

Technical Note: 001a  
Date: 23<sup>rd</sup> January 2020  
Site: Eden Park Sheffield  
Reference:2019/2495

**Eden Park Sheffield – Mixed Development**  
**Surface Water Onsite Runoff**

**Existing Runoff from the Site**

The total site area affected by this development has been estimated at approximately 2412m<sup>2</sup> (0.24 ha). The existing site is currently a large car park, access road and commercial building.

There are no open or culverted watercourses close to the development site.

The site is elevated above lower ground to the east. It is therefore assumed that the majority of the site is made ground. Any soakaways would need to be constructed into the natural ground level and below the level of the existing development to the east to ensure there is no horizontal discharge from the soakaway structures which may flood other adjacent land users. Subsequently, at this stage and until detailed site investigation is provided soakaways are not considered to be a practical solution for the site.

There is a 225mm diameter combined sewer located within Penistone Road to the west of the site. The sewer is approximately 2.5m deep. There is a 100mm diameter connection from the site into the sewer. The connection manhole in the site is approximately 1.5m deep.

Following discussions with the client it is understood that there is a second point of discharge from the lower part of the site east via a private dwelling which is understood to be connected to a Yorkshire Water sewer. There is an existing gully in the south east corner of the site which currently serves the lower paved area.

The Yorkshire Water sewer plan is provided at Appendix A.

**Discharge to Yorkshire Water sewer**

The existing development site consists of 0.24 hectares of roofed and paved area. The site appears to drain to the Yorkshire Water combined sewer.

**Table 1: Modified Rational flows from existing site 0.24 hectares**

<b>Return Period</b>	<b>Flow in litres per second (l/s)</b>
1 in 1 year	34.76
1 in 30 year	89.00
1 in 100 year	147.86

The Modified Rational Method has been used to calculate the existing peak runoff from the site for various storms. The calculation sheet is provided at Appendix B of this report. Generally, Yorkshire Water would stipulate the discharge is restricted to 1 year rate minus 30% which is approximately 24l/s. However, the site currently discharges via two 100mm diameter pipes, one to the west into the 225mm YW sewer and one to the east via a private

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sewer before entering the YW sewer system. Subsequently, the peak runoff from the site would be in the order of 10l/s. Therefore, taking account of some foul discharge and reducing by 30% a discharge rate of 7l/s from the site is proposed into the YW 225mm diameter sewer and the private connection to the east via the existing connection.

Any discharge from the site into the sewer will require the consent of the appropriate water authority/riparian owner, as such, they will also need to be approached to agree the discharge restriction from the site.

Therefore, for this assessment the peak discharge rate from the site has been restricted to 7l/s with 5l/s being the restriction into the YW 225mm diameter sewer and 2l/s into the private sewer to the east.

### **Attenuation requirements**

The proposal will reduce the impermeable area to 2162m<sup>2</sup> (0.216 hectares). It is proposed that the upper part of the site which has an impermeable area of 1482m<sup>2</sup> drains west into the Yorkshire Water 225mm diameter combined sewer via the existing 100mm diameter connection. A single crate tank has been provided to attenuate runoff to a peak 5l/s. The lower part of the site which has an impermeable area of 680m<sup>2</sup> drains east into a private sewer via a 100mm diameter connection. A single crate tank has been provided to attenuate runoff to a peak 2l/s.

Using WinDes Source Control software developed by Microdrainage the required attenuation has been calculated for the 1 in 100 year plus climate change (40%) event.

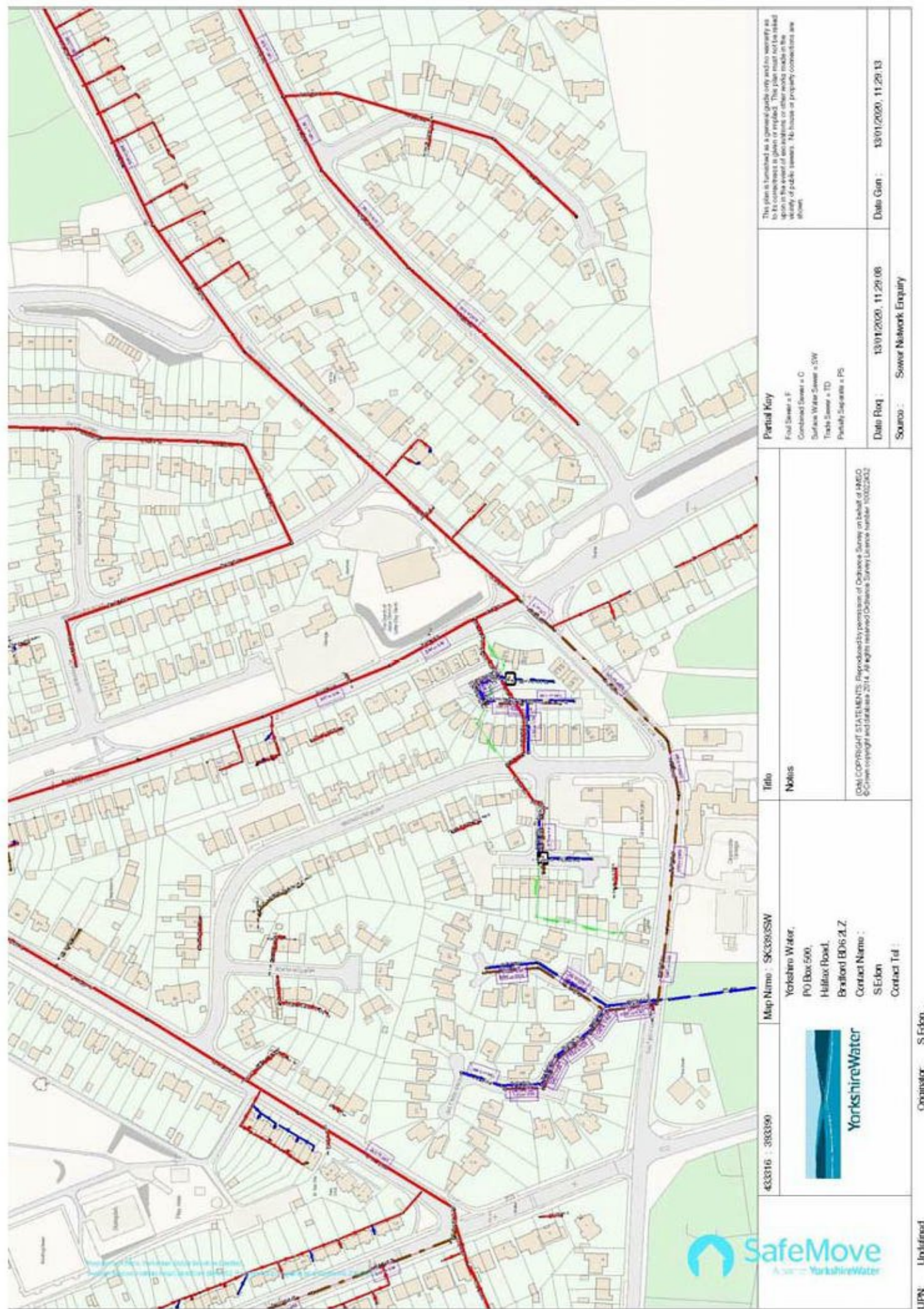
Reference should be made to Appendix C and Appendix D where the calculation sheets are provided for the upper and lower areas. The attenuation size has been tabulated below in Table 2. It is estimated that during the 1 in 100 year plus climate change (40%) event that 103.5m<sup>3</sup> of storage will be required. This will be provided within an 80m<sup>2</sup> by 0.8m deep crate tank at the front of the site and a 40m<sup>2</sup> by 0.8m deep at the rear. The drainage strategy drawing provided at Appendix E shows the initial drainage strategy for the site.

**Table 2: WinDes 1 in 100 year+CC40% Storage**

<b>Drainage Area</b>	<b>Area (m<sup>2</sup>)</b>	<b>Required Attenuation</b>	<b>Approx Volume (m<sup>3</sup>)</b>
<b>Upper Site</b>	1482	23m by 3.5m x 800mm deep tank	69.6
<b>Lower Site</b>	680	6.5m by 6m x 800mm deep tank	33.9

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**Attachment A – YW sewer plan**



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