# Drainage Strategy Report

## Development to rear of Chantry House

## 3 Chapel Lane

## Statherm

## Melton Mowbray

## LE14 4HA

Version 02
Date of Report: 19/04/2021

**Schedule**

**Re: Development to rear of Chantry House, 3 Chapel Lane, Statherm, Melton Mowbray**

**LE14 4HA**

| Revision | Status | Author | Reason for Issue | Date of Issue |
|---|---|---|---|---|
| Draft | First Issue to Client | RNL | For Client to comment | 19/04/2021 |
| 01 | Second Issue to Client | RNL | For Client to comment | 22/04/2021 |
| 02 | Second Issue to Client | RNL | For Client to comment | 15/07/2021 |
| | | | | |

## List of Contents



## List of Appendices

## List of Calculations



## List of Tables

## 1.0 Executive Summary

The Planning application has been submitted and approved by the Local Planning Authority for Development to rear of Chantry House, 3 Chapel Lane, Statherm, Melton Mowbray LE14 4HA.

This report in support Planning Conditions:

Condition 7 states that –

*No development approved by this planning permission shall take place until such time as a surface water drainage scheme has been submitted to, and approved in writing by, the Local Planning Authority. The scheme shall include, but not be limited to, demonstration that there should be no increase to average or peak flows of surface water run off leading towards the nearby watercourse.*

The source controls are -

- The surface water runoff discharge from the roof area to be discharged into the watercourse.
- The private access road to the new development will form as gravel area. The surface water runoff from path will retain within site.
- The landscape area forming surrounding the site to mature tree all will help to retain surface water run-off within site.

The foul flows generated from the new development will be free flow into public sewerage system.

The development site falls within in Flood Zone 1 area with a low probability of flooding.

The surface water runoff will retain the first 5mm of rainfall development site.

Since the new development to be on greenfield site, our aim to achieve 50% betterment surface water runoff rate.

## 2.0 Brief

2.1 East Midlands Drainage Services Ltd have been commissioned by Jared Hather (Proprietor) to undertake the drainage strategy to discharge Planning Conditions 7 in connection with the development to rear of Chantry House, 3 Chapel Lane, Statherm, Melton Mowbray LE14 4HA.

2.2 The purpose of this document is to report on the conceptual drainage strategy of the proposed development.

## 3.0 Introduction

3.1 The local lead flood authority (LLFA) is Melton Borough Council.

3.2 The site is located within Melton Borough Council (MBC) administrative areas and to comply with Local Plan 2014.

3.3 The Local Authority Planning Application no.- 21/00477/FUL.

3.4 The site is located off Chapel Lane, Statherm. The Ordnance survey area SK7731SW.
The national grid reference:
X (Easting) 477060
Y (Northing) 331080

3.5 The entrance to site can be access side of 3 Chapel Lane, Statherm.

3.6 The development site is designated as greenfield land situated land to rear of 3 Chapel Lane, Statherm LE14 4HA.

3.7 The drainage strategy report has been prepared by EMD Services Ltd in support of the MBC for a new two storey four bedroom dwelling development to rear of 3 Chapel Lane, Stathern.

3.8 A location can be found in Appendix A.

3.9 The total development considered to be greenfield site with an approximate area 1957 sq/m (0.1957ha).

3.10 The aim of the report is to provide an overview of the proposed drainage strategy for the development and should be used in conjunction with all other submitted information relating to drainage.

## 4.0. Document Examined

4.1 Proposed site layout plans produced by Martin Spencer (Architect) can be found in Appendix B.

4.2 Extent of flood zone map from the Environment Agency can be found in Appendix K.

4.3 Developers enquiry and obtain sewer record plan record from by Severn Trent can be found in Appendix I.

4.4 Hydraulic calculation supported by HR Wallingford and Causeway Flow can be found in Appendix K, L & M.

## 5.0 Proposed Development

5.1 The new development for a new two storey four bedroom dwelling to rear of 3 Chapel Lane, Stathern.

5.2 Existing and proposed breakdown site area can be found in Appendix C & D.

## 6.0 SuDS Hierarchy

6.1 General principles of surface water run-off from new development site.

6.2 The DEFRA Sustainable Drainage Systems states that the following options should be considered for disposal of surface water runoff in order of preference:

- Discharge to ground
- Discharge to surface water body
- Discharge to surface water sewer
- Discharge to combined sewer

To integrate and maximise potential use of SuDS in accordance with the National Planning Policy Guidance (NPPG) SuDS Hierarchy can be found in Table 3.

## 7.0. Sewer Sources

7.1 Severn Trent Water is responsible for the operation and maintenance of public sewers within Stathern and Severn Trent Water asset records will need to be obtained as part of an initial developer enquiry.

7.2 Tidal/Coastal.

7.3 The site is not coastal and as such is not affected by coastal or tidal flooding.

7.4 According to Environment Agency record there is a low probability of surface flooding. For further information this can be found in Appendix J.

## 8.0. Artificial Water Bodies

8.1 Reservoir flooding is extremely unlikely to happen.

8.2 There is no risk of flooding from river or sea.

## 9.0 Flood Risk Assessment

9.1 Since the site less than 5 hectares therefore a Flood Risk Assessment and Flood Plan not required.

9.2 According to the EA Flood Map for Planning the development site located in Flood Zone 1 (with a low probability of flooding as defined in the NPPF).

9.3 In accordance with (CIRIA C635 Designing for exceedance in urban drainage) the surface water generated has adequate capacity in drainage network will not exceeded during intense rainfall events or incidents of system blockage.

## 10.0 Surface Area Summary

Existing Area

The development site considered to be greenfield site with an area of 1957 sq/m (0.1957ha). For breakdown area can be found in Appendix C.

Propose Area

The proposed development roof area of 105 sq./m (0.0105 ha). The proposed surface breakdown area can be found in Appendix D.

Greenfield runoff rate

In accordance with the Sustainable Urban Design Systems (SuDS) Manual C753 and CIRIA, 2015 edition, the greenfield runoff from the site has been calculated using the IH124 methodology.

The soil classification can be found in Table 4. The National Planning Policy Framework (NPPF) for flood zone 1 can be found in Table 5. The Extract from National Planning Policy Guidance can be found in Table 6.

Using Causeway Flow simulation latest software version 10.1 (November 2020) for IH124 the surface water discharge for greenfield runoff rainfall intensity rate as follow –

The greenfield run-off rates are based on the parameters provided as follow:

Table 1 - Rural run-off calculator parameters:

| Parameter | Value |
|---|---|
| Area (ha) | 0. 1957 |
| SAAR (mm) | 618 |
| Soil Type | 4 |

The roof area being impermeable to be positively drain into watercourse. The calculations presented in Appendix M can be summarised as follow:

Table 2 - Existing Greenfield Run-off Rates:

| Parameter | Value for site (l/s) |
|---|---|
| Q1 BAR | 0.00 |
| Q10 BAR | 0.10 |
| **Q30 BAR** | **0.10** |
| Q100 (l/s) | 0.10 |

## 11.0 Exceedance Flood Route

A review of ordnance survey mapping illustrates that the development site occupies a small plateau approximately 70.660m AOD.

The development site is steeps with approximate distance of 78m from south to north and 40m east to west with an area of 1807 sq/m (0.1957 ha). This can be found in Appendix G.

The development site designed to manage potential exceedance flows are managed within the site without increasing risk to the development or adjacent site.

In accordance with CIRIA C635 the exceedance flows are “flows generated when the capacity of the drainage network is surpassed during intense rainfall events at 1 in 100 year return per period plus 40% climate change.

## 12.0 Drainage Strategy

### Impermeable Area

The roof area comprises of roof area 105.00 sq/m (0.0105ha).

The rainwater pipe (rwp) and waste connections to be finalised at detailed drainage design as part of Building Control submission.

### Source Control

The source controls are -

- The surface water runoff from the roof 105 sq/m (0.015a) to be discharged into watercourse to South boundary of the site.
- The grave area of 200 sq/m (0.0220ha).
- The landscape area comprises of hedge, some trees and grassed with an area of 1652 sq/m (0.1652ha).

For information on source control can be found in Appendix H.

## 13.0 Surface Water Drainage

13.1 There is a public surface water some distance away in Main Street. This can be found in Appendix I.

13.2 Severn Trent Water is responsible for the operation and maintenance of surface water sewers within Stathern.

13.3 The site is designated as greenfield site to be used as new development for single residential plot.

### 13.4 Surface Water Drainage

The proposed surface water drainage runoff of the site can be summarised as follows:

Surface water runoff from the roof to be discharged into the watercourse.

13.5 Under no circumstance foul waste must **not** be allowed to connect into surface water drainage system.

13.6 For further detail the surface water drainage strategy can be found in Appendix I.

13.7 In the event rainfall the new development will retain the first 5mm of rainfall within development site for sustainable drainage. This has been demonstrated using hydraulics calculations produced. This can be found Appendix M.

13.8 Part H of the Building Regulations 2010 recommends that surface water run-off shall discharge to one of the following, listed in order of priority.

- An adequate soakaway, rainwater harvesting or some other adequate infiltration system,
- A watercourse,
- A public surface water sewer.

13.9 There is a watercourse to southern boundary of the site which could be utilised to discharge surface water runoff from the development.

13.10 Sewers within the site are to be designed in accordance with the latest industry standards. Thus, it is proposed to follow the guidelines of Building Regulations Approved Document H – Drainage and Waste Disposal (2002 Edition incorporating 2010 amendments)

13.11 The development site area 1957 sq/m2 (0.1957 ha). Within hydraulic calculations, we have allowed 10% urban creep. The proposed rate of discharge to be QBAR, pr = 0.10 lit/sec which can be found in Appendix M.

## 14.0 Foul Water Drainage

14.1 There is a public combined sewer system to North of Chapel Lane, Stathern. his can be found in Appendix I.

14.2 Severn Trent Water is responsible for the operation and maintenance of foul water sewers within Stathern.

14.3 Foul Water Drainage Strategy.

14.4 A new foul water drainage system is to be constructed on site. Foul water effluent generated by the development is to drain into the adopted foul sewer system situated in Chapel Lane at an unrestricted rate.

14.5 Propose drainage layout can be found in Appendix F.

14.6 Sewers within the site are to be designed in accordance with the latest industry standards. Thus, it is proposed to follow the guidelines of Building Regulations Approved Document H – Drainage and Waste Disposal (2002 Edition incorporating 2010 amendments).

## 15.0 Propose Drainage

15.1 The proposed foul and storm can be found in full drainage strategy in Appendix H.

15.2 The proposed drainage for Planning purpose only. This is not to be confused with detailed drainage design which will be required separately for Building Regulation Part H 2010.

15.3 The proposed drainage manholes should be publicly accessible and for future maintenance purpose.

15.4 Demarcation chambers to be provided for foul and storm drainage system.

15.5 Upon construction 'As Built' site drainage drawing and schedule to be made available serving building to enable drainage maintenance and future works to be undertaken.

15.6 The foul and surface water drainage to remain private and responsibility of the owner/occupier upon construction.

15.7 In accordance with The SuDS Manual CIRIA C753 please refer to manhole & inspection chamber maintenance schedule Table 7**.**

15.8 The outfall maintenance schedule can be found in Table 8**.**

15.9 The flap valve maintenance and inspection can be found in Table 9**.**

15.10 The minimum is required access and removing the need for direct man access to sewer manhole.

## 16.0 Sustainable Drainage Systems (SuDS)

16.1 The integration of sustainable underground drainage systems (SuDS) has been taken into consideration to reduce surface water runoff and comply with the National Planning Policy Guidance: Flood risk and coastal change (2014).

16.2 The purpose of SuDS to reduce surface water runoff which comply with National Planning Policy Guidance.

16.3 The gravel including path and area all will help reduce surface runoff within site.

16.4 The SuDS managements consist of soft landscape area of 1652 sq/m.

16.5 The benefits SuDS management will minimise likelihood of flooding and improve water quality and bio-diversity.

## 17.0 Water Quality Treatment

17.1 In accordance with The SuDS Manual (CIRIA C753) 2015, wherever possible good practice, should be considered as follow:

- Manage surface water run-off close within site,

- Manage surface water run-off close within site,
- Minimise impacts from accidental spills,
- Treat surface water run-off on the surface,
- Treat surface water run-off to remove a range of contaminants,

17.2 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution close to the source and can help keep pollutant levels and accumulation rates low. To help maximise the amenity & biodiversity and to keep maintenance activities straightforward and cost-effective.

17.3 This can be effectively managed by an appropriate sequence of SuDS components.

17.4 The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be retained on site.

17.5 The proposed development is a combination of runoff from roof water low to medium hazard area.

## 18.0 Landscaping

18.1 The green area mainly to be grassed with hedge at front with an area of 1652 sq/m (0.1652 ha).

18.2 The private access to the new development will form gravel area. The gravel area will retain within site.

## 19.0 Summary

SuDS techniques has been considered to reduce surface water runoff and comply with the National Planning Policy Framework Guidance and in accordance with CIRIA C753.

This report has met and produced in accordance with the SuDS Manual CIRIA C697.

The surface water runoff within the development site to retain the first 5mm of rainfall.

Based on the findings, we would conclude that the most appropriate means of managing surface water run-off from the proposed development would be through a gravity connection from proposed roof into nearby watercourse to southern boundary of the site.

For best management practice and low-level impact to development this will form part of SuDS technique.

## 20.0 Recommendations

20.1 The surface water runoff into the watercourse will require consent to discharge from the Environment Agency

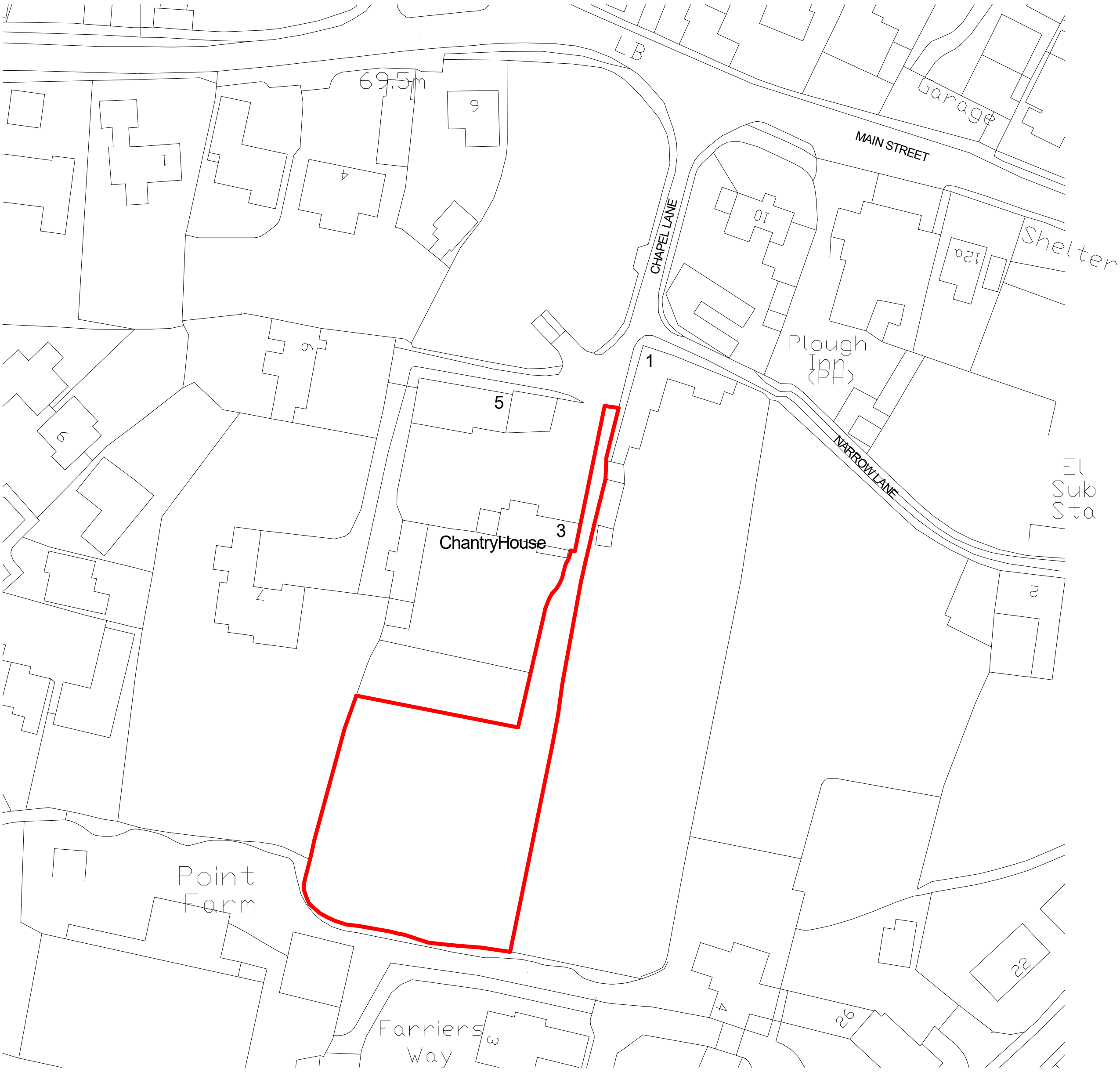
20.2 It is advisable to check for any easement.

20.3 To check for possible below ground services.

20.4 To check for any other site constraint to which we may not be aware of.

# APPENDICES

# Appendix A



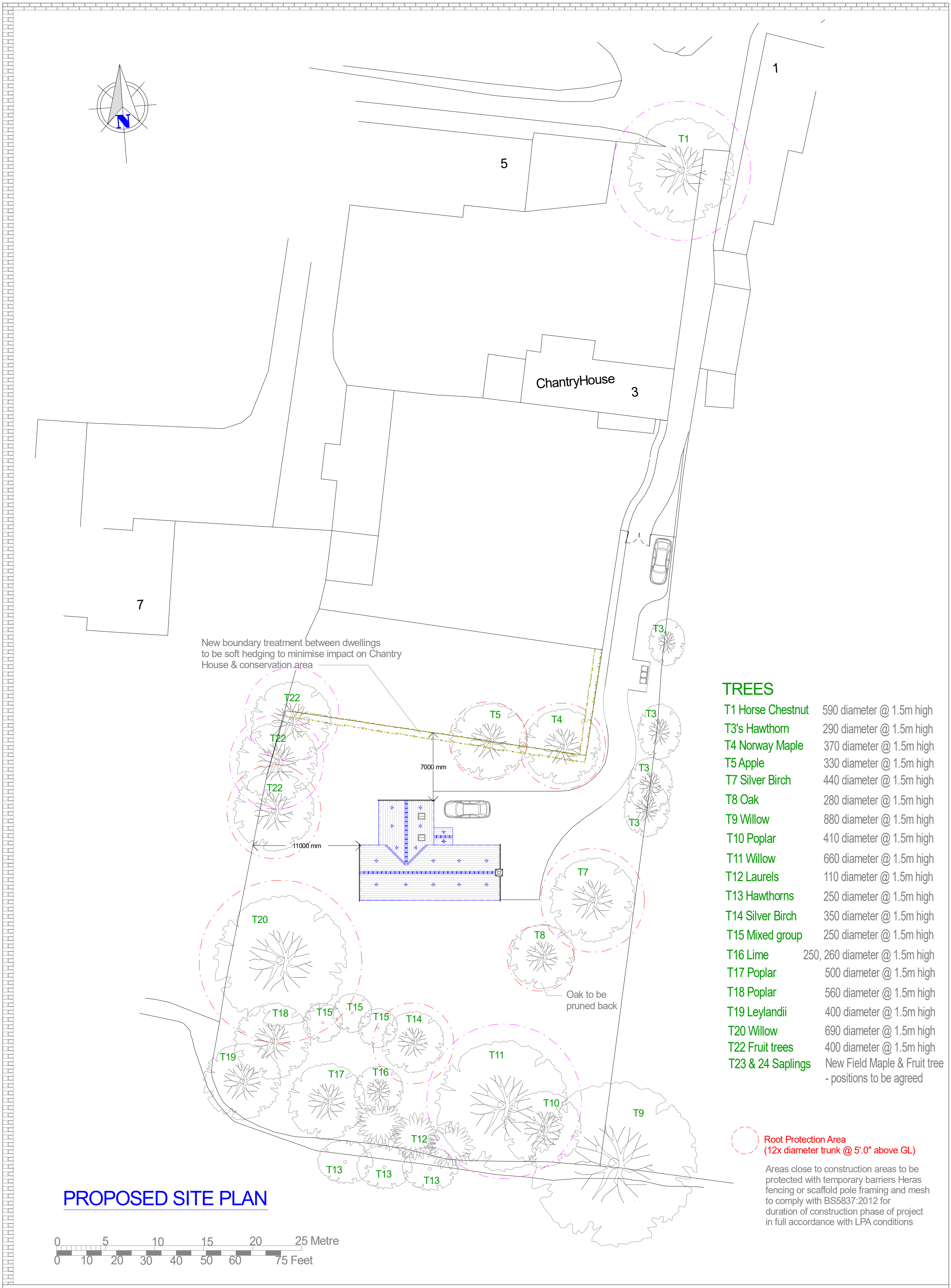

Application Site

0 10 20 30 40 50 60 80 100 Metres
0 50 100 200 300 Feet



| | | | | | |
|---|---|---|---|---|---|
| PROJECT | New Dwelling | PLANNING HOME & BUILDING Improvements PHaB Tel. 01526 860761 | DETAIL Location | | STATUS Building Control |
| LOCATION | Adjacent 3 Chapel Lane, Stathern, LE14 4HA | | DRAWN Martin Spencer | DATE September 2020 | DWG No. Rev. |
| CLIENT | Jared Hather | | SHEET SIZE A4 SCALE 1:1250 @ A4 or as otherwise shown | DIMS M | HS2030/L/01 |

# Appendix B



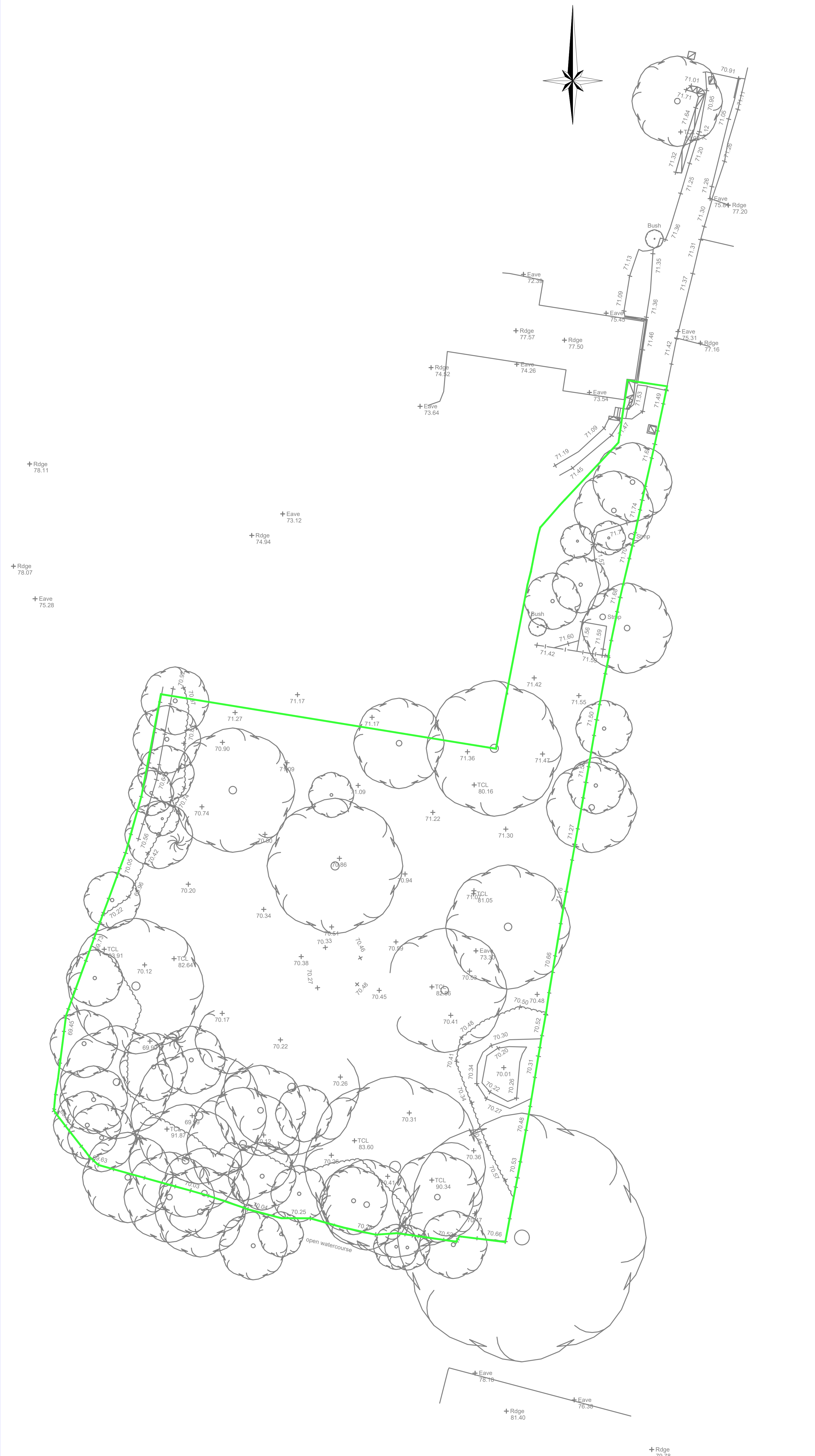



| | | | |
|---|---|---|---|
| PROJECT New Dwelling | PLANNING HOME & BUILDING improvements PHaBi | DETAIL Proposed Site Plan | STATUS Planning |
| LOCATION Adjacent 3 Chapel Lane, Stathern, LE14 4HA | Tel. 01526 860761 | DRAWN Martin Spencer / DATE April 2021 | DWG No. Rev. |
| CLIENT Jared & Polly Hather | SHEET SIZE A4 SCALE 1 : 500 @ A4 or as otherwise shown | DIMS mm | HS2049/SP/02 |

# Appendix C

**Existing Area**

Existing site area 1957sq/m (0.1957ha)




General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| A | 03/04/21 | Site boundary and legend updated. | RNL | JH |

STATUS

FOR PLANNING



CLIENT

JARED HATHER

SITE

Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE

Existing Area

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH

Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED RNL | PASSED JH |

| DRAWING NO. | REV. |
|---|---|
| 20/174.50/010 | A |

## Appendix D

**Propose Area**

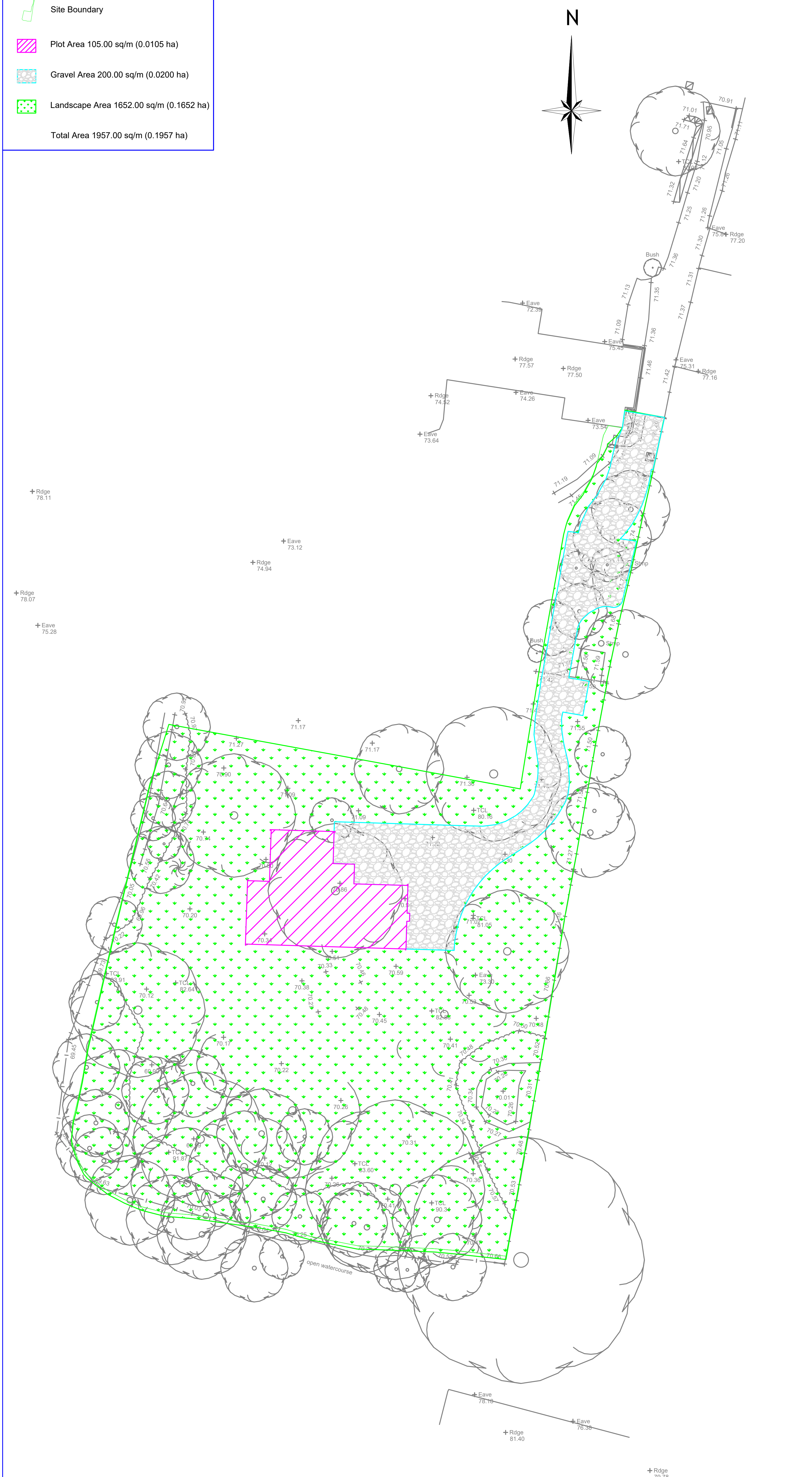
Site Boundary

Plot Area 105.00 sq/m (0.0105 ha)

Gravel Area 200.00 sq/m (0.0200 ha)

Landscape Area 1652.00 sq/m (0.1652 ha)

Total Area 1957.00 sq/m (0.1957 ha)




General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| B | 14/07/21 | Site area updated. | RNL | JH |
| A | 03/04/21 | Site boundary updated. | RNL | JH |

STATUS

FOR PLANNING



CLIENT

JARED HATHER

SITE

Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE

Propose Area

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH

Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED RNL | PASSED JH |

DRAWING NO. 20/174.50/020

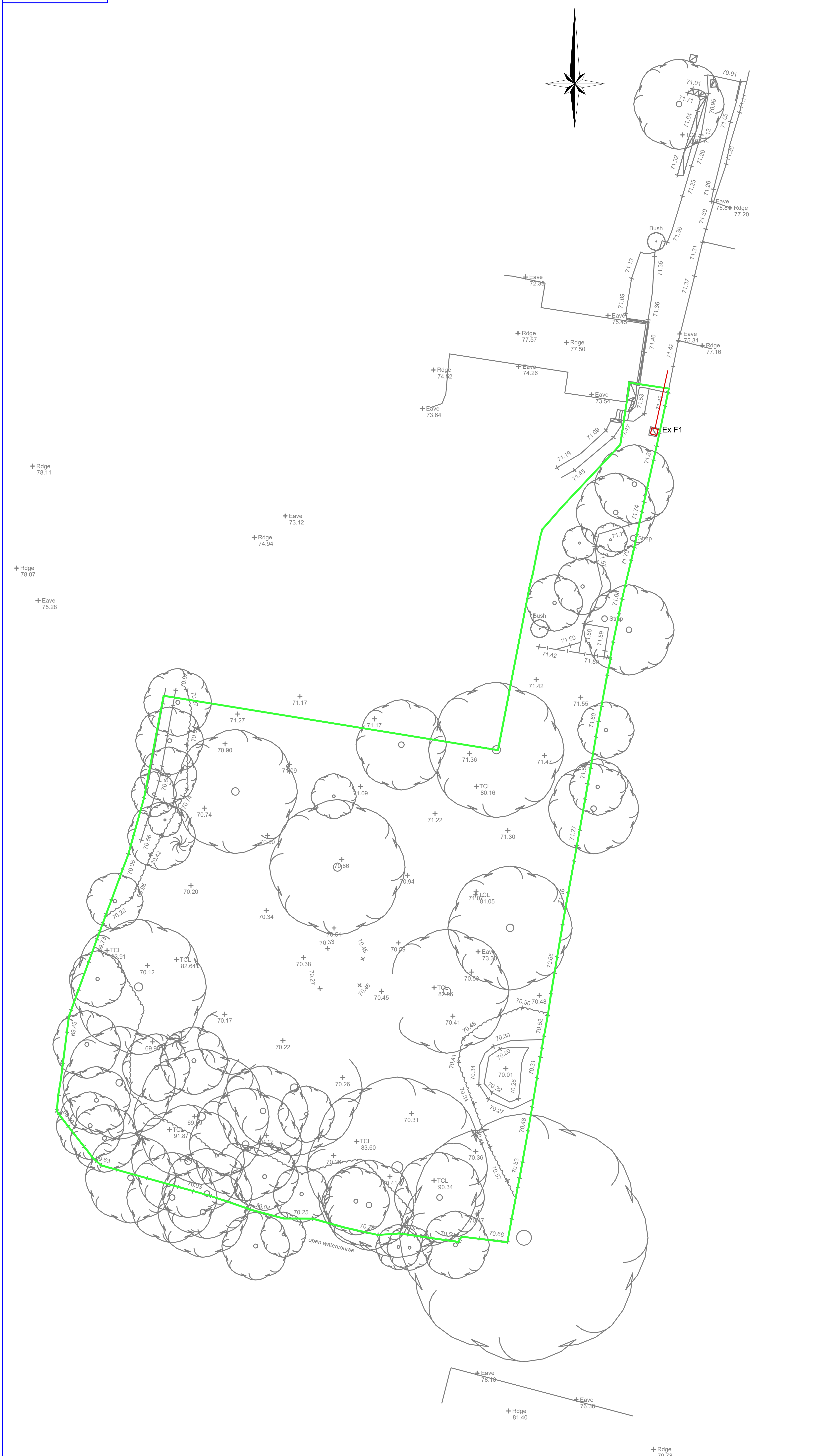
REV. B

# Appendix E

**Legend**

Existing Drain

Ex F1 Combined Drain




General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|

STATUS

FOR PLANNING



CLIENT

JARED HATHER

SITE Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE

Existing Drain

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH
Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED RNL | PASSED JH |

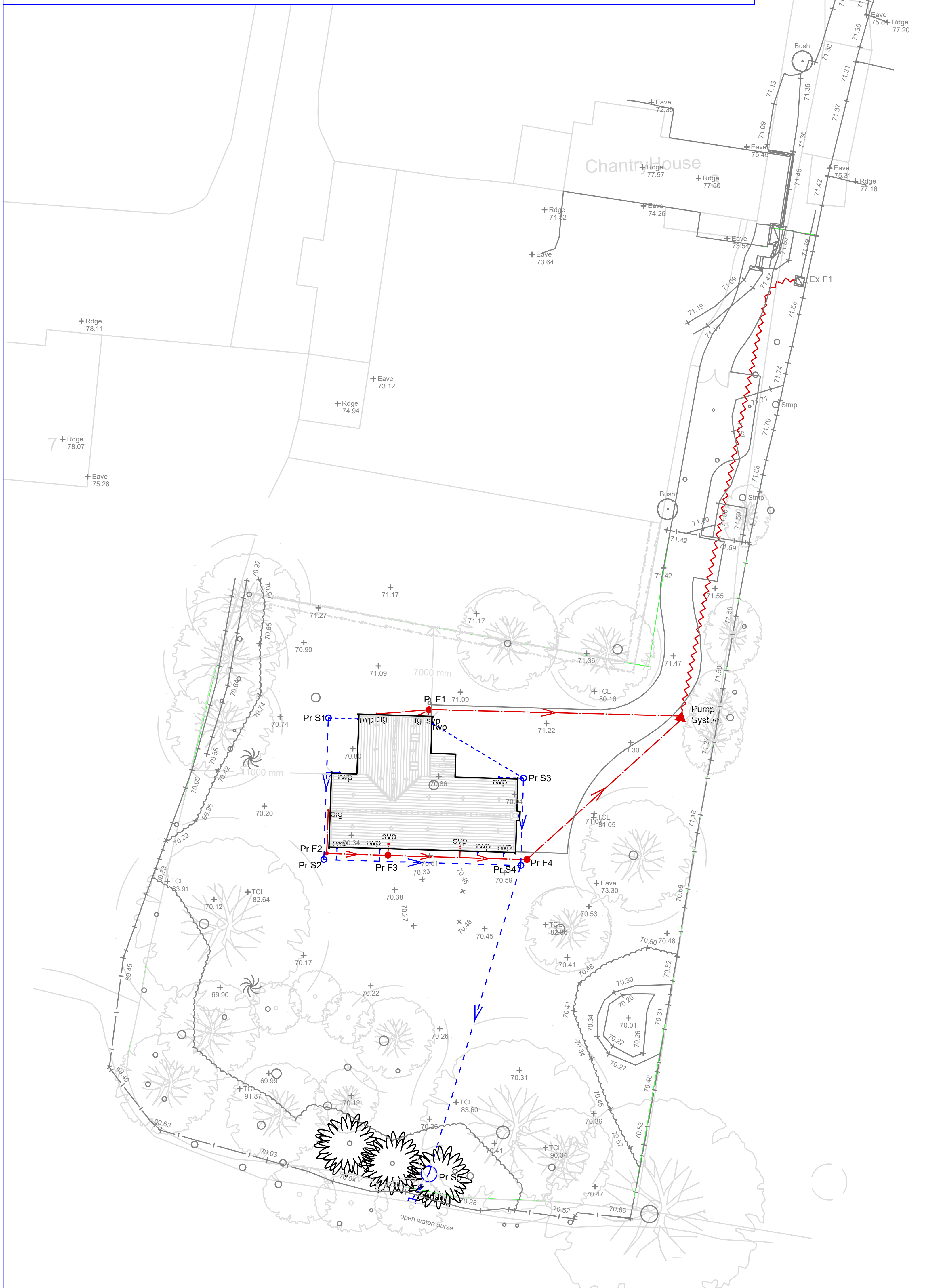
DRAWING NO. 20/174.50/030

REV. –

# Appendix F

**Manhole Schedule**

| Manhole Number | Function | Type | Approximate Cover Level (m) | Invert Level (m) | Depth (m) | Pipe Size (mm) Ø | Length (m) | Gradient (1/x) | Pipe | Class | Manhole Type | Minimum Internal Size Diameter (mm) | Access Cover Type | Access Cover Opening | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pr F1 | Foul | Propose | 70.510 | 70.010 | 0.500 | 110 | 19.100 | 1 in 80 | pvc | B125 | pipe | 450 | B125 | 225mm Ø | Head of the run. |
| Pr F2 | Foul | Propose | 70.510 | 69.950 | 0.560 | 110 | 4.700 | 1 in 80 | pvc | B125 | pipe | 225 | B125 | 450mm Ø | None. |
| Pr F3 | Foul | Propose | 70.510 | 69.890 | 0.620 | 110 | 10.650 | 1 in 80 | pvc | B125 | pipe | 450 | B125 | 450mm Ø | None. |
| Pr F4 | Foul | Propose | 70.510 | 69.755 | 0.755 | 110 | 15.855 | 1 in 80 | pvc | B125 | pipe | 450 | B125 | 225mm Ø | Head of the run. |
| Pump system | Foul | Propose | 71.300 | 69.555 | 1.745 | 75 | 35.500 | - | - | - | - | - | - | - | Pumped main to existing manhole up to 35m. Anticipated foul flow rate of 0.038 lit/sec at 1/3 design flow rate. |
| Ex F1 | Foul | Existing | 71.585 | 70.315 | 1.270 | - | - | - | - | - | - | - | - | - | Outgoing pipe IL= 70.315m. Incoming IL=70.355m |
| | | | | | | | | | | | | | | | |
| Pr S1 | Storm | Propose | 70.510 | 70.110 | 0.400 | 150 | 10.855 | 1 in 100 | pvc | B125 | pipe | 450 | B125 | 450mm Ø | Head of the run. |
| Pr S2 | Storm | Propose | 70.510 | 70.000 | 0.510 | 150 | 15.100 | 1 in 100 | pvc | B125 | pipe | 450 | B125 | 450mm Ø | None. |
| Pr S3 | Storm | Propose | 70.510 | 69.850 | 0.660 | 150 | 6.700 | 1 in 100 | pvc | B125 | pipe | 450 | B125 | 600mm Ø | Concrete manhole. |
| Pr S4 | Storm | Propose | 70.510 | 69.785 | 0.725 | 150 | 24.500 | 1 in 100 | pvc | B125 | pipe | 450 | B125 | 450mm Ø | None. |
| Pr S5 | Storm | Propose | 70.300 | 69.540 | 0.760 | 150 | 2.300 | 1 in 100 | pvc | B125 | pipe | 450 | B125 | 450mm Ø | Concrete manhole with 500mm sump. |
| | | | - | 69.565 | 0.735 | 150 | | | | | | | | | Pipe IN from Pr S4 |
| | | | - | 69.040 | 1.260 | 150 | | | | | | | | | Sump |
| Outfall | Storm | Propose | - | 69.500 | - | 150 | - | - | clay | B125 | concrete | 1200 | D400 | 600mm Ø | Pipe OUT 150 mmm dia. Preform concrete outfall. Flap valve fitted at outgoing pipe. Restricted flow at 2 lit/sec. |




**Legend**

Existing Drain

- Combined Drain

Propose Drain

- Foul Drain
- Pump system
- Soil Vent Pipe (svp)
- Back Inlet Gully (big)
- Storm Drain
- Storm Outfall
- Rainwater Pipe (rwp)
- Storage Tank (4.0 cu/m)

General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| C | 15/04/21 | Propose drainage and manhole schedule updated. | RNL | JH |
| B | 12/04/21 | Added online storage tank. | RNL | JH |
| A | 09/04/21 | FFL updated. Added pump main & legend. Manhole schedule updated. | RNL | JH |

STATUS

FOR PLANNING



CLIENT

JARED HATHER

SITE

Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE

Proposed Drain

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH

Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED: RNL | PASSED: JH |

DRAWING NO. 20/174.50/040

REV. C

# Appendix G


General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| A | 14/07/21 | Flood route updated due to relocation on Plot layout. | RNL | JH |

STATUS

FOR PLANNING



CLIENT

JARED HATHER

SITE

Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE

Flood Route Plan

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH
Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED RNL | PASSED JH |

DRAWING NO. 20/174.50/050

REV. A

## Appendix H

**Legend**

Site Boundary

Existing Drain
- Combined Drain

Propose Drain
- Foul Drain
- Soil Vent Pipe (svp)
- Back Inlet Gully (big)
- Storm Drain
- Storm Drain with orifice plate
- Rainwater Pipe (rwp)
- Rodding Eye Access (re)
- Storage Tank (4.0 cu/m)

**Area**

- Plot Area 105.00 sq/m (0.0105 ha)
- Gravel Area 200.00 sq/m (0.0200 ha)
- Landscape Area 1652.00 sq/m (0.1652 ha)

Site Details

Site Area
Existing site area: 1957 sq./m2 = 0.1957 ha

Development site area: 305 sq./m2 = 0.0305 ha

Breakdown
Impermeable (roof) area: 105q./m = 0.0105 ha

Gravel area: 200 sq./m = 0.00200 ha

Grassed/soft area: 1652 sq./m = 0.1652 ha

Building Regulations notes
Any pipe size with cover to soffit less than those stated above are to have a Class Z concrete pipe bed & surround

Minimum pipe cover to soffit to be as per The Building Regulations 2010 Part H for thermoplastic pipes:

0.6m in pedestrian or landscape area

0.9m in vehicle accessible area

Any pipe size with cover to soffit less than those stated above are to have a Class Z concrete pipe bed & surround

key points

1. All drains to remain private.
2. The propose surface water flow to be 2 lit/sec.
3. Consent to discharge will be required into the watercourse from the Environment Agency.

Important Notes

Proposed foul and surface water drain connection to combined drainage system will require approval from Severn Trent Water.

Proposed drainage to be finalised at Building Control approval.


General Notes

1. DO NOT SCALE.
2. Note All dimensions in metres (m) unless otherwise stated.
3. This drawing based on 3D topographical survey produced by Survey Hub dated 16/12/2019.
3. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the contractor commence site work prior to such approval being given it is entirely at his own risk.
5. Sketch proposals are for illustrative purposes only & as such are subject to detailed site investigation including ground conditions / contaminants, drainage, design & planning/density negotiations.

| REV | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| A | 15/07/21 | Drainage strategy plan updated due to relocation on Plot layout. | RNL | JH |

STATUS
FOR PLANNING



CLIENT
JARED HATHER

SITE
Development to rear of Chantry House
3 Chapel Lane
Statherm
Melton Mowbray
LE14 4HA

TITLE
Drainage Strategy Plan

East Midlands Drainage Services

East Midlands Drainage Services Ltd
Leicester Business Centre
111 Ross Walk
Leicester
LE4 5HH

Tel: 0116 208 1155
Tel: 01509 39 38 37
info.emdrainage.co.uk
www.emdrainage.co.uk

| SCALE | DRAWN | DATE |
|---|---|---|
| 1 to 500 @ A3 | RNL | March 2021 |
| | CHECKED RNL | PASSED JH |
| DRAWING NO. 20/174.50/060 | | REV. A |

# Appendix I

WONDERFUL ON TAP

East Midlands Drainage Services Ltd.
Leicester Business Centre
111, Ross Walk
Leicester
LE4 5HH

FAO: Ras Limbachia

**Severn Trent Water Ltd**
Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

Tel: 024 777 16843

www.stwater.co.uk
**net.dev.east@severntrent.co.uk**

Contact: Asset Protection East (waste water)

15th December 2020

Our Ref: 8442005

Dear Sir,

**Rear of 3, Chapel Lane, Stathern, Melton Mowbray, Leics.**
**Proposed 1 detached dwelling (477060, 331080)**

I refer to your 'Development Enquiry Request' in respect of the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) which refer to surface water disposal from development sites.

Protective Strips

There are no public sewers, as shown on the records, located within the proposed development site.

Due to recent change in legislation, there could be sewers, which have transferred over to the Company that are not shown on the statutory sewer records but may be located on your clients land. These sewers will have protective strips that we will not allow to be built over. The sewers could be identified whilst the land is being surveyed. If this is the case, please contact us for further guidance upon discovery.

Please note: there is no guarantee that you will be able to build over or close to any Severn Trent sewers, and where a diversion is required there is no guarantee that you will be able to undertake those works on a self-lay basis. Every approach to build near to or divert our assets has to be assessed on its own merit and the decision of what is or isn't permissible is taken based on the risk to the asset and the wider catchment it serves. It is vital therefore that you contact us at the earliest opportunity to discuss the implications of our assets crossing your site. Failure to do so could significantly affect the costs and timescales of your project if it transpires diversionary works need to be carried out by Severn Trent.

Foul Water Drainage

The application has stated the new property will connect into the private drainage system of the adjacent property 3, Chapel Lane which connects to the public 150mm dia public sewer in Chapel Lane.

It is assumed that the connection into the private system can be achieved by gravity and as such the flows will be very low and have negligible impact on the network. Therefore, the connection for the foul flow can be accepted.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2010, the disposal of surface water by means of soakaways should be considered as the primary method. If this is not practical and no watercourse is available as an alternative, the use of sewerage should be considered. In addition, other sustainable drainage methods should also be explored before a discharge to the public sewerage system is considered.

If ground conditions are not suitable, for soakaways and other SUDs techniques, evidence should be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter). This would satisfy the SGN (enclosed).

The proposed surface water run-off from the new impermeable areas of this property are to drain to the watercourse along the southern boundary of the site, therefore there is no need for me to comment on the surface water.

Any flows generated by the site in excess of the permitted discharge rate will have to be attenuated within the development site, as agreed with the LLFA.

Connections

For any new connections including the use, reuse and indirect to the public sewerage system, the developer will need to submit Section 106 application. Our Developer Services department are responsible for handling all such enquiries and applications. To contact them for

WONDERFUL ON TAP

an application form and associated guidance notes please call 0800 707 6600 or download from www.stwater.co.uk

Please quote the above reference number in any future correspondence (including e-mails) with STW Limited. Please send **all correspondence** to the net.dev.east@severntrent.co.uk email inbox address, a response will be made within 15 days.

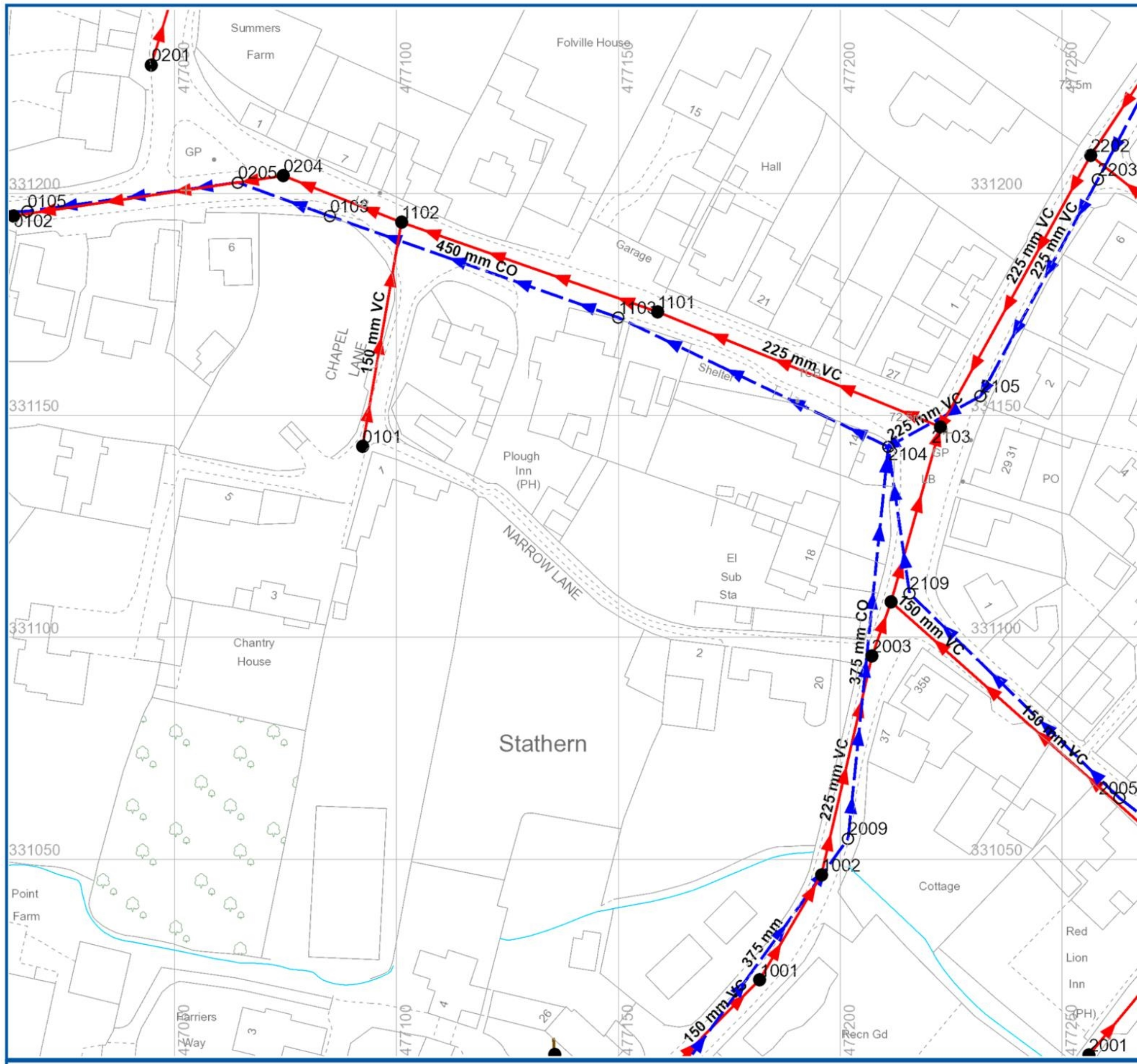
If you require a VAT receipt for the application fee please email MISCINCOME.NC@SEVERNTRENT.CO.UK quoting the above Reference Number.

Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely,

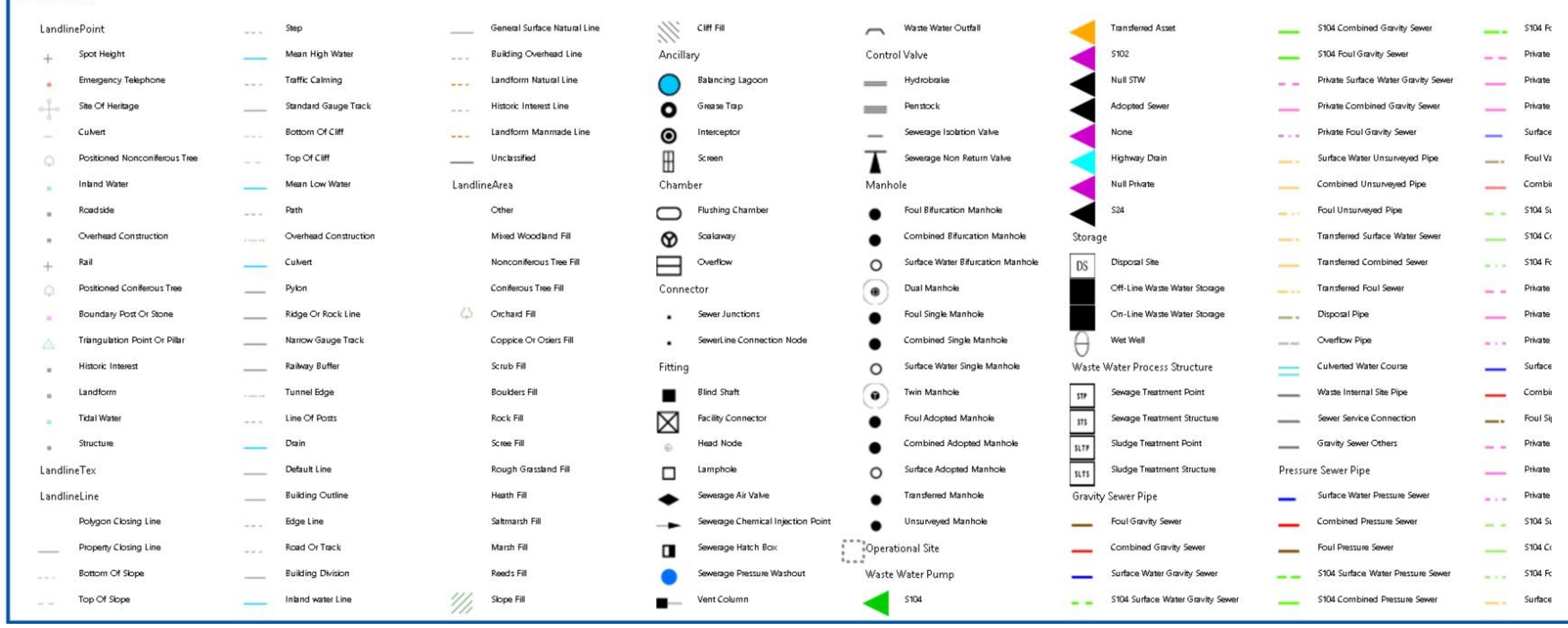
K Baker

Keith Baker
**Senior Evaluation Technician**
**Asset Protection East (wastewater)**
**Asset Strategy & Planning**
**Chief Engineer**




| Reference | Cover Level | Invert Level Upstream | Invert Level Downstream | Purpose | Material | Pipe Shape | Max Size | Min Size | Gradient | Year Laid |
|---|---|---|---|---|---|---|---|---|---|---|
| SK77311101 | 71.3499 | 68.6 | 67.9 | C | VC | C | 225 | <UNK> | 87.19 | 31/12/1899 00:00:00 |
| SK77311102 | 70.0199 | 67.9 | 67.44 | C | VC | C | 225 | <UNK> | 61.37 | 31/12/1899 00:00:00 |
| SK77311001 | 73.79 | 71.94 | 71.72 | C | VC | C | 225 | <UNK> | 122.41 | 31/12/1899 00:00:00 |
| SK77312001 | 75.34 | 74.11 | 73.81 | C | VC | C | 150 | <UNK> | 156.2 | 31/12/1899 00:00:00 |
| SK77312003 | 73.04 | 71.25 | 71.08 | C | VC | C | 225 | <UNK> | 74.41 | 31/12/1899 00:00:00 |
| SK77312009 | <UNK> | <UNK> | 71.25 | S | CO | C | 375 | <UNK> | 0 | 31/12/1899 00:00:00 |
| SK77312109 | <UNK> | <UNK> | 71.25 | S | CO | C | 375 | <UNK> | 0 | 31/12/1899 00:00:00 |
| SK77312202 | 73.3499 | 69.49 | 69.12 | C | VC | C | 225 | <UNK> | 187.43 | 31/12/1899 00:00:00 |
| SK77312102 | 72.9 | 71.08 | 69.12 | C | VC | C | 225 | <UNK> | 21.16 | 31/12/1899 00:00:00 |
| SK77310103 | 69.79 | 68.57 | 67.78 | S | CO | C | 450 | <UNK> | 30.82 | 31/12/1899 00:00:00 |
| SK77312105 | 72.7699 | 71.45 | 71.25 | S | VC | C | 225 | <UNK> | 120.95 | 31/12/1899 00:00:00 |
| SK77310102 | 68.29 | 66.33 | 65.43 | C | VC | C | 225 | <UNK> | 58.9 | 31/12/1899 00:00:00 |
| SK77310201 | 68.69 | 67.24 | 66.64 | C | VC | C | 150 | <UNK> | 81.73 | 31/12/1899 00:00:00 |
| SK77310205 | 69.43 | 67.78 | 66.42 | S | CO | C | 450 | <UNK> | 33.49 | 31/12/1899 00:00:00 |
| SK77310105 | 68.4 | 66.42 | 66.02 | S | CO | C | 450 | <UNK> | 67.55 | 31/12/1899 00:00:00 |
| SK77310204 | 69.47 | 67.44 | 66.33 | C | VC | C | 225 | <UNK> | 54.66 | 31/12/1899 00:00:00 |
| SK77312203 | 73.37 | 71.76 | 71.45 | S | VC | C | 225 | <UNK> | 178.94 | 31/12/1899 00:00:00 |
| SK77311103 | 71.0299 | 69.84 | 68.57 | S | CO | C | 450 | <UNK> | 53.55 | 31/12/1899 00:00:00 |
| SK77312103 | 72.4899 | 69.12 | 68.6 | C | VC | C | 225 | <UNK> | 132.85 | 31/12/1899 00:00:00 |
| SK77312104 | 72.2399 | 71.25 | 69.84 | S | CO | C | 450 | <UNK> | 47.9 | 31/12/1899 00:00:00 |
| SK77310101 | 70.6399 | 68.78 | 67.9 | C | VC | C | 150 | <UNK> | 56.42 | 31/12/1899 00:00:00 |
| SK77311002 | 73.7099 | 71.72 | 71.25 | C | VC | C | 225 | <UNK> | 107.34 | 31/12/1899 00:00:00 |
| SK77312005 | 74.5299 | 73.52 | <UNK> | S | CO | C | 375 | <UNK> | 0 | 31/12/1899 00:00:00 |
| <UNK> | <UNK> | <UNK> | <UNK> | F | VC | <UNK> | <UNK> | <UNK> | <UNK> | 29/01/2020 00:00:00 |

## LEGEND



**MATERIALS**
- - NONE
- AC - ASBESTOS CEME
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRP - GLASS REINFORCED PLASTIC
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- ST - STEEL
- U - UNKNOWN
- VC - VITRIFIED CLAY
- XXX - OTHER

**CATEGORIES**
- W - WEIR
- C - CASCADE
- DB - DAMBOARD
- SE - SIDE ENTRY
- FV - FLAP VALVE
- BD - BACK DROP
- S - SIPHON
- D - HIGHWAY DRAIN
- S104 - SECTION 104

**SHAPE**
- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

**PURPOSE**
- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER

SEVERN TRENT

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

# SEWER RECORD (Tabular)

**O/S Map Scale:** 1:1,250

**This map is centred upon:**

**Date of Issue:** 15-12-20

**X:** 477139.82 **Y:** 331123.53

**Disclaimer Statement:**

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.



5 Ordnance Survey licence number: **100031673**

# SUPPLEMENTARY GUIDANCE NOTES RELATING TO DISPOSAL OF SURFACE WATER

SEVERN TRENT WATER

## Introduction

The purpose of this guidance note is to provide advice to applicants when completing the surface water drainage design for a new development, both for Greenfield and Brownfield sites. This does not affect foul drainage disposal which should be discussed with Severn Trent as early as possible to ensure additional flows can be accommodated without undue delay to the development.

## Lead Local Flood Authority (LLFA) Consultation

Since April 2015, the LLFA have assumed the role of being a statutory consultee in the planning process for developments of 10 dwellings or more; or equivalent non-residential and/or mixed development. The LLFAs role is vital to ensure that surface water disposal on new development is adequately assessed so that the local planning authority can satisfy themselves that drainage proposals are satisfactory and to make sure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for future maintenance of sustainable drainage systems (SuDS) over the lifetime of the development. This will also ensure surface water disposal aligns with local planning policies, flood risk strategies and national policies, such as the National Planning Policy Framework (NPPF).

<u>It is strongly recommend that the LLFA are involved in early pre-application discussions when the development of a site is initially being considered. Pre-application discussions will help to ensure that SuDS are appropriately considered ahead of or as part of preliminary development layouts, and that they are fully integrated into the final development layout. Whilst Severn Trent are willing to advise on sewerage availability this does to negate the planning requirement relating to adequacy of SuDS on new development.</u>

## SuDS Hierarchy

Severn Trent is fully supportive of the fundamental SuDS principle that priority should be given to managing surface water as close to source as possible. In accordance with national standards and guidance a sequential series of checks should be undertaken to ensure the relevant SuDS features are being proposed whereby (in order of priority) rainwater re-use, infiltration to ground and controlled discharge to a water body are properly considered ahead of any <u>controlled</u> connection to a culverted watercourse/other drainage system or public surface water sewer.

A controlled connection to a public combined/foul sewer would only be considered under rare exceptional circumstances where all other options have been completely exhausted. Acceptance of surface water into a combined sewer is not only unsustainable because of the need to convey/treat rainwater but is also takes away existing capacity which could constraint the connection of foul flows on future development. It is also possible that connection of additional surface water flows will require capacity upgrades to the existing sewerage system which may delay development.

## Connection to a Public Sewer

Whilst Severn Trent will be able to provide advice on potential public surface water sewer connection options, it is essential that a developer contacts the LLFA as early as possible to discuss surface water disposal as they will be able to provide guidance on surface water flood risk policy which may influence SuDS requirements. It is strongly recommended that LLFA discussions take place <u>before</u> contacting Severn Trent. Where the outcome of LLFA discussions concludes that a controlled discharge to the public sewerage system is the only viable option then Severn Trent would be pleased to discuss sewer connection options, satisfied that the LLFA have been consulted in line with their surface water management role and in their capacity as statutory consultee.

Evidence must be provided to demonstrate why the sequential SuDS checks have concluded that a connection to the public sewer is required. This must include a Site Investigation Report including percolation test data/graphs/calculations/results together with relevant correspondence with the LLFA.

## Design Standards

Surface water disposal design should consider the interactions between the adoptable sewer design criteria based on a 30 year design storm (outlined in 'Sewers For Adoption') and the "Non-statutory technical standards for SuDS" requirement to restrict discharge from a site up to and including the 1 in 100 year critical storm event plus an allowance for climate change as required by the LLFA.

For Greenfield development, the peak runoff rate should never exceed the peak pre-development run-off rates/volumes for the same rainfall event irrespective of the design storm duration consistent with the national non-statutory technical standards. For developments which were previously developed (Brownfield), the peak runoff rate must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment again for the same rainfall event. This requirement to remove pre-development surface water discharges to the sewerage system will help remove capacity constraints and aid future development.

To establish the pre-development run-off rates a detailed existing drainage survey will be required indicating pipe locations including sizes and levels, impermeable area connectivity to each pipe and topographical information to support existing drainage assumptions. Photographs of the existing buildings and surface features should be provided and where necessary a CCTV sewer survey should be provided to support the drainage survey to demonstrate connectivity.

In line with 'Sewers for Adoption', the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event. For higher storm return periods the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station, electricity substation, water booster station) within the development.

## Small Developments

Whilst developments of fewer than 10 dwellings (or their equivalent) are excluded from the post April 2015 planning requirements the underlying principles regarding sustainable surface water management are still valid. The collective impacts of surface water discharges from smaller developments can have an adverse impact on flood risk, especially in smaller rural catchments where smaller sewerage systems are more susceptible to increases in surface water inflow. On small developments infiltration to ground and peak flow attenuation must be considered to mitigate flood risk in the community but where a sewer connection is envisaged then the developer is recommended to discuss surface water disposal options with Severn Trent as early as possible.

## Contact

For further assistance please contact our Asset Protection teams via:

net.dev.west@severntrent.co.uk

(Birmingham & Black Country, Staffordshire, Shropshire, Worcestershire, Gloucestershire, Herefordshire, Powys)

net.dev.east@severntrent.co.uk

(Derbyshire, Leicestershire, Nottinghamshire, Warwickshire, Coventry)

## Appendix J

Environment Agency

# Flood map for planning

| Your reference | Location (easting/northing) | Created |
|---|---|---|
| **Chapel Lane** | **477060/331131** | **27 Feb 2020 14:15** |

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

### This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

**Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.


Environment Agency

**Flood map for planning**

Your reference
**Chapel Lane**

Location (easting/northing)
**477060/331131**

Scale
**1:2500**

Created
**27 Feb 2020 14:15**

Selected point
Flood zone 3
Flood zone 3: areas benefitting from flood defences
Flood zone 2
Flood zone 1
Flood defence
Main river
Flood storage area

0 20 40 60m

# Appendix K

# Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

| | |
|---|---|
| Calculated by: | Rasik Limbachia |
| Site name: | EMDS/20174 |
| Site location: | Statherm |

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

**Site Details**

| | |
|---|---|
| Latitude: | 52.87186° N |
| Longitude: | 0.85624° W |
| Reference: | 3576023822 |
| Date: | April 08 2021 10:18 |

**Runoff estimation approach** IH124

**Site characteristics**

Total site area (ha): 0.1957

**Methodology**

| | |
|---|---|
| $Q_{BAR}$ estimation method: | Calculate from SPR and SAAR |
| SPR estimation method: | Calculate from SOIL type |

**Soil characteristics**

| | Default | Edited |
|---|---|---|
| SOIL type: | 4 | 4 |
| HOST class: | N/A | N/A |
| SPR/SPRHOST: | 0.47 | 0.47 |

**Hydrological characteristics**

| | Default | Edited |
|---|---|---|
| SAAR (mm): | 618 | 618 |
| Hydrological region: | 4 | 4 |
| Growth curve factor 1 year: | 0.83 | 0.83 |
| Growth curve factor 30 years: | 2 | 2 |
| Growth curve factor 100 years: | 2.57 | 2.57 |
| Growth curve factor 200 years: | 3.04 | 3.04 |

**Notes**

**(1) Is $Q_{BAR}$ < 2.0 l/s/ha?**

When $Q_{BAR}$ is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

**(2) Are flow rates < 5.0 l/s?**

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

**(3) Is SPR/SPRHOST ≤ 0.3?**

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

**Greenfield runoff rates**

| | Default | Edited |
|---|---|---|
| $Q_{BAR}$ (l/s): | 0.82 | 0.82 |
| 1 in 1 year (l/s): | 0.68 | 0.68 |
| 1 in 30 years (l/s): | 1.63 | 1.63 |
| 1 in 100 year (l/s): | 2.1 | 2.1 |
| 1 in 200 years (l/s): | 2.48 | 2.48 |

# Appendix L

| CAUSEWAY | EM Drainage Services Ltd<br>Leicester Business Centre<br>111 Ross Walk<br>Leicester | File: EMDS20174_Strathem Fo<br>Network: Foul Network<br>Rasik Limbachia<br>09/04/2021 | Page 1 |
|---|---|---|---|

## Design Settings

| | | | |
|---|---|---|---|
| Frequency of use (kDU) | 0.10 | Minimum Velocity (m/s) | 1.00 |
| Flow per dwelling per day (l/day) | 4000 | Connection Type | Level Soffits |
| Domestic Flow (l/s/ha) | 2000.0 | Minimum Backdrop Height (m) | 0.200 |
| Industrial Flow (l/s/ha) | 0.0 | Preferred Cover Depth (m) | 1.200 |
| Additional Flow (%) | 0 | Include Intermediate Ground | ✓ |

## Private Drain Manhole Type

| Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) |
|---|---|---|---|
| 370 | 450 | 500 | 450 |
| 450 | 450 | 900 | 450 |

>900 Link+900 mm

| Max Depth (m) | Diameter (mm) | Max Depth (m) | Diameter (mm) |
|---|---|---|---|
| 1.500 | 1050 | 99.999 | 1200 |

## Nodes

| Name | Dwellings | Cover Level (m) | Manhole Type | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|
| Ex F1 | | 71.585 | Private Drain | -20.246 | 60.109 | 1.776 |
| Pump main | 1 | 71.300 | Private Drain | 20.239 | 60.306 | 0.985 |

## Links (Results)

| Name | Pro Vel @ 1/3 Q (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Dwellings (ha) | Σ Units (ha) | Σ Add Inflow (ha) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 0.038 | 0.096 | 0.8 | 0.0 | 0.885 | 1.676 | 0.000 | 1 | 0.0 | 0.0 | 17 | 0.053 |

# Appendix M

| CAUSEWAY | EM Drainage Services Ltd<br>Leicester Business Centre<br>111 Ross Walk<br>Leicester | File: 20174-Stratham.pfd<br>Network: Storm Network<br>Rasik Limbachia<br>09/04/2021 | Page 1<br>Version 2<br>Updated 15/07/2021 |
|---|---|---|---|

## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 100 | Maximum Rainfall (mm/hr) | 50.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 20.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.400 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 5.00 | Enforce best practice design rules | ✓ |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| Outfall | 0.000 | 5.00 | 70.400 | 150 | -20.223 | 59.866 | 0.900 |
| Pr S5 | 0.000 | 5.00 | 70.510 | 1200 | 40.123 | 59.862 | 0.970 |
| Pr S4 | 0.003 | 5.00 | 70.510 | 600 | 40.454 | 99.600 | 0.805 |
| Pr S1 | 0.003 | 5.00 | 70.510 | 450 | -9.044 | 100.244 | 0.400 |
| Pr S2 | 0.003 | 5.00 | 70.510 | 450 | 19.719 | 99.819 | 0.495 |
| Pr S3 | 0.003 | 5.00 | 70.510 | 450 | 40.535 | 120.156 | 0.560 |

## Links (Results)

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 1.003 | 0.186 | 7.4 | 1.6 | 0.745 | 0.675 | 0.012 | 0.0 | 72 | 0.149 |
| 1.002 | 0.120 | 4.8 | 1.6 | 0.580 | 0.745 | 0.012 | 0.0 | 90 | 0.109 |
| 1.000 | 0.105 | 1.9 | 0.4 | 0.250 | 0.345 | 0.003 | 0.0 | 48 | 0.084 |
| 2.000 | 0.214 | 3.8 | 0.4 | 0.410 | 0.655 | 0.003 | 0.0 | 33 | 0.140 |
| 1.001 | 0.161 | 2.8 | 0.8 | 0.345 | 0.655 | 0.006 | 0.0 | 55 | 0.138 |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Drain Down Time (mins) | 240 |
| FSR Region | England and Wales | Additional Storage ($m^3$/ha) | 0.0 |
| M5-60 (mm) | 20.000 | Check Discharge Rate(s) | ✓ |
| Ratio-R | 0.400 | 1 year (l/s) | 0.0 |
| Summer CV | 0.750 | 10 year (l/s) | 0.1 |
| Winter CV | 0.840 | 30 year (l/s) | 0.1 |
| Analysis Speed | Normal | 100 year (l/s) | 0.1 |
| Skip Steady State | x | Check Discharge Volume | 2.0 |

**Storm Durations**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 |

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 |
| 100 | 40 | 0 | 0 |

Post Development Discharge Rate

| | | | |
|---|---|---|---|
| Site Makeup | Greenfield | Growth Factor 30 year | 1.95 |
| Greenfield Method | IH124 | Growth Factor 100 year | 2.48 |
| Positively Drained Area (ha) | 0.011 | Betterment (%) | 10 |
| SAAR (mm) | 572 | QBar | 2.0 |
| Soil Index | 4 | Q 1 year (l/s) | 0.0 |
| SPR | 0.47 | Q 10 year (l/s) | 0.1 |
| Region | 4 | Q 30 year (l/s) | 0.1 |
| Growth Factor 1 year | 0.85 | Q 100 year (l/s) | 0.1 |
| Growth Factor 10 year | 1.49 | | |

**Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | Outfall | 25 | 69.525 | 0.025 | 1.0 | 0.0000 | 0.0000 | OK |
| 30 minute winter | Pr S5 | 25 | 69.609 | 0.069 | 1.1 | 0.0783 | 0.0000 | OK |
| 30 minute summer | Pr S4 | 21 | 69.789 | 0.084 | 1.3 | 0.0239 | 0.0000 | OK |
| 15 minute winter | Pr S1 | 12 | 70.154 | 0.044 | 0.4 | 0.0069 | 0.0000 | OK |
| 30 minute summer | Pr S2 | 20 | 70.062 | 0.047 | 0.7 | 0.0074 | 0.0000 | OK |
| 15 minute winter | Pr S3 | 11 | 69.982 | 0.032 | 0.4 | 0.0052 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | Pr S5 | 1.003 | Outfall | 1.0 | 0.165 | 0.134 | 0.0159 | 1.0 |
| 30 minute summer | Pr S4 | 1.002 | Pr S5 | 1.1 | 0.102 | 0.223 | 0.2609 | |
| 15 minute winter | Pr S1 | 1.000 | Pr S2 | 0.3 | 0.079 | 0.184 | 0.0480 | |
| 30 minute summer | Pr S2 | 1.001 | Pr S4 | 0.6 | 0.086 | 0.208 | 0.1115 | |
| 15 minute winter | Pr S3 | 2.000 | Pr S4 | 0.4 | 0.109 | 0.102 | 0.0398 | |

**Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Outfall | 16 | 69.537 | 0.037 | 2.1 | 0.0000 | 0.0000 | OK |
| 15 minute winter | Pr S5 | 16 | 69.636 | 0.096 | 2.4 | 0.1088 | 0.0000 | OK |
| 15 minute winter | Pr S4 | 13 | 69.834 | 0.129 | 2.8 | 0.0364 | 0.0000 | OK |
| 15 minute winter | Pr S1 | 11 | 70.175 | 0.065 | 0.8 | 0.0104 | 0.0000 | OK |
| 15 minute winter | Pr S2 | 12 | 70.087 | 0.072 | 1.5 | 0.0115 | 0.0000 | OK |
| 15 minute winter | Pr S3 | 11 | 69.997 | 0.047 | 0.8 | 0.0074 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Pr S5 | 1.003 | Outfall | 1.5 | 0.216 | 0.286 | 0.0255 | 1.5 |
| 15 minute winter | Pr S4 | 1.002 | Pr S5 | 2.4 | 0.132 | 0.505 | 0.4556 | |
| 15 minute winter | Pr S1 | 1.000 | Pr S2 | 0.7 | 0.094 | 0.391 | 0.0850 | |
| 15 minute winter | Pr S2 | 1.001 | Pr S4 | 1.3 | 0.112 | 0.469 | 0.1830 | |
| 15 minute winter | Pr S3 | 2.000 | Pr S4 | 0.8 | 0.117 | 0.209 | 0.0666 | |

**Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol ($m^3$) | Flood ($m^3$) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Outfall | 15 | 69.543 | 0.043 | 2.9 | 0.0000 | 0.0000 | OK |
| 15 minute winter | Pr S5 | 15 | 69.650 | 0.110 | 3.2 | 0.1249 | 0.0000 | OK |
| 15 minute winter | Pr S4 | 13 | 69.855 | 0.150 | 3.6 | 0.0424 | 0.0000 | OK |
| 15 minute winter | Pr S1 | 11 | 70.185 | 0.075 | 1.0 | 0.0120 | 0.0000 | OK |
| 15 minute winter | Pr S2 | 12 | 70.100 | 0.085 | 1.9 | 0.0135 | 0.0000 | OK |
| 15 minute winter | Pr S3 | 11 | 70.003 | 0.053 | 1.0 | 0.0084 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol ($m^3$) | Discharge Vol ($m^3$) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Pr S5 | 1.003 | Outfall | 1.8 | 0.241 | 0.390 | 0.0308 | 1.9 |
| 15 minute winter | Pr S4 | 1.002 | Pr S5 | 3.2 | 0.143 | 0.664 | 0.5558 | |
| 15 minute winter | Pr S1 | 1.000 | Pr S2 | 0.9 | 0.099 | 0.499 | 0.1030 | |
| 15 minute winter | Pr S2 | 1.001 | Pr S4 | 1.7 | 0.120 | 0.609 | 0.2099 | |
| 15 minute winter | Pr S3 | 2.000 | Pr S4 | 1.0 | 0.122 | 0.262 | 0.0759 | |

**Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol ($m^3$) | Flood ($m^3$) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Outfall | 14 | 69.551 | 0.051 | 4.0 | 0.0000 | 0.0000 | OK |
| 15 minute winter | Pr S5 | 14 | 69.669 | 0.129 | 4.4 | 0.1455 | 0.0000 | OK |
| 15 minute winter | Pr S4 | 12 | 69.885 | 0.180 | 4.8 | 0.0509 | 0.0000 | OK |
| 15 minute winter | Pr S1 | 11 | 70.199 | 0.089 | 1.3 | 0.0142 | 0.0000 | OK |
| 15 minute winter | Pr S2 | 12 | 70.118 | 0.103 | 2.5 | 0.0164 | 0.0000 | OK |
| 15 minute winter | Pr S3 | 11 | 70.011 | 0.061 | 1.3 | 0.0096 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol ($m^3$) | Discharge Vol ($m^3$) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Pr S5 | 1.003 | Outfall | 2.5 | 0.272 | 0.545 | 0.0377 | 2.5 |
| 15 minute winter | Pr S4 | 1.002 | Pr S5 | 4.4 | 0.157 | 0.914 | 0.6876 | |
| 15 minute winter | Pr S1 | 1.000 | Pr S2 | 1.2 | 0.105 | 0.658 | 0.1287 | |
| 15 minute winter | Pr S2 | 1.001 | Pr S4 | 2.3 | 0.139 | 0.813 | 0.2304 | |
| 15 minute winter | Pr S3 | 2.000 | Pr S4 | 1.3 | 0.125 | 0.342 | 0.0813 | |

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol ($m^3$) | Flood ($m^3$) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Outfall | 13 | 69.559 | 0.059 | 5.4 | 0.0000 | 0.0000 | OK |
| 15 minute winter | Pr S5 | 13 | 69.687 | 0.147 | 5.7 | 0.1663 | 0.0000 | OK |
| 15 minute winter | Pr S4 | 12 | 69.925 | 0.220 | 6.4 | 0.0624 | 0.0000 | OK |
| 15 minute winter | Pr S1 | 13 | 70.235 | 0.125 | 1.9 | 0.0198 | 0.0000 | OK |
| 15 minute winter | Pr S2 | 13 | 70.194 | 0.179 | 3.5 | 0.0285 | 0.0000 | SURCHARGED |
| 15 minute winter | Pr S3 | 11 | 70.024 | 0.074 | 1.9 | 0.0117 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol ($m^3$) | Discharge Vol ($m^3$) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | Pr S5 | 1.003 | Outfall | 3.5 | 0.302 | 0.725 | 0.0447 | 3.5 |
| 15 minute winter | Pr S4 | 1.002 | Pr S5 | 5.7 | 0.171 | 1.185 | 0.8145 | |
| 15 minute winter | Pr S1 | 1.000 | Pr S2 | 1.6 | 0.112 | 0.868 | 0.1805 | |
| 15 minute winter | Pr S2 | 1.001 | Pr S4 | 2.7 | 0.155 | 0.944 | 0.2658 | |
| 15 minute winter | Pr S3 | 2.000 | Pr S4 | 1.8 | 0.140 | 0.485 | 0.0879 | |

## Table 3

### SuDS Hierarchy

| Component | Recommendations |
|---|---|
| Rainwater Harvesting | Advantage<br>Unpredictable rainfall. Rainfall is hard to predict, and sometimes little, or no rainfall can limit the supply of rainwater to be recycled supplying for domestic purpose.<br><br>Disadvantage<br>Initial high cost would very high. Regular maintenance. Storage limits. Roof may seep chemical, dirt, moss growth. |
| Bioretention | Advantage<br>Can reduce volume and rate of runoff. Can be planned as landscaping features. Highly effective in removing urban pollutants.<br><br>Disadvantage<br>Requires landscaping and management. Susceptible to clogging if surrounding landscape is not managed. The landscape area 1652 sq/m is not enough area. |
| Filter Drains | Advantage<br>Removes Toxic Materials and Disease Organisms. Reduces Soil Erosion.<br><br>Disadvantage<br>Expensive to maintain. Require regular maintenance. Can Contaminate Bodies of Water. |

## Table 4

### Soil Classification Guide

| Soil classification | Typical range for coefficient of permeability K (ms) | Typical range of CBR values |
|---|---|---|
| heavy clay | $10^{-10}$ to $10^{-8}$ | 2 to 5 |
| silty clay | $10^{-9}$ to $10^{-8}$ | 3 to 6 |
| sandy clay | $10^{-9}$ to $10^{-6}$ | 5 to 20 |
| poorly graded sand | $5 \times 10^{-7}$ to $5 \times 10^{-6}$ | 10 to 40 |
| well graded sand | $5 \times 10^{-6}$ to $10^{-4}$ | 10 to 40 |
| well graded sandy gravel | $10^{-5}$ to $10^{-3}$ | 30 to 80 |

## Table 5

### National Planning Policy Guidance defining Flood Zone 1

Guidance as having a ‘Low Probability’ of flooding.

| Flood Zone | Definition |
|---|---|
| Zone 1 – Low Probability | Land having a less than 1 in 1,000 annual probability of river or sea flooding. (shown as ‘clear’ on the Flood Map – all land outside Zones 2 and 3) |

East Midlands Drainage Services

## Table 6

### Extract from National Planning Policy Guidance: Flood Risk

Vulnerability and Flood Zone 'Compatibility'

| Flood Zone | Flood Risk Vulnerability Classification | | | | |
|---|---|---|---|---|---|
| | **Essential infrastructure** | **Highly vulnerable** | **More vulnerable** | **Less vulnerable** | **Water compatible** |
| **Zone 1** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Zone 2** | ✓ | Exception test required | ✓ | ✓ | ✓ |
| **Zone 3a †** | Exception test required † | ✗ | Exception test required | ✓ | ✓ |
| **Zone 3b *** | Exception test required * | ✗ | ✗ | ✗ | ✓ * |

KEY:

✓ DEVELOPMENT IS APPROPRIATE

✗ DEVELOPMENT SHOULD NOT BE PERMITTED

## Table 7

### Manhole/Inspection Chamber Maintenance Schedule

| Schedule | Features | Required Action | Frequency | By |
|---|---|---|---|---|
| Occasional Maintenance | Foul & surface water drainage | Remove silt and leaf build up from gullies, chambers and gutters etc. | Annually | The Owner/ Occupier |
| | Demarcation chamber | Remove silt/sediment from the chamber | Quarterly | The Owner/ Occupier |
| Remedial Action | Foul & Surface Water drainage | Remove and dispose oil or fuel (petrol/diesel) residues using safe standard practices | As required | The Owner/ Occupier |
| | Demarcation chamber | Remove and dispose of contaminate oil or fuel (petrol /diesel) residues using safe standard practices | As required | The Owner/ Occupier |
| Monitoring | Foul & Surface Water Drainage | Check for any wear and tear. | Monthly | The Owner/ Occupier |
| | Foul & Surface Water Drainage | Check gullies, chambers | Annually | The Owner/ Occupier |
| | Demarcation chamber | Inspect of contaminates | Annually | The Owner/ Occupier |

## Table 8

### Outfall Maintenance Schedule

| Schedule | Features | Required Action | Frequency | By |
|---|---|---|---|---|
| Occasional Maintenance | SW Outfall | Remove silt/sediment from the chamber | Quarterly | The Owner/ Occupier |
| Remedial Action | SW Outfall | Remove and dispose of con-taminate oil or fuel (petrol /die-sel) residues using safe stand-ard practices | As required | The Owner/ Occupier |
| Monitoring | SW Outfall | Check for any wear and tear. | Monthly | The Owner/ Occupier |
| | SW Outfall | Access to concrete chamber | Quarterly | The Owner/ Occupier |

East Midlands Drainage Services

## Table 9

### Flap Valve Maintenance Schedule

| Schedule | Features | Required Action | Fre-quency | By |
|---|---|---|---|---|
| Maintenance | Flap valve | Regular inspection and maintenance are particularly important to ensure the effective long-term operation of surface water drainage, sewers and sustainable drainage systems (SuDS). | Regular | The Owner/ Occupier |
| Inspection | Flap valve | Inspections should be carried out at frequent and regular intervals. The frequency will depend upon the location and the environment and should be based on local knowledge. Action is only required in the event of a blockage or suspected blockage. | 3-6 months | The Owner/ Occupier |
| Monitoring | Flap valve | Flap valve require no routine maintenance although inspections should be carried out at regular intervals. | Regular | The Owner/ Occupier |