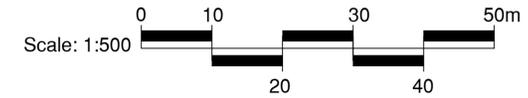
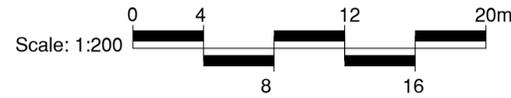
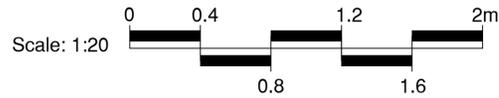


# Haydon School

New AGP

Attenuation			
Number	Minimum Elevation	Maximum Elevation	Colour
1	0.00	0.25	
2	0.25	0.50	
3	0.50	0.75	
4	0.75	1.00	
5	1.00	1.25	
6	1.25	1.50	
7	1.50	1.75	
8	1.75	2.00	
9	2.00	2.25	
10	2.25	2.50	



**SSL**  
SURFACING STANDARDS LIMITED  
SPORTS PITCH CONSULTANTS

CONSULTANTS  
Surfacing Standards Ltd  
Office: 2, Longbridge Works,  
Aston Road, Edgbaston, LE15 9NY  
0151 402 012

1. DO NOT SCALE FROM DRAWING UNLESS FOR PLANNING PURPOSES ONLY. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.  
2. THIS DRAWING IS COPYRIGHT TO SURFACING STANDARDS LTD.  
3. ALL PERSONNEL SHOULD BE AWARE OF THE HEALTH AND SAFETY PLAN WHICH IS RETAINED IN THE SITE MANAGERS OFFICE.

## 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. The stone base will act as an attenuation system 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 existing outfall chamber at the south east of the development site.

It is intended that a positive drainage scheme; 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.

The area is in a Category 1 Flood Zone and as such is at a low risk of flooding. Water discharging from the playing field area currently reaches the existing surface water drainage system, without any control or restrictions.

The collector drainage pipe to the synthetic pitch will connect to the existing surface water chamber within the site with a restricted outfall rate.

In terms of the proposed restricted outfall rate, where one restricted discharge rate is proposed for all events, the Qbar (average annual) greenfield runoff rate should be used. The QBAR for this site is 3.51 l/s which has been used as the suggested limited discharge rate. Calculations have been based on a 1 in 100 year storm event with a 40% allowance for climate change.

Surface water discharge rate will be restricted and the installation of the new drainage system to this area of the site will provide a more careful, managed control of discharge than the current arrangement.

The foundations of the new synthetic turf area (shown below) includes:

- 150mm deep layer of type 3 stone
- 40mm macadam
- 10mm shockpad
- 30mm infill of sand and rubber on the carpet

The minimum 230mm deep sub-base construction offers a wedge for surface water attenuation prior to filling and flooding the pitch surface or surrounding grassed areas. The available volume of the wedge is created through the following calculations:

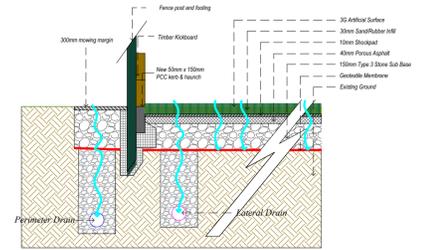
- The pitch layer constructed at a 1 in 100 gradient offers a volume and capacity of 50m<sup>3</sup>
  - Based on a voidage space of 37% this offers 18m<sup>3</sup> of water attenuation.
- The imported fill material to flatten the pitch levels will offer a volume and capacity of 4600m<sup>3</sup>
  - Based on a voidage space of 37% this offers 1702m<sup>3</sup> of water attenuation.

Therefore,

The surface water attenuation calculations as per the table below shows the following;

- 1 in 100 year storm event + 40% allowance for climate change at run off restricted to 6.38 l/s - would require 688m<sup>3</sup> of attenuation

The attenuation provided by the pitch design will comfortably cater for a 1 in 100 storm event +40% without flooding either the pitch surface or surrounding areas



AGP Section - Scale 1:20

Minimum Storage Required: **613 m<sup>3</sup>**

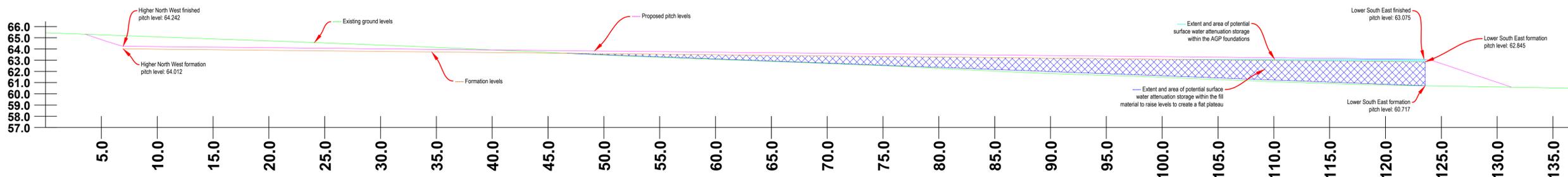
FACTOR	VALUE	SOURCE
Return Period (yrs):	100	Environment Agency, Water Authority, etc.
Limiting Discharge (l/s):	3.51	Environment Agency, Water Authority, etc.
Contributing Area (ha):	0.655	Site plans
Impervious, PIIMP (%):	100	Site plans
M5-60min (mm):	20	Volume 3 maps and site location
SAAR (mm/yr):	660	Volume 3 maps and site location
Ratio, r:	0.4	Volume 3 maps and site location
Soil Type:	4	Volume 3 maps and site location
SOIL:	0.45	Soil Type and Volume 1, Section 7.4
UCWL:	62	SAAR and Volume 1, Figure 9.7
Calculated PR	78.30	
Percentage Runoff =	100.00	

FACTOR	VALUE
Additional Inflow (l/s):	0
Calculate/Specify PR:	Specify
Specify PR:	100
Climate Change Allowance	40

Duration, D (min)	M100-D (mm)	incl climate change	Area C (ha)	PR (%)	Runoff (m <sup>3</sup> )	Add. Runoff (m <sup>3</sup> )	Total Runoff (m <sup>3</sup> )	Limiting Discharge (m <sup>3</sup> /min)	Limiting Runoff (m <sup>3</sup> )	Storage Required (m <sup>3</sup> )
15	27.7	38.8	0.66	100	254.2	0.0	254.2	0.21	3.2	251.0
30	36.2	50.6	0.66	100	331.6	0.0	331.6	0.21	6.3	325.3
60	44.8	62.7	0.66	100	410.6	0.0	410.6	0.21	12.6	398.0
120	56.0	78.4	0.66	100	513.5	0.0	513.5	0.21	25.3	488.2
240	67.6	94.6	0.66	100	619.6	0.0	619.6	0.21	50.5	569.1
360	73.9	103.4	0.66	100	677.2	0.0	677.2	0.21	75.8	601.4
480	77.8	109.0	0.66	100	713.8	0.0	713.8	0.21	101.1	612.7
600	80.7	112.9	0.66	100	739.6	0.0	739.6	0.21	126.4	613.2
720	82.8	115.9	0.66	100	759.2	0.0	759.2	0.21	151.6	607.6
840	84.5	118.2	0.66	100	774.5	0.0	774.5	0.21	176.9	597.6
1440	89.9	125.8	0.66	100	824.1	0.0	824.1	0.21	303.3	520.8
2160	93.7	131.2	0.66	100	859.5	0.0	859.5	0.21	454.9	404.6
2880	96.8	135.5	0.66	100	887.5	0.0	887.5	0.21	606.5	280.9
3000	97.3	136.2	0.66	100	892.0	0.0	892.0	0.21	631.8	260.2
3300	98.5	137.9	0.66	100	903.0	0.0	903.0	0.21	695.0	208.0
3600	99.6	139.5	0.66	100	913.6	0.0	913.6	0.21	758.2	155.4

AGP Attenuation Volume Calculations

## AGP Attenuation Scheme - Scale 1:500



Section A-AA Showing Surface Water Attenuation Storage - Scale 1:200

00 PLANNING ISSUE ME 08.10.21  
REV DESCRIPTION REV CK DATE

**SSL**  
Surfacing Standards Limited  
SPORTS PITCH CONSULTANTS

ME

TITLE  
Haydon School  
New AGP  
Proposed AGP Drainage Strategy

PROJECT G-214594 SCALE Varies SIZE A1  
DRAWING No 08 REVISION 00