

Surface Water Drainage Statement for Land at #2 Downview Road

Land at #2 Downview Road

Off Burndell Road

Yapton

ARUNDEL

BN18 0HS

PROPOSED WORKS :

Sub division of existing plot and build new a 4-unit block within a single terraced configuration, and associated works.

GEOLOGY :

The British Geological Survey maps the area with the Superficial of “River Terrace Deposits” of fluvial origin, consisting of Sand, silt and clay, overlying bedrock of the “Lewes Nodular Chalk et seq” of shallow marine origin.

SURFACE WATER DRAINAGE CONSIDERATIONS :

Any SuDS and source control solutions for a surface water disposal strategy, should follow “the hierarchy of preference for different types of sustainable surface water drainage disposal systems” as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDs Manual. These being :-

1. Rainwater reuse where possible.
2. Complete discharge into the ground (infiltration).
3. Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer.
4. Restricted discharge to an appropriate water body.
5. Restricted discharge to a surface water sewer (public / private).
6. Restricted discharge to a combined sewer

Note a water body may be defined as a river, watercourse, ditch, culverted watercourse, reservoir, wetland or the sea.

In general options 1) & 2) above are always the preferred solution and options 3) to 6) above are only to be considered after rigorous groundwater monitoring and soil infiltration testing has discounted option 2) as unviable.

GROUNDWATER MONITORING :

Due to the variability of soils encountered in the local area, a formal Groundwater Monitoring exercise will need to be carried out.

The current Arun DC guidelines allow for a relaxed period of groundwater monitoring, during the period of December to February for impermeable roof areas of 250 square metres or less. The proposed 4-unit terraced block, at 175 square metres falls within this guideline so groundwater monitoring will be carried out within the wet winter period of December 2025 to February 2026 inclusive. Readings will be taken manually, at a maximum weekly interval, to conform to the Arun DC guidelines.

It is proposed that two 150mm diameter boreholes are to be augered, to a depth of typically 3000mm Below Ground Level (BGL) on-site at either side to establish the current groundwater level. Should 'rest groundwater levels' (RWL) be encountered shallower than typically 1300mm BGL, then this would be adequate to inform as to the non-viability of infiltration techniques and thus to cease continuing the monitoring exercise.

Should this initial recorded RWL be deeper than 1300mm BGL then it is proposed to install an Open Head Piezometer Groundwater Monitoring Point (slotted monitoring pipe) within each borehole with readings being carried out manually weekly until the end of the winter period – end February 2026 or for at least 2 weekly consecutive readings of less than 1300mm BGL – to establish peak the groundwater level. At this point monitoring groundwater monitoring should be considered to be ceased as the Freeboard will unlikely to be achieved.

SOIL INFILTRATION (PERCOLATION) TESTING :

From two very close-by previously investigated sites, Soil Infiltration Rates, from Percolation Testing, at the locations and depths of their infiltration structures, have yielded very favourable rates of the low E-05 metres / second. This is not to be assumed for this site but does however indicate favourable infiltration soil conditions.

Again however due to the variability of soils encountered in the local area, infiltration rates of substrata can vary significantly and can be very site specific. As a consequence, should the above described groundwater monitoring exercise prove to successfully meet the required Freeboard, then infiltration will need to be fully investigated with a site specific Soil Infiltration (Percolation) Testing exercise, to be carried out to meet the requirements of BRE DG365 (2016), or a similar approved method such as CIRIA R156. Testing will need to be carried out within the winter period of February 2026 to March 2026, in line with BRE DG365 principles, at the location and approximate depth of the proposed infiltration structure, within a single Trial Pit, of a minimum size 1000mm long x 300mm wide x DEPTH, and 3 tests consecutively will be required to replicate saturated ground conditions. The DEPTH of the Trial Pit will be determined by, and needs to be above, the peak groundwater level recorded at the location of the testing, plus the 1000mm Freeboard. The water fill for testing will only be that of the response zone of the infiltration structure. It is anticipated that only 1 layer deep (400mm) of geocells will be available to be used.

Shallow testing for the self draining permeable driveway and parking areas, within a second Trial Pit of a minimum size 1000mm long x 300mm wide x typically 450mm deep will also be required with 3 tests consecutively carried out to replicate saturated ground conditions.

PROPOSED DRAINAGE DISPOSAL :

The proposed new formal drainage, for the complete 4-unit terraced building, is anticipated to drain to a single soakaway structure consisting of a single layer of type Geo-Cellular. This will need to be designed based on Soil Infiltration (Percolation) rates.

From the hierarchy of preference for different types of sustainable surface water drainage disposal systems outlined above :-

Option 1) -- Ideally, it is recommended that the use of water butts, with diverter kits, are to be included on all of the new rainwater down pipes. These water butts offer a small impact on the full drainage strategy, as recommended by the SUDs Manual, and are also included as an environmental consideration. Similarly, a suitably designed “Rainwater Harvesting” system may merit consideration.

Option 2) – Complete Discharge into the Ground (Infiltration). Either within a traditional soakaway structure or a larger shallow permeable blanket structure. Should this option be non-viable due to very poor (slow) soil infiltration rates or being unable to meet the Freeboard requirements of the SUDs Manual due to very shallow peak recorded groundwater levels (below ground level), then following the “the hierarchy”, options 3) to 6) are to be followed.

Option 3) – Hybrid Infiltration and restricted discharge to an appropriate water body or surface water sewer. If option 2) is non-viable then this option is unlikely to be suitable.

Option 4) -- Restricted discharge to a surface water body e.g. ditch or (culverted) watercourse. There are no surface water bodies available in the area to allow a gravity connection to be made. If an available surface water body were to be available as the selected method of disposal, then additional consent would be required from West Sussex County Council (WSSCC) Lead Local Flood Authority (LLFA) in the form of an ‘Ordinary Watercourse Land Drainage Consent’. It is considered that this option would not be available.

Option 5) -- Restricted discharge to a Surface Water Sewer (public or private). Thus continuing with the “the hierarchy”, option 5) would become relevant. Here the records show that there is no availability of a public surface water sewer close by, in which a possible connection could be made.

There is though, a highway drainage system (WSSCC private) running just inside the southern boundary of the property, and an online inspection chamber in which a connection could be made. This inspection chamber serves the adjacent road gully just outside of the property in the highway Burndell Road. Arun DC drainage engineers have historically included this method of disposal within other local consultations. This system could be designed to take all or part (just the front roof areas) of the drainage flows, or possibly just acting as a high level overflow. The caveats to this method of disposal are :-

- 1) Agreement with WSCC would be required.
- 2) The relevant levels need to be ascertained so that a gravity connection could be made from the site since a pumped system would not be acceptable to Arun DC drainage engineers as it is not approved within the SUDs Manual.

In order for Arun DC to accept this method of draining the proposed planning application, a formal written agreement between the applicant and WSCC will be required and will need to be submitted with any Discharge of Conditions (DoC) or the submission of a planning application.

Option 6) -- Restricted discharge to a combined sewer. The only exception to the disposal of surface water into the foul drainage system is where Southern Water specifically designate a sewer to be a 'Combined System' which is not the case here.

It should be noted that surface water disposal into the Foul Water Sewer System is not supported within the SUDs Manual and as such, here no disposal of surface water will be recommended, especially with the site being within the Lidsey Catchment Area.

Other Considerations

- All drainage disposal options above will be required to drain via a separate Silt Trap / Catch Pit, within the curtilage of the property, prior to its disposal point.
- When utilising options 3) to 6) above, the outgoing connection will typically be required to drain via a separate independent Flow Control Device (orifice plate or hydrobrake) to replicate natural catchments – this being subject to a detailed design, and be also situated within the curtilage of the property.
- Any soakaway or point of infiltration must be located a minimum distance of 5 metres from any controlled structure. This being any permanent habitable structure (house etc.) and includes garages, so as not to compromise the stability of any foundations.
- Additionally all soakaways or points of infiltration must be located a minimum distance of 5 metres from any new or existing soakaways so as not compromise the infiltrating capacity of the soils of each other.
- Additionally any new soakaway, or point of infiltration must be located a minimum distance of 5 metres from any Public Foul or Public Surface Water Sewer on, or adjacent to, the site so as not to compromise the integrity of any sewer line.

- Best practice will also need to be taken into consideration as regards a 2½ metre distancing from any existing or proposed boundary.
- It is not considered that any 'ground raising' will be required.

IMPERMEABLE AREAS :

The proposed new full roof area, of the single 4-unit terraced block, to be accounted for is 175 square metres. This to use the external discharge points as detailed above.

The proposed new driveway and parking areas are considered to be self-draining with no additional storage capacity. They are proposed to be of a Permeable Construction – either of a permeable pavement type, a gravel surface or simply grass-crete on the existing surface, to the applicant's specification. The existing entrance driveway off the highway remains unchanged.

The impermeable small pathways are to be allowed to drain their runoff to the adjacent garden areas.

There are no more impermeable surfaces to be accounted for.

It should be noted that, should a formal soakaway be excluded due to its base depth conflicting with the Freeboard Guidance of the SUDs Manual, a possible solution could be to use the driveway extension to act as infiltration & storage as well as being self draining. This can only be considered if it then means that the Freeboard is maintained due to the proposed new driveway acting as a plane blanket infiltration structure, utilising base infiltration only, with less depth than a formal soakaway structure.

DESIGN CONSIDERATIONS :

- All the designs for drainage flows must use FEH rainfall data, preferably FEH22 though FEH13 may be considered to be acceptable by the Local Planning Authority (LPA). It should be noted that using FSR rainfall data is not accepted.
- Climate Change Addition (CCA) to be +45% as per current Environment Agency (EA) guidelines (as at 2024).
- Volumetric Runoff Coefficient (C_v) to be set to 1.0 for both summer & winter design storm events.

- Water Quality Assessment is such that any formal treatment need not to be included since only clean roof areas are to be accounted for.
- Urban Creep will need to be accounted for at +10% typically, of the proposed main building roof area, in this instance.
- Infiltration design rates must be applied to the sides only for traditional soakaways or to the base only if permeable paving or infiltration blankets are utilised. Design rates must not be applied to both the base and sides of any infiltration structure.
- Half-drain times must be less than 24 hours for the 1 in 10 year (10% AEP) and 1 in 100 year (1% AEP) design storm events, plus climate change allowance, for all infiltration structures.
- A Silt Trap is required to be the final part of the drainage train, with a minimum sump depth of 435mm.
- A Flow Control (Attenuation) Chamber may be required, if following options 3) to 6) of “the hierarchy of preference for different types of sustainable surface water drainage disposal systems”
- The full drainage flow must be a gravity system – Not Pumped – to replicate natural catchments.
- Factor of Safety (FoS) used in calculations to be set at 1.5
- Tree Root Protection Areas (RPA) to be detailed on the drainage layout – there must be no conflicts between existing or proposed trees and any of the drainage infrastructure.

(RC 29-11-2025 version 1)

Mate Geo-Technic Services

REFERENCES

Building Regulations Part H.

CIRIA SuDS Manual 2015 at

www.ciria.org

Arun DC Supplementary Guidance notes regarding surface water drainage at

<https://www.arun.gov.uk/surfacewater>

Arun DC Groundwater Monitoring Guidance note at

<https://www.arun.gov.uk/groundwater-monitoring>

Arun DC Infiltration Testing Guidance note at

<https://www.arun.gov.uk/infiltration-testing>

WSCC Ordinary Watercourse Land Drainage Consent at

<https://www.arun.gov.uk/land-drainage-consent>

Lidsey Surface Water Management Plan 3.0 (October 2014) at

<https://www.arun.gov.uk/lidsey-waste-water-treatment-catchment-area>