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Sofie Fieldsend / Flood Risk Team
London Borough of Camden

By Email: Sofie Fieldsend <Sofie.Fieldsend@camden.gov.uk>

Dear Sofia / LBC Flood Risk Team,

190 GOLDHURST TERRACE
RESPONSE TO LBC FLOOD RISK TEAM

This letter is to address the comments from the London Borough of Camden (LBC) regarding the flood risk concerns of the proposed basement extension (2021/2946/P) on the 18th July 2022.

Since the issue of our previous work, the LBC Section 19 Flood Investigation Report has been issued to the public for the 12th July and 25th July 2021 flood events. This included a detailed section on the flooding experienced in Goldhurst Terrace.

The most recent response from the LBC flood risk team includes information from the newly published Section 19 Flood Investigation Report for the July 2021 event. As such, we have reviewed this new data in respect of the proposed development at 190 Goldhurst Terrace. Please find this below:

Review of Camden Section 19 Flood Investigation Report

The Section 19 reports concludes that the properties at the western end of Goldhurst Terrace did not experience flooding of any kind in the 12th July and 25th July 2021 flood events. Figure 3-21 of the Section 19 report) shows the site is clearly located in an area of "No Impact" from flood events. The closest reports of flooding including surcharge are approximately 200 m to the east of the site, in the low-lying area of Goldhurst Terrace.

The low-lying area of Goudhurst Terrace is designated as an area which is deemed a "Flood hotspot" in the Section 19 Report (Figure 4-18). The western and eastern ends of Goldhurst Terraces, including the site, are not classified as being in this said "Flood Hotspot" because they are naturally elevated.

Reviewing the evidence within the report: Photographs 82-84 are taken at the junction with Fairhazel Gardens. This is part of the low-lying part of Goldhurst Terrace. Photograph 79 is taken on Goldhurst Road. This photograph shows Wilson House in the background. Wilson House is a distinctive block of flats on Goldhurst Road and is located at 161-169 Goldhurst Terrace. This block of flats is located at least 300 m to the east of the site. The depth of flooding shown in the photographs is deep enough to overtop the pavement (typically 150 mm) but not sufficiently deep enough to lift cars (300 mm[1]). If more than 300 mm of flooding occurred, it is possible for vehicles to be lifted by flood water and float away. There were no reports documented of any cars being moved in the July flood events which further demonstrates that flood depths were less than 300 mm, even at the lowest part of Goldhurst Terrace.

[1] https://www.theaa.com/driving-advice/seasonal/driving-through-flood-water

As outlined in our previous correspondence, the area predicted to flood and those areas which experienced flooding in July 2021 (roughly the same location) do not to affect 190 Goldhurst Terrace.

The Section 19 report also concluded that flood depths were also elevated during both flood events because of poor maintenance of the gullies. A number of the gullies were reported blocked before the flood events. This could have amplified the flooding situation in Goldhurst Terrace.

Taking this addition information, we will now address each comment in turn.

Comment – "*straightforward analysis of local, and site, topography in relation to surface water flooding sources (assume nearby highways & other hard standing channels in respect of surcharging sewer drains and/or overland flows from higher elevations)*"

The previously issued technical note (19032-FRA-TN-01 C01) and formal report (19032-FRA-RP-01 C02) presented a straightforward analysis of the local topography via LiDAR data and the site levels from an on site topographic survey.

Goldhurst Terrace is a long road, over 1 km in length with a natural valley located at the junction of Fairhazel Garden. The assessment undertaken by us in the technical note on the local topography is reflective of the statements in section 4.5.3 in the Section 19 report by LBC.

The Section 19 Report makes the point that the slope of the road will create a continuous flow path for the surface water to the low-lying sections of the road. We agree with this assessment. The slope of the road at the western end of Goldhurst Terrace will encourage overland flow / surface water to the low-lying point on the road. The surface water will therefore flow past the site or be intercepted by highway gullies.

In terms of surface water flow from "higher elevations", the junction of Goldhurst Terrace with Priory Road is the natural watershed for the road. The Section 19 Report alludes to this, as the investigation of the flooding in Priory Road is shown to be southwards towards Belsize Road. No.190. is approximately 150 m downhill of the watershed and 300 m upstream of the low point. Any surface water in the area would flow past the site and not pool. This is shown clearly in the assessment of LiDAR data in the technical note issued previously.

Sewer flooding occurs when the sewer network reaches capacity and floods (surcharges) at road level or internally within developments. Typically, sewers surcharge / cause flooding from their lowest point in the system and start to back up the drainage network and flooding occurs were the network opens up first; be that a manhole in the road or a connection to a development.

The Section 19 report records a manhole cover in Goldhurst Terrace surcharged. The estimated flood levels were 200 mm. This depth of flooding correlates to the photographs within the report, which are located some 300 m east of the site. As previously mentioned, the flood water is shown to be deep enough to overtop the pavement (typically 150 mm) but not sufficiently deep to lift cars (300 mm[2,3]).

The Thames Water asset plans show the site is served by a brick lined egg-shaped sewer which is 956 x 635-610 mm. The top of the run is located outside 196 Goldhurst Terrace, and there is a corresponding 991 x 610 mm egg-shaped sewer running east along Aberdare Gardens from the same location. The capacity of these

[2] https://www.theaa.com/driving-advice/seasonal/driving-through-flood-water
[3] DEFRA/Environment Agency Flood and Coastal Defence R&D Programme "Flood Risks to People" Phase 2: Guidance Document (FD2321/TR2), March 2006

two sewers combined is such that it is extremely unlikely that surcharge will occur at the manhole at the head of the run. There are no further manholes shown on the Thames Water asset location plans until well downstream of 166, although there are small air vents in the centre of the carriageway outside number 194 and 178. The position of the property near the head of the runs reduces the likelihood of sewer surcharge because of the flow dynamics of pipe surcharge. In addition, the average gradient of the road is approximately 1 in 130 from the head of the run to a point outside number 194, where it steepens to approximately 1 in 100. The gradient further increases to 1 in 80 around number 140, before levelling off at around number 120. Since the sewer is of brick construction it is likely to mirror the slope of the road. Thus, the most likely location for surcharge is in the area immediately upstream of number 120 where the gradient reduces. This is approximately 200 m to the east, where the road is approximately 2 m lower than outside the site.

The Thames Water sewer flood history confirms that Thames Water hold no records of internal or external flooding from sewers at the property.

The depth of the Thames Water sewer at 190 Goldhurst Terrace is not catalogued in the Thames Water asset records system, although the head of the run is 4 m below ground level at 37.44m AOD. Due to the construction type and age of the sewer, it is likely that the depth is relatively consistent and therefore would be expected to be around 4 m below ground level along the length of the road, however this is uncertain. The depth of the sewer therefore cannot be analysed against the proposed depth of the proposed basement. It is not uncommon for basement extensions to be at a similar depth to the adopted sewer network. A full CCTV survey of the site drainage should be undertaken as part of the drainage design (detailed design) to determine the current drainage network (route & depth) and point of connection to the Thames Water sewer.

With all below ground extensions it is highly recommend that a positive pumped drainage system and / or non-return pump is introduced to the drainage network on site. This is to reduce the risk of internal sewer flooding at basement level. The design of the drainage for the development will implement this measure.

Comment – "do not exercise strict reliance on EA/Camden published flood risk modelling results"

The email from the LBC flood risk team states, "*there is an overreliance of the Surface Water flooding maps*". This would be appropriate statement if there was a more reliable data available, or the detailed analysis of the ground levels and slopes in the area had not been incorporated into the previous assessment. As outlined in point 3.6 our Technical Note the Long Term Flood Risk Maps for Surface Water / Drain London is the best available dataset on surface water flooding, and is appropriate for "Town to Street" level in this location - the second highest level of reliability, indicating a high degree of scrutiny and calibration of the modelling. The assessment is based on these as the starting point, and then supplemented by local ground level analysis and evidence from the London Review and other anecdotal evidence.

The assessment of flood risk has assessed local topography and historic evidence alongside the flood modelling available throughout this process and is therefore based on evidence derived from a variety of sources all of which support the same conclusion that the site is not at risk of flooding.

Comment – "*attributes of the existing/proposed buildings in relation to position of potential water ingress points*" and "Application of a freeboard of 300 mm"

The FRA report and technical note has outlined a freeboard is not required for the development because it is located outside an area at risk of flooding. This is in accordance with the Environment Agency standing advice for minor household developments.

The entrances are already or are proposed to be elevated above the surrounding ground level. These are listed in point 3.15 of the technical note.

The design of the rear lightwell has incorporated the comments from the LBC flood risk team and design team for the basement extension for the ground floor flat at 190 Goldhurst Terrace, and will lower the external lightwell by 300 mm to ensure the basement will have a raised finished floor level above the lightwell / patio.

Conclusion

The site is not at risk of surface water flooding as demonstrated by multiple sources including:

- Drain London / Long Term Flood Risk Mapping: robust "town to street" standard surface water flood modelling (which indicates areas of the street that are at risk of flooding, allowing for confirmed surveyed extents and capacities of the sewer network and other hydraulic structures in the area);
- Detailed reports into surface water and sewer flooding events, including both London Review and the Section 19 flood reports into the 2021 flood events; and
- Analysis of the ground levels and slopes of the general area, the road, and the Thames Water asset information including depths and location of possible surcharge points.

As the site is not at risk of flooding, and threshold levels are raised at least 300 mm above road levels and over 150 mm above surrounding ground, all habitable uses are acceptable for the proposed development. This includes the basement, which is only accessed internally.

Yours sincerely,

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Associate

Encl.