



The diagram illustrates a 1D lattice with a sawtooth potential. The top part shows a periodic potential (black line) and a corresponding wavefunction (red line). Below, a unit cell is defined by dashed blue lines. Inside the unit cell, four basis states are shown: RG (a square with three vertical lines), YG (an empty square), RE (a square with an 'X'), and a square with a diagonal line from bottom-left to top-right.

Existing Foul/Surface Sewer/Drain to be retained

Existing Foul/Surface Sewer/Drain to be abandoned

Channel Drain

Road Gully

Yard Gully

Rodding Eye

Formpave Distribution Box

Formpave Fin Drain

Foul Sewer/Drain
Soil and Vent Pipe / Gully Connection
Air Admittance Valve (durgo) / Stub Stack
FW Type 4 Inspection Chamber (190Ø min)
FW Type 3 Inspection Chamber (450Ø min)
FW Type 1/2 Manhole
Vertical/Dumped Backdoor

Soil and Vent Pipe / Gully Connection
Air Admittance Valve (durgo) / Stub Stack
FW Type 4 Inspection Chamber (190Ø min)
FW Type 3 Inspection Chamber (450Ø min)
FW Type 1/2 Manhole

FW Type 1/2 Manhole

Vertical/Repped Backdrop

Diagram illustrating the components of a vertical sewer line:

- Surface Water Sewer/Drain
- Rainwater Pipe
- SW Type 4 Inspection Chamber (1900 min)
- SW Type 3 Inspection Chamber (4500 min)
- SW Type 1/2 Manhole
- Back Inlet Gully

Sk

BIG

10 000

Rainwater Pipe

SW Type 3 Inspection Chamber (1900Ø min)

SW Type 3 Inspection Chamber (4500Ø min)

SW Type 1/2 Manhole

Back Inlet Gully

Finished Floor Level

SW Type 1/2 Manhole
Back Inlet Gully
Finished Elevation

10,000 Exhibit 5

Porous Block Paving - Formpave Infiltration system acting as Attenuation tank with formation varying with grade and DBM construction surface
Refer to Formpave Drawings for formation levels/construction and details

1.	SW Design
1.1.	Soakaways unviable due to cohesive soils and high ground water table resulting in v poor infiltration rates. Refer to Soils Report on site testing
1.2.	Existing Site
1.2.1.	Some paved and roof areas discharged to on site foul/combined drainage system.
1.2.2.	Majority of site is thought to discharge to either HWD or Pond to south of site via existing RGs along the site's southern boundary - to be verified through CCTV survey prior to construction.
1.3.	Proposed Site
1.3.1.	All SW runoff diverted/removed from existing combined drain on site, and directed to existing RG's along site's southern boundary.
1.3.2.	Discharges restricted to existing flow rates using existing RG's as throttle for flows from site, subject to TW & LPA approval on site attenuation provided to cater for 100 yr SRP with 30% CC allowance using aggregate sub base of Porous Block Paving - Formpave - subject to detailed design by Formpave. System not to be tanked allowing some infiltration of surface water runoff into ground prior to overflowing into HWD, max flow rate 7.9l/s.
1.3.4.	Total Area Drained = 642 m² (Roof = 270 m²; Paving = 373 m²)

2. **FW Drainage Design**

2.1. Existing Flow from site (1 Dwelling & Retail Unit)

2.1.1. Peak FW Flow

2.1.2. 2No Houses = 0.093 l/s Peak FW Flow (SFA) (Retail assumed as Dwelling for flows)

2.1.3. SW flow to CD/FWD - circa 200m² @ 50mm/hr = 2.7l/s

2.1.4. Combined flow from site to FWS = 2.87 l/s

2.2. Proposed Flow from Site (4 Dwelling & Retail Unit)

2.2.1. Peak FW Flow

2.2.2. 5No Houses = 0.23 l/s Peak FW Flow (SFA) (Retail assumed as Dwelling for flows)

2.2.3. Significant reduction in flow to FWS.

SUBJECT TO THE APPROVAL OF:
LPA
BUILDING CONTROL/NHBC

Subject to confirmation of the following:

- Foundations
- External Levels
- Formpave Design
- Ex SWD/RG outlets

NOTES

1. This drawing is to be read in conjunction with drawing Nos. FC2705/01-25.
2. Existing onsite drainage is shown on drawing FC2705/01.
3. All adopted drainage and connections to the sewer system are to be constructed in accordance with 'Sewers for Adoption' 6/7th Edition or as stipulated in the Southern Water Addendum.
4. Connections to the adopted drainage system are subject to the approval of Southern Water the Drainage Authority. Diverted, divested, built close to sewer services, and new sewers are subject to SW approval. All other drainage is to remain private.
5. All pipes and fittings to be adopted, or connecting to adopted drains, and/or situated under highway to be vitrified clay (min 40kN/m² to BS EN 295 & BS65 (SW/S only), or Concrete pipes to BE EN 1916 & BS5911 Part 1, or Ductile Iron Street Mains to BS EN 588 & BS EN 13476-1 & W5 and W35 4-35 (class 8kN/m²), or Ductile Iron to BS EN 588, and be capable of withstanding 4000 FSI jetting pressure.
6. Cover levels shown are approximate. Covers and frames shall be set to finished ground levels and falls.
7. All drainage to be constructed to BS EN 752:1999 and subject to the approval of Building Control/LPA and the Environment Agency.
8. Gully and channel drain positions are liable to amendment when the design levels have been determined.
9. All downpipes to new dwellings are to be sealed, ie connected directly to the stormwater drain. All downpipes to existing dwelling are to be connected to trapped gullies. Access points to be provided 1m above ground level for external RWP's and 1m above FFL for internal RWP's.
10. All below ground connection to accord with AACEC site classification of AC-1 - the refer to Geotechnical Investigation
11. AC channel drain to be K1005 with grade C250 Quicklock 'Helioguard' cast iron grating or equivalent, where adjacent to kerbing or within pedestrian areas. Elsewhere AC channel drain to be Road Drain 100 Class F. All channel drain outlets to have oil traps
12. The Contractor should construct works in accordance with the Local Authority specification for the works they are to undertake
13. Road gully pipes are to be 150mm dia. with concrete surface and flexible joints, all other un-referenced pipes are assumed to be 100mm dia.
FW min gradient - 1 in 40 (100 dia) no WC's connected
FW min gradient - 1 in 80 (100 dia) min 1 WC connected
FW min gradient - 1 in 150 (150 dia) min 2WC's
SW min gradient - 1 in 100 (100/150 dia)
14. If any sub soil drains engineered are uncovered during the Works contact the Drainage system for instructions. Generally sub soil drains affected are to be diverted around new Works and connected into the surface water drainage system. Pipe diameters and gradients are to be maintained.
15. Before commencing construction the Contractor must check the invert levels of existing sewers to which connections are made. In addition the Contractor must locate and determine invert levels of the existing surps to which connections are proposed. Additional 'surplus/interflow' connections are to be agreed with the relevant adopting authority. Any discrepancies are to be notified to the Engineer immediately, prior to construction.
16. Road reinstatements are to be to the Highway Authority approval.
17. No private areas are to drain onto adoptable areas and vice versa.
18. All redundant drains to be abandoned once the Contractor and Client have satisfied themselves that no connections remain live. Drains and sewers less than 1.5m deep which are in open ground should as far as is practicable be removed. All adopted pipes and connections at both ends and at any other point of connection to solidified drains must not exceed 25mm with Class G3 or G4 filled at intervals not exceeding 25mm with Class G3 or G4

NOTE THE FOLLOWING:

Southern Water Agreements

- 1.1. SW Ref S106-010519 dated 14/12/2017
- 1.2. Direct connection to off site FWS MH

WSCC Highways

2. SWD Connection from site to HWD
2.1. Approved via email from K Macknay dated 22/09/1

Formpave Attenuation Tank

- 3.1. Dwg Ref: FSC3933-D1 Rev B & D100 Rev A

G	SW updated S106 approval added Formpage Dwg Refs added	18/12/17
F	Updated based on new site layout	12/12/17
E	Updated based on new site layout	06/12/17
D	SW S106 ref added	30/10/17
C	Issued For BUDGET/APPROVAL ONLY	02/10/17
B	Issued For BUDGET/APPROVAL ONLY	18/09/17
A	Issued For BUDGET/APPROVAL ONLY	14/08/17
-	Issued For BUDGET/APPROVAL ONLY	10/08/17
REV	DESCRIPTION	DATE



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PROJECT	155 MIDDLETONE LANE MIDDLETON ON SEA WEST SUSSEX PO22 6DF							
DRAWING	PROPOSED DRAINAGE LAYOUT							
SCALE	FC2705/02							
1:125	DATE	AUGUST 07	INITIAL	MH	CHKD	REV	G	
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