



ODYSSEY

DEVELOPING JOURNEYS

CONVALESCENT HOME

SEA ROAD, RUSTINGTON

**DRAINAGE MAINTENANCE AND MANAGEMENT
PLAN**



CONVALESCENT HOME, SEA ROAD, RUSTINGTON

DRAINAGE MAINTENANCE AND MANAGEMENT PLAN

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1.0 INTRODUCTION & OVERVIEW

1.1. Preamble

- 1.1.1 Odyssey have been commissioned by Macar Homes (Rustington) Limited to produce this drainage maintenance & management plan (DMMP) to accompany the application to discharge relevant planning drainage condition associated with proposed residential development located at Convalescent Home, Sea Road, Rustington. The local planning authority is Arun District Council (Arun DC) and planning reference number R/258/18/PL. The proposal for the site is to erect new and refurbish a number of existing buildings to provide a total number of 33 dwellings.
- 1.1.2 Drainage features serving single dwelling only will be the responsibility of an individual householder. Drainage features of any shared drainage system will be the responsibility of and be maintained long term by the appointed management company in accordance with this plan or the drainage suppliers' requirements / recommendations if different. Please refer to Section 5 for further explanation.
- 1.1.3 The actions outlined in this plan are common to all types of drainage, and are the minimum standard of maintenance and inspection however, the management company and individual householders (where appropriate) may find it beneficial to vary the maintenance regularity, and to include extra tasks such as
- To record the measurements of sediment levels;
 - To make a photographic record of problem areas;
 - To identify and clear areas where refuse is a problem;

1.2. Proposed Surface Water Drainage Strategy

- 1.1.4 The proposed surface water (SW) drainage strategy is shown on the drawings which are appended in **Appendix A**.
- 1.1.5 The SW network apart from the typical sub-surface pipes and manholes includes infiltration geocellular tanks, and permeable road system and is designed to cater for a 1 in 100-year return storm (1% annual probability) plus a climate change allowance of 40%. 10% urban creep has been allowed for roofs within the design catchments.



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- 1.1.6 The drainage system design is based on a full-bore condition where no flooding is allowed. Should rainwater start to escape from the drainage system it will be necessary to investigate the issue and necessary corrective maintenance will be undertaken accordingly.
- 1.1.7 It is proposed that the SW runoff generated from roofs and hard standing areas would be gravity conveyed by the permeable paving granular sub-base to a suitable location and then ultimately discharged into the ground via infiltration.



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2.0 MAINTENANCE OF PIPE SYSTEMS, GULLIES, DRAINAGE CHANNELS, MANHOLES, DIFFUSER UNITS AND SILT TRAPS

2.1.1 The standard piped sewer system can be identified on the drainage layout drawings using the following symbols;

	FWMH - FOUL WATER MANHOLE (PCC RINGS) - MIN 1.2m DIA
	FW-IC3 - FOUL WATER INSPECTION CHAMBER - MIN 0.45m DIA
	FW-IC4 - FOUL WATER INSPECTION CHAMBER - MIN 0.25m DIA
	SWMH - SURFACE WATER MANHOLE (PCC RINGS) - MIN 1.2m DIA
	SW-IC3 - SURFACE WATER INSPECTION CHAMBER - MIN 0.6m DIA
	SW-IC3 - SURFACE WATER INSPECTION CHAMBER - MIN 0.75m x 0.60m
	SW-IC3 - SURFACE WATER INSPECTION CHAMBER - MIN 0.45m DIA
	SW-IC4 - SURFACE WATER INSPECTION CHAMBER - MIN 0.25m DIA
	RODDING EYE
	100 Ø 1/12 FOUL WATER DRAINAGE
	225 Ø 1/199 SURFACE WATER (SW) DRAINAGE
	225mm SURFACE WATER DRAINAGE - PERFORATED PIPE / UNDER DRAIN
	SW CHAMBER WITH SILT TRAP
	ROAD GULLY
	YARD GULLY
	DIFFUSER UNIT - UNIT TYPE / SIZE TO BE DETERMINED BY THE MANUFACTURER
	SURFACE WATER DRAINAGE CHANNEL WITH SUMP (I.E ACO M100D 0.0 OR SIMILAR APPROVED)

2.1.2 Drainage systems comprising of pipe runs, manholes, drainage channels and gullies are a more conventional method of draining SW run-off from roofs and hardstanding areas.



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- 2.1.3 Surface water falling on impermeable areas such as roofs drain to gutters and downpipes or at surface level to gullies / drainage channels which convey the water below ground to the main drainage network. Manholes are also provided on the main drainage system at intervals, changes in sewer direction, gradient or pipe diameter. This type of drainage system can be accessed from the gullies or manholes for routine inspection and maintenance.
- 2.1.4 Gullies / drainage channels are to be 'trapped' such that on collecting and conveying SW, they trap sediment and prevent any unpleasant odours returning from the sewers.
- 2.1.5 Due to the nature of the diffuser units its maintenance from the practical point of view would be restricted to the monitoring for siltation – via internal CCTV inspection. Should diffuser unit prove to be completely silted up (and thus slowing down the flow of water into the granular sub-base of permeable paving) or damaged it would be necessary to replace it completely.
- 2.1.6 Schedule for maintenance and inspection of pipe systems, gullies, drainage channels, manholes and silt traps is shown in **Table 2.1**.



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Table 2.1: Pipe Systems, Gullies, Drainage Channels, Manholes, Diffuser Units and Silt Trap Maintenance Activities & Frequency

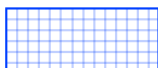
Maintenance Category	Maintenance Activity	Comments	Frequency
Routine Maintenance	Litter and debris removal	Debris removal which may cause risks to performance.	Monthly
	Checking of blockages, cleaning of gutters, drainage channels and silt traps (where applicable)	Silt traps found to be non-functioning/blocked on annual inspection will be noted and cleared at six monthly intervals. Recurring blockages should be investigated.	Annually (or as required)
		Cleaning of gutters and drainage channels	Annually (or as required based on inspections)
	Correct Operation	Check for blockages, inspect and identify any areas that are not operating correctly. If required, take corrective action and maintenance.	Monthly for three months after installation and then six monthly
Infrequent Maintenance	Clear blockages	Cleaning/jetting	As required
	Desilting of silt traps	Remove sediment and debris from silt traps	As required
Corrective Maintenance	Repair	Repair/rehabilitation of system components	As required
Monitoring	Initial Inspection	Initial Inspection	Monthly for three months after installation
	Operation Inspection	Inspect for evidence of poor operation. Check silt traps for prolonged surcharge. If required, take corrective action and maintenance.	3-monthly and 48 hours after large storms for silt traps checks
		Inspect silt accumulation rates and establish appropriate cleaning frequencies.	
	Clogging Inspection		Monthly in the first year and then as required
	Inspection Chambers, Silt traps	Monitor inspection chambers and silt traps.	Annually or as required



3.0 MAINTENANCE OF GEOCELLULAR SYSTEMS



- 3.1.1 The SW drainage system consist areas of geocellular crates. The geocellular crates are located within publicly accessible land throughout the site. The geocellular crates can be identified on the drainage layout drawings using the following symbols;



GEOCELLULAR TANK - GEOTEXTILE AND
GEOMEMBRANE WRAPPED



GEOCELLULAR TANK - GEOTEXTILE WRAPPED

- 3.1.2 The crates would be maintained, repaired, and replaced as required by the private management company appointed for the site.
- 3.1.3 Geocellular crate systems provide storage within a void space. They are usually built out of plastic, or other man-made materials, and can store and infiltrate run-off (where conditions permit). Geocellular systems are sub-surface components that can cater for vehicle loading, given appropriate specification and installation depth.



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- 3.1.4 As geocellular systems only offer a limited improvement in water quality, it is preferable that they form one part of a treatment train. It is important to pre-treat upstream as this will curtail sediment influx and increase the system's longevity.
- 3.1.5 Surface water flow to the geocellular units will be via trapped gullies or in case of off-line units run-off would be filtrated through the permeable paving surface and granular material of the permeable paving system. All manholes immediately upstream of the geocellular storage structure will incorporate a silt trap / sump.
- 3.1.6 Schedule for maintenance and inspection of geocellular systems is shown in **Table 3.1**.

Table 3.1: Geocellular System Maintenance Activities & Frequency

Maintenance Category	Maintenance Activity	Comments	Frequency
Routine Maintenance	Inspect and identify any areas that are not operating correctly		Monthly (for the first three months) then annually)
	Remove sediment from upstream silt trap (sump)	Remove sediment from sump when 50% volume lost. N.B. Sumps must be maintained to limit sediment entry into the underground cells.	Annually or as required.
Corrective Maintenance	Excavate, uncover & jet geocellular units to remove sediment. Repair and rehabilitate inlets, outlets and vents.		As required
Monitoring	Inspect accessible inlets / outlets, vents to check they are in good condition and operating as designed		Annually
	Survey inside of geocellular tanks for sediment build-up and remove if necessary		Every five years or as required

- 3.1.7 The above maintenance and inspection regime is recommended however, reference should also be made to the appropriate manufacturer's guidance and recommendations as the more frequent maintenance and inspection regime might be required.



4.0 MAINTENANCE OF PERMEABLE PAVING



- 4.1.1 The SW drainage system consist of permeable paving (with associated perforated pipes) the locations of which can be identified on the drainage layout drawings using the following symbols;



PERMEABLE BLOCK PAVING

225mm
SURFACE WATER DRAINAGE - PERFORATED PIPE
/ UNDER DRAIN

- 4.1.2 The permeable paving with perforated pipes which sit at the bottom of the permeable paving sub-base (as indicated on drainage layout drawings) would be the responsibility of the appointed management company.
- 4.1.3 Permeable block paving allows water to pass through the gaps between the blocks into underlying sand and gravel layers allowing for attenuation, conveyance and where possible, infiltration of surface water run-off.
- 4.1.4 Permeable paving will cleanse the SW run-off. The initial cleansing occurs within the sand bedding layer where hydrocarbons are collected. The layer of geotextile below the sand acts as a secondary filter before infiltrations through to the sub-base further filters the discharge before ultimately infiltration into the ground (at suitable locations identified on the Engineering Layout).



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- 4.1.5 It is recommended that the surfaces should be regularly inspected and cleaned accordingly. Based on the results of full-scale trials carried out by Aggregate Industries, the most effective method is to use a cleaner with suction only. Even if the surface has become completely clogged, trials have shown that this method of cleaning can rehabilitate the surface to an acceptable level.
- 4.1.6 The below maintenance and inspection regimes are recommended however, reference should also be made to the appropriate manufacturers' guidance and recommendations.
- 4.1.7 Schedule for maintenance and inspection of permeable paving is shown in **Table 4.1**.

Table 4.1: Permeable Paving Maintenance Activities & Frequency

Maintenance Category	Maintenance Activity	Comments	Frequency
Routine Maintenance	Sweeping	Regular removal of silt and other sediments to maintain infiltration capacity.	Minimum of 3 surface sweepings per year
	Brushing and Vacuuming	Brush and suction cleaner (either lorry-mounted or small precinct sweeper) Care should be taken to adjust vacuum equipment to ensure jointing material is not removed. Any lost material should be replaced.	1. End of winter (April) - to collect winter debris 2. Mid-summer (July/August) - to collect dust, flower and grass-type deposits. 3. After autumn leaf fall (November) Or as required based on site specific observations of clogging or manufacturer's recommendations
Infrequent Maintenance	Landscaping trimming	Stabilise and mow adjacent areas.	As required
	Weeding	Removal of weeds from permeable pavement structure.	As required
Corrective Maintenance	Landscape Remediation	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
	Rutting and Damage Remediation	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to	As required



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Maintenance Category	Maintenance Activity	Comments	Frequency
		the structural performance or a hazard to users.	
	Structural Remediation	Rehabilitation of surface and upper sub-structure Rehabilitation of inter-connection pipe links and/or diffuser units	Every 10 to 15 years or as required (if infiltration performance is reduced because of significant clogging or CCTV reports structural damage to diffusers or pipes)
	Initial Inspection	Initial Inspection	Monthly for 3 months after installation
	Operation Inspection	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	3-monthly and 48 hours after large storms
Monitoring	Clogging Inspection	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Inspection manholes within permeable paving and permeable paving inter-connection chambers	These are installed to allow inspection of the inter-connection arrangement and check on the water level in the granular sub-base of permeable paving system.	48 hours after large storms and CCTV inter-connections every 5 years to check for siltation and structural stability of diffuser units



5.0 MAINTENANCE RESPONSIBILITIES

- 5.1.1 A pre-handover inspection will be required prior to the commencement of any maintenance periods.
- 5.1.2 The residents of each dwelling would be responsible for all elements of drainage which would fall within the extent of land conveyed to them through each individual plot purchase. This would include all chambers, rodding eyes, drainage channels and pipework as necessary. The responsibilities would include the required maintenance activities, as well as the replacement and repair of components as required.
- 5.1.3 A private management company would be responsible for all elements of any shared drainage system. The remit of the private management company would include the regular and satisfactory maintenance of the components listed above, as well as the “end of life” replacement as required by the manufacturer’s guidance. The private management company would be required to identify a suitable storage or disposal location for all green and organic waste. The private management company would also be required to prepare an action plan for dealing with accidental spills of pollutants, as well as task specific Risk Assessments and Method Statements associated with the relevant maintenance activity.
- 5.1.4 Private management company must have access rights to all areas (even private) where the maintenance of a shared drainage system would be necessary.
- 5.1.5 The maintenance regimes set out in this document are subject to review at periods deemed suitable by the appointed management company and their internal processes and procedures may be amended to suit.
- 5.1.6 Should repairs to the drainage system be needed it is expected that upon completion any drainage system reinstatement works will provide the same construction and functioning standards as per the approved drainage designs (please refer to **Appendix A** for approved designs).
- 5.1.7 It would be necessary for the maintenance company to prepare a bespoke maintenance record sheet, however as a guide a CIRIA’s C753 SuDS Manual example is shown in **Appendix B**.
- 5.1.8 If the appointed private management company is no longer able to fulfil its duties, then the responsibility will remain with the residents to form and / or appoint a new management company to undertake the maintenance of the shared drainage system.



6.0 ACCIDENTAL SPILLAGES OF POLLUTANTS

- 6.1.1 If the spill cannot be safely contained or if the spill is causing a threat to life, evacuate the area and call emergency services from a safe location.
- 6.1.2 If it is safe to do so an action for dealing with accidental spillages should follow the stop-contain-notify-clean up procedures. These procedures must only be followed if the nature of the spillage and associated hazard is known and understood.
- 6.1.3 'Stop' – If appropriate stop work immediately and stop the leak or eliminate the source of the spill.
- 6.1.4 'Contain' – Spills involving hazardous materials should first be contained to prevent spread of the material to other areas. Use pollution control equipment (e.g. spill kits, drip trays, etc) to contain the spill. Check the spill has not reached any drains or water bodies.
- 6.1.5 'Notify' – Once the spill has been contained notify emergency contact, either nominated management company or emergency services by calling 999.
- 6.1.6 'Clean up' – Attempt to soak up the spill using absorbent material (or by suction tank or similar if appropriate). Wherever possible the material should be rendered safe by treating with appropriate chemicals. Treated material should be absorbed onto inert carrier material to allow the material to be cleared up and removed to a safe place for disposal or further treatment as appropriate. Any areas of affected permeable block paving surfacing should be appropriately cleaned and re-laid on a new bedding material. In case of a heavy pollution of the sub-base it might be necessary to replace the sub-base as appropriate.



7.0 FINANCIAL MANAGEMENT AND MAINTENANCE COSTS

7.1.1 The management company will collect funds through estate charges (monthly, annually or as appropriate) from all residents to cover costs for the ongoing maintenance.

7.1.2 Within the estates charges a contingency pot / sinking fund will accumulate monies which will cover costs for unforeseen maintenance / repairs and the future replacement of any major components at the end of the manufacturers' recommended design life.

Appendix A

Approved Drawings

Appendix B

CIRIA C753 SuDS Manual Maintenance Record Pro-forma Example

TABLE SuDS maintenance inspection checklist
B.25

General information								
Site ID								
Site location and co-ordinates (GIS if appropriate)								
Elements forming the SuDS scheme				Approved drawing reference(s)				
Inspection frequency				Approved specification reference				
Type of development				Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)				

Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
General inspection items								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?								
Silt/sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								

continued...

continued from...

TABLE B.25 SuDS maintenance inspection checklist

Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)?								
Does permeable or porous surfacing require sweeping to remove silt?								
System blockages and litter build-up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Vegetation								
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)								
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required								
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (eg wheel ruts?)								
Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow controls?								

continued...

continued from...

TABLE B.25 SuDS maintenance inspection checklist

Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
Other observations								
Information appended (eg photos)								
Suitability of current maintenance regime								
Continue as current Increase maintenance Decrease maintenance								
Next inspection								
Proposed date for next inspection								