

WATER LANE, ANGMERING
SUDS MAINTENANCE MANUAL

BARRATT DAVID WILSON HOMES

27 MAY 2021



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1.0 Maintenance Manual

Context

- 1.1. Abley Letchford Partnership has produced this SuDS Maintenance Manual with regards to Barratt David Wilson Homes (BDW) interests in respect of the development of Water Lane, Angmering.
- 1.2. The development will accommodate 175 dwellings (Arun District Council (ADC) planning application reference: A/99/17/OUT). This permission was granted in March 2019.
- 1.3. This Manual provides written evidence to support the overall site discharge of planning conditions and should be read in conjunction with drawings associated with those packages.

Adoption and Ownership

- 1.4. The drainage system is designed to the appropriate standards including Sewers for Adoption, the Building Regulations, the requirement of the National Planning Policy Framework and also Arun District Council, and West Sussex County Council, as LLFA, Policies and standards
- 1.5. The intention of adoption and ownership of drainage and SuDS is as follows:
 - Surface water sewers within development parcels to be offered for adoption to Southern Water under the Section 104 process of the Water Industry Act. Alternatively, they could be offered to a third party service provider such as Icosa Water.
 - Surface water highway drains, gullies and leads within adopted roads to be maintained by the Highway Authority.
 - Foul sewers within development parcels to be offered for adoption to Southern Water under the Section 104 process of the Water Industry Act. Alternatively, they could be offered to a third party service provider such as Icosa Water.
 - Above and below ground SuDS within development parcels (i.e. swales, permeable paving, infiltration devices and basins), to be maintained by a private maintenance company funded by residential properties.
- 1.6. Until such time as the drainage is approved and the construction has begun a management company will not be procured. Therefore, exact details of the management company cannot be provided at this time.
- 1.7. A management and adoption plan is provided in the appendix.

SuDS Maintenance Strategy

- 1.8. For the water treatment effects of SuDS features to remain effective, a comprehensive maintenance strategy will be implemented.
- 1.9. During construction, maintenance of SuDS features will be undertaken by the Contractor. Upon completion, the assets will be passed over to the Management Company or community group commissioned to maintain the features in perpetuity.



- 1.10. A regular maintenance regime will be created, which consists of several primary measures required to ensure the longevity of the system. These should be undertaken on a regular basis to ensure consistent performance. Typical maintenance activities consist of:
- Inspecting and reporting; relatively regular review of the condition identifying issues and providing resolutions. Periodic review from the maintenance contractor;
 - Litter and debris removal;
 - Grass trimming, overall cutting and localised strimming preventing blockages;
 - Weed and evasive plant control;
 - Shrub management;
 - Aquatic and shoreline vegetation management;
 - Sweeping pervious surfaces; and
 - Oil removal from proprietary systems.
- 1.11. A remedial maintenance schedule will be recommended as part of the handover of the SuDS features. Remedial maintenance is required to provide repairs to the system and monitor long term damage ensuring the system remains consistently productive. The schedule would consist of;
- Structure rehabilitation and repair;
 - Infiltration surface rehabilitation;
 - Scarifying to remove “Thatch”;
 - Spiking or Tining the soil;
 - Air pressure treatment.
- 1.12. The maintenance schedule contents and timing will depend upon multiple factors including usage, contents of water utilising the system, location and biology. To this end, comprehensive maintenance schedules for each SuDS feature is provided in the appendix.

SuDS Description and Design Lifetimes

- 1.13. Refer to the Drainage Maintenance Plan in the Appendix for locations.

Drainage Area 1

- 1.14. Drainage Area 1 relates to the northern basin, which is a lined Detention Basin with positive discharge to the Black Ditch controlled by a Hydro-brake. The basin and associated infrastructure is to be completed by the first Phase 1 dwelling completion.
- 1.15. Within the Appendix there are maintenance schedules for a Detention Basin.
- 1.16. The Hydro-brake can be procured with a maintenance regime for the lifetime of the development. However, as the Hydro-brake will be adopted by either Southern Water or Icosa Water they will be responsible for the maintenance and operation of this item through the lifetime of the development.



Drainage Area 2

- 1.17. Drainage Area 2 relates to the southern basin, which is an Infiltration Basin with discharge to the ground. The Infiltration Basin overlies Attenuation Storage Tanks beneath to cater for the 1:10 plus climate change storm event. The SuDS and associated infrastructure is to be completed by the first Phase 11 dwelling completion.
- 1.18. Within the Appendix there are maintenance schedules for both, an Infiltration Basin and Attenuation Storage Tanks.
- 1.19. The Attenuation Storage Tanks have a 60 year lifecycle. However, as these items are relatively new to the market it is thought their lifetime is much longer than this. As the tanks will be managed by the Management Company they will be responsible for the maintenance and operation of this item through the lifetime of the development, through funding by the residents service charges.

Drainage Area 3

- 1.20. Drainage Area 3 relates to the northern Swale in the central open space area, which is an Infiltration Swale with discharge to the ground. The Swale overlies Attenuation Storage Tanks beneath to cater for the 1:10 plus climate change storm event. The SuDS and associated infrastructure is to be completed by the first Phase 12 dwelling completion.
- 1.21. Within the Appendix there are maintenance schedules for both, a Swale and Attenuation Storage Tanks.
- 1.22. The Attenuation Storage Tanks have a 60 year lifecycle. However, as these items are relatively new to the market it is thought their lifetime is much longer than this. As the tanks will be managed by the Management Company they will be responsible for the maintenance and operation of this item through the lifetime of the development, through funding by the residents service charges.

Drainage Area 4

- 1.23. Drainage Area 4 relates to the southern Swale in the central open space area, which is an Infiltration Swale with discharge to the ground. The Swale overlies Attenuation Storage Tanks beneath to cater for the 1:10 plus climate change storm event. The SuDS and associated infrastructure is to be completed by the first Phase 24 dwelling completion.
- 1.24. Within the Appendix there are maintenance schedules for both, a Swale and Attenuation Storage Tanks.
- 1.25. The Attenuation Storage Tanks have a 60 year lifecycle. However, as these items are relatively new to the market it is thought their lifetime is much longer than this. As the tanks will be managed by the Management Company they will be responsible for the maintenance and operation of this item through the lifetime of the development, through funding by the residents service charges.

Drainage Area 5

- 1.26. Drainage Area 5 relates to the western Swale in the western parcel, which is an Infiltration Swale with discharge to the ground. The Swale overlies Attenuation Storage Tanks beneath to cater for the 1:10 plus climate change storm event. The SuDS and associated infrastructure is to be completed by the first Phase 14 dwelling completion.



- 1.27. Within the Appendix there are maintenance schedules for both, a Swale and Attenuation Storage Tanks.
- 1.28. The Attenuation Storage Tanks have a 60 year lifecycle. However, as these items are relatively new to the market it is thought their lifetime is much longer than this. As the tanks will be managed by the Management Company they will be responsible for the maintenance and operation of this item through the lifetime of the development, through funding by the residents service charges.

Drainage Area 6

- 1.29. Drainage Area 6 relates to the Permeable Paving in the western parcel. The Permeable Paving overlies Attenuation Storage Tanks beneath to cater for the 1:10 plus climate change storm event. The SuDS and associated infrastructure is to be completed by the first Phase 14 dwelling completion.
- 1.30. Within the Appendix there are maintenance schedules for both, Pervious Pavements and Attenuation Storage Tanks.
- 1.31. The Attenuation Storage Tanks have a 60 year lifecycle. However, as these items are relatively new to the market it is thought their lifetime is much longer than this. Permeable Paving has a typical design life of 25 years although again with robust maintenance regimes this can be extended. As the tanks and Permeable Paving will be managed by the Management Company they will be responsible for the maintenance and operation of this item through the lifetime of the development, through funding by the residents service charges.



Appendices

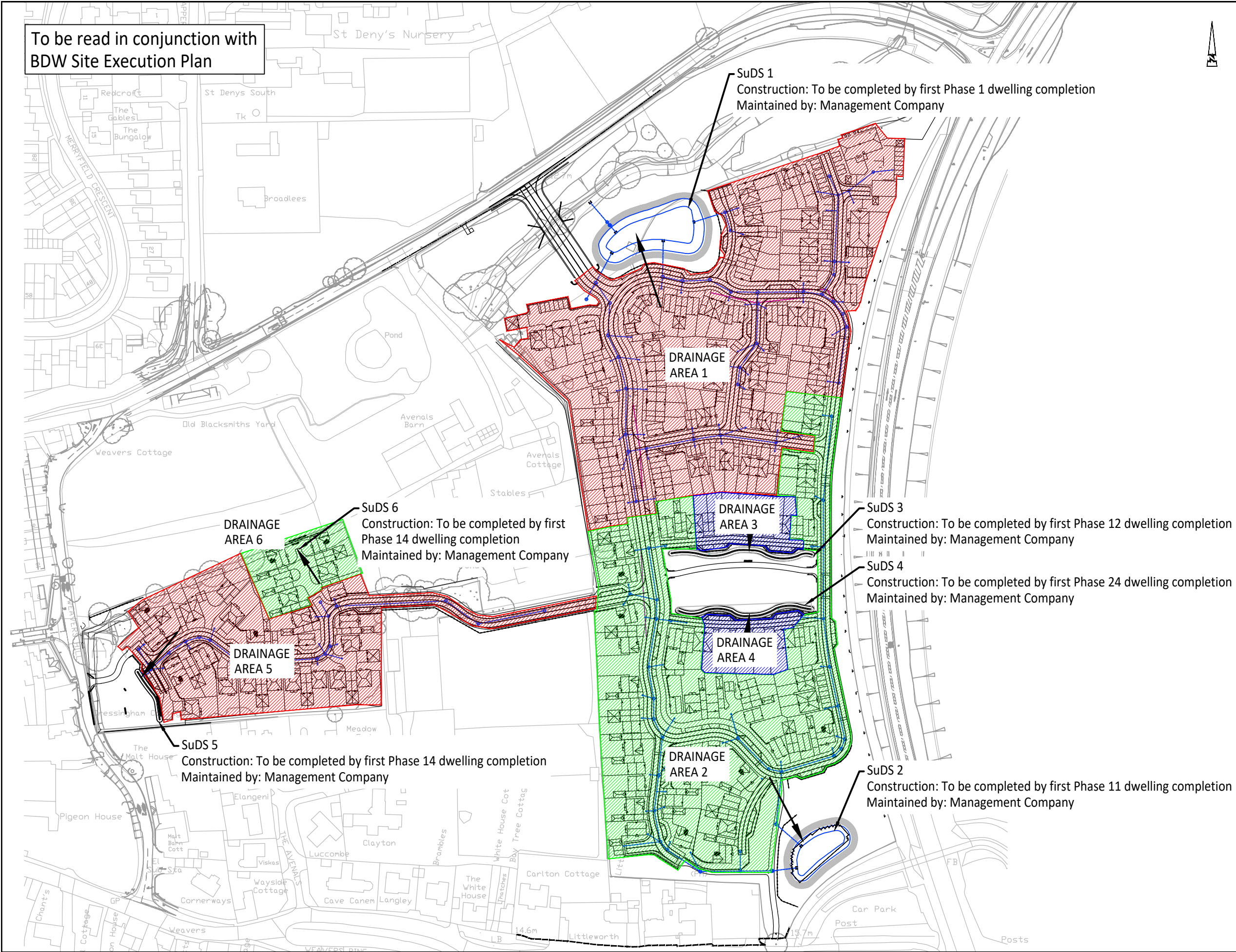


Appendix 1 – Drawings

Drainage maintenance Plan

BDW Site Execution Plan

To be read in conjunction with
BDW Site Execution Plan



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Notes:

1. All adoptable drainage to be owned and maintained by Southern Water
2. All private drainage to be owned and maintained by the individual property owner.

P4	05/21	Updating SuDS information	CB	SL
P3	05/21	Updating SuDS information	CB	SL
P2	05/21	Adding SuDS information	CB	SL
P1	05/21	First issue	CB	SL
Rev	Date	Description	Drawn	Checked



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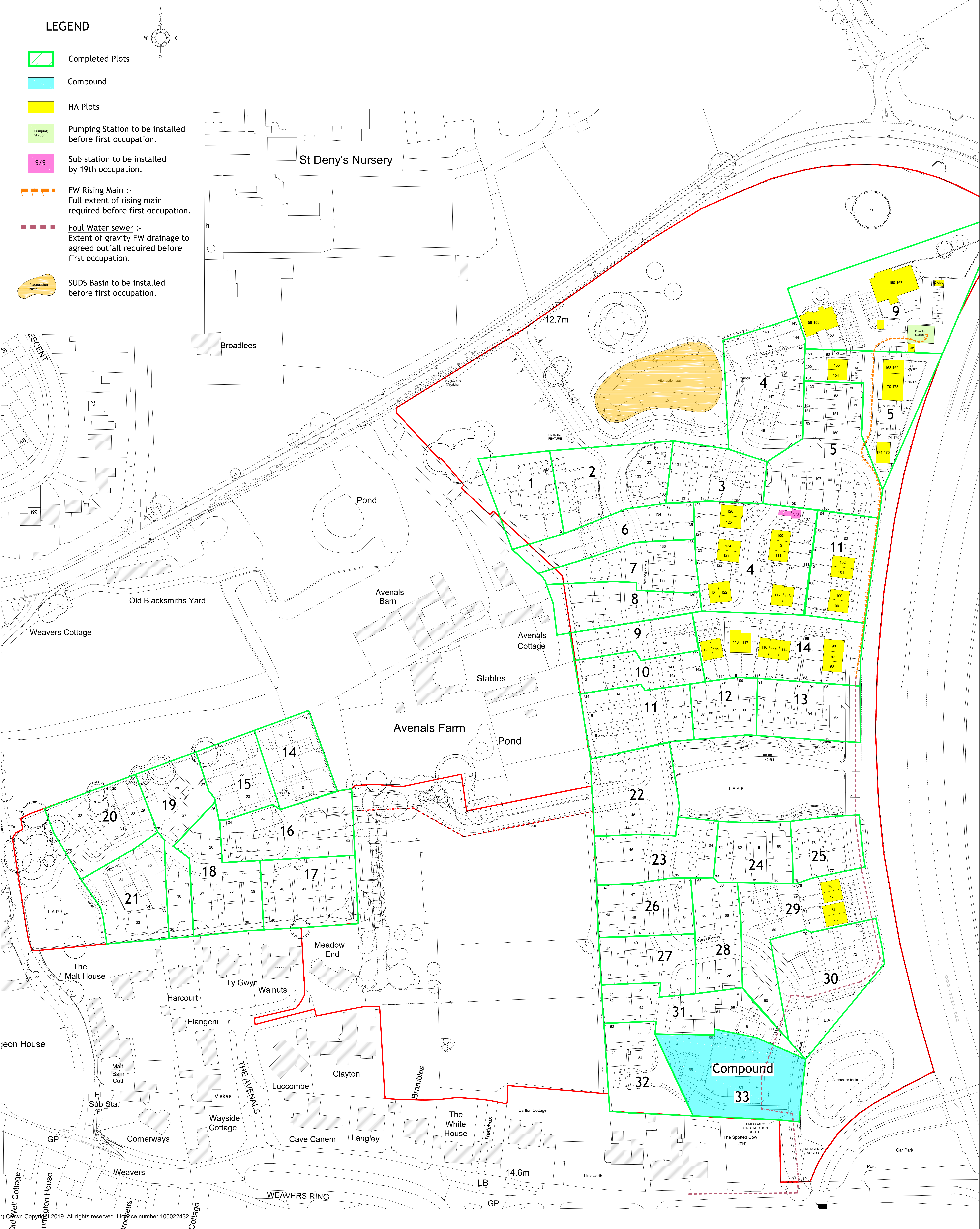
Client
**BARRATT
DAVID WILSON HOMES**

Project
WATER LANE, ANGMERING

Title
**DRAINAGE MAINTENANCE
PLAN**

Status
FOR INFORMATION

Scale	Date	Drawn	Checked
1:2000 @ A3	MAY 2021	CB	SL
Drawing No	Revision		
A290-SK50	P4		



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DIRECTOR APPROVAL

This drawing must be reviewed and approved by the following management:

Managing Director: _____ Date: _____
Technical Director: _____ Date: _____
Sales Director: _____ Date: _____
Construction Director: _____ Date: _____
Commercial Director: _____ Date: _____
Finance Director: _____ Date: _____
Development Director: _____ Date: _____
SHE Manager: _____ Date: _____

B	20.05.21	Additional information added to Legend	KS	JW
A	19.05.21	Column: Updated to Numbered build sequence	KS	CH
Rev	Date	Detail	Drawn	Checkd
Barratt Southern Counties Barratt House, Walnut Tree Close Guildford, Surrey GU1 4SW				
Project Name		Water Lane Angmering		
Drawing Title		Site Execution Plan		
Drawn by	Checked By	Barratt Southern Counties Drg No		
KS	-	BH	8150	09c
Date Created	14.01.21	Orig. size	A0	Scale
		NTS		
		SEP	01	B



Appendix 2 – Schedules

SuDS Maintenance Schedules

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Ponds and Wetlands	Regular	Remove litter and debris	Monthly (or as required)
		Cut the grass – public areas	Monthly (during growing season)
		Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
		Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
		Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
		Inspect water body for signs of poor water quality	Monthly (May – October)
		Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
		Check any mechanical devices, eg penstocks	Half yearly
		Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
		Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
		Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
		Remove sediment from any forebay	Every 1-5 years ,or as required
		Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
	Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25-50 years
	Remedial Actions	Repair erosion or other damage	As required
		Replant, where necessary	As required
		Aerate pond when signs of eutrophication are detected	As required
		Realign rip-rap or repair other damage	As required
		Repair / rehabilitate inlets, outlets and overflows	As required

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Detention Basin	Regular Maintenance	Remove litter and debris	Monthly
		Cut grass - for spillways 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)
		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 facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
		Check any penstocks and other mechanical devices	Annually
		Tidy all dead growth before start of growing season	Annually
		Remove sediment from inlets, outlet and forebay	Annually (or as required)
		Manage wetland plants in outlet pool – where provided	Annually
	Occasional Maintenance	Reseed areas of poor vegetation growth	As required
		Prune and trim any trees and remove cuttings	Every 2 years, or as required
		Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
	Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
		Realignment of rip-rap	As required
		Repair/rehabilitation of inlets, outlets and overflows	As required
		Relevel uneven surfaces and reinstate design levels	As required

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Infiltration Basin	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

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Soakaway	Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
		Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
		Trimming any roots that may be causing blockages	Annually (or as required)
	Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
	Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
		Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
	Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
		Check soakaway to ensure emptying is occurring	Annually

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Filter Drain	Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
		Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
		Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
		Remove sediment from pre-treatment devices	Six monthly, or as required
	Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
		At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
		Clear perforated pipework of blockages	As required

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Pervious Pavements	Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumnal leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturers 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

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Swales	Regular maintenance	Remove litter and debris	Monthly, or as required
		Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
		Manage other vegetation and remove nuisance plants	Monthly at start, then as required
		Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
		Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours	Monthly, or when required
		Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
	Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
	Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
		Relevel uneven surfaces and reinstate design levels	As required
		Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
		Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
		Remove and dispose of oils or petrol residues using safe standard practices	As required

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Trees	Regular maintenance	Remove litter and debris	Monthly (or as required)
		Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
		Inspect inlets and outlets	Inspect monthly
	Occasional maintenance	Check tree health and manage tree appropriately	Annually
		Remove silt build-up from inlets and surface and replace mulch as necessary	Annually, or as required
		Water	As required (in periods of drought)
	Monitoring	Inspect silt accumulation rates and establish appropriate removal frequencies	Half yearly

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Proprietary treatment systems	Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
		Change the filter media	As recommended by manufacturer
		Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
	Remedial actions	Replace malfunctioning parts or structures	As required
	Monitoring	Inspect for evidence of poor operation	Six monthly
		Inspect filter media and establish appropriate replacement frequencies	Six monthly
		Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

SUDS MAINTENANCE SCHEDULE

Suds Feature	Maintenance Schedule	Maintenance Requirement	Frequency Details
Attenuation Storage Tanks	Regular Maintenance	Inspect and identify any areas that are not operating correctly if required take remedial action	Monthly for 3 months, then annually
		Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
		For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter, remove and replace surface infiltration medium as necessary	Annually
		Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
	Remedial Actions	Repair/habilitate inlets, outlet, overflows and vents	As required
	Monitoring	Inspect/check all inlet, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
		Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

development planning
infrastructure design
transport HIGHWAYS
drainage
CIVIL ENGINEERING
site appraisal
flood risk assessment
travel plans
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