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Construction Management Plan for Sustainable Drainage Systems

Crow Trees Farm, Chatburn

Pringle Homes

Ref: K39346.CMP/005A

Version	Date	Prepared By	Checked By	Approved By
Original	22nd March 2024	[redacted]	[redacted]	[redacted]
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1 INTRODUCTION

1.1 TERMS OF REFERENCE

R. G. Parkins & Partners Ltd (RGP) has been appointed by Pringle Homes to provide a Construction Management Plan for the Sustainable Drainage Systems (SuDS) and conventional drainage systems for their housing development at Crow Trees Farm in Chatburn.

The following plan gives an overview of the SuDS construction methodology proposed. Reference should be made to the following publication, which provides the framework to the following document.

- CIRIA C768 – Guidance on the Construction of SuDS, 2017

Methodology is subject to change during construction and following contractor involvement. SuDS construction by a competent and experienced contractor shall mitigate risk associated with silt mobilisation and unacceptable compaction of ground at SuDS locations. The following report is provided to demonstrate a feasible construction methodology which shall ensure the functionality of SuDS components following construction.

This document has been prepared to discharge Planning Condition no. 14 from Planning Permission ref: 3/2022/0966. It has been undertaken prior to construction. Pringle Homes and their appointed groundworks subcontractor will directly undertake the construction of all earthworks, SuDS and below ground drainage.

Reference should be made to the following RGP drawings when reviewing this plan:

- K39346-20 Foul & Surface Water Drainage Plan
- K39346-21 Foul & Surface Water Drainage Construction Details (1 of 2)
- K39346-22 Foul & Surface Water Drainage Construction Details (2 of 2)

2 GENERAL CONSTRUCTION

The management of soils / silt and construction materials must be undertaken with due consideration of the potential for contamination or adverse impacts to drainage locations which could result in a reduction in performance. The following measures shall therefore be implemented throughout all phases of construction:

- Soil Strip – A minimum turf and topsoil strip shall be undertaken at all times, sufficient to allow the programmed activity, with grass and soils to be retained wherever possible. Reinstatement of grassed areas shall be undertaken at the earliest opportunity.

- Stockpiles – All material stockpiles are to be capped when not in use and when adverse weather is forecast.

- Compaction of soil – Compaction of attenuation areas by construction plant is to be avoided as far as is practical. Construction management to limit plant size / movements over such areas is required. Attenuation structures to be excavated to formation level immediately prior to installation.

- Cement – Cement dust has the potential to alter the soil matrix and could runoff into the UU sewer network or SuDS areas. Wherever possible pre-cast components are specified. It will be necessary to provide concrete surrounds to manholes and cement would also be required for mortar. Larger quantities of cement are to be provided to site ready mixed. Where required, smaller batches are to be mixed in a designated area underlain by an impermeable surface. Dust suppression should be considered as appropriate.

- Dewatering – Dewatering operations should not be required. In the extremely unlikely event that perched groundwater is encountered on the site the engineer is to be notified as this may necessitate re-design. Any dewatering operation must be discharged to a grassed area a minimum distance of 10m from all excavations / exposed soils.

- Wheel washing – to be employed as and when require to minimise transportation of silt from the site onto the surrounding highways network.

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3 STAGE 1 - SITE SETUP

3.1 PRE-START SURVEY

A pre-start survey of the development site, including access roads, third party right of way, routes of existing services and all trees and boundaries shall be undertaken by the contractor prior to commencement. The survey shall be documented with photographic evidence and stored within the site office.

The site is primarily Greenfield with the existing farmhouse, barns and outbuilidngs. There are a number of trees present along the site boundaries and within the site. An arboricultural survey is available. No other potential significant hazards have been identified.

3.2 CONTRACTOR'S COMPOUND AND SITE ACCOMMODATION

The main site offices, welfare and contractors' compound will be identified in the Construction Traffic Management Plan to be prepared by Pringle Homes. The offices shall be provided with a metered mains power supply, mains water supply and electric heating and will comply with CDM regulations (2015). Mobile toilet blocks are envisaged. Following foul drainage construction and connection to the public sewer site welfare shall be connected.

An allocated car parking area shall also be formed within the site compound. All temporary paving shall be permeable and all roof runoff from cabins shall be directed to the permeable subbase underlying the units to ensure runoff is distributed over an equal surface area.

All chemicals and fuels will be stored in an appropriately sized bunded area and a designated re-fuelling area is to be provided. An oil spill kit will be present on site, and will be suitable for absorbing oils, fuels, and solvents, whilst rejecting water.

3.3 MANAGING RUNOFF DURING CONSTRUCTION

The site is located in Flood Zone 1 and is not predicted to be at risk of fluvial flooding. The site is also not at risk of surface water flooding. Ground investigations have confirmed that the site is at a low risk of groundwater flooding. Following the initial site strip and during construction, it is recognised that runoff containing silt and other construction-related contaminants may migrate towards the lowest levels potentially causing siltation and flooding in those areas. Silty runoff could also be directed towards the existing farm access road and Crow Trees Brow.

Figure 3.1 below shows the direction of runoff during the construction phase, which will primarily be towards the central section of the site where several large mature trees and existing hedgerow are to be retained. Based on the existing levels, it is anticipated that some surface water will pond in this area, and will drain via a combination of infiltration, evaporation and transpiration. In extreme wet weather, or after periods of prolonged heavy rainfall, there is a risk that the ponding water will not have sufficient time to drain away and as such a more permanent pond could form in this area. This situation is to be monitored by Pringle Homes during the construction phase, and if a permanent pond starts to form, appropriate action will be taken to remove the water. This may include a tanker/vacuumation unit attending site to remove the water and take it off-site to an appropriate treatment facility.

The natural flow path from this area will be via a narrow channel corridor to the north, towards the existing farm access road. It is therefore proposed that a series of temporary hay bale silt traps are placed within this corridor to attenuate the flow and remove silt, prior to the run-off passing downstream. The performance of the hay bales will be monitored by Pringle Homes throughout the construction phase and replaced as required.

Despite the risk of surface water runoff being very low, Pringle Homes will install a series of temporary earth bunds along the relevant boundaries as shown in Figure 3.1. The bunds will be 300mm high and formed with suitably selected site-won material. These bunds will intercept and store run-off and prevent uncontrolled run-off entering neighbouring land. Pringle Homes will undertake ongoing monitoring of the bunds on the site boundaries once work has commenced and will take appropriate remedial measures as required. Such remedial measures include removing silt, reprofiling or increasing the height of the bund.

Other areas that may be of concern i.e. at the bottom on new slopes and embankments, will benefit from stone filled filter drains installed along the toe. These filter drains will comprise a 500mm wide by 500mm deep trench infilled with clean stone, which will intercept and infiltrate direct run-off from the slope. The filter drain to the north of Plot 25 will be extended across the back of the existing farm access road to provide an additional level of protection for any run-off that passes through the temporary hay bales located in this area. Again, the performance of the filter drains will be monitored during construction and appropriate measures taken to replace stone or remove an accumulation of silt.

If surface water run-off does eventually flow off-site from the ponding area, through the hay bales, over the stone filled filter drain and down the farm access road, flows would spill onto Crow Trees Brow and enter the existing drainage system via the road gully network. It can therefore be seen that these flows, having been attenuated on-site, would be less than the equivalent pre-development Greenfield run-off rates. As such, any additional proprietary flow control system to limit the pass forward flow is not deemed necessary.

Based on the proposed levels and temporary drainage works highlighted above it can be concluded that the risk of uncontrolled, silty surface water run-off entering existing properties, neighbouring land, existing highways and drainage systems is very low. All surface water flows will be carefully monitored, and temporary drainage works will be maintained during the construction stage to ensure they continue to perform as required.

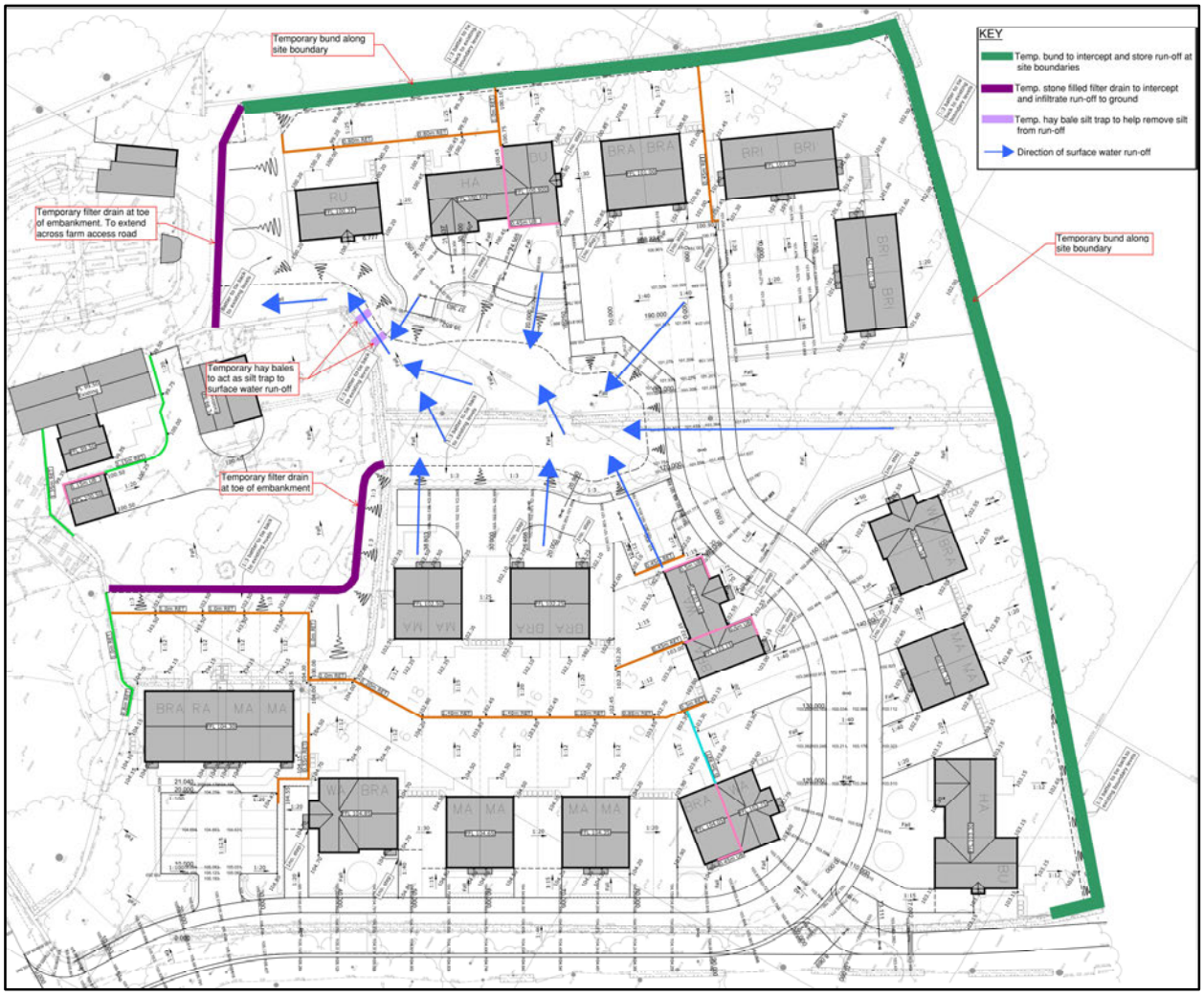

Figure 3.1 Temporary works to manage surface water run-off during construction

3.4 LAYDOWN AREA

A designated laydown area will be identified in the Construction Traffic Management Plan to be prepared by Pringle Homes. Site-won material shall be stored in this area for future use, all material is to be capped to protect stockpiles from the weather when not in use or if adverse weather is forecast.

All excess material shall be removed from site as required to a licensed tip or taken to an exemption site subject to the relevant testing. Some of the materials may be processed on site for re-use.

3.5 SIGNAGE / SITE DELINEATION

Prior to construction vulnerable areas shall be marked to exclude construction traffic. Sensitive areas include geocellular tank locations and as indicated on the drainage layout plans.

4 STAGE 2 - MAIN DRAINAGE & ACCESS ROAD CONSTRUCTION

4.1 ROAD CONSTRUCTION

Bulk earthworks for the main access roads shall be undertaken during the early stages of construction. Site strip is to be limited to the area under construction and associated dwellings. It is envisaged that the acccess roads will be constructed to base/binder asphalt course and used as temporary running surface during construction. Final asphalt surfacing will be installed at the end of the construction phase.

4.2 MAIN DRAINAGE

The main foul and surface water drainage shall be constructed under the new access road in accordance with RGP's drawings. The foul drainage will run through the site and under the existing farm access road to form a connection with the public combined sewer located in Crow Trees Brow. The main surface water sewer will discharge into the large geocellular attenuation tank, with a new offsite surface water sewer running parallel to the new foul sewer through the farm access road with a separate connection onto the public combined sewer.

All new sewer pipes will be jetted and cleaned at the end of the works as required.

4.3 GEOCELLULAR ATTENUATION TANKS

The geocellular attenuation tank systems will comprise 2no. 1.2m deep tanks. The attenuation tanks will be wrapped in an impermeable geomembrane to provide a watertight system. Silt trap manholes will be located directly upstream of the tanks and will help to intercept silt that may be conveyed by the upstream pipe network into the tanks. The formation of the tanks is to be undisturbed natural ground and all hard/soft spots are to be excavated and backfilled with well compacted DfT Type 1 sub-base. The formation will be protected during inclement weather to ensure a consistent, firm foundation to the tanks.

4.4 GROUND PROFILING

Site strip is to be limited to the area under construction only. Selected site won material is to be used wherever possible. Any imported material shall be of high permeability.

5 STAGE 3 - PLOT CONSTRUCTION

5.1 FOUNDATION & RETAINING WALL CONSTRUCTION

Plot construction shall commence in a phased manner and topsoil strip shall be minimised. Foundations will primarily comprise conventional concrete strip and trench footings.

External retaining walls in rear gardens will be constructed as per Pringle Homes' programme.

5.2 PLOT DRAINAGE

Plot drainage works will commence after the main sewers have been constructed and connections made as required. Private plot drainage will be constructed in accordance with Part H of the Building Regulations and will be subject to inspection by Building Control.

Plot construction shall be undertaken in a timely manner. Once groundworks and external works are complete the area shall be seeded / landscaped as appropriate, and the plot connected to the drainage system as required. Silt traps and inspection chambers shall be monitored and maintained throughout construction. Pipework will be jetted and cleaned at the end of the works as required.

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6 STAGE 4 - CONCLUSION OF MAIN WORKS

Following completion of the main works all SuDS systems and associated silt traps, flow control chambers and pipework is to be inspected, surveyed, and cleaned. Defects will be identified and rectified as soon as possible. Thereafter, all SuDS components should be inspected and maintained in accordance with the recommendations listed within the SuDS Operation and Maintenance Plan prepared by RGP.

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7 REFERENCES

[1] CIRIA, Guidance on the Construction of SuDS, Report C768, 2017