Drainage Maintenance Strategy

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West Cumberland Hospital Phase 2 Development





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1.0 Introduction

1.1 Project Background

In June 2021, Curtins were instructed by North Cumbria Integrated Care NHS Foundation Trust to undertake a Flood Risk Assessment and Outline Drainage Strategy of the site at West Cumberland Hospital, CA28 8JG. The site is centred on NGR 298950, 516040.

1.2 The Development

There are two areas for development as part of the proposals, phase 2 and the waste compound and access road. Phase 2 includes the construction of an acute hospital building with associated hard landscaping and car parking. The other is the redevelopment of the waste compound, construction of an access road, widening of a section of the existing road to allow for 2-way traffic and a reconfigured entrance/ exit to the site. The access road is due to be constructed/ widened first, followed by the proposed building, car parking and associated hard landscaping and finally the waste compound. The proposed building will be set at a finished floor level (FFL) of 91.200 with banking required to the north to support the proposed access road which is approximately 4m above the building FFL.



2.0 Maintenance Requirements

This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus an allowance for climate change particular to the requirements of the site. It may be that the exceedance flows above the 1 in 100-year plus climate change storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking or other space. As the flows are generally being attenuated on site and within SuDS features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted in this section.

2.1 Components

The following components have been included within the drainage design for the proposed development:

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Drainage Channels, Kerbs and Gullies
- Permeable Pavements
- Geocellular Attenuation Structures
- Flow Control Units
- Interceptor

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

It is assumed that the maintenance of the drainage network will be the responsibility of an on-site facilities management team.

A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.



It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

2.2 Inspection, Manhole and Catchpit Chambers

The indicative locations of the Inspection Chambers, Manholes are indicated on Curtins drainage drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

Access points should be located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

2.3 Pipes

The indicative locations of the drainage pipes are indicated on Curtins drainage strategy drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.

Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

Access for maintenance is provided through access chambers and manholes.





Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

2.4 Drainage Channels, Kerbs and Gullies

The indicative locations of and typical details of the drainage channels and gullies are indicated on Curtins drainage drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

Channels, drainage kerbs and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The

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throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including channel outlet boxes.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near channel runs.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.



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Remedial Action	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.

2.5 Permeable Pavements

The indicative locations and build-up of the permeable paving areas are indicated on Curtins drainage drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

Permeable pavements contain proprietary products and as such where used the manufacturer's recommendations should be followed.

The permeable pavements are intended to be water quality and attenuation storage features. These features are intended to be dry except during rainfall events.

The surface has been designed to contain gaps where rain can flow through the upper construction layers into the voided stone or which makes up the subbase.

Access for maintenance is provided by inspection/access pipes, although access will be limited as this is a surface feature only.

Regular inspection and maintenance is important for the effective operation of the pervious pavement.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should	3-monthly, 48 hours after large storms.





	be reprofiled to provide a flat area or berm adjacent to the paving.	
Regular maintenance\ inspection	Brushing and Vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required and as per landscape architect's specification.
	Removal of weeds	As required.
Remedial Action	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material. The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	As required (if infiltration performance is reduced as a result of significant clogging).





2.6 Attenuation Structure

The location and typical details of the geocellular attenuation structures are indicated on Curtins drainage drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

Access for maintenance should be provided, for example by locating inspection chambers within the crate structure.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Litter and Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre- treatment structures, catchpits and filter chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets/outlets.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material.	As required (if performance is reduced as a result of significant eroding).



The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	
Reconstruct sub-base and or replace or clean void area / fill, if performance deteriorates or failure occurs	As required
Replace clogged geotextile (will required reconstruction of soakaway). Terram 1000 has a life span of 25 years.	As required

2.7 Flow Control Unit

The indicative locations and typical details of flow control chambers are shown on Curtin's drainage drawings WCHPH2-CUR-VV-XX-DR-C-92001 & WCHPH2-CUR-VV-XX-DR-C-92002.

The flow control units are intended for flood control and flow restriction. The flow control specification is subject to detailed design. The manufacturer's recommendations should also be taken into consideration.

Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.



	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre- treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

2.8 Oil Separator

A bypass separator has been specified on surface water drainage system to protect the receiving sewer and downstream system from pollution by oil, which may be present due to minor leaks from vehicles and plant, from accidental spillage.

The installed separator should meet the British (and European) standard (EN 858-1 and 858-2) for the design and use of prefabricated oil separators has been adopted. New prefabricated separators should comply with the standard.

Maintenance of the separator should be in accordance with manufacturers requirements. It is advisable to enter into a maintenance and service contract either with manufacturer or with an appropriately qualified maintenance engineer.



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3.0 Appendices

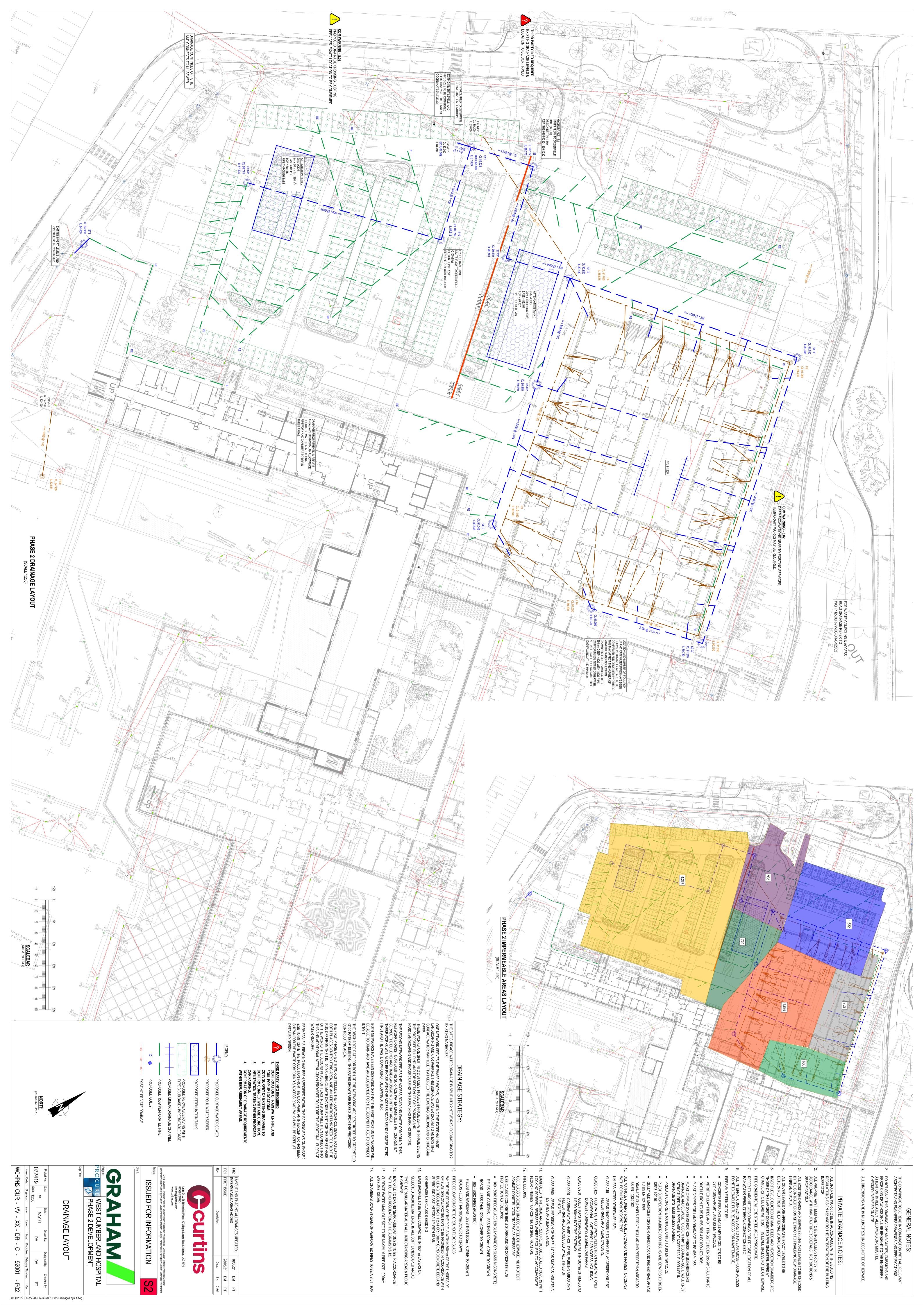
Appendix A Drainage Strategy Drawings

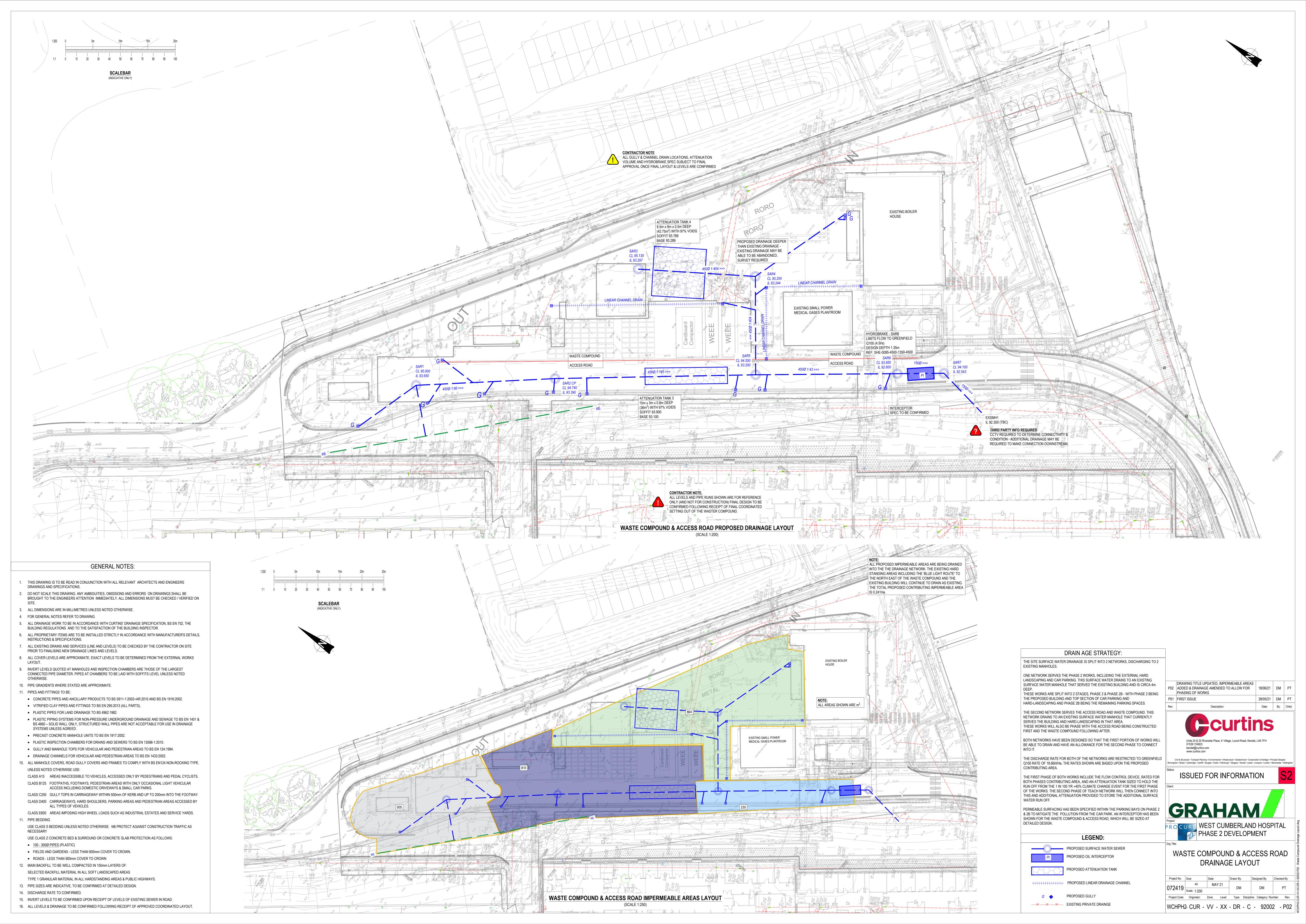
Appendix B Drainage Details Drawing

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Appendix A Drainage Strategy Drawing

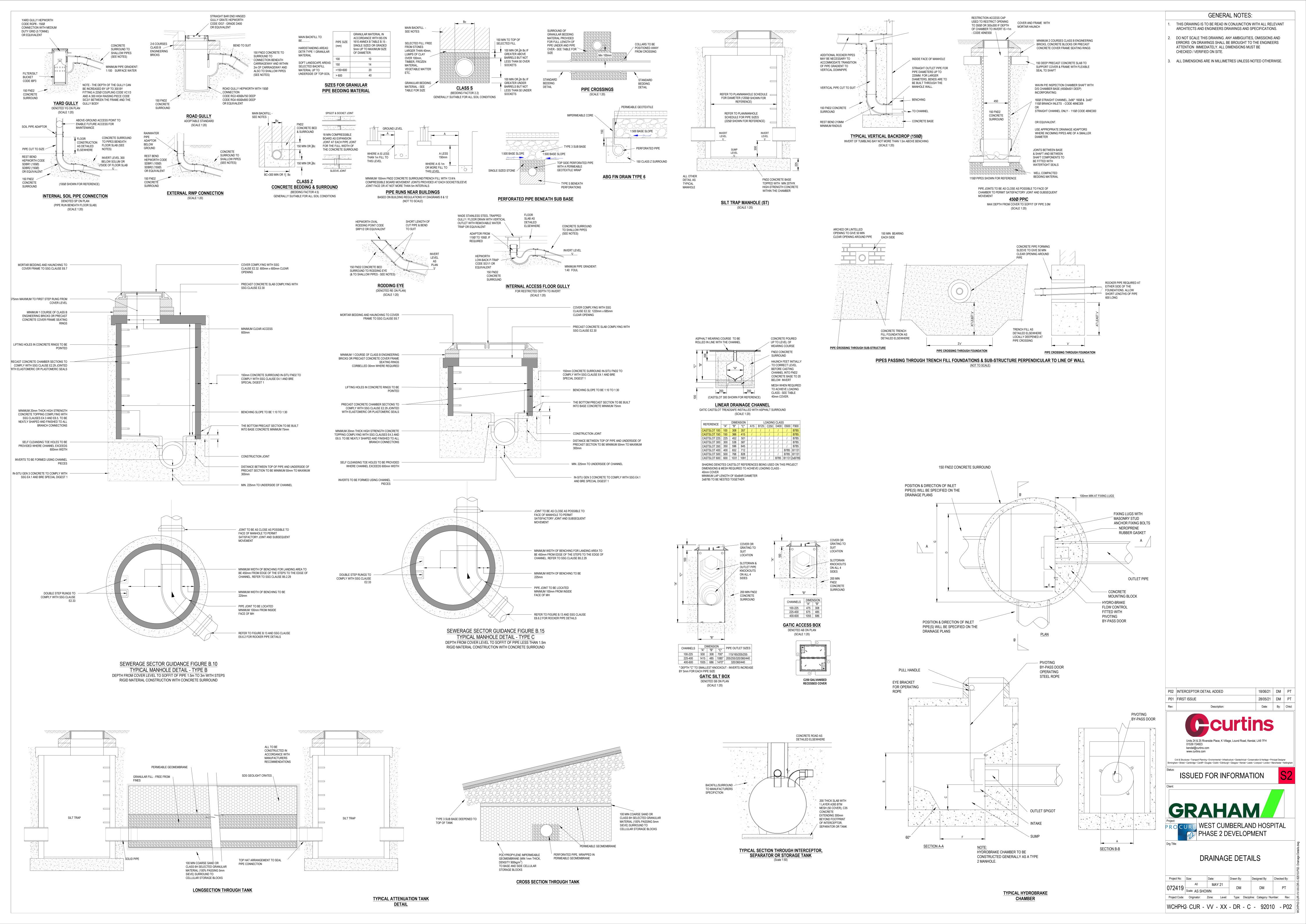




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Appendix B Drainage Details Drawing



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