

Intended for  
**Hanbury Properties**

Document type  
**Drainage Maintenance Strategy**

Date  
**July 2019**

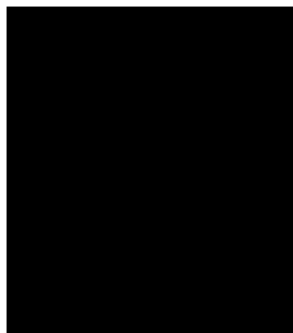
# **OLDLANDS FARM - PHASE 1A DRAINAGE MAINTENANCE STRATEGY**



## DRAINAGE MAINTENANCE STRATEGY

Revision **R02**  
Date **19/08/2019**  
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Approved by **Mark Dewson**  
Description **Drainage Maintenance Strategy**

Ref 00003993-RAM-HWY-RP-500-001



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# 1. INTRODUCTION

## 1.1 General Introduction

- 1.1.1 This document considers the surface water and foul water drainage systems for the Oldlands Phase 1A development. A layout plan of the drainage systems is shown on Ramboll drawing 1620003993-RAM-0500-01A-DR-CR-10001 which is included as Appendix 1 to this report.
- 1.1.2 This document outlines each aspect of the surface water and foul water drainage systems, a brief description, issues to be aware of and any required maintenance. This document should form part of the Operation and Maintenance Manual for the scheme.
- 1.1.3 Flude Commercial will have responsibility for repair and maintenance of the SUD works and operate a service charge for the estate.

## 1.2 System Synopsis

- 1.2.1 Surface water run-off from the new buildings and paved areas of the site will discharge to the Oldlands Farm ditch to the east of the site via permeable block paving within the parking bays, permeable subbase across the majority of the site and diffuser units from the building rain water pipes.
- 1.2.2 Foul drainage from the new buildings will be collected in a simple gravity drainage system and connected into the existing foul drainage network at manhole ref. FWMH5(EX), as shown on drawing 1620003993-RAM-0500-01A-DR-CR-10001. The existing private drainage network following this leads to the foul pumping station to the northwest of the site.

## 1.3 Access

- 1.3.1 The site estate's management team will coordinate and ensure maintenance requirements are met and allow suitable access for all required maintenance outlined in this document.

## 1.4 Sub-catchments & Exceedance Routing

- 1.4.1 The entire catchment drains via permeable subbase and then standard carrier pipe drainage network. The site has been designed to contain all flow up to and including the 1 in 100 year storm + 40% for climate change. Overland flow direction is generally west to east towards the kerb lines within the car parks. As such the 100 year return period plus climate change will not prohibit access and egress.

## 2. ROUTINE INSPECTION AND MAINTENANCE SCHEDULE

### 2.1 Surface Water Drainage

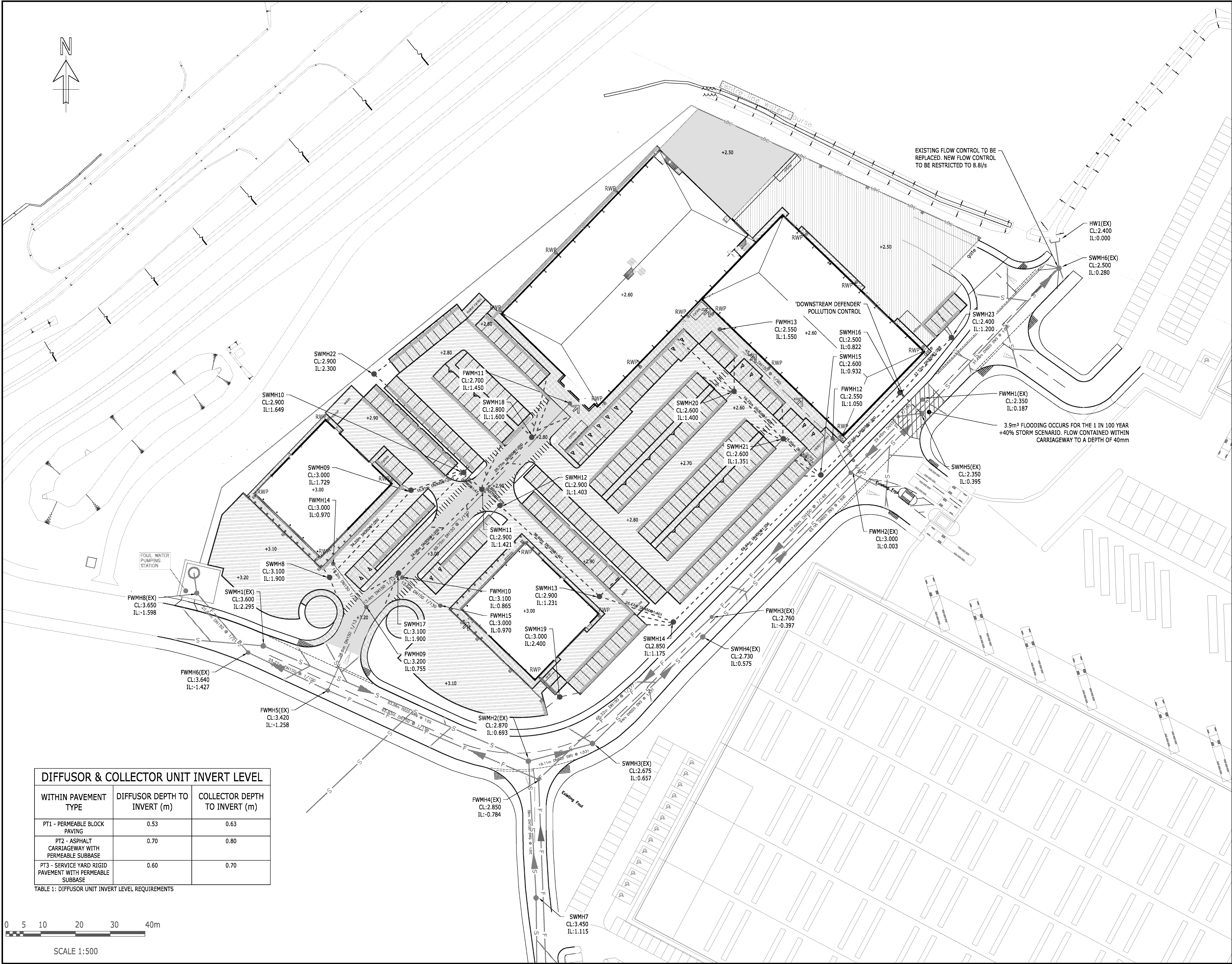
| Item No. | Item                                                  | Description                                                                                                                                             | Maintenance Issues                                                                                                  | Details of Inspection/Maintenance Activity/Plant Requirements                                                                                                                                        |
|----------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1      | Gullies                                               | Surface water is drained from impermeable areas through grated gullies located at low points and conveyed to discharge points.                          | Gullies can become blocked by excessive build up in silt and debris.<br><br>Grating openings can become obstructed. | Inspection and maintenance at 6 month intervals.<br>Clearing of gullies using a gully sucker to be determined upon inspection.                                                                       |
| 1.2      | Catchpit/Manhole Chambers (incl. Hydrobrake Chambers) | Manholes and catchpit chambers provide rodding and jetting access to pipework.                                                                          | Manholes/catchpits can become blocked by excessive build up in silt and debris.                                     | Manhole chambers should be inspected annually and catchpit chambers should be inspected every spring and autumn after leaf fall. Silt and debris should be removed using a gully sucker if required. |
| 1.3      | Carrier Drains                                        | Carrier drains convey surface water across junctions.                                                                                                   | Pipes can become blocked with silt/debris.                                                                          | Inspection and maintenance at 12 month intervals.<br>Water jetting to be undertaken when required.<br>CCTV equipment to inspect pipe runs may be needed where necessary.                             |
| 1.4      | Channel/Slot Drains                                   | Surface water is drained from impermeable areas through narrow linear openings on the surface and conveyed to discharge points along a channel section. | Slot openings and channels can become congested with silt/debris.                                                   | Periodic inspection is required to ensure slot openings and channels are clear. Should a blockage occur, rodding or jetting from an access point will be required.                                   |
| 1.5      | Ditches/Swales                                        | Shallow tracts of usually vegetated land designed to attenuate run-off through infiltration.                                                            | Can collect litter/debris.<br><br>Vegetation can become overgrown                                                   | Maintenance of vegetation can be incorporated into general landscape management.<br><br>Litter and debris should be removed when required.                                                           |

| Item No. | Item                   | Description                                                                                                                                 | Maintenance Issues                                                                                      | Details of Inspection/Maintenance Activity/Plant Requirements                  |
|----------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 1.6      | Permeable Block Paving | A proprietary paving system with impervious blocks laid to provide void space for run-off to percolate through the surface to the sub-base. | Silts can build up in the joints between blocks. Ponding is an indication of contaminated block paving. | For maintenance of Marshalls Priors Concrete Block Paving refer to Appendix 2. |

## 2.2 Foul Water Drainage

| Item No. | Item                               | Description                                                                                                     | Maintenance Issues                                                  | Details of Inspection/ Maintenance Activity/Plant Requirements                                             |
|----------|------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| 1.1      | Foul Carrier Drains                | Carrier drains convey foul water across junctions.                                                              | Pipes can become blocked particularly on bends                      | Inspection and maintenance at 12 month intervals. Water jetting or rodding to be undertaken when required. |
| 1.2      | Foul Manhole Chambers              | Manholes chambers provide rodding and jetting access to pipework.                                               | Unlikely to experience issues, provide access to maintain pipework. | Manhole chambers should be inspected annually, debris should be removed if required.                       |
| 1.3      | Foul sewer stacks/sewer vent pipes | Provide a connection between appliances within the building that emit foul waste and the foul drainage network. | Pipes can become blocked particularly on bends                      | Inspection and maintenance at 12 month intervals. Water jetting or rodding to be undertaken when required. |

**APPENDIX 1**  
**FOUL AND SURFACE WATER DRAINAGE PLAN**



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NOTES

- DO NOT SCALE FROM THIS DRAWING.
- ALL DIMENSIONS ARE METRES UNLESS OTHERWISE STATED.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE STATED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- RAIN WATER PIPE CONNECTIONS FROM BUILDING SHOWN INDICATIVELY ONLY. TO BE CONFIRMED AT DETAILED DESIGN.

KEY:

- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- S --- EXISTING SURFACE WATER DRAINAGE
- F --- EXISTING FOUL WATER DRAINAGE
- LDC --- LINEAR CHANNEL
- MANHOLE (SURFACE WATER)
- GULLY
- RWP --- INDICATIVE RAIN WATER PIPE
- HEADWALL
- PERMAVOID COLLECTOR UNITS
- PERMAVOID DIFFUSOR UNITS
- +3.00 INDICATIVE FINISHED LEVEL
- PT1 - PERMEABLE BLOCK PAVING WITH PERMEABLE SUBBASE
- PT2 - IMPERMEABLE ASPHALTIC CONCRETE WITH PERMEABLE SUBBASE
- PT3 - RIGID PAVEMENT WITH PERMEABLE SUBBASE
- PT4 - ACCESS ROAD ASPHALTIC CONCRETE

|     |             |       |    |     |
|-----|-------------|-------|----|-----|
| P02 | PRELIMINARY | 07/08 | CL | MRD |
| P01 | PRELIMINARY | 25/06 | CL | MRD |
| Rev | Description | Date  | By | App |

PRELIMINARY

OLDLANDS FARM  
BOGNOR REGIS

RAMBOLL

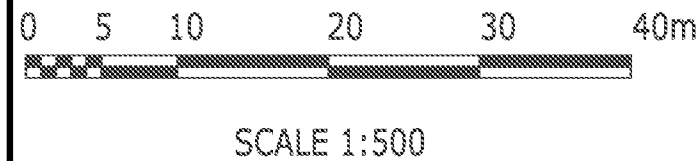
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PHASE 1A  
DRAINAGE LAYOUT

|                          |              |        |        |
|--------------------------|--------------|--------|--------|
| Project No:              | Scale (@A1): | Drawn: | Date:  |
| 1620003993               | 1:500        | CL     | JUN.19 |
| Drawing No:              | Rev:         |        |        |
| RAM-0500-01A-DR-CR-10001 | P02          |        |        |

| DIFFUSOR & COLLECTOR UNIT INVERT LEVEL                   |                              |                               |
|----------------------------------------------------------|------------------------------|-------------------------------|
| WITHIN PAVEMENT TYPE                                     | DIFFUSOR DEPTH TO INVERT (m) | COLLECTOR DEPTH TO INVERT (m) |
| PT1 - PERMEABLE BLOCK PAVING                             | 0.53                         | 0.63                          |
| PT2 - ASPHALT CARRIAGEWAY WITH PERMEABLE SUBBASE         | 0.70                         | 0.80                          |
| PT3 - SERVICE YARD RIGID PAVEMENT WITH PERMEABLE SUBBASE | 0.60                         | 0.70                          |

TABLE 1: DIFFUSOR UNIT INVERT LEVEL REQUIREMENTS



**APPENDIX 2**  
**MARSHALLS PRIOR CONCRETE BLOCK PAVING MAINTENANCE**

# MAINTENANCE

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## **GUIDELINES FOR THE MAINTENANCE OF MARSHALLS PRIORA CONCRETE BLOCK PAVING.**

To ensure the performance of the Piora permeable paving, Marshalls recommend the following maintenance be carried out as shown.

The maintenance of the pavement is to ensure the infiltration of the paving is not compromised. The following guidelines are offered as an initial regime, but maybe either increased or decreased depending on pavings local environment and any external contributing factors.

- A visual inspection of the paving may be carried out on a regular basis. This will confirm the effectiveness of the agitation maintenance due to variations between sites and allow any refinement of the regular agitation activity if necessary.
- The paving should be agitated (e.g. brushed, vacuumed, etc.) at least twice a year. This is to ensure no vegetation of any sort is allowed to grow and develop in the joints. Ideally, this activity should be carried out in the spring and autumn seasons.
- The paving should be inspected after any heavy precipitation to ensure no displacement of any organic matter onto the surface of the pavement.
- For winter maintenance, the controlled use of de-icing may be used without causing significant detrimental effects towards the permeable pavements performance. When used carefully, the use of these chlorides will not result in an increase in the chloride levels in the local ground.
- Where non-infiltration systems have been employed, the inspection of the outfalls should be undertaken initially on a twice-yearly basis.

Depending on the amount of usage and the environment the permeable pavement has received and been exposed to, the laying course material may require either cleaning after a 25 to 30 year period. This would be evident if the infiltration rate of the paving became prolonged, allowing ponding to develop. Should this occur, the uplifting and cleaning (or replacing, depending on the costings of the activity,) of the laying course maybe considered. The laying course material, jointing and Piora blocks may be reused, minimising costs.

# MAINTENANCE

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## **GUIDELINES FOR THE ACCESSING OF MARSHALLS PRIORA CONCRETE BLOCK PAVING.**

Marshalls would advise during the design stage of the project, consideration should be given to the placement and location of underground utilities. This is intended to minimise the need to carry out any excavation work within the main permeable pavement construction

Should a situation arise where access is required, Marshalls would suggest the following approach to the works.

The initial trench width for excavating should be related to the depth of the sub-base material. For example, consideration to the width of the utility should be considered, plus a degree of working space. The utility undertaker will decide this. In addition to this figure, Marshalls would advise the overall width is determined by the depth of the open graded material plus 20%.

When removing the first block, a suitable location, such as at the perimeter of the installation or where a unit exists with a larger joint width surrounding it should be considered. Next, as much jointing material should be cleared as possible to reduced the integrity being offered by this material.

Once a block has become suitably loosened, a block lifter should used to remove it. Due to the interlock offered by the spacer nib profile, it may be necessary to have the block being lifted held in a lifted position, whilst a second person taps the adjacent blocks with a suitable lump hammer or rubber mallet. This may be repeated for the first few units during removal.

Once the desired area of paving has been removed and carefully staked for reuse, a suitable surfacing material (e.g. membrane, wooden boards, etc.) should be placed on the surrounding paving for the laying course and sub-base materials to be separately stock-piled.

Once completion of the utility work, the pavement should be reconstructed as per Marshalls Installation Guide.

If the pavement construction contains any water-proof membranes or geotextiles, these should be sliced, folded back and weighed down during the opening of the pavement.

Upon reinstatement, these should be folded back into their original position and be overlaid with a new corresponding material (overlap dimension to be determined between the utility contractor and the membrane/geotextile manufacturer; consideration to bonding/welding the reinstated material should

be given depending on site conditions) which has been cut to an appropriate size, before continuing with the next layer of construction.