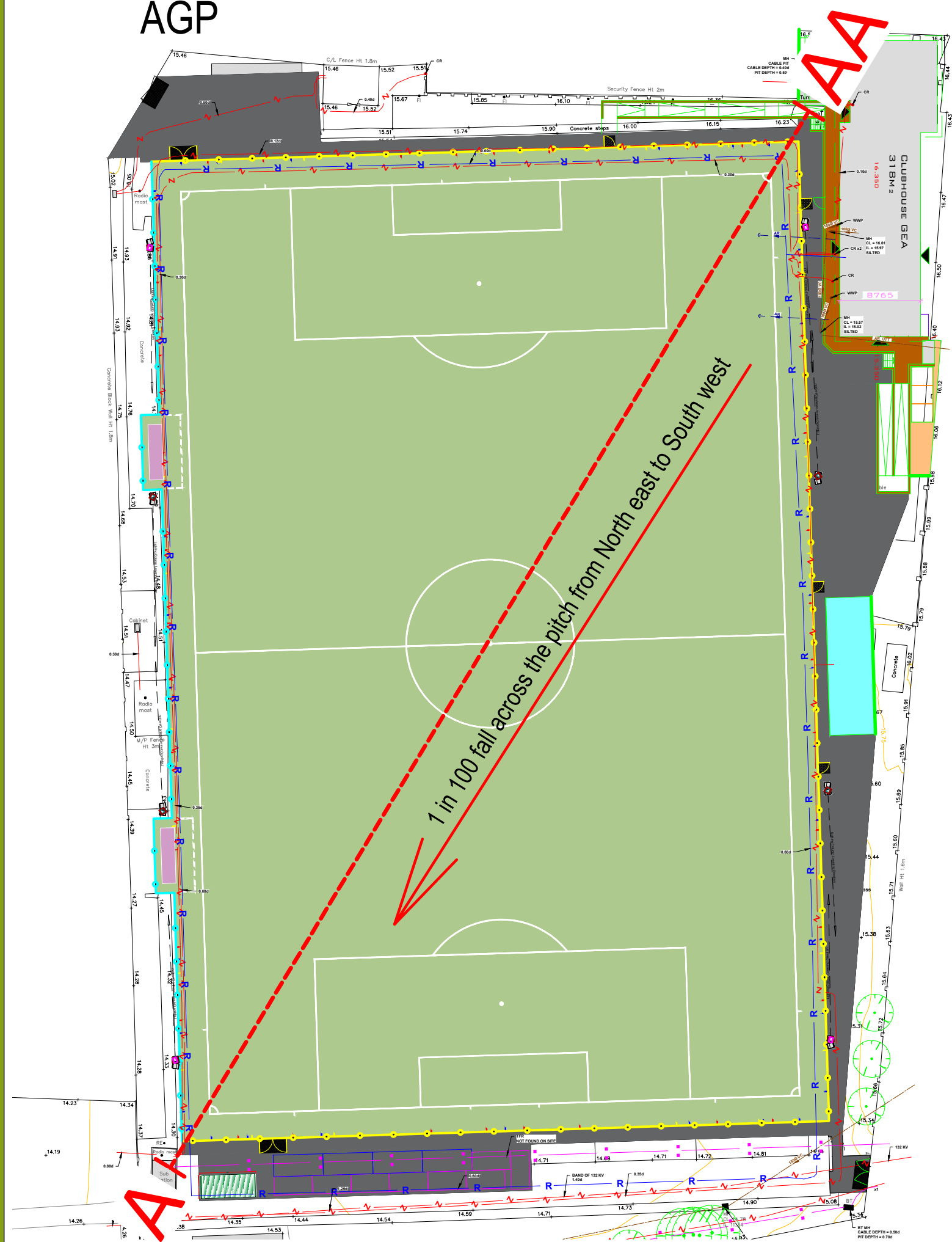
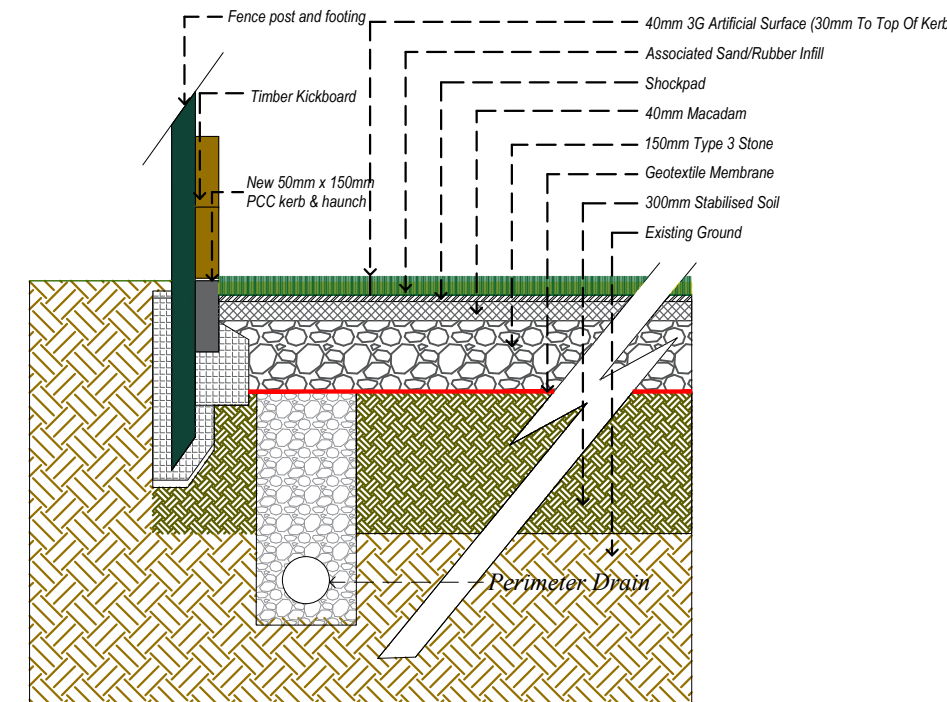


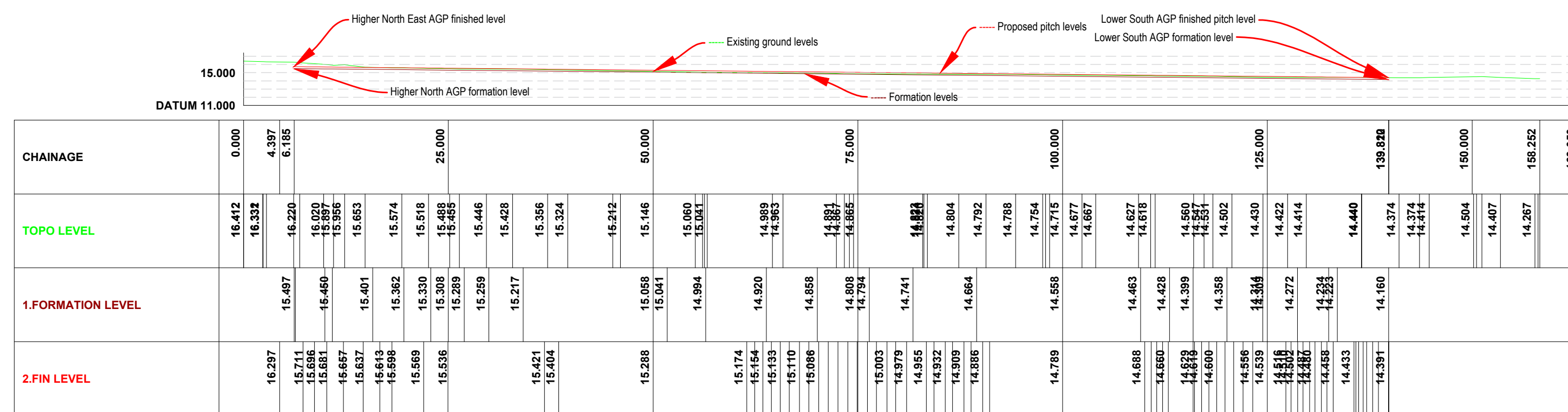
AGP



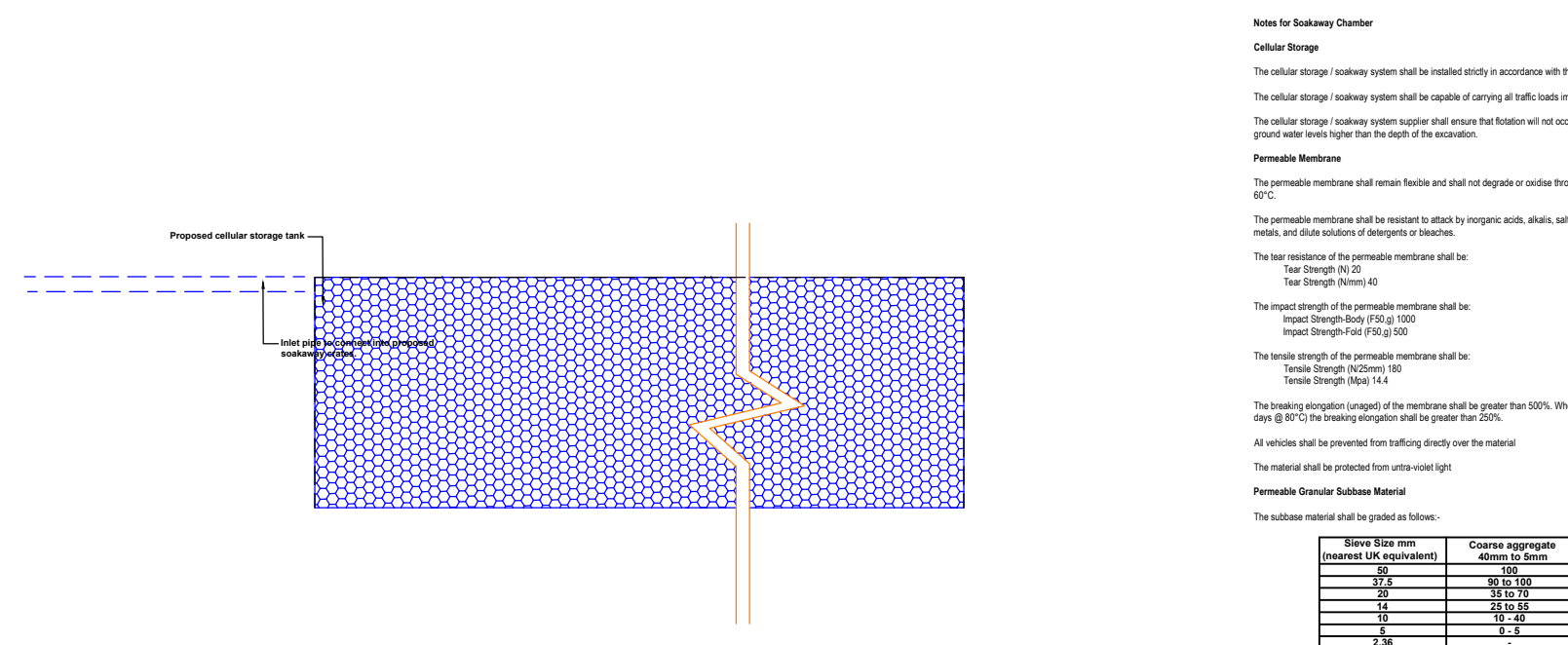
AGP Attenuation Scheme - Scale 1:500



AGP Section - Scale 1:20



Section A-AA Showing Section of AGP and Formation against existing level



Plan View of Soakaway Storage Unit

Surface Water Drainage Design

It is intended that a positive drainage scheme (land drainage); shall be installed beneath the development area comprising UPVC perforated carrier and lateral pipe drains.

The granular pitch substrate (typically consisting of Type 3 unbound (SHW 800 Series) to comply with BSEN 13285) is intended to provide onsite containment and attenuation within the granular sub-base, before surface water enters an outfall.

The designed surface water drainage solution should be based upon the following criteria, to maintain satisfactory system performance:

- Provide adequate functionality over a period of twenty years.
- Ensure that surface water is removed from the surface area at a rate necessary to prevent surface flooding experienced during acute rainstorms and to ensure the facility will not be lost through rain at the highest intensity which may be expected to occur either once every five years or through continuous rainfall of 50mm over a 24 hour period.
- Ensure that surface water is effectively removed from the facility construction to ensure that load bearing capacity of the substrate is not weakened by an increase in moisture content or becomes more susceptible to frost damage.
- Protect the installation from influences of groundwater or surface water from surrounding areas.
- Prevent the risk of uncontrolled flooding elsewhere (to land adjacent to the development).
- Comply with all applicable Sustainable Urban Drainage System (SUDS) requirements with attenuated flows (containment within the granular pitch sub-base) incorporated wherever necessary, without affecting the performance of the pitch.

Only natural surface water is being dealt with. The new development will not increase to the volume of water that the existing site area is currently subjected to.

An infiltration rate of 5.2×10^{-5} m/s has been obtained on the site. Due to this, a soakaway approach has been adopted. Infiltration will be available through the soakaway crate. Calculations have been made for a 1 in 100 year + 45% CC storm events.

As per the soakaway calculations (right), the soakaway needs to be sized 105.5m x 5m x 1.2m depth with the 95% void space which allows for a total volume of storage at 601.35m³ with the requirement needing to be 600.47m³ in order to drain entirely through the sides of soakaway system with consideration to its base along with no attenuation requirements within the AGP.

Consider Area to be drained = 8569 m ²		Discharge via external soakaway		
<u>Flow</u>				
Time (min)	M100-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
15	26.0	322.4	12.4	310.02
30	34.8	432.1	24.8	407.32
60	44.5	553.3	49.6	503.64
120	53.8	668.5	99.3	569.18
240	64.3	799.1	198.6	600.47
360	71.0	881.9	297.9	584.06
480	75.9	943.6	397.2	546.39
600	79.9	992.4	496.5	495.93
720	83.1	1032.9	595.7	437.15
840	85.9	1067.1	695.0	372.03
1440	95.6	1187.6	1191.5	0
2160	103.4	1284.5	1787.2	0
2880	109.4	1359.5	2383.0	0
		Climate change allowance =		45 %

Outflow

Infiltration rate: 0.00312 m/min 5.2E-05 m/s

External Soakaway

Soakaway details:	105.5 m length	5 m width	1.2 m depth
	Assume void ratio	0.95	

Available storage area = 601.35 m³

Surface area: 265.20 m²

Eff volume: 601.35 m³ > 600.47 m³ OK

Additional storage volume required: -0.88 m³

Half drain down time (soakaway only):	43543	secs	12.0952	hours
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The dimensions of this soakaway have been confirmed as being 105.5m x 5m x 1.2m depth. For the purposes of the calculations, it is assumed that infiltration will occur only through the sides of the soakaway.

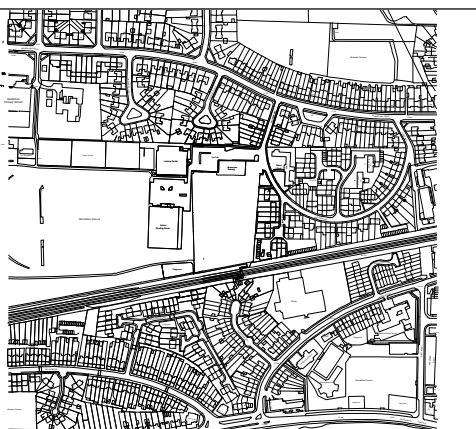
No additional storage volume will be required to accommodate flows from all modelled 1 in 100 year + 45% climate change events.

In order to meet building regulation standards, a half drain-down time of 24 hours should be achieved. This requirement is met at the site.

AGP Soakaway Calculations

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Proposed AGP Drainage Strategy

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