Eckersley O'Callaghan

For the Attention of:

Lead Local Flood Authority
London Borough of Camden

17241 / MJ
09.12.2019

Dear Sir/Madam

156-164 Gray's Inn Road, WC1X 8ED – Application Reference 2019/4478/P

We have been forwarded your response to the Flood Risk Assessment and Drainage Strategy issued with the above Planning Application reference.

To enable us to address your concerns we have extracted the items raised as 'issues' and 'actions for applicant' in your response. Taking these in order we respond as follows:

Issue: Applicant appears to have used the 30-minute storm scenario whereas the 6-hour event should be used instead.

Response:
We note you refer to 'Best practice guidance recommended within the non-statutory technical standards' which you maintain calls for constraint of run-off volumes to greenfield run off volumes for the 1 in 100 year 6 hour event.

We would point out that this is the case for Greenfield developments only. The requirement for previously developed sites is as follows:

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

We have made the case in the Flood Risk Assessment and Drainage Strategy that the site is highly constrained with a good proportion of the existing structures, basements etc. remaining in place, which restricts the amount of attenuation storage available bearing in mind the need for buried incoming services and the like. Nevertheless we have reduced the run-off rate to well below the existing whilst allowing for a 40% increase in rainfall due to climate change. We therefore maintain that we have achieved and arguably exceeded the requirement in the non statutory technical standards in this regard.

Issue: 1:100 yr plus 40% climate change events are discussed but figures are not provided.

Response:
If you refer to the attenuation calculations appended to the FRA & Drainage Strategy; on page 3 of each of the Microdrainage calculation sets you will note that the 1, 30 and 100 year rainfall figures used include a +40% allowance for climate change. See the following screen clip.

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 531001 182083	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Thus the design is based on an addition of 40% to the rainfall and the storage volume is increased to suit.

Issue: Not meeting minimum 50% improvement. The report states – reasonably – the following:

Due to the intensity of development already on the site it is considered that achieving a 50% run-off reduction in line with the minimum London Plan and Camden SFRA requirements whilst mitigating climate change impacts would be a practicable response to the site constraints.

The proposed discharge rate for the 'West catchment' part of the site is 4.78 l/s, a 75-81% reduction (30 & 100 yrs no climate change – see issue above) which approaches greenfield rates.

However, no reduction is proposed for the East part meaning the proposed rate for the entire site is 27 – 35 l/s or a 34-37% reduction (again with no climate change allowance added). As it stands this does not meet policy or the report's own target of 50% (allowing for climate change), quoted above.

Response:

Apologies, we should have made it clearer that although the target was a 50% reduction for the whole site, this would not be 'reasonably practicable' in line with the non statutory technical standards bearing in mind the retention of all of the existing buildings and basement areas on the Panther House side of the development. We have therefore maximised the attenuation storage on the Gray's Inn/Tram shed area to balance out the overall impact of the development as far as practicable. As noted above, climate change allowances have been made and we therefore consider that the reduction in run-off is well in excess of the minimum required by the non statutory technical standards.

Issue Content of Pro-forma is not consistent – numbering of report references needs updating.

Response:

Further apologies, a paragraph was introduced to the body of the FRA & Drainage Strategy and the required changes to references in the pro forma were not picked up. The attached Revision A of the FRA and Drainage Strategy should resolve this.

Issue A maintenance schedule has been referenced in the Pro-forma but could not be located in the report.

Response:

Section 7 of the FRA and Drainage Strategy outlines the maintenance items that would need to be covered in the operation and maintenance manual for the development. Normally the maintenance schedule is produced during detailed design rather than at planning stage so that it covers the actual facilities installed. We also sometimes issue generic maintenance schedules in response to a Planning Condition. To confirm that the Applicant takes the issue of drainage maintenance seriously we have appended a draft maintenance schedule that would form the basis of the final version produced at building handover.

Action for applicant: Submit required information and review targets. They should include drawings showing details of SuDS extent and position (including invert levels and site exceedance flows), as well as details on maintenance requirements and arrangements.

Response:

The attached revised FRA and Drainage Strategy shows invert levels for the attenuation storage and the flow control manhole, which were included in the calculations previously but not shown on the drawing. The revised drawing also shows indicative drainage exceedance flow routes.

Issue Details of the attenuation tank arrangements are sparse.

Response:

We have added further details of the tank on the revised drawing 1461/C01 Revision D. We cannot reasonably develop the design further until planning is granted as it requires input from the contractor and further coordination with foundations. I can confirm that any changes would not affect the capacity of the tank or cause any increase in off-site discharge rates.

Issue No maintenance plan provided.

Response:

As stated previously we have appended a draft maintenance schedule that would form the basis of the final version to be produced at building handover.

Issue The report has apparently not considered blue or blue-green roofs. This option should be considered to improve runoff rates by adding capacity at the point of rainfall. Blue roofs could reduce the reliance on buried tanks and presumed pumped storage, which are further down the drainage hierarchy.

Action for applicant: Provide missing details and review strategy to include blue or blue-green roofs where feasible.

Response:
The proposed attenuation storage is a simple gravity system with no pumps required. The design team have given consideration to incorporating blue-green roofs, however they have not been incorporated for the following reasons:

- The requirement for raised parapets would increase the building heights slightly and potentially raise issues of overbearing on adjacent properties and general reduction in aesthetic quality
- The increased maintenance requirement at high level would worsen health and safety concerns and require challenging means of access through the roof from inside the buildings
- The increased roof and parapet loading would impact the structural requirements, particularly where the existing structures are being retained with the addition of extra floors.
- Given that a relatively simple, easily maintained attenuation system can be installed at ground level with a controlled gravity outlet restricting the discharge by significantly more than the non statutory technical standards require, it was felt that green/blue roof system would not add sufficient benefit to outweigh the increased maintenance, construction cost and operational risk.

We trust the above responses address your concerns adequately and enable you to respond positively to the Application with respect to flood risk and drainage issues. If you require further information please get in touch.

Yours Faithfully

Martin Jones MICE
Director – Infrastructure Design Studio

Appendix 1 – Drainage Maintenance Schedule

156-164 Gray's Inn Road & Panther House – Drainage Maintenance Schedule			
Ref	**Maintenance Item**	**Required Action**	**Frequency**
01	**Below Ground Drainage Pipework**	All drainage to be fully jetted and inspected for integrity by CCTV survey.	10 yearly
		Where pipework is damaged or obstructed localised repairs will be needed immediately to ensure operation of drainage systems.	As required
02	**Manholes**	Inspect manholes and for integrity and debris. Remove cover and ensure water is flowing freely and unobstructed.	5 yearly
		Clean out blockages and repair damage	As required
		To be cleaned via jetting when any debris/ silt reduces the cross-sectional area by 20% or more. Inspection to include both the channel and silt trap/ gully outlets.	As required
03	**Roof Gutters**	Visually inspect gutters for leaves and debris.	Annually
		Clearing/jetting of gutters to remove build-up of debris and leaves to prevent carry of material to below ground system. Waste material to be disposed to refuse.	As required
04	**External Gullies**	Inspect surface water gullies and silt traps for silt depth, damage and general functionality	Annually
		To be cleaned with vacuum tanker when silt exceeds 50% of catch pit depth	As required
05	**Overland Flow Paths**	Inspection of overland flow routes to ensure route not blocked by new structures, furniture, overgrown vegetation, fences, walls or debris. Remove and maintain as necessary	6 monthly
06	**Vortex Flow Control**	Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Ensure bypass flap is closed.	Annually
07	**Attenuation Storage**	Remove silt and debris from the silt trap sump when attenuation is dry and when silt level exceeds 50% of catch pit depth (150-200mm depth of silt).	As required