

**PROPOSED RESIDENTIAL DEVELOPMENT
FORMER AMBULANCE STATION
MILITARY ROAD, CANTERBURY**

DRAINAGE MANAGEMENT PLAN

**FOR
ROGATE**

31st January 2018

Report no: 1

Rev A

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1 Introduction and Brief

This report has been produced to provide general maintenance procedures for the various components of the foul water (FW) and surface water (SW) drainage systems serving the proposed development at the Former Ambulance Station, Military Road, Canterbury.

The FW and SW systems are wholly separate with the FW discharging to Combined Sewer in Military Road via an existing connection from the site and the SW discharging to the Highway Drain in Military Road via an existing connection from the site.

This document has been produced in accordance with current best practise and the recommendations and guidance set out in CIRIA C697 'The SuDs Manual'.

The proposed Construction Issue site layout is attached at Appendix 1.

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2 Surface Water Drainage

This section examines the details and maintenance requirements of the components forming the Surface Water (SW) drainage system.

2.1 Pipework and General Requirements

The system comprises standard pipework, inspection chambers and manholes with a control structure (dealt with later). Regular inspection and maintenance of drainage systems is essential to ensure effective long term performance. Maintenance needs of the system should be monitored and schedules adjusted to suit the specific requirements of the development.

The following maintenance regime would be recommended as a minimum but actions and frequencies should be adjusted to suit the specific requirements of this development. However, the previous discussed, component specific regimes and any manufacturer's specific recommendations should always be followed.

Maintenance Schedule	Required Works/Action	Frequency
Routine Maintenance	<ul style="list-style-type: none"> Inspect and identify incorrect operation. Debris removal from catchment area using sweeping and vacuuming. Removal of sediment from pre-treatment components i.e catchpits. 	<p>Monthly</p> <p>3 Monthly</p> <p>Annually</p>

Table 3.1 - Recommended Maintenance Requirements

2.2 Attenuation Tank

The system includes a 22.4cu.m capacity storage tank (Aquacells or similar approved). The tanks are laid with a nominal fall across them to the outfall. Pipework and channels feeding the system include silt traps. Regular inspection of geo-cellular storage systems is required to

ensure effective long term performance of the system. Maintenance needs of the system should be monitored and schedules adjusted to suit the specific requirements of the development.

The following maintenance regime would be recommended as a minimum but actions and frequencies should be adjusted to suit the specific requirements of this development. However, manufacturer’s specific recommendations should always be followed.

Maintenance Schedule	Required Works/Action	Frequency
Regular Maintenance	<ul style="list-style-type: none"> Inspect and identify incorrect operation. Debris removal from catchment area using sweeping and vacuuming. Removal of sediment from pre-treatment components i.e. catchpits. 	<p>Monthly</p> <p>3 Monthly</p> <p>Annually</p>

Table 3.2 – Recommended Maintenance Requirements

Current best practise suggests that underground geo-cellular storage systems are constructed with access ‘turrets’ to ease future maintenance. These ‘turrets’ allow the annual removal of any silts or sediments directly from the tank ensuring effective long term performance.

2.3 Hydrobrake® Flow Control Structure

The control structure is limits discharge to 5 l/s and has a minimum final orifice of 75mm to reduce the likelihood of a blockage. Regular inspection of flow control devices is required to ensure effective long term performance of the system.

Maintenance needs of the system should be monitored and schedules adjusted to suit the specific requirements of the development and to accord with the manufacturers requirements.

The following maintenance regime would be recommended as a minimum but actions and frequencies should be adjusted to suit the specific requirements of this development. However, manufacturer's specific recommendations should always be followed:

Maintenance Schedule	Required Works/Action	Frequency
Regular Maintenance	<ul style="list-style-type: none"> Inspect and identify incorrect operation. 	Monthly
	<ul style="list-style-type: none"> Removal of sediment from pre-treatment components i.e catchpits. 	Annually

Table 3.3 – Recommended Maintenance Requirements

2.4 Permeable Paving

Permeable surfaces need to be regularly cleared of silt and other debris to ensure their permeability is preserved. Current advice suggests that a minimum of three surface sweepings per year. However, manufacturer's specific recommendations should always be followed.

A brush and suction cleaner, which can be a lorry mounted device or smaller precinct sweeper, should be used and the sweeping regime should be as follows:

1. End of winter (April) – to collect winter debris
2. Mid-summer (July/August) – to collect dust and other plant type deposits
3. End of autumn (November) – to collect leaf fall.

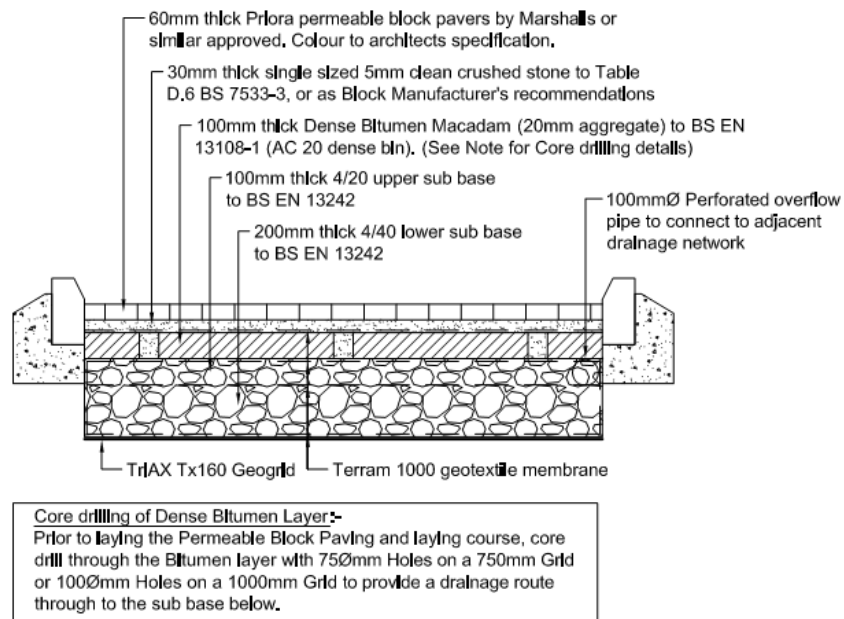
In addition to surface sweeping and vacuuming the following maintenance regime would also be recommended.

Maintenance Schedule	Required Works/Action	Frequency
Regular Maintenance	<ul style="list-style-type: none"> Brushing and Vacuuming. 	Three times a year as above or as required following further monitoring
Occasional Maintenance	<ul style="list-style-type: none"> Removal of weed growth. 	3 Monthly
Ongoing Monitoring	<ul style="list-style-type: none"> Inspection for evidence of poor operation or ponding marks. Inspect debris accumulation on surface and adjust sweeping regime if necessary. Inspect silt accumulation in inspection chambers and remove as necessary. Inspect silt accumulation in overflow pipework and remove as necessary. 	3 Monthly, 24-48h after a storm Annually Annually Annually

Table 3.4 – Recommended Maintenance Requirements

Rehabilitation of the surface laying course should be carried out if evidence of poor performance is observed during the quarterly inspections. If it is deemed necessary, the following procedures should be followed:

1. Lift block pavers and set aside or reuse removing jointing material.
2. Remove laying course and geotextile membrane.
3. Inspect cores and replace granular fill as required.
4. Renew geotextile membrane.
5. Renew laying course, block pavers and jointing material in accordance with the construction detail shown in figure 3.4 below.



Typical Permeable Parking Area Construction
Design 3% < CBR < 4%

Fig 3.4 – Typical Permeable Parking Area Construction.

2.5 Oil/Petrol/Fuel Interceptors – where installed

Regular inspection and maintenance of interceptors is required to ensure effective long term performance of the system. Maintenance needs of the system should be monitored and schedules adjusted to suit the specific requirements of the development.

The following maintenance regime would be recommended as a minimum but actions and frequencies should be adjusted to suit the specific requirements of this development. However, manufacturer’s specific recommendations should always be followed.

Maintenance Schedule	Required Works/Action	Frequency
Regular Maintenance	<ul style="list-style-type: none"> Removal of stored oil/petrol. Inspect and identify incorrect operation. Removal of sediment from pre-treatment components i.e catchpits. 	Product dependant Monthly Annually

Table 3.5 – Recommended Maintenance Requirements

It is recommended that all interceptors are fitted with high level alarms to ensure the system does not exceed its oil and sediment storage capacity. The alarm should be linked to the building management system to ensure the system is constantly monitored.

It is also recommended that all interceptors are installed and commissioned by the manufacturer, or their approved sub-contractor to ensure correct operation from first installation.

3 Foul Water Drainage

This section deals with the maintenance requirements and provisions for the Foul Water system serving the proposed development.

3.1 General Maintenance

The system comprises standard 100mm and 150mm diameter pipework laid to falls with standard inspection chambers, rodding eyes and manholes. Regular inspection and maintenance of drainage systems is essential to ensure effective long term performance. Maintenance needs of the system should be monitored and schedules adjusted to suit the specific requirements of the development.

Maintenance Schedule	Required Works/Action	Frequency
Routine Maintenance	<ul style="list-style-type: none"> Inspect and identify incorrect operation. 	Monthly

Table 4.1 – General Maintenance Schedule

The system is a simple wholly gravity solution with pipes laid at self cleansing gradients. The system should effectively be 'self cleansing' in normal use. However, there are access points at each major pipe junction or change of direction including rodding eyes at the head of runs allowing easy access in the event of a blockage occurring.

4 Summary

- The development site is a consented redevelopment of a former Ambulance Station in Military Road, Canterbury.
- The proposed drainage system comprises separate piped systems for both Surface Water (SW) and Foul Water (FW) with the SW discharging to Highway Drain and the FW to existing Combined Sewer both utilising existing connections in Military Road.
- The FW system is normal piped drainage of 100mm until a second property connects at which point the pipes increase to 150mm diameter. The system is gravity and as such is a typical, normal drainage system. There are rodding eyes to heads of runs and access chambers at significant pipe junctions and changes of direction. The gradients of the pipes are such that it is a 'self cleansing' system. In the event of a blockage there are ample access points to ensure that any blockage can be readily cleared with little or no disruption. The FW system is a standard gravity system and maintenance requirements are simple for such systems.
- The proposed solution for SW is to restrict flows to a full Greenfield Runoff Rate of 5 l/s using a Hydrobrake control manhole. The quantity of SW storage in attenuation tanks is 22.4 cu.m for 1 in 100 year event (plus 30% for climate change). This restricted discharge is then connected to the FW/Combined sewer in Military Road via the last pipe run to the road. The pipes are all laid at a self cleansing gradient with the exception of the storage attenuation tanks. These are laid at a nominal fall however incoming pipes and channels include elements of silt trapping to ensure the likelihood of significant silt build up is reduced. The remainder of the system is gravity fed with self cleansing gradients and standard inspection chambers and manholes to facilitate easy access for maintenance. The flow control structure is a Hydrobrake® which is a standard product that has a minimum orifice of 75mm to ensure that it is unlikely to block in normal use.

Appendix 1

Proposed Site Plan

CDM 2015 RESIDUAL RISKS

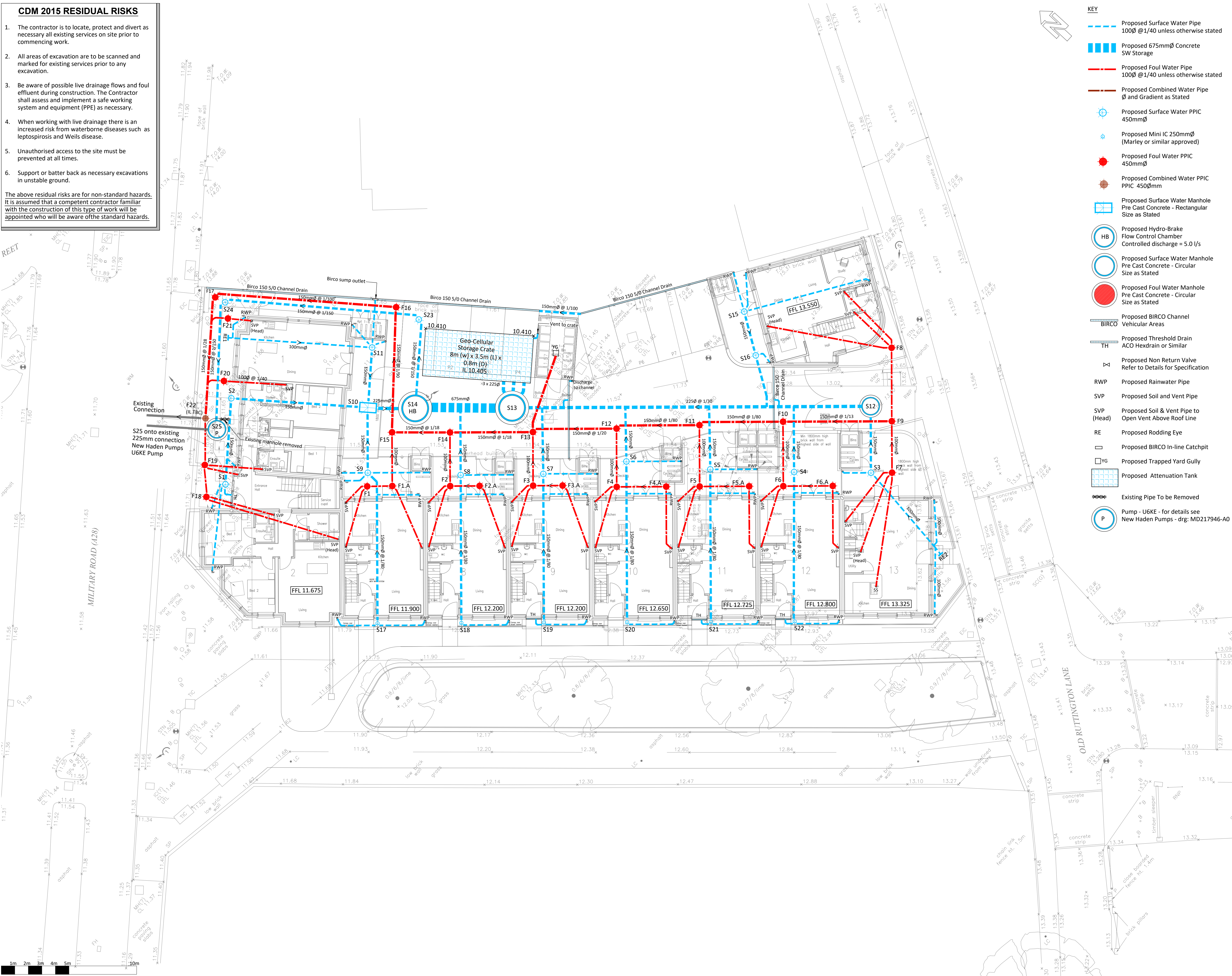
- The contractor is to locate, protect and divert as necessary all existing services on site prior to commencing work.
- All areas of excavation are to be scanned and marked for existing services prior to any excavation.
- Be aware of possible live drainage flows and foul effluent during construction. The Contractor shall assess and implement a safe working system and equipment (PPE) as necessary.
- When working with live drainage there is an increased risk from waterborne diseases such as leptospirosis and Weils disease.
- Unauthorised access to the site must be prevented at all times.
- Support or batter back as necessary excavations in unstable ground.

The above residual risks are for non-standard hazards. It is assumed that a competent contractor familiar with the construction of this type of work will be appointed who will be aware of the standard hazards.

KEY

- Proposed Surface Water Pipe 100Ø @1/40 unless otherwise stated
- Proposed 675mmØ Concrete SW Storage
- Proposed Foul Water Pipe 100Ø @1/40 unless otherwise stated
- Proposed Combined Water Pipe Ø and Gradient as Stated
- Proposed Surface Water PPIC 450mmØ
- Proposed Mini IC 250mmØ (Marley or similar approved)
- Proposed Foul Water PPIC 450mmØ
- Proposed Combined Water PPIC 450Ømm
- Proposed Surface Water Manhole Pre Cast Concrete - Rectangular Size as Stated
- Proposed Hydro-Brake Flow Control Chamber Controlled discharge = 5.0 l/s
- Proposed Surface Water Manhole Pre Cast Concrete - Circular Size as Stated
- Proposed Foul Water Manhole Pre Cast Concrete - Circular Size as Stated
- Proposed BIRCO Channel Vehicular Areas
- Proposed Threshold Drain ACO Hexdrain or Similar
- Proposed Non Return Valve Refer to Details for Specification
- RWP Proposed Rainwater Pipe
- SVP Proposed Soil and Vent Pipe
- SVP (Head) Proposed Soil & Vent Pipe to Open Vent Above Roof Line
- RE Proposed Rodding Eye
- Proposed BIRCO In-line Catchpit
- YG Proposed Trapped Yard Gully
- Proposed Attenuation Tank
- Existing Pipe To be Removed
- P Pump - UGKE - for details see New Haden Pumps - drg: MD217946-A0

- Notes:**
General Notes
- Do not scale this drawing.
 - This drawing is to be read in conjunction with all other relevant drawing issues and the specification.
 - All building materials, components and workmanship to comply with the appropriate public health acts, building regulations, british standards and codes of practice and the appropriate manufacturers recommendations.
 - For all specialist work see relevant drawings.
 - Any discrepancies, errors or omissions to be reported to the project co-ordinator for further instructions before commencement of works.
 - The Engineer is not responsible for dimensions, except where shown on his drawings. All setting out information, dimensions, etc, shall be calculated from the Architects drawings.
 - All private drainage shall comply with the requirements of the Building Regulations approved Document H.
 - All drainage forming part of, or connecting to a public sewer shall comply with the requirements of Sewers for Adoption 7th Edition.
 - Cover levels are shown indicative only and are subject to final adjustment on site.
 - All FW pipes to be 100mm diameter unless noted otherwise.
 - All SW pipes to be 100mm diameter unless noted otherwise.
 - Minimum depth to invert of foul branch pipes to SVP/SS below finished floor level to be:
 - 450mm 0 - 3 storey's
 - 750mm 3 - 5 storey's
 - Gradient of under floor branch pipes to be 1:40 and no flatter than 1:80 (minimum of 1 WC connected).
 - All RWP, SVP and SS positions are subject to confirmation from the architect.
 - Refer to Architect / M&E drawings for continuation of drainage above ground floor.
 - Cover levels of chambers in decking areas are set = 150mm below F.F.L. Access hatch to be provided in decking over chambers for east of access and maintenance.



Rev	Amendment	Date
F	Construction issue	08.12.17
E	Highway Connection Drainage updated	30.03.17
D	Drainage amended	09.09.16
C	FW connection to existing amended	03.08.16
B	SW storage amended	01.07.16
A	Drainage amended	08.06.16
-	Preliminary Issue	20.05.16

APPROVAL/COMMENT	DATE
PRELIMINARY	
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CONSTRUCTION	

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Client: **JENNER GROUP**
for **ROGATE**

Project: **MILITARY ROAD**
CANTERBURY

Drawing Title: **PROPOSED DRAINAGE LAYOUT**

Drawing No: **15031-500**
Date: **MAY 2016**
Rev: **F**

1m 2m 3m 4m 5m 10m
SCALE 1:125