

CAS02 Rossett Road, Rossett

Castle Green Homes Ltd



SuDS Maintenance and Management

Site: Rossett Road, Rossett

Application Ref.: H6955/A/19/3231048

Management: Private / ~~Adoptable~~

Management Company: To Be Confirmed



For

Castle Green
Unit 20
St Asaph Business Park
St Asaph
Denbighshire
LL17 0LJ

Castle |||| Green



The Institution of
Structural Engineers



Old Marsh Farm Barns
Welsh Road, Sealand
Flintshire CH5 2LY
Telephone: 01244 288 178

PERMEABLE PAVING

Permeable surfaces as permeable block paving, porous Asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc. Permeable block paving and porous asphalt can be cleaned by suction brushing.

Type and Location

The type of permeable paving proposed is a 'Block paving' product finish for the Roads and Drive/Parking areas.

The areas where permeable surfacing are proposed are indicated on the Proposed Surfacing Materials plans drawing ref. HYD554 - 0102 - D - Castle Green - Southern Land Parcel - Surfacing Areas & HYD554 - 0105 - D - Castle Green - Northern Land Parcel - Surfacing Areas, these areas are wholly within private ownership and do not form part of any highway adoption.

Construction

The exact construction build-up should be confirmed at detailed design.

The block paving finish proposed (80mm) is on 50mm thick Laying Course & 125mm Base Course with a geotextile wrapped sub- base (sub-base thickness varies depending on soakaway infiltration rate). Final construction thicknesses to be determined at detailed design stage of external works and levels design.

The drive/parking construction build-up specification is to be as above excluding the base course.

Typical construction details are shown on the Highway Construction Details – Permeable Surfacing sheet drawing ref. CAS02 - 222 - B - Highway Construction Details - Permeable Surfacing.

Maintenance Schedule

Table 4 Maintenance regime for permeable paving



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TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical 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 maintenance	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 – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	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 jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
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, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

(Source CIRIA, 2021)



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Infiltration Basin

Regular inspection and maintenance is required to ensure the effective long-term operation of infiltration systems. Maintenance responsibility for systems should be placed with a responsible organisation. Guidance on the operation and maintenance requirements that may be appropriate are outlined below; the list is not exhaustive and some actions may not always be required.

Type and Location

The Infiltration system should be designed to manage storms up to the 100 year return period event with an allowance for climate change. The infiltration component should discharge from full to half-full within a reasonable time so that the risk of it not being able to manage a subsequent rain fall event is minimised.

There are two basins proposed and both are located within the northern land parcel as indicated on the Northern Area Drainage Plan drawing ref. CAS02 - 101 - B -Main Drainage - Northern Land Parcel. Both of the Infiltration Basins are wholly within private ownership and do not form part of any adoption.

Construction

Where possible, construction of infiltration basins should take place after the site has been stabilised, in order to minimize the risk of premature system failure due to high sediment loadings in run off from disturbed ground. It is essential that infiltration basins should not be used to manage construction run off and trap construction sediments.

The proposed basins should be sized appropriately to cater for the extreme storm events; approximately 685m³ for the 100yr+40% Climate Change return period for Basin 1, approximately 595m³ for the 100yr+40% Climate Change return period for Basin 2 (*Base on QSE's*).

The exact pond shape and size are subject to engineering review at detailed design.

Maintenance Schedule

Table 13.2 Maintenance regime for infiltration basins



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TABLE 13.2 Operation and maintenance requirements for infiltration basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

(Source CIRIA, 2021)


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SURFACE WATER HEADWALL

There are two 150mm diameter inlet pipes and headwalls from the proposed drainage system into the infiltration basins and two emergency outlets (overflows) from each basin.

Maintenance Schedule

Table 4 Maintenance regime for headwalls

Inlets, outlets, controls and inspection chambers	
Regular maintenance	Frequency
Inlets, outlets and surface control structures Inspect surface structures, removing obstructions and silt as necessary. Check there is no physical damage. Strim vegetation 1 m min. surround to structures and keep hard aprons free from silt and debris	Monthly
	Monthly
Inspection chambers and below-ground control chambers Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn	Annually
Occasional maintenance	
Check topsoil levels are 20 mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial work	Frequency
Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary	As required
Repair physical damage if necessary	As required

(Source CIRIA, 2021)

BELOW GROUND CONVEYANCE PIPE NETWORK

There are below ground surface water pipes for conveyance, sized to convey flows up to the 100-year return period storm event with an allowance for climate change; pipe sizes range from 150-450mm diameter.

Maintenance Schedule

Maintenance regime for below ground pipes and manholes

Pipes, Manholes and Inspection Chambers (below-ground)	
<i>Regular maintenance</i>	<i>Frequency</i>
Manholes and Inspection Chambers Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
<i>Remedial work</i>	<i>Frequency</i>
Repair physical damage if necessary	As required
<i>Regular maintenance</i>	<i>Frequency</i>
Pipes Following inspection in manholes, if flow is impeded then arrange for CCTV inspection, if significant debris is observable within manholes or inspection chambers then jetting may be required prior to CCTV survey.	Annually
<i>Remedial work</i>	<i>Frequency</i>
Undertake jetting of the system if necessary, undertake root-cutting if necessary, repair physical damage if necessary.	As required



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GULLY POTS

Gully pots contain silt traps which require emptying periodically to maintain effective silt removal and to further minimise the risk of silt deposits within the system. The maintenance regimes for these assets are detailed in the table below.

Maintenance Schedule

Gully pots	
<i>Regular maintenance</i>	<i>Frequency</i>
Empty the gully pots bi-annually, ideally in spring and late autumn to remove the leaf litter and debris. Note areas where debris is significant or lesser and the schedule can be adjusted accordingly. Inspect for physical damage.	Spring and autumn
<i>Remedial work</i>	<i>Frequency</i>
Repair physical damage if necessary	As required



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SILT TRAP MANHOLES

600mm deep silt traps to be provided upstream of the inlet to the infiltration basins to further minimise the risk of silt deposits within the system.

450mm deep silt traps to be provided upstream of the inlet to the permeable paving sub-base to further minimise the risk of silt deposits within the system

The maintenance regimes for these assets are detailed in the table below.

Maintenance Schedule

Manholes and Inspection Chambers (below-ground)	
<i>Regular maintenance</i>	<i>Frequency</i>
Remove cover and inspect, ensuring that water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
<i>Remedial work</i>	<i>Frequency</i>
Repair physical damage if necessary	As required



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