

Our Ref: 66504/LT/001

29th October 2019

**Former Shredded Wheat Site, Broadwater Road,
Welwyn Garden City, AL8 6UN**

Dear Sir/Madam

Please see below Curtins responses to comments made by Julia Puton of Hertford County Council in her letter dated 30th August 2019.

Condition 5:

1. Surface water discharge rates and connection points into the public surface water sewer for each future sub-catchment included within the entire development site.

Curtins Response:

Surface water drainage general arrangements show the location and discharge rate for each outfall. Site consists of 3 surface water outfalls, each controlled using a hydro-brake. Total site outfall is 12.91l/s. Refer to Curtins drawing: 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT (PHASE 1) for discharge rates and connection points. Phase 1 comprises of sub-catchment 1 and part of sub catchment 2.

2. Confirmation of the capacity study results and agreement for the proposed discharge rates and connection points from each future sub-catchment for surface water sewer network undertaken in line with Thames Water recommendations.

Curtins Response:

Thames Water response to pre-development enquiry evidence of acceptable flow and capacity in the system. Refer to Thames Water letter: Wastewater Pre-planning enquiry: Confirmation of sufficient capacity. Thames Water Ref: DS6045396 (Attached in appendices below)

3. Limiting the surface water run-off generated by the critical storm events so that it will not exceed surface water Greenfield run-off rates (or as close as possible rates) for the relevant rainfall events for the 1 in 1 year event, the 1 in 30 year event and the 1 in 100 year event including plus 40% of climate change allowance. If Greenfield run-off rates cannot be achieved, strong technical justification should be provided. As a minimum 50% betterment in run-off rates for each sub-catchment should be provided following the relevant rainfall events including the 1 in 1 year event, the 1 in 30 year event and the 1 in 100 year event including plus 40% of climate change allowance.
No increase of the risk of flooding off-site should be identified.



Curtins Response:

Proposed drainage strategy and drawings highlight the discharge rate, attenuation requirements and compliance with greenfield run-off rates. Evidence of compliance with greenfield rates and no flooding is shown by the MicroDrainage calculation print outs. Refer to drainage strategy 061731-CUR-00-XX-RP-S-001, Drawing 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT PHASE 1), Micro drainage calculations: Outfall SW08 and SW23 and Thames Water letter as above.

4. Confirmation of attenuation volumes required for each phase identified within the development proposal. Final results should be appropriately split between future sub-catchments identified within the drainage strategy.

Curtins Response:

Total storage requirements for each catchment are as follows:

Catchment	Discharge Rate (l/s)	Attenuation Volume (m ³)		
		Storage Tank	Pond	Permeable Pavement
1	6.95 l/s	392m ³	46.9m ³	197m ³
2	5.96 l/s	334m ³	N/A	152m ³
3	6.95 l/s	380m ³	315m ³	270m ³

Refer to drainage strategy 061731-CUR-00-XX-RP-S-001, Drawing 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT (PHASE 1), Micro drainage calculations: Outfall SW08 and SW23.

Note: Sub-Catchment 1 and Sub-Catchment 2 operate and discharge separately.

Condition 6:

1. Providing storage to ensure no increase in surface water run-off volumes for all rainfall events up to and including the 1 in 100 year including plus 40% for climate change event and details as how this is to be achieved.

Curtins Response:

Surface water drainage strategy and MicroDrainage results show there is no flooding during the 1 in 100 year +40% CC event. Reference documents also show there is a net decrease in impermeable area between the pre and post developments. Therefore, a net decrease in volume discharge from the site.

Refer to drainage strategy 061731-CUR-00-XX-RP-S-001, Drawing 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT (PHASE 1), Micro drainage calculations: Outfall SW08 and SW23.



2. Detailed calculations to demonstrate how the system operates during up to and including the 1 in 100 year critical duration storm event including drain down times for all storage features included within the drainage proposal.

Curtins Response:

*There is no infiltration across the site, therefore drain down times assumed to be the time taken to empty attenuation into the public sewer.
Refer to Micro drainage calculations: Outfall SW08 and SW23.*

3. Demonstrate an appropriate SuDS management and treatment train and inclusion of above ground features reducing the requirement for any underground storage.

Curtins Response:

*Internal car parks discharge to foul as not exposed to surface water. External (Minor) parking is minimal and also passes through permeable pavement and bypass separator. (Separator cannot be assessed by treatment train as this is a proprietary product)
Refer to Drawing 066571-CUR-00-00-DR-C-90001 for locations of swales/storage ponds and permeable paving.*

4. Full detailed engineering drawings including cross and long sections, location, size, volume, depth and any inlet and outlet features. This should be supported by a clearly labelled drainage layout plan showing pipe networks. The plan should show any pipe 'node numbers' that have been referred to in network calculations and it should also show invert and cover levels of manholes. Total storage volumes provided within each future sub-catchment should be identified.

Curtins Response:

*Engineering details shown on the following drawings. Refer to Drawings:
066571-CUR-00-00-DR-C-90003 PROPOSED DRAINAGE LAYOUT (PHASE 1)
066571-CUR-00-00-DR-C-90001 SITE WIDE
066571-CUR-00-XX-DR-C-98001 PROPOSED DRAINAGE DETAILS SHEET 1
066571-CUR-00-XX-DR-C-98002 PROPOSED DRAINAGE DETAILS SHEET 2
066571-CUR-00-XX-DR-C-98003 PROPOSED DRAINAGE DETAILS SHEET 3
Drainage strategy 061731-CUR-00-XX-RP-S-001.*

5. Where an outfall discharge control device is to be used such as a hydrobrake or orifice, this should be shown on the plan with the rate of discharge stated.

Curtins Response:

Discharge rate for each vortex flow control shown at the relevant outfall. Refer to Drawing 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT (PHASE 1).

6. Silt traps for protection for any residual tanked elements.

Curtins Response:

*Refer to Drawing 066571-CUR-00-00-DR-C-90003 "PROPOSED DRAINAGE LAYOUT (PHASE 1)
Catchpit manholes provided at each attenuation tank. Baffle plates to be included where required.*

7. Details regarding any areas of informal flooding (events those exceeding 1 in 30 year rainfall event), this should be shown on a plan with estimated extents and depths.



Curtins Response:

No informal flooding.

8. Full details of any required mitigation/ management measures of any identified source of flooding.

Curtins Response:

*All residual flood risks listed in the FRA document are considered "Low Risk".
Refer to RMA Environmental Flood Risk Assessment Document RMA-C1787*

9. Details of final exceedance routes, including those for an event which exceeds to 1:100 rainfall event including climate change event.

Curtins Response:

Refer to Drawing 066571-CUR-00-00-DR-C-98010 Final Exceedance Route.

Please refer to Appendices below for outfall calculations and Thames Water Pre-Planning Enquiry.

Yours faithfully

Nigel Hickman
Senior Technician
For and on behalf of
Curtins Consulting Ltd



APPENDICES

