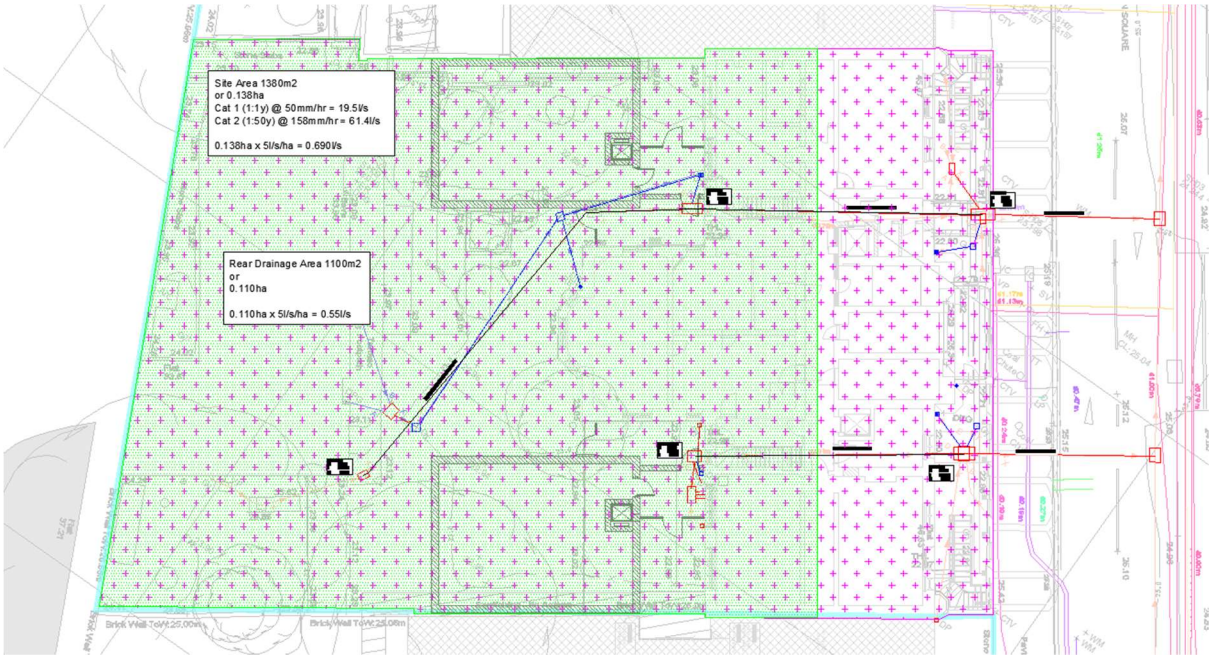
Existing Site Drainage

The existing site has two 100Ø outfall drain connections into the combined sewer within Gordon Square.

- The total drainage area of the site is 1,380m2.
- The surface water runoff from a 1:1yr storm of 50mm/hr is 19.5 l/s.
- The existing outfall drains do not have the capacity to evacuate 19.5 l/s.

Therefore, it is proposed to attenuate the rear of the site to elevate the flood risk and satisfy the SuDS requirement for the proposed rear extension.

The screen shot below shows the drainage areas – the green area is to be attenuated and the magenta to remain as gravity.



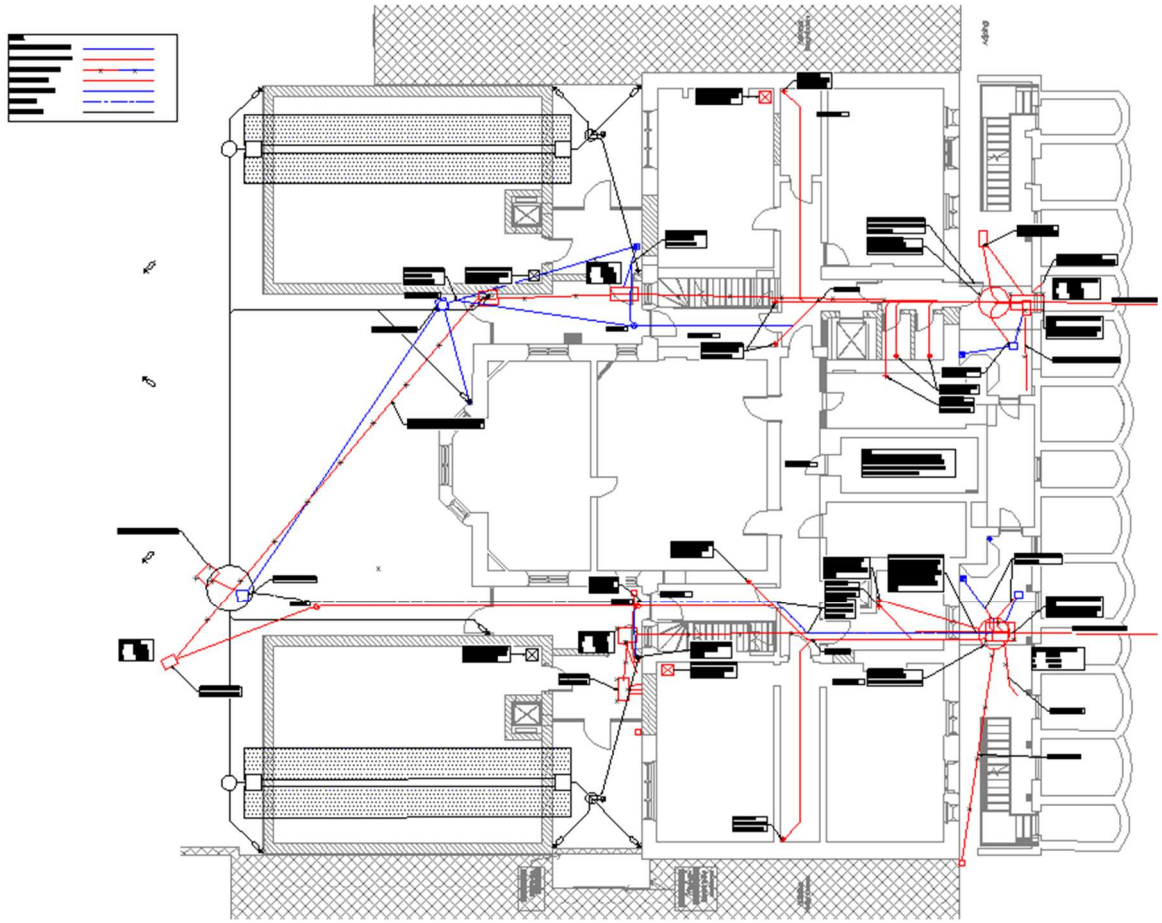
SuDS

- The surface water drainage system is to be designed in accordance with CIRIA C753 v3 The SuDS Manual. The SuDS system shall accommodate the 1:100 year storm event period + 40% climate change.

- Surface water disposal should be directed to ground (through infiltration) as the first option; the second option directly to a watercourse (with an agreed restricted discharge) and the third option to sewer (with an agreed restricted discharge).

- The first option to discharge to ground is not viable, because the building footprint covers the majority land within the site boundary and there is insufficient space to construct a soakaway 5m away from the buildings and roads (Building Regulations – H3 3.25). The second option is also not viable, because no watercourse is adjacent to the site boundary. The third option to discharge to sewer is viable, reusing the existing 2No. 100Ø outfalls into Gordon Square.

The drawing below shows where the attenuation tanks can be installed, under the two proposed extensions.



Pumped Discharge

- The surface water from the site is to be pumped, because the existing drainage system does not have the depth to install a gravity system.

- The pump selection is based on the smallest three phase commercial pump from New Haden Pumps, because of the reliability of the 3 phase motors and durable materials used for the construction of the pump and impeller. The pump selection is shown below and will provide a volumetric restriction of 3 litres per second at 4.5m head, as marked in blue on the pump performance curve below.

NEW HADEN PUMPS
PUMPING SOLUTIONS

US 73-253 Range, Heavy Duty Drainage Pumps.

Application

The US73-253 are ideal for all types of drainage work, where solids present are no larger than 30mm in size.

Pump sizes US 73 & 103 are available is single phase electrics E or three phase D. These sizes can be supplied with built level floats ES or DS. The larger sizes US 153D & 253D are three phase only and require separate level controls and control panel.

Construction

Cast Iron casing, stainless shaft, wear resisting GRF impeller and wear plate, and a silicon carbide mechanical seal.

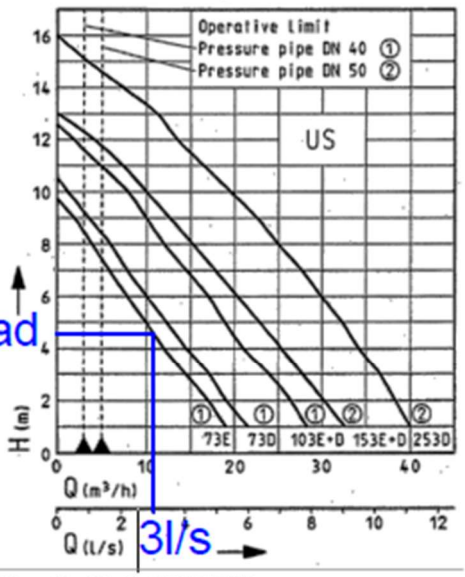
The US 73 and 103 have a 1 ½" discharge whilst the US153 and 253 have 2".

The motor has an IP68 enclosure, insulation class B and incorporates a thermal cut-out fitted to protect the motor for sizes US73 and 103.

All pumps have 10 metres of electrical cable.

Optional Extras

- Guiderail system
- IP54 sheet steel isolator panel with high level alarm
- IP54 sheet steel control panel for duplex pumps
- Pipework and valves



Technical Data

Type	Voltage	Motor rating	RPM	FLC	Weight
US 73E & ES	1-50-230	0.83kW	2510	3.9amps	12.5kg
US 73D & DS	3-50-415	0.85kW	2690	1.4amps	12.5kg
US 103E & ES	1-50-230	1.37kW	2700	6.0amps	14.0kg
US 103D & DS	3-50-415	1.36kW	2740	2.4amps	14.5kg
US 153D	3-50-415	1.6kW	2925	3.0amps	26.5kg
US 253D	3-50-415	2.6kW	2860	4.4amps	27.5kg

New Haden Pumps Ltd, Cheadle, Staffs ST10 2NW
Tel. 01538 757900. Fax 01538 757999. email. info@NHPumps.com
Website. www.nhpumps.com

The pumping main shall also be restricted in size to 32mm to help restrict the flow to 3 litres per second. The duty/standby pumps will alternate following each operation, with only one pump running at any one time.

<u>Attenuation Volume</u>

- MicroDrainage source control 2019.1 software was used to calculate the storage volume required to accommodate the 1:100 year storm return event + 40% climate change, without the tank and drainage system overflowing.

- The calculations show that the required attenuation storage is 45.1m^3, peaking at 120 minutes during a winter storm, with a volumetric flow restriction of 3 litres per second.

- This volume equates to an attenuation tank size of 45.1m^3 and requires 26m of twin 1.2Ø attenuation pipes.

SUMMARY

- The surface water system is designed in accordance with CIRIA C753 v3 The SuDS Manual. The SuDS system shall accommodate the 1:100 year return period + 40% climate change.

- The above calculations demonstrate that 45.1m^3 of storm water storage is required when the surface water runoff is restricted to 3 litres per second. This storage is contained within 26m of twin 1.2Ø attenuation pipes.

- The installation of the SuDS described above will result in a substantial reduction in surface water discharge to the adjacent sewer and will help reduce the flood risk within the local area.

The above statement is to be developed into a formal SuDS Report, once the drainage design for the second phase is complete.