



Cala Homes (North Home Counties) Ltd

# Oughtonhead Lane, Hitchin

Pre-Construction and Construction Surface Water Management Plan

340680-R01 (00)

## RSK GENERAL NOTES

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**Project No.:** 340680 R01 (00)

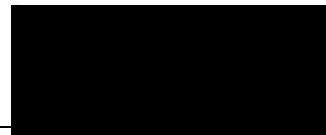
**Title:** Pre-Construction and Construction Surface Water Management Plan:  
Oughtonhead Lane, Hitchin

**Client:** Cala Homes (North Home Counties) Ltd

**Date:** 20 June 2025

**Office:** RSK Environment Limited, Battle Gate Road, Boxworth, Cambridge, CB23 4NN.  
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|               |                                                                                    |                           |                                                                                      |
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|                        |                                                                                     |                         |                                                                                       |
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| Revision control sheet |              |                     |             |              |
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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

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# 1 INTRODUCTION

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## 1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by Cala Homes (North Home Counties) Ltd to carry out a Pre-Construction and Construction Surface Water Management Plan (CSWMP) for the proposed residential development at the land south of Oughtonhead Lane, Hitchin, Hertfordshire (hereafter referred to as 'the site'). The services undertaken by RSK have been carried out to an agreed brief as set out in RSK's proposal, reference 340680 T01 (00) dated 09 May 2025).

## 1.2 Scope of works

This document presents a strategy to manage surface water and run-off occurring during both pre-construction and construction phases of the development.

The CSWMP will cover the mitigation measures that are to be implemented to manage surface water and silt concerns across the site and reduce risks prior to development.

The strategy is also designed to mitigate silt-laden surface water entering the surface water drainage system (when constructed) on site and impacting down gradient sensitive receptors such as the surface water drainage network, neighbouring properties and infrastructure.

This CSWMP is for the proposed residential development by Cala Homes (North Home Counties) Ltd and includes a detailed assessment of potential risks to the identified sensitive receptors. It makes recommendations for appropriate silt mitigation measures to be undertaken by the developer and associated contractors during pre-construction and construction phases of the development.

The general advice and recommendations given in this report should be reviewed and CSWMP should be updated, as necessary, throughout the progress of the project.

The CSWMP has been produced with reference to available online information (MAGIC Maps, Google earth, [www.gov.uk](http://www.gov.uk)), a site walkover undertaken on 23 May 2025, and the following documents supplied by the client:

### Reports:

- Phase I/II Geoenvironmental Assessment: Land South of Oughtonhead Lane, Hitchin, GEMCO, report reference 1873 R01, Issue 1, dated 12 March 2021.
- Additional BRE Digest Infiltration Testing and Site Investigation Works at Land South of Oughtonhead Lane, Hitchin, GEMCO, Letter report reference 1873 R03 20210428 CHL SALR, Issue 1, dated 28 April 2021.
- Hitchin Cricket Club Phase 2, Premier Energy, project number 60875, report revision 2, dated 7 September 2022.
- Ecological Impact Assessment: Oughtonhead Lane, Hitchin, Ethos Environmental Planning, project reference ETH23-042, revision V1, March 2023.
- Flood Risk Assessment: Proposed Residential Development, Hitchin Cricket Club Phase 2, AEQ Consultants Ltd, report reference AEQ-210/FRA Rev E, dated 26 July 2023.
- Cut and Fill Volumes Calculations, Cala, tabular format. File reference H1402\_Hitchin, Oughtonhead Lane\_CUT-FILL AREAS-VOLUMES\_Construction\_ - no date.

## Figures:

- Topographic Survey, Hitchin Cricket Club, Mark Beaver Surveying, drawing reference 1021/02A and 1021/03A, dated 02 December 2017, with amendments made on 08 December 2022.
- Site Layout Plan: Oughtonhead Lane, Architectus, drawing reference 23/003/11, rev PL06, dated February 2023.
- External Works Sheets 1 to 3: Oughton Head Lane, Hitchin. Miakoda Designs, drawing reference 1396-MDL-EXT-W100 to -W102, Issue B, dated September 2023.
- Site Layout and Levels: Oughtonhead Lane, Hitchin, Aventus Design, project reference BH14902, drawing reference BA00378-C02, -C03 and -C04, Issue C, dated October 2023.
- Site Layout and Drainage: Oughtonhead Lane, Hitchin, Aventus Design, project reference H1402, drawing reference BA00378-C05, -C06, Issue C and drawing reference BA00378-C07, Issue B, dated October 2023.
- Site Setting Out: Oughtonhead Lane, Hitchin, Aventus Design, project reference H1402, drawing reference BA00378-C08 and -C09, Issue -, dated November 2023.
- S104 Adoption Layout 1:500: Oughtonhead Lane, Hitchin, Aventus Design, project reference H1402, drawing reference BA00378-C14 and -C15, Issue B, dated November 2023.
- Development Plan, Miakoda Designs, project reference 00378, drawing reference 1396-MDL-DEV-W910, dated 14 December 2023.
- Construction Traffic Management Plan, Oughtonhead Lane Hitchin, Cala, drawing reference 01102024/RS/CTMP, rev 0, dated January 2024.
- Cut and Fill Model 01 to 03: Oughtonhead Lane Hitchin, Aventus Design, project reference H1402, drawing reference BA00378-C40 to -C42, dated April 2024.

As a result of global warming, it is generally accepted that extreme weather events, including increased intensity and frequency of heavy rainfall events is likely to be more common during the proposed construction period of this development. Therefore, it is considered that a consistent implementation of a coherent CSWMP will help reduce the risk of silt pollution to controlled waters from the construction of the proposed development and thus lessen the environmental impact and increase the sustainability of the construction project as a whole.

This report is subject to the RSK service constraints given in **Appendix A** and limitations that may be described through this document.

## 1.3 Site personnel and documentation

The following measures are to be implemented to increase awareness and bring existing site documentation up to date:

- undertake additional detailed site-based awareness training (site safety briefing Toolbox Talks) on silt and surface water management and protection for all site staff including groundworkers
- include a detailed section relating to protection measures for the site and the responsibilities of groundworkers within the site induction folder
- undertake a monthly site inspection (additional visits during inclement weather/sensitive works, when the risks from silt pollution are likely to be higher); maintain a written and photographic

record of the inspection, and obtain support from the Environmental Consultant if or when required

- it is recommended to increase the inspection frequency to weekly during periods of heavy ground disturbance and earthworks activities, including archaeology works if proposed prior to main construction activities on site.

Prior to the commencement of the construction works at the site, a SWMP should be in place to manage and mitigate the potential issues associated with silt during construction works. RSK may provide support with supplementary site inspection visits or attendance at meetings ahead of key stages of the development in relation to silt management.

The site inspection sheet and gully inspection log are within **Appendix F**.

## 2 SITE DETAILS

### 2.1 Site location

Site location details are presented in **Table 1** and a site location plan is provided on **Figure 1**.

**Table 1: Site location details**

|                                                   |                                                   |
|---------------------------------------------------|---------------------------------------------------|
| <b>Site name</b>                                  | Oughtonhead Lane, Hitchin                         |
| <b>Full site address and Postcode</b>             | Land south of Oughton Head Lane, Hitchin, SG5 2NA |
| <b>National Grid coordinates (centre of site)</b> | 517551, 229640                                    |

### 2.2 Site description

The site boundary is shown on **Figure 2**; the site covers an area of c. 1.86 ha. The proposed development plan, reference 23/003/11 rev PL06, provided by the client, is presented in **Appendix B**.

A site walkover was conducted on 23 May 2025 prior to any construction activities. The land currently comprises an undeveloped field of long grass / meadow with patches of scrub and brambles, and site boundaries of mature to semi mature trees, hedgerows, scrub and brambles.

Site photographs depicting the site condition are shown in **Appendix C**.

#### 2.2.1 Land use and site history

The GEMCO phase I/II geoenvironmental assessment reports that the site had been undeveloped since the earliest available mapping of 1881, and that it was used as a site compound / storage area for an adjacent residential development c. 2018-2020.

Ordnance Survey Mapping (accessed via Bing Maps, 2025) has a label indicating the site or immediate surrounds is or was a caravan park.

The topographic survey of accessible areas on site (drawing ref: 1021/02A and 1021/03A, dated 02 December 2017) indicates that the highest point on site is in the southwest at approximately 87.25 metres above Ordnance Datum (mAOD), falling gently towards a low point in the northeast at approximately 82.42 mAOD. The western boundary has a downslope onto site from the adjacent land of around 0.50 m in the northwest, and a downslope from site onto the adjacent cricket club land of up to 2.50 m elevation in the southwest.

#### 2.2.2 Surrounding land uses

The surrounding land generally slopes down towards the north, east and west from the site.

A summary of surrounding land uses is as follows:

- North: a bridle path (Oughton Head Lane) and hedgerow / treeline / scrub form the northern site boundary, with residential properties and private gardens associated with Lower Innings and Westbury Close beyond.
- East: residential properties with private gardens associated with Oughton Close.

- South: residential properties associated with Bowlers End (recent residential development) to the southeast, and Hitchin Cricket Club sports ground (cricket pitch, access track and buildings) to the southwest.
- West: sports ground (cricket pitch) at Hitchin Cricket Club.

## 2.3 Geology

The BGS Geoindex indicates that the whole site is underlain by superficial deposits of Glaciofluvial Deposits (sand and gravel). The bedrock geology at depth is expected to be the West Melbury Marly Chalk Formation (chalk) in the southern half of the site, then the Gault Formation (clay / mudstone), which is present underlying the chalk in the centre and south of site, and underlying the superficial geology in the north.

The encountered geology on site reported within the GEMCO phase I/II geoenvironmental assessment (dated 12 March 2021) and GEMCO additional infiltration testing report (dated 28 April 2021) comprises:

- Topsoil (slightly gravelly sandy clay: cohesive) to depths between 0.20 metres below ground level (m bgl) and 0.40 m bgl
- Made ground (gravelly clay: cohesive) in four locations to depths between 0.15 m and 0.80 m bgl,
- Variable Glaciofluvial Deposits across the whole site:
  - Cohesive Glaciofluvial Deposits (slightly sandy to sandy slightly gravelly clay) across the majority of locations
  - Granular Glaciofluvial Deposits (thick horizons of slightly clayey fine to medium sand, or thin horizons of sand, or gravelly sand))
- Bedrock of Weathered Chalk locally encountered from top depths between 1.30 m and 2.80 m bgl.

Based on this, the majority of the site at shallow depth could be cohesive in nature. The ground conditions underlying the site have the potential to generate silt in run-off that may remain in suspension for long periods of time and be slow to settle with gravity-based settlement techniques.

## 2.4 Hydrology

The Environment Agency (EA) catchment data mapping indicates the site is within the Ivel operational catchment of the Ouse Upper and Bedford management catchment, which drains towards the northeast.

The northwest half of the site lies within the Hiz (downstream of Hitchin) water body catchment, and the southeastern half of the site lies within the Hiz (through Hitchin) water body catchment. Both catchments are classified with moderate ecological status by the Environment Agency.

Rivers within these catchments and downgradient of the site include the River Hiz, flowing from south to north, c. 1.05 km east, and the River Oughton, flowing from southwest to northeast, c. 1.00 km northwest. The closest water feature identified in Ordnance Survey mapping is a pond c. 0.50 km northeast.

The Environment Agency interactive flood risk maps indicate the site is in flood zone 1 with a low probability of flooding from rivers and the sea, and a low probability of flooding from surface water. The highest surface water flooding risk identified on site is for a 1 in 1000 year event along the eastern boundary only.

## 2.5 Hydrogeology

Groundwater was not encountered during the GEMCO site investigation works undertaken in January and April 2021.

The superficial Glaciofluvial Deposits are designated a Secondary A Aquifer, and the bedrock West Melbury Marly Chalk Formation present in the southern half of the site is designated a Principal Aquifer. The Gault Formation is designated as an unproductive stratum.

The site is located within a Zone 3 (total catchment) groundwater source protection zone (SPZ) and in a drinking water safeguarding zone (SgZ) for surface water.

## 2.6 Proposed site development and phasing

At the time of the walkover, no development had been undertaken on site. It is understood from the GEMCO Phase I/II report that the southern half of the site had been used as a compound / storage for an adjacent land parcel between c. 2018 and 2020.

Any construction soil disturbance activities during *pre-construction works* (e.g. additional site investigation works, removal of trees or scrub,, archaeological works if required, outbuilding removal) or *construction phases* (the enabling phase may include earthworks to modify site levels, topsoil strip, stockpiling of soil, and possibly road construction, drainage excavations; the plot construction phase would include any remaining works such as foundation and services excavations, placement of stockpiled soil) are likely to result in stockpiled soils and exposed ground which will create potential sources and pathways for silt run-off and pollution. Prior to, and during these works, the CSWMP will need to be reviewed and updated as required to ensure all appropriate mitigation measures are in place to protect both on-site and off-site receptors.

It is anticipated, based on the construction traffic management plan (ref 01102024/RS/CTMP, rev 0, dated January 2024), that the site will be connected into the local road network via a bridlway crossing to be constructed in the northwest of the site. However, discussion with the Cala representative on site during the walkover indicated that there may be interim vehicle access proposed via the southwest corner of the site. The traffic management plan indicates multiple proposed areas for site compound and materials storage across the site, and that the build route will commence in the northwest with priority on the access road and western plots.

## 2.7 Proposed finished levels and drainage proposals

The cut and fill drawings, reference BA00378-C40 to -C42, dated April 2024, indicate a proposed cut of up to 0.50-1.00 m and fill of up to 0.50-1.00 m in discrete areas across the site. Proposed site levels fall gently down from the southwest towards the northeast and northwest.

The S104 drainage strategy indicates that the foul drainage will have adoptable drainage in the northeast only, leading offsite towards a sewer connection on Westbury Close. No adoptable surface water drainage is proposed.

The Site Layout and Drainage drawing files indicate that there will be small soakaway crates for surface water runoff from houses, gardens and roads to infiltrate to ground, which will be widespread across the site in private garden areas. Surface water runoff in the northeast and southwest will be drained to Permavoid Distribution Boxes (attenuation crates with impermeable wrap) and conveyed to a larger soakaway infiltration crate, SA1, in the northwest. All soakaway crates will infiltrate to ground with no offsite outfall proposed.

## 2.8 Sensitive Land uses

Sensitive land uses within 250.00 m of the site are residential properties to the north, east and south, the cricket club to the south and west, and bridleway and road routes to the north, east and south.

There is one site of special scientific interest (SSSIs) or designated sites within 500.00 m: the Oughtonhead Lane SSSI (Geological Formation), 254.00 m northwest. The closest downgradient environmentally sensitive sites are the Oughtonhead Lane SSSI (Geological Formation) 254.00 m northwest and Oughtonhead Common Local Nature Reserve (LNR) c. 540.00 m west.

Considering the distance from the site, the LNR has not been carried forward as being at risk from site activities.

There is a risk of impact to the SSI from site activities given the relative proximity to the site and the presence of the bridleway as a direct pathway for surface water runoff.

## 2.9 Sensitive receptors to silt pollution

The following sources, pathways and sensitive receptors on site and off site have been identified with respect to silt pollution. Consideration of these along with additional factors can be used to determine a potential pollution risk rating.

### **Sources of silt pollution:**

#### **Pre-construction works**

At present, the site is a field with full vegetation cover. Any soil disturbance by removal of existing structures or trees by breaking ground, additional site investigation works, site stripping, cut and fill to formation level or other ground disturbances could create point sources of silt pollution or large areas of exposed soil.

The principal sources of potential soil pollution to the sensitive receptors will be from cut and fill, road construction, excavation and stockpiling activities, particularly along the north, east and west site boundaries due to proximity to offsite downgradient receptors.

#### **Construction phase:**

The principal sources of potential soil pollution to the surface water receptors will be from the on-site earthworks and construction activities. Particular point sources will occur where soil has been disturbed including foundation excavation, topsoil stripping, stockpiling and dewatering of any excavation of standing water.

### **Pathways:**

#### **Pre-construction**

Plausible pathways for silt pollution to impact the identified receptors include direct surface run-off towards the east and north in line with topography, runoff along the bridleway forming the northern boundary, and runoff to the west down the steep localised boundary slope.

Although there are generally good infiltration rates within the subsoil, historical land drains may be present in more clay-rich areas and clayey horizons could promote lateral migration of water within the ground, which may impact offsite receptors.

## **Construction**

Plausible pathways for silt pollution to impact the identified receptors include direct surface run-off towards the east and north in line with topography, runoff along the bridleway forming the northern boundary, runoff to the west down the steep localised boundary slope, run-off via potential historical land drains and runoff via the newly constructed surface water or ingress to the foul water drainage networks.

## **Sensitive Receptors**

### **On-site:**

- The proposed site compound, storage and other temporary construction phase installations.
- The proposed drainage network, including permeable paving of roads, surface water sewers, impermeable attenuation crates and soakaway infiltration crates of the constructed drainage system. (once constructed)
- Residents in completed plots (upon completion and occupation).

### **Off-site:**

- Public Right of Way: the proposed construction site entrance is at the bridleway (Oughton Head Lane) forming the northern boundary
- Offsite roads and associated drains– the main site access point is proposed in the northwest at the southern end of Lower Innings Road, with Oughton Close and Lucas Lane also downgradient to the east, and Westbury Close downgradient to the northeast.
- Residential housing and associated private gardens to the north, east and south.
- Cricket club (playing fields and buildings) to the south and west. This will include runoff down the boundary slope in the southwest and, if confirmed as a suitable temporary access route, this will be the main site traffic entrance until the construction of the road access point in the northwest is complete.
- Existing surface watercourses – the closest water feature is a pond c. 500.00 m northeast, with two rivers c. 1.00 km away. These have been discounted from direct site impacts due to the distance from the site, high infiltration potential of the site and surrounds, and intervening land uses (including residential and agricultural uses), giving a very low risk of direct impact to the offsite water features.

### 3 RISK RATING AND ASSESSMENT

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A risk rating is provided as guidance to the level of risk associated with silt pollution to the surrounding water environment receptors from the identified sources of pollution occurring during the proposed development. The risk rating assesses a number of risk factors in line with the source-pathway- receptor model. It assesses the sensitivity of any identified receptor and combines that with hazard consequence and probability to classify the risk rating as high, medium or low.

**High:** Indicates the positive identification of a sensitive receptor and / or the likelihood of a potential risk to the surrounding environment.

**Medium:** Indicates the potential identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

**Low:** Indicates no identification of a sensitive receptor or the likelihood of a potential risk to the surrounding environment.

Based on the identified risk rating, plans will be developed and implemented to treat, control and minimise risk.

| RISK RATING AND ASSESSMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                                                                                                                                                                                                                                                                                                                                                                               |                     |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------|
| Risk Factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Identified | Detail                                                                                                                                                                                                                                                                                                                                                                        | Risk Rating (pre-c) | Risk Rating (c) |
| <b>Sensitive Receptors</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                                                                                                                                                                                                                                                                                                                                                                               |                     |                 |
| Visible flowing water course within 100.00 metres of site boundary and category of watercourse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No         | The closest water features is c. 500.00 m distant with fast (10 <sup>-5</sup> m/s) infiltration rates to ground identified in the superficial geology on site, and the same geology mapped in the surrounds – it is considered very unlikely that there would be a direct impact from site activities over a >500.00 m distance.                                              | Low                 | Low             |
| Discharge from site flows directly into a water course                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No         | At present, the site is fully vegetated and infiltrates to ground. The proposed drainage strategy has infiltration to ground, and the closest surface water receptor identified in mapping is almost 500.00 m distant.                                                                                                                                                        | Low                 | Low             |
| Water course contains visible aquatic life (fish etc.) or has been assessed as environmentally sensitive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A        | The watercourses are classified with moderate ecological sensitivity by the EA; however, given the distance from site, it is considered unlikely that there would be a direct impact from site activities. No negative impacts to water have been identified in the ecological impact assessment report.                                                                      | Low                 | Low             |
| Local water course used as local amenity, fishing, canoeing, boating, swimming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N/A        | No water courses within the immediate vicinity of the site were identified as being used for recreational use.                                                                                                                                                                                                                                                                | Low                 | Low             |
| Likely volumes of temporary discharge will exceed those designed for infiltration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | No         | No change to the drainage regime during the pre-construction works. However, temporary runoff prior to the completion of the soakaway drainage system on site may exceed calculated final discharge/infiltration rates during storm events, during the construction phase, due to unsurfaced areas with increased run-off rates.                                              | Low                 | Medium          |
| Treatment of water discharge is likely to be required to achieve the quality standard of acceptability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No         | Treatment of site surface water is not anticipated at this stage.                                                                                                                                                                                                                                                                                                             | Low                 | Low             |
| SSSI and Sensitive Receptors located downstream from the development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes        | There are downgradient residential properties with private gardens and roads with drainage networks in the vicinity of the site. There is an SSSI (Oughtonhead Lane SSSI) at 254.00 m northwest of the site, which is topographically downgradient of the site.                                                                                                               | Medium              | Medium          |
| Soils investigation identifies clay/silt (impermeable materials)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes        | The intrusive site investigations have confirmed the site to be surfaced with cohesive topsoil overlying Glaciofluvial deposits (cohesive and granular), underlain by chalk at depth in the south. The cohesive deposits will impede infiltration and may lead to significant runoff and ponding, in areas stripped of topsoil.                                               | Medium              | Medium          |
| Site exposed, or at high altitude, or steep gradient.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No         | The site generally has a gentle slope down from southwest to northeast and northwest; there is a moderately steep slope on the southwestern boundary leading down to the offsite cricket club.                                                                                                                                                                                | Low                 | Low             |
| Soils investigation identifies on-site contamination that may pose a risk to controlled waters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No         | The site investigation carried out by GEMCO does not identify any elevated levels of contaminants within soils onsite and has classified the site with low risk to groundwater due only marginal chemical exceedances in onsite soil and no groundwater encountered during fieldwork. Therefore, it is considered that there is no risk to controlled waters from site soils. | Low                 | Low             |
| Groundwater level detected at installed drainage pipework depths                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No         | Groundwater was not encountered during fieldwork.                                                                                                                                                                                                                                                                                                                             | Low                 | Low             |
| Records indicate that site suffers from seasonal flooding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No         | There is a very low risk from surface water and groundwater flooding to the site based upon the gov.uk Flood Risk for Planning service.                                                                                                                                                                                                                                       | Low                 | Low             |
| Does the development require a programme of earthworks to change/modify site levels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes        | Earthworks are anticipated for cut and fill activities of up to 1m level change across the site, in addition to road construction, soakaway installation and plot building activities                                                                                                                                                                                         | Low                 | Medium          |
| Construction of attenuation basins programmed for construction within 3 months of development commencement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A        | No basin is proposed. It is noted that the soakaway drainage should be installed as soon as reasonably possible and suitably protected upon construction of hardstanding and buildings to allow for infiltration to ground.                                                                                                                                                   | Low                 | Low             |
| <p>Note: the risk rating is presented separately in columnar format for the pre-construction (Pre-C) and construction (C) phases in the table above.</p> <p>It is considered that site should be classed as <b>Medium to Low</b> risk during the pre-construction and construction phases in the absence of any protection measures, given that:</p> <ol style="list-style-type: none"> <li>1. Cohesive soils have been identified at shallow depths</li> <li>2. Due to the small size of the site, it is considered unlikely that a phased topsoil strip will be proposed, instead creating a large area of unsurfaced ground at the start of construction activities,</li> <li>3. Soakaway and attenuation crate installation will be required early in the build programme to accommodate increased runoff from building, hardstanding and slow infiltration rate areas.</li> <li>4. Offsite sensitive receptors including residential properties, playing fields, roads, bridleway and SSSI.</li> </ol> <p>The risk rating may be considered to be <b>Low/Medium Risk</b> after the construction of recommended silt protection measures.</p> |            |                                                                                                                                                                                                                                                                                                                                                                               |                     |                 |

## 4 PROTECTION MEASURES

---

The following protection measures are to be implemented on all areas of the site to protect the surface water system.

The recommendations for mitigation measures required during pre-construction and construction phases are shown schematically on **Figure 2** and **Figure 3**, respectively.

### 4.1 Pre-construction activities

#### 4.1.1 Watercourses and runoff

- No watercourses have been identified in the vicinity.
- Further mitigation measures are unlikely to be required prior to the main construction phase as long as the vegetated buffer on boundaries remain undamaged. Advice should be sought from RSK for suitable protective measures if site activities damage the vegetated buffer on site boundaries.

#### 4.1.2 Roads and access (including public right of way)

- To protect offsite receptors including residential properties, public rights of way and roads, the **retention of a vegetated buffer** on all site boundaries is recommended to promote infiltration and reduce risk of any silt laden surface water runoff from impacting adjacent land during adverse weather conditions. The established vegetation cover will reduce flow rates and encourage infiltration; however, during periods of prolonged rainfall, the perimeter areas should be checked to ensure surface run-off is not occurring.
- If a topsoil strip is undertaken, the retention of an undisturbed boundary vegetated buffer would also ensure a **reduced dig step down in levels** at site boundaries, which would effectively manage surface water runoff and prevent it from leaving the site.
- Mitigation measures such as the installation of **boundary silt fencing** may be required on the north, east and south-west boundaries where the surrounding land is topographically downgradient from the site, and infiltration to ground is less likely (as highlighted in these areas on the drainage drawings where attenuation crates are proposed).
- Provision of a road sweeper on the surrounding road network during periods of heavy rain if necessary (to be continually assessed by client)
- Provision of a wheel wash or jet wash station on site to stop off-site tracking of mud onto the surrounding roads, if necessary, during these works
- Minimise the movement of plant on and off roads to prevent the tracking of excess soil onto roads and highways (i.e. planning of working day, utilising designated plant crossing points of surface roads)
- Selection of dedicated vehicle routes across the site to minimise risk of soil erosion through surface cover disturbance across vegetated areas.
- If a temporary vehicle access point is installed on the southwestern boundary, it is recommended that there should be protection measures such as silt fencing or sandbags

parallel to the vehicle route to protect the offsite cricket club land from silt laden surface water runoff from moving plant.

#### **4.1.3 Soil disturbance**

- Maximise the retention of topsoil cover to limit exposure of underlying soils to erosion by run-off).
- If ground disturbance is undertaken in the pre-construction works, for example during site investigation, tree or scrub removal, archaeology works or outbuilding removal, it is recommended that these areas are monitored to assess the suitability of the vegetated buffer and silt fencing recommendations for the retention and infiltration of surface water.
- Retention of vegetation as far as reasonably practicable, particularly along site boundaries, to promote infiltration of any surface water and silt run-off and therefore be protective of movement of silt towards offsite receptors.
- Control of site surface strip: it is imperative that the wholesale stripping of surface vegetation and associated topsoil should be minimised. For the effective management of run-off, it is critical that any soil disturbance including site investigation, archaeology (if required), tree and scrub removal or other necessary works should be carefully managed in accordance with a site strip plan that phases the site strip to enable specific areas to be investigated whilst maintaining surface vegetation to promote infiltration and minimising run-off. No clearing shall be undertaken without suitable drainage and sediment control measures. All reasonable and practicable measures must be taken to minimise the duration that soils are exposed by staging earthworks and stabilising the surface
- Placement of stockpiled materials (topsoil and subsoil) within designated areas as far as reasonably practicable from any site perimeters (particularly adjacent to roads). Consider placement of a silt fence at the base of any stockpiles to control runoff. Stockpiles of stripped topsoil should be no greater than 2.50 m in height to reduce any degradation of the soil structure.
- Subsoil and topsoil should be backfilled into excavations as soon as temporary investigation works have completed in original succession order
- Selection of dedicated vehicle routes across the site to minimise risk of soil erosion through surface cover disturbance across vegetated areas
- If dewatering of excavations is required (not anticipated due to encountered ground conditions), RSK should be contacted immediately to review suitable options and advise on the need for permits and suitable methods of work

#### **4.1.4 Vegetation**

- The boundary hedgerows and treelines should be retained as much as possible along all site boundaries to minimise ecological and soil disturbance. The root zones, where present, or a 5.00 m standoff from site boundaries, should be left undisturbed to act as a vegetated buffer.
- maximise the retention of topsoil cover to limit exposure of underlying soils to erosion by run-off, promote infiltration of surface water, and therefore be protective of movement of silt towards offsite downgradient receptors.
- Replacement of disturbed vegetation at the earliest opportunity.

## 4.2 Construction phase (enabling works and plot construction) protection measures

The following recommendations for silt mitigation measures, in addition to the measures outlined in **Section 4.1** should also be considered during construction works. These mitigation measures are shown schematically on **Figure 3**.

- **Establishment of the drainage system** as early as possible in the development programme to provide run-off attenuation control. Appropriate protection of soakaway infiltration crates and attenuation crates such as a **geotextile filter at all crate and drainage inlets** to ensure effective protection against silt buildup within crates, which would reduce the capacity and efficacy of the drainage system.
- **Retention of silt fencing and vegetated buffers** incorporated into pre-construction activities, to ensure interception of silt laden surface water and promote infiltration. This will protect offsite downgradient receptors when construction works begin.
- Additional boundary silt fencing may be required beyond that proposed for pre-construction, including adjacent to construction areas and in the northwest associated with the road crossing to reduce the risk of water leaving site or entering existing offsite drainage infrastructure from the site, especially during adverse weather conditions.
- Control of site surface strip: it is imperative that the wholesale stripping of surface vegetation and associated topsoil should be minimised. For the effective management of run-off, it is critical that the site strip should be carefully managed in accordance with a site strip plan that phases the site strip to enable specific areas to be developed whilst maintaining surface vegetation to promote infiltration and minimising run-off. No clearing shall be undertaken without suitable drainage and sediment control measures. All reasonable and practicable measures must be taken to minimise the duration that soils are exposed by staging earthworks and stabilising the surface. A vegetated buffer should be retained (and not stripped) along all site boundaries. Maximum retention of topsoil cover within the site as possible, such that if removal of vegetation is required, it is undertaken in accordance with the build route to avoid excessive clearance (to limit exposure of underlying soils to erosion by run-off).
- Provision of a road sweeper on site and surrounding road network during periods of heavy rain (to be continually assessed by site management).
- Provision of a wheel wash or jet wash station on site to stop off-site tracking of mud onto the surrounding roads (to be continually assessed by site management).
- Placement of stockpiled materials (topsoil and subsoil) within designated areas as far as reasonably practicable from any surface water receptors such as constructed inlets to soakaway drainage network. Consider placement of a silt fence at the base of any stockpiles to control runoff. Stockpiles of stripped topsoil should be no greater than 2.50 m in height to reduce any degradation of the soil structure. If stockpiles are being left for over six months they should be seeded / vegetated to reduce runoff.

Allowance should be made for on-site storage/availability of additional silt fencing and silt trap materials to enable deployment at short notice if required during heavy rain and to facilitate on-going maintenance of installations

#### 4.2.1 Roads and access

- Temporary site access proposed in southwest and permanent access proposed in northwest – suitable measures should be adopted to ensure silt does not impact the bridleway, Lower Innings or the cricket club. These could include a **vehicle wheel wash** at the site entrance, **coarse stone** hardcore for removal of mud from wheels, and **silt fencing barriers** to each side of the access road to contain loose sediment.
- Once the road crossings are installed, the disturbed ground should be immediately **silt fenced** and **seeded** until vegetated to protect from surface water runoff and erosion / scour.
- Oughton Head Lane (bridleway) crossing: **silt fencing** to east and west of the proposed bridleway crossing in the northwest, to mitigate uncontrolled run-off to the bridleway and adjacent roads from adjacent stripped areas.
- A **gully inspection** should be undertaken to identify local blockages or cleaning requirements within the active construction zones and site access routes. If no gullies are present (for example due to porous block construction) housekeeping on the road network should be paramount to ensure silt ingress to the drainage network is minimised. Consideration should be given to **protection of the gullies** (e.g. gully guards, gully bags) in the offsite drainage network (e.g. along Lower Innings) which may be impacted by construction site traffic routes.
- Regular **scrapping** of roads to remove significant silt build-up; avoid excessive use of water or jet-washing the road as this will wash the silt and mud into the drainage system.
- **Minimise the movement of plant** on and off roads to prevent the tracking of excess soil onto roads and highways (i.e. planning of working day, utilising designated plant crossing points of surface roads, defining designated plant tracking routes within the traffic management plan).
- Use/installation of **wheel washes** (if necessary) to stop silt build up when leaving site.

#### 4.2.2 Site condition

- The installation of **hard standing areas** to the front of all plots to enable 'clean' forklift access.
- The placement of topsoil and **planting/seedling** at the earliest opportunity to control surface run-off from completed areas.

#### 4.2.3 Site activities

- Avoid tracking or washing out next to any drains, porous road and driveway surfaces or boundaries with adjacent off-site residents.
- General good housekeeping of the site, with site audits/inspection.

#### 4.2.4 Management of dewatering

Dewatering is not anticipated due to the groundwater conditions reported in the GEMCO site investigation reports. Should dewatering of excavations be required, the following options may be considered:

- Over-pumping into the construction foul water drainage system with the requisite consent gained from the local water company to discharge.
- Adequate silt mitigation measures should be implemented (potentially comprising but not limited to; use of filter bags on any pump inlet and outlet and passing water through either a settlement

tank) to minimise discharge of silt into the constructed construction foul water drainage system and subsequently off-site.

- Any discharge of construction surface waters during the construction phases will likely be classified by the Environment Agency as a trade effluent and discharge should be undertaken under the control of an EA Environmental Permit should discharge to foul sewer not be feasible.

#### **4.2.5 Drainage infrastructure**

- Drainage installation and attenuation/infiltration crates should be programmed to be completed as soon as possible. This will enable their use to store and control run-off.
- Construction water should be retained within the attenuation and infiltration crate to allow infiltration to ground. However, sediment buildup needs to be mitigated by the installation of a **geotextile filter** at crate inlets to ensure no sediment enters (and buildup occurs within) the infiltration and attenuation systems.

### **4.3 Protection measures within non-active development zone**

The following protection measures are to be implemented on non-active development areas (e.g. vegetated buffers, sitewide, and landscaped recreation area in northwest) to protect the surface water system:

- Minimise vegetation removal within non-active development areas.
- Retain (or re-establish) vegetation in areas upgradient of the active development area and on downgradient site boundaries to minimise run-off generation
- Prevent the movement of any plant within those areas of the site, which may cause disturbance to existing surface cover.

### **4.4 Ongoing site maintenance (both active and non-active areas)**

- on site storage/availability of silt fencing, silt matting and sandbags to enable deployment at short notice if required (i.e. during inclement weather) and to facilitate on-going maintenance of potential installations. Supporting information – installation examples are within **Appendix D**
- removal of residual silt held back by installed protection measures (behind silt fences/geotextile filters etc).

### **4.5 Pre-construction and construction phase monitoring procedures, records and recommendations**

Specific monitoring points (shown schematically in **Figure 2** and **Figure 3**) should be established and monitored at regular intervals and during periods of heavy rain.

The following monitoring procedures should be carried out by the site team on a monthly basis during pre-construction and construction to enable continuous review of the measures listed above during these phases of works. It may be prudent to increase the monthly site inspection to weekly during active phases of soil disturbance including site investigation, cut and fill and site development, or as necessary throughout periods of heavy rain.

A comprehensive record of the effectiveness of the system will be maintained to enable further review by any parties attending the site.

- **Primary monitoring points** – to be visually checked on a monthly basis and weekly or as necessary during periods of heavy and/or prolonged rainfall and during any ground disturbance works. Monitoring locations M1 to M2 are shown on **Figure 2** and **Figure 3**.
  - 1) Monitoring location M1: monitor the condition of silt protection measures, road/track surface and housekeeping at proposed temporary road access in southwest.
  - 2) Monitoring location M2: monitor the condition of silt protection measures, road and bridleway surfaces and housekeeping at proposed permanent access road in northwest.
- **Secondary monitoring points (to be incorporated once site enabling work and construction phase begins)** – to be visually checked on a monthly basis and weekly or as necessary during periods of heavy and/or prolonged rainfall and during any ground disturbance works. Monitoring locations M3 to M6 are shown on **Figure 2** and **Figure 3**.
  - 3) Monitoring location M3: monitor the condition of silt fencing and vegetated buffer along northern boundary, protective of offsite bridleway and residential plots.
  - 4) Monitoring location M4: monitor the condition of silt fencing and vegetated buffer along eastern boundary, protective of offsite residential plots.
  - 5) Monitoring location M5: monitor the condition of silt fencing and vegetated buffer along southern boundary, protective of offsite residential plots and cricket club.
  - 6) Monitoring location M6: monitor the condition of silt fencing and vegetated buffer along western boundary, protective of offsite cricket club.
- maintenance, cleaning and replacement of silt entrapment materials as required
- keeping a photographic log and written record of monitoring using the site inspection form within **Appendix F**, which will assist in documenting any changes on site and identifying any changes needed to the protection systems as the development progresses
- all records will be reviewed on a quarterly/as-required basis. Additionally, advice can be obtained by the site team at any time from the appointed environmental consultant.

It is not anticipated that there would be accessible pooled water during the pre-construction works or construction works to collect samples for laboratory testing for total suspended solids. Nevertheless, if water is present, RSK is able to advise and or undertake this.

## **4.6 RSK support**

RSK are able to undertake site visits to assess surface water management measures, following which, an updated version of this report may be issued to reflect any changes/additional measures. It is recommended that there is a quarterly site visit for visual checks of the site condition and monitoring points (once pre-construction work has commenced), including a review of silt protection measures, general site silt and surface water management, and measurement of water quality via testing with NTU meter (if water is present during the inspection). This should be carried out by RSK on a quarterly basis for the duration of the development works, or on a notable change of site conditions.

| CONTACT DETAILS (To be used for support and advice) |                     |              |                          |
|-----------------------------------------------------|---------------------|--------------|--------------------------|
| RSK Environment Ltd.                                | Helen Gildersleeves | 07423 075801 | hgildersleeves@rsk.co.uk |
| RSK Environment Ltd.                                | Jason Monk          | 07503 644512 | jmonk@rsk.co.uk          |

# FIGURES

---



**Figure 1 SITE LOCATION PLAN**



|     |            |             |       |      |      |
|-----|------------|-------------|-------|------|------|
| C01 | 18.06.2025 | First Issue | AA    | HG   | HG   |
| Rev | Date       | Amendment   | Drawn | Chkd | Appd |

— Site boundary

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**RSK**  
**GEOSCIENCES**

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Web: [RSKGeosciences.co.uk](http://RSKGeosciences.co.uk)

Client

Cala Homes (North Home Counties) Ltd

Project Name

Oughtonhead Lane, Hitchin

Description

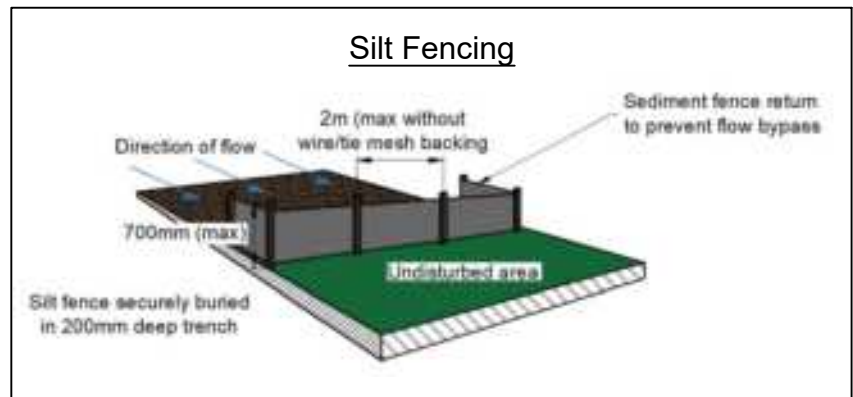
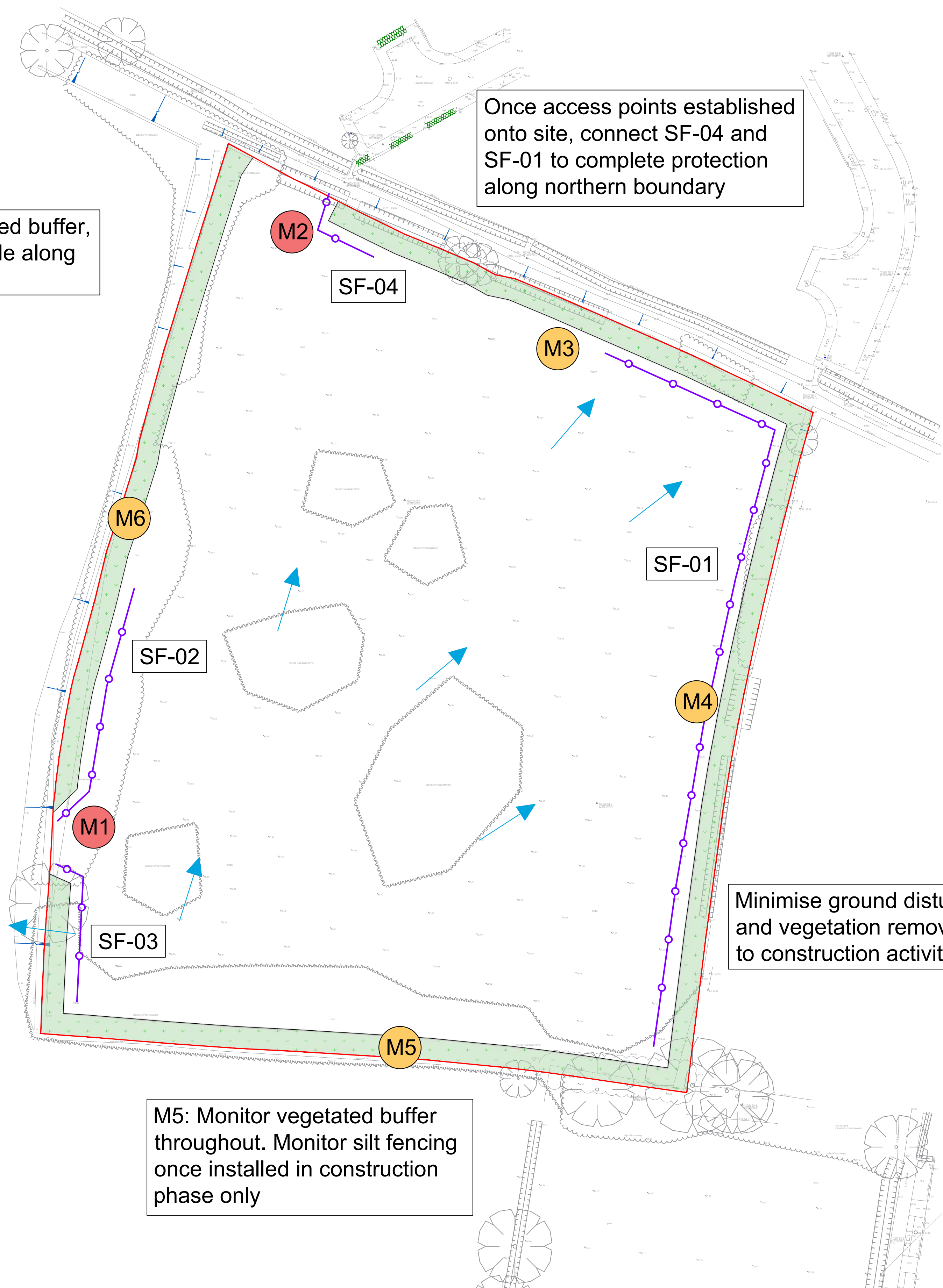
Site Location Plan

|                |            |                   |                               |                      |                      |            |                                             |
|----------------|------------|-------------------|-------------------------------|----------------------|----------------------|------------|---------------------------------------------|
| Dimension<br>m | Size<br>A4 | Scale<br>1:25,000 | Geolocation<br>517551, 229640 | Project ID<br>340680 | Drawing no.<br>11101 | Rev<br>C01 | File name<br>340680-CA-111-XX-D-G-11101-C01 |
|----------------|------------|-------------------|-------------------------------|----------------------|----------------------|------------|---------------------------------------------|

**Figure 2 PRE-CONSTRUCTION SURFACE WATER MANAGEMENT  
SCHEMATIC**



DO NOT SCALE FROM THIS DRAWING



**Monitoring Rationale:**  
Monitoring points are to be visually checked on a monthly basis and weekly during periods of heavy and/or prolonged rainfall and during any ground disturbance works.

**Primary Monitoring Locations:**  
M1: monitor the condition of silt protection measures, road/track surface and housekeeping at proposed temporary road access in southwest.  
M2: monitor the condition of silt protection measures, road and bridleway surfaces and housekeeping at proposed permanent access road in northwest.

**Secondary Monitoring Locations:**  
M3: monitor the condition of silt fencing and vegetated buffer along northern boundary, protective of offsite bridleway and residential plots.  
M4: monitor the condition of silt fencing and vegetated buffer along eastern boundary, protective of offsite residential plots.  
M5: monitor the condition of silt fencing and vegetated buffer along southern boundary, protective of offsite residential plots and cricket club.  
M6: monitor the condition of silt fencing and vegetated buffer along western boundary, protective of offsite cricket club.

**Roads and gullies:**  
Ensure good housekeeping of permeable / porous paving on site to ensure it is not blinded by construction sediment.  
Ensure good housekeeping along offsite roads carrying vehicle traffic. Liaise with landowner/council/highways to install gully bags in offsite gullies if required, to prevent sediment buildup within surface water drainage network.

**Stockpiles:**  
Monitor each stockpile to ensure no surface water run-off is occurring. Assess the requirement for placement of silt fencing at the base of the stockpile to control run-off.

**Excavations:**  
Monitor any excavation to ascertain whether surface water has begun to flood the excavation/ these are already flooded and at risk of over-topping, and therefore whether there is any requirement for the placement of bunds or silt fencing up-gradient of the excavation to control run-off.

**Contingency:**  
On site storage / availability of silt fencing to enable deployment at short notice if required (i.e., during inclement weather) and to facilitate on-going maintenance of potential installations.

**Vegetation:**  
Retain vegetated buffer along site boundaries to promote infiltration, reduce potential for erosion and mitigate runoff to watercourses.

**Drainage:**  
It is recommended to construct infiltration crates with suitable inlet protection prior to main construction activities, to enable effective control of construction surface water throughout the construction phase.

- LEGEND**
- Site boundary
  - Recommended line of silt fencing
  - Primary monitoring location
  - Buffer zones
  - Anticipated direction of surface water run-off based on topography

**Notes:**  
The drawing must be read in conjunction with the Construction Surface Water Management Plan.

The drawing is not meant to be an accurate base plan but is used to present the general relative locations of features on, and surrounding, the site. Features annotated on site plans are not drawn to scale but are centered over the approximate location. Such features should not be used for setting out and should be considered indicative only.

Base plan provided by: Client  
Drawing Ref: 1021-01B-02A-03A(topo)

|     |            |             |       |      |      |
|-----|------------|-------------|-------|------|------|
| C01 | 20.06.2025 | First Issue | AA    | HG   | HG   |
| Rev | Date       | Amendment   | Drawn | Chkd | Appd |



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|                                                |             |          |
|------------------------------------------------|-------------|----------|
| Client                                         |             |          |
| Cala Homes (North Home Counties) Ltd           |             |          |
| Project Name                                   |             |          |
| Oughtonhead Lane, Hitchin                      |             |          |
| Description                                    |             |          |
| Pre-construction Surface Water Management Plan |             |          |
| Project ID                                     | Drawing no. | Revision |
| 340680                                         | 27601       | C01      |
| File name                                      |             |          |
| 340680-CA-276-XX-D-G-27601-C01                 |             |          |
| Dimensions                                     | Scale       | Size     |
| m                                              | 1:500       | A1       |





**Figure 3 CONSTRUCTION PHASE SURFACE WATER  
MANAGEMENT SCHEMATIC**



Phase the vegetation removal and topsoil strip to minimise the area of exposed soil

Store stockpiled materials at least 5m from site boundaries with a height of up to 2.5m

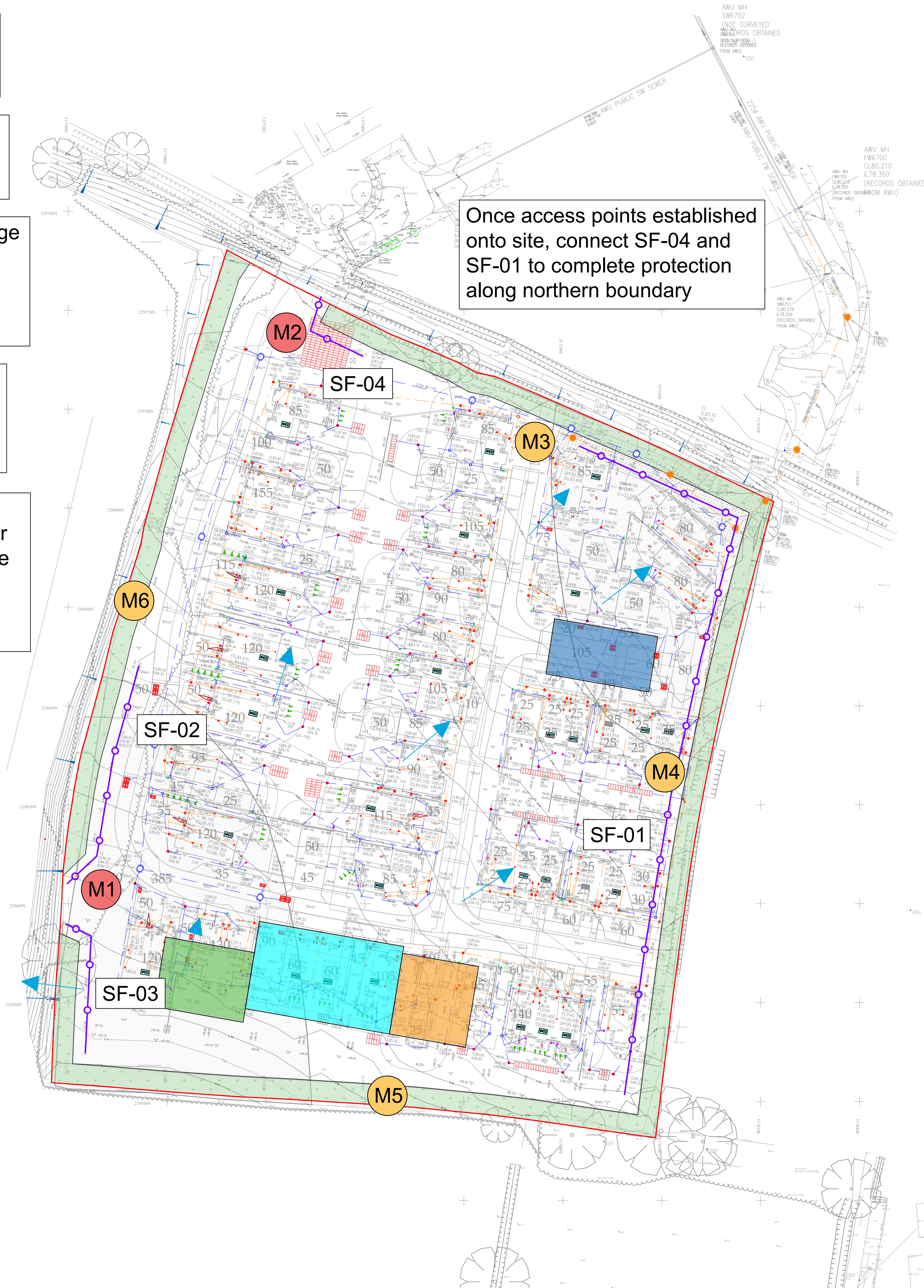
Install geotextile filter at drainage inlets on site to infiltration and attenuation crates to capture sediment and prevent buildup within crates

Ensure clean access on permeable/porous paving and site roads to prevent blinding of installed drainage

Inspect traffic routes on offsite roads and liaise with landowner to install gully protection if there is a risk from tracking mud, to ensure no sediment impact to offsite drainage

Retain vegetated buffer, at least 5m wide along all boundaries

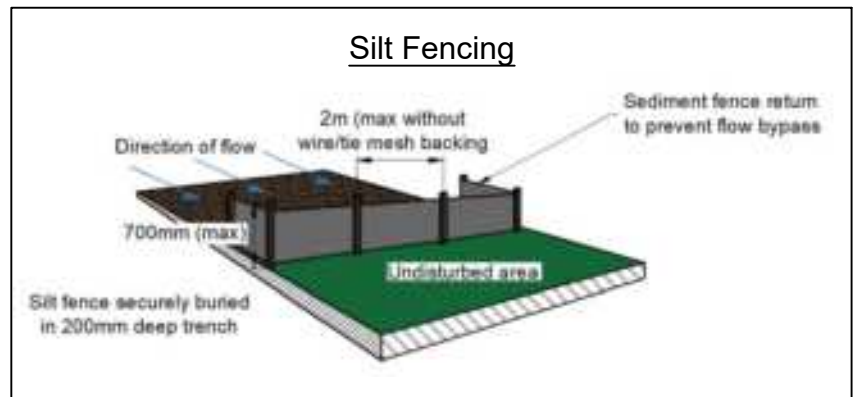
Once access points established onto site, connect SF-04 and SF-01 to complete protection along northern boundary



DO NOT SCALE FROM THIS DRAWING

#### LEGEND

- Site boundary
- Surface water drainage
- Foul water drainage
- Recommended line of silt fencing
- Anticipated direction of surface water run-off based on topography
- Primary monitoring location
- Secondary monitoring location
- Buffer zones
- Storage Compound
- Compound
- Car Park
- Storage



**Monitoring Rationale:**  
Monitoring points are to be visually checked on a monthly basis and weekly during periods of heavy and/or prolonged rainfall and during any ground disturbance works.

**Primary Monitoring Locations:**  
M1: monitor the condition of silt protection measures, road/track surface and housekeeping at proposed temporary road access in southwest.  
M2: monitor the condition of silt protection measures, road and brideway surfaces and housekeeping at proposed permanent access road in northwest.

**Secondary Monitoring Locations:**  
M3: monitor the condition of silt fencing and vegetated buffer along northern boundary, protective of offsite brideway and residential plots.  
M4: monitor the condition of silt fencing and vegetated buffer along eastern boundary, protective of offsite residential plots.  
M5: monitor the condition of silt fencing and vegetated buffer along southern boundary, protective of offsite residential plots and cricket club.  
M6: monitor the condition of silt fencing and vegetated buffer along western boundary, protective of offsite cricket club.

**Roads and gullies:**  
Ensure good housekeeping of permeable / porous paving on site to ensure it is not blinded by construction sediment.  
Ensure good housekeeping along offsite roads carrying vehicle traffic. Liaise with landowner/council/highways to install gully bags in offsite gullies if required, to prevent sediment buildup within surface water drainage network.

**Stockpiles:**  
Monitor each stockpile to ensure no surface water run-off is occurring. Assess the requirement for placement of silt fencing at the base of the stockpile to control run-off.

**Excavations:**  
Monitor any excavation to ascertain whether surface water has begun to flood the excavation/ these are already flooded and at risk of over-topping, and therefore whether there is any requirement for the placement of bunds or silt fencing up-gradient of the excavation to control run-off.

**Contingency:**  
On site storage / availability of silt fencing to enable deployment at short notice if required (i.e., during inclement weather) and to facilitate on-going maintenance of potential installations.

**Vegetation:**  
Retain vegetated buffer along site boundaries to promote infiltration, reduce potential for erosion and mitigate runoff to watercourses.

**Drainage:**  
It is recommended to construct infiltration crates with suitable inlet protection prior to main construction activities, to enable effective control of construction surface water throughout the construction phase.

**Notes:**  
The drawing must be read in conjunction with the Construction Surface Water Management Plan.

The drawing is not meant to be an accurate base plan but is used to present the general relative locations of features on, and surrounding, the site. Features annotated on site plans are not drawn to scale but are centered over the approximate location. Such features should not be used for setting out and should be considered indicative only.

Base plan provided by: Client  
Drawing Ref: H1402-C02C, C03C, C04C, C05D, C06D, C07B, C08, C09, C10, C14B, C15B

|     |            |             |       |      |      |
|-----|------------|-------------|-------|------|------|
| C01 | 20.06.2025 | First Issue | AA    | HG   | HG   |
| Rev | Date       | Amendment   | Drawn | Chkd | Appd |



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Client  
**Cala Homes (North Home Counties) Ltd**

Project Name  
**Oughtonhead Lane, Hitchin**

Description  
**Construction Surface Water Management Schematic**

|            |             |          |
|------------|-------------|----------|
| Project ID | Drawing no. | Revision |
| 340680     | 27602       | C01      |

File name  
**340680-CA-276-XX-D-G-27602-C01**

|            |       |      |
|------------|-------|------|
| Dimensions | Scale | Size |
| m          | 1:500 | A1   |



## **APPENDICES**

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## **APPENDIX A**

### **SERVICE CONSTRAINTS**

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# APPENDIX A

## SERVICE CONSTRAINTS

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### 1. Service Constraints

1.1. This Report (the "Report") and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Carbon Zero Consulting, Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the "Appointment") between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.



1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

- a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
- b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.
- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.
- d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

## **2. Service Constraints where the Report provides an intrusive assessment of ground conditions:**

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent

of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

### **3. Service Constraints where the Report relates to Surface Water Management:**

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.



3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibility for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

#### **4. Service Constraints where the Report relates to Waste Management:**

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the



comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

## **5. Service Constraints for Construction Environmental Management Plan Reports:**

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

## **6. Service Constraints where the Report relates to Ground Gas Membrane Verification:**

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

## **7. Service Constraints for Environmental Due Diligence (EDD) Reports:**

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.



7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

## **8. Service Constraints for Ground source heat energy Reports:**

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

## **9. Service Constraints for Water Abstraction Borehole Reports:**

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.



## **APPENDIX B SITE DEVELOPMENT PLAN AND OUTLINE DRAINAGE STRATEGY**

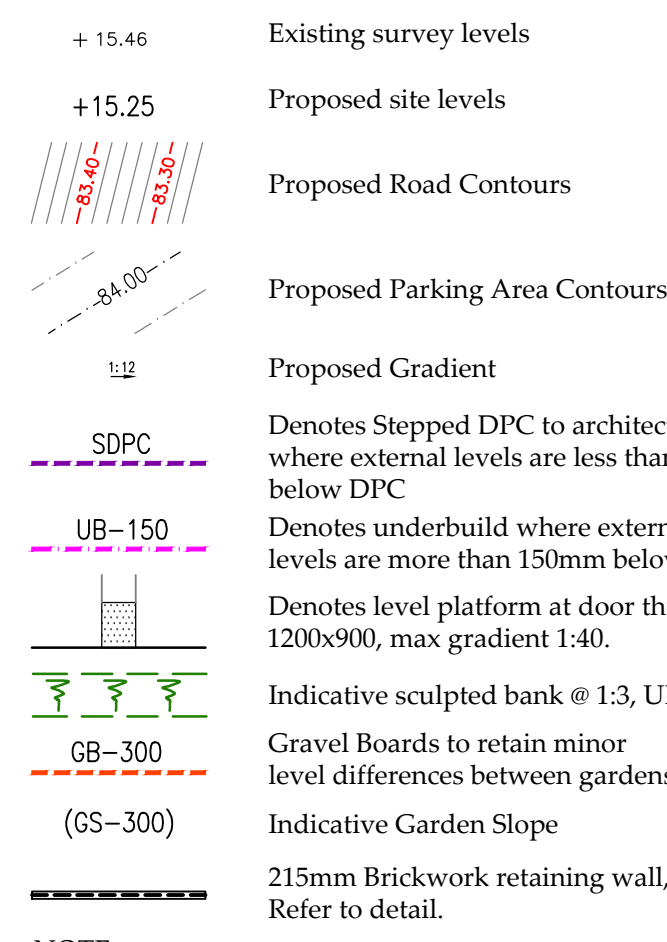
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FILL SPECIFICATION  
Fill under adoptable carriageway and other vehicularised areas to be to Department of Transport Specification for Highway Works Part 1 Table 6/1 Class 1 (General Granular Fill) and compacted in accordance with Table 6/4. Subject to the final approval of the adopting Authority.

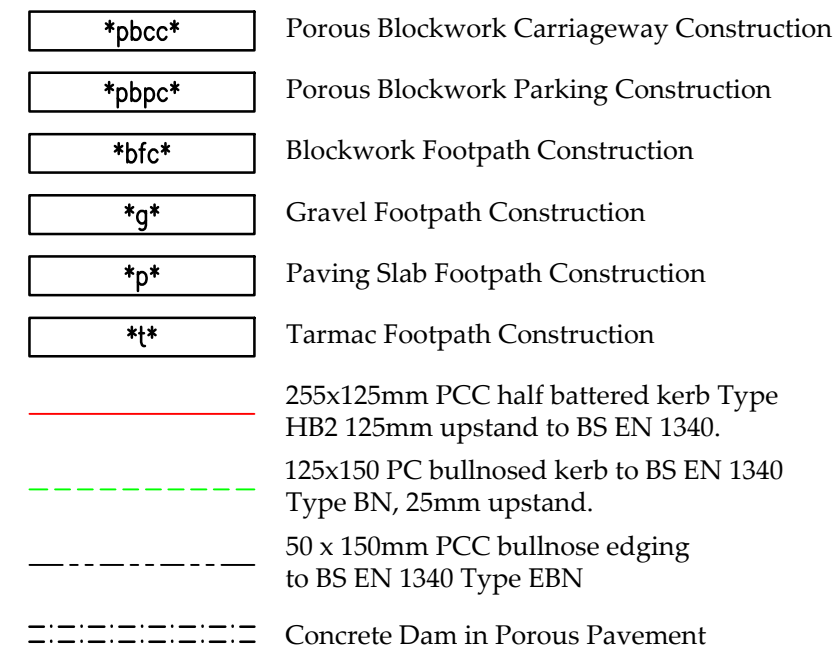
Fill under gardens and other landscaped areas to be as raised from site excavations and compaction shall be sufficient to remove large voids and to produce a coherent mass whilst preventing overcompaction and any build up of excess pore pressures.

Levels Key

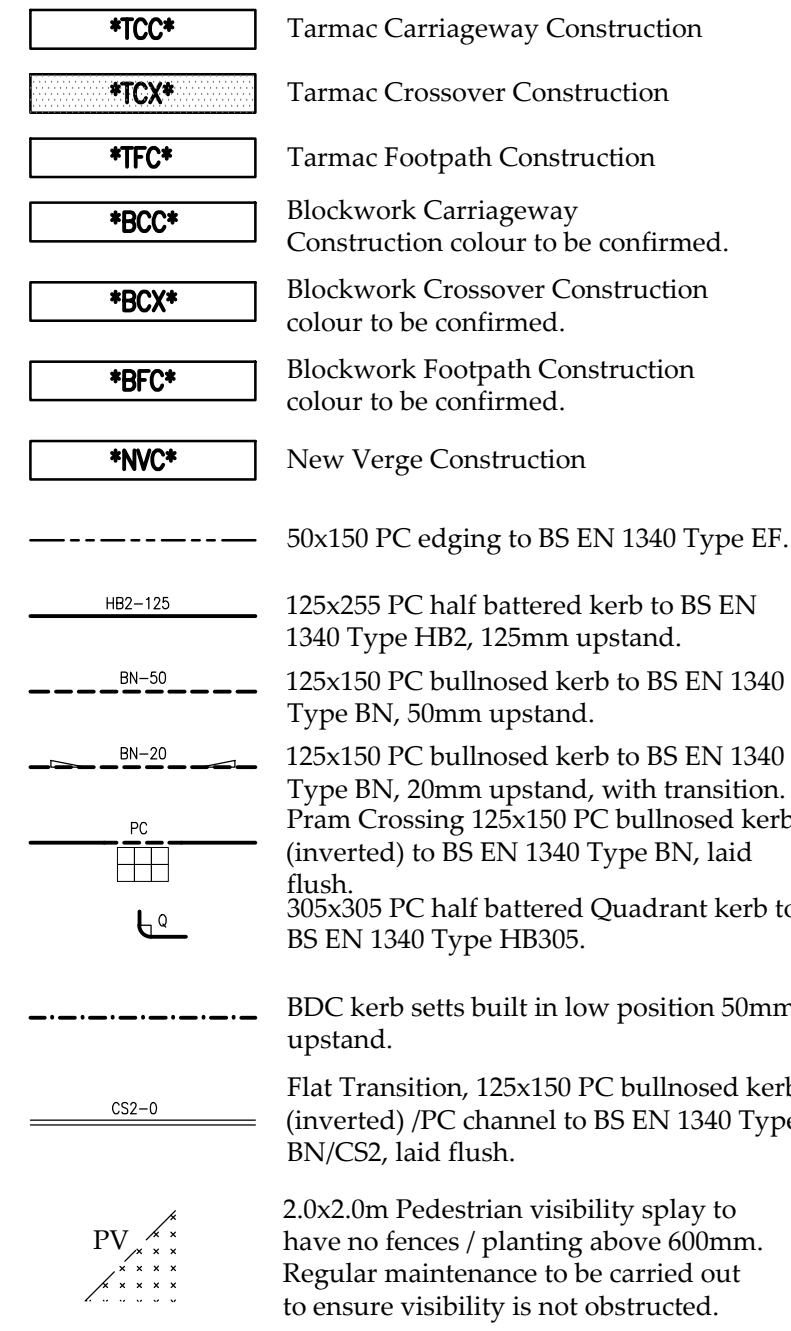


NOTE:  
Where level threshold access occurs, a stepped DPC to architects detail is to be constructed where the adjacent levels are above the normal DPC detail.

Private Areas



Adoptable Areas



NOTE:  
Where shown on the layout hatched thus: Porous paving to have an impermeable Polypropylene membrane and be drained using Permavoid Distribution boxes. Impermeable membrane to be wrapped in a protective fleece or similar Geotextile to detail.

Notes:

- Do not scale from this drawing.
- All dimensions are in m unless otherwise specified.
- In case of any discrepancies in drawings or details refer to engineer for clarification. Unilateral decisions by the contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects Consultants & Sub-Contractors drawings and specifications.
- The Contractor is to ensure that all design drawings and information are read concurrently and any discrepancies or omissions reported directly to Aventus Design.
- This drawing is based upon the survey by Mark Beaver Surveying, reference 102103A dated 8th December 2022 provided in digital format.
- Level datum of survey relate to OSGB36(02).
- The grid relates to Ordnance Survey.
- The Contractor must check the levels of all existing drainage outfalls prior to construction of any drainage, unless otherwise agreed, to ensure the proposed design may be achieved. Any discrepancies must be reported immediately to Aventus Design.
- Sulphates have been determined as class 1 (DS-1) for design purposes in accordance with BRE Special Digest 1 (2001). Buried Concrete to be in accordance with AC119 Site Class AC-1.
- All external building dimensions are to be checked against the Architects Drawings prior to any construction commencing.
- All adoptable highway works to be in accordance with the Local Authorities Specifications.
- All adoptable drainage works to be in accordance with the Water Authorities standard guidelines for connections etc.
- Formation to road/handstanding to be proof rolled and any soft spots in subgrade of road/handstanding areas are to be excavated and replaced with well compacted sub-base or free draining granular material to Department of Transport Specification for Highway Works Part 2 Table 6/1 Class 1 (General Granular Fill) and compacted in accordance with Table 6/4.

CDM REGULATIONS 2015  
Aventus Design has considered, when reasonably practicable, avoided foreseeable risks in the preparation of the design shown on this and related drawings. Significant risks which remain and associated control measures are identified in the Risk Register and should be given particular attention by the main contractor on site.  
RISKS RELATING TO THIS DRAWING:  
RISK NUMBERS 6 - 9 on Risk Register  
NOTE: The Risk Register records only those elements considered unusual, difficult to manage or outside the anticipated expertise of a competent contractor.

PRELIMINARY ISSUE



|      |          |                                                                                                                            |     |     |
|------|----------|----------------------------------------------------------------------------------------------------------------------------|-----|-----|
| C    | 21.02.24 | SDPC's reviewed/amended, steps/walls updated, ASPH levels amended when next to level threshold. POS/footpath levels added. | SU  | -   |
| B    | 14.02.24 | SDPC's reduced as requested by the NHBC, steps added, Garage Levels to plots 1/2, 17/18 & 21/22 lowered.                   | SU  | -   |
| A    | 01.12.23 | Layout updated, Substation removed, finishes added.                                                                        | SU  | -   |
| REV. | DATE     | DESCRIPTION                                                                                                                | CHK | APP |



NOTE:  
Refer to Drawing  
BA00378-C15 for  
Adoptable  
Drainage Layout.

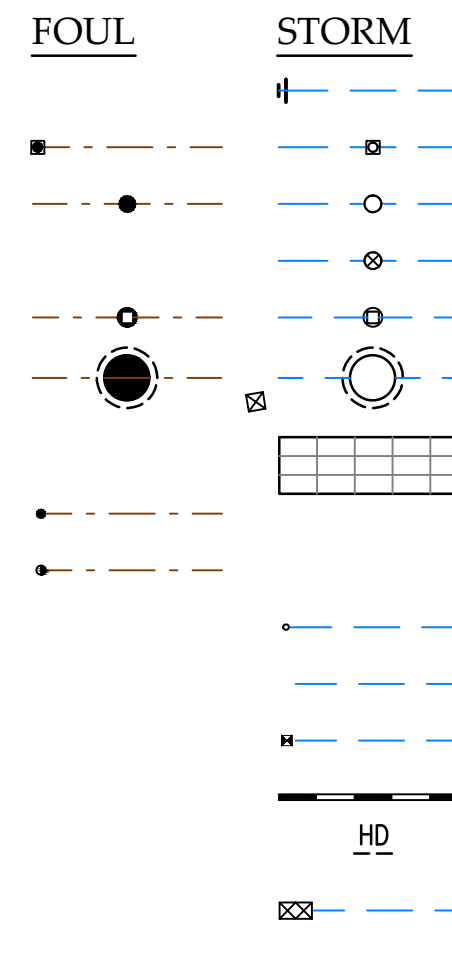
- PRIVATE DRAINAGE NOTES**
- 3.1 All private drainage works to be in accordance with Part H of the current Building Regulations and BS 8301.
- 3.2 All private drainage to be either:  
PVCu to BS EN 1401-1 (BS 4660/5481) by Osmo, Marley or similar.  
OR  
Vitrified Clayware to BS 65 and BS EN 295.  
OR  
Concrete to BS 5911 and flexibly jointed.
- The drainage design shown on this drawing has been based upon a PVCu drainage system.
- 3.3 All private drainage to be 100mm diameter unless noted otherwise. Gully laterals to be sized to suit gully outlets. Connections to public sewers to be 150mm dia unless noted otherwise.
- 3.4 Foundations adjacent to drain runs are to be constructed so that the difference between the formation level of the foundation and inlet level of any drain must not exceed the horizontal distance minus 50mm.
- 3.5 Where foul and surface water sewers cross and there is less than 100mm clearance short lengths of both runs are to be encased in concrete.
- 3.6 All RWP, SWP and foul drainage positions are to be confirmed by the Architect.
- 3.7 Where RWP's are connected direct to drain, rodding access plates are to be provided.
- 3.8 For pipe bedding and backfill details refer to drawing number BA00378-C21.
- 3.9 Inspection chambers shown thus IC, are not part of the critical drainage run. Depth to invert is between 550-750mm.
- SOAKAWAY NOTES**
- 4.1 Site investigation report by Gemo Ref: 1873 has shown the infiltration rate to range between 1.4x10<sup>-5</sup> to 5.0x10<sup>-5</sup>m/s. Soakaways have been designed using the lowest value of 1.4x10<sup>-5</sup>m/s to accord with BRE365 & Ciria Report 156 utilising this value.
- 4.2 Soakage tests (to BRE365) are to be undertaken at the location of each soakaway in order to confirm that the design infiltration rate is achieved. Any discrepancy in the infiltration rate must be reported immediately to Aventus Design Civils Department.
- 4.3 All soakaways to be sited 5m minimum from any building or wall, existing or proposed, or any other soakaway.
- 4.4 No soakaway bases to penetrate water table level.
- 4.5 No soakaway to be constructed in contaminated ground.

- EXISTING DRAINAGE NOTE:**
- 6.1 The contractor shall investigate all existing drainage within the vicinity of the site prior to demolition / construction.
- 6.2 Existing drainage to be traced and the status determined.
- 6.3 Any live drainage to be reported to Aventus Design Civils Department.
- 6.4 Redundant drainage to be grubbed out and void filled with compacted layers of type 1 material. In garden and landscaped areas, compacted layers of as dug backfill may be used.
- 6.5 Where redundant drainage is grubbed out up to the site boundary, a concrete plug shall be used to cap off existing drainage.
- 6.6 Existing drainage outfalls that are proposed to be reused shall be CCTV surveyed and results forwarded to Aventus Design, Civils Department for verification.

NOTE:  
Drainage design is modelled on the 1100year storm + 40% for climate change and been checked to ensure flooding of buildings does not occur.

Private Drainage Key

- Rodding Eye  
Shallow Inspection Chamber  
450Ø IC with 300mm sump  
450Ø IC Restricted Access  
PCC Manhole / Catchpit  
Cellular Crate Soakaway  
Soil and Vent Pipe  
Stub Stack  
Rainwater Pipe  
Private Road Gully  
Small Gully to ASHP  
ACO channel MD100  
Hex drain to level thresholds  
Permavoid Distribution box



NOTE:  
Where ICs are located in hard paved areas, recessed covers shall be used suitable for the final surfacing

NOTE:  
Refer to Drawing BA00378-C22 For Cellular Crate Soakaway sites

NOTE:  
Where shown on the layout hatched thus:  
Porous paving to have an impermeable Polypropylene membrane and be drained using Permavoid Distribution boxes. Impermeable membrane to be wrapped in a protective fleece or similar Geotextile to detail.

- Notes:**
- 1.1 Do not scale from this drawing.
- 1.2 All dimensions are in m unless otherwise specified.
- 1.3 In case of any discrepancies in drawings or details refer to engineer for clarification. Unilateral decisions by the contractor will not be accepted.
- 1.4 This drawing is to be read in conjunction with all related Architects Consultants & Sub-Contractors drawings and specifications.
- 1.5 The Contractor is to ensure that all design drawings and information are read concurrently and any discrepancies or omissions reported directly to Aventus Design.
- 1.6 This drawing is based upon the survey by Mark Beaver Surveying, reference 102103A, dated 8th December 2022 provided in digital format.
- 1.7 Level datum of survey relate to OSGB36(02).
- 1.8 The grid relates to Ordnance Survey.
- 1.9 The Contractor must check the levels of all existing drainage outfalls prior to construction of any drainage, unless otherwise agreed, to ensure the proposed design may be achieved. Any discrepancies may be reported immediately to Aventus Design.
- 1.10 Sulphates have been determined as class 1 (DS-1) for design purposes in accordance with BRE Special Digest 1 (2001). Buried Concrete to be in accordance with AC119 Site Class AC-1.
- 1.11 All external building dimensions are to be checked against the Architects Drawings prior to any construction commencing.
- 1.12 All adoptable highway works to be in accordance with the Local Authorities Specifications.
- 1.13 All adoptable drainage works to be in accordance with the Water Authorities standard guidelines for connections etc.
- 1.14 Formation to road/hardstanding to be proof rolled and any soft spots in subgrade of road/hardstanding areas are to be excavated and replaced with well compacted sub-base or free draining granular material to Department of Transport Specification for Highway Works Part 2 Table 6/1 Class 1 (General Granular Fill) and compacted in accordance with Table 6/4.

**CDM REGULATIONS 2015**  
Aventus Design have considered all reasonably practicable avoided foreseeable risks in the preparation of the design shown on this and related drawings. Significant risks which remain and associated control measures are identified in the Risk Register and should be given particular attention by the main contractor on site.  
**RISKS RELATING TO THIS DRAWING:**  
RISK NUMBERS 6 - 9 on Risk Register  
NOTE: The Risk Register records only those elements considered unusual, difficult to manage or outside the anticipated expertise of a competent contractor.

PRELIMINARY ISSUE



|                                                                                                                                                                                      |          |                                                                           |     |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------|-----|-----|
| C                                                                                                                                                                                    | 24.04.25 | F2-F5 amended.                                                            | CU  | -   |
| B                                                                                                                                                                                    | 21.02.24 | Gully to SPS area added, SAI revised, gully to ASHP added, SAI amended.   | SU  | -   |
| A                                                                                                                                                                                    | 01.12.23 | Layout updated, Substation removed, Private drainage & soakaways amended. | SU  | -   |
| REV.                                                                                                                                                                                 | DATE     | DESCRIPTION                                                               | CHK | APP |
| <b>Aventus Design Ltd</b><br>Unit 5 - Leaches Farm<br>Business Centre<br>Ricecroft Road<br>Kingsthorpe<br>Aylesbury<br>Bucks HP18 0RF<br>Tel: 01296 770066<br>www.ventusdesign.co.uk |          |                                                                           |     |     |
| <b>Civil &amp; Structural Engineers</b>                                                                                                                                              |          |                                                                           |     |     |

|             |                                                 |              |                  |
|-------------|-------------------------------------------------|--------------|------------------|
| Client:     | Cala Homes                                      |              |                  |
| Site:       | Oughtonhead Lane,<br>Hitchin,<br>Herts. SG5 2NA |              |                  |
| Title:      | Site Layout & Drainage (A0)                     |              |                  |
| Drawing no: | BA00378-C05                                     | Aventus Ref: | H1402            |
| Scale:      | 1:200 @ A0                                      | Sheet:       | 1 of 1           |
| Drawn:      | Drn: S.L.C.                                     | Checked:     | Chk: C.S.23      |
| By:         | Drn: S.L.C.                                     | Approved:    | App: [Signature] |

ORIGINAL SIZE - A0

 Foul Water Sewer  
 Foul Sewer Easement

- 2.1 All adoptable drainage works to be in accordance with the Sewerage Sector Guidance (SSG)
- 2.2 All adoptable drainage to be either:  
Vitrified Clayware to BS 65 and BS EN 295.  
OR  
Concrete to BS 5911 Part 100 Class M loading and flexibly jointed (Class 3 Sulphate resistant cement).

- 2.3 All precast concrete units are to be to BS 5911 (Class 3 Sulphate resistant cement).
- 2.4 All manhole covers and frames are to be to BS EN 124 and kite marked (refer to schedule for load class) and badged 'FW' or 'SW' as appropriate.
- 2.5 All gully grates and frames to be to BS EN 124 Class D400
- 2.6 Where foul and surface water sewers cross and there is less than 100mm clearance short lengths of both runs are to be encased in concrete.
- 2.7 All gully connections are to be made via pre-formed junctions.
- 2.8 For pipe bedding and backfill details refer to drawing number BA00378-C23.

NOTE:  
Refer to Drawing  
BA00378-C05 for  
keys and notes.

- 1.1 Do not scale from this drawing.
- 1.2 All dimensions are in m unless otherwise specified.
- 1.3 In case of any discrepancies in drawings or details refer to engineer for clarification. Unilateral decisions by the contractor will not be accepted.
- 1.4 This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- 1.5 The Contractor is to ensure that all design drawings and information are read concurrently and any discrepancies or omissions reported directly to Aventus Design.
- 1.6 This drawing is based upon the survey by Mark Beaver Surveying, reference 1021/034 dated 8th December 2022 provided in digital format.
- 1.7 Level datum of survey relate to OSGB36(02).
- 1.8 The grid relates to Ordnance Survey.
- 1.9 The Contractor must check the levels of all existing drainage outfalls prior to construction of any drainage, unless otherwise agreed, to ensure the proposed design may be achieved. Any discrepancies must be reported immediately to Aventus Design.
- 1.10 Sulphates have been determined as class 1 (DS-1) for design purposes in accordance with BRE Special Digest 1 (2001). Buried Concrete to be in accordance with AACEE Site Class AC-1.
- 1.11 All external building dimensions are to be checked against the Architects drawings prior to any construction commencing.
- 1.12 All adoptable highway works to be in accordance with the Local Authorities Specifications.
- 1.13 All adoptable drainage works to be in accordance with the Water Authorities standard guidelines for connections etc.
- 1.14 Formation to road/hardstanding to be proof rolled and any soft spots in subgrade of road/Hardstanding areas are to be excavated and replaced with well compacted sub-base or free draining granular material to Department of Transport Specification for Highway Works Part 2' Table 6/1 Class 1 (General Granular Fill) and compacted in accordance with Table 6/4.

Aventus Design has considered and where reasonably practicable avoided foreseeable risks in the preparation of the design shown on this and related drawings. Significant risks which remain and associated control measures are identified in the Risk Register and should be given particular attention by the main contractor on site.

**RISKS RELATING TO THIS DRAWING:**

**RISK NUMBERS 6 - 9 on Risk Register**

**NOTE:** The Risk Register records only those elements considered unusual, difficult to manage or outside the anticipated expertise of a competent contractor.



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**Aventus**  
DESIGN

Civil & Structural Engineers

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|  |
|--|
|  |
|--|

250mm 120mm 150mm 100mm 50mm

P

ORIGINAL SIZE - A1

## APPENDIX C

### SITE RECONNAISSANCE PHOTOGRAPHS

#### PHOTOGRAPHIC LOG

| Photo no. | Date:      |
|-----------|------------|
| 1         | 23/05/2025 |

#### Description:

- a) View facing south at proposed permanent site access road crossing from Lower Innings towards Oughton Head Lane and northern site boundary. Lower Innings is hardstanding with surface water gullies, currently clean and tidy.
- b) View facing north at proposed permanent site access road location towards Lower Innings..



|                                                                                                                                          |                                   |                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><b>2</b>                                                                                                             | <b>Date:</b><br><b>23/05/2025</b> |  |
| <b>Description:</b><br>View facing east along Oughton Head Lane (bridleway), which forms northern site boundary. Site is to right/south. |                                   |                                                                                    |

|                                                                                                   |                                   |                                                                                      |
|---------------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><b>3</b>                                                                      | <b>Date:</b><br><b>23/05/2025</b> |  |
| <b>Description:</b><br>View facing south from<br>bridleway onto site. Site is<br>fully vegetated. |                                   |                                                                                      |

|                                                                                                                               |                                   |                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><b>4</b>                                                                                                  | <b>Date:</b><br><b>23/05/2025</b> |  |
| <b>Description:</b><br>View facing east towards eastern boundary.<br>Residential properties immediately beyond site boundary. |                                   |                                                                                    |

|                                                                                                                            |                                   |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><b>5</b>                                                                                               | <b>Date:</b><br><b>23/05/2025</b> |  |
| <b>Description:</b><br>View facing south at southeastern corner of site towards offsite new build residential development. |                                   |                                                                                     |

|                                                                                                                                                                                                                                                           |                                   |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><b>6</b>                                                                                                                                                                                                                              | <b>Date:</b><br><b>23/05/2025</b> |  |
| <b>Description:</b><br><br>a) View facing west towards proposed temporary vehicle access route onto site, from cricket club.<br><br>b) View facing southwest at proposed vehicle access point (near south end of western boundary), towards cricket club. |                                   |                                                                                     |

|                                                                                             |                                |                                                                                      |
|---------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------|
| <b>Photo No.</b><br><br>7                                                                   | <b>Date:</b><br><br>23/05/2025 |  |
| <b>Description:</b><br>View facing northeast from centre of site towards northern boundary. |                                |                                                                                      |

## APPENDIX D

### SUPPORTING INFORMATION – INSTALLATION EXAMPLES

Retention of a wide vegetated buffer and step down in site levels due to reduced dig



Placement of stone to the front of plots to create clean forklift access



Installation of silt fencing to control run-off from an unsurfaced area



## APPENDIX E

### SUPPORTING INFORMATION – MANUFACTURER’S PRODUCT SHEETS

| Product:                               | Application                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Manufacturer and product                                                                                                                                                                                                                                         |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Gully Protection</b>                | Prevent silt and construction debris entering the drainage system and blocking gully pots. Proprietary products often yield superior results to straw and terram and require less maintenance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Forest Group – Gully Guard</li> <li>• Hy-Tex – Ultra drain guards</li> </ul>                                                                                                                                            |
| <b>Silt Fencing</b>                    | Attenuate water on site to promote settlement of silt within overland run-off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Frog Environmental – Silt Fence</li> <li>• Hy-Tex – Terrastop™ Silt Fence</li> <li>• Silbuster – Silt Fence</li> </ul>                                                                                                  |
| <b>Silt Matting</b>                    | Capture settled silt as it naturally falls from suspension within watercourses, swales, attenuation basins to prevent its resuspension.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Frog Environmental – Silt Mat</li> <li>• Hy-Tex – SediMat™</li> </ul>                                                                                                                                                   |
| <b>Flocculant Treated Silt Matting</b> | Capture settled silt within watercourses, swales, attenuation basins to prevent its resuspension. The addition of flocculant treatment encourages silt to settle out of suspension more readily. The Environment Agency must be consulted prior to utilisation of flocculants, and an environmental permit gained where required.                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• Frog Environmental – Floc Mat</li> </ul>                                                                                                                                                                                |
| <b>Silt Wattle</b>                     | Used as check dams within watercourses / swales providing filtration and also slowing the flow of water to promote settlement of silt. Typically used in conjunction with silt matting (or flocculant coated silt matting) to capture sediment that was caused to settle. Can also be used to separate silty and clear water (i.e. within attenuation basins, or watercourses), on slopes to reduce erosion from overland run-off or to divert silty water to collection areas (i.e. on roads to divert silty run-off away from gullies).                                                                                                                        | <ul style="list-style-type: none"> <li>• Frog Environmental – Silt Wattle</li> <li>• Hy-Tex – Ultra Erosion Guard (suitable for use as a check dam to control erosion only, due to its different construction to the Frog Environmental Silt Wattle).</li> </ul> |
| <b>Filter socks</b>                    | Fitted to hose end during dewatering of excavations to collect sediment. Capable of dealing with smaller volumes and lower flow rates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Hy-Tex – Pro-Tex Pipe Socks</li> <li>• Murlac – Silt Sock</li> <li>• Dirtbags UK – Utility Bag</li> </ul>                                                                                                               |
| <b>Filter bags</b>                     | Fitted to hose end during dewatering of excavations to collect sediment. Capable of dealing with larger volumes and larger flow rate, typically up to a 6" pump. Note – * denotes those bags which are sized to be used within a roll on roll off skip for ease of disposal of capture silt.                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Hy-Tex – Ultra Dewatering Bag</li> <li>• Silbuster – Siltstoppa Dewatering Bag*</li> <li>• Murlac – Silt Bag</li> <li>• Dirtbags UK – Dirtbag/ Titan Dirtbag*</li> </ul>                                                |
| <b>Settlement Tanks</b>                | Settlement and capture of suspended solids during dewatering / over pumping works of a larger volume than suitable for a dewatering bag, or during extended periods of dewatering / over pumping.<br><br>The unit required is dependent on the grain size of suspended particles, how quickly these settle from suspension, and the required flow rate. Liaison with the supplier is best undertaken to ensure a suitable product is selected. Can be used in conjunction with flocculants and coagulants to promote settlement, however the Environment Agency must be consulted prior to their utilisation, and an environmental permit gained where required. | <ul style="list-style-type: none"> <li>• Silbuster – wide range of settlement units available</li> <li>• Andrew Sykes Group – settlement tanks / Silt Away.</li> <li>• Dirtbags UK – Dirtbox</li> </ul>                                                          |

## GULLY PROTECTION

### The Gully Guard

#### Installation guide



1. Lever open gully grid. Gully Guard is designed to fit all size gullies.



2. Hold handles at top of the Gully Guard, work beads to top and insert base into water filled gully pot.



3. Lower the Gully Guard into the pot. The beads will fall freely into the void within the pot.



4. Tuck the holding handles to the side of the Gully Guard.



5. Close gully grid.

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Newent, Gloucestershire GL18 1LG

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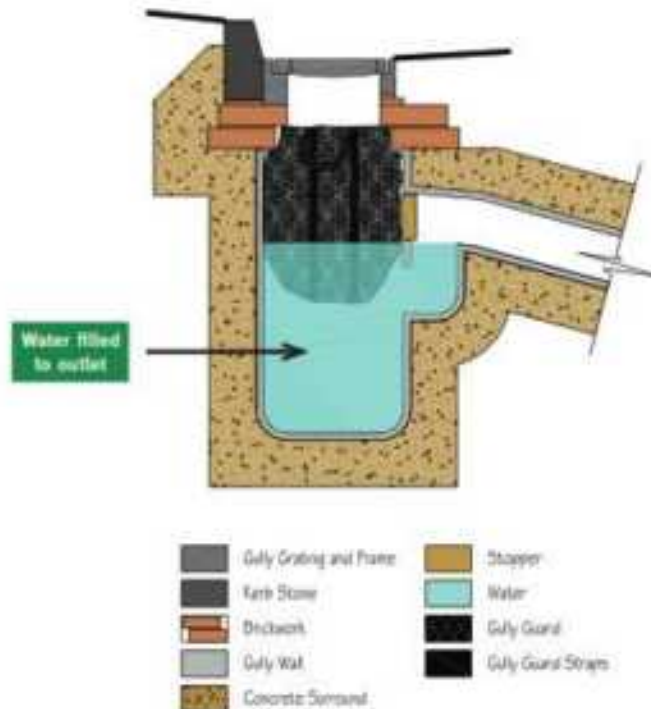
[www.forestgroupuk.co.uk](http://www.forestgroupuk.co.uk)

Patent no. 2472690

**fg The Forest Group**  
High performance, versatile solutions

# The Gully Guard

## Installation diagram



## Maintenance

The Company (Forest Drainage Products) would recommend that an inspection procedure be put in place for the product by the organisation on a 3-4 months basis depending on site conditions.

Maintenance would simply involve the removal of the Product and power hose off in a bund to contain and manage silt and any contaminants prior to reinsertion back into the gully pot.

Without prior knowledge of the type and concentration of the contaminants that each Gully Guard has been subjected to, the Company cannot advise on appropriate disposal. The Company advises that an environmental risk assessment is conducted on an individual case-by-case basis to fully evaluate the nature of contaminants. In order to determine the appropriate method of disposal the Company would recommend that you follow your organisation's environmental waste disposal policy.

Forest Drainage Products Limited (the "Company")

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High performance, versatile solutions

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## Hy-Tex Ultra Drain Guard for Drainage Gully Sediment Control



Ultra Drain Guards are designed to remove oil and sediment pollution from surface water running into gully drains from surrounding construction sites, farms, industrial estates, or other areas prone to storm water pollution or cleaning operations.

Ultra Drain Guards are made from a high permeability non-woven polypropylene geotextile that trap solids and oils but allow water to drain through and also incorporate bypass ports to further maintain flow into the drain.

They are designed to be easily placed directly into the drain gully pot to filter out materials as they flow into the drain without compromising drainage, and the Oil and Sediment model absorbs up to 3.29 litres of hydrocarbons as well as up to 18 kg of sediment, sand or debris.

### Installation:

1. Remove catch basin grating
2. Clean dirt and debris from grating ledge
3. Insert Drain Guard
4. Reinstall grate. To insure maximum effectiveness, Drain Guard skirt should be secured (pinched) between grating and ledge
5. Cut the excess fabric off with a blade or knife if desired.

### Maintenance and disposal:

6. The Ultra-Drain Guard filters are designed to be used for 3 to 6 months under normal conditions.
7. Where heavy contamination is present the unit will have a reduced life expectancy. When the unit has collected about 6 inches of sediment it is recommended that it be replaced. The unit should also be replaced if free oil can be seen floating and is not being absorbed. The Ultra-Drain Guards should be inspected on a regular basis.
8. Dispose of unit in accordance with applicable environmental laws and regulations. The user is solely responsible for compliance with maintenance and disposal laws and regulations. The manufacturer or seller assumes no responsibility for proper or improper maintenance or disposal.



| Model          | Code | Oil Capture         | Sediment Capture  | Collection Area              | Flow Rate               | Size                                       |
|----------------|------|---------------------|-------------------|------------------------------|-------------------------|--------------------------------------------|
| Oil & Sediment | 9217 | 3.29 l<br>(.87 gal) | 18 kg<br>(40 lbs) | 25.4 x 45.7cm<br>(10" x 18") | 1893 l/min<br>(500 gpm) | 121.9 x 91.4 x 45.7cm<br>(48" x 36" x 18") |



All of this was removed from 50 Ultra Drain Guards after just two weeks in storm drains

| Property                 | ASTM Test | Value                                                    |
|--------------------------|-----------|----------------------------------------------------------|
| Material                 |           | Non-woven polypropylene geotextile                       |
| Grab Tensile Strength    | D 4632    | 979 N (220 lb)                                           |
| Elongation               | D 4632    | 50%                                                      |
| Trapezoid Tear           | D 4533    | 423 N (95 lb)                                            |
| Puncture Resistance      | D 4833    | 600 N (135 lbs)                                          |
| Mullen Burst             | D 3786    | 2,896 kpa (420 psi)                                      |
| Permittivity             | D 4491    | 1.4 sec <sup>-1</sup>                                    |
| Pore Size                | D 4751    | 180 micron (50 US sieve no)                              |
| UV Stability             | D 4355    | 70% strength retained after 500hr                        |
| Weight                   | D 5261    | 272 g/m <sup>2</sup> (8 oz/yd <sup>2</sup> )             |
| Flow Rate - Fabric       | D 4491    | 3,660 l/min/m <sup>2</sup> (90 gal/min/ft <sup>2</sup> ) |
| Flow Rate - Bypass Ports | D 4491    | 2,914 l/min                                              |

All data stated and the recommendations made herein are offered free of charge and are accurate to the best of our knowledge. Hy-Tex (UK) Ltd assumes no liability for the accuracy or completeness of this information or for the ultimate use of the purchaser. Hy-Tex disclaims any and all express, implied, or statutory warranties, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, material, or information furnished herein. Final determination of the use of any information or material, or how it is useful, and whether the use infringes any patents is the sole responsibility of the user.

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**Hy-Tex (UK) Limited**  
 Committed to Quality, Value & Service

## SILT FENCING



**frog  
environmental**

product information sheet

### **Silt Fence**

temporary silt control barrier



frog environmental supply Silt Fence and quarter cut 1.2 metre posts, ideal for providing support

Silt Fence is inexpensive to buy and install, but it must be correctly positioned and maintained for it to be an effective pollution control measure.

Each line of Silt Fence should be inspected on a regular basis, especially after rainfall.

If stakes are broken or gaps appear between the fence and the ground, then the fence should be re-trenched. Accumulated silt must be removed regularly from Silt Fence, typically when it reaches a third of the way up the fence.

Multiple smaller runs of silt fence are usually more effective at controlling pollution than longer lines.

#### **Applications**

- Silt Fence is deployed on construction sites to help prevent silt pollution in water bodies or from impacting public highways.
- Silt Fence provides a 'ponding' function; it allows silt laden water to collect behind it and for silt to drop out of suspension while the water slowly drains away or evaporates.
- Silt Fence is usually deployed in conjunction with other silt pollution control measures, especially on sites with clayey soils.

frog environmental Silt Fence is made from high specification geo-textile material and has medium porosity, making it suitable for use on most construction sites.

**Poorly installed Silt Fence can cause erosion underneath or around the edges of fencing. This can lead to an increased silt pollution risk.**

## Technical information

## Silt Fence

**Dimensions:** 100 metres x 0.9 metres (single roll)

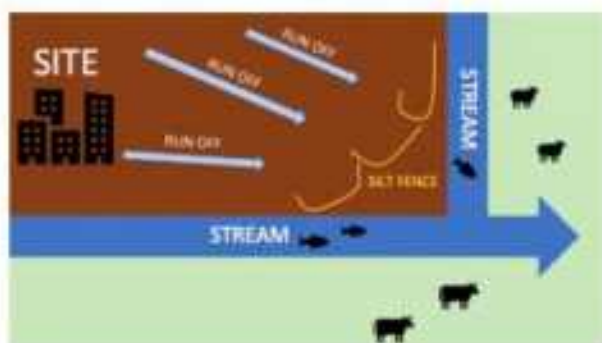
**Dry Weight p/m:** 110 g/m<sup>2</sup> (9.9 kg single roll)

**Permeability:** 7 (l/m<sup>2</sup> /sec)

**Material used:** tear resistant polypropylene geotextile, PFSC timber stakes (cable ties or staples/nails to fix)

**Function:** creates a temporary fence to provide a pooling function that allows silt to drop from suspension

**Disposal:** all materials fully reusable or recyclable



*Shorter 'J' shaped runs of silt fence typically provide more effective pollution control than longer runs.*



*Silt Fence can be used as a temporary measure to prevent muddy water escaping from construction sites.*

### 10 TIPS for successful Silt Fence deployments:

- Fence posts should be spaced a maximum of 1.5m apart
- Silt Fence should be trenched a minimum of 20cm into the ground and compacted
- Shorter 'J' shaped installations of Silt Fence act like mini-retention areas and are typically more effective than longer runs (as shown in the diagram above)
- Longer runs of silt fence will concentrate water in the lowest point, where the fence can become weakened and water can undercut or overflow the fence avoid these where possible
- Water flowing around the edges of silt fence can cause erosion and add to the pollution loading from site
- The lower part of the end of each run of silt fence should ideally be above the top of the middle section of the run
- Removal of accumulated silt and regular inspection are key maintenance activity for silt fence. A named individual should be responsible for this action on site
- Silt fences are not designed to handle continuous high volume flows and will not be an effective stand-alone control in these circumstances
- Factors such as soil type, slope angle and slope length are key factors in determining how much silt fence is needed on site
- If ground conditions are clayey Silt Fence alone is unlikely to be an effective pollution control

for technical support and sales of  
Silt Fence contact frog environmental

0345 057 4040

info@frogenvironmental.co.uk

www.frogenvironmental.co.uk

@frogenv

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Midlands: The Byre, Bokenhall Park, Barton Under  
Needwood, Staffordshire, DE13 8FU



## SILT MATTING



frog  
environmental

product information sheet

**SiltMat**  
silt capture mat



SiltMat is a fully biodegradable mat that captures and prevents sediment resuspension.

The mats can be placed in natural or artificial channels, ditches or directly on land to trap suspended sediments.

SiltMat can be orientated sideways or lengthways and fits into all channel types.

SiltMats are used to manage sediment release to watercourses from construction sites and for capturing silts suspended by in channel or works on river banks.

### Applications

- Silt control from construction sites
- Silt control from river or bank works
- Deployed in rivers, streams and ditches
- Deployed in Silt Capture Channels
- Used in forestry and agricultural applications

**SiltMat is proven in the field to reduce downstream levels of suspended solids**

## Technical information

## SiltMat

**Dimensions:** 2 x 1 x 0.12 metres

**Dry Weight:** 12kg per mat

**Material used:** coir (80%) jute (20%)

**Function:** Captures and prevents resuspension of silt

**Performance:** Single mat captures up to 40kg of silt

**Disposal:** Fully biodegradable, with correct permissions used mats can be disposed ofland.



### four step guide to using SiltMats

Use our reference table (below) to judge optimal placement. As a rule of thumb, SiltMat is best placed in areas where stream energy is reduced and natural deposition takes place.

SiltMat is unfolded and orientated to cover the width of the channel. The edges of silt mat can be overlaid without gaps. Mats are staked in place or weighted with local material.

SiltMat will trap large amounts of sediment. Stakes or weights are removed and the mats rolled up ready for disposal.

With correct permission SiltMat can be seeded and left on site, creating an environmental enhancement and avoiding disposal costs.

Reference table showing the distance that different particle sizes travel at differing water velocities

| Particle Size | Water Speed (m/s) |       |       |       |        |
|---------------|-------------------|-------|-------|-------|--------|
|               | 0.2               | 0.4   | 0.6   | 0.8   | 1      |
| Fine Gravel   | 20 cm             | 40 cm | 60 cm | 80 cm | 1 m    |
| Sand          | 70 cm             | 1.4 m | 2.1 m | 2.8 m | 3.5 m  |
| Fine Sand     | 8 m               | 17 m  | 25 m  | 33 m  | 40 m   |
| Silt          | 228 m             | 456 m | 683 m | 911 m | 1139 m |

for technical support and sales of  
Silt Wattle contact frog environmental

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Midlands: The Byre, Bickenhill Park, Barton Under

Needwood, Staffordshire, DE13 6PJ



## FLOCCULANT TREATED SILT MATTING



frog  
environmental

product information sheet

**Floc Mat™**

water treatment mat



### **Floc Mat™ is a versatile silt control device**

A mat created to treat and capture fine silts and suspended particles in construction site run off.

The main function of the mat is to flocculate very fine particles, making them easier to separate from water.

Floc Mats can be laid flat out in dispersion fields, used with Silt Wattles or silt fence and deployed in the frog environmental Silt Capture Channel as part of a versatile water treatment process to remove silt from construction site run off.

### **Applications**

- In a Silt Capture Channel
- With Silt Wattles and SiltMats
- In site ditches and low flow channels
- In combination with silt fence
- On natural dispersion fields
- In combination with dewatering bags and silt socks

- **Floc Mat™ is a fully biodegradable water treatment and silt capture mat that treats muddy water and helps prevent silt pollution**
- **They are a cost effective way of treating water in ditches and channels, without the need for pumps – saving energy and CO<sub>2</sub>**

## Technical information

## FlocMat™

**Dimensions:** 2x1 x 0.10m

**Variants:** FM1 (30g/m<sup>2</sup>), FM2 (100g/m<sup>2</sup>)  
FM0(untreated)

**Active ingredient:** Water Lynx™

**Dry Weight:** 12 kg per mat

**Material used:** coir fibres, coir netting, coir rope, anionic flocculant, water

**Function:** Water treatment – aids solid water separation. Can be used to segregate low flow channel to in bankside works.

**Performance:** Single mat captures up to 50kg of silt in live test

**Disposal:** Fully biodegradable, suitable for re-use on site (with correct permit).

Waste classification and disposal legislation must be followed at all times. Always liaise with the regulator before deploying a product containing flocculant. If in doubt contact frog environmental on 0345 0574040 for further information and advice.



*Close up FlocMat showing accretion of silt*



*Deployed in Silt Capture Channels with Silt Wattles*

100% sustainably sourced natural fibres are used to create Floc Mat, this ensures the mats are biodegradable and suitable for use as backfill material once used, reducing waste disposal costs. Floc Mat is available in treated and untreated forms. The fibres of the treated version of Floc Mat are coated with Water Lynx™, a non-hazardous, non-toxic, synthetic anionic polymer which contains no coagulants, cations or metals such as Al and Fe that are ecotoxic.

When deployed in a Silt Capture Channel the Floc Mat provides a safe, low carbon and easy solution to support the removal of suspended solids and associated pollutants from construction site run off.



*Deployed to treat muddy excavation water*

for technical support and sales of  
Silt Wattle contact frog environmental

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Needwood, Staffordshire, DE13 6PJ



## SILT WATTLE



frog  
environmental

product information sheet

**Silt Wattle**  
silt control sausage



**Silt Wattles are a versatile silt control device.**

They are deployed on building sites to control movement of suspended silt and in ditches, channels and streams to slow the flow and naturally capture silt.

Silt Wattles are often deployed with frog environmental SiltMats and FlocMats as part of a silt pollution prevention strategy.

### Applications

- Silt Wattles can be used to reduce silt release into watercourses from construction sites and deployed directly in channel to reduce movement of suspended silts.
- The tough exterior netting means they can be left for months on site with out degradation, whilst the biodegradable treated wood fibre continues to slow the flow and trap silt particles.
- Silt Wattles mould to the shape of the river bed or ground and can be joined end on end or pyramided to help clean dirty water.
- Wattles are highly versatile and can be weighted or staked in position depending on bed/ground conditions and flows.
- Silt Wattles can be joined end of end to create temp low flow channel and protect rivers from pollution arising from bank works.

**Silt Wattles are a versatile product suitable for use in a wide range of silt control applications on construction sites and in river works**

## FILTER SOCKS

[products](#)
[specialist](#)
[technology](#)
[geotextiles](#)
[agribusiness](#)
[environment](#)

### Hy-Tex Pro-Tex Dewatering Socks for Pumped Sediment Control

- ☒ Ideal for small dewatering jobs.
- ☒ Traps sediment and oil.



#### USE THIS



Pro-Tex Dewatering Socks control pollution caused when pumping dirty water from excavations, and offers an economical alternative to traditional dewatering bags or filtration products.

These easy to use and popular sediment filters bags are ideal for projects with small budgets and minor pollution problems to control of sediment and oil sheen from pumped water.

Designed to attach directly to the discharge pipe, they quickly filter water to help prevent unwanted sediment, silt, debris or pollutants leaving the site in run-off.

The socks have been designed to control pollution caused by pumping dirty water from excavations, trenches, lift shafts, bunds and the like, by filtering out sediment from contaminated water down to 90 micron, while the fabric the socks are constructed from has an inherent ability to absorb hydrocarbons too.

#### Advantages

The main advantage of using an Oil & Sediment filter is that it removes hydrocarbons and sediment from pumping activities.

It provides an alternative solution that delivers a considerable cost saving and is user friendly. Furthermore it reduces site time over existing methods such as hiring a vacuum tanker. If you wish to carry out street works with a minimal disruption to the public, this is the ideal solution.

Other benefits include:

- Simple set-up with built in tie
- Hydrocarbon detection strip to identify oil pollution
- Lightweight and compact
- Very easy to empty



#### OIL DETECTION INDICATOR

A light blue paper oil detection strip is attached to each bag.



If strip turns **DARK BLUE**  
**OIL PRESENT**  
Stop pumping

Contact your Environmental Manager

Product: Pro-Tex Dewatering Sediment Bag, Premium Pipe Sock.

Application: Oil and Sediment Filter

Effective Pore Size: 90 micron

Sediment Capacity: Approx 18kg

Permeability: 72 litres/m<sup>2</sup>/sec

Tensile Strength: 19 kN/m

CBR Puncture Strength: 2.900N

Material: UV stabilised, continuous filament, non-woven, needle punched polypropylene fabric.

Bag Size: Approx 1.00 x 0.30m lay flat

Additional Features: Tying cord and hydrocarbon detection strip

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**Hy-Tex (UK) Limited**  
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## FILTER BAGS



### Hy-Tex Ultra Dewatering Bags for Pumped Sediment Control



Hy-Tex Ultra Dewatering Bags provide an effective way to collect harmful sediments from dirty water pumped out of excavation works (such as foundations, pipe line construction, water, sewer and utility trenches, waterways and lakes) that would otherwise pollute the surrounding environment.

It is a legal requirement to prevent silty water from leaving site untreated, and a finable offence if you do not take appropriate pollution control measures. The Environment Agency Pollution Prevention Guidelines PPG6 (See side panel), in summary, require that the majority of suspended solids (gravel, sand, and silt) must be removed from site water before it is discharged into a drain, sewer or watercourse.

Traditionally settlement methods (such as straw bale structures or settlement ponds/tanks) are often ineffective, rely on slow water movement, long settlement times, expensive and time consuming tank maintenance and large works areas.

Ultra Dewatering Bags are an efficient, practical, quick, simple and cost effective alternative solution to manage this ongoing environmental problem of removing suspended solid pollutants from pumped water on construction sites.

Sediment-laden water is simply pumped into the high quality filter bags, which trap the solids inside and allow filtered water to flow freely out through the geotextile fabric to disperse into the surrounding ground or another collection point.

Ultra Dewatering Bags can also be used for gravity feed applications such as outfall pipes from site drainage or lagoons.

The silt filter bags provide a passive non-mechanical solution, without the use of excessive or specialist machinery (other than possible lifting equipment when full), and do not require a large work area.

The sediment bags are also light, compact and easy to store, with minimal cleaning up required - when full just dispose of the bag and replace with another bag.

The Ultra Dewatering Bags detain both oil and sediment, offering a combination of benefits not available in alternative products. They can also be used to contain contaminated sediment whilst treatments are applied (such as flocculants or absorbents).

The standard 1.80 x 1.80m Ultra Dewatering bags has the capacity to trap near 1 tonne of silt and cope with flow rates up to 2,730 l/min, while the larger 3.05 x 4.55m bags can trap over 4 tonnes of silt and cope with flow rates up to 6,818 l/min.



**The Environment Agency**  
**'Working at construction and demolition sites**  
**PPG6 Pollution Prevention Guidelines**

"Your management of silt and silty water is a major cause of serious pollution incidents from construction sites. Silt for these purposes is a fine inert sediment derived from soil and rocks. Silt pollution can: damage and fill aquatic life by smothering and suffocating; reduce water quality; cause flooding by blocking culverts and channels..."

"You must not discharge any silty water to a drain or watercourse without prior treatment to settle or remove suspended solids. If you've identified that you will be generating silty water, identify suitable means to treat the water before discharge; examples include: lagoons, settlement tanks, oil traps, grassy areas that slow water and allow solids to settle..."

"You must have prior permission from the local sewerage provider if you intend to discharge settled water to the foul sewer because this will be regarded as a trade effluent."

"You must have prior permission from the Environment Agency if you need to discharge anything to a watercourse. In Scotland if you comply with certain conditions, a discharge will be covered by a General Discharge Rule and you will not need to contact SEPA."

| Property              | ASTM Test | Value                                                    |
|-----------------------|-----------|----------------------------------------------------------|
| Material              |           | Non-woven polypropylene geotextile                       |
| Grab Tensile Strength | D 4632    | 912 N (205 lb)                                           |
| Elongation            | D 4632    | 50%                                                      |
| Trapezoid Tear        | D 4533    | 378 N (85 lb)                                            |
| Puncture Resistance   | D 4833    | 578 N (130 lbs)                                          |
| Mullen Burst          | D 3786    | 2,758 kpa (400 psi)                                      |
| Permittivity          | D 4491    | 1.4 sec <sup>-1</sup>                                    |
| Pore Size             | D 4751    | 180 micron (80 US sieve no)                              |
| UV Stability          | D 4355    | 70% strength retained after 500hr                        |
| Weight                | D 5261    | 272 g/m <sup>2</sup> (8 oz/yd <sup>2</sup> )             |
| Flow Rate             | D 4491    | 3,660 l/min/m <sup>2</sup> (90 gal/min/ft <sup>2</sup> ) |

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## Hy-Tex Ultra Dewatering Bags for Pumped Sediment Control



### Usage Guidelines

Ideally position the Ultra Dewatering Bag on a slope, so incoming water flows downhill through the bag, and, as a precaution, install Terrastop Premium silt fence down slope of the bags to control any potential run-off pollution.

The bag is fitted with a collar which fits around delivery hoses or connectors. Strap the neck of the Ultra Dewatering Bag tightly to the discharge hose using the attached tying cord.

To increase filtration efficiency place the bag on an aggregate, or a layer of Hy-Pave tiles, to maximize water flow through the under surface of the bag.

Plan ahead for removal. If the filled bags are to be lifted for disposal then place suitable lifting straps under bag prior to pumping, alternatively you can roll the bags into a digger bucket.

Regularly check the bags. The Ultra Dewatering Bag is full when it no longer can efficiently filter sediment or pass water at a reasonable rate.

Flow rates will vary depending on the size of the Ultra Dewatering Bag, the type and amount of sediment discharged into the bag, the type of ground, rock or other substance under the bag and the degree of the slope on which the bag lies.

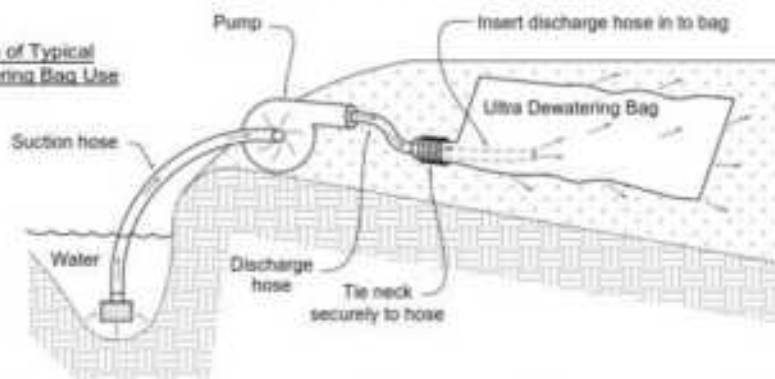
Under most circumstances Ultra Dewatering Bags will accommodate flow rates of up to 2.730 l/min for the 1.80 x 1.80m bags and 6.816 l/min for the 3.05 x 4.55m bags.

Use of excessive flow rates, or overfilling Ultra Dewatering Bags with sediment, may cause ruptures of the bags or failure of the hose attachment straps.

Dispose of the Ultra Dewatering Bag as directed by the site engineer. Normally allow the bags to dry in place then either cut open, spread and landscape on site or remove and dispose of the filled bags (Heavy lifting machinery may be required).



Illustration of Typical Ultra Dewatering Bag Use



| Size                          | Code | Surface Area                                   | Max Flow Rate                  | Max Pump Size     | Sediment Capacity                                                   | Oil Capacity       |
|-------------------------------|------|------------------------------------------------|--------------------------------|-------------------|---------------------------------------------------------------------|--------------------|
| 1.80 x 1.80 m<br>(6 x 6 ft)   | 9724 | 6.68 m <sup>2</sup><br>(72 ft <sup>2</sup> )   | 2.730 l/min<br>(500 gal/min)   | 10 cm<br>(4 inch) | 0.51 m <sup>3</sup> / 980 kg<br>(16 ft <sup>3</sup> / 2,160 lbs)    | 14 l<br>(3.7 gal)  |
| 3.05 x 4.55 m<br>(10 x 15 ft) | 9725 | 27.87 m <sup>2</sup><br>(300 ft <sup>2</sup> ) | 6.816 l/min<br>(1,500 gal/min) | 15 cm<br>(6 inch) | 4.20 m <sup>3</sup> / 4,082 kg<br>(150 ft <sup>3</sup> / 9,000 lbs) | 57 l<br>(15.1 gal) |

### Notes:

Flow/Dewatering rates will vary according to soil type (Sand typically dewater at the fastest rate, while clay dewater at the slowest). Clay may also blind over the fabric in some instances, significantly reducing flow.

Max flow rate is a cautious figure based on a significantly de-rating of the clean fabric flow rate of approx 3,660 l/min/m<sup>2</sup> (90 gal/min/ft<sup>2</sup>) to allow for pump pressure build up due to silt accumulation.

Sediment capacity is calculated using wet sand weight of approx 1,920kg/m<sup>3</sup> (120 lbs/ft<sup>3</sup>) and a bag fill height of approx 150mm.

Oil capacity is estimated at low flow conditions with approx 2.00 l/m<sup>2</sup> (0.5 gal/ft<sup>2</sup>) absorption capacity.

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## Siltbuster Siltstoppa Bags

Siltstoppa Bags provide a low cost solution for the dewatering of sludges and slurry.

Pre-conditioned (floculated) slurry is pumped into the Siltstoppa Bag and allowed to dewater. The water released from the sludge bleeds through the geotextile fabric whilst the trapped solids remain in the bag.

Siltstoppa De-watering Bags are available individually, for sit on a suitable slab or drainage area or can be supplied as a complete treatment solution including as required sludge conditioning unit, and roll-on/roll-off (RORO) container.

When the bag is full and the trapped solids have dewatered, the Siltstoppa bag can either be split open on-site and the dewatered solids removed by means of an excavator (or similar equipment), or the full RORO container can be transported for off-site disposal.

### Siltbuster Siltstoppa Bags Specs

| Separation Method | Separate Streams   |
|-------------------|--------------------|
| Height            | Open-bottom        |
| Length            | 3.0m               |
| Width             | 1.7m               |
| Dry Weight        | See Specsheet      |
| Material          | Coarse and Durable |
| Material Colour   | Black              |
| Bag Capacity      | 100%               |
| Operating Range   | Waste and Sludge   |

## Siltbuster Siltstoppa Skip

Siltstoppa De-Watering Bags have been conveniently sized to fit an industry standard roll on roll off (RORO) Siltstoppa skip. The RORO dewatering skip provides a secure and environmentally acceptable means of bunding a Siltbuster Siltstoppa Dewatering Bag.

When the skip is full with either single or multiple bags (stacked up on top of each other), the skip and its contents can be transported to a Waste Management Facility for disposal of the dewatered sludge/slurry contained within the Siltstoppa Bags.

The Siltstoppa Skip comes complete with an integral pump, allowing easy removal of the water which escapes from the dewatering sludge/slurry.

### Siltbuster Siltstoppa Skip Specs

| Separation Method  | Separate Streams   |
|--------------------|--------------------|
| Height             | 1.7m               |
| Length             | 3.0m               |
| Width              | 2.0m               |
| Dry Weight         | 2.0tonne           |
| Material           | Robust and Durable |
| Operating Capacity | 1 Bag              |
| Lifting Method     | RORO (Roll-off)    |
| Operating Range    | Waste and Sludge   |



## SETTLEMENT TANKS



### Gravity Settlement ▶ Siltbuster Settlement Units & Water Clarifiers

Siltbuster is the UK's leading provider of mobile settlement units and Landfill Clarifiers. Each unit is the ultimate single is specifically designed to remove suspended solids and settleable matter from effluent and surface water run-off and groundwater.

Effective gravity based solid/liquid separation requires the largest possible settlement area and optimum hydraulic flow. Siltbuster Clarifiers utilise lamella plate technology to maintain ideal settlement conditions within each unit, thereby, ensuring maximum particle settlement and maximum out flowpoint.

Small footprint units are ideal for sites in the urban environment, including emergency situations.

Flow distribution is optimised to ensure the system is fully utilised at the design settlement rate with:

- Flow distribution is optimised to ensure the system is fully utilised at the design settlement rate with:
- Flow distribution is optimised to ensure the system is fully utilised at the design settlement rate with:
- Flow distribution is optimised to ensure the system is fully utilised at the design settlement rate with:

To achieve maximum flow capacity and flexibility, all units are fully modular and can be configured in parallel, as required.

Siltbuster mobile clarifiers are robust, easy to install, compact and lightweight, making them simple to transport, install and operate. They are ideal for sites with limited access, restricted space and temporary projects. Higher settlement units can be fitted on demand with an automatic sledge system without further making their operation virtually maintenance free.

#### Typical applications

**Construction**

- ▶ Pumping & dewatering
- ▶ Effluent water treatment
- ▶ Site run-off treatment
- ▶ Drilling, piling & other dewatering
- ▶ In-situ & clean water works

**Other applications**

- ▶ De-silting & dredging
- ▶ Ponds, pipelines & other water projects
- ▶ Plant, vehicle & wheel-washing
- ▶ Site water management

## Silt Management

[www.siltbuster.com](http://www.siltbuster.com)

**The Siltbuster Mobile Range**

Siltbuster offers a range of various sized units to provide treatment with flexibility and the opportunity to hire or purchase a tailored unit for the ideal solution.

**The Mobile Range Size Comparison**



| Model                                                                   | HD10                                  | HD15                                  | HD20                                  | HD25                                  | HD30                              |
|-------------------------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------|
| Flow treatment and treatment with The Siltbuster Industry's flexibility | Flow treatment and treatment with     | Flow treatment and treatment with     | Flow treatment and treatment with     | Flow treatment and treatment with     | Flow treatment and treatment with |
| Length: 1.0m                                                            | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                      |
| Length: 1.0m                                                            | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                          | Length: 1.0m                      |
| Width: 1.0m                                                             | Width: 1.0m                           | Width: 1.0m                           | Width: 1.0m                           | Width: 1.0m                           | Width: 1.0m                       |
| Effective settlement area: 10m²                                         | Effective settlement area: 15m²       | Effective settlement area: 20m²       | Effective settlement area: 25m²       | Effective settlement area: 30m²       |                                   |
| Dry Weight: 1,000kg                                                     | Dry Weight: 1,500kg                   | Dry Weight: 2,000kg                   | Dry Weight: 2,500kg                   | Dry Weight: 3,000kg                   |                                   |
| Max: 4" Inlet                                                           | Max: 4" Inlet                         | Max: 4" Inlet                         | Max: 4" Inlet                         | Max: 4" Inlet                         |                                   |
| Outlet: 2" Inlet                                                        | Outlet: 2" Inlet                      | Outlet: 2" Inlet                      | Outlet: 2" Inlet                      | Outlet: 2" Inlet                      |                                   |
| Typical Operating Capacity: 1-10m³/hr                                   | Typical Operating Capacity: 1-15m³/hr | Typical Operating Capacity: 1-20m³/hr | Typical Operating Capacity: 1-25m³/hr | Typical Operating Capacity: 1-30m³/hr |                                   |

**The Benefits**

- Rapidly transportable, load and simple to setup, easy to operate
- Small footprint units with large settlement area
- Unique design enables rapid particle settlement and water clarification
- Up to 10 times more efficient than conventional settlement tanks and lagoons of the same plant area
- Choice of unit sizes and capacities to suit most applications
- Units can be used individually or linked to accommodate a wide range of flows, partly solid and partially dewaterable

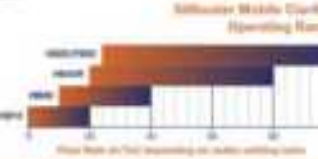


**Options & Process Add-ons**

**Full Water Treatment Solutions**

Siltbuster Clarifiers can be configured as single or multiple units for basic gravity separation and discharge to river or lagoons. They can also be supplied as part of a complete, tailored packaged treatment solution - including auxiliary equipment, such as:

- Lids, covers, walkways & access platforms
- Flow control valves, flow meters & target points
- Automatic flow proportional, single or multi stage chemical dosing treatment
- Fully computerised dosing systems
- Pumps, mixers
- Pipe floatation or interlocking tanks
- Automatic dewatering systems
- Sledge pumps & storage storage tanks
- De-watering systems



For hire, sales or more details call Siltbuster on 01490 772256



## Process Add-ons

## ► Chemical Dosing, Pre-treatment & Reaction Systems

Siltwater is water that, wherever possible, the use of chemicals to treat excess silt water should be avoided. However, there are some types of waste water contaminants and effluent where it will require the use of chemicals to increase the particle settlement rate, in order to achieve final removal. This can be due to either the presence of any fine particles, suspended matter, colour or simply the silt's own irregular particle structure which need to be coagulated in order for settlement to occur.

In such cases, chemical dosing is unavoidable. Consequently, Siltwater has developed an extensive range of chemical dosing systems to complement its siltwater settling systems units.



## Silt Management

[www.siltwater.com](http://www.siltwater.com)

### Treatment Systems

#### Pre-treatment Systems

Basically, a flocculant is a solid form, when dissolved in water the solid dissolves, releasing the chemicals, causing a reaction.

#### Single-Stage & Multi-Stage Dosing Systems

Siltwater's Single-Stage dosing systems range from a single dosing pump linked to a float of liquid or liquid level for pH adjustment, through to an IBC based flocculant supply system and associated pump/dosing. The dosing rate is fully controllable and can be linked to flow rate and chemistry can be added to every reaction tank. In-line or on-off dosing is available. For more complex dosing regimes requiring precise levels of accuracy, Siltwater offer Multi-Stage dosing systems, including integral coagulant and flocculant dosing, often with an intermediate stage for pH adjustment.

### Chemical Reaction Systems

The reaction rate of treatment chemicals, dictates the system required.

#### Mixing Tanks

Siltwater can supply mixing tanks ranging from 1m<sup>3</sup> to 100m<sup>3</sup> capacity.

#### Pipeflow Reactors

For faster reacting chemicals, various pipeflow reactors are available.



### Containerised Integrated Dosing Units

Siltwater can provide secure, self-contained, in-line dosing units which include the controlled flow proportional multi-stage addition of treatment chemicals. For flow up to 150m<sup>3</sup>/hr the plug & play systems come pre-installed for pH plus, coagulant and flocculant dosing containers, as required.

#### Options include:

- Random chemical storage
- Flow proportional dosing systems
- Reactor/aging tanks and pipeflow reactors
- Control panels and dosing
- Insulation, lighting and heating
- Integrated Langelier or CaCl<sub>2</sub> level output to monitor and dose
- Automatic monitoring of feed and discharge water



### Full Treatment Packages

Siltwater's in-house laboratory can test a wide range of chemicals to identify the treatment regime most suited to your needs. A sample of the untreated water, your flows and the required discharge limits are all that is needed.

## APPENDIX F

### SITE INSPECTION SHEET AND GULLY INSPECTION LOG

Site location: .....

Name of person undertaking inspection: .....

Date: .....

Current weather conditions: .....

| Description                                                                                                                                                                                                                               | Comments | Action | Initial |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|---------|
| <p>1) What is the current condition of the gully protection measures within the completed / un-adopted areas of the site?</p> <p><i>Note any gullies requiring maintenance measures</i></p>                                               |          |        |         |
| <p>2) What is the current condition of the gully protection measures within the active areas of the site?</p> <p><i>Note any gullies requiring maintenance measures</i></p>                                                               |          |        |         |
| <p>3) Are site roads clean and relatively free of mud? Is the frequency of visits by the road sweeper adequate?</p> <p><i>Consider whether additional visits should be scheduled.</i></p>                                                 |          |        |         |
| <p>4) Are there currently unsurfaced areas being trafficked which may be causing silt to enter the site drainage or stream?</p> <p><i>Note if additional measures are required to reduce the run-off from these unsurfaced areas.</i></p> |          |        |         |



## SITE INSPECTION OF MONITORING POINTS

Site: Oughtonhead Lane, Hitchin .....

Name of person undertaking inspection: .....

Date: .....

Current weather conditions: .....

| Monitoring Points | NTU* (if water present) | Observations  |                     | Additional comments / Actions required |
|-------------------|-------------------------|---------------|---------------------|----------------------------------------|
|                   |                         | Surface Water | Protection Measures |                                        |
| M1                |                         |               |                     |                                        |
| M2                |                         |               |                     |                                        |
| M3                |                         |               |                     |                                        |
| M4                |                         |               |                     |                                        |
| M5                |                         |               |                     |                                        |
| M6                |                         |               |                     |                                        |

| Completed by | Name | Signature | Date |
|--------------|------|-----------|------|
| Site Manager |      |           |      |