Flood Risk Assessment

T00TING TRIANGLE
366 CAVENDISH ROAD
LONDON SW12 0PP
February 2020

Flood risk assessment in support of a planning application for erection of rear and side extensions with installation of new roofing; installation of new doors; installation of new platforms with disabled access ramps; installation of new all weather football pitches with associated fencing and floodlights.

1.0 **Introduction**

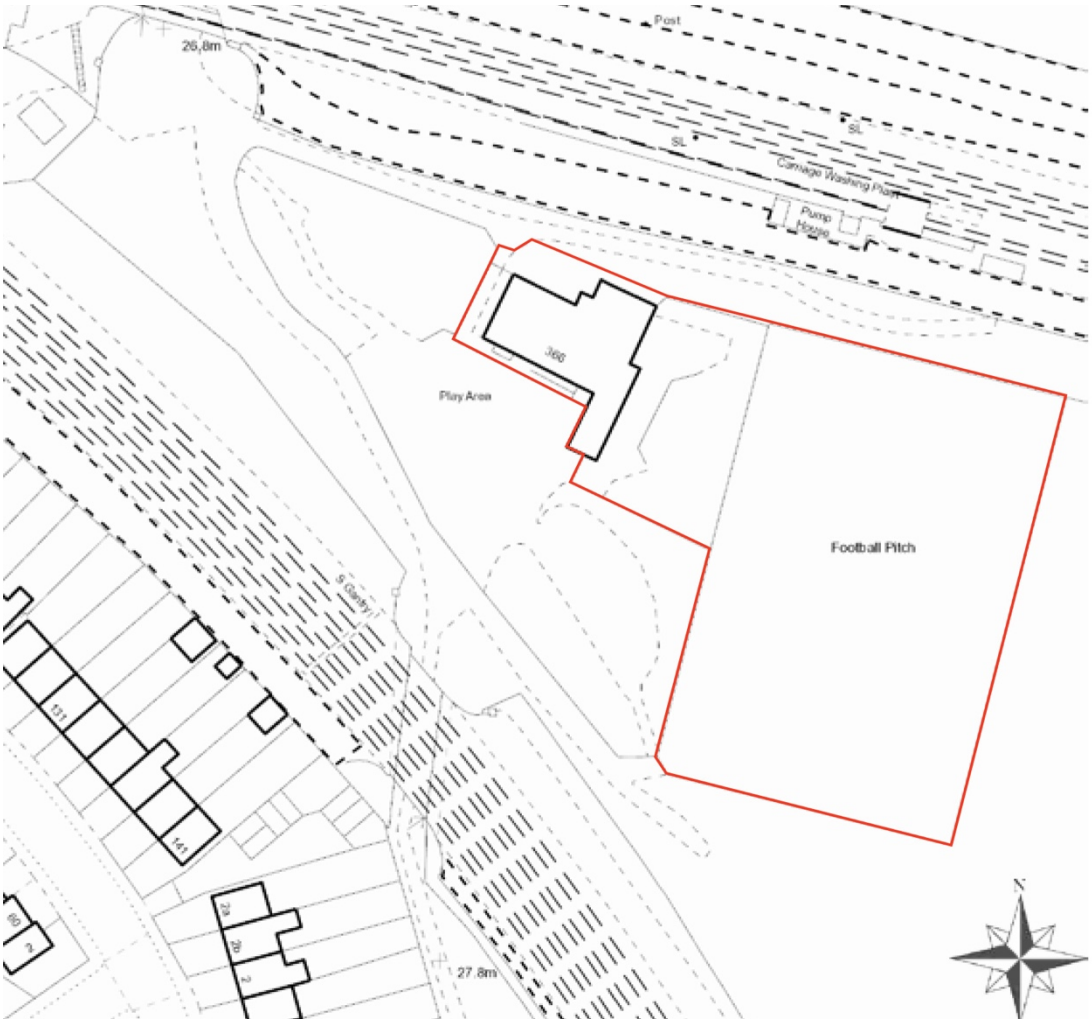
1.1 This Flood risk assessment's purpose is to identify and assess a known flooding problem and seek to put forward an effective and permanent solution to the problem.

1.2 The application site is known to flood during wet weather on a regular basis.

1.3 The application site currently does not have adequate surface water drainage in place.

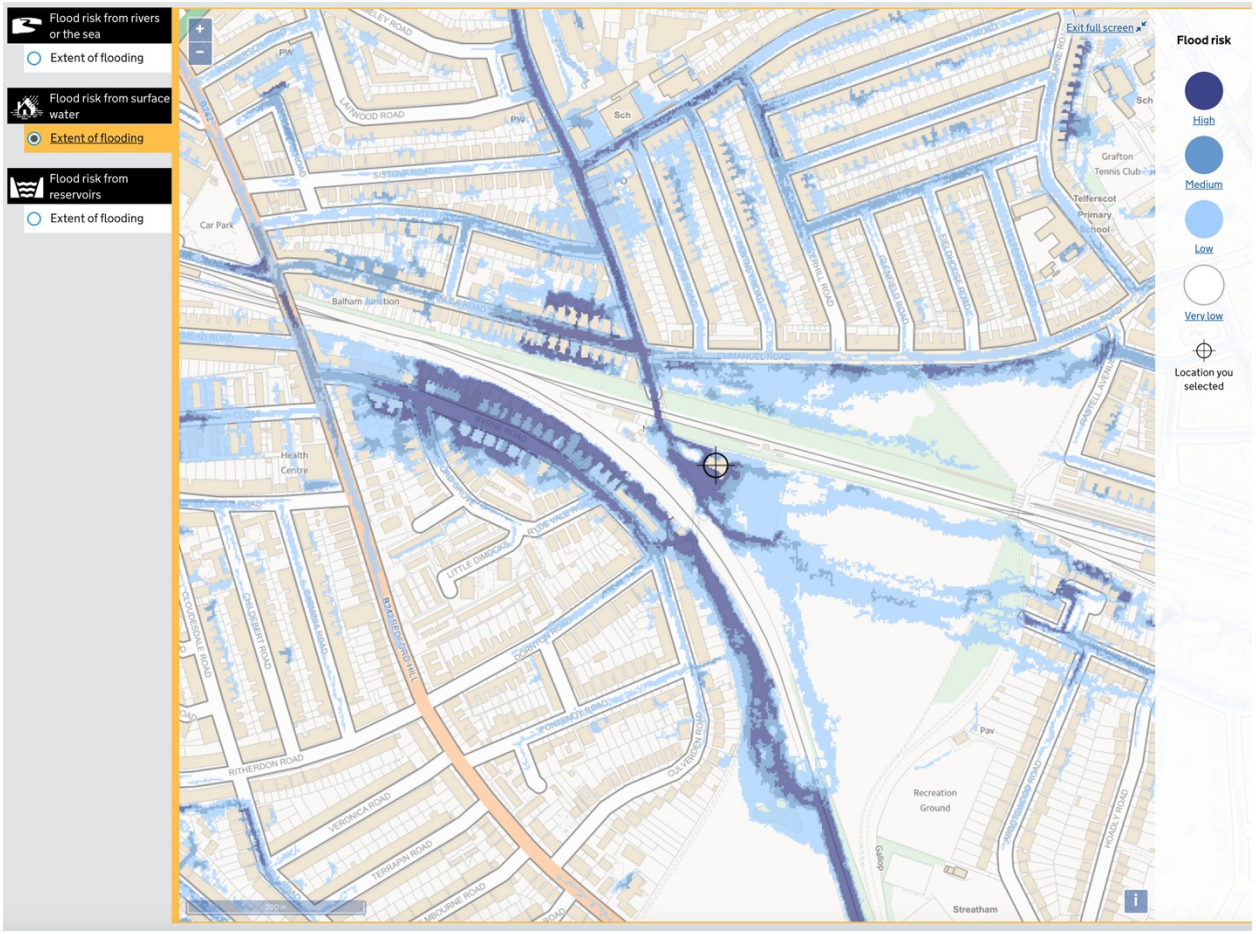
1.4 The application site covers 5000 square metres and consist of the existing boxing club, play group space, garden and football pitch all of which are often put out of action by surface water flooding.

1.5 There is no flooding from rivers or sewers; the flooding is solely due to precipitation.



Site location plan

2.0 Assessment of known flooding



2.1 According to the Environment Agency data there is a known risk of surface water flooding at this site which is well confirmed by recent on site observations.

2.2 Observation 1. on 16 January 2020 following heavy overnight rain the football pitch, garden, play area and changing rooms to the Boxing Club were inundated. While water was going down the channel drain in the garden, it was not able to discharge fast enough to prevent the water penetrating the buildings.

2.3 Observation 2. on 11 February 2020 the garden and pitch was mostly clear of water, but the common to the east had areas of standing water and no capacity to hold any more.

2.4 Observation 3. on 13 February 2020 following heavy overnight rain the pitch was flooded and water was running in the garden and managing to escape via the channel drain. Water did briefly flood the floor of the changing rooms, then subsided. Water was observed running down the path at the northeast corner of the site constantly topping up the standing water on the pitch and in turn, flowing into the garden.

3.0 Assessment of cause of flooding

3.1 The overall site is very flat with the topographical survey showing a fall of only 100mm over 170 metres from the southeast corner to the northwest corner, so standing water cannot escape to lower ground.

3.2 The subsoil is heavy London clay and totally impermeable, so surface water cannot soak into the ground.

3.3 Although the topographical survey does not cover the common to the east of the site, it does appear to be just slightly higher, which is borne out by observation of the water running onto the pitch on the northeast corner.

3.4 The drainage schematic shows that all surface water on the application site can only escape via the channel drain in the garden that is connected to the building's 100mm foul drain.

3.5 The south of the Triangle manages better as there is a large gully near to the play area that feeds directly into Thames Water 300mm drain close by. Water was observed running from the common along the track parallel to the railway and draining freely into this gully on both 16 January 2020 and 13 February 2020.

3.6 When there are periods of wet weather the top soil on the common grassland becomes saturated to the point that it is effectively a bog. If there is further rain in this situation it drains towards the west and floods the football pitch and garden beyond.

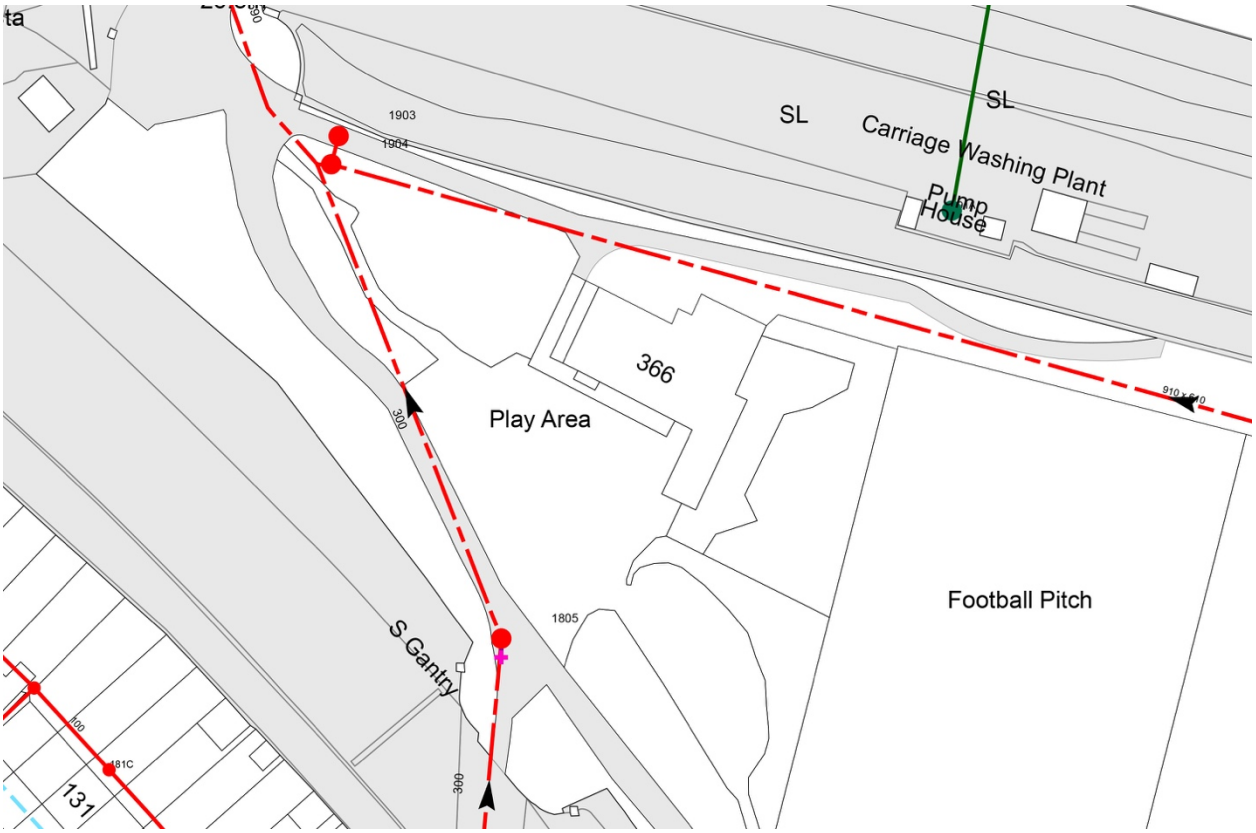
3.7 The large volumes of water generated by heavy rain onto already saturated land can only escape via the gully on the south side of the Triangle and 100mm foul drain serving the building on the north side.

3.8 The 100mm drain does not have the capacity to remove these large volumes of surface water quickly enough, so they back up and the water spreads.

3.9 Although there is no documentation available, we are advised by the management of the site that at some point in the past a land drain consisting of a trench filled with sand and gravel was installed between the common and the pitch and that a soakaway was constructed to the south of the pitch. The soakaway would only be able to release water to the topsoil as the underlying subsoil is impermeable clay; therefore, once the topsoil is saturated the soakaway ceases to function.

4.0 Conclusion and proposed solution

Thames Water sewer map



4.1 Below ground there is substantial drainage capacity with a main carrier sewer running along the north side of the common and exiting towards Cavendish Road under the railway bridge. Also connecting to this is a 300mm diameter pipe running from the south side of the Triangle.

4.2 The drainage survey shows that the current 100mm foul drain from the buildings on the site connect to Thames Water's chamber no.1904 which has an invert level of 5.07 metres and feeds into a culvert measuring 1070mm x 690mm.

4.3 Because the 100mm foul drain is the only means of draining surface water currently an alternative higher capacity drain will be required or the flooding events will continue.

4.4 The proposed all weather sports pitches and stay and play facilities will not be able to operate during wet weather if the current drainage is not considerably improved.

4.5 It is proposed to run a large capacity 450mm diameter surface water drain to connect the deep level sewer running below the site and to bypass the current 100mm foul water drain.

4.6 The current pitch will be taken up and a new permeable substrate laid with a network of 60mm perforated pipes connecting to two 100mm collector pipes which will effectively remove any surface water as it forms in wet conditions.

4.7 The new pitch will be two metres shorter than the existing pitch, so at the north end of the pitch there will be space to lay 50 metres of 450mm perforated drainage pipe that will both collect water draining from the pitch and water running off the common as most of that water collects in this location.

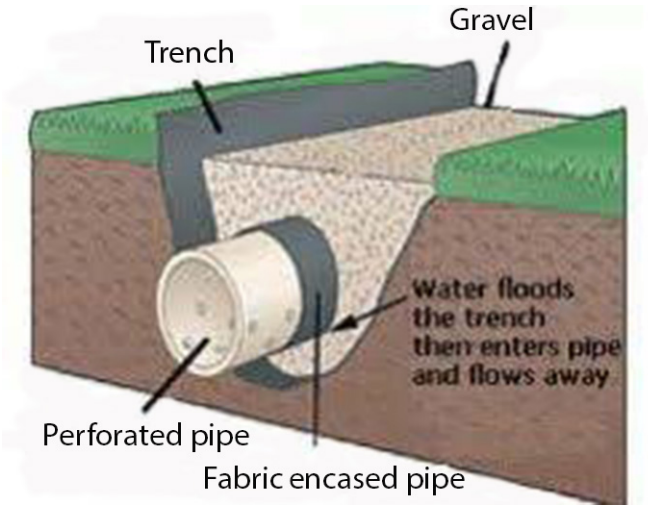
4.8 The precipitation event water volume calculations provided by Croft Structural Engineers specify that a 450mm diameter pipe is required to remove such volumes of rain water in the most extreme rainfall events. This diameter of pipe will be more than adequate to remove excess surface water draining from the common as this water is not fast running.

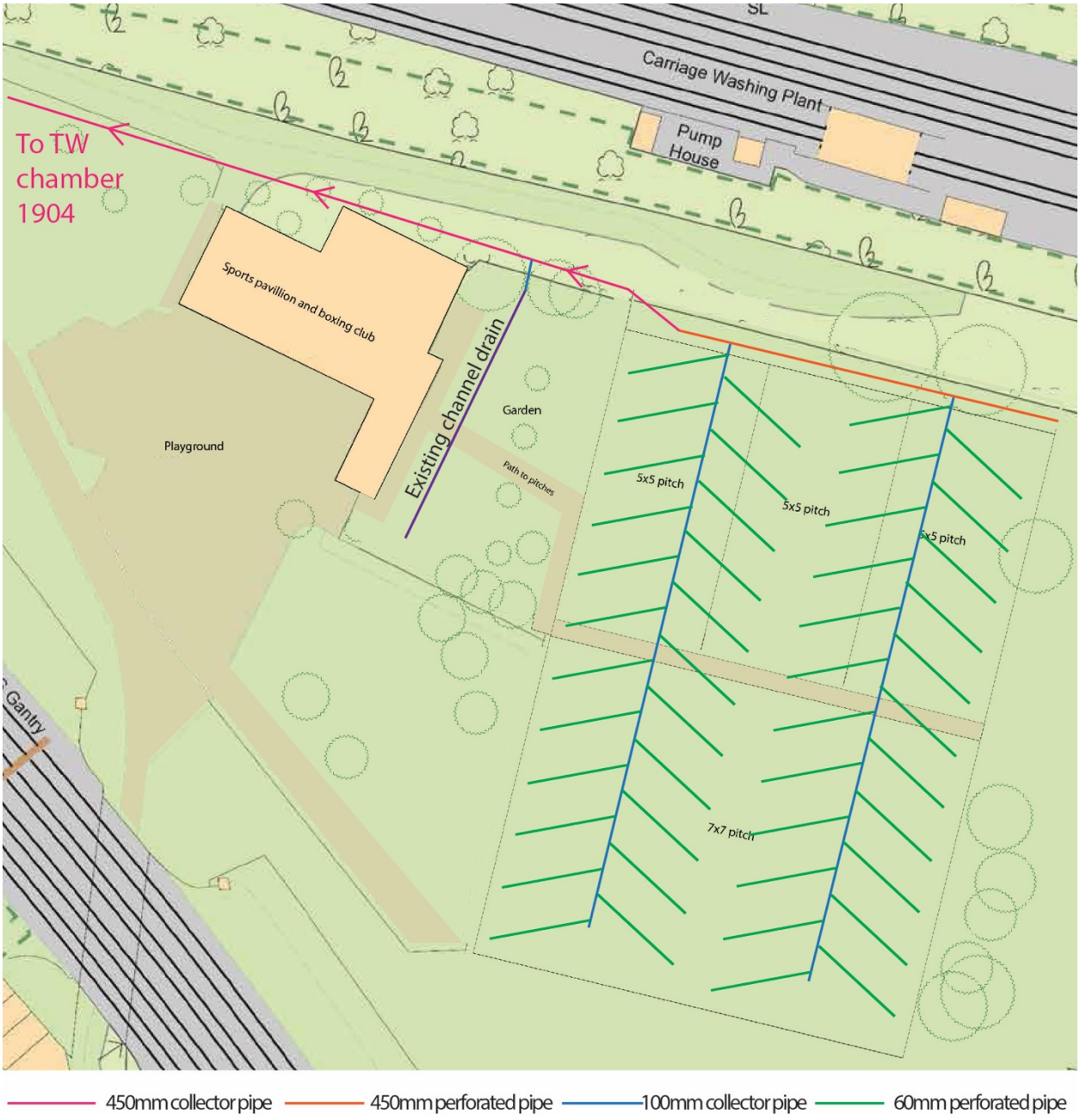
4.9 The new 450mm surface water drain will connect to the 450mm land drain pipe and run a further 90 metres parallel to the path along the north side to connect to the Thames Water sewer chamber no.1904 located close to the entrance to the children's play area.

4.10 The channel drain in the garden will be disconnected from the foul drain and connected to the new 450mm surface water drain.

4.11 Only with the aforementioned robust measures to drain excess surface water will it be possible to prevent further flooding problems and allow the sports and play and stay facility to function fully in all weather conditions.

4.12





Proposed surface water drainage plan.

Appendix:

1. Site drainage schematic
2. Photographs of flooding
3. Thames Water asset report
4. Thames Water sewer flooding report
5. Environment agency river flood assessment
6. Engineer's surface water volume calculation