



Haigh Huddleston & Associates

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**PROPOSED SWS OPERATIONS & MAINTENANCE ITINERARY
FOR
DEVELOPMENT OFF LINGARDS ROAD, SLAITHWAITE for SB HOMES LTD**

Introduction

This report has been initially prepared to set out the responsibilities for management and maintenance of the proposed drainage systems at the above development and outlines a recommended maintenance regime to be implemented by the responsible party.

The maintenance plan should be reviewed periodically to confirm it is meeting the objective of ensuring all effective drainage is maintained and should be reviewed if necessary to keep the system working effectively.

All underground drainage, attenuation & SuDS features (excluding the private networks serving the dwellings and highway drainage) have been designed to 'Codes for Adoptable Sewers' and, once the Section 104 agreement is complete, will be the responsibility of Yorkshire Water as the sewerage undertaker. However, during the interim period before adoption, the responsibility will be deemed to SB Homes Ltd until the site becomes occupied at which point the maintenance will be undertaken by a 3rd party management company.

SB Homes can confirm that the adopted highway, highway drains and gullies will be fully maintained by SB Homes / Management Company (as above) until an agreement has been entered into under Section 38 of the Highways Act 1980, at which point those streets covered by the agreements will be the responsibility of the Local Highway Authority following the satisfactory completion of the maintenance period.

The responsibility for the future maintenance of any private / land drainage serving a single property, and within the curtilage of the property, will remain the responsibility of the relevant property owner.

Surface Water System

Surface water run off from roofs, roads and other hardstanding areas is drained via gullies and underground carrier pipes to an attenuation tank located within third party land west of the site and sized to provide adequate storage to cater for extreme rainfall of up to 1 in 100yr storm events including the allowance for a 30% increase due to future impacts of climate change. The water is released from this tank at a restricted rate of 6.6lit/sec, with the flow rate controlled by a Hydrabrake



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flow control device fitted to the manhole downstream of the tank where the discharge from the tank is then drained into an existing culverted watercourse running parallel with the western boundary.

A secondary storage system is to be constructed within the shared private driveway at the end of Road 2 and is sized to cater for plots 13-22 and the adopted accessway (Road 2 & 2A), as well as the additional flood volumes during extreme rainfall of up to 1 in 100yr storm events including 30% increase for climate change.

The flow rate from this system will be restricted to a restricted rate of 3lit/sec with the use of a Hydrobrake flow control device fitted to the downstream manhole. The surface water drainage system, together with the private foul wastewater from plots 13-22, is then discharged into the existing combined public sewer located to the north of the site.

Foul Water System

All domestic foul wastewater will be drained via underground carrier pipes to the existing public sewer in Manchester Road located to the South of the site with Plots 13-22 connecting into the existing combined sewer to the east of the site.

Land Drainage / Watercourse Diversions

The maintenance and management of the shared land drainage and watercourses within the new development will be the responsibility of a 3rd party management company for the lifetime of the site.

Due to its dilapidated condition, the existing watercourse culvert located at the western boundary will be replaced and upsized to accommodate the surface water flows from the new development and flows from the land drainage systems serving plots 1-8 and any overspill flows from the open watercourse adjacent to plot 8.

A new 300 diam land drainage system is to be provided to collect flows from the existing spring located in the adjacent field west of the site and redirected into the existing watercourse culvert at the site boundary.

All existing watercourses entering the southern part of the site are to be located at the boundary and diverted through the new development and discharged into the open watercourse located to the front of Plots 6-8. The existing banking of the watercourse is to be lowered at the eastern boundary and a concrete overspill will be constructed to allow for any blocked / excess flows from the watercourse to be directed into the new land drainage system.

A new land drainage system will also be constructed to intercept the on-site natural spring and divert the flows through the new development and into the existing water tank / feature. A high-level overflow from the water tank will also be constructed to discharge flows from the tank into the open watercourse located to the front of plots 6-8.

Maintenance & Management Itinerary

It is recommended that the itinerary set out below is referred to for the inspection, upkeep, and maintenance of the full drainage system during the interim period before the adoption process is complete. Further advice on inspection and maintenance is set out in CIRIA C753 The SuDS Manual (2015).



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Proposed SWS Operations & Maintenance Itinerary

<u>Activity</u>	<u>Risks Identified</u>	<u>Design Steps to Eliminate/Control Risk</u>	<u>Further Action Required</u>
1. Existing / New Adopted Drainage on Site	i) Silt build up within new highway / private gullies constructed on site. ii) Flow control device installed. iii) Prolonged final adoption and transfer to Yorkshire Water. iv) Maintenance during interim period before adoption.	i) Use terram with newly installed gullies to reduce silt run-off into new system. ii) Install flow control device at an early stage to control run-off flows into existing watercourse. iii) Inspections & maintenance of new system to be carried out by the developer / manage company annually and after major rainfall events for a minimum 5 year period or until adoption is completed by Yorkshire Water.	i) Weekly inspections recommended and /or following heavy rainfall during construction period then annually and after major rainfall events once development is complete. ii) Jet vac to be used to remove any silt build up and ensure the new drainage system is always silt free and operating correctly. iii) Flow control device to be inspected annually and accessed by 'confined space' trained personnel using winch access. iv) Release valves to be greased when necessary to ensure flow control device is operating correctly at all times. v) Neoprene seals fitted to flow control device to be checked and replaced when necessary.



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2. New SWS Attenuation Tank Installed on Site.	i) Silt build up within attenuation tank installed on site. iii) Prolonged final adoption and transfer to Yorkshire Water. iv) Maintenance during interim period before adoption.	i) Install attenuation tank at an early stage to provide SWS storage for new development and prevent potential flood risk during and after the development is constructed. iii) Inspections & maintenance of new attenuation tank to be carried out by the developer / management company annually and after major rainfall events for a minimum 5 year period or until adoption is completed by Yorkshire Water.	i) Weekly inspections recommended and /or following heavy rainfall during construction period then annually and after major rainfall events once development is complete. ii) Inlets, outlets and overflows within tank to be inspected/checked to ensure all are operating as designed. ii) Jet vac to be used to remove any silt build up and ensure the attenuation tank is always silt free and operating correctly. iii) Attenuation tank to be entered via access shafts as per manufactures design by 'confined space' trained personnel using winch access.
3. Land Drainage on Site	i) Poor maintenance following Plot sale. ii) Maintenance during and after construction on site.	i) Land drainage to be constructed within easy to access areas and kept as shallow as possible for maintenance purposes. ii) Silt traps / inverted soakaways included within land drainage design to intercept silt and provide location for regular maintenance.	i) Developer to highlight presence of any land drainage to new purchaser and notify of their responsibility in the future. ii) Developer to protect land drain once constructed on site to avoid construction damage prior to handover.



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			iii) Developer to provide CCTV of completed land drainage system prior to handover to ensure operating effectively
4. Existing Watercourse / Natural Spring Diversions	i) Silt build up within new watercourse / Natural spring diversions during constructed on site. ii) Maintenance during and after construction on site. ii) Potential blockages occurring at upstream & downstream headwalls during construction and following heavy rainfall.	i) Watercourse diversions to be constructed within easy to access areas and kept as shallow as possible for maintenance purposes. ii) Silt traps included within diversion design to intercept silt and provide location for regular maintenance. iii) Trash grilles to be fitted to new headwall structures upstream & downstream of open section of watercourse iv) Ground level at downstream section of open watercourse to be lowered and concrete overspill to be constructed to direct any blocked / excess flows into the new land drainage system.	i) Developer to highlight presence of any diversion works to new purchaser and notify of their responsibility in the future. ii) Developer to protect diversion works once constructed on site to avoid construction damage prior to handover. iii) Weekly inspections of headwall trash grilles are recommended and /or following heavy rainfall during construction period, then seasonally and after major rainfall events once development is complete.