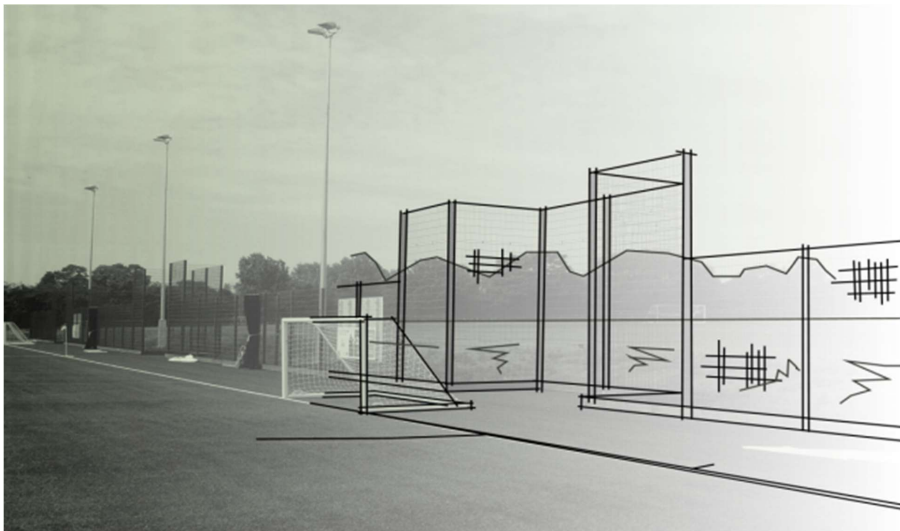


Leafy Lane Playing Fields

Creation of a 3G Artificial Grass Pitch (AGP) with perimeter fencing, hardstanding areas, storage container, floodlights, an access footpath and associated bund

Drainage Strategy



Client	Leafy Lane Playing Fields Leafy Lane Corsham Wiltshire SN13 0JY		
Project	Creation of a 3G Artificial Grass Pitch (AGP) with perimeter fencing, hardstanding areas, storage container, floodlights, an access footpath and associated bund		
SSL project code	G-231622		
Document title	Drainage Strategy		
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	First Issue	OP	4th November 2025

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1. Introduction

Surfacing Standards Limited has been appointed to consider and develop an application for full planning permission for the Creation of a 3G Artificial Grass Pitch (AGP) with perimeter fencing, hardstanding areas, storage container, floodlights, an access footpath and associated bund.

The assessment has been carried out in accordance with the guidance set out in the National Planning Policy Framework (NPPF).

2. Site Details

2.1. The Proposal

The proposed development will include the creation of an Artificial Grass Pitch (AGP) with new fencing and hard standing pathways as shown within table 1.

Table 1 – Area of pitch and associated development

Aspect	Area
3G artificial grass pitch area	5,917m ²
Porous Asphalt surfaced areas	489m ²
Proposed bunding	863m ²
Total Development Area	7,269m²

2.2. Subject Area

The proposed development is situated at:

Leafy Lane Playing Fields
Leafy Lane
Corsham
Wiltshire
SN13 0JY

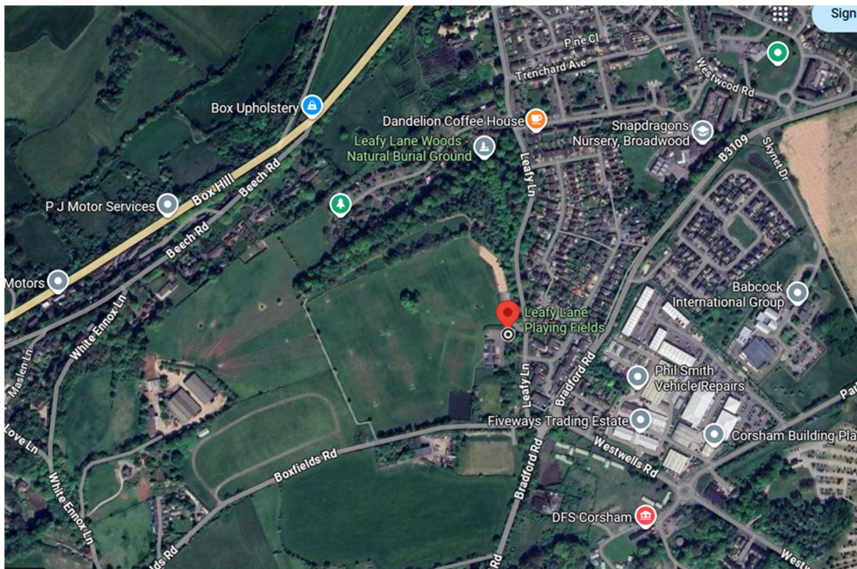


Figure 1 – Site Location

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2.3. Site Description

The site comprises grassed playing fields and a small existing artificial grass pitch accessed from Leafy Lane on the edge of the town of Corsham. The clubhouse and car park serving the site are situated to the immediate east of the proposed development with residential properties further to the east on the other side of Leafy Lane. To the south beyond the boundary hedge is Boxfields Road. To the north beyond the remaining playing field space is a line of trees with residential properties beyond that. To the west beyond the remainder of the playing fields is agricultural land.

2.4. Site History

Historical mapping shows the site as an open field. It wasn't until late 1998 that the site was developed for sporting use with the addition of the small artificial grass pitch and clubhouse, with parking following on from that.

2.5. Site Topography

The topographical survey shows there to be a gentle rise across the playing fields towards the north of the site. Further information on existing levels can be seen on G-231622 01- Existing Site Plan.

2.6. Local Watercourses

There are no natural surface water bodies within the immediate vicinity of the site with the nearest surface water feature over 1.7m to the southwest, making any connection unfeasible. However, there is a reservoir located to the east of the existing artificial pitch.

2.7. Existing Drainage

There is currently no existing field drainage.

2.8. Coal Mining

Coal Authority mapping data shows the site does not lie within a Coal Mining Reporting area.

2.9. Ground Conditions Encountered

Ground conditions comprise Forest Marble Formation – Limestone, with Sedimentary bedrock. The site is considered to be freely draining.

2.10. Infiltration Potential

Indicative infiltration testing was carried out and achieved suitable infiltration to derive a rate. Based on this testing and local ground conditions encountered the site is considered to be suitable for soakaways.

2.11. Assessment Context

The proposed pitch development area is approximately 0.7ha.

2.12. Flood Map

The Government websites confirm the proposed development area is located within a flood zone 1.

Flood zone 1 - This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). The likelihood of flooding from the rivers or the sea at the proposed development site is very low.

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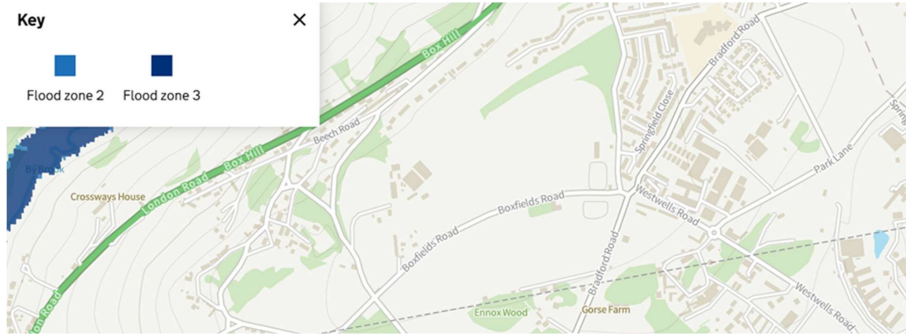


Figure 2 – Flood map for planning

2.13. Risk of Flooding from Rivers and Sea

The Government website confirms the proposed development area is at low risk of flooding from rivers or sea, which happens when there are high tides and stormy conditions.

2.14. Risk of Flooding from Surface Water

The Government website confirms the proposed development area is at very low risk of flooding from surface water, which happens when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead.

Very low risk means that each year this area has a chance of flooding of less than 0.1%.

Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

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3. Framework & Flood Risk Policy

3.1. National Planning Policy Framework (2024)

Section 14 – Meeting the Challenge of Climate Change, Flooding and Coastal Change

Policy extract:

Paragraph 181:

When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment⁵⁵. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- d) any residual risk can be safely managed; and*
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

Department for Environment, Food and Rural Affairs

Sustainable Drainage Systems

Non-statutory technical standards for sustainable drainage systems

March 2015

The surface water drainage scheme must be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards and unless otherwise agreed in writing by the Local Planning Authority, no surface water shall discharge to the public sewerage system either directly or indirectly.

To assist the application for full planning permission and to facilitate the satisfactory implementation and delivery of the project, an assessment of flood risk and a sustainable drainage proposal is required in accordance with national policies.

With reference to Table 2 of Planning Practice Guidance to the National Planning Policy Framework, the proposed development for an outdoor sports facility would be classified as Water Compatible Development.

Table 2 - Extract from Table 2 of the PPG for Flood Risk and Coastal Change is replicated below in Table 2.

Flood Risk Vulnerability Classification	
Vulnerability	Development types
Water Compatible Development	Flood control infrastructure Water transmission infrastructure and pumping stations Sewage transmission infrastructure and pumping stations Sand and gravel working Docks, marinas and wharves Navigation facilities Ministry of Defence installations Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location Water-based recreation (excluding sleeping accommodation) Lifeguard and coastguard stations Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan
Source: Planning Practice Guidance - 2014	

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3.2. Flood Risk Vulnerability and Flood Zone Compatibility

Based on the above assessment of the site being located within a flood zone 1 and classified as a 'water compatible development' and with reference to Planning Practice Guidance for 'Flood Risk and Coastal Change' to the National Planning Policy Framework (Table 3), the proposed development of this site would be considered 'appropriate'.

A copy of Table 3 is presented below to confirm the assessment above.

Table 3 - No exception test

Flood risk vulnerability and flood zone compatibility					
Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3A	Exception Test required	✓	✗	Exception Test required	✓
Zone 3B	Exception Test required	✓	✗	✗	✗
Key:					
✓Development is appropriate					
✗Development should not be permitted					

3.3. Sequential Test

As the site is located within a flood zone 1, a sequential test is not required, and it is worth noting the site is used (and historically designated) as a sports complex (active playing field) the development can be deemed to have passed the sequential test.

3.4. Current Conditions

The proposed development will replace part of an existing playing field and part of an existing artificial grass pitch.

3.5. Surface Water Disposal Requirements

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained in the most sustainable way. No foul sewage will be created as part of this development.

The NPPG clearly outlines the hierarchy to be investigated by the developer when considering a surface water drainage strategy. As such, the developer must consider the following drainage options in the following order of priority:

- A. Into the ground (infiltration);
- B. To a surface water body;
- C. To a surface water sewer, highway drain, or another drainage system;
- D. To a combined sewer.

This is necessary to promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution.

3.6. Flood Compensation

Flood compensation measures will not be required as finished (floor) levels will not affect current flood plain storage onsite.

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4. Surface Water Drainage Strategy

4.1. Surface Water Disposal Solution

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained on a separate system with foul water draining to the public sewer and surface water draining in the most sustainable way.

The NPPG clearly outlines the hierarchy to be investigated by the developer when considering a surface water drainage strategy in the following order of priority:

- A. Into the ground (infiltration);
- B. To a surface water body;
- C. To a surface water sewer, highway drain, or another drainage system;
- D. To a combined sewer.

4.2. Surface Water Disposal Options

A. Soak away

The surface soils across the development area are considered amenable to the use of soakaway type systems.

B. Surface Water Body

There are no natural surface water bodies close to the site, making a connection unfeasible.

C. Surface Water Sewer

There does not appear to be any surface water sewers located within the area surrounding the site.

D. Combined Sewer

There is a foul sewer located to the east of the site however this is in a residential area and would require work across Leafy Lane to secure a connection, and there is no guarantee of this being approved by the local water authorities.

4.3. Surface Water Drainage Strategy

FIFA's Quality Concept for Football Turf (Handbook of Requirements January 2015 Edition) requires a 3G artificial turf to provide water permeability (for outdoor uses) >180mm/hr and advises that to ensure adequate drainage of a field, all individual elements of the football turf should satisfy this requirement.

A positive drainage scheme (land drainage); shall be installed beneath the Artificial Grass Pitch (AGP) 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 the proposed surface water connection.

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.
- 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.

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 infiltrating through the underlying permeable geology.

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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.

Flow	Time (min)	M100-D (mm)	Inflow M ³	Outflow M ³	Storage M ³
	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	46.3	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	959.6	244477.4	0
	2160	111.9	1058.0	366716.2	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.

Figure 7re – 1 in 100 year + 40% CC

Commented [ME1]: Input calcs + restriction

A hydraulic model has not been developed to simulate the flows within and flooding from the piped drainage network. It is not possible to simulate the pitch drainage within the hydraulic modelling software to accurately simulate the flow within a perforated pipe network which uses the pitch sub-base as attenuation and storage, as is the case with this particular drainage network.

The design of the pitch sub-base and the associated drainage network is such that additional surface water flows that cannot be accommodated within the piped drainage network will enter the pitch sub-base via the perforated pipe network, and will be attenuated in the sub-base until such a time and the flows within the piped network have subsided to a level which will allow the surface water to re-enter the piped network and soak through the underlying permeable geology.

As such, in the case of surface water networks for pitches, which use the sub-base as a storage area, it is accepted that confirming that there is adequate storage within the pitch to accommodate any flooding, is an acceptable work-around for the shortfall.

Further information on the design and attenuation volumes within such events can be seen within:

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G-231622 09 – Proposed AGP Drainage Layout
G-231622 09 – Proposed AGP Drainage Strategy
Appendix Q - BRE365 Infiltration Rates

4.4. Foul Water Drainage Strategy

There will be no foul water produced as part of the site development.

4.5. Surface Drainage Maintenance

The drainage system will be designed to minimise maintenance requirements; however, a full maintenance scheme will be established for those elements not being offered for adoption.

Maintenance operations will be carried out by the existing ground maintenance team, in perpetuity post development.
Further information on the Drainage Management & Maintenance is displayed below within **section 5 of the report**.

4.6. Site Drainage Proposals Conclusions

- The proposed development includes the creation of a new external artificial grass pitch with perimeter ball-stop fencing, and clean hardstanding accesses.
- Surface water is to be disposed of into a soakaway.
- Adequate attenuation within pitch base and upper surface (comprising a permeable granular sub-base) to ensure that excess volumes, which would be experienced during a critical storm event, does not bypass the control system.
- This drainage strategy is designed to ensure no above ground flooding occurs up to and including the 1 in 100 year event + 45% allowance for climate change.
- The surface water drainage from this site, post development, is such that the surface water will be managed and disposed of within the site boundary, thus complying with the Planning Practice Guidance for 'Flood Risk and Climate Change' to the National Planning Policy Framework.
- Based on the above and providing the above strategies are adopted; the developed site will not contribute further to flood risk thus satisfying the principles of the National Planning Policy Framework.

4.7. Construction Surface Water Management

Due to the nature of the construction works, little onsite material storage is required. During the processes when it is required it will be for relatively short periods of time.

Below is a brief description of the key construction works for an Artificial Grass Pitch and associated activities:

- Once the base is put into place the new drainage system shall be installed with the process taking approximately 3 days to complete. The materials largely involve the delivery of pea shingle material stockpiled within the development footprint with 80mm and 150mm Ø UPVC perforated corrugated plastic carrier drainage pipes to EN1401-1:1998 laid into geotextile lined, gravel-filled trenches. The UPVC perforated corrugated plastic carrier pipes shall be stored onsite within the designated fenced and enclosed storage areas prior to being securely laid and covered within the ground.
- The boundary of the development shall be lined with PCC kerb edging detail and the necessary fence posts, floodlighting foundations that involves concrete foundations. These materials will be stored within the designated storage area in bulk delivery with each being heavily weighted with minimal risk of movement.
- At this stage the fencing system shall be erected and in place around the development footprint and any/all materials within the development will be safely secured.
- The development area shall then be surfaced with tarmacadam. The process of tarmac surfacing requires material to be delivered and laid at set temperatures and therefore no materials will be storage onsite for this process and works and shall take approximately 5 days to complete.
- Upon completion of the base works the artificial surfacing shall be delivered in bulk to the pitch base within the secure fenced area. The material is rolled out and laid with the boundary of the surfacing being clamped and secured to the edging detail so that the material stays insitu and cannot be removed during any flood event or otherwise.

The development location itself acts as a sediment trap / barrier that retains surface water within the site boundary with any/all surface water run off going through the existing infrastructure of the hard-standing surfacing, stone foundation, geotextile membrane and entering into the existing and proposed drainage network that is lined with a geotextile membrane, pea shingle and drainage channels that each connect to a silt trap inspection chamber. This process will adequately trap and retain sediment throughout the construction process.

The existing and proposed levels and gradients of the site lead across the sports pitch. Whilst travelling across the development through the natural fall of levels the surface water will infiltrate through the stone foundation, geotextile membrane and entering into the existing and proposed drainage network that is lined with a geotextile membrane, shingle and drainage channels that each connect to a silt trap inspection chamber. This process will adequately trap and retain sediment throughout the construction process. Any run off that travels through the site prior to naturally infiltrating through the base would be retained within the development

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boundary. Surface water would sit within the development area until it naturally infiltrates through the existing hard-standing surfacing, stone foundation, geotextile membrane and entering into the existing and proposed drainage network that is lined with a geotextile membrane, shingle and drainage channels that each connect to a silt trap inspection chamber.

Throughout the development works the areas and development footprint will be cleared, cleaned and jet washed with the silt traps collecting all sediment and being emptied as / when required until all construction works are completed.

Run-off rates from the site will be managed so they are no greater than pre-development or in keeping with the best practice guidance to minimise risk of blockage.

Run-off control will include provision of appropriate levels / grading to direct any water from the construction site to remain on site.

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5. Drainage Management & Maintenance

GULLIES, PIPEWORK, INSPECTION CHAMBERS AND CONTROLS	
Required Action	Frequency
Regular Maintenance	
Remove cover and inspect chambers and pipework ensuring water is flowing freely and that the exit route for water is unobstructed.	Annually
Undertake inspection after leaf fall in autumn, remove leaves from gullies, chambers and pipes	Every autumn
Inspect silt traps and clear of silt	Every 6 months or as required
Inspect catchpits and clear of silt	Every 6 months or as required
Remedial work	
Remove debris, silt and leaves from inspection chambers and flow control chambers.	As required
Remove debris and silt from pipework through high pressure jet washing.	As required
Repair physical damage if necessary	As required
Monitoring	
CCTV survey to establish condition of pipe runs. Cleansing or repair of physical damage to be conducted if necessary	Every 5 years or as required

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PERMEABLE AND POROUS SURFACES	
Required Action	Frequency
Regular Maintenance	
Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Tasks	
Stabilise and mow contributing and adjacent areas	As required
Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required and in accordance with manufacturer's recommendations
Remedial Work	

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Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost material.	As required
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Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
If efficiency of water percolating to the sub-base drops, jet washing and suction cleaning could substantially reinstate paving to 90% efficiency (as per recent experience).	As required
Monitoring	
Initial inspection	Monthly for three months after installation
Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48h after large storms in first six months
Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
Monitor inspection chambers	Annually

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