

21108 – Waters Edge – Surface Water Statement

28 September 2021

Introduction

To be read in conjunction with Coast Consulting Engineers drawing reference 21108/02/P3.

Coast Consulting Engineers have been commissioned by Story Homes to provide a design for modifications to an existing gravity fed surface water drainage system at Waters Edge, Whitehaven. The system is located within a residential development constructed by Story Homes.

It is proposed that the existing residential development will be further extended to the south by another developer with surface water discharging into the Story Homes system.

The modifications are required to ensure that the existing Story Homes system falls in line with current planning standards and storage is provided to accommodate the 100-year event with a 40% allowance for climate change within the modified system.

Existing system

The existing surface water system was designed during 2013 and was constructed in line with the relevant standards. The design drawings include the following statement with regards to surface water discharge.

SURFACE WATER

It is intended to discharge surface water from the development to the existing land drainage / watercourse adjacent the site. Site investigations have located a number of existing pipes watercourses discharging to the existing cliff however it has been identified that two of the three are in poor condition. Discussions with David bechelli (Copeland land drainage dept) identified the existing 375mm piped watercourse north of the development would be more suitable due to its excellent condition. In that we are discharging to a watercourse the discharge rate from the site should be limited to greenfield runoff. Using ICPSUDS we have calculated the 1 year greenfield runoff as 15.8 lts/sec, this includes a 27% allowance for the partially urbanized catchments ie existing concrete hardstanding (formally buildings). The SW design will incorporate twin 2400mm diam on line storage pipes sized to discharge 15.8 lts/sec for the 100 year including 30% climate change. A surface water requisition will be served on United Utilities to provide the off site sewer and connection.

Within the system designed during 2013, an allowance of 6 l/s was provided to accommodate flows from the extension land to the south.

Proposed system

The proposed surface water system for the extension land has been designed by a 3rd party consultant engineer on behalf of the developer. The proposals include a flow control to restrict discharge to 6 l/s and a storage system to accommodate the 100 year event with a 40% allowance for climate change. Coast Consulting Engineers have been provided with a copy of the proposed calculations to allow both the existing and proposed system to be assessed as one network.

Modifications to the existing system

Surface water calculations have been produced by Coast using Micro Drainage software. A copy of the MDX file and PDF copies of the calculations are provided for review by the LLFA.

The calculations are an amalgamation of the 2013 Story Homes calculations and the 3rd party calculations produced for the developer of the extension land.

For ease of reference, the manholes on the existing network are prefixed with the letter S and the extension network with the letter G.

The unmodified calculations show that for the 100 year event with a 40% allowance for climate change, a volume of flooding of approximately 80m³ occurs at manhole S25, within the network, Manhole S25 is the existing flow control chamber, with a pass forward rate of 15.8 l/s.

Due to constraints with land ownership and topography, it is not possible to provide additional storage at manhole S25, so an alternative location has been agreed with Story Homes.

It is proposed to retrofit manhole S14 with a flow control to restrict the downstream discharge rate to 6.2 l/s. In order to accommodate attenuated flows, a number of options have been considered. The use of surface SuDS features such as basins or swales cannot provide the required volume of storage due to site constraints. Oversized pipes are an uneconomical solution and would require that significant disruption to the existing highways is incurred. The proposed storage system is an offline cellular storage system, with a volume of 82.1m³. The cellular storage system will be located within an existing area of public open space, off the existing public highway.

The cellular storage system will be maintained by an appointed management company. At the time of writing, United Utilities Ltd will not adopt offline cellular storage systems.

Conclusion

The proposed solution satisfies the brief provided by Story Homes, to mitigate flooding for the 100-year event with a 40% allowance for climate change, as a result of the development of the extension land.

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