maps (following a national programme adopted by the Agency in 1996), detailed data and maps for priority areas at risk are available, to provide precise information for building developments.

The Government looks to local planning authorities under the NPPF to apply the risk-based approach to their decisions on development control through a sequential test. Under the test, sites are to be categorised under the following zones.

1 Areas with little or no potential risk of flooding (annual probability less than 0.1% for rivers, tidal & coastal). These areas would have no constraints on development other than the need to ensure that the development does not increase run-off from the site to greater than that from the site in its undeveloped or presently developed state. For development proposals on sites located within Flood Zone 1 comprising one hectare or above the vulnerability to flooding from other sources as well as from river and the sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a FRA.

2 Areas with low potential risk of flooding (annual probability between 1.0% - 0.1% for rivers and between 0.5% - 0.1% for tidal & coastal). These areas would be suitable for most developments.

3a Areas with high potential risk of flooding (annual probability greater than 1.0% for rivers and greater than 0.5% for tidal & coastal). These areas will generally be suitable for "Less Vulnerable" uses such as commercial, retail and industrial uses, provided there are adequate flood defences in place, that ensure buildings are designed to resist flooding, there are suitable warning and evacuation procedures in place and the new development does not add to flood risk downstream. "More Vulnerable" uses such as residential, health and education will require the Exception Test to be passed.

3b Areas at highest risk from flooding (including those areas behind defences that offer a standard of defence less than 1% for rivers and less than 0.5% for tidal & coastal or where there is a significant risk that failure could lead to rapid inundation by fast flowing water). These areas may be suitable for recreation, sport and conservation use.

5 Strategic Flood Risk Assessments

Strategic Flood Risk Assessments are produced by Local Authorities in order to form the basis for preparing appropriate policies for flood risk management. The Environment Agency advise that Developers "should consult the Strategic Flood Risk Assessment prepared by your local planning authority" when preparing their design.

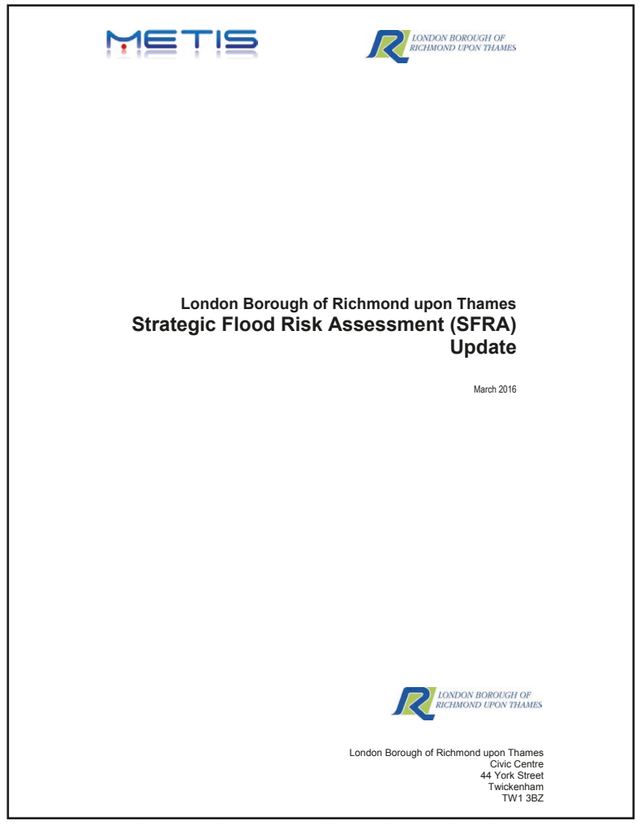
The site has been the subject of the London Borough of Richmond upon Thames (LBRuT) Strategic Flood Risk Assessment (SFRA) dated March 2016. The key findings and recommendations from this report relating to the development site are summarised in the following section and have been used to inform the preparation of this site-specific flood risk assessment.

5.1 LB Richmond upon Thames SFRA

The London Borough of Richmond upon Thames commissioned Metis Consultants to undertake the March 2016 SFRA to update the previous 2010 SFRA in order to reflect new knowledge of flood risk within the Borough and amendments to national, regional and local guidance and policy.

The key recommendations / conclusions that impact the proposed development area are:

- A large proportion of Richmond Borough is situated in proximity to the River Thames and its tributaries; it is the only Borough to span both sides of the River Thames. Therefore, a relatively large number of properties within the Borough are potentially at risk of flooding from rivers.
- The River Thames within this Borough extends from Barnes to Hampton Court (upstream of Teddington Weir). Teddington Weir represents the upper tidal extent of the River Thames, and the Borough is at risk from both fluvial (river) and tidal (sea) flooding.
- Downstream of Teddington Weir, the Borough is protected against flooding from the River Thames by the Thames Tidal Defence (TTD) system. The TTD system provides protection against tidal flooding through a combination of raised flood defences, flood proofing to riverside properties and the Thames Barrier. A 'combined' event can be observed when an unusually high tide happens to coincide with particularly high river levels due to prolonged rainfall in the upper catchment.
- Approximately 6,500 of the Borough's 100,000 properties are located within flood zone 2, approximately 13,300 properties within flood zone 3 and around 600 properties in the functional floodplain. Flooding represents a risk to both property and life, and it is essential that planning decisions are informed, and take due consideration of the risk posed to (and by) future development by flooding.
- The SFRA has outlined specific development control recommendations that should be placed upon development within Zone 3a (High Probability) to minimise both the damage to property, and the risk to life in case of flooding. It is essential that the developer carries out a detailed Flood Risk Assessment to consider the site-based constraints that flooding may place upon the proposed development.
- Where flood risk has been identified as a potential constraint to future development, recommend possible flood mitigation solutions that may be integrated into the design (by the developer) to minimise the risk to property and life should a flood occur (in accordance with the NPPF Exception Test).
- Self-contained residential basements and bedrooms at basement level will not be permitted in Flood Zone 3. All basements, basement extensions and basement conversions must have internal access to a higher floor and flood resistant and resilient design techniques must be adopted.
- Sites close to flood defences are important because even minor developments can affect their structural integrity and / or the Environment Agency's ability to access them for inspection and maintenance purposes. Therefore, the Environment Agency will be consulted on all proposals, including minor developments, that fall within 20 metres of the landward side of the flood defence, if present, or the bank of the river, if not.
- Ground floor levels for developments in Flood Zone 3a with an 'extreme & significant' tidal breach flood hazard should be situated above the Thames 2100 Year 2100 tidal flood level. The Development appears to span over the 'Significant' and 'Moderate' zones.


METIS

LONDON BOROUGH OF RICHMOND UPON THAMES

London Borough of Richmond upon Thames
Strategic Flood Risk Assessment (SFRA) Update

March 2016

LONDON BOROUGH OF RICHMOND UPON THAMES

London Borough of Richmond upon Thames
Civic Centre
44 York Street
Twickenham
TW1 3BZ

Figure 5.1 London Borough of Richmond upon Thames Strategic Flood Risk Assessment

6 Sources of Flooding

In accordance with the NPPF, it is a requirement to assess the flood risk to the site from all potential sources. For the purposes of this assessment this has been broken down into five potential sources:

- Flooding from rivers and sea
- Flooding from sewers
- Flooding from groundwater
- Flooding from artificial sources (e.g. reservoirs and canals
- Flooding from surface water

These sources are discussed and assessed in more detail in Sections 6.3 to 6.7 below.

Figure 6.1 Environment Agency Flood Map for Planning (Rivers and Sea)

6.1 Sequential Test

A risk-based Sequential test should be applied at all stages of the planning process. The aim is to steer developments to areas at the lowest probability of flooding (i.e. to Flood Zone 1).

Based on the Environment Agency's "Flood Map for Planning (Rivers and Sea)" (refer to Figure 6.1), the site is located within Flood Zone 3a - an area assessed as having a high probability of flooding from rivers and sea without the local flood defences. The flood defences protect the development area against a river flood with a 1 in 100 annual probability or 1 in 200 annual probability of sea flooding.

The proposed development comprises of plant areas and "back of house" care facilities including communal areas and a public cafe at ground floor level with residential units at the upper floor levels.

In accordance with NPPF Table 2 (reproduced below), leisure, cultural and cafe uses at ground floor level are classified as "less vulnerable" and the residential uses at first floor level and above would be classed as "more vulnerable".

Referring to NPPF Table 3 (reproduced below) "less vulnerable" land uses are suitable in Flood Zone 3 and the "more vulnerable" uses, i.e. the residential units require the Exception Test to be applied and passed.

Flood Risk vulnerability classification (see Table 2)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

National Planning Policy Framework: Table 3 - Flood Risk Vulnerability and Flood Zone 'Compatibly'

Essential infrastructure
- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable
- Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure").

More vulnerable
- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, *subject to a specific warning and evacuation plan.*

Less vulnerable
- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

Water-compatible development
- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to a specific warning and evacuation plan.*

National Planning Policy Framework: Table 2 - Flood Risk Vulnerability Classification

6.2 Exception Test

The NPPF states that:

"If, following application of the Sequential Test, it is not possible or is not consistent with wider sustainability objectives for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared.
- A site-specific flood risk assessment must 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.
- Within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location.
- Development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems."

There are a number of points that have been considered in respect of providing evidence for the Exception Test:

- There is a considerable shortfall of modern appropriate housing for the elderly both locally and nationally. The proposed development will provide modern, purpose-built Specialist Extra Care housing.
- The proposed enhancement of the metropolitan open land space fronting the River will provide benefit to the community. Community facilities will include a cafe, a childrens play area and access to the MOL.
- The proposed development will met relevant environmental and sustainability standards noted in national and planning policy.
- The development targets an 'Excellent' score under the BREEAM resulting in high standards of sustainability through design and building quality, with attention given to reducing the environmental impact throughout the whole lifetime of the proposed development.
- The proposed development will provide sustainable benefits to the wider community by the reduction in volume of surface water flow in extreme rainfall events by the provision of SuDS devices.
- The development land currently sits within and below the tabulated breach area and levels. Rising the entire development above the breach level of 6.09m AOD would impact on the surrounding flood plain and flow paths in the event of breach. The volume of displacement from the proposed development if raised would impact on the surrounding flood levels.
- The more vulnerable uses are located at first floor level 8.6 m AOD and above which is 2.5m above the maximum flood level of 6.09m AOD provided by the Environment Agency in the event of a breach event (refer to Appendix 3).
- The EA inspect the flood defences twice a year and confirmed that the current grade of defences in the area is 2 (good) in the Borough. These defences are maintained in good condition and are therefore unlikely to fail.
- The site is located within a Flood Warning / Flood Alert area which would alert occupiers to potential flooding allowing them to move to upper floors if necessary under supervision of trained staff. Detailed consideration of emergency procedures in the event of breach of flood defences is given in Section 7 of this report.

It is therefore believed that the more vulnerable uses on the site pass the requirements of the Exception Test, and should be taken into account by the Local Planning Authority.