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Certificate No: 14272



Please reply to: Julian Pearson

Your ref: DC/21/2999

Our ref: 21/00398/FUL

Date: 24 September 2021

Dear Knowsley Council

Re: Lakeside School, Naylors Road, Knowsley, L27 2YA

We have received your comments dated 22/09/2021, submitted at planning for our application 21/00398/FUL. We understand from the response that as the LLFA you have comments for us to consider overcoming the objection you have to the proposed development. Please find below your queries and our responses provided in red following each bullet point copied from your response letter;

- An explanation/evidence of existing drainage system and flow paths of the site is required. If there is a positive drainage system on the existing site, it should be explained, what is the system? How does it work? Which parts of the existing system will remain unchanged? Where does the surface water runoff discharge to/connect to at the exiting condition? And what is the maximum discharge rate from the site (considering the pipe size or controlling devices)?

We would like to refer you to our completed flood risk assessment and drainage strategy report referenced TC-L9523-2020-04 which outlines the above. Section 2.3, Appendix A and Appendix F shows the existing private and public drainage across the site and the neighbouring land occupied by Lakeside School. The topographical survey submitted at planning also shows all existing drainage and outlines its direction etc this topographical survey can also be found in Appendix A of this response for convenience. Please note that no existing drainage will be reused across the proposed development. The existing drainage will be entirely replaced and therefore a check of the existing system is not required.

- How is the existing site affected by the surface water runoff from neighbouring fields (considering the topography of land)? Is there any chance that the surface water the surface water runoff finds its way to the site before or after development?

Section 1.2 of TC-L9523-2020-04 outlines topography and states the surrounding land is too flat to have adverse effects on overland flows entering the site. Section 3.3 also includes EA surface water maps that clarifies the same outcome, whereby surface water flooding does not adversely affect the site from neighbouring overland flows.

- Parts of drainage strategy proposals are based on the fact that there is not infiltration on the site, but no evidence of the results of infiltration tests undertaken have been provided. To assess the feasibility of infiltration techniques as part of the proposed drainage strategy, evidence must be provided to show that a suitable number of soakaway tests have been completed across the whole site within different geology and to a suitable depth (i.e. a similar depth to the proposed infiltration devices). The tests should be completed according to the BRE 365 method and their results should be submitted with the full application.

Infiltration testing with associated calculations were completed and documented within TC-L9523-2020-04. All results can be found in Section 2.4 and Appendix G. Please note the reason for completing falling head tests prior to BRE365 test was completed due to the desk top study. It was therefore determined that if falling head tests found sufficient infiltration properties the BRE365 tests would be carried out. As these

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properties matched the desk top study and were found insufficient the expensive and intrusive investigations were deemed unnecessary as geology was consistent across the site.

- A survey of contributing area to the proposed sewer system is required. Considering the contributing area, a capacity assessment is required. A CCVT will be required to have a full picture of the sewer connectivity/condition if the owner does not have these information. No evidence has been provided that the applicant has contacted the owner of the sewer system and obtained the principal agreement for connection.

As per bulled point two this has all been provided within TC-L9523-2020-04. The existing drainage system to the proposed development site is to be entirely replaced. A CCTV survey has been provided in Appendix F for the drainage within the adjacent lakeside school site, where we propose a connection is to be made through the proposed new drainage system.

- The proposed option for the north car park as the self-containing storage area is not acceptable. This is due to unpredictability nature of heavy rainfall events and risk imposed to people and assets. Therefore, an alternative solution must be provided.

The north car park is not self-containing. It is connected to the main system which storage has been provided for as per the drainage layout plan ref: TC/L9523/21/104 indicates, included in Appendix D and the associated calculations demonstrate in Appendix B. The car park has provided a treatment method not a storage method it is drained positively as indicated. The permeable paving system is classed as a Type C system whereby it must be positively drained through the sub-base to a main drainage system.

- A drawing of the permeable and impermeable area before and after development is required.

There is no evidence within the 2015 Non-Statutory Technical Standards for SuDS to provide a catchment plan for a private non-adopted drainage system. A catchment plan is required under a Section 104 agreement for adoptable design. However, this is a private system which voids that requirement. The pre and post-development areas have been indicated within Appendix B of TC-L9523-2020-04 and have been replicated on drawing TC/L9523/21/104 in Appendix D.

- A 50% betterment discharge rate for post development would be acceptable provided that the existing/proposed brownfield discharge rates are cautiously estimated.

The pre and post impermeable areas have been produced within Appendix B using topographical surveys for pre-development and proposed architectural site plans for post-development and would be more than considered cautiously estimated. Brownfield betterment has been achieved as per the Knowsley Council's SuDS Pro-Forma Document.

- Brownfield discharge rates calculated using the Rational Method, although it results could be indicative, they must be compared with results obtained using a more reliable method and, more importantly, they should be compared with the maximum discharge rate that may be estimated using the outlet pipe size already discharging the surface water runoff from the existing site (if any outlet pipe).

The rational method is one of the most established calculations available. The rational method derived from The Wallingford Procedure document Volume 4 The Modified Rational Method, published in 1983 is still widely used. If the LLFA could please provide the "reliable method" they wish us to design to and the standard/legislation which states its required use, we can run these calculations. The outfall pipe from the site is unutilised by any other catchment and/or development. The existing drainage system on the proposed development site is to be entirely replaced by a system covered by the calculations documented

in Appendix B of TC-L9523-2020-04. These calculations demonstrate the pipe is more than adequate enough to cope with the proposed development.

- No calculations have been provided for proposed attenuation storage. It seems that, the total attenuation storage required has significantly been underestimated and until the details of the calculations are not provided, the proposed figure is not acceptable.

Storage calculations can be found on Page 4 of the Surface Water Calculations included in Appendix B of TC-L9523-2020-04. A full network model has also been provided in Appendix B. This includes the 1 in 2, 1 in 30 and 1 in 100 yr + 40% CC results indicating no flooding. Storage structure analysis and design inputs are also included in Appendix B. Storage 1 is the geo-cellular tank located by S103 and Storage 2 is the geo-cellular tank located by S107 as can be seen by their volume provision.

- Contributing areas to each proposed attenuation device should be specified. The surface water volume generated from each contributing area should be consistent with the capacity of each attenuation storage proposed. More importantly, the workability/feasibility of each proposed attenuation storage in receiving surface water runoff giving the site features (e.g. topography) should be investigated.

Contributing areas can be found on Page 1 and Page 4 of the Surface Water Calculations included in Appendix B of TC-L9523-2020-04. Not only have attenuation device contribution areas been provided, but each node contribution has also been provided as per the above bullet point references.

- No explanation has been provided why the exiting pond has not been considered as part of the proposed sustainable drainage system.

3rd party land. A connection has been refused by the landowner.

- No information on the correct number of treatment stages in the surface water management train have been provided, for further information see the CIRIA SuDS Manual (C753). Demonstrating that adequate water quality of the off-site surface water flows (draining into a sewer, watercourse and ground) in accordance with the Simplified Index Approach as set out within Section 26 of the SUDS Manual (C753) can be achieved during all phases of the development.

Treatment has been discussed in section 5.9 of TC-L9523-2020-04. In Appendix B of this response Simple Index Method results can also be found.

- An exceedance flows plan will be required at resubmission. The exceedance flows plan should be able to identify where the destination of exceedance flows are and where they would pool and flow. The LLFA requires that cross sections of the flood routing, duration of flooding, maximum depth, and the route of flood flows to be established in order to mitigate the flood impact and ensure the kerb heights and surrounding topography do not allow flood flows to impose risk to properties, and other assets.

Exceedance has been discussed in section 5.8 of TC-L9523-2020-04. Exceedance arrows can also be added to the drawing plan. As the above reference states exceedance will be toward Naylor Rd as this is the route of the access road. Highway's drainage in Naylor's road will help convey flood waters away from the development. Worst case scenario for extreme floods beyond the requirements of the calculations, is the hydro-brake floods with a small section of car parking to the southwest of the site allowing flood waters to pond, which will not prevent safe egress and access to and from the site. The LLFA should provide the standards/guidance whereby it states cross sections should be provided when calculations have proven the storage provided has the capability of storing a 100 year return period + 40% climate change of critical duration.

- An evaluation of impact of potential failure of the proposed drainage system is required. Where the probability and consequence of such failure modes are considered unacceptable, then the drainage proposal should be modified or, the site layout changed, or topography altered. Failure mechanisms include blockage of pipes, blockage of outlet structures, failure of pumps and risk of impediments across planned flood routing paths.

The drainage system has been designed as not to fail. The system is an entirely new system designed to the recommended design standards and guidelines. We would not propose failing nodes or any other areas we expect to fail. The school will have 2No. full time site managers to maintain the system with a comprehensive framework for service providers to fix any damages caused through general 'wear and tear'.

- Detailed Drainage Scheme Plan showing the layout of the proposed drainage network, post development impermeable area, the location of the storage within the proposed development and how these relate to the submitted calculations, including any chamber, pipe numbers, direction of flow, invert and cover levels, gradients diameters and dimensions.
- An updated drainage strategy report will be required considering the above. This report should be accompanied with the layout of the proposed drainage network for the development, post development impermeable area, the location of the interception methods/storage within the proposed development and how these relate to the submitted calculations, including any chamber, pipe numbers, direction of flow, invert and cover levels, gradients diameters and dimensions.

A detailed drainage scheme plan was provided in Appendix D (Drawing 104) of TC-L9523-2020-04. We have clarified the required data in our responses above which we believed does not warrant a revision of the drainage strategy report. We may also add that the existing report consist of all the information requested within the second bullet point.

Yours faithfully

Julian Pearson BSc (Hons) CEng MICE
Associate

For and on behalf of Thomas Consulting Ltd

APPENDIX A



APPENDIX B