DEPOT DRAINAGE SYSTEM RESPONSE BY CRISTINA CHALÉ

Section 4.11.12.7 of the EIAR presents a summary of the main characteristics. Further details are as follow:

The depot is placed over an embankment with a gentle slope towards the south-east.

Main ground levels: the track connection to the mainline is at 61.8 mOD, the AWP (Automatic Washing Plant) and Service Slab are at 62.8 mOD and the stabling area and main building are at 65.3 mOD.

The elevation of the depot was designed in such a way that curtails the need for excessive fill/embankments and the consequent visual impacts of the infrastructure whilst still allowing for sustainable drainage within a flooding area.

The stormwater runoff and sizing of the drainage collectors and volumes of the attenuation ponds have considered the storm with a 100-year recurrence interval and a 20% increase in rainfall to account for climate change impacts. The ponds have been designed to cope with the attenuation storage volumes needed for such an event, and their levels and elevations are consider discharge above the 1 in a 100-year return period + climate change flooding level.

The design has analysed each sub-catchment area to determine the runoff and total flow on the basis of the runoff coefficient applied to their surface treatments. This includes the buildings, paved areas, green areas, and ballast areas.

In particular, the two attenuation ponds discharge to the Ballycaghan stream with the discharge rates presented and agreed upon with Kildare County Council in a meeting on 16th of March 2022. The controlled discharge rates that were calculated match the greenfield equivalent and are:

- For the main pond: 2.46 l/s/ha, which results in 3.29 l/s.
- For the secondary/eastern pond: 3.74 l/s/ha, which results in 1.78 l/s.

Both ponds have then been sized considering the recommendations given in the CIRIA SUDS Manual resulting in the following volumes:

For the main pond:

- total volume of 12,568m³, treatment volume 2,037m³ and attenuation volume 10,531m³.
- Invert level in the discharge pipe: 62.4 mOD, which corresponds to the 1 in 100 years + CC flooding level at that point.
- Top water level: 64.07 mOD.

For the eastern pond:

- total volume of 3,862m³, treatment volume 728m³ and attenuation volume 3,134m³
- Invert level in the discharge pipe: 61.11 mOD, which corresponds to the 1 in 100 years
 + CC flooding level at that point.
- Top water level: 62.63 mOD.

The stormwater drainage system consists of filter strips and vegetated under-drained swales for attenuation and pervious pavements in the car parking spaces. Rainwater harvesting in the main building will provide for reuse in the stabling water points and the deep cleaning area within the maintenance shed.

The design includes fuel interceptors in specific locations. These are not required as we are applying a SUDS management train in accordance with CIRIA Guidance (C753), but these are included as an additional preventive measure.

The aforementioned swales are 300mm in height, with 150mm of stone cover over the perforated pipe that will be 450mm in diameter as a minimum at its starting point. The slopes are low, typically 1 in 500 with the maximum continuous drainage run of approximately 900m, assuring low flow velocities in accordance with the general principles applied to sustainable drainage systems.

Collectively considering all of these items, the stormwater system is reliable, resilient, and robust. The drainage network is designed to convey and store the 1 in 100 year rainfall event (including a 20% increase in rainfall intensities). The attenuation ponds provide further polishing of stormwater runoff and ensure that there is no increased risk of flooding downstream.