

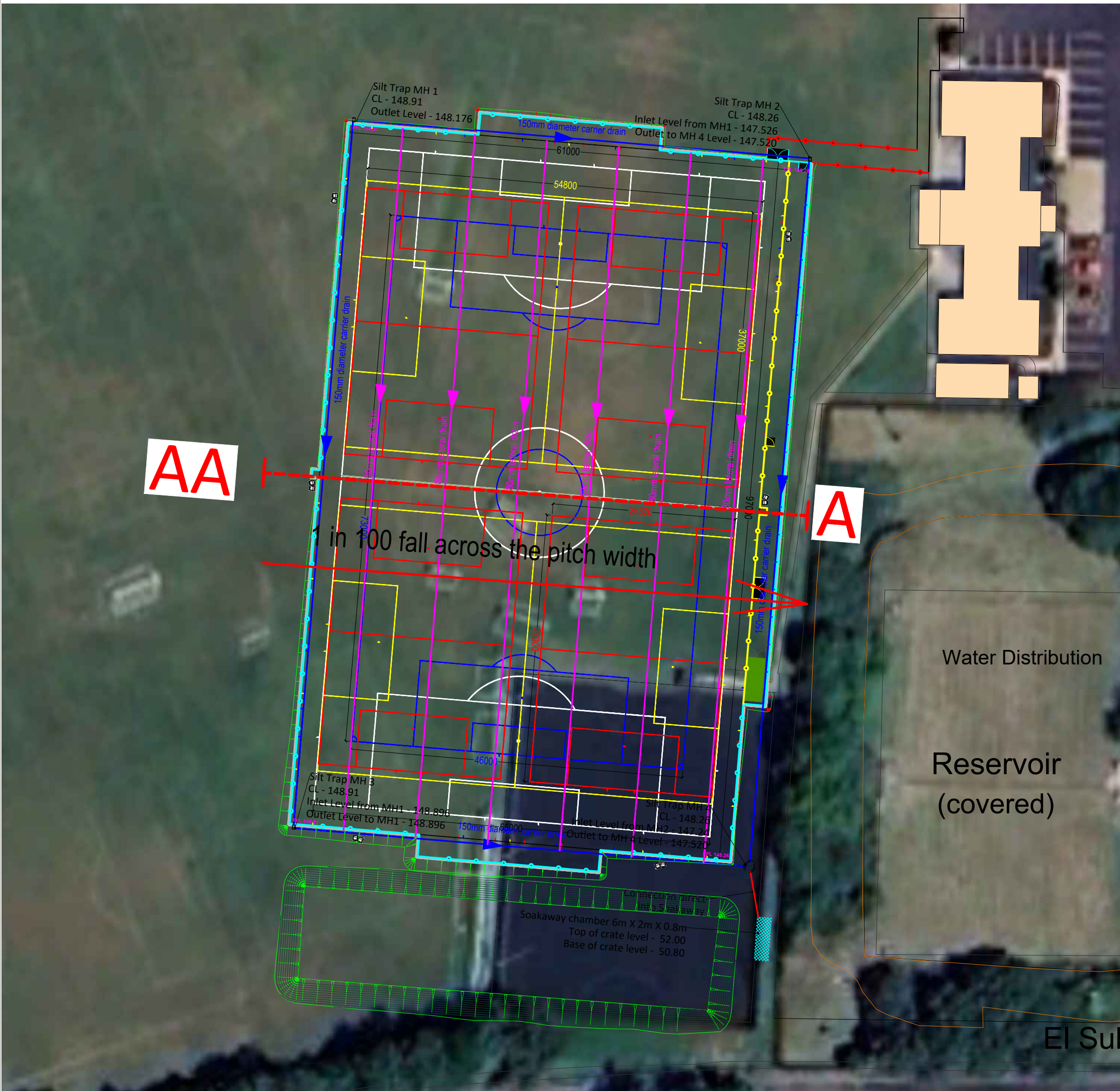
Leafy Lane Playing Fields

AGP



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AGP Attenuation Scheme - Scale 1:500

Surface Water Drainage Design

The proposed design of the AGP development is for a permeable surface construction. The surface of the synthetic turf area shall be permeable with the underlying stone sub-base acting as an attenuation/storage area for surface water to increase attenuation capabilities of the playing field area. This is combined with a perforated drainage system being installed underneath the pitch base to connect to the proposed soakaway to the southeast of the site.

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 infiltrates through the underlying geology.

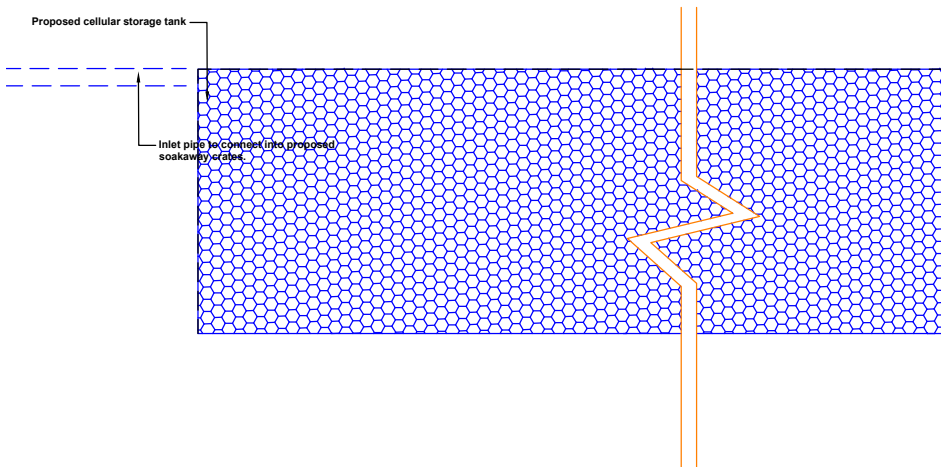
The designed surface water drainage solution should be based upon the following criteria, to maintain satisfactory system performance:

- 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 0.0005 m/s has been obtained on the site. Due to this, the artificial turf pitch and its permeable base construction acts as a soakaway system with the permeable geology. Infiltration will be available through the AGP base over the entire area whilst a generic soakaway size has also been introduced to allow for any general surface water run off to keep it off of the base construction in prolonged rainfall events. Calculations have been made for a 1 in 100 year + 45% CC storm events.

As per the calculations (left), the pitch base acts as a suitable system that has an additional 216m3 of attenuation storage in exceedance above the requirements for a 1 in 100 year storm event + 45% climate change. An additional small soakaway has been introduced sized 6m x 2m x 0.8m to ensure prolonged rainfall does not become stored in the base construction and cause potential movement or settlement to the AGP base construction.



Plan View of Soakaway Storage Unit

Notes for Subsurface Chamber

Cellular Storage

The cellular storage soakaway system shall be installed strictly in accordance with the Manufacturers instructions.

The cellular storage soakaway system shall be capable of carrying all traffic loads imposed on it.

The cellular storage soakaway system shall be installed in such a manner that the soakaway shall be designed to ground water levels higher than the depth of the soakaway.

Permeable Membrane

The permeable membrane shall be resistant to attack by inorganic acids, alkalis, salt solutions which causes corrosion to metals, and does not degrade in service throughout the temperature range -20°C to 80°C.

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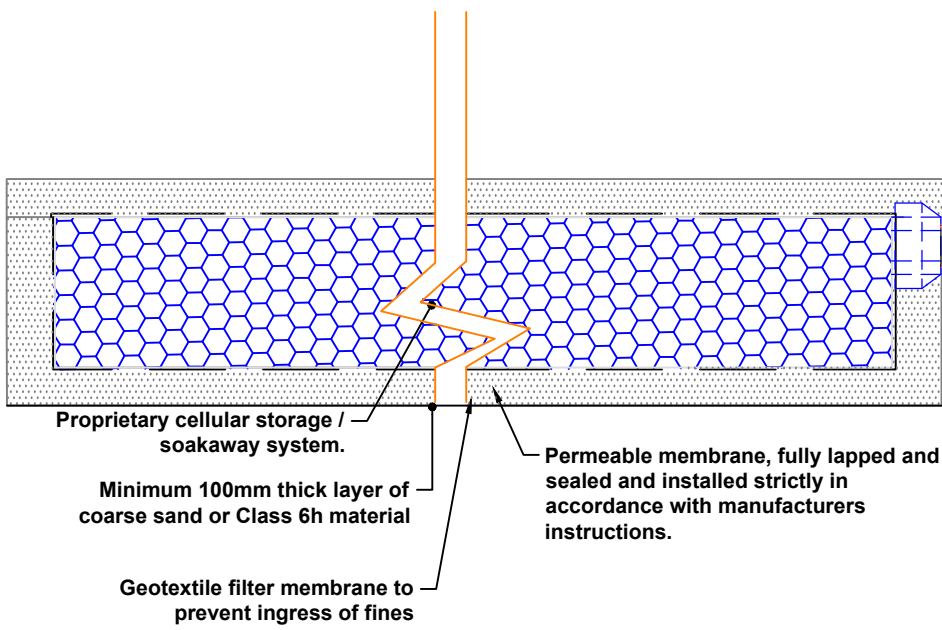
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Side View of Cellular Storage Unit

Flow	Time (min)	M100-D (mm)	Inflow M³	Outflow M³	Storage M³
	15	23.1	218.2	2546.6	0
	30	30.6	289.4	5093.3	0
	60	38.6	365.5	10186.6	0
	120	46.8	442.6	20373.1	0
	240	57.9	547.2	40746.2	0
	360	66.3	626.6	61119.4	0
	480	73.1	691.7	81492.5	0
	600	78.9	746.1	101865.6	0
	720	83.8	792.5	122238.7	0
	840	88.0	832.6	142611.8	0
	1440	102.5	969.6	244477.4	0
	2160	111.9	1058.0	368716.2	0
	2880	117.6	1112.2	488954.9	0

Climate change allowance = 45 %

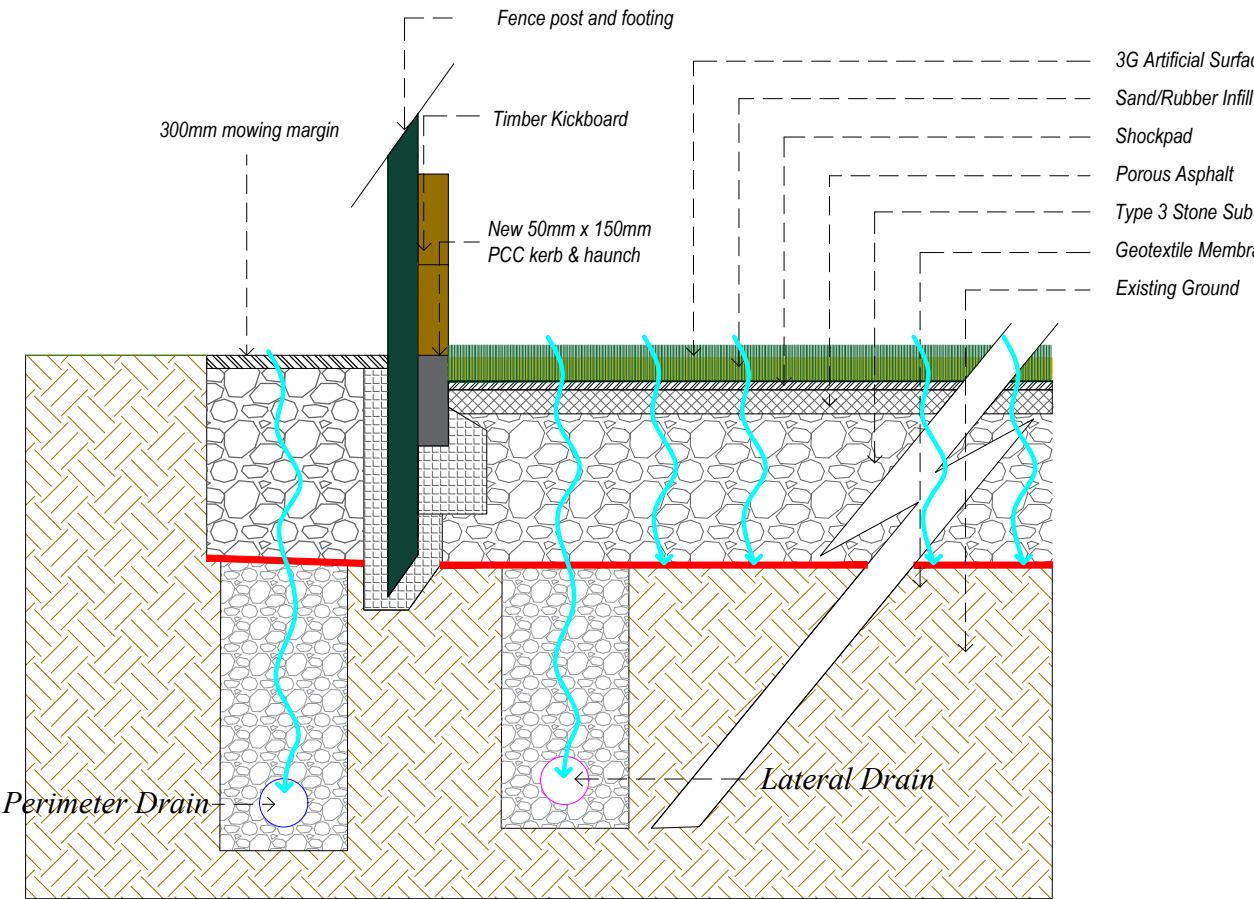
Outflow	Infiltration through pitch sub-base
Infiltration rate:	0.03144 m/min 0.0005 m/s
Soakaway details:	60 m wide 90 m length 0.1 m deep
	Assume void ratio 0.4 ∴ 216.00 m³
Available storage area =	216.00 m³
Surface area:	5400 m²
Eff volume:	216.00 m³ > 0.00 m³ OK
Additional storage volume required:	-216.00 m³

The pitch base will be permeable, with surface water discharging directly to the underlying ground below the pitch. Surface water attenuation will be provided within the pitch sub-base, should additional storage be required.
Due to the high infiltration rate and infiltration area (pitch sub-base), no additional storage is required.
This volume will accommodate flows from all modelled 1 in 100 year + 45% climate change events.

AGP Soakaway Calculations



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



AGP Generic Section

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