

1331/APP/2017/1883 - Former Nestle Factory , Nestles Avenue, Hayes,

Barratt London Residential Development

Flood Risk and Drainage

This note has been compiled in response to comments dated 3rd July 2017 from London Borough of Hillingdon Flood Risk Authority. The responses relate to the comments on the residential development only.

We have reviewed the comments received and would like to respond as follows:

Foul Drainage

At the time of issue of the FRA Thames Water were in the process of carrying out a capacity assessment of their foul sewers located within Nestles Avenue. The purpose of this was to ascertain whether the existing sewers would have sufficient capacity to cope with the proposed development.

Thames Water have now completed their assessment and have confirmed that their existing sewers have sufficient capacity. Correspondence from Thames Water confirming this is attached in the appendices.

Surface Water

Catchment Areas

Please find attached the updated catchment area plans, C151867/C/100 P2 (Existing Drainage catchment areas), C151867/C/101 Rev P7 and C151867/C/104 Rev P3 (Proposed drainage catchment areas).

The catchment area plans demonstrate how the existing catchments that drain to Nestle Avenue and the canal compare to the proposed catchments to these areas.

i.e. the existing catchment to Nestle Avenue is 35,229m². The proposed catchment to Nestle Avenue is 20,027m². The proposed catchment to Nestles Avenue is therefore reduced. The existing catchment to the canal is 36,282m², the proposed catchment is 20,743m² which again is significantly reduced from the existing.

Where areas can be drained to verges or permeable landscaping these have been excluded from the proposed catchment plans.

Condition of Existing and Retained Assets

There are three existing outfalls into the canal located with the Barratt site. Where possible we shall retain and reuse existing outfalls into the canal. Within the next stage of the design works the length of existing pipe which leads to the outfalls shall be surveyed for condition. Where the condition deems the pipe to not be reusable the pipe shall be replaced. As a minimum we would expect to need to refurbish the flap valves for each retained outfall to ensure it's in good working order. The existing pipe diameter / or angle to the canal

Hydrock Consultants Ltd

Registered office: Over Court Barns, Over Lane, Almondsbury, Bristol BS32 4DF
Registered in England & Wales no. 3118932

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may also require the pipe to be replaced if it is not suitable. This is something which shall be worked through during the next stage of design. The current design is based on the existing invert level of the outfalls.

The drainage layout also shows a number of connections into the Thames Water sewers in Nestles Avenue for both the surface water and the foul water. These generally connect via an existing manhole, apart from one location where a new manhole shall be constructed to allow the connection.

While the surface water that enters the Nestle Avenue drainage may enter Yielding Brook, the same outfall and sewers within Nestles Avenue also serve many more properties. We would not consider it our responsibility to address the condition of the Thames Water network all the way down to its point of outfall. Additionally, the proposal to restrict the site to green field run off rate which is significantly reduced from the existing brownfield rate shall only have a positive effect on the water level in Yielding Brook. If the outfall is submerged or not it will be no worse than the existing situation following the development.

Greenfield Rates

In line with your comments we have recalculated the proposed discharge rate to the Thames Water Sewers for the site based on 1 x the greenfield runoff rate.

The proposed discharge rate shall therefore be 44.5l/s for a 1 in 100 year +40% CC event.

The proposed discharge rate to the canal was based on the calculation method stipulated by Canal and River Trust which allows the discharge to match the existing flows. Recent correspondence with the CRT shows that they are happy with this and that their risk assessment shows there to be no detrimental effect due to the canal working as a form of attenuation (correspondence is attached) . However, we propose a 30% betterment of the existing flow. The proposed discharge rate shall therefore be 60l/s.

Climate Change

To clarify, the climate change used for design purposes is 40%. The proposed discharge rate calculated for either the TW catchment or the Canal catchment does not have a climate changes figure applied in line with guidance. Where the CRT proforma shows other climate change figures, they are in error.

Sustainable Drainage Measures

To account for the additional attenuation required following the revision of the discharge rates we have extended the use of SUDS within the site.

The initial design included permeable paving within roadways and most car parks, blue roofs on the podiums and green roofs on the new blocks.

In response to the LBH comments blue roofs have been added to the new blocks. This shall work in combination with the green roofs to store water, some of which will be lost through evaporation and transpiration, the remainder shall be released at a limited rate. A blue roof remains within the podium landscaping.

Permeable paving remains within the roadways and most parking areas. Within Sandow Yard we are proposing to use below ground crates. The rear portion of Block F1 is to drain to the canal via this attenuation,



the distance away means that the invert required of the attenuation suits below ground crates but would be unreasonable for permeable paving to be at such a depth (greater than 1m).

In addition to the above SUDS we have considered options for above ground conveyance and storage, some of which have been included, others have been discounted. The options considered are as follows:

Option Considered	Included Y/N?	Reasoning
Swale to bottom of existing rail embankment adjacent to Coffee Park to drain running track	No	Concerns over amending embankment/ existing trees and lengthy permissions/ dealings with Network Rail
Rainwater harvesting - Draining of Coffee Park Track to dished channel, water collected for use as irrigation to Viveash Square gardens	Yes	Water harvesting from track can be collected and stored for gardens irrigation
Sunken Tree pits to Sandow Walk	Yes	The road shall be cambered to drain surface water runoff into tree pits that line Sandow Walk. This shall allow filtration of the water, enhancing water quality as well as reducing the volume of water leaving the site. Surplus water shall drain into the network.
Tree pits alongside Milk Street and Canal Street acting with permeable paving	No	The tree pits shall act independently of the permeable paving taking the nearby footway catchment only. Water from the adjacent permeable paving shall not be able to cross over to the tree pits from the permeable paving because there are concerns that the volume of water would be too great for the tree. There shall be an impermeable liner between the two. Additionally the tree pit cannot be drained back into the permeable paving as the tree pit is significantly deeper.
Suds to Sandow Square	No	This area is a play/ activity area and is not suited to SUDS. Aco style channels within this area shall drain positively to the permeable paving.

Exceedance Events

The network is built up of different forms of attenuation, blue roof, permeable paving and below ground crates. The permeable paving is designed to store a 1in 100 year event +40% climate change within the voided subbase. In the event of a storm exceeding this the surface run off shall still enter the permeable paving and the level shall rise above the top of the voided subbase. There is 220mm of road construction above the subbase, therefore the water level will rise a further 220mm before flooding occurs.

In the event of the storm exceeding the a 1 in 100 year + 40% climate change , the blue roof would be exceeded and the water level rise into the green roof substrate. Water would be stored on the roof, the additional head allowing additional flow out via the orifices. Where the blue roof is situated on the podium slabs water can sit above ground against centrally against the landscaping, the falls ensure the water shall sit away from the buildings. Refer to the podium cross section detail.

External pedestrian areas are graded away from buildings, during an exceedance event water shall be able to sit at the low points at channels/ gullies, until it is able to enter the network.



Future Provision

The design allows for the additional catchment area from the future spaces. The permeable paving is designed based on this catchment but is located only over the 'day 1' permeable paving area. In essence, this is the worst scenario, and if the bays were constructed they would not necessarily be required to be permeable paving as the permeable paving will have been sized to allow for this.

Maintenance

An update to the maintenance requirements table (Table 4 within the FRA) is provided below:

Drainage Component	Actions	Action carried out by and frequency:
External areas	<ul style="list-style-type: none"> Site to be generally kept free from litter and debris which may enter the drainage system. 	<ul style="list-style-type: none"> Site management – continual
Permeable paving	<ul style="list-style-type: none"> Brush/ suction cleaner, replacing any lost material and remove weeds. Inspect for poor operation. Inspect silt accumulation within upstream catchpits. Remedial works to depressions/ cracked blocks. Continual litter management through the site required Remedial measures to structure of pavement 	<ul style="list-style-type: none"> Specialist Contractor -Annually Site management – 3 times a year following heavy rain Site management – may require specialist if issue found –annually Specialist Contractor -as required Site management – continual Specialist Contractor – every 10-15 years.
Green roofs	<ul style="list-style-type: none"> Inspect substrate, all components and vegetation. Remove debris and litter to prevent clogging. Replace dead plants, remove nuisance plants. Mow/ prune as required. Stabilise any erosion channels. 	<ul style="list-style-type: none"> Specialist Contractor – annually Specialist Contractor – six monthly Will occur as required during the above specialist inspections
Attenuation – blue roofs	<ul style="list-style-type: none"> Inspect inlet /outlets for condition and remove silt if needed. CCTV survey the attenuation internally, remove sediment as required. 	<ul style="list-style-type: none"> Site management - annually Blue roof specialist – Annually –to be combined with greenroof inspection if possible



Attenuation – below ground crates	<ul style="list-style-type: none">• Inspect inlet /outlets for condition and remove silt if needed.• CCTV survey the attenuation internally, remove sediment as required.	<ul style="list-style-type: none">• Site management - annually• CCTV drainage specialist - Every 5 years
Bypass separator	<ul style="list-style-type: none">• Inspect, remove litter/ debris and sediment.• Change filter.• Remove oils/ grease etc.	<ul style="list-style-type: none">• 6 monthly, more regularly for first 6 months to establish sediment build up rate – site management• As recommended by manufacturer – by specialist• 6 monthly or after spill. Frequency may be varied dependant on finding of inspections. – by drainage specialist
General network including all channels/ manholes	<ul style="list-style-type: none">• Manholes covers to be lifted and inspected for sediment build up, remove as required.	<ul style="list-style-type: none">• Yearly by site management. If issues found specialist contractor can be called in for remedial works

This development is not being offered for adoption, it shall be managed by a site management company.



Appendix A – Thames Water correspondence

Dear Sir,

I refer to the above impact study related to the proposed development at Nestles Avenue. TW Asset Planners and Modellers have come back with the following response after progressing the study.

- TW Asset Planners:- ***“Thank you for your recent application to undertake an impact study, whilst completing preparatory works in relation to the Impact study, we have determined that the proposed development will not cause detriment to the public sewer system. We therefore deem it unnecessary to continue with our investigation.”***
 - ❖ It would appear that TW Asset Planners have determined that during the early stages of the Impact study, there is no detriment as a result of the proposed development and hence their response above.
 - ❖ As such you can proceed with your development and discharge to TW network as you had initially indicated to TW in your original Pre Development application
 - ❖ Also as only a part of the Impact study was progressed in determining the above, a proportion of the payment made for this Impact study will be refunded. I will take this up with TW Modellers and pass it to TW Admin to process the refund in due course.

Any queries please come back to me,

Regs,

Siva Sivarajan

Senior Adoptions Engineer
Strategic Partnering

Thames Water Infrastructure Alliance

0800 009 3921 siva.sivarajan@thameswater.co.uk

Thames Water Utilities Ltd, Clearwater Court, Vastern Road, Reading, Berkshire, RG1 8DB



Appendix B – Canal and River Trust correspondence

Wed 19/07/2017 14:46

Hi John,

Thank you for your call yesterday.

Regarding accepting surface water discharge from the Former Nestle Factory Site. The Canal and River Trust have carried out a risk based assessment on the proposed discharge rate which will be regulated by means of a licence to discharge to our property. The risk based assessment takes into account the water balance within the canal for maintaining navigation and managing flood risk. The assessment has found the discharge will not represent an increased flood risk to the canal. Additionally discharging to the canal is a form of attenuating peak run-off from the site before water enters the natural watercourse supplementing the SuDS water management chain implemented on-site.

Speaking to the other members of our hydrology and utilities team there has not been an instance of this before and we are keen to ensure that we can continue to accept discharges without challenges from the local authority. If the council continue object please get back in touch.

Regards,

Toby

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