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## **DRAINAGE STATEMENT FOR THE HUB, CLEATOR MOOR**

### **Site Location:**

The proposed development is located on the corner of High Street & Market Street, Cleator Moor CA25 5AP.

The grid reference for the site is 301950E, 515052N

### **Introduction**

A L Daines & Partners LLP (ALD) have been engaged to undertake a surface water drainage strategy to manage the flows from the re-developed site at the above site. This strategy has been provided to guide the design process and to provide clarity to all parties regarding the reasoning behind the design.

### **Site plan**

See Day Cummins site plan drawings for details of the proposed re-development plans.

### **Development Description**

The proposed re-development will seek to remodel both internal and external areas providing single storey extensions and landscaping works as indicated on the Day Cummins plans.

The extension and landscaping works will result in a slight decrease in total hardstanding area throughout the site when compared to the existing scenario.

The existing hardstanding areas comprise the roof of the existing building, parking areas to the front and side of the building and pedestrian access areas.

The reconfigured scheme will contribute from similar types of surfacing on a slightly reduced scale while also utilising green sedum roofing to provide an overall reduction in hardstanding areas.

The site is on split levels with the southern part of the site set approximately 1.2m higher than the front of the site. The floor levels of the existing buildings also vary to suit the site levels.

	Total area	Hardstanding	% hardstanding
Existing site	0.39ha	0.359ha	92.05
Proposed site	0.39ha	0.3484ha	89.33

### Permeability

Preliminary investigation of the ground by GEO Environmental has revealed firm clay below made ground and approx. 250mm topsoil (where not hardstanding paved areas).

3No. boreholes were excavated. The trial holes were positioned between the two buildings and to the rear of both buildings.

No permeability tests were performed as the ground make up was clearly not conducive to infiltration. The presence of potentially contaminated made ground above the impermeable clay layers also reinforced that infiltration should not be pursued.

### Current Drainage Provision

#### Surface water

The site is currently 92% developed by the existing buildings and car parking, with landscaping areas making up 8% of the site. These isolated landscaped areas are also positively drained into the drainage system indicating that the whole site contributes to the site run off.

The existing surface water drainage is routed through downpipes and gullies to manholes on the northern and southern elevation of the buildings before discharging into the combined mains drainage on Market Street to the eastern boundary.

There are no existing bodies of water nearby.

Any surface water system should utilise the existing drainage connections leaving the site as infiltration is not feasible.

#### Foul water

The foul water from the site exits via the same route as the surface water into the United Utilities combined system within Market Street. There are no separate connections into the mains system for foul and surface water.

## **Surface water drainage strategy**

The aim of the strategy is to provide a design which will avoid, reduce and delay the discharge of surface water flows into public sewers and watercourses. This will aid in the protection of watercourses but will also ensure that no knock-on effects are seen beyond the site and that the risk of localised flooding and pollution within the site are reduced as far as possible.

To satisfy these criteria, surface water flows shall be subject to assessment via the hierarchy of drainage in accordance with the LASOO Non-Statutory Technical Standards for Sustainable Drainage: Practice Guidance. The hierarchy is as follows:

### Hierarchy options:

1. Drain into the ground (infiltration);
2. To a surface water body;
3. To a surface water sewer, highway drain or another drainage system;
4. To a combined sewer.

The drainage strategy for the site is to be developed using the fourth tier on the hierarchy above. The reasons for this are given below:

- The existing ground is not suitable for infiltration, as proven by the borehole investigation.
- There are no existing surface water bodies within or near the site.
- There are no existing surface water drainage systems within or near the site. All drainage systems surrounding the site are part of the combined UU systems.
- The existing site drains both foul and surface water via the same connection and the intention is to maintain these for the site redevelopment.
- The existing flows within the site are via combined pipes. Foul and surface water flows are combined at source and are therefore difficult to separate.

## **Surface water drainage scheme**

LASOO guidance for previously developed sites states:

*For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.*

Unfortunately, due to the tight restrictions and existing combined drainage systems within the site, it is unrealistic under the scope of the scheme to separate the surface and foul water systems and provide a system that would restrict flows to greenfield run off.

The previous development provides no surface water control and therefore a strategy is to be provided which ensures there is no increase to run off rates or volumes from the previous scenario.

### Surface water drainage proposals

The surface water (SW) system has been designed to capture the surface water run-off from the buildings and the hardstanding areas and keep these in separate systems as far as is possible prior to discharge into the combined mains systems.

Green roof areas on the rear extensions will provide meaningful volume and peak flow rate restrictions. Green roofing can be expected to reduce the volume of flows by 50% compared to the same area of hardstanding due to retention and evaporation, while also reducing peak flow rates by 40-50% even in prolonged wet periods.

The scheme also maintains a construction arrangement which is achievable within the tight site constraints and is not overly economically burdensome on the developer.

As the scheme provides a slightly reduced hardstanding area, there is to be no increase in flow rates leaving the site, indeed a slightly reduced rate due to the introduction of the green roof systems to the rear extensions.

The proposed surface water arrangement is shown on attached drawing 25-C-18146/17.

### **Management**

The surface water drainage systems will all remain within the curtilage of the site and will therefore be maintained by the land owner.

The green roof system will be maintained by the site owner at regular intervals in accordance with the manufacturer's instructions.

The SuDS Manual provides recommendations for green roof maintenance, Table 12.5 below, which should form the minimum requirements and be supplemented by the manufacturers guidelines to form a robust maintenance regime.

**TABLE 12.5** Operation and maintenance requirements for green roofs

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

## Foul water

The foul water from the site will drain via gravity to the existing combined mains sewer system.

Where possible new foul drainage elements have been kept separate from the surface water system as far as is practicable prior to combining before leaving the site and joining the existing combined sewer in Market Street to the east of the site.

The new café kitchen is to be served by a grease separator to be sized in accordance with the proposed café capacity and kitchen appliances. Contractor to confirm acceptability of system with manufacturer prior to construction.

There is not anticipated to be a significant increase in foul loadings from the previous site usage.

**S MARSHALL C.Eng. MICE**  
**For and on behalf of**  
**A L DAINES & PARTNERS LLP**