

**Chase New Homes** 

# Former Friends School, Saffron Walden

Flood Risk Assessment and Surface Water Drainage Strategy

680119-R1(2)-FRA





**APRIL 2022** 



### **RSK GENERAL NOTES**

| Project No.: | 680119-R1(2)-FRA  |  |  |
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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK LDE Ltd.

Chase New Homes Former Friends School, Saffron Walden Flood Risk Assessment and Surface Water Drainage Strategy 680119-R1(2)-FRA



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### **1** INTRODUCTION

RSK Land and Development Engineering Ltd were commissioned by Chase New Homes (the client) to provide a Flood Risk Assessment (FRA) to support the planning application at the Former Friends School in Saffron Walden (the site). Development proposals include the conversion of two existing buildings on site and the construction of a number of new buildings in the grounds to provide a total of 96 residential units.

The purpose of the FRA is to establish the risk associated with the proposed development and to propose suitable mitigation, if required, to reduce the flood risk to a more acceptable level. The FRA must demonstrate that the development will be safe for its lifetime (in this case assumed to be 100 years) taking account of the vulnerability of its users, without increasing flood risk elsewhere.

This document has been produced to assess the flood risk from tidal, fluvial, surface water, groundwater, sewer and artificial sources in line with the National Planning Policy Framework (NPPF)<sup>1</sup> and its corresponding Planning Practice Guidance (PPG)<sup>2</sup>. It includes a summary of the proposed surface water drainage strategy, demonstrating how Sustainable Drainage Systems (SuDS) have been used to ensure surface water is appropriately managed on-site to ensure there is no increased risk of flooding on-site or elsewhere as a result of the development.

This assessment has been undertaken in consultation with the relevant authorities, and with reference to data, documents and guidance published by the Environment Agency (EA), the Lead Local Flood Authority (LLFA) (Essex County Council), the Local Planning Authority (LPA) (Uttlesford District Council) and the Water Authority (Anglian Water).

The comments given in this report and opinions expressed are subject to RSK Group Service Constraints provided in **Appendix A**.

<sup>1</sup> Communities and Local Government, 'National Planning Policy Framework', February 2019.

<sup>2</sup> Communities and Local Government, 'Planning Practice Guidance - Flood Risk and Coastal Change, ID 7', March 2014. http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/ Chase New Homes



### 2 SITE DESCRIPTION & PROPOSALS

#### 2.1 Existing site

#### 2.1.1 Site Description

The site is located to the south of Mount Pleasant Road, Saffron Walden in the county of Essex and can be located at National Grid Reference 553954<sup>E</sup>, 237670<sup>N</sup>. A site location plan is included as **Figure 2.1**.

The site covers an area of approximately 32,765m<sup>2</sup> (3.28ha) and currently comprises a disused school site with a main school building, various outbuildings, gym, swimming pool, sports courts and associated landscaping.

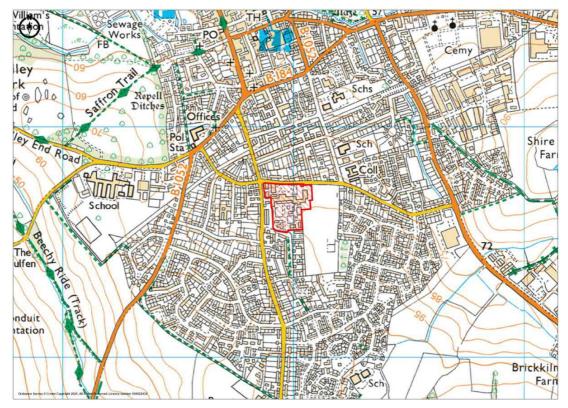


Figure 2.1: Site location plan

A site walkover was undertaken on 22<sup>nd</sup> July 2021. The following key points have been noted:

- The site was largely level with the frontage sloping down to meet Mount Pleasant Road. As the site has been previously developed some noticeable changes in level were observed within the school grounds associated with the historic landscaping of the courtyard areas;
- Anecdotal evidence provided by the school's caretaker indicated that the main school building was built in circa 1700, with additional buildings constructed more recently in the 1960/70s and 2010s. Therefore, existing drainage infrastructure is suspected to be of different ages and designed to different standards;
- Rainwater pipes draining the roof of the main school building do not discharge to surface, instead discharging directly to the drainage network below ground level; and



 Access to the various basements was not provided during the walkover, however, the caretaker indicated that they do experience some degree of seepage following periods of heavy rainfall.

#### 2.1.2 Topography

A site-specific topographic survey has been carried out by Datum Survey Services Ltd. The survey shows the existing site levels vary from 83.39m above ordnance datum (mAOD) to 90.74m AOD. The land generally slopes from east to west. The land to the north of the existing main building also slopes to the north to meet the level of Mount Pleasant Road, whilst the land to the south slopes gradually southwards to meet the level of The Avenue.

The topographic survey and existing site layout are included in **Appendix B**.

#### 2.1.3 Existing Drainage

#### 2.1.3.1 Public

Anglian Water sewer plans have been obtained for the site and are included in **Appendix C**. These plans indicate the following network of sewers in the vicinity of the site:

- No public sewers are located within the site boundary;
- A 225mm diameter (Ø) foul sewer is located beneath Debden Road, conveying flows to the north;
- A small section of foul sewer (225mm Ø) is located beneath Mount Pleasant Road, conveying flows to the west and discharging to the aforementioned sewer; and
- A 150mm Ø foul sewer is located beneath The Avenue, conveying flows to the west and also discharges to the sewer in Debden Road.

#### 2.1.3.2 Private

A CCTV Survey of the existing private drainage network was produced by Service Location Ltd in November 2018 and has been included, along with an existing drainage regime plan, in **Appendix D**. This information indicates the following network of private sewers onsite:

- Surface and foul water flows from the main building, buildings in the north west of the site and buildings directly south of the main building are conveyed to the north western corner of the site, before discharging via a single 225mm Ø connection to the public foul water sewer in Mount Pleasant Road;
- A series of surface water soakaways are located in the north east of the site, discharging runoff from the hardstanding areas to ground;
- Surface water runoff from the gym building in the north east of the site also discharges to ground via a soakaway beneath the car parking area in this location;
- Surface water runoff from the buildings in the south of the site is conveyed to the east and is discharged to ground via a soakaway; and
- Foul water flows from the buildings in the south of the site are conveyed to the south and discharge to the public foul sewer in The Avenue via a 150mm Ø connection to the west of the existing southern site access;
- Some existing impermeable areas, including the main driveway, the path through the centre of the site and much of the sports courts are not drained formally, instead surface water runoff runs overland to landscaped areas where runoff is assumed to infiltrate. Given the topography in the north of the site and the lack of formal drainage



in this location, runoff from the driveway is thought to run overland onto Mount Pleasant Road; and

• The CCTV survey identified 0 Grade 5 defects within the existing private drainage network, a Grade 5 defect being serious and indicating urgent repair. Grade 3-4 defects are less serious and less urgent concerning repair; 57 defects of this grade were noted. Finally, 192 Grade 1-2 defects were identified, a Grade 1-2 defect being relatively minor and could be monitored and/or repaired if thought necessary.

#### 2.2 Development Proposals

The development proposals for the site include the construction of a small block of flats to provide 6 units, the conversion of the existing Croydon Building to provide 4 flats and the conversion of the existing assembly hall to provide 4 cottages and 2 flats in the north west of the site. Proposals also include converting the main school building to provide 52 flats and constructing a new building just west of the main building to provide an additional 12 flats. A small extension to the main school building is proposed to provide new changing rooms for the sports facilities onsite. A terrace of 7 houses are proposed in the south east of the site and a further 9 houses are proposed in the south of the site, accessed via a cul-de-sac off The Avenue. A total of 96 residential units are proposed across the site with associated accesses, car parking and landscaping works.

The relevant proposed site plans are included as Appendix E.



### **3 ENVIRONMENTAL SETTING**

#### 3.1 Hydrology

Reference to Ordnance Survey (OS) mapping and the EA's web-based mapping indicates that the nearest EA Main River is The Slade, which is located approximately 500m to the east of the site. The river flows to the north before continuing west through the town centre, eventually discharging to the River Cam.

#### 3.2 Geology

Based on published geological records for the area (British Geological Survey online mapping), the site exhibits the following geology:

- Superficial Geology: None recorded.
- Bedrock Geology: Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated).

BGS Borehole TL53NW209 is located approximately 200m to the east of the site and confirmed the above, with some Made Ground overlying "off white structureless weathered Chalk".

Site-specific geotechnical investigations were undertaken by CGL in the north of the playing fields located directly east of the site (**Appendix F**). The report details existing geology, hydrogeology and permeability in this area. The key points related to flood risk and drainage are highlighted below:

- Three Trial Pits (TPs) were completed in the north of the playing fields directly to the east of the site, to depths of 2.2m, 3.3m and 3.6m below ground level (bgl);
- In TPs 1 and 2 the ground conditions encountered comprised topsoil to depths of 0.55m and 1.1m bgl respectively, each underlain by the Lewes Nodular Chalk Formation;
- TP3 had topsoil present to 1.1m bgl but was underlain by firm white and light brown clayey gravelly silt where the gravel was composed of flint and chalk it was suspected that this material was superficial deposits; and
- No groundwater was encountered in the TPs during excavation.

Soakage Tests were carried out in the three trial pits in accordance with BRE DG 365<sup>3</sup> and the infiltration rates in Table 3.1 were calculated.

#### Table 3.1: Summary of infiltration results

| Trial pit | Strata tested        | Estimated infiltration rate (m/s) |
|-----------|----------------------|-----------------------------------|
| TP1       | Structureless Chalk  | 1.69 x 10⁻⁵                       |
| TP2       | Structureless Chalk  | 1.43 x 10⁻⁵                       |
| TP3       | Superficial Deposits | 9.66 x 10 <sup>-7</sup>           |

<sup>3</sup> Building Research Establishment, 'Soakaway Design. BRE DG 365', Revised 2016. Chase New Homes



### 3.3 Hydrogeology

Hydrogeological information was obtained from the online Magic Maps service. These maps indicate that the site is underlain by a Principal bedrock aquifer.

The site is located within a Zone 3 (Total Catchment) Groundwater Source Protection Zone.

Groundwater was not encountered in the TPs to the east of the site.



### 4 SOURCES OF FLOOD RISK

#### 4.1 Criteria

In accordance with the NPPF and advice from the EA, an assessment of the risk associated with various flooding sources is required along with consideration of the effects of climate change over the design life of the development (in this case assumed to be 100 years).

Changes to EA climate change guidance in July 2021<sup>4</sup> indicate that increased allowances in peak river flow and rainfall intensity should now be incorporated within any assessment. The appropriate allowance for peak river flow is based on the site's location in the country, the lifetime of development, the relevant flood zone and the vulnerability of the proposed end use.

The flood risk elements that need to be considered for any site are defined in BS 8533-'Assessing and managing flood risk in development Code of practice'<sup>5</sup> as the "Forms of Flooding" and are listed as:

- Flooding from rivers (fluvial flood risk);
- Flooding from the sea (tidal flood risk);
- Flooding from the land;
- Flooding from groundwater;
- Flooding from sewers (sewer and drain exceedance, pumping station failure etc); and
- Flooding from reservoirs, canals and other artificial structures.

The following section reviews each of these in respect of the subject site.

#### 4.2 Flooding from rivers (fluvial flood risk)

The EA Flood Zone mapping study for England and Wales is available on their website at: <u>https://flood-map-for-planning.service.gov.uk</u>.

The latest EA published flood zone map (**Figure 4.1**) shows that the site lies within Flood Zone 1, land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding.

<sup>4</sup> Environment Agency, 'Guidance: Flood Risk Assessments: Climate Change Allowances'. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances, July 2021.

<sup>5</sup> BSI, 'BS 8533-2011 Assessing and managing flood risk in development Code of practice', October 2011.

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Figure 4.1: Environment Agency 'Flood map for planning'

The Uttlesford District Council Strategic Flood Risk Assessment (SFRA)<sup>6</sup> states that some areas of Saffron Walden are at risk of flooding from The Slade, however, The Slade is located over 550m to the east of the site. The Slade is culverted beneath much of the town and as a result flood risk has been exacerbated by poorly maintained or blocked culverts.

Fluvial flooding is likely to increase as a result of climate change. A greater intensity and frequency of precipitation is likely to raise river levels and increase the likelihood of a river overtopping its banks. Climate change guidance for river modelling was updated by the EA in July 2021. The impact upon the site should be negligible given its location within Flood Zone 1.

Given the distance of the site from The Slade and the sites location within Flood Zone 1, the overall risk of fluvial flooding is considered to be **very low**.

### 4.3 Flooding from the sea (tidal flood risk)

The site is not considered to be at risk from tidal flooding due to its inland location. Therefore, tidal flood risk is considered to be **very low**.

### 4.4 Flooding from the land (overland pluvial flood risk)

If intense rain is unable to soak into the ground or be carried through manmade drainage systems, for a variety of reasons, it can run off over the surface causing localised floods before reaching a river or other watercourse. Generally, where there is impermeable



surfacing or where the ground infiltration capacity is exceeded, surface water runoff can occur.

The EA's surface water flood map (**Figure 4.2**) shows that some localised 'low' to 'medium' risk surface water ponding is predicted to occur in the centre of the site corresponding to two localised lower areas to the rear of the main building. The remainder of the site is at a 'very low' risk of flooding from this source.



High Medium Low Very Low

#### Figure 4.2: Environment Agency 'Flood risk from surface water' map

The SFRA indicates that Saffron Walden has been identified as a Tier 2 area of local flood risk (500 - 1,000 people at risk) by the LLFA due to its surface water risk and flood history. The SFRA also includes a summary of significant flood events and indicates that surface water flooding has affected Saffron Walden in 1875, 1917, 1960, 2001 and 2014.

The Essex County Council Preliminary Flood Risk Assessment (PFRA)<sup>7</sup> and its accompanying addendum<sup>8</sup> state that there is a high risk of flooding from local sources across Essex, particularly surface water.

The topography on site shows the site falls away towards the north, west and south and therefore any surface water runoff will likely fall away in these directions. Any onsite ponding would be avoided by careful design of finished levels and new drainage connections. The proposed development is likely to generate on-site surface water runoff, which needs to be controlled to prevent surface water flooding elsewhere. This is discussed further in Section 7.

The surrounding topography indicates that the playing fields to the east fall towards the site, however, given the undeveloped nature of the playing fields and the underlying

<sup>8</sup> Essex County Council, 'Preliminary Flood Risk Assessment Addendum', December 2017.

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<sup>&</sup>lt;sup>7</sup> URS Scott Wilson for Essex County Council, 'Essex Preliminary Flood Risk Assessment', January 2011.



geology, it is considered unlikely that significant runoff generated from this area would flow towards the site. Given this, the potential runoff is considered low.

Surface water flooding is likely to increase as a result of climate change in a similar ratio to fluvial flooding. Increased intensity and frequency of precipitation is likely to lead to reduced infiltration and increased overland flow. Climate change guidance for rainfall intensity was updated by the EA in July 2021. Revised allowances for climate change have been included in the indicative drainage strategy below.

In line with the EA's flood risk from surface water map, the overall risk of surface water flooding at the site is considered to be **low**.

#### 4.5 Flooding from groundwater

Groundwater flooding tends to occur after long periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

The SFRA states that groundwater flooding is limited and very localised within Uttlesford district.

Available geological mapping indicates the site is underlain by Chalk bedrock which forms a Principal bedrock aquifer. As a result groundwater is likely to be present beneath the site, however, there is no ground investigation data available for the site to confirm onsite geology and groundwater levels. Nearby BGS borehole TL53NW209 was completed to a depth of 2m and did not strike groundwater. In addition, the three TPs completed in the playing fields to the east of the site were completed to depths of 2.2m, 3.3m and 3.6m and also did not strike groundwater.

Anecdotal evidence has been collected that indicates the existing basements experience seepage during heavy rainfall events. It is not clear whether this is as a result of groundwater seepage or surface water entering through basement covers, external entrances and/or light wells.

Climate change could increase the risk of groundwater flooding as a result of increased precipitation filtering into the groundwater body. If winter rainfall becomes more frequent and heavier, groundwater levels may increase. Higher winter recharge may however be balanced by lower recharge during the predicted hotter and drier summers. This is less likely to cause a significant change to flood risk than from other sources, since groundwater flow is not as confined. It is probable that any locally perched aquifers may be more affected, but these are likely to be isolated. The change in flood risk is likely to be low.

As groundwater has not been encountered during the intrusive investigations in the site to the east, the overall groundwater flood risk is considered to be **low**. However, following completion of a site specific ground investigation this risk classification may need to be revised.



#### 4.6 Flooding from sewers

Flooding from artificial drainage systems occurs when flow entering a system, such as an urban storm water drainage system, exceeds its conveyance capacity, the system becomes blocked or it cannot discharge due to a high water level in the receiving watercourse. A sewer flood is often caused by surface water drains discharging into the combined sewer systems; sewer capacity is exceeded in large rainfall events causing the backing up of floodwaters within properties or discharging through manholes.

Sewer details have been referenced from sewer record plans obtained from Anglian Water. The plans indicate a network of public foul sewers are located in the roads surrounding the site.

Most adopted surface water drainage networks are designed to the criteria set out in Sewers for Adoption<sup>9</sup>. One of the design parameters is that sewer systems be designed such that no flooding of any part of the site occurs in a 1 in 30 year rainfall event. By definition a 1 in 100 year event would exceed the capacity of the surrounding sewer network as well as any proposed drainage.

When exceeded, the surcharged pipe work could lead to flooding from backed up manholes and gully connections. This could lead to immediate flooding within highways surrounding the site. Surface water would most likely follow the road levels and flow away from the site to the north and west along Mount Pleasant Road and The Avenue.

The SFRA states that sewer flooding is limited and very localised within Uttlesford district. A total of four sewer flooding incidents were recorded in Saffron Walden within a ten year period.

Development has the potential to cause an increase in impermeable area, an associated increase in surface water runoff rates and volumes, and a consequent potential increase in downstream flood risk due to overloading of sewers, watercourses, culverts and other drainage infrastructure. To ensure that sewer and surface water flooding is not exacerbated, surface water must be considered within the design of the site. This ensures that any additional surface water and overland flows are managed correctly, to minimise flood risk to the site and the surrounding area. The proposed surface water network on the site should be designed to ensure exceedance of the network has been considered.

Climate change is likely to result in an increase in flooding from sewers. Increased rainfall and more frequent flooding put existing sewer and drainage systems under additional pressure resulting in the potential for more frequent surcharging and potential flooding. This would increase the frequency of local sewer flooding but would not be significant in terms of the proposed development.

As the roads surrounding the site are set below the ground levels onsite, sewer flood risk is considered to be **low**.



#### 4.7 Other sources of flooding

#### 4.7.1 Reservoirs

Flood events can occur from a sudden release of large volumes of water from reservoirs, canals and artificial structures.

The EA reservoir flood map (reproduced as **Figure 4.3**) shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. Since this is a prediction of a worst-case scenario, it is unlikely that any actual flood would be this large. According to the EA Reservoir flood maps the site is not at risk of flooding from reservoirs.



Extent of flooding from reservoirs
Maximum extent of flooding

#### Figure 4.3: Environment Agency 'Flood risk from reservoirs' map

Reservoirs can be managed over time, controlling inflow/outflow of water and therefore there is the capacity to control the effects of climate change. Increased rainfall has the potential to increase base flow, but this should be minimal. It is unlikely that there will be a substantial change to the risk of flooding for this site as a result of climate change.

The resultant flood risk is considered to be very low.

#### 4.7.2 Canals

There are no Canal & River Trust owned canals within the vicinity. Therefore, flood risk from this source is considered to be **very low**.

#### 4.7.3 Other artificial features

No other artificial features with the potential to result in a flood risk to the site have been identified.



### 5 MITIGATION MEASURES AND RESIDUAL RISK

#### 5.1 Overland flood flow

No overland flow routes have been identified across the site. All surface water runoff up to the 1 in 100 year climate change storm generated on site will be stored on site and discharged in line with the drainage hierarchy as detailed in Section 7. Surface flows may be generated on site due to drainage capacity exceedance, which can be conveyed into the SuDS features via surface flows along the proposed roads and careful design of external levels.

#### 5.2 Finished floor levels

As this site is not predicted to be affected by fluvial or surface water flooding there is no need to incorporate any freeboard levels into the finished floor levels of the design. Low lying areas that could lead to ponding of surface flows will be avoided by careful design of finished levels. If, following completion of onsite ground investigations, groundwater is found to be shallow, Finished floor levels and other flood resistance and resilience measures may need to be considered in more detail.

#### 5.3 Flood compensation

The site is shown to be outside the 1 in 100 year climate change floodplain so floodplain compensatory measures are not required.

#### 5.4 Safe access/egress

As the site lies outside of the 1 in 1,000 year fluvial / tidal flood extent, safe access and egress will be available even during the most extreme flooding scenarios.

#### 5.5 Basements

A number of existing basements are present across the site. Anecdotal evidence indicates that these features are known to become wet following periods of heavy rain. The exact source of this flooding is unknown, although it is likely to be a combination of shallow groundwater ingress and/or surface water overland flow collecting at and entering through poorly sealed basement covers, external entrances and/or light wells. Further investigation of this flooding mechanism will improve understanding of the severity of the problem and whether further mitigation in the form of additional sealing, flood proofing and tanking, etc. is required.



### 6 PLANNING CONTEXT

#### 6.1 Land use vulnerability

Table 3 of the PPG indicates the compatibility of various land uses in each flood zone, dependent on their vulnerability to flooding. Table 6.1 below is reproduced from Table 3 of PPG.

| Flood Risk<br>Vulnerability<br>Classification |                                     | Essential<br>Infrastructure | Water<br>Compatible | Highly<br>Vulnerable          | More<br>Vulnerable            | Less<br>Vulnerable            |
|---|-------------------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------|
| Flood   | Zone 1                              | Appropriate                 | Appropriate         | Appropriate                   | Appropriate                   | Appropriate                   |
| Zone  | Zone 2                              | Appropriate                 | Appropriate         | Exception<br>Test<br>Required | Appropriate                   | Appropriate                   |
|   | Zone 3a                             | Exception<br>Test Required  | Appropriate         | Should not<br>be<br>permitted | Exception<br>Test<br>Required | Appropriate                   |
|   | Zone 3b<br>functional<br>floodplain | Exception<br>Test Required  | Appropriate         | Should not<br>be<br>permitted | Should not<br>be<br>permitted | Should not<br>be<br>permitted |

Table 6.1: Flood risk vulnerability and flood zone 'compatibility'

With reference to Table 2 of the PPG, the proposed development, based on its residential use, is classed as 'more vulnerable'. This classification of development is appropriate for areas within Flood Zone 1 and therefore appropriate for the subject site.

#### 6.2 Sequential Test

The Sequential Test aims to direct new development to areas with the lowest probability of flooding. The site has been identified as located within Flood Zone 1 with no other flooding issues from other sources. It is therefore considered to pass the Sequential Test.

#### 6.3 Exception Test

In accordance with Table 6.1, there is no requirement to apply the Exception Test for a 'more vulnerable' development within Flood Zone 1.



### 7 SURFACE WATER DRAINAGE ASSESSMENT

#### 7.1 Scope

This section discusses the potential quantitative effects of the development on both the risk of surface water flooding on-site and elsewhere within the catchment, as well as the type of potential SuDS features that could be incorporated as part of the masterplan.

In accordance with the Defra Non-Statutory Technical Standards<sup>10</sup>, the surface water drainage strategy should seek to implement a SuDS hierarchy that aspires to achieve reductions in surface water runoff rates to greenfield rates. Where a reduction to the greenfield rate is not practicable, the proposed surface water drainage strategy should not exceed the existing runoff rate.

In addition, Building Regulations Part H<sup>11</sup> requires that the first choice of surface water disposal should be to discharge to an adequate soakaway or infiltration system, where practicable. If this is not reasonably practicable then discharge should be to a watercourse, the least favourable option being to a sewer (surface water before combined). Infiltration techniques should therefore be applied wherever they are appropriate.

This assessment includes an overview and comparison of the existing brownfield scenario and proposed development scenario. The existing and proposed areas are included in **Table 7.1** below.

| Land use    | Existing area (m <sup>2</sup> ) | Proposed area (m <sup>2</sup> ) |
|-------------|---------------------------------|---------------------------------|
| Impermeable | 18,821 (57%)                    | 16,098 (49%)                    |
| Permeable   | 13,944 (43%)                    | 16,667 (51%)                    |
| Total       | 32,765 (100%)                   | 32,765 (100%)                   |

Table 7.1: Existing and proposed site areas

#### 7.2 Pre-development situation

The existing site area is 3.28ha and 57% impermeable.

The pro-rata IoH 124<sup>12</sup> method has been used to estimate the greenfield surface water runoff for the site. Calculations are contained in **Appendix G**.

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<sup>&</sup>lt;sup>10</sup> DEFRA, 'Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems', March 2015.

<sup>&</sup>lt;sup>11</sup> HM Government (2010 with 2013 amendments), 'The Building Regulations 2010: Approved Document H - Drainage and Waste Disposal (2002 Edition incorporating 2010 amendments)'.

<sup>&</sup>lt;sup>12</sup> Institute of Hydrology (IoH), 'Flood Estimation for small catchments - Report 124', 1994.

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| Return period | Peak flow (I/s) |
|---------------|-----------------|
| QBar          | 0.45            |
| 1 in 1 year   | 0.39            |
| 1 in 30 year  | 1.11            |
| 1 in 100 year | 1.62            |

#### Table 7.2: IOH 124 surface water runoff (greenfield)

As a developed site, the pre-development surface water runoff from the site has been calculated for a range of return periods using the Modified Rational method. However, it should be noted that this assumes the site runs off in an unmanaged fashion, which is not strictly representative of the site in its brownfield condition as some portions of the site drain to soakaways. The Modified Rational method uses the following equation to calculate peak runoff rate from an area:

#### Q = 2.78 Cv Cr i A

Where:

2.78 =Coefficient which accounts for the differences in units used for the inputs and the outputs of the equation.

Cv = Volumetric Runoff Coefficient - a co-efficient that describes the proportion of rainfall appearing in the surface water drainage system, assumed to be 0.95 for impermeable areas

Cr = Routing Coefficient - a routing co-efficient added to the Rational Method to represent runoff characteristics of a particular site or area in a more accurate manner, assumed to be 1.3 for urban areas

i = Rainfall Intensity (mm/hr) based on a 1 hour rainfall event

A = Area (ha)

| Return period | Rainfall Intensity (mm) | Peak flow (I/s) |
|---------------|-------------------------|-----------------|
| QBar          | 12.92                   | 83.5            |
| 1 in 1 year   | 9.71                    | 62.7            |
| 1 in 30 year  | 30.58                   | 197.6           |
| 1 in 100 year | 39.75                   | 256.9           |

Rainfall data has been taken from the Depth Duration Frequency rainfall calculator contained within the FEH 2013 web service, with the associated screenshots included in **Appendix H**.



#### 7.3 Post-development situation

The proposed development is for a residential end use and will result in a decrease in impermeable area and surface water runoff across the site. With that said, it remains necessary to manage surface water on-site, providing sufficient attenuation for all events up to the 1 in 100 year event inclusive of 40% climate change (based on latest climate change guidance).

#### 7.3.1 Point of discharge

Discharge options from the site have been considered in line with the SuDS hierarchy, as follows.

#### 7.3.1.1 Infiltration

Infiltration should be considered as the primary option to discharge surface water from the developed study area. The effectiveness of infiltration is completely dependent on the physical conditions at the study area. Potential obstacles include:

- Local variations in permeability preventing infiltration It is understood from the local geology that the site is situated on an area of Chalk, which is considered suitable for the use of soakaways due to its high permeability. Soakaway testing for an area just east of the site was undertaken in January 2019 by CGL, infiltration rates were shown to be sufficient (Appendix F);
- Shallow groundwater table For infiltration drainage devices, Building Regulation
  approved document H2 states that these "should not be built in ground where the
  water table reaches the bottom of the device at any time of the year". Groundwater
  was not encountered to the east of the site (investigations were undertaken to 3.6m
  bgl), however, if shallow groundwater is present beneath the site this may limit the
  depth at which infiltration can be used.
- Source Protection Zones The study area is located within a Zone 3 Total Catchment Groundwater Source Protection Zone.

From the information available, infiltration is considered a viable option as part of the drainage strategy. Whilst published records indicate that the underlying geology is uniform across the site area and the playing fields to the east where site investigation has been undertaken, additional site specific ground investigations should be undertaken to confirm the suitability of shallow infiltration drainage features and accurately refine infiltration rates.

#### 7.3.1.2 Discharge to watercourse

Discharging surface water directly to a local watercourse is not considered feasible as there are no watercourses within the vicinity.

#### 7.3.1.3 Discharge to sewer

Discharging surface water to sewer as the primary means of surface water disposal is not considered necessary as more preferable methods are thought to be available. However, if onsite infiltration is not found to be viable, discharging to sewer should be explored in more detail.



If infiltration is feasible, connections to sewer should still be considered during detailed design as the infiltrating features may require emergency overflows.

#### 7.3.2 Proposed drainage strategy

The proposed SuDS for the site include a combination of geo-cellular soakaways and an infiltration basin which have been located depending on the position of the proposed and retained buildings. The SuDS have been designed to encourage surface water infiltration into the ground and reduce the amount that is required to store. The site has been split into 7 catchments, as detailed in **Appendix I**, and the proposed drainage layout drawing is shown in **Appendix J**. In principle, the strategy contains the following features and criteria:

- It is considered likely that infiltration techniques will be suitable on site due to the permeable nature of the underlying geology and therefore soakaways will be the main feature incorporated into the drainage design. As the site is underlain by chalk, 10m stand-off distances from buildings to soakage features have been observed within the design, based upon guidance given in the CIRIA publication 'Engineering in Chalk'<sup>13</sup>. All soakaways will need to be designed taking into consideration groundwater levels (to prevent any interference with the water table), any potential contamination (considered unlikely on this site) and site-specific infiltration rates, all of which will need to be confirmed at the detailed design stage;
- Modular storage tanks have been located mainly beneath shared surfaces (public open space, sports courts and courtyards) to provide additional attenuation and comprise the sole soakage features in Catchments B, C, D, E, F and G. In most locations modular storage has been indicated as 1.2m deep, with the tank in Catchment C indicated as 1.4m deep and Catchment E 1.5m deep. However, as mentioned previously, all soakaways will need to be designed taking into consideration groundwater levels, any potential contamination and the site-specific infiltration rates at the detailed design stage.
- An **infiltration basin** has been located to the north of the existing school building within the area of open space. This basin receives runoff from Catchment A and facilitates its infiltration whilst also providing biodiversity and water quality benefits.

The dimensions, volumes and location of the SuDS features will need to be revised during the detailed design stage. Detailed design of individual features is not part of the scope of this report. Preliminary design criteria have been based upon guidance given in the CIRIA publication 'The SUDS Manual'<sup>14</sup>.

Temporary drainage should be established for the construction phase of development to prevent silt mobilisation, potentially impacting on flow regimes and silt pollution downstream. The construction of SuDS should be considered in the early stages of site design.

#### 7.3.3 Network Modelling

To determine whether the proposed SuDS provide sufficient attenuation storage, the WinDes' 4-Stage Design Guide' tool has been used. The WinDes '4-Stage Design Guide' tool allows for indicative networks to be modelled based upon attenuation feature dimensions, rainfall values and permitted infiltration rates, in line with CIRIA guidance.

<sup>14</sup> CIRIA, 'The SuDS Manual – C753', 2015.
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<sup>&</sup>lt;sup>13</sup> CIRIA, 'Engineering in Chalk – C574', 2002.



These volumes can be later revised at detail design stage by the introduction of site specific infiltration rates.

Calculations have been run using the worst case infiltration rate produced during soakage testing directly into Chalk on the site to the east  $(1.43 \times 10^{-5} \text{ m/s})$  to demonstrate a conversative approach. The proposed impermeable areas for each modelled catchment are illustrated in Table 7.4 below, however following survey of the existing roof catchments the contributing impermeable areas may need to be revised.

#### Table 7.4: Proposed catchment areas

| Site area   | Impermeable area (m²) |
|---|-----------------------|
| Catchment A   | 4,218                 |
| Catchment B   | 2,828                 |
| Catchment C   | 1,323                 |
| Catchment D   | 1,090                 |
| Catchment E   | 3,285                 |
| Catchment F   | 1,498                 |
| Catchment G   | 1,158                 |
| Other (existing footpaths, hardstanding sports courts, etc.)* | 698                   |
| Total   | 16,098                |

\*Proposed to drain as per the existing scenario, i.e. not formally drained. Footpaths and sports courts assumed to convey flows overland to soft landscaping.

Calculations show these systems can attenuate surface water runoff without flooding during a 1 in 100 year event inclusive of 40% climate change. Further details on the storage structure and sizing, with attenuation calculations can be found in **Appendix K**.

A summary of the calculations and proposed drainage strategy is provided within the completed Essex SuDS proforma, included as **Appendix L**.

#### 7.3.4 Adoption and Maintenance

The Design and Construction Guidance for Foul and Surface Water Sewers (DCG)<sup>15</sup> states that as of April 1st 2020, sewerage authorities are required to adopt some SuDS features, including basins and swales. However, SuDS features that are classified as forming part of a building or yard (i.e. permeable paving and green roofs) will not be adoptable under the DCG and will require a second adopting authority or maintenance company. Therefore, the long-term maintenance of some SuDS features within the site boundary will most likely be undertaken by Anglian Water as the adopting authority. However, the maintenance of other features may be undertaken by a management company.

<sup>15</sup> Water UK, 'Sewerage Sector Guidance Appendix C – Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England', March 2020.



Maintenance of SuDS features should be undertaken in line with maintenance schedules outlined in the SuDS Manual and if adopted, any Anglian Water maintenance guidance. Full maintenance schedules should be confirmed at the detailed design stage in consultation with appropriate product suppliers.

#### 7.4 Water quality

The SUDS Manual contains guidance on how to assess water quality, stating "Determining the hazard posed by the land use activities at a site and the extent to which underlying soil layers and/or proposed treatment components reduce the associated risk can be done using a variety of methods that vary in complexity and data requirements."

The assessment methodology required is determined by reference to Table 4.3 of the SuDS Manual. Based on this, the quality impacts of the proposed development can be summarised with the following pollution hazard levels and management requirements for discharge to the receiving groundwater:

- Residential roofs Very Low Pollution Hazard Simple Index Approach;
- Other roofs (typically commercial/industrial roofs) Low Pollution Hazard Simple Index Approach; and
- Individual property driveways, roofs, residential car parks, low traffic roads, nonresidential car parking with infrequent change (schools, offices) – Low Pollution Hazard – Simple Index Approach.

It is therefore considered appropriate to use the Simple Index Approach (SIA) for the purpose of this assessment. The Simple Index Approach (SIA) to assessing water quality management requirements has been developed by CIRIA to support the implementation of the water quality management design methods set out in the SuDS Manual, with appropriate cross referencing to the relevant 'Design Conditions'. The CIRIA Susdrain website contains a spreadsheet based procedure that can be used for all the UK.

#### Simple Index Approach

Table 26.1 of the SUDS Manual indicates that for the Simple Index Approach:

- Simple pollution hazard indices should be based on land use (e.g. Table 26.2); and
- Risk reduction for groundwater should be done using Simple SuDS hazard mitigation indices (e.g. Table 26.4).

Extracts of Tables 26.2 and 26.4 are replicated below, highlighting the relevant features applicable to this site:

### Table 7.5: Extract of SuDS Manual Table 26.2: Pollution hazard indices for different land use classifications

| Land Use          | Pollution<br>Hazard<br>Level | Total<br>Suspended<br>Solids<br>(TSS) | Metals | Hydro-<br>carbons |
|-------------------|------------------------------|---------------------------------------|--------|-------------------|
| Residential roofs | Very Low                     | 0.2                                   | 0.2    | 0.05              |



| Land Use  | Pollution<br>Hazard<br>Level | Total<br>Suspended<br>Solids<br>(TSS) | Metals   | Hydro-<br>carbons |
|---|------------------------------|---------------------------------------|--|-------------------|
| Other roofs (typically commercial/industrial roofs)   | Low                          | 0.3                                   | 0.2 (up to<br>0.8 where<br>there is<br>potential for<br>metals to<br>leach from<br>the roof) | 0.05              |
| Individual property<br>driveways, residential car<br>parks, low traffic roads (eg<br>cul de sacs, homezones and<br>general access roads) and<br>non-residential car parking<br>with infrequent change (eg<br>schools, offices) ie <300<br>traffic movements/day | Low                          | 0.5                                   | 0.4  | 0.4               |

Table 7.6: Extract of SuDS Manual Table 26.4: Indicative SuDS mitigation indices for discharges to groundwater

| Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates  | TSS                                       | Metals   | Hydro-<br>carbons          |
|---|---|--|----------------------------|
| A soil with good contaminant attenuation potential of at least 300mm in depth   | 0.4                                       | 0.3  | 0.3                        |
| Infiltration trench (where a suitable depth of<br>filtration material is included that provides<br>treatment, i.e. graded gravel with sufficient smaller<br>particles but not single size coarse aggregate such<br>as 20mm gravel) underlain by a soil with good<br>contaminant attenuation potential of at least<br>300mm in depth | 0.4                                       | 0.4  | 0.4                        |
| Proprietary treatment systems   | can addres<br>contaminar<br>levels for ir | t demonstra<br>s each of the<br>nt types to ac<br>flow concen<br>the contribu-<br>rea. | e<br>cceptable<br>trations |

The SuDS Manual States:

#### Total SuDS mitigation index ≥ pollution hazard index

#### (for each contaminant type) (for each contaminant type)

Taking each land type use in turn:

 Residential roofs – a soil with good contaminant attenuation potential of at least 300mm in depth (i.e. shared soakaway) (mitigation 0.3 – 0.4) is sufficient to mitigate for any of the potential pollutants (indices 0.05-0.2);



- Other roofs (the existing school buildings to be converted) a soil with good contaminant attenuation potential of at least 300mm in depth (i.e. shared soakaway) (mitigation 0.3 0.4) is sufficient to mitigate for any of the potential pollutants (indices 0.05-0.3); and
- Individual property driveways, residential car parks, low traffic roads, non-residential car parking with infrequent change a soil with good contaminant attenuation potential of at least 300mm in depth alone (i.e. shared soakaway) (mitigation 0.3 0.4) is not sufficient to mitigate for the potential pollutants (indices 0.4-0.5). In these cases, the incorporation of proprietary treatment systems should be considered.

#### 7.5 Foul drainage provision

Foul drainage work is outside the scope of the assessment. However, it is likely that foul water will be connected into the public foul network as per the existing scenario. Existing and proposed flow rates should be calculated and capacity confirmed with Anglian Water.



### 8 CONCLUSIONS AND RECOMMENDATIONS

This FRA complies with the NPPF and Planning Practice Guidance and demonstrates that flood risk from all sources has been considered in the proposed development. It is also consistent with the Local Planning Authority requirements with regard to flood risk.

The proposed development site lies in an area designated by the EA as Flood Zone 1, and is outlined to have a chance of flooding of less than 1 in 1,000 (<0.1%) in any year.

The NPPF sets out a Sequential Test, which states that preference should be given to development located within Flood Zone 1. This FRA demonstrates that the requirements of the Sequential Test have been met. The proposed development is classified as 'more vulnerable' and therefore considered appropriate within Flood Zone 1 without application of the Exception Test.

This FRA has considered multiple sources of flooding and concluded the following:

| Source        | Level of risk           | Mitigation  |
|---------------|-------------------------|---|
| Fluvial       | Very Low - Flood Zone 1 | N/A   |
| Tidal         | Very Low - Flood Zone 1 | N/A   |
| Surface water | Low                     | Proposals will follow best practice regarding site<br>drainage to ensure that surface water runoff from the<br>development is managed. Surface water from the<br>proposed development will be attenuated and<br>discharged directly to the ground via infiltration<br>features. In order to prevent flooding, both on and off<br>the site, a variety of SuDS will be utilised to control<br>surface water flows, including geo-cellular<br>soakaways and infiltration basins. These features will<br>be designed to store the volume of water associated<br>with a 1 in 100 year rainfall event, plus an allowance<br>for climate change. |
| Groundwater   | Low                     | A site specific ground investigation should be<br>undertaken to confirm onsite groundwater levels.<br>Following this it may be necessary to revise the<br>classification of groundwater flood risk.<br>Existing basements are known to become wet<br>following periods of heavy rain. Further investigation<br>of this mechanism will improve understanding of the<br>severity of the problem and whether mitigation in the<br>form of tanking, etc. is required.   |
| Sewers        | Low                     | N/A   |
| Reservoir     | Very Low                | N/A   |
| Other sources | Very Low                | N/A   |

#### Table 8.1: Flood risk summary

Overall, taking into account the above points, the development of the site should not be precluded on flood risk grounds.



### APPENDIX A RSK GROUP SERVICE CONSTRAINTS

1. This report and the drainage design carried out in connection with the report (together the "Services") were compiled and carried out by RSK LDE Ltd (RSK) for Chase New Homes (the "client") in accordance with the terms of a contract between RSK and the "client" dated June 2021. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable civil engineer at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.

6. The observations and conclusions described in this report are based solely upon the Services, which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at predetermined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the appropriate location. Such features should not be used for setting out and should be considered indicative only.

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### APPENDIX B TOPOGRAPHIC SURVEY

Chase New Homes Former Friends School, Saffron Walden Flood Risk Assessment and Surface Water Drainage Strategy 680119-R1(2)-FRA

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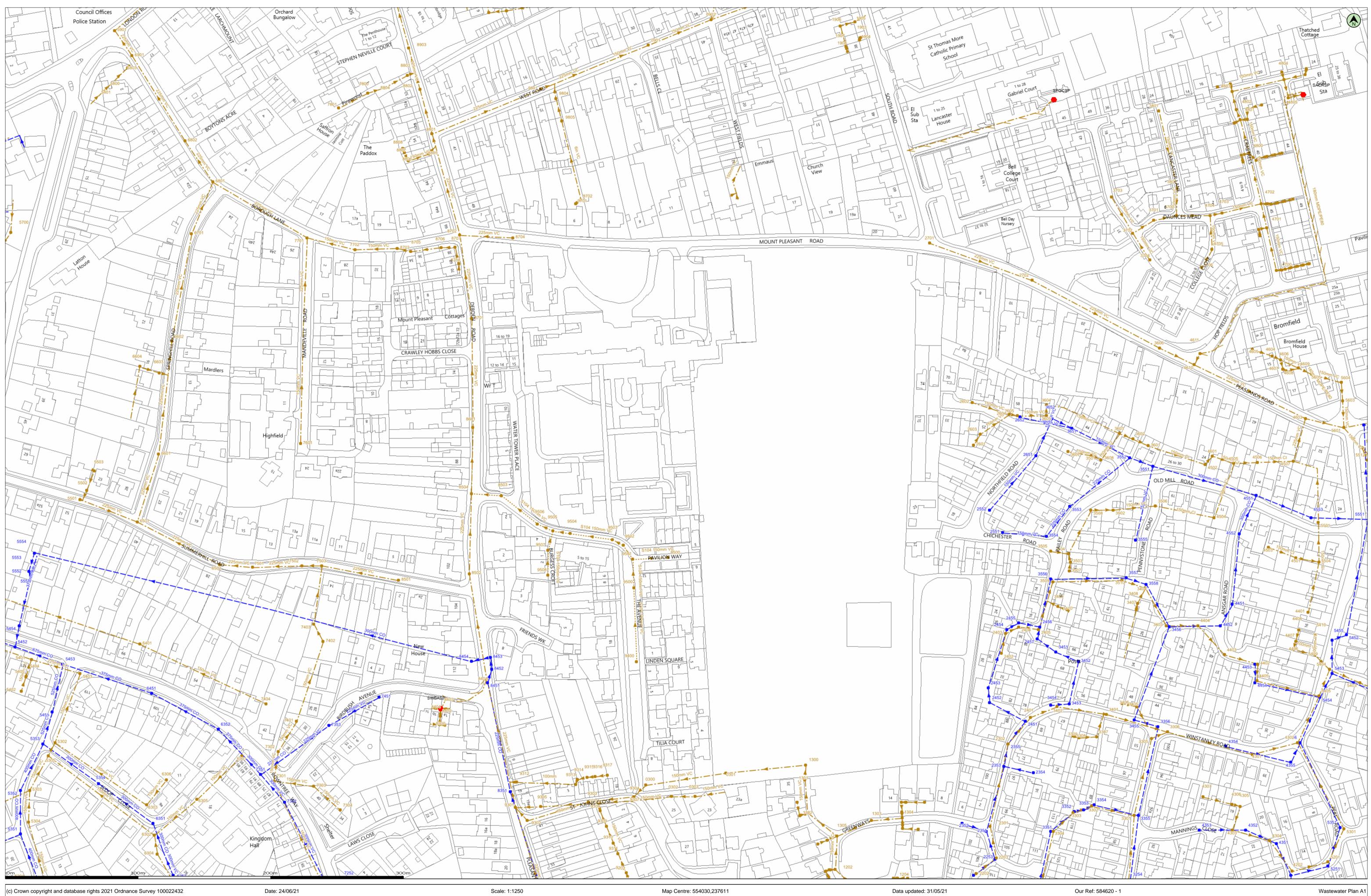
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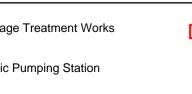


### APPENDIX C ANGLIAN WATER PUBLIC SEWER RECORDS

Chase New Homes Former Friends School, Saffron Walden Flood Risk Assessment and Surface Water Drainage Strategy 680119-R1(2)-FRA



| (c) Crown copyright and database rights 2021 Ordnance Survey 100022432 Date: 24/06/2   | 1   |         |          | Scale | e: 1:1250 |
|--|---|---------|----------|-------|-----------|
| search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before   | Foul Sewer<br>Surface Sewer<br>Combined Sewer |         | Outfall* | e     | Sewage    |
| discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services<br>Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian<br>Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or | Final Effluent<br>Rising Main*                | <b></b> | Inlet*   | €     | Public P  |
|  | Private Sewer*<br>Decommissioned Sewer*       |         | Manhole* | •     | Decomr    |



Map Centre: 554030,237617 cnewlands@rsk.co.uk

Walden School



ommissioned Pumping Station
\*(Colour denotes effluent type)

|              | rence Easting    | Northing         | Liquid Type | Cover Level | Invert Level | Depth to Inve |
|--------------|------------------|------------------|-------------|-------------|--------------|---------------|
| 300          | 553999           | 237354           | F           | -           | 84.172       | -             |
| 301          | 554060           | 237363           | F           | -           | 86.25        | -             |
| 302          | 554018           | 237345           | F           | -           | -            | -             |
| 303          | 554036           | 237345<br>237525 | F           | -           | -            | -             |
| 901          | 554016<br>554001 | 237525           | F<br>F      | - 75.8      | - 73.94      | - 1.86        |
| 902          | 554048           | 237930           | F           | 75.64       | 73.71        | 1.93          |
| 202          | 554142           | 237290           | F           | -           | 90.49        | -             |
| 204          | 554186           | 237284           | F           | -           | 91.922       | -             |
| 300          | 554120           | 237369           | F           | -           | 88.3         | -             |
| 301          | 554119           | 237358           | F           | -           | 88.678       | -             |
| 302          | 554121           | 237333           | F           | -           | 89.288       | -             |
| 303          | 554169           | 237327           | F           | -           | 90.868       | -             |
| 304          | 554192           | 237329           | F           | -           | 91.621       | -             |
| 305          | 554143           | 237315           | F           | -           | 90.071       | -             |
| 903          | 554160           | 237917           | F           | -           | -            | -             |
| 904          | 554160           | 237915           | F           | -           | -            | -             |
| 905          | 554157           | 237929           | F           | -           | -            | -             |
| 906          | 554146           | 237925           | F           | -           | -            | -             |
| 907          | 554149           | 237913           | F           | -           | -            | -             |
| 908          | 554150           | 237909           | F           | -           | -            | -             |
| 202          | 554248           | 237287           | F           | -           | -            | -             |
| 203          | 554263           | 237299           | F           | -           | -            | -             |
| 2301         | 554259<br>554272 | 237323<br>237385 | F<br>F      | 94.931      | 93.611       | 1.32          |
| 2401         | 554272           | 237365           | F           | -           | -            | -             |
| 401          | 554267           | 237403           | F           | -           | -            | -             |
| 402          | 554207           | 237455           | F           | -           | -            | -             |
| 403          | 554280           | 237408           | F           | -           | -            | -             |
| 405          | 554295           | 237473           | F           | -           | -            | -             |
| 601          | 554246           | 237610           | F           | 89.98       | 88.33        | 1.65          |
| 602          | 554245           | 237642           | F           | 89.01       | 87.47        | 1.54          |
| 603          | 554251           | 237618           | F           | 89.59       | 87.95        | 1.64          |
| 604          | 554273           | 237633           | F           | 88.25       | 86.09        | 2.16          |
| 605          | 554279           | 237632           | F           | 87.79       | 85.83        | 1.96          |
| 701          | 554213           | 237762           | F           | 86.71       | 84.69        | 2.02          |
| 702          | 554290           | 237734           | F           | 83.24       | 81.32        | 1.92          |
| 301          | 554367           | 237331           | F           | -           | -            | -             |
| 302          | 554335           | 237338           | F           | -           | -            | -             |
| 303          | 554321           | 237333           | F           | -           | -            | -             |
| 304          | 554306           | 237319           | F           | -           | -            | -             |
| 305          | 554380           | 237389           | F           | -           | -            | -             |
| 306          | 554392           | 237394           | F           | -           | -            | -             |
| 307          | 554339           | 237390           | F           | -           | -            | -             |
| 308          | 554325           | 237389           | F           | -           | -            | -             |
| 309          | 554321           | 237391           | F           | -           | -            | -             |
| 401          | 554346           | 237407           | F           | -           | -            | -             |
| 402          | 554309           | 237413           | F           | -           | -            | -             |
| 3403<br>3404 | 554391           | 237474<br>237502 | F<br>F      | -           | -            | -             |
| 3404<br>3405 | 554375<br>554369 | 237502           | F           | -           | -            | -             |
| 3405<br>3406 | 554358           | 237413           | F           | -           | -            | -             |
| 3408<br>3407 | 554369           | 237415           | F           | -           | -            | -             |
| 3408         | 554370           | 237491           | F           | -           | -            | -             |
| 3409         | 554310           | 237488           | F           | -           | -            | -             |
| 3410         | 554317           | 237486           | F           | -           | -            | -             |
| 501          | 554335           | 237602           | F           | 87.41       | 85.45        | 1.96          |
| 502          | 554351           | 237561           | F           | 88.21       | 86.86        | 1.35          |
| 3503         | 554319           | 237522           | F           | 91.32       | 89.73        | 1.59          |
| 504          | 554317           | 237528           | F           | 91.19       | 89.56        | 1.63          |
| 505          | 554304           | 237530           | F           | 91.5        | 90.13        | 1.37          |
| 506          | 554383           | 237564           | F           | 86.86       | 85.35        | 1.51          |
| 507          | 554318           | 237515           | F           | 91.52       | 89.94        | 1.58          |
| 508          | 554334           | 237561           | F           | 89.49       | 88.22        | 1.27          |
| 509          | 554306           | 237507           | F           | -           | -            | -             |
| 510          | 554358           | 237508           | F           | -           | -            | -             |
| 601          | 554378           | 237609           | F           | 84.59       | 82.72        | 1.87          |
| 602          | 554366           | 237615           | F           | 84.78       | 83.02        | 1.76          |
| 603          | 554356           | 237619           | F           | 85.11       | 83.61        | 1.5           |
| 604          | 554301           | 237640           | F           | -           | -            | -             |
| 605          | 554301           | 237632           | F           | 87.43       | 85.54        | 1.89          |
| 606<br>607   | 554386           | 237683           | F           | 78.98       | 77.03        | 1.95          |
| 607          | 554317           | 237605           | F           | 87.96       | 86.45        | 1.51          |
| 608          | 554342           | 237599           | F<br>F      | -           | -            | -             |
| 700<br>701   | 554399<br>554382 | 237783<br>237779 | F           | -           | -            | -             |
| 5701<br>5702 | 554382           | 237779           | F           | -           | -            | -             |
| 702<br>703   | 554366           | 237769           | F           | -           | -            | -             |
| 3703<br>3704 | 554350           | 237749           | F           | -           | -            | -             |
| 800          | 554399           | 237803           | F           | -           | -            | -             |
| 801          | 554386           | 237861           | F           | -           | -            | -             |
| 202          | 554486           | 237289           | F           | -           | -            | -             |
| 301          | 554456           | 237377           | F           | -           | -            | -             |
| 302          | 554490           | 237386           | F           | -           | -            | -             |
| 303          | 554441           | 237320           | F           | -           | -            | -             |
| 304          | 554469           | 237312           | F           | -           | -            | -             |
| 305          | 554447           | 237338           | F           | -           | -            | -             |
| 306          | 554441           | 237339           | F           | -           | -            | -             |
| 307          | 554419           | 237345           | F           | -           | -            | -             |
| 401          | 554498           | 237484           | F           | 84.94       | 83.73        | 1.21          |
| 402          | 554460           | 237445           | F           | -           | -            | -             |
| 403          | 554435           | 237452           | F           | -           | -            | -             |
| 404          | 554415           | 237474           | F           | -           | -            | -             |
| 405          | 554459           | 237432           | F           | -           | -            | -             |
| 406          | 554487           | 237456           | F           | -           | -            | -             |
| 407          | 554489           | 237462           | F           | -           | -            | -             |
| 408          | 554491           | 237470           | F           | -           | -            | -             |
| 501          | 554489           | 237525           | F           | 82.26       | 81.06        | 1.2           |
| 502          | 554420           | 237595           | F           | 83.11       | 81.71        | 1.4           |
| 503          | 554468           | 237533           | F           | 82.61       | 81.69        | 0.92          |
|              | 554427           | 237555           | F           | 85.48       | 83.89        | 1.59          |
| 504<br>505   | 554442           | 237596           | F           |             |              |               |

| Manhole Refe   | erence Easting  | Northing   | Liquid Type                          |
|--|---|--|--------------------------------------|
| 4507   | 554487  | 237598   | F                                    |
| 4601<br>4603   | 554426  | 237602<br>237630   | F                                    |
| 4604   | 554471  | 237630   | F                                    |
| 4605   | 554456  | 237682   | F                                    |
| 4606   | 554477  | 237674   | F                                    |
| 4607<br>4608   | 554479  | 237667<br>237666   | F                                    |
| 4609   | 554491  | 237668   | F                                    |
| 4610   | 554412  | 237670   | F                                    |
| 4611   | 554417  | 237679   | F                                    |
| 4700<br>4701   | 554474  | 237741   | F<br>F                               |
| 4702   | 554463  | 237792   | F                                    |
| 4703   | 554433  | 237785   | F                                    |
| 4704   | 554424  | 237783   | F                                    |
| 4705<br>4706   | 554426<br>554418  | 237757<br>237743   | F                                    |
| 4800   | 554454  | 237830   | F                                    |
| 4801   | 554447  | 237855   | F                                    |
| 4802   | 554444  | 237862   | F                                    |
| 4803<br>4804   | 554441  | 237876<br>237885   | F                                    |
| 4805   | 554483  | 237803   | F                                    |
| 5201   | 554513  | 237296   | F                                    |
| 5301   | 554525  | 237321   | F                                    |
| 5302   | 553554  | 237386   | F                                    |
| 5303<br>5304   | 553535<br>553534  | 237350<br>237326   | F<br>F                               |
| 5305   | 553549  | 237376   | F                                    |
| 5401   | 553536  | 237448   | F                                    |
| 5402   | 553529  | 237425   | F                                    |
| 5403   | 553573  | 237438   | F                                    |
| 5403<br>5404   | 554537<br>553533  | 237431<br>237438   | F<br>F                               |
| 5404   | 554514  | 237441   | F                                    |
| 5405   | 553532  | 237435   | F                                    |
| 5405   | 554506  | 237421   | F                                    |
| 5409   | 554503  | 237452   | F                                    |
| 5410<br>5501   | 554504<br>553573  | 237467<br>237569   | F<br>F                               |
| 5501   | 554506  | 237552   | F                                    |
| 5502   | 553578  | 237576   | F                                    |
| 5503   | 553584  | 237590   | F                                    |
| 5504   | 554506  | 237522   | F                                    |
| 5512<br>5601   | 554543<br>554525  | 237599<br>237623   | F<br>F                               |
| 5603   | 554524  | 237643   | F                                    |
| 5604   | 554523  | 237657   | F                                    |
| 5605   | 554501  | 237663   | F                                    |
| 5606<br>5700   | 554539<br>553521  | 237608<br>237770   | F<br>F                               |
| 5800   | 553596  | 237882   | F                                    |
| 5801   | 553590  | 237876   | F                                    |
| 5901   | 553599  | 237922   | F                                    |
| 6301<br>6302   | 553695  | 237376   | F                                    |
| 6302<br>6303   | 553629<br>553623  | 237316<br>237339   | F<br>F                               |
| 6304   | 553631  | 237302   | F                                    |
| 6305   | 553661  | 237343   | F                                    |
| 6306   | 553638  | 237358   | F                                    |
| 6401<br>6501   | 553618<br>553616  | 237460<br>237552   | F F                                  |
| 6502   | 553678  | 237520   | F                                    |
| 6601   | 553632  | 237603   | F                                    |
| 6602   | 553642  | 237688   | F                                    |
| 6603   | 553633  | 237664   | F                                    |
| 6604<br>6701   | 553618<br>553657  | 237669<br>237769   | F<br>F                               |
| 6801   | 553673  | 237808   | F                                    |
| 6802   | 553652  | 237839   | F                                    |
| 6803   | 553609  | 237894   | F                                    |
| 6901<br>7301   | 553612<br>553719  | 237903<br>237357   | F                                    |
| 7302   | 553719  | 237379   | F                                    |
| 7303   | 553749  | 237353   | F                                    |
| 7304   | 553769  | 237335   | F                                    |
| 7401   | 553736  | 237402   | F                                    |
| 7402<br>7403   | 553756<br>553749  | 237462<br>237475   | F                                    |
| 7404   | 553713  | 237415   | F                                    |
| 7501   | 553703  | 237518   | F                                    |
| 7502   | 553740  | 237519   | F                                    |
| 7503<br>7601   | 553755<br>553739  | 237519<br>237611   | F                                    |
| 7701   | 553739  | 237766   | F                                    |
| 7702   | 553780  | 237757   | F                                    |
| 7800   | 553790  | 237875   | F                                    |
|  | 553768  | 237864   | F                                    |
| 7801   | 553844<br>553879  | 237399<br>237434   | F                                    |
| 8300   | 1.1.1.1.1.0 / M   |  | F                                    |
| 8300<br>8401   | 553844  | 237406   |                                      |
| 8300<br>8401<br>8402   |   | 237406   | F                                    |
| 8300<br>8401<br>8402<br>8403   | 553844  | 237411<br>237412   |                                      |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501   | 553844<br>553849<br>553841<br>553813  | 237411<br>237412<br>237508   | F<br>F<br>F                          |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501<br>8502                                 | 553844<br>553849<br>553841<br>553813<br>553866  | 237411<br>237412<br>237508<br>237513                               | F<br>F<br>F<br>F                     |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501<br>8502<br>8503                         | 553844           553849           553841           553813           553866           553890                     | 237411<br>237412<br>237508<br>237513<br>237572                     | F<br>F<br>F<br>F<br>F<br>F           |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501<br>8502                                 | 553844<br>553849<br>553841<br>553813<br>553866  | 237411<br>237412<br>237508<br>237513                               | F<br>F<br>F<br>F                     |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501<br>8502<br>8503<br>8503                 | 553844<br>553849<br>553841<br>553813<br>553866<br>553890<br>553868  | 237411<br>237412<br>237508<br>237513<br>237572<br>237573           | F<br>F<br>F<br>F<br>F<br>F<br>F      |
| 8300<br>8401<br>8402<br>8403<br>8404<br>8501<br>8502<br>8503<br>8503<br>8504<br>8601 | 553844         553849         553841         553813         553866         553890         553868         553869 | 237411<br>237412<br>237508<br>237513<br>237572<br>237573<br>237623 | F<br>F<br>F<br>F<br>F<br>F<br>F<br>F |

| 82.46          | -<br>81.45     | -<br>1.01    |
|----------------|----------------|--------------|
| 75.78          | 73.78          | 2            |
| 74.76<br>75.1  | 73.81<br>74.35 | 0.95         |
| -              | 73.63          | -            |
| -              | 73.5           | -            |
| -              | 73.45          | -            |
| -              | 73.2           | -            |
| -              | -              | -            |
| 72.52          | 69.55          | 2.97         |
| 71.37          | 69             | 2.37         |
| 71.17<br>-     | 68.877<br>-    | 2.293        |
| -              | -              | -            |
| -              | -              | -            |
| -<br>71.36     | -<br>68        | -<br>3.36    |
| 71.4           | 67.826         | 3.574        |
| 71.33          | 67.771         | 3.559        |
| 71.19<br>68.5  | 67.675<br>64.7 | 3.515<br>3.8 |
| 68.35          | 64.603         | 3.747        |
| -              | -              | -            |
| -<br>75 05     | -              | -            |
| 75.05<br>-     | 73.34<br>-     | 1.71         |
| 74.47          | 72.52          | 1.95         |
| •              | -              | -            |
| 73.59<br>73.78 | 71.71          | 1.88         |
| 73.78<br>74.47 | 72.22<br>72.55 | 1.56<br>1.92 |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | •            |
| 77.03<br>79.88 | 75.47<br>78.21 | 1.56<br>1.67 |
| -              | -              | -            |
| -              | -              | -            |
| 81.57          | 80.21          | 1.36         |
| -<br>74.15     | -<br>72.31     | -<br>1.84    |
| 73.87          | 72.79          | 1.04         |
| 73.89          | 72.91          | 0.98         |
| 73.93          | 73.04          | 0.89         |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | -            |
| -              | -              | -            |
| 81.57<br>79.07 | 78.69<br>76.66 | 2.88<br>2.41 |
| 77.92          | 75.91          | 2.41         |
| 79.14          | 77.03          | 2.11         |
| 79.67          | 78.09          | 1.58         |
| 79.01<br>75.23 | 76.65<br>73.53 | 2.36<br>1.7  |
| 78.01          | 75.16          | 2.85         |
| 78.26          | 76             | 2.26         |
| 79.37          | 74.81          | 4.56         |
| 77.95<br>-     | 74.18          | 3.77         |
| -              | -              | -            |
| 75.05          | 73.69          | 1.36         |
| -              | -              | -            |
| 71.8<br>-      | 69.85<br>-     | 1.95<br>-    |
| -              | -              | -            |
| 82.08          | 80.43          | 1.65         |
| 81.9           | 79.89          | 2.01         |
| 83.15<br>84.52 | 81.24<br>83.61 | 1.91         |
| 84.52<br>81.65 | 83.61<br>79.38 | 0.91<br>2.27 |
| 79.26          | 78.02          | 1.24         |
| 79.24          | 77.88          | 1.36         |
| 79.62          | 77.99          | 1.63         |
| 78.44<br>79.2  | 76.34<br>77.17 | 2.1<br>2.03  |
| 79.49          | 77.5           | 1.99         |
| 82.91          | 81.15          | 1.76         |
| 79.46          | 77.8           | 1.66         |
| 81.59<br>-     | 80.03          | 1.56<br>-    |
| -              | -              | -            |
| -              | -              | -            |
| 82.3           | 80.5           | 1.8          |
| -              | -              | -            |
| -              | -              | -            |
| 80.94          | 79.08          | 1.86         |
| -              | -              | -            |
| -              | -              | -            |
| -<br>86.39     | 79.47          | 6.92         |
| 85.74          | 78.98          | 6.76         |
|                |                |              |
| 32.4           | 78.68          | 3.72         |

| 8705   | 553822                     | 237756           | F      | -                    | -                    | -                |
|--|----------------------------|------------------|--------|----------------------|----------------------|------------------|
| 8706   | 553845                     | 237759           | F      | -                    | -                    | -                |
| 8700   | 553855                     | 237759           | F      |                      | _                    |                  |
|  |                            |                  |        | -                    | -                    | -                |
| 8708   | 553858                     | 237746           | F      | -                    | -                    | -                |
| 8801   | 553838                     | 237844           | F      | -                    | -                    | -                |
| 8802   | 553829                     | 237878           | F      | -                    | -                    | -                |
| 8803   | 553820                     | 237888           | F      | -                    | -                    | -                |
| 8804   | 553802                     | 237879           | F      | -                    | -                    | -                |
| 8805   | 553836                     | 237829           | F      | -                    | -                    | -                |
| 8806   | 553820                     | 237824           | F      |                      |                      |                  |
|  |                            |                  |        | -                    | -                    | -                |
| 8807   | 553817                     | 237830           | F      | -                    | -                    | -                |
| 8808   | 553816                     | 237833           | F      | -                    | -                    | -                |
| 8903   | 553821                     | 237909           | F      | -                    | -                    | -                |
| 9202   | 553984                     | 237288           | F      | -                    | -                    | -                |
| 9301   | 553901                     | 237337           | F      | 84.62                | 82.38                | 2.24             |
|  |                            |                  |        | 04.02                |                      | 2.24             |
| 9302   | 553910                     | 237327           | F      | -                    | 82.774               | -                |
| 9303   | 553956                     | 237341           | F      | -                    | 83.414               | -                |
| 9304   | 553990                     | 237345           | F      | -                    | 83.998               | -                |
| 9305   | 553920                     | 237338           | F      | -                    | -                    | -                |
| 9306   | 553964                     | 237340           | F      | -                    | -                    | -                |
| 9307   | 553988                     | 237342           | F      |                      |                      |                  |
|  |                            |                  |        | -                    |                      |                  |
| 9308   | 553965                     | 237335           | F      | -                    | -                    | -                |
| 9309   | 553969                     | 237323           | F      | -                    | -                    | -                |
| 9310   | 553975                     | 237310           | F      | -                    | -                    | -                |
| 9311   | 553978                     | 237302           | F      | -                    | -                    | -                |
| 9312   | 553902                     | 237356           | F      | -                    | -                    | -                |
| 9312   | 553946                     | 237354           | F      |                      |                      | _                |
|  |                            |                  |        | -                    | -                    |                  |
| 9314   | 553948                     | 237358           | F      | -                    | -                    | -                |
| 9315   | 553955                     | 237360           | F      | -                    | -                    | -                |
| 9316   | 553961                     | 237360           | F      | -                    | -                    | -                |
| 9317   | 553970                     | 237361           | F      | -                    | -                    | -                |
| 9400   | 553992                     | 237447           | F      |                      | _                    | -                |
|  |                            |                  |        |                      |                      |                  |
| 9500   | 553990                     | 237502           | F      | -                    | -                    | -                |
| 9501   | 553989                     | 237524           | F      | -                    | -                    | -                |
| 9502   | 553982                     | 237534           | F      | -                    | -                    | -                |
| 9503   | 553974                     | 237539           | F      | -                    | -                    | -                |
| 9504   | 553942                     | 237543           | F      | -                    | -                    | -                |
|  |                            |                  | F      |                      | -                    | _                |
| 9505   | 553929                     | 237545           |        | -                    | -                    | -                |
| 9506   | 553918                     | 237550           | F      | -                    | -                    | -                |
| 9507   | 553925                     | 237531           | F      | -                    | -                    | -                |
| 9508   | 553925                     | 237512           | F      | -                    | -                    | -                |
| 9701   | 553946                     | 237792           | F      | -                    | -                    | -                |
|  |                            |                  | F      |                      |                      |                  |
| 9702   | 553950                     | 237794           |        | -                    | -                    | -                |
| 9801   | 553920                     | 237878           | F      | 76.73                | 74.32                | 2.41             |
| 9804   | 553931                     | 237871           | F      | -                    | -                    | -                |
| 9805   | 553936                     | 237854           | F      | -                    | -                    | -                |
| 2252   | 554246                     | 237286           | S      | _                    | -                    | _                |
| 2253   | 554262                     | 237298           | S      | _                    | -                    | _                |
|  |                            |                  |        | 04.005               | 00.405               |                  |
| 2351   | 554256                     | 237319           | S      | 94.985               | 93.485               | 1.5              |
| 2352   | 554237                     | 237325           | S      | 94.639               | 93.689               | 0.95             |
| 2353   | 554269                     | 237368           | S      | -                    | -                    | -                |
| 2354   | 554291                     | 237363           | S      | -                    | -                    | -                |
|  |                            |                  |        |                      |                      |                  |
| 2355   | 554272                     | 237385           | S      | -                    | -                    | -                |
| 2451   | 554285                     | 237402           | S      | -                    | -                    | -                |
| 2452   | 554258                     | 237416           | S      | -                    | -                    | -                |
| 2453   | 554257                     | 237427           | S      | -                    | -                    | -                |
| 2454   | 554271                     | 237471           | S      | -                    | -                    | -                |
| 2455   | 554280                     | 237476           | S      |                      | _                    |                  |
|  |                            |                  | S      |                      |                      |                  |
| 2456   | 554296                     | 237473           |        | -                    | -                    | -                |
| 2457   | 554294                     | 237464           | S      | -                    | -                    | -                |
| 2551   | 554268                     | 237544           | S      | 92.04                | 90.59                | 1.45             |
| 2552   | 554258                     | 237561           | S      | 91.81                | 90.78                | 1.03             |
| 2651   | 554293                     | 237602           | S      | 88.98                | 87.87                | 1.11             |
| 2652   | 554281                     | 237631           | S      | 88.9                 | 87.35                | 1.55             |
|  |                            |                  |        | 00.0                 | 51.00                | 1.00             |
| 3351   | 554304                     | 237319           | S      | -                    | -                    | -                |
| 3352   | 554322                     | 237334           | S      | -                    | -                    | -                |
| 3353   | 554329                     | 237335           | S      | -                    | -                    | -                |
| 3354   | 554337                     | 237339           | S      | -                    | -                    | -                |
| 3355   | 554370                     | 237331           | S      | -                    | -                    | -                |
| 3356   | 554385                     | 237398           | S      | -                    | -                    | -                |
| 3451   | 554308                     | 237454           | S      |                      | _                    | _                |
|  |                            |                  |        |                      |                      |                  |
| 3452   | 554325                     | 237447           | S      | -                    | -                    | -                |
| 3453   | 554318                     | 237415           | S      | -                    | -                    | -                |
| 3454   | 554304                     | 237414           | S      | -                    | -                    | -                |
| 3455   | 554367                     | 237403           | S      | -                    | -                    | -                |
| 3456   | 554393                     | 237473           | S      | -                    | -                    | -                |
| 3551   | 554381                     | 237594           | S      | 85.53                | 83.89                | 1.64             |
| 3552   |                            |                  | S      | 86.03                | 84.55                |                  |
|  | 554364                     | 237600           |        |                      |                      | 1.48             |
| 3553   | 554318                     | 237564           | S      | 89.61                | 88.17                | 1.44             |
| 3554   | 554301                     | 237541           | S      | 91.42                | 89.81                | 1.61             |
| 3555   | 554368                     | 237538           | S      | 89.19                | 87.78                | 1.41             |
| 3556   | 554304                     | 237509           | S      | -                    | -                    | -                |
| 3557   | 554361                     | 237510           | S      | -                    | -                    | -                |
| 3558   | 554376                     | 237505           | S      | -                    | -                    | -                |
| 3651   | 554320                     | 237623           | S      | 86.69                | 85.63                | 1.06             |
|  |                            |                  |        | 00.03                | 00.00                | 1.00             |
| 3652   | 554305                     | 237630           | S      | -                    | -                    | -                |
| 4252   | 554485                     | 237286           | S      | -                    | -                    | -                |
| 4351   | 554474                     | 237310           | S      | -                    | -                    | -                |
| 4352   | 554451                     | 237320           | S      | -                    | -                    | -                |
| 4353   | 554416                     | 237320           | S      | -                    | -                    | -                |
|  |                            |                  |        |                      |                      |                  |
| 4354   | 554436                     | 237383           | S      | -                    | -                    |                  |
| 4355   | 554485                     | 237371           | S      | -                    | -                    | -                |
| 4356   | 554492                     | 237386           | S      | -                    | -                    | -                |
| 4451   | 554441                     | 237490           | S      | -                    | -                    | -                |
|  | 554432                     | 237474           | S      | -                    | -                    | -                |
| 4452   |                            |                  |        |                      | _                    |                  |
|  | 554458                     | 237445           | S      | -                    | -                    |                  |
| 4453   |                            | 237431           | S      | -                    | -                    | -                |
| 4453<br>4454   | 554458                     |                  |        | 91.00                | 80.38                | 1.61             |
| 4453<br>4454   | 554458<br>554459           | 237572           | S      | 81.99                | 00.00                | 1.01             |
| 4453<br>4454<br>4551   |                            | 237572<br>237543 | S<br>S | -                    | -                    | -                |
| 4453<br>4454<br>4551<br>4552                                 | 554459                     |                  | S      | -<br>-               | -                    | -                |
| 4453<br>4454<br>4551<br>4552<br>4553                         | 554459<br>554446<br>554500 | 237543<br>237555 | S<br>S | -                    | -<br>-               | -                |
| 4452<br>4453<br>4454<br>4551<br>4552<br>4553<br>5251<br>5351 | 554459<br>554446           | 237543           | S      | -<br>-<br>-<br>77.73 | -<br>-<br>-<br>75.73 | -<br>-<br>-<br>2 |

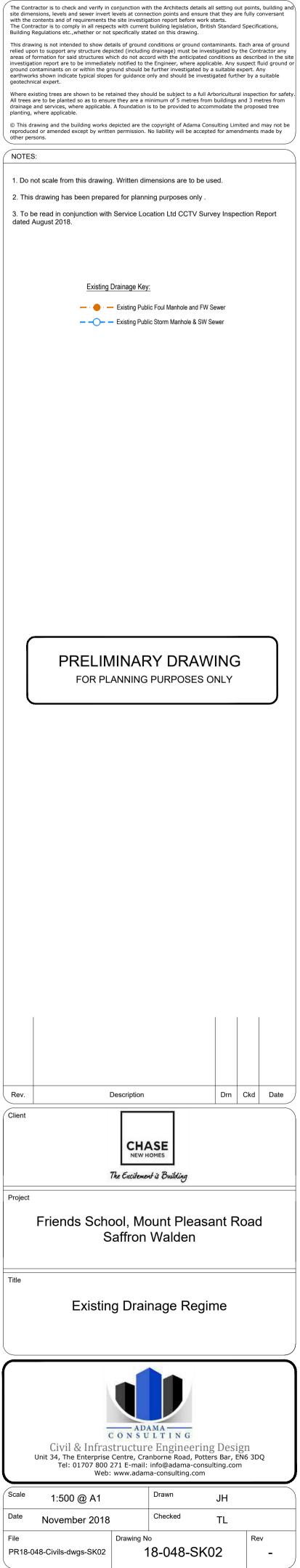
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|--------------|------------------|------------------|----------|---------------|------------|------|
| 5352         | 553528           | 237350           | S        | 76.52         | 73.76      | 2.76 |
| 5353         | 553545           | 237385           | S        | 74.93         | 72.5       | 2.43 |
| 5354         | 553587           | 237355           | S        | 76.37         | 74.64      | 1.73 |
| 5451         | 553552           | 237409           | S        | 74.38         | 72.1       | 2.28 |
| 5452         | 553524           | 237458           | S        | 73.27         | 71.25      | 2.02 |
| 5452         | 554527           | 237467           | S        | -             | -          | -    |
| 5453         | 553560           | 237445           | S        | 74.12         | 71.56      | 2.56 |
| 5453         | 554516           | 237438           | S        | -             | -          | -    |
| 5454         | 553527           | 237474           | S        | 73.3          | 71.61      | 1.69 |
| 5454         | 554507           | 237420           | S        | -             | -          | -    |
| 5455         | 554516           | 237463           | S        | -             | -          | -    |
| 5551         | 553535           | 237508           | S        | 8.47          | 7.72       | 1    |
| 5552         | 553536           | 237511           | S        | 9.15          | 7.9        | 1    |
| 5553         | 553535<br>553539 | 237515           | S<br>S   | 9.275         | 8.1<br>8.9 | 1    |
| 5554<br>5651 | 554540           | 237529           | S        | 9.67<br>73.54 | 71.89      | 1.65 |
| 6252         | 553643           | 237625<br>237286 | S        | 79.87         | 77.61      | 2.26 |
| 6252<br>6351 | 553628           | 237200           | S        | 78.55         | 76.39      | 2.20 |
| 5351<br>5352 | 553628           | 237325           | S        | 78.55         | 76.39      | 1.86 |
| 6451         | 553627           | 237396           | S        | 79.44         | 75.14      | 1.56 |
| 7252         | 553770           | 237284           | S        | 86.15         | 84.04      | 2.11 |
| 7351         | 553709           | 237264           | S        | 81.69         | 79.16      | 2.53 |
|              |                  |                  |          |               |            |      |
| 7352         | 553727           | 237341           | S        | 82.82         | 80.56      | 2.26 |
| 7353         | 553760           | 237399           | S        | 81.89         | 79.63      | 2.26 |
| 7451         | 553798           | 237420           | S        | 81.48         | 79.98      | 1.5  |
| 3351         | 553897           | 237349           | S        | 84.09         | 83.2       | 0.89 |
| 3451         | 553880           | 237431           | S        | 82.23         | 81.35      | 0.88 |
| 3452         | 553883           | 237441           | S        | 82.32         | 81.31      | 1.01 |
| 3453         | 553882           | 237450           | S        | 82.46         | 81.2       | 1.26 |
| 3454         | 553868           | 237447           | S        | 82.16         | 80.9       | 1.26 |
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### APPENDIX D EXISTING PRIVATE DRAINAGE SURVEY

Chase New Homes Former Friends School, Saffron Walden Flood Risk Assessment and Surface Water Drainage Strategy 680119-R1(2)-FRA







Page 1

#### Mount Pleasant Road - CCTV Survey Report : 08/08/18

| Name :     | SERVICE LOCATION LTD           |  |  |
|------------|--------------------------------|--|--|
| Contact :  | RA                             |  |  |
| Location : | Unit 75 Basepoint              |  |  |
| Town :     | Tewkesbury Business Park       |  |  |
| Region :   | Tewkesbury                     |  |  |
| Postcode : | GL208SD                        |  |  |
| Tel :      | 0845 6023966                   |  |  |
| Mobile :   |                                |  |  |
| Email :    | Drainage@servicelocation.co.uk |  |  |
| Fax :      |                                |  |  |

#### **Client Information**

| Name :     | Datum Services Ltd              |
|------------|---------------------------------|
| Contact :  | Gary Richbell                   |
| Location : | Brickfield House, High Road     |
| Town :     | Thornwood, Epping               |
| Region :   | Essex                           |
| Postcode : | CM16 6TH                        |
| Tel :      |                                 |
| Mobile :   |                                 |
| Email :    | datum@datumsurveyservices.co.uk |
| Fax :      |                                 |

#### Site Information

| Name :     | Walden School  |
|------------|----------------|
| Contact :  |                |
| Location : | Saffron Walden |
| Town :     |                |
| Region :   |                |
| Postcode : |                |
| Tel :      |                |
| Mobile :   |                |
| Email :    |                |
| Fax :      |                |

#### Total grades for project

| Grade 1 Defects 0 | Grade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-------------------|---------------------|--------------------|-------------------|-----------------|---|



#### Graded defect count per section

This section shows the number of graded defects per individual survey. A grade 5 defect being serious and indicating more urgent repair. Grade 3-4 defects are less serious and are less urgent concerning repair. Grade 1-2 defects are relatively minor and could be monitored and/or repaired if thought necessary.

| Section: 1 St   | art: MH1     | End: E         | Ind                 | Road: | Mount Ple | asant Road |    |
|-----------------|--------------|----------------|---------------------|-------|-----------|------------|----|
| Length: 5.5     | Use: Surface | Water          | <b>Depth:</b> 670   | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 05.50m | 150          | Vitrified Clay | (i.e. all clayware) |       | 7         | 2          | 0  |
| Section: 2 St   | art: IC1A    | End: I         | C2A                 | Road: | Mount Ple | asant Road |    |
| Length: 31.9    | Use: Combine | ed             | <b>Depth:</b> 0     | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 31.90m | 100          | Vitrified Clay | (i.e. all clayware) |       | 2         | 1          | 0  |
| Section: 3 St   | art: IC2     | End: I         | C15                 | Road: | Mount Ple | asant Road |    |
| Length: 35.43   | Use: Combine | ed             | <b>Depth:</b> 1200  | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 18.93m - 35.43m | 150          | Vitrified Clay | (i.e. all clayware) |       | 2         | 1          | 0  |
| Section: 4 St   | art: MH2     | End: M         | /H3                 | Road: | Mount Ple | asant Road |    |
| Length: 5.93    | Use: Combine | ed             | Depth: 0            | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 05.93m | 100          | Vitrified Clay | (i.e. all clayware) |       | 4         | 0          | 0  |
| Section: 5 St   | art: MH3     | End: I         | C17                 | Road: | Mount Ple | asant Road |    |
| Length: 7       | Use: Combine | ed             | <b>Depth:</b> 1300  | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 07.00m | 150          | Vitrified Clay | (i.e. all clayware) |       | 0         | 1          | 0  |
| Section: 6 St   | art: MH4     | End: M         | /H3                 | Road: | Mount Ple | asant Road |    |
| Length: 12.41   | Use: Combine | ed             | <b>Depth:</b> 1200  | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 12.41m | 100          | Vitrified Clay | (i.e. all clayware) |       | 2         | 0          | 0  |
| Section: 7 St   | art: MH4     | End: E         | Ind                 | Road: | Mount Ple | asant Road |    |
| Length: 8.87    | Use: Combine |                | <b>Depth:</b> 1200  | Place | :         |            |    |
| From To         | Dia          | Material       |                     |       | G1 - 2    | G3 - 4     | G5 |
| 00.00m - 08.87m | 100          | Vitrified Clay | (i.e. all clayware) |       | 6         | 1          | 0  |
|                 |              |                |                     |       |           |            |    |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



| Section: 8 Start  | : IC4   | End: IC2  |  | Road: Mount Pl  | easant Road  |                         |
|---|---|---|--|---|--|-------------------------|
| Length: 18.33   | Use: Combir   | ned   | <b>Depth:</b> 1000   | Place:  |  |                         |
| From To   | Dia   | Material  |  | G1 - 2  | G3 - 4   | G5                      |
| 10.88m - 18.33m   | 150   | Vitrified Clay (i.e   | . all clayware)  | 3   | 1  | 0                       |
| Section: 9 Start  |   | End: IC3  |  | Road: Mount Pl  | easant Road  |                         |
| Length: 11.35   | Use: Surface  |   | <b>Depth:</b> 800  | Place:  |  |                         |
| From To   | Dia   | Material  |  | G1 - 2  | G3 - 4   | G5                      |
| 00.00m - 11.35m   | 150   | Vitrified Clay (i.e   | . all clayware)  | 2   | 0  | 0                       |
| Section: 10 Start   | : IC5A  | End: IC10   | )  | Road: Mount Pl  | easant Road  |                         |
| <b>_ength:</b> 3.18   | Use: Foul   |   | <b>Depth:</b> 0  | Place:  |  |                         |
| From To   | Dia   | Material  |  | G1 - 2  | G3 - 4   | G5                      |
| 00.00m - 03.18m   | 150   | Vitrified Clay (i.e   | . all clayware)  | 0   | 1  | 0                       |
| Section: 11 Start   | : IC5A  | End: IC4/   | Δ  | Road: Mount Pl  | easant Road  | •                       |
| Length: 7.25  | Use: Foul   |   | <b>Depth:</b> 0  | Place:  |  |                         |
| From To   | Dia   | Material  |  | G1 - 2  | G3 - 4   | G5                      |
| 00.00m - 07.25m   | 150   | Vitrified Clay (i.e   | . all clayware)  | 0   | 2  | 0                       |
|   |   |   |  |   |  |                         |
|   | : IC6A  | End: MH4  |  | Road: Mount Pl  | easant Road  |                         |
| <b>_ength:</b> 2.74   | Use: Combir   | ned   | <b>Depth:</b> 0  | Place:  |  |                         |
|   |   |   |  |   |  |                         |
|   | Dia   | Material  |  | G1 - 2  | G3 - 4   | G5                      |
| <b>From To</b><br>00.00m - 02.74m   | <b>Dia</b><br>100   | Material<br>Vitrified Clay (i.e   | . all clayware)  | <b>G1 - 2</b><br>3  | <b>G3 - 4</b><br>0   | <b>G5</b><br>0          |
| 00.00m - 02.74m   |   |   | . all clayware)  |   | 0  |                         |
| 00.00m - 02.74m Section: 13 Start   | 100   | Vitrified Clay (i.e   | . all clayware) Depth: 0                                     | 3   | 0  |                         |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97  | 100<br>: IC6A   | Vitrified Clay (i.e   |  | Road: Mount Pl<br>Place:<br>G1 - 2  | 0  |                         |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97  | 100<br>: IC6A<br>Use: Combir  | Vitrified Clay (i.e<br>End: GY  | Depth: 0   | Road: Mount Pl<br>Place:  | 0<br>easant Road   | 0                       |
| Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m   | 100<br>: IC6A<br>Use: Combin<br>Dia<br>100  | Vitrified Clay (i.e<br>End: GY<br>ned<br>Material<br>Vitrified Clay (i.e  | Depth: 0   | 3           Road:         Mount Pl           Place:         G1 - 2           1  | 0<br>easant Road<br><b>G3 - 4</b><br>0                     | 0<br><b>G5</b><br>0     |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start   | 100<br>: IC6A<br>Use: Combin<br>Dia<br>100  | Vitrified Clay (i.e<br>End: GY<br>ned<br>Material<br>Vitrified Clay (i.e<br>End: IC4  | Depth: 0   | Road: Mount Pl<br>Place:<br>G1 - 2  | 0<br>easant Road<br><b>G3 - 4</b><br>0                     | 0<br><b>G5</b><br>0     |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start<br>Length: 10.88  | 100<br>: IC6A<br>Use: Combin<br>Dia<br>100<br>: IC7   | Vitrified Clay (i.e<br>End: GY<br>ned<br>Material<br>Vitrified Clay (i.e<br>End: IC4  | <b>Depth:</b> 0  | 3           Road:         Mount Pl           Place:         G1 - 2           1         1           Road:         Mount Pl   | 0<br>easant Road<br><b>G3 - 4</b><br>0                     | 0<br><b>G5</b><br>0     |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start<br>Length: 10.88  | 100<br>: IC6A<br>Use: Combir<br>Dia<br>100<br>: IC7<br>Use: Combir  | Vitrified Clay (i.e<br>End: GY<br>ned<br>Material<br>Vitrified Clay (i.e<br>End: IC4  | Depth: 0<br>. all clayware)<br>Depth: 900                    | 3       Road:     Mount Pl       Place:     G1 - 2       1       Road:     Mount Pl       Place:  | 0<br>easant Road<br>G3 - 4<br>0<br>easant Road             | 0<br>G5<br>0            |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start<br>Length: 10.88<br>From To<br>00.00m - 10.88m                      | 100<br>: IC6A<br>Use: Combin<br>Dia<br>100<br>: IC7<br>Use: Combin<br>Dia   | Vitrified Clay (i.e<br>End: GY<br>Material<br>Vitrified Clay (i.e<br>End: IC4<br>Material                                     | Depth: 0<br>. all clayware)<br>Depth: 900<br>. all clayware) | 3           Road:         Mount Pl           Place:         G1 - 2           1         1           Road:         Mount Pl           Place:         G1 - 2   | 0<br>easant Road<br>0<br>easant Road<br><b>G3 - 4</b><br>1 | 0<br>G5<br>0<br>G5<br>0 |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start<br>Length: 10.88<br>From To<br>00.00m - 10.88m<br>Section: 15 Start | 100         100         : IC6A         Use: Combin         100         : IC7         Use: Combin         Dia         100         : IC7         Use: Combin         150                            | Vitrified Clay (i.e<br>End: GY<br>Material<br>Vitrified Clay (i.e<br>End: IC4<br>Material<br>Vitrified Clay (i.e<br>End: IC5/ | Depth: 0<br>. all clayware)<br>Depth: 900<br>. all clayware) | 3         Road:       Mount Pl         Place:       G1 - 2         1       1         Road:       Mount Pl         Place:       G1 - 2         1       1   | 0<br>easant Road<br>0<br>easant Road<br><b>G3 - 4</b><br>1 | 0<br>G5<br>0<br>G5<br>0 |
| 00.00m - 02.74m<br>Section: 13 Start<br>Length: 1.97<br>From To<br>00.00m - 01.97m<br>Section: 14 Start<br>Length: 10.88<br>From To<br>00.00m - 10.88m                      | 100         100         : IC6A         Use: Combin         100         : IC7         Use: Combin         Dia         100         : IC7         Use: Combin         Dia         150         : IC10 | Vitrified Clay (i.e<br>End: GY<br>Material<br>Vitrified Clay (i.e<br>End: IC4<br>Material<br>Vitrified Clay (i.e<br>End: IC5/ | Depth: 0<br>. all clayware)<br>Depth: 900<br>. all clayware) | Bit I         Bit I <th< td=""><td>0<br/>easant Road<br/>0<br/>easant Road<br/><b>G3 - 4</b><br/>1</td><td>0<br/>G5<br/>0<br/>G5<br/>0</td></th<> | 0<br>easant Road<br>0<br>easant Road<br><b>G3 - 4</b><br>1 | 0<br>G5<br>0<br>G5<br>0 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



| Section: 16 Start  | 1010  | End: IC   |   | Nuau.  |  | asant Road   |                               |
|--|---|---|---|--|--|--|-------------------------------|
| Length: 9.3  | Use: Com  | bined   | Depth: 0  | Place  | :  |  |                               |
| From To  | Dia   | Material  |   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 09.30m  | 150   | Vitrified Clay  | (i.e. all clayware)   |  | 0  | 3  | 0                             |
|  | : IC11  | End: IC   |   |  |  | asant Road   |                               |
| Length: 0  | Use: Surfa  | ace Water   | <b>Depth:</b> 0   | Place  | :  |  |                               |
| From To  | Dia   | Material  |   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 00.00m  | 100   | Vitrified Clay  | (i.e. all clayware)   |  | 0  | 0  | 0                             |
| Section: 18 Start  | : IC11  | End: E  | ND  | Road:  | Mount Ple  | asant Road   |                               |
| <b>_ength:</b> 9.77  | Use: Surfa  | ace Water   | Depth: 0  | Place  | :  |  |                               |
| From To  | Dia   | Material  |   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 09.77m  | 100   | Vitrified Clay  | (i.e. all clayware)   |  | 2  | 1  | 0                             |
| Section: 19 Start  | : IC12  | End: 10   | <b>`1</b> 3   | Road:  | Mount Ple  | asant Road   |                               |
| <b>_ength:</b> 6.48  | Use: Surfa  |   | <b>Depth:</b> 0   | Place  |  |  |                               |
| -  | Dia   | Material  |   |  | G1 - 2   | G3 - 4   | G5                            |
|  | пла   |   |   |  |  |  |                               |
| 00.00m - 06.48m  | 150   |   | (i.e. all clayware)   |  | 3  | 0  | 0                             |
| 00.00m - 06.48m  | 150   | Vitrified Clay  | (i.e. all clayware)   |  | 3  |  |                               |
| 00.00m - 06.48m<br>Section: 20 Start   | 150<br>: IC13   | Vitrified Clay  | C13A  |  | 3<br>Mount Ple   | 0<br>asant Road  |                               |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43   | 150<br>: IC13<br><b>Use:</b> Surfa  | Vitrified Clay<br>End: IC   |   | Road:<br>Place                                     | 3<br>Mount Ple   | asant Road   | <u> </u>                      |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To  | 150<br>: IC13<br>Use: Surfa   | Vitrified Clay<br>End: IC<br>ace Water<br>Material  | C13A<br>Depth: 0  |  | 3<br>Mount Ple<br>:<br>G1 - 2  |  | G5                            |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43   | 150<br>: IC13<br><b>Use:</b> Surfa  | Vitrified Clay<br>End: IC<br>ace Water<br>Material  | C13A  |  | 3<br>Mount Ple   | asant Road   | <u> </u>                      |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m   | 150<br>: IC13<br>Use: Surfa   | Vitrified Clay<br>End: IC<br>ace Water<br>Material  | C13A<br><b>Depth:</b> 0<br>(i.e. all clayware)  | Place  | 3<br>Mount Ple<br>::<br>G1 - 2<br>1  | asant Road   | <b>G5</b><br>0                |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start  | 150<br>: IC13<br>Use: Surfa<br>Dia<br>150   | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10   | C13A<br><b>Depth:</b> 0<br>(i.e. all clayware)  | Place  | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple  | asant Road G3 - 4 1  | <b>G5</b><br>0                |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12   | 150<br>150<br><b>Use:</b> Surfa<br><b>Dia</b><br>150<br>150<br><b>:</b> IC14  | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10   | C13A<br><b>Depth:</b> 0<br>(i.e. all clayware)  | Place<br>Road:                                     | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple  | asant Road G3 - 4 1  | <b>G5</b><br>0                |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12   | 150<br>: IC13<br>Use: Surfa<br>Dia<br>150<br>: IC14<br>Use: Coml  | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material  | C13A<br><b>Depth:</b> 0<br>(i.e. all clayware)  | Place<br>Road:                                     | 3<br>Mount Ple<br>:<br><b>G1 - 2</b><br>1<br>Mount Ple   | asant Road<br>G3 - 4<br>1<br>asant Road  | <b>G5</b><br>0                |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12<br>From To<br>00.00m - 29.12m   | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150   | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (  | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)   | Place<br>Road:<br>Place                            | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1  | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2                                   | G5<br>0<br>G5<br>0            |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12<br>From To<br>00.00m - 29.12m<br>Section: 22 Start  | 150<br>: IC13<br>Use: Surfa<br>Dia<br>150<br>: IC14<br>Use: Coml<br>Dia   | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: M  | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)   | Place<br>Road:<br>Place                            | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple   | asant Road<br>G3 - 4<br>1<br>asant Road  | G5<br>0<br>G5<br>0            |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12<br>From To<br>00.00m - 29.12m<br>Section: 22 Start<br>Length: 49.01   | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150         : IC14         Use: Coml         Dia         150  | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: M  | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)<br>IH3  | Place<br>Road:<br>Place<br>Road:                   | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple   | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2                                   | G5<br>0<br>G5<br>0            |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12<br>From To<br>00.00m - 29.12m<br>Section: 22 Start<br>Length: 49.01   | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150         : IC15         Use: Coml  | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: Material   | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)<br>IH3  | Place<br>Road:<br>Place<br>Road:                   | 3<br>Mount Ple<br>:<br><b>G1 - 2</b><br>1<br>Mount Ple<br>:<br><b>G1 - 2</b><br>1<br>Mount Ple<br>:  | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2<br>asant Road                     | G5<br>0<br>G5<br>0            |
| 00.00m - 06.48m<br>Section: 20 Start<br>ength: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>ength: 29.12<br>From To<br>00.00m - 29.12m<br>Section: 22 Start<br>ength: 49.01<br>From To<br>35.43m - 49.01m  | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150         : IC15         Use: Coml         Dia         150  | Vitrified Clay (<br>End: 10<br>Ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: M<br>bined<br>Vitrified Clay (<br>Vitrified Clay (     | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)<br>IH3<br>Depth: 1220<br>(i.e. all clayware)      | Place<br>Road:<br>Place<br>Road:<br>Place          | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1   | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2<br>asant Road<br>G3 - 4<br>0      | G5<br>0<br>G5<br>0<br>G5<br>0 |
| 00.00m - 06.48m<br>Section: 20 Start<br>Length: 0.43<br>From To<br>00.00m - 00.43m<br>Section: 21 Start<br>Length: 29.12<br>From To<br>00.00m - 29.12m<br>Section: 22 Start<br>Length: 49.01<br>From To<br>35.43m - 49.01m<br>Section: 23 Start  | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150         : IC14         Use: Coml         Dia         150         : IC15         Use: Coml         Dia   | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: 10 | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)<br>H3<br>Depth: 1220<br>(i.e. all clayware)<br>C2 | Place<br>Road:<br>Place<br>Road:<br>Place          | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2<br>asant Road<br>G3 - 4<br>63 - 4 | G5<br>0<br>G5<br>0<br>G5<br>0 |
| Section:         20         Start           Length:         0.43           From To         00.00m - 00.43m           Section:         21         Start           Length:         29.12           From To         00.00m - 29.12m           Section:         22         Start           Length:         49.01           From To         35.43m - 49.01m | 150         150         Use: Surfa         Dia         150         : IC14         Use: Coml         Dia         150         : IC14         Use: Coml         Dia         150         : IC15         Use: Coml         Dia         150         : IC15         Use: Coml         Dia         150         : IC15         Use: Coml         Dia         150 | Vitrified Clay (<br>End: 10<br>ace Water<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: 10<br>bined<br>Material<br>Vitrified Clay (<br>End: 10 | C13A<br>Depth: 0<br>(i.e. all clayware)<br>C7<br>Depth: 1860<br>(i.e. all clayware)<br>IH3<br>Depth: 1220<br>(i.e. all clayware)      | Place<br>Road:<br>Place<br>Road:<br>Place<br>Road: | 3<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple<br>:<br>G1 - 2<br>1<br>Mount Ple | asant Road<br>G3 - 4<br>1<br>asant Road<br>G3 - 4<br>2<br>asant Road<br>G3 - 4<br>0      | G5<br>0<br>G5<br>0<br>G5<br>0 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|

SERVICE LOCATION LTD

### Page 5

| Section: 24 Star  | . 1010   | End: END  | -                                | Road: Mount Ple   |  |                                  |
|---|--|---|----------------------------------|---|--|----------------------------------|
| Length: 16.26   | Use: Surfa   | ace Water <b>Depth:</b>   | 0                                | Place:  |  |                                  |
| From To   | Dia  | Material  |                                  | G1 - 2  | G3 - 4   | G5                               |
| 00.00m - 16.26m   | 100  | Vitrified Clay (i.e. all claywar  | re)                              | 3   | 0  | 0                                |
| Section: 25 Star  | t: IC17  | End: BIC2   | I                                | Road: Mount Ple   | asant Road   | I                                |
| Length: 30.03   | Use: Com   | bined Depth:  | 0                                | Place:  |  |                                  |
| From To   | Dia  | Material  |                                  | G1 - 2  | G3 - 4   | G5                               |
| 00.00m - 30.03m   | 150  | Vitrified Clay (i.e. all claywar  | re)                              | 3   | 3  | 0                                |
| Section: 26 Star  | <b>t:</b> IC17   | End: MH3  | I                                | Road: Mount Ple   | asant Road   | l                                |
| <b>_ength:</b> 7.41   | Use: Com   | bined Depth:  | 0                                | Place:  |  |                                  |
| From To   | Dia  | Material  |                                  | G1 - 2  | G3 - 4   | G5                               |
| 00.00m - 07.41m   | 150  | Vitrified Clay (i.e. all claywar  | re)                              | 0   | 0  | 0                                |
| Section: 27 Star  | t: IC18  | End: BIC1   |                                  | Road: Mount Ple   | asant Road   |                                  |
| L <b>ength:</b> 6.48  | Use: Com   | bined Depth:  | 0                                | Place:  |  |                                  |
| From To   | Dia  | Material  |                                  | G1 - 2  | G3 - 4   | G5                               |
|   |  |   |                                  |   | -  | -                                |
| 00.00m - 06.48m   | 100  | Vitrified Clay (i.e. all claywar  | re)                              | 0   | 0  | 0                                |
|   | 100<br>t: IC19   | Vitrified Clay (i.e. all claywa   |                                  | 0 Road: Mount Ple   |  |                                  |
| Section: 28 Star  |  | End: BIC1   |                                  |   |  |                                  |
| Section: 28 Star<br>Length: 6.48  | t: IC19  | End: BIC1   |                                  | Road: Mount Ple   |  |                                  |
| Section: 28 Star<br>Length: 6.48  | t: IC19<br>Use: Surfa  | End: BIC1<br>ace Water Depth:   | 0                                | Road: Mount Ple   | asant Road   |                                  |
| Section: 28 Star<br>Length: 6.48<br>From To<br>00.00m - 06.48m  | t: IC19<br>Use: Surfa  | End: BIC1<br>ace Water Depth:<br>Material   | 0<br>re)                         | Road: Mount Ple<br>Place:<br>G1 - 2   | G3 - 4   | <b>G5</b><br>0                   |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star  | t: IC19<br>Use: Surfa<br>Dia<br>100  | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2   | 0<br>re)                         | Road: Mount Ple<br>Place:<br>G1 - 2<br>0  | G3 - 4   | <b>G5</b><br>0                   |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62   | t: IC19<br>Use: Surfa<br>Dia<br>100<br>t: IC20   | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2   | 0<br>re)                         | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple   | G3 - 4   | <b>G5</b><br>0                   |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62   | t: IC19<br>Use: Surfa<br>Dia<br>100<br>t: IC20<br>Use: Com   | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:   | 0<br>re)<br>0                    | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:   | G3 - 4<br>1<br>basant Road   | <b>G5</b><br>0                   |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m   | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100  | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar   | 0<br>re)<br>0<br>re)             | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>2  | G3 - 4<br>1<br>assant Road<br>1<br>assant Road<br>G3 - 4<br>0  | <b>G5</b><br>0<br><b>G5</b><br>0 |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m           Section:         30         Star  | t: IC19<br>Use: Surfa<br>Dia<br>100<br>t: IC20<br>Use: Com<br>Dia  | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21  | 0<br>re)<br>0<br>re)             | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2   | G3 - 4<br>1<br>assant Road<br>1<br>assant Road<br>G3 - 4<br>0  | <b>G5</b><br>0<br><b>G5</b><br>0 |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m   | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100<br>t: BIC2   | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21  | 0<br>re)<br>0<br>re)             | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>2<br>Road: Mount Ple   | G3 - 4<br>1<br>assant Road<br>1<br>assant Road<br>G3 - 4<br>0  | <b>G5</b><br>0<br><b>G5</b><br>0 |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m           Section:         30         Star           Length:         33.06  | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100<br>t: BIC2<br>Use: Com   | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth:  | 0<br>re)<br>0<br>re)             | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>2<br>Road: Mount Ple<br>Place:                                   | G3 - 4<br>1<br>assant Road<br>G3 - 4<br>0<br>assant Road   | <b>G5</b><br>0<br><b>G5</b><br>0 |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m           Section:         30         Star           Length:         33.06           From To         00.00m - 33.06m  | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100<br>t: BIC2<br>Use: Com<br>Dia  | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth:  | 0<br>re)<br>0<br>re)<br>0        | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>2<br>Road: Mount Ple<br>Place:<br>Place:<br>G1 - 2                         | G3 - 4         1         easant Road         G3 - 4         0         easant Road         0         easant Road         0 | G5<br>0<br>G5<br>0<br>G5<br>0    |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m           Section:         30         Star           Length:         33.06           From To         00.00m - 33.06m           Section:         31         Star | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100<br>t: BIC2<br>Use: Com<br>Dia<br>150   | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth: | 0<br>re)<br>0<br>re)<br>0<br>re) | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>2<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>6                    | G3 - 4         1         easant Road         G3 - 4         0         easant Road         0         easant Road         0 | G5<br>0<br>G5<br>0<br>G5<br>0    |
| Section:         28         Star           Length:         6.48           From To         00.00m - 06.48m           Section:         29         Star           Length:         3.62           From To         00.00m - 03.62m           Section:         30         Star           Length:         33.06           From To         00.00m - 33.06m  | t: IC19<br>Use: Surfa<br>100<br>t: IC20<br>Use: Com<br>Dia<br>100<br>t: BIC2<br>Use: Com<br>Dia<br>100<br>t: BIC2<br>Use: Com<br>Dia<br>150<br>t: IC21 | End: BIC1<br>ace Water Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC2<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth:<br>Material<br>Vitrified Clay (i.e. all claywar<br>End: IC21<br>bined Depth: | 0<br>re)<br>0<br>re)<br>0<br>re) | Road: Mount Ple<br>Place:<br>G1 - 2<br>0<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>2<br>Road: Mount Ple<br>Place:<br>G1 - 2<br>6<br>Road: Mount Ple | G3 - 4         1         easant Road         G3 - 4         0         easant Road         0         easant Road         0 | G5<br>0<br>G5<br>0<br>G5<br>0    |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



| Section: 32 Start    | : IC21       | End: IC2           | 2                  | Road: Mou | unt Plea | asant Road |    |
|----------------------|--------------|--------------------|--------------------|-----------|----------|------------|----|
| <b>_ength:</b> 10.17 | Use: Combine | ed                 | <b>Depth:</b> 1600 | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 00.47m      | 150          | Polyvinyl Chlor    | de                 | 0         |          | 0          | 0  |
| 00.47m - 10.17m      | 150          | Vitrified Clay (i. | e. all clayware)   | 6         |          | 4          | 0  |
| Section: 33 Start    | : IC21       | End: MH            | 82                 | Road: Mou | unt Plea | asant Road |    |
| Length: 52.08        | Use: Combine | ed                 | <b>Depth:</b> 0    | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 52.08m      | 150          | Vitrified Clay (i. | e. all clayware)   | 1         |          | 0          | 0  |
| Section: 34 Start    | : IC21       | End: IC6           | 5                  | Road: Mou | unt Plea | asant Road |    |
| Length: 16.2         | Use: Combine | ed                 | <b>Depth:</b> 0    | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 16.20m      | 150          | Vitrified Clay (i. | e. all clayware)   | 3         |          | 0          | 0  |
| Section: 35 Start    | : IC22       | End: EN            | <br>D              | Road: Mou | unt Plea | asant Road |    |
| Length: 8.34         | Use: Combine | ed                 | Depth: 1300        | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 08.34m      | 100          | Polyvinyl Chlori   | de                 | 2         |          | 1          | 0  |
| Section: 36 Start    | IC22         | End: EN            | D                  | Road: Mou | unt Plea | asant Road |    |
| Length: 10.17        | Use: Combine | ed                 | Depth: 1300        | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 10.17m      | 100          | Vitrified Clay (i. | e. all clayware)   | 2         |          | 0          | 0  |
| Section: 37 Start    | IC22         | End: EN            | D                  | Road: Mou | unt Plea | asant Road |    |
| Length: 12.18        | Use: Combine |                    | <b>Depth:</b> 1300 | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 12.18m      | 100          | Vitrified Clay (i. | e. all clayware)   | 7         |          | 1          | 0  |
| Section: 38 Start    | : IC24       | End: IC2           | 8                  | Road: Mou | unt Ple: | asant Road | •  |
| Length: 18.93        | Use: Surface |                    | <b>Depth:</b> 550  | Place:    | -        |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 18.93m      | 100          | Vitrified Clay (i. | e. all clayware)   | 6         |          | 0          | 0  |
| Section: 39 Start    | : IC26       | End: IC2           | 7                  | Road: Mou | unt Plea | asant Road |    |
| Length: 34.09        | Use: Combine |                    | <b>Depth:</b> 780  | Place:    |          |            |    |
| From To              | Dia          | Material           |                    | G1        | - 2      | G3 - 4     | G5 |
| 00.00m - 34.09m      | 100          | Vitrified Clay (i. |                    | 13        |          | +          | 0  |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|

SERVICE LOCATION LTD

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| Section: 40 Star  | t: IC28   | End: IC30   |                          | Road:  |  | asani Nuac  |  |
|---|---|---|--------------------------|--|--|---|--|
| <b>_ength:</b> 40.41  | Use: Surfa  | ace Water Depth   | : 660                    | Place  | ):   |   |  |
| From To   | Dia   | Material  |                          |  | G1 - 2   | G3 - 4  | G5                                       |
| 00.00m - 40.41m   | 100   | Vitrified Clay (i.e. all claywa   | are)                     |  | 14   | 0   | 0  |
| Section: 41 Star  | t: IC28   | End: IC30   |                          | Road:  | Mount Ple  | asant Road  | ł  |
| <b>_ength:</b> 41.16  | Use: Surfa  | ace Water Depth   | : 660                    | Place  | <b>:</b> :   |   |  |
| From To   | Dia   | Material  |                          |  | G1 - 2   | G3 - 4  | G5                                       |
| 40.79m - 41.16m   | 100   | Vitrified Clay (i.e. all claywa   | are)                     |  | 1  | 0   | 0  |
| Section: 42 Star  | t: IC29   | End: IC40   |                          | Road:  | Mount Ple  | asant Road  | ł  |
| <b>_ength:</b> 5.2  | Use: Com  | bined Depth   | : 840                    | Place  | ):   |   |  |
| From To   | Dia   | Material  |                          |  | G1 - 2   | G3 - 4  | G5                                       |
| 00.00m - 05.20m   | 100   | Vitrified Clay (i.e. all claywa   | are)                     |  | 0  | 4   | 0  |
| Section: 43 Star  | t: IC30   | End: END  |                          | Road:  | Mount Ple  | asant Road  |  |
| Length: 31.42   | Use: Surfa  |   | : 1000                   | Place  | ):   |   | -  |
| From To   | Dia   | Material  |                          |  | G1 - 2   | G3 - 4  | G5                                       |
| 00.00m - 31.42m   | 005   |   |                          |  | 0  | 4   | 0  |
| 00.0011 - 31.4211   | 225   | Vitrified Clay (i.e. all claywa   | are)                     |  | 6  | 1   | U  |
|   |   |   | are)                     | Road:  |  | asant Roac  | 1-                                       |
| Section: 44 Star  |   | End: End  |                          | Road:<br>Place                                     | Mount Ple  | asant Roac  | 1-                                       |
| Section: 44 Star<br>Length: 35.19   | t: IC30   | End: End  |                          |  | Mount Ple  | easant Road   | 1-                                       |
| Section: 44 Star<br>Length: 35.19   | t: IC30<br>Use: Surfa   | End: End<br>ace Water Depth   | : 430                    |  | Mount Ple  |   | -<br> <br>                               |
| Section: 44 Star<br>Length: 35.19<br>From To<br>00.00m - 35.19m   | t: IC30<br>Use: Surfa<br>Dia<br>225   | End: End<br>ace Water Depth<br>Material   | : 430                    | Place  | Mount Ple<br><b>G1 - 2</b><br>2  | <b>G3 - 4</b><br>0  | <b>G5</b>                                |
| Section:         44         Star           Length:         35.19           From To           00.00m - 35.19m           Section:         45  | t: IC30<br>Use: Surfa   | End: End ace Water Depth Material Vitrified Clay (i.e. all claywa End: END  | : 430<br>are)            | Place  | Mount Ple<br>G1 - 2<br>2<br>Mount Ple  | G3 - 4  | <b>G5</b>                                |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18  | t: IC30<br>Use: Surfa<br>Dia<br>225<br>t: IC32  | End: End ace Water Depth Material Vitrified Clay (i.e. all claywa End: END  | : 430<br>are)            | Place<br>Road:                                     | Mount Ple<br>G1 - 2<br>2<br>Mount Ple  | <b>G3 - 4</b><br>0  | <b>G5</b>                                |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18  | t: IC30<br>Use: Surfa<br>Dia<br>225<br>t: IC32<br>Use: Surfa  | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth   | : 430<br>are)            | Place<br>Road:                                     | Mount Ple<br>G1 - 2<br>2<br>Mount Ple<br>2   | <b>G3 - 4</b><br>0<br>easant Road   | <b>G5</b>                                |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m  | t: IC30<br>Use: Surfa<br>225<br>t: IC32<br>Use: Surfa<br>Dia<br>100   | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride   | : 430<br>are)            | Place<br>Road:<br>Place                            | Mount Ple         G1 - 2         2         Mount Ple         :         G1 - 2         1  | <b>G3 - 4</b><br>0<br>easant Roac<br><b>G3 - 4</b><br>1   | <b>G5</b><br>0<br><b>G5</b><br>0         |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m           Section:         46         Star   | t: IC30<br>Use: Surf:<br>225<br>t: IC32<br>Use: Surf:<br>Dia  | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END   | : 430<br>are)            | Place<br>Road:<br>Place                            | Mount Ple         e:         G1 - 2         2         Mount Ple         e:         G1 - 2         1         Mount Ple  | <b>G3 - 4</b><br>0<br>easant Road   | G5<br>0<br>65<br>0                       |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m  | t: IC30<br>Use: Surf:<br>225<br>t: IC32<br>Use: Surf:<br>Dia<br>100<br>t: IC34  | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END   | are)<br>a: 670           | Place<br>Road:<br>Place<br>Road:                   | Mount Ple         e:         G1 - 2         2         Mount Ple         e:         G1 - 2         1         Mount Ple  | <b>G3 - 4</b><br>0<br>easant Roac<br><b>G3 - 4</b><br>1   | G5<br>0<br>65<br>0                       |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m           Section:         46         Star           Length:         0.65  | t: IC30<br>Use: Surf:<br>225<br>t: IC32<br>Use: Surf:<br>Dia<br>100<br>t: IC34<br>Use: Surf:  | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END<br>ace Water Depth  | are)<br>a: 670           | Place<br>Road:<br>Place<br>Road:                   | Mount Ple         G1 - 2         2         Mount Ple         S:         G1 - 2         1         Mount Ple         S:  | G3 - 4         0         easant Road         G3 - 4         1         easant Road   | G5<br>0<br>G5<br>0                       |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m           Section:         46         Star           Length:         0.65           From To         00.00m - 00.65m  | t: IC30<br>Use: Surf:<br>225<br>t: IC32<br>Use: Surf:<br>Dia<br>100<br>t: IC34<br>Use: Surf:<br>Dia<br>100                              | End: End<br>ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END<br>ace Water Depth<br>Material<br>Polyvinyl Chloride  | are)<br>a: 670           | Place<br>Road:<br>Place<br>Road:<br>Place          | Mount Ple         G1 - 2         2         Mount Ple         :         G1 - 2         1         Mount Ple         :         G1 - 2         1         Mount Ple         :         G1 - 2         1         Mount Ple         :         1         1          | G3 - 4         0         easant Road         G3 - 4         1         easant Road         G3 - 4         0  | G5<br>0<br>G5<br>0<br>G5<br>0<br>G5<br>0 |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m           Section:         46         Star           Length:         0.65           From To         00.00m - 00.65m           Section:         47         Star | t: IC30<br>Use: Surfa<br>225<br>t: IC32<br>Use: Surfa<br>100<br>t: IC34<br>Use: Surfa<br>100<br>t: IC34                                 | End: End<br>Ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>Ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END<br>Ace Water Depth<br>Ace Water Depth<br>Ace Water Depth<br>Ace Water END<br>Ace Water END | are)<br>:: 670<br>:: 380 | Place<br>Road:<br>Place<br>Road:<br>Place          | Mount Ple         G1 - 2         2         Mount Ple         G1 - 2         1         Mount Ple         G1 - 2         1         Mount Ple         I         Mount Ple         I         Mount Ple         I         Mount Ple         I         Mount Ple | G3 - 4         0         easant Road         G3 - 4         1         easant Road         G3 - 4         1         easant Road         G3 - 4         1 | G5<br>0<br>G5<br>0<br>G5<br>0<br>G5<br>0 |
| Section:         44         Star           Length:         35.19           From To         00.00m - 35.19m           Section:         45         Star           Length:         3.18           From To         00.00m - 03.18m           Section:         46         Star           Length:         0.65           From To         00.00m - 00.65m  | t: IC30<br>Use: Surfa<br>225<br>t: IC32<br>Use: Surfa<br>100<br>t: IC34<br>Use: Surfa<br>100<br>t: IC34<br>Use: Surfa<br>100<br>t: IC34 | End: End<br>Ace Water Depth<br>Material<br>Vitrified Clay (i.e. all claywa<br>End: END<br>Ace Water Depth<br>Material<br>Polyvinyl Chloride<br>End: END<br>Ace Water Depth<br>Ace Water Depth<br>End: END<br>Ace Water Depth<br>Ace Water END<br>Ace Water END<br>Ace Water END<br>Ace Water END<br>Ace Water END<br>Ace Water END<br>Ace Water END                       | are)<br>:: 670<br>:: 380 | Place<br>Road:<br>Place<br>Road:<br>Place<br>Road: | Mount Ple         G1 - 2         2         Mount Ple         G1 - 2         1         Mount Ple         G1 - 2         1         Mount Ple         I         Mount Ple         I         Mount Ple         I         Mount Ple         I         Mount Ple | G3 - 4         0         easant Road         G3 - 4         1         easant Road         G3 - 4         0  | G5<br>0<br>G5<br>0<br>G5<br>0<br>G5<br>0 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



| Section: 48 Start  | : IC36   | End: M   | 1H4   | Road:  | Mount Ple  | asant Road   |                               |
|--|--|--|---|--|--|--|-------------------------------|
| Length: 14.31  | Use: Combin  | ned  | <b>Depth:</b> 810   | Place  | :  |  |                               |
| From To  | Dia  | Material   |   |  | G1 - 2   | G3 - 4   | G5                            |
| 01.18m - 14.31m  | 100  | Vitrified Clay   | (i.e. all clayware)   |  | 3  | 0  | 0                             |
|  | : IC37   | End: IC  |   | Road:  | Mount Ple  | asant Road   |                               |
| Length: 1.18   | Use: Combin  | ned  | <b>Depth:</b> 680   | Place  | :  |  |                               |
| From To  | Dia  | Material   |   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 01.18m  | 100  | Vitrified Clay   | (i.e. all clayware)   |  | 0  | 0  | 0                             |
| Section: 50 Start  | : IC39   | End: M   | 1H2   | Road:  | Mount Ple  | asant Road   |                               |
| <b>_ength:</b> 9.46  | Use: Combin  | ned  | <b>Depth:</b> 490   | Place  | :  |  |                               |
| From To  | Dia  | Material   |   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 09.46m  | 100  | Vitrified Clay   | (i.e. all clayware)   |  | 2  | 0  | 0                             |
| Section: 51 Start  | : IC39   | End: E   | ND  | Road   | Mount Ple  | asant Road   |                               |
| <b>_ength:</b> 4.96  | Use: Combin  |  | <b>Depth:</b> 490   | Place  |  |  |                               |
| From To  | Dia  | Material   | •   |  | G1 - 2   | G3 - 4   | G5                            |
| 00.00m - 04.96m  | 100  | Polyvinyl Chlo   | oride   |  | 2  | 2  | 0                             |
|  |  |  |   |  |  |  |                               |
|  |  |  |   |  |  |  |                               |
|  | : IC39   | End: E   |   |  |  | asant Road   |                               |
| <b>_ength:</b> 3.43  | Use: Combin  | ned  | Depth: 490  | Road:<br>Place                                     | :  | _  |                               |
| Length: 3.43<br>From To  | Use: Combin  | ned<br>Material  | <b>Depth:</b> 490   |  | :<br>G1 - 2  | G3 - 4   | G5                            |
| <b>_ength:</b> 3.43  | Use: Combin  | ned<br>Material  |   |  | :  | _  |                               |
| Length: 3.43<br>From To<br>00.00m - 03.43m   | Use: Combin  | ned<br>Material  | Depth: 490<br>(i.e. all clayware)   | Place  | e:<br><b>G1 - 2</b><br>1   | G3 - 4   | G5<br>0                       |
| -ength: 3.43<br>From To<br>00.00m - 03.43m<br>Section: 53 Start  | Use: Combin<br>Dia<br>100  | Material<br>Vitrified Clay<br>End: 10  | Depth: 490<br>(i.e. all clayware)   | Place  | <b>G1 - 2</b><br>1<br>Mount Ple  | <b>G3 - 4</b><br>0   | G5<br>0                       |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia   | ned<br>Material<br>Vitrified Clay<br>End: IC<br>ned<br>Material  | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740  | Place<br>Road:                                     | e:<br>G1 - 2<br>1<br>Mount Ple<br>e:<br>G1 - 2   | <b>G3 - 4</b><br>0   | G5<br>0<br>G5                 |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin  | ned<br>Material<br>Vitrified Clay<br>End: IC<br>ned<br>Material  | Depth: 490<br>(i.e. all clayware)   | Place<br>Road:                                     | : <b>G1 - 2</b><br>1<br>Mount Ple  | <b>G3 - 4</b><br>0<br>asant Road   | <b>G5</b><br>0                |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia   | ned<br>Material<br>Vitrified Clay<br>End: IC<br>ned<br>Material  | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)   | Place<br>Road:<br>Place                            | <b>G1 - 2</b> 1 Mount Ple <b>G1 - 2</b> 0  | <b>G3 - 4</b><br>0<br>asant Road<br><b>G3 - 4</b>  | G5<br>0<br>G5<br>0            |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia<br>100  | ned Material Vitrified Clay End: IG Material Vitrified Clay End: IG End: IG  | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)   | Place<br>Road:<br>Place                            | <ul> <li>G1 - 2</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> <li>Mount Ple</li> </ul>  | <b>G3 - 4</b><br>0<br>asant Road<br><b>G3 - 4</b><br>0   | G5<br>0<br>G5<br>0            |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start           Length:         30.45   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia<br>100<br>:: IC42   | ned Material Vitrified Clay End: IG Material Vitrified Clay End: IG End: IG  | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)<br>C6                                       | Place<br>Road:<br>Place<br>Road:                   | <ul> <li>G1 - 2</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> <li>Mount Ple</li> </ul>  | <b>G3 - 4</b><br>0<br>asant Road<br><b>G3 - 4</b><br>0   | G5<br>0<br>G5<br>0            |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start           Length:         30.45   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia<br>100<br>:: IC42<br>Use: Combin  | ned Material Vitrified Clay End: 10 Material Vitrified Clay End: 10 Ned Material Vitrified Clay End: 10 Ned Material   | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)<br>C6                                       | Place<br>Road:<br>Place<br>Road:                   | <ul> <li>G1 - 2</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> <li>Mount Ple</li> </ul>  | G3 - 4<br>0<br>asant Road<br>G3 - 4<br>0<br>asant Road   | G5<br>0<br>G5<br>0            |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start           Length:         30.45           From To         00.00m - 30.45m   | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>Dia<br>100<br>:: IC42<br>Use: Combin<br>Dia<br>100  | ned Material Vitrified Clay End: IC ned Material Vitrified Clay End: IC ned Material Nitrified Clay End: IC Ned Vitrified Clay                                 | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)<br>C6<br>Depth: 1360<br>(i.e. all clayware) | Place<br>Road:<br>Place<br>Road:<br>Place          | <ul> <li>G1 - 2</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> <li>Mount Ple</li> <li>G1 - 2</li> <li>O</li> </ul> | G3 - 4         0         asant Road         G3 - 4         0         asant Road         G3 - 4         1 | G5<br>0<br>G5<br>0<br>65<br>0 |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start           Length:         30.45           From To         00.00m - 30.45m           Section:         55         Start | Use: Combin<br>Dia<br>100<br>:: IC41<br>Use: Combin<br>100<br>:: IC42<br>Use: Combin<br>Dia<br>Dia   | ned Material Vitrified Clay End: 10 Material Vitrified Clay Material Vitrified Clay Material Vitrified Clay Material Vitrified Clay Ned Vitrified Clay End: 10 | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)<br>C6<br>Depth: 1360<br>(i.e. all clayware) | Place<br>Road:<br>Place<br>Road:<br>Place          | <ul> <li>G1 - 2</li> <li>Mount Ple</li> </ul>               | G3 - 4<br>0<br>asant Road<br>G3 - 4<br>0<br>asant Road   | G5<br>0<br>G5<br>0<br>65<br>0 |
| Length:         3.43           From To         00.00m - 03.43m           Section:         53         Start           Length:         17.26           From To         00.00m - 17.26m           Section:         54         Start           Length:         30.45           From To         00.00m - 30.45m   | Use: Combin<br>Dia<br>100<br>100<br>Combin<br>Dia<br>100<br>Combin<br>Dia<br>100<br>Combin<br>Dia<br>100<br>Combin<br>Dia<br>100<br>Combin<br>Dia<br>100<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin<br>Combin | ned Material Vitrified Clay End: 10 Material Vitrified Clay Material Vitrified Clay Material Vitrified Clay Material Vitrified Clay Ned Vitrified Clay End: 10 | Depth: 490<br>(i.e. all clayware)<br>C42<br>Depth: 740<br>(i.e. all clayware)<br>C6<br>Depth: 1360<br>(i.e. all clayware) | Place<br>Road:<br>Place<br>Road:<br>Place<br>Road: | <ul> <li>G1 - 2</li> <li>Mount Ple</li> </ul>               | G3 - 4         0         asant Road         G3 - 4         0         asant Road         G3 - 4         1 | G5<br>0<br>G5<br>0<br>65<br>0 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



| Section: 56 Start   | : IC46   | End: IC42  | 2                                    | Road:          | Mount Ple  | asant Road                            |                     |
|---|--|--|--------------------------------------|----------------|--|---------------------------------------|---------------------|
| Length: 17.01   | Use: Comb  | vined  | <b>Depth:</b> 240                    | Place          | :  |                                       |                     |
| From To   | Dia  | Material   |                                      |                | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 17.01m   | 100  | Vitrified Clay (i.e  | . all clayware)                      |                | 2  | 1                                     | 0                   |
| Section: 57 Start   |  | End: END   |                                      |                |  | asant Road                            |                     |
| Length: 6.97  | Use: Surfac  |  | <b>Depth:</b> 690                    | Place          | Í  |                                       |                     |
| From To   | Dia  | Material   | -                                    |                | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 06.97m   | 100  | Polyvinyl Chlorid  | le                                   |                | 2  | 2                                     | 0                   |
| Section: 58 Start   | : IC47   | End: END   | )                                    | Road:          | Mount Ple  | asant Road                            |                     |
| <b>_ength:</b> 5.32   | Use: Surfac  | ce Water   | <b>Depth:</b> 690                    | Place          | :  |                                       |                     |
| From To   | Dia  | Material   |                                      |                | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 05.32m   | 100  | Vitrified Clay (i.e  | . all clayware)                      |                | 0  | 1                                     | 0                   |
| Section: 59 Start   | : IC48   | End: END   | <b>N</b>                             | Pood:          | Mount Plo  | asant Road                            | •                   |
| <b>_ength:</b> 27.89  | Use: Surfa   |  | <b>Depth:</b> 0                      | Place          |  | asani Nuau                            |                     |
| From To   | Dia  | Material   |                                      | 1 1400         | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 27.89m   | 225  | Vitrified Clay (i.e  | all clayware)                        |                | 7  | 1                                     | 0                   |
|   |  |  |                                      |                | Ľ  | •                                     | Ľ                   |
|   | : IC48   | End: IC49  | )                                    | Road:          | Mount Ple  | asant Road                            |                     |
| <b>_ength:</b> 30.17  | Use: Surfa   | ce Water   | <b>Depth:</b> 2470                   | Place          | :  |                                       | -                   |
| From To   | Dia  | Material   |                                      |                | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 30.17m   | 225  | Vitrified Clay (i.e  | . all clayware)                      |                | 1  | 2                                     | 0                   |
| Section: 61 Start   | : IC49   | End: IC52  | 2                                    | Road:          | Mount Ple  | asant Road                            |                     |
| Length: 19.4  | Use: Surfac  | ce Water   | <b>Depth:</b> 0                      | Place          | :  |                                       |                     |
| From To   |  |  |                                      |                |  |                                       |                     |
|   | Dia  | Material   |                                      |                | G1 - 2   | G3 - 4                                | G5                  |
| 00.00m - 19.40m   | <b>Dia</b><br>225                                    | Material<br>Vitrified Clay (i.e  | . all clayware)                      |                | <b>G1 - 2</b><br>10                              | G3 - 4<br>1                           | G5<br>0             |
|   | 225  | Vitrified Clay (i.e  |                                      | Poodu          | 10   | 1                                     | 0                   |
| Section: 62 Start   | 225<br>:: IC50                                       | Vitrified Clay (i.e<br>End: IC51   |                                      |                | 10<br>Mount Ple                                  | G3 - 4<br>1<br>asant Road             | 0                   |
| Section: 62 Start<br>Length: 17.91  | 225<br>:: IC50<br><b>Use:</b> Comb                   | Vitrified Clay (i.e<br>End: IC51<br>bined  |                                      | Road:<br>Place | 10<br>Mount Ple                                  | 1<br>asant Road                       | 0                   |
| Section: 62 Start<br>-ength: 17.91<br>From To   | 225<br>:: IC50                                       | Vitrified Clay (i.e<br>End: IC51<br>bined<br>Material                                    | <b>Depth:</b> 420                    |                | 10<br>Mount Ple                                  | 1                                     | 0                   |
| Section: 62 Start<br>Length: 17.91<br>From To<br>00.00m - 17.91m                                      | 225<br>:: IC50<br>Use: Comb<br>Dia<br>100            | Vitrified Clay (i.e<br>End: IC51<br>bined<br>Material<br>Vitrified Clay (i.e             | <b>Depth:</b> 420<br>. all clayware) |                | 10<br>Mount Ple<br>::<br>G1 - 2                  | 1<br>asant Road<br>G3 - 4             | 0<br>G5             |
| Section: 62 Start<br>Length: 17.91<br>From To<br>00.00m - 17.91m<br>Section: 63 Start                 | 225<br>:: IC50<br>Use: Comb<br>Dia<br>100<br>:: IC52 | Vitrified Clay (i.e<br>End: IC51<br>bined<br>Material<br>Vitrified Clay (i.e<br>End: END | <b>Depth:</b> 420<br>. all clayware) | Place<br>Road: | 10<br>Mount Ple<br>:<br>G1 - 2<br>0<br>Mount Ple | 1<br>asant Road<br>G3 - 4             | 0<br><b>G5</b><br>0 |
| Section: 62 Start<br>Length: 17.91<br>From To<br>00.00m - 17.91m<br>Section: 63 Start<br>Length: 0.11 | 225<br>:: IC50<br>Use: Comb<br>Dia<br>100            | Vitrified Clay (i.e<br>End: IC51<br>bined<br>Material<br>Vitrified Clay (i.e<br>End: END | <b>Depth:</b> 420<br>. all clayware) | Place          | 10<br>Mount Ple<br>:<br>G1 - 2<br>0<br>Mount Ple | 1<br>asant Road<br><b>G3 - 4</b><br>0 | 0<br><b>G5</b><br>0 |
| Section: 62 Start<br>Length: 17.91<br>From To<br>00.00m - 17.91m<br>Section: 63 Start                 | 225<br>:: IC50<br>Use: Comb<br>Dia<br>100<br>:: IC52 | Vitrified Clay (i.e<br>End: IC51<br>bined<br>Material<br>Vitrified Clay (i.e<br>End: END | <b>Depth:</b> 420<br>. all clayware) | Place<br>Road: | 10<br>Mount Ple<br>:<br>G1 - 2<br>0<br>Mount Ple | 1<br>asant Road<br><b>G3 - 4</b><br>0 | 0<br><b>G5</b><br>0 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Section: 64 Star  | t: IC53  | End: JCT   |   | Road: Mount I  | Pleasant Road   | b  |
|---|--|--|---|--|---|--|
| Length: 9.99  | Use: Surfa   | ce Water   | <b>Depth:</b> 0   | Place:   |   |  |
| From To   | Dia  | Material   |   | G1 - 2   | G3 - 4  | G5   |
| 00.00m - 09.99m   | 150  | Vitrified Clay (i.e  | . all clayware)   | 1  | 1   | 0  |
| Section: 65 Star  | t: IC56  | End: IC56  | i   | Road: Mount I  | Pleasant Road   | b  |
| Length: 0   | Use: Foul  |  | <b>Depth:</b> 620   | Place:   |   |  |
| From To   | Dia  | Material   |   | G1 - 2   | G3 - 4  | G5   |
| 00.00m - 00.00m   | 100  | Polyvinyl Chlorid  | е   | 0  | 0   | 0  |
| Section: 66 Star  | t: IC57  | <b>End:</b> IC56   | ;   | Road: Mount I  | Pleasant Road   | b  |
| <b>_ength:</b> 8.04   | Use: Comb  | bined  | <b>Depth:</b> 590   | Place:   |   |  |
| From To   | Dia  | Material   |   | G1 - 2   | G3 - 4  | G5   |
| 00.00m - 08.04m   | 100  | Vitrified Clay (i.e  | . all clayware)   | 0  | 0   | 0  |
| Section: 67 Star  | t: IC65  | End: IC62  |   | Road: Mount I  | Pleasant Road   | d  |
| Length: 3.11  | Use: Comb  |  | Depth: 0  | Place:   |   | ~  |
| From To   | Dia  | Material   |   | G1 - 2   | G3 - 4  | G5   |
| 00.00m - 03.11m   | 150  | Polyvinyl Chlorid  | 0   | 2  | 0   | 0  |
|   |  | - , , ,  | C   | -  | Ŭ   | v  |
| Section: 68 Star  | t: IC65  |  |   | Road: Mount I  |   |  |
| Section: 68 Star<br>Length: 4.45  | I<br>I: IC65<br><b>Use:</b> Comb   | End: IC63  |   |  |   |  |
| Length: 4.45  |  | End: IC63  |   | Road: Mount I  | Pleasant Road   |  |
| Length: 4.45  | Use: Comb  | End: IC63  | Depth: 0  | Road: Mount I<br>Place:  | Pleasant Road   | d  |
| Length: 4.45<br>From To<br>00.00m - 04.45m  | Use: Comb  | End: IC63<br>bined<br>Material   | <b>Depth:</b> 0   | Road: Mount I<br>Place:<br>G1 - 2  | Pleasant Road   | <b>G5</b>  |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start   | <b>Use:</b> Comb<br><b>Dia</b><br>150  | End: IC63<br>bined<br>Material<br>Polyvinyl Chlorid<br>End: IC64   | <b>Depth:</b> 0   | Road:         Mount I           Place:         G1 - 2           1         1  | Pleasant Road   | <b>G5</b>  |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8  | Use: Comb<br>Dia<br>150<br>t: IC65   | End: IC63<br>bined<br>Material<br>Polyvinyl Chlorid<br>End: IC64   | Depth: 0<br>e   | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I  | Pleasant Road   | <b>G5</b>  |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8  | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb  | End: IC63 bined Material Polyvinyl Chlorid End: IC64 bined   | <b>Depth:</b> 0<br>e<br><b>Depth:</b> 0                         | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:  | Pleasant Road   | <b>G5</b><br>0   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m  | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150  | End: IC63 bined Material Polyvinyl Chlorid End: IC64 bined Material Vitrified Clay (i.e  | Depth: 0<br>e<br>Depth: 0<br>. all clayware)                    | Road:       Mount I         Place:       G1 - 2         1       1         Road:       Mount I         Place:       G1 - 2         1       1  | Pleasant Road   | <b>G5</b><br>0<br>d<br><b>G5</b><br>0<br>d<br><b>G5</b><br>0   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m<br>Section: 70 Start   | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia   | End: IC63<br>bined<br>Material<br>Polyvinyl Chlorid<br>End: IC64<br>bined<br>Material  | Depth: 0<br>e<br>Depth: 0<br>. all clayware)                    | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:<br>G1 - 2  | Pleasant Road   | <b>G5</b><br>0<br>d<br><b>G5</b><br>0<br>d<br><b>G5</b><br>0   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m  | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150<br>t: IC67                                       | End: IC63 bined Material Polyvinyl Chlorid End: IC64 bined Material Vitrified Clay (i.e  | Depth: 0<br>e<br>Depth: 0                                       | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I  | Pleasant Road   | <b>G5</b><br>0<br>d<br><b>G5</b><br>0<br>d<br><b>G5</b><br>0   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m<br>Section: 70 Start<br>Length: 63.97  | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150<br>t: IC67<br>Use: Foul                          | End: IC63<br>bined<br>Polyvinyl Chlorid<br>End: IC64<br>bined<br>Material<br>Vitrified Clay (i.e<br>End: IC68  | Depth: 0<br>e<br>Depth: 0<br>. all clayware)<br>Depth: 1910     | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:  | Pleasant Road   | G5<br>0<br>3<br>G5<br>0<br>3   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Stard<br>Length: 4.8<br>From To<br>00.00m - 04.80m<br>Section: 70 Stard<br>Length: 63.97<br>From To<br>00.00m - 63.97m                      | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150<br>t: IC67<br>Use: Foul<br>Dia<br>225            | End: IC63 pined Material Polyvinyl Chlorid End: IC64 pined Material Vitrified Clay (i.e End: IC68 Material Vitrified Clay (i.e) Vitrified Clay (i.e) | Depth: 0<br>e<br>Depth: 0<br>. all clayware)<br>. all clayware) | Road:       Mount I         Place:       G1 - 2         1       1         Road:       Mount I         Place:       G1 - 2         1       1         Road:         Mount I         Place:       1         Road:       Mount I         Place:       1         G1 - 2         1       1 | G3 - 4         0         Pleasant Road         Pleasant Road      < | G5<br>0<br>3<br>G5<br>0<br>3<br>3<br>G5<br>0<br>3<br>3<br>5<br>0   |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m<br>Section: 70 Start<br>Length: 63.97<br>From To<br>00.00m - 63.97m<br>Section: 71 Start | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150<br>t: IC67<br>Use: Foul<br>Dia                   | End: IC63 bined Material Polyvinyl Chlorid End: IC64 bined Material Vitrified Clay (i.e End: IC68 Material Material Material                         | Depth: 0<br>e<br>Depth: 0<br>. all clayware)<br>. all clayware) | Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:<br>G1 - 2<br>1<br>Road: Mount I<br>Place:  | G3 - 4         0         Pleasant Road         Pleasant Road      < | G5<br>0<br>3<br>G5<br>0<br>3<br>3<br>G5<br>0<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3 |
| Length: 4.45<br>From To<br>00.00m - 04.45m<br>Section: 69 Start<br>Length: 4.8<br>From To<br>00.00m - 04.80m<br>Section: 70 Start<br>Length: 63.97<br>From To<br>00.00m - 63.97m                      | Use: Comb<br>Dia<br>150<br>t: IC65<br>Use: Comb<br>Dia<br>150<br>t: IC67<br>Use: Foul<br>Dia<br>225<br>t: IC68 | End: IC63 pined Material Polyvinyl Chlorid End: IC64 pined Material Vitrified Clay (i.e End: IC68 Material Vitrified Clay (i.e) Vitrified Clay (i.e) | Depth: 0<br>e<br>Depth: 0<br>. all clayware)<br>. all clayware) | Road:Mount IPlace:G1 - 21Road:Mount IPlace:G1 - 21Road:Mount IPlace:G1 - 21Road:Mount IPlace:1Road:Mount IPlace:   | Pleasant Road   | G5<br>0<br>3<br>G5<br>0<br>3<br>3<br>G5<br>0<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|

UNDERGROUND SURVEYING & MAPPING

**Inspection Report** 

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| Section: 72 Start: | MH71        | End: IC7            | D                  | Road: | Mount Ple | asant Roac  | ł  |
|--------------------|-------------|---------------------|--------------------|-------|-----------|-------------|----|
| Length: 9.66       | Use: Surfac | e Water             | <b>Depth:</b> 870  | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 09.66m    | 100         | Polyvinyl Chlori    | de                 |       | 1         | 0           | 0  |
| Section: 73 Start: | MH71        | End: ENI            | D                  | Road: | Mount Ple | easant Road | I  |
| Length: 21.37      | Use: Surfac | e Water             | <b>Depth:</b> 870  | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 21.37m    | 100         | Polyvinyl Chlori    | de                 |       | 1         | 3           | 0  |
| Section: 74 Start: | IC72        | End: MH             | 76                 | Road: | Mount Ple | asant Road  | I  |
| Length: 16.04      | Use: Surfac | e Water             | <b>Depth:</b> 610  | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 16.04m    | 100         | Polyvinyl Chlori    | de                 |       | 1         | 0           | 0  |
| Section: 75 Start: | MH76        | End: MH             | 77                 | Road: | Mount Ple | asant Road  | 1  |
| Length: 19.06      | Use: Foul   |                     | <b>Depth:</b> 840  | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 19.06m    | 100         | Polyvinyl Chlori    | de                 |       | 0         | 0           | 0  |
| Section: 76 Start: | MH77        | End: MH             | 82                 | Road: | Mount Ple | asant Road  | I  |
| Length: 22.97      | Use: Combi  | ned                 | <b>Depth:</b> 1010 | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 22.97m    | 100         | Polyvinyl Chlori    | de                 |       | 1         | 0           | 0  |
| Section: 77 Start: | MH77        | End: MH             | 83                 | Road: | Mount Ple | asant Road  | 1  |
| Length: 20.76      | Use: Surfac | e Water             | Depth: 1010        | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 20.76m    | 100         | Polyvinyl Chlori    | de                 |       | 0         | 0           | 0  |
| Section: 78 Start: | BIC1        | End: BIC            | 2                  | Road: | Mount Ple | easant Road | 1  |
| Length: 3.95       | Use: Combi  |                     | <b>Depth:</b> 0    | Place | :         |             |    |
| From To            | Dia         | Material            |                    |       | G1 - 2    | G3 - 4      | G5 |
| 00.00m - 03.95m    | 100         | Vitrified Clay (i.e |                    |       | 0         | 1           | 0  |

|                 |   |                 |     |                 |    |                 |   |                 | _ |   |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |   | 0 |



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## Site: Mount Pleasant Road

Section 1

| CI   | ient:                              |   | Location (St  | reet Name):                              | City/T  | own/Village | Cust   | t Job Ref.       | Survey                                       | ors Name:                            |                        | Dat     | e:            |
|--|------------------------------------|---|---|--|---------|-------------|--------|------------------|--|--------------------------------------|------------------------|---------|---------------|
|  |                                    |   | Mount Plea  | asant Road                               |         |             |        |                  |  |                                      |                        | 08/08/2 | 2018          |
| Start Node I<br>Start Node I<br>Start Node (   | Depth:                             | ate:  | 1   | MH1 Finish N<br>670 Finish N<br>Finish N |         |             |        |                  | d Direction:<br>D Use:<br>Material:          | U<br>S<br>VC                         | Heigł<br>Shap<br>Clear |         | 150<br>C<br>N |
| Drain Type                                     | Lining                             | Туре  | Lining Mat.   | Year Const.                              | Weather | Flow Cont.  | Length |                  |  | Remarks                              |                        |         |               |
| А  |                                    |   |   |  | D       | N           | 5.5    |                  |  |                                      |                        |         |               |
| 01.18m<br>01.18m<br>02.12m                     | MH<br>JD<br>DER<br>DEE<br>DES<br>R | Start<br>Joint<br>Settle<br>Attac<br>Settle<br>Root | node type,<br>displaced n<br>ed deposits<br>thed deposits<br>ed deposits<br>s | nedium<br>coarse 10<br>ts, encrusta      |         | %           |        | 6.<br>6.<br>6.   | ic Grade<br>_0<br>_3<br>_2<br>_4<br>_5<br>_7 | 0<br>2<br>3<br>3<br>3<br>2<br>2      | 1                      | 0m      |               |
| 02.60m<br>04.13m<br>04.73m<br>05.32m<br>05.50m | R<br>JD<br>DES                     | Settle  |   | fine 15%                                 |         |             |        | 6 <u>.</u><br>6. | _10<br>_12<br>_13<br>_99                     | 2<br>2<br>2<br>2<br>2<br>2<br>2<br>0 | 1/1                    | 5.5m    |               |

#### Total grades for project

0



| Pos    | Code | Description   | Image                     |
|--------|------|---|---------------------------|
| 00.00m | MH   | Start node type, manhole  | Image Provided - Ref: 6_0 |
|        |      | MH1   |                           |
| 00.01m | JDM  | Joint displaced medium - Grade 2                                    | Image Provided - Ref: 6_3 |
|        |      |   |                           |
| 00.35m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 6_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 D | efects 54 Grade 4 Defects 3 Grade 5 Defects 0 |
|---|---|
|---|---|



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| Pos    | Code | Description   | Image                     |
|--------|------|---|---------------------------|
| 01.18m | DEE  | Attached deposits, encrustation at 9 o'clock:<br>5% Cross sectional area loss - Grade 3 | Image Provided - Ref: 6_4 |
| 01.18m | DES  | Settled deposits fine: 10% Cross sectional<br>area loss - Grade 2                       | Image Provided - Ref: 6_5 |
| 02.12m | R    | Roots - Grade 2   | Image Provided - Ref: 6_7 |
| 02.60m | R    | Roots - Grade 2   |                           |

| Grade 1 Defects |   | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |   | 1 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
| Glade I Delects | 0 | Glade 2 Delects | 192 | Glade 5 Delects | 54 | Glade 4 Delects | 3 | Glade 5 Delects | 0 | J |



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| Pos    | Code | Description  | Image                        |
|--------|------|--|------------------------------|
| 04.13m | R    | Roots - Grade 2  | Image Provided - Ref: 6_10   |
| 04.73m | JDM  | Joint displaced medium - Grade 2   | Image Provided - Ref: 6_12   |
| 05.32m | DES  | Settled deposits fine: 15% Cross sectional<br>area loss - Grade 2                              | Image Provided - Ref: 6_13   |
| 05.50m | MHF  | Finish node type, manhole<br>End - Unable To Proceed As Drain Becomes<br>Blocked With Deposits | Image Provided - Ref: 6_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



## Site: Mount Pleasant Road

## Section 2

| CI   | Client: Location (Street Name): |        |              |               |         | own/Village | Cust   | Job Re | f. Surv                           | eyors Name | :        | Dat     | e:            |
|--|---------------------------------|--------|--------------|---------------|---------|-------------|--------|--------|-----------------------------------|------------|----------|---------|---------------|
|  |                                 |        | Mount Plea   | asant Road    |         |             |        |        |                                   |            |          | 08/08/2 | 2018          |
| Start Node Ref:IC1AFinish Node RefStart Node Depth:0Finish Node DeStart Node Coordinate:Finish Node Co |                                 |        |              |               |         |             |        | IC     | 2A Direction<br>0 Use:<br>Materia | C          | Shap     |         | 100<br>C<br>N |
| Drain Type   | Lining                          | Туре   | Lining Mat.  | Year Const.   | Weather | Flow Cont.  | Length |        |                                   | Remarks    |          |         |               |
| А  |                                 |        |              |               | D       | N           | 31.9   |        |                                   |            |          |         |               |
| Position   | Code                            | Desc   | ription      |               |         |             |        | CD     | Pic Gra                           | ıde        | $\wedge$ | 0m      |               |
| 00.00m   | IC                              | Start  | node type,   | inspection of | chamber |             |        |        | 88_0                              | 0 —        |          |         |               |
| 05.82m   | R                               | S1 R   | oots         |               |         |             |        | S1     | 88_2                              | 2          | 1        |         |               |
| 07.58m   | R                               | F1 R   | oots         |               |         |             |        | F1     | 88                                | 2 —        | ///      |         |               |
| 08.46m   | JN                              | Junc   | tion 9:100   | mm Diamet     | er      |             |        |        | 88_3                              | 0 —        | //       |         |               |
| 08.68m   | R                               | S2 R   | oots         |               |         |             |        | S2     | 88_4                              | 2          |          |         | 2             |
| 09.23m   | R                               | F2 R   | oots         |               |         |             |        | F2     | 88                                | 2          |          |         | 2             |
| 20.78m   | JN                              | Junc   | tion 9 : 100 | mm Diamet     | er      |             |        |        | 88_5                              | 0 —        |          |         |               |
| 31.56m   | DER                             | Settle | ed deposits  | coarse 20     | %       |             |        |        | 88_6                              | 3 —        |          |         |               |
| 31.90m   | ICF                             | Finis  | h node type  | , inspection  | chambe  | r           |        |        | 88_9                              | 0 —        | $\sum$   | 31.9n   | n             |
|  |                                 |        |              |               |         |             |        |        |                                   |            | 1        |         |               |
|  |                                 |        |              |               |         |             |        |        |                                   |            |          |         |               |

#### Total grades for project

0



| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC1A | Image Provided - Ref: 88_0 |
| 05.82m | S1 R | Roots5.82m - 7.58m - Grade 2                | Image Provided - Ref: 88_2 |
| 07.58m | F1 R | RootsDefect End - Grade 2                   |                            |
| 08.46m | JN   | Junction at 9 o'clock: 100mm Diameter       | Image Provided - Ref: 88_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 08.68m | S2 R | Roots8.68m - 9.23m - Grade 2  | Image Provided - Ref: 88_4 |
| 09.23m | F2 R | RootsDefect End - Grade 2   |                            |
| 20.78m | JN   | Junction at 9 o'clock: 100mm Diameter                               | Image Provided - Ref: 88_5 |
| 31.56m | DER  | Settled deposits coarse: 20% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 88_6 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | С   | ) |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|-----|---|
|                 | - |                 |     |                 |    |                 | - |                 | 1 - | - |



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| Pos    | Code | Description                          | Image                         |
|--------|------|--------------------------------------|-------------------------------|
| 31.90m | ICF  | Finish node type, inspection chamber | Image Provided - Ref: 88_9999 |
|        |      | IC2A                                 |                               |

#### Total grades for project



## Site: Mount Pleasant Road

Section 3

| CI   | ient:                       |  | Location (St   |                             |                   | City/T                               | own/Village | Cust            | t Job Ref.           | Surve                           | eyors Name |                        | Date<br>08/08/2 |               |
|--|-----------------------------|--|--|-----------------------------|-------------------|--------------------------------------|-------------|-----------------|----------------------|---------------------------------|------------|------------------------|-----------------|---------------|
| Start Node<br>Start Node<br>Start Node                     | Depth:                      | ate:                                     |  | IC2 F<br>200 F              | inish No          | ode Ref:<br>ode Depth:<br>ode Coordi |             |                 | IC1:<br>1220         | 5 Directio<br>0 Use:<br>Materia | С          | Heigh<br>Shap<br>Clear | nt/Dia:<br>e:   | 150<br>C<br>N |
| Drain Type<br>A  | Lining                      | Туре                                     | Lining Mat.  | Year C                      | Const.            | Weather<br>D                         | Flow Cont.  | Length<br>35.43 |                      |                                 | Remarks    |                        |                 |               |
| Position<br>18.93m<br>19.30m<br>20.02m<br>22.81m<br>35.43m | IC<br>WL<br>JD<br>JD<br>DEE | Start<br>Wate<br>Joint<br>Joint<br>Attac | ription<br>node type,<br>or level 5%<br>displaced n<br>displaced n<br>hed deposit<br>h node type | nediur<br>nediur<br>is, enc | n<br>n<br>crustat | hamber<br>tion 9-3                   | 5%          |                 | 3.<br>3.<br>3.<br>3. | ic Grad                         |            |                        | 0m<br>35.43r    |               |

#### Total grades for project

0



0

| Pos    | Code | Description                                | Image                     |
|--------|------|--|---------------------------|
| 18.93m | IC   | Start node type, inspection chamber<br>IC2 | Image Provided - Ref: 3_0 |
| 19.30m | WL   | Water level: 5% Height/Diameter            | Image Provided - Ref: 3_1 |
| 19.30m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 3_2 |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |  |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|



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| Pos    | Code | Description   | Image                        |
|--------|------|---|------------------------------|
| 20.02m | JDM  | Joint displaced medium - Grade 2                                | Image Provided - Ref: 3_3    |
|        |      |   |                              |
| 22.81m | DEE  | Attached deposits, encrustation from 9                          | Image Provided - Ref: 3_5    |
|        |      | o'clock to 3 o'clock: 5% Cross sectional area<br>loss - Grade 3 |                              |
| 35.43m | ICF  | Finish node type, inspection chamber                            | Image Provided - Ref: 3_9999 |
|        |      | IC15  |                              |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects |  |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|--|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|--|



## Site: Mount Pleasant Road

### Section 4

| CI                                     | ient:  |        | Location (St | reet l | Name):   | City/T                               | own/Village | Cust   | t Job Ref. | Surve | eyors Name    | :            | Date    | ):            |
|--|--------|--------|--------------|--------|----------|--------------------------------------|-------------|--------|------------|-------|---------------|--------------|---------|---------------|
|  |        |        | Mount Plea   | isant  | Road     |                                      |             |        |            |       |               |              | 08/08/2 | 2018          |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   | ſ            |        |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH3<br>(   |       | С             |              | e:      | 100<br>C<br>N |
| Drain Type                             | Lining | Туре   | Lining Mat.  | Yea    | r Const. | Weather                              | Flow Cont.  | Length |            |       | Remarks       |              |         |               |
| A                                      |        |        |              |        |          | D                                    | N           | 5.93   |            | Unat  | ole To Lift C | over         |         |               |
| Position                               | Code   | Desc   | ription      |        |          |                                      |             |        | CD Pi      | c Gra | de            |              | 0m      |               |
| 00.00m                                 |        |        | node type,   | mar    | hole     |                                      |             |        |            | 6_0   | 0 —           |              |         |               |
| 00.65m                                 | JD     | Joint  | displaced n  | nedi   | um       |                                      |             |        | 46         | 6_1   | 2 —           | //           |         |               |
| 00.87m                                 | JD     | Joint  | displaced n  | nedi   | um       |                                      |             |        | 40         | 6_2   | 2 —           | /            |         |               |
| 01.53m                                 | JD     | Joint  | displaced n  | nedi   | um       |                                      |             |        | 40         | 6_3   | 2 —           | -            |         |               |
| 03.62m                                 | JD     | Joint  | displaced n  | nedi   | um       |                                      |             |        | 40         | 6_4   | 2 —           | ~            | FLOW    | 7             |
| 05.93m                                 | MHF    | Finisl | h node type  | , ma   | anhole   |                                      |             |        | 46         | 6_9   | 0 —           | _            |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               | $\mathbf{X}$ |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               | $\backslash$ | 5.93m   | i i           |
|  |        |        |              |        |          |                                      |             |        |            |       |               | X            | -       |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |
|  |        |        |              |        |          |                                      |             |        |            |       |               |              |         |               |

#### Total grades for project



| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | МН   | Start node type, manhole<br>MH2  | Image Provided - Ref: 46_0 |
| 00.65m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 46_1 |
| 00.87m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 46_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



Page 25

| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 01.53m | JDM  | Joint displaced medium - Grade 2                        | Image Provided - Ref: 46_3    |
| 03.62m | JDM  | Joint displaced medium - Grade 2                        | Image Provided - Ref: 46_4    |
| 05.93m | MHF  | Finish node type, manhole<br>MH2 - Unable To Lift Cover | Image Provided - Ref: 46_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects 54 | 1 | Grade 4 Defects |  | 3 | Grade 5 Defects |
|-----------------|---|-----------------|-----|--------------------|---|-----------------|--|---|-----------------|
|-----------------|---|-----------------|-----|--------------------|---|-----------------|--|---|-----------------|



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## Site: Mount Pleasant Road

Section 5

| Cli  | ient:  |        | Location (St<br>Mount Plea |            |          | City/T                               | own/Village | Cust | Job Ref.     | Survey  | ors Name:    | C                     | Date: |  |
|--|--------|--------|----------------------------|------------|----------|--------------------------------------|-------------|------|--------------|---------|--------------|-----------------------|-------|--|
| Start Node I<br>Start Node I<br>Start Node I | Depth: | ate:   |                            | ИНЗ<br>300 |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |      | IC17<br>1350 |         | Dia:<br>d    | 150<br>C<br>N         |       |  |
| Drain Type                                   | Lining | Туре   | Lining Mat.                | Yea        | r Const. | Weather                              | Flow Cont.  | Ū    |              | I       | Remarks      |                       |       |  |
| A  |        |        |                            |            |          | D                                    | Ν           | 7    |              |         |              |                       |       |  |
| Position                                     | Code   | Desc   | ription                    |            |          |                                      |             |      | CD Pi        | c Grade | е            |                       | 0m    |  |
| 00.00m                                       | MH     | Start  | node type,                 | man        | hole     |                                      |             |      | 5_           | _0      | 0 —          |                       |       |  |
| 05.91m                                       | JD     | Joint  | displaced la               | arge       |          |                                      |             |      | 5_           | _5      | 3 —          |                       |       |  |
| 06.15m                                       | LRH    | Line   | of drain/sew               | /er d      | leviates | right [ha                            | lf]         |      | 5_           | _6      | 0            |                       |       |  |
| 06.86m                                       | JN     | Junct  | tion 9:100                 | mm         | Diamet   | er                                   |             |      | 5_           | _7      | 0            |                       | 3     |  |
| 06.86m                                       | JN     | Junct  | tion 3 : 100               | mm         | Diamet   | er                                   |             |      | 5_           | _8      | 0 —///       | $\langle     \rangle$ | FLOW  |  |
| 07.00m                                       | ICF    | Finisl | h node type                | , ins      | pection  | chambe                               | r           |      | 5_           | _99     | 0//          | $\mathbb{N}$          |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         | $\backslash$ |                       | 1     |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              | Æ.                    | 7m    |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |
|  |        |        |                            |            |          |                                      |             |      |              |         |              |                       |       |  |

#### Total grades for project

0



| Pos    | Code | Description                               | Image                     |
|--------|------|---|---------------------------|
| 00.00m | MH   | Start node type, manhole<br>MH3           | Image Provided - Ref: 5_0 |
| 05.91m | JDL  | Joint displaced large - Grade 3           | Image Provided - Ref: 5_5 |
|        |      |   |                           |
| 06.15m | LRH  | Line of drain/sewer deviates right [half] | Image Provided - Ref: 5_6 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|--|---|-----------------|---|
|--|---|-----------------|---|



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| Pos    | Code | Description                                  | Image                        |
|--------|------|--|------------------------------|
| 06.86m | JN   | Junction at 9 o'clock: 100mm Diameter        | Image Provided - Ref: 5_7    |
| 06.86m | JN   | Junction at 3 o'clock: 100mm Diameter        | Image Provided - Ref: 5_8    |
| 07.00m | ICF  | Finish node type, inspection chamber<br>IC17 | Image Provided - Ref: 5_9999 |

| Grade 1 Defects ( | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects |  |
|-------------------|---|-----------------|-----|-----------------|----|-----------------|--|
|-------------------|---|-----------------|-----|-----------------|----|-----------------|--|



## Site: Mount Pleasant Road

## Section 6

| CI   | ient:  |       | Location (St | reet Name): | City/T                               | own/Village | Cust   | Job Ref.    | Surveyo      | rs Name:     | Da                               | te:     |
|--|--------|-------|--------------|-------------|--------------------------------------|-------------|--------|-------------|--------------|--------------|----------------------------------|---------|
|  |        |       | Mount Plea   | asant Road  |                                      |             |        |             |              |              | 08/08/                           | /2018   |
| Start Node  <br>Start Node  <br>Start Node | Depth: | ate:  |              |             | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH3<br>1300 |              | D<br>C<br>VC | Height/Dia:<br>Shape:<br>Cleaned | 10<br>( |
| Drain Type                                 | Lining | Туре  | Lining Mat.  | Year Const. | Weather                              | Flow Cont.  | Length |             | R            | emarks       |                                  |         |
| А  |        |       |              |             | D                                    | N           | 12.41  | Conti       | nuation From | n Drain D    | eviating Dow                     | n       |
| Position                                   | Code   | Desc  | ription      |             |                                      |             |        | CD Pi       | c Grade      |              | 0m                               |         |
| 00.00m                                     | MH     | Start | node type,   | manhole     |                                      |             |        | 20          | 0_0 0        |              | /                                |         |
| 00.47m                                     | WL     | Wate  | er level 5%  |             |                                      |             |        | 20          | )_1 0        |              | //                               |         |
| 02.60m                                     | JD     | Joint | displaced n  | nedium      |                                      |             |        | 20          | )_3 2        |              |                                  |         |
| 03.19m                                     | JD     | Joint | displaced n  | nedium      |                                      |             |        |             | _4 2         |              |                                  |         |
| 11.70m                                     |        |       | of drain/sew |             | left [qua                            | rter]       |        |             | )_5 0        | $\neg$       |                                  | TOW     |
| 12.41m                                     | MHF    | Finis | h node type  | , manhole   |                                      |             |        | 20          | )_9 0        | -/           |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              | 12.4                             | 1m      |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |
|  |        |       |              |             |                                      |             |        |             |              |              |                                  |         |

#### Total grades for project

0



0

## **Descriptive Report with Remarks and Observation Images**

| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | MH   | Start node type, manhole<br>MH4  | Image Provided - Ref: 20_0 |
| 00.47m | WL   | Water level: 5% Height/Diameter  | Image Provided - Ref: 20_1 |
| 02.60m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 20_3 |

| Grade 1 Defects 0 Grade 2 Defe | ts 192 G | rade 3 Defects 54 | Grade 4 Defects | 3 | Grade 5 Defects |  |
|--------------------------------|----------|-------------------|-----------------|---|-----------------|--|
|--------------------------------|----------|-------------------|-----------------|---|-----------------|--|



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| Pos    | Code | Description                                 | Image                         |
|--------|------|---|-------------------------------|
| 03.19m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 20_4    |
| 11.70m | LLQ  | Line of drain/sewer deviates left [quarter] | Image Provided - Ref: 20_5    |
| 12.41m | MHF  | Finish node type, manhole<br>MH3            | Image Provided - Ref: 20_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 D |
|-----------------|---|-----------------|-----|-----------------|----|-----------|
|-----------------|---|-----------------|-----|-----------------|----|-----------|



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## Site: Mount Pleasant Road

Section 7

| Client:   |   | Location (St  | reet Name):   | City/T   | own/Village | Cust Job Ref.  |  | Surveyors Name:                                      |              |      | Date    | e:            |
|---|---|---|---|--|-------------|----------------|--|--|--------------|------|---------|---------------|
|   |   | Mount Plea  | asant Road  |  |             |                |  |  |              |      | 08/08/2 | 2018          |
|   | art Node Depth: 120<br>art Node Coordinate:                           |   |   | h Node Ref:<br>h Node Depth:<br>h Node Coordinate: |             |                | End<br>1200                                  | Use:<br>Material:                                    | U<br>C<br>VC | Shap |         | 100<br>C<br>N |
| A Lini  | ng Type   | Lining Mat.   | Year Const.   | Weather<br>D                                       | Flow Cont.  | Length<br>8.87 |  | K  | emarks       |      |         |               |
| Position         Code           00.00m         MH           01.65m         JD           02.60m         JD           02.83m         JN           03.90m         JD           06.03m         JD           07.33m         JD           07.92m         JN           08.16m         JD           08.87m         SA | Start<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Settle | ription<br>node type,<br>displaced n<br>displaced n<br>tion 10 : 10<br>displaced n<br>displaced n<br>tion 10 : 10<br>displaced n<br>ed deposits<br>ey abandon | nedium<br>Omm Diame<br>nedium<br>nedium<br>nedium<br>Omm Diame<br>nedium<br>coarse 5% | eter   |             |                | 21<br>21<br>21<br>21<br>21<br>21<br>21<br>21 | _0 0<br>_2 2<br>_3 2<br>_4 0<br>_6 2<br>_7 2<br>_8 2 |              |      | 0m      |               |

#### Total grades for project



| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | MH   | Start node type, manhole<br>MH4  | Image Provided - Ref: 21_0 |
| 01.65m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 21_2 |
| 02.60m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 21_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | ] [ 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|-------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|-------|



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| Pos    | Code | Description                            | Image                      |
|--------|------|--|----------------------------|
| 02.83m | JN   | Junction at 10 o'clock: 100mm Diameter | Image Provided - Ref: 21_4 |
| 03.90m | JDM  | Joint displaced medium - Grade 2       | Image Provided - Ref: 21_6 |
| 06.03m | JDM  | Joint displaced medium - Grade 2       | Image Provided - Ref: 21_7 |
| 07.33m | JDM  | Joint displaced medium - Grade 2       | Image Provided - Ref: 21_8 |

| Grade 1 Defects 0 Grade 2 Defe | ts 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|--------------------------------|------------------------|--------------------|---|-----------------|---|
|--------------------------------|------------------------|--------------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 07.92m | JN   | Junction at 10 o'clock: 100mm Diameter                              | Image Provided - Ref: 21_9  |
| 08.16m | JDM  | Joint displaced medium - Grade 2                                    | Image Provided - Ref: 21_10 |
| 08.16m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3  | Image Provided - Ref: 21_11 |
| 08.87m | SA   | Survey abandoned<br>Unable To Get Camera Passed Settled<br>Deposits |                             |

|                 |   |                 |     |                 |    |                 |   |   |                 | _ |   |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|---|-----------------|---|---|
| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | 3 | Grade 5 Defects |   | 0 |



## Site: Mount Pleasant Road

Section 8

| C                                      | Client: Location (Street Name): |   |                      | City/Town/Village Cust Job Ref. |           |                                      | Surveyors Name: |       |           | Da      | ie:  |     |                                  |               |
|--|---------------------------------|---|----------------------|---------------------------------|-----------|--------------------------------------|-----------------|-------|-----------|---------|------|-----|----------------------------------|---------------|
|  |                                 |   | Mount Plea           | asant                           | Road      |                                      |                 |       |           |         |      |     | 08/08/                           | 2018          |
| Start Node<br>Start Node<br>Start Node | Depth:                          | ate:                                      | 1                    | IC4<br>000                      |           | ode Ref:<br>ode Depth:<br>ode Coordi |                 |       | IC<br>120 |         |      | c s | łeight/Dia:<br>Shape:<br>Cleaned | 150<br>C<br>N |
| Drain Type                             | Lining                          | Туре                                      | Lining Mat.          | Yea                             | ır Const. | Weather                              | Flow Cont.      | _     |           | Remarks |      |     |                                  |               |
| A                                      |                                 |   |                      |                                 |           | D                                    | N               | 18.33 |           |         |      |     |                                  |               |
| Position                               | Code                            | Desc                                      | ription              |                                 |           |                                      |                 |       | CD P      | ic G    | rade |     | 0m                               |               |
| 10.88m                                 | IC                              | Start node type, inspection chamber 2_0 0 |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
| 10.88m                                 | R                               | Roots 2_1 2                               |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
| 10.88m                                 | DER                             | Settled deposits coarse 10% 2_2 3         |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
| 10.88m                                 | WL                              | Wate                                      | Water level 5% 2_3 0 |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
| 12.18m                                 |                                 | Roots 2_4 2                               |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
| 18.08m                                 |                                 | Root                                      |                      |                                 |           |                                      |                 |       |           | _6      | 2 -  |     |                                  |               |
| 18.33m                                 | ICF                             | Finisl                                    | h node type          | , ins                           | spection  | chambe                               | r               |       | 2         | _99     | 0 -  | _// | x                                |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     | 18.33                            | Bm            |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |
|  |                                 |   |                      |                                 |           |                                      |                 |       |           |         |      |     |                                  |               |

#### Total grades for project

0



# Descriptive Report with Remarks and Observation Images

| Pos    | Code | Description   | Image                     |  |  |  |  |  |
|--------|------|---|---------------------------|--|--|--|--|--|
| 10.88m | IC   | Start node type, inspection chamber<br>IC4 Part Of Longer Run To MH3 From IC7 | Image Provided - Ref: 2_0 |  |  |  |  |  |
| 10.88m | R    | Roots - Grade 2   | Image Provided - Ref: 2_1 |  |  |  |  |  |
|        |      |   |                           |  |  |  |  |  |
| 10.88m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3           | Image Provided - Ref: 2_2 |  |  |  |  |  |

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects 5 | 54   Grade 4 Defects   3   Grade 5 Defects   0 |
|---|--|
|---|--|



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| Pos    | Code | Description                                 | Image                        |
|--------|------|---|------------------------------|
| 10.88m | WL   | Water level: 5% Height/Diameter             | Image Provided - Ref: 2_3    |
| 12.18m | R    | Roots - Grade 2                             | Image Provided - Ref: 2_4    |
| 18.08m | R    | Roots - Grade 2                             | Image Provided - Ref: 2_6    |
| 18.33m | ICF  | Finish node type, inspection chamber<br>IC2 | Image Provided - Ref: 2_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects |
|-----------------|---|-----------------|



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## Site: Mount Pleasant Road

Section 9

| CI   | ient:    |                         | Location (Str<br>Mount Plea                        |                |          | City/T                               | own/Village | Cust            | Job Ref. |                                  | Surveyors                  | Name:                    | Date<br>08/08/2 |               |
|--|----------|-------------------------|--|----------------|----------|--------------------------------------|-------------|-----------------|----------|----------------------------------|----------------------------|--------------------------|-----------------|---------------|
| Start Node I<br>Start Node I<br>Start Node ( | Depth:   | e:                      |  | 800 F          | inish No | ode Ref:<br>ode Depth:<br>ode Coordi |             |                 |          | 00 Us                            | ection:<br>e:<br>iterial:  | U Hei<br>S Sha<br>VC Cle |                 | 150<br>C<br>N |
| Drain Type<br>A                              | Lining T | уре                     | Lining Mat.  | Year           | Const.   | Weather<br>D                         | Flow Cont.  | Length<br>11.35 |          |                                  | Rem                        | arks                     |                 |               |
| Position<br>00.00m<br>02.36m<br>04.13m       | JD JD JD | Start<br>Joint<br>Joint | iption<br>node type, i<br>displaced m<br>node type | nediu<br>nediu | m<br>m   |                                      |             |                 | 7        | Pic<br>7_0<br>7_2<br>7_3<br>7_99 | Grade<br>0 -<br>2 -<br>0 - |                          | 0m              |               |

#### Total grades for project

0



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**Descriptive Report with Remarks and Observation Images** 

### Total grades for project

0



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| Pos    | Code | Description                                | Image                        |
|--------|------|--|------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC5 | Image Provided - Ref: 7_0    |
| 02.36m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 7_2    |
| 04.13m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 7_3    |
| 11.35m | MHF  | Finish node type, manhole<br>IC3           | Image Provided - Ref: 7_9999 |

| Grade 1 Defects 0 Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 | ] |
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|---|



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## Site: Mount Pleasant Road

Section 10

| CI                                     | ient:  |        | Location (St  | reet l   | Name):   | City/T                               | own/Village | Cus    | t Job Ref. | Survey                             | vors Name:    | Date    | e:            |
|--|--------|--------|---------------|----------|----------|--------------------------------------|-------------|--------|------------|------------------------------------|---------------|---------|---------------|
|  |        |        | Mount Plea    | asant    | Road     |                                      |             |        |            |                                    |               | 08/08/2 | 2018          |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   | 10            |          |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        |            | 0 Direction<br>0 Use:<br>Material: | F SH<br>VC CI |         | 150<br>C<br>N |
| Drain Type                             | Lining | Туре   | Lining Mat.   | Yea      | r Const. | Weather                              | Flow Cont.  | Length |            |                                    | Remarks       |         |               |
| A                                      |        |        |               | D N 3.18 |          |                                      |             |        |            |                                    |               |         |               |
| Position                               | Code   | Desc   | ription       |          |          |                                      |             |        | CD P       | ic Grad                            | e /           | 0m      |               |
| 00.00m                                 | IC     | Start  | node type,    | insp     | ection o | chamber                              |             |        | 8          | 9_0                                | 0 —           |         |               |
| 01.31m                                 | CUW    | Loss   | of vision, ca | ame      | ra unde  | r water                              |             |        | 8          | 9_1                                | 0 —           |         |               |
| 03.07m                                 | WL     | Wate   | er level 20%  | 6        |          |                                      |             |        | 8          | 9_2                                | 0 - \         |         |               |
| 03.18m                                 | DER    | Settle | ed deposits   | coai     | rse 40   | %                                    |             |        | 8          | 9_3                                | 3             |         |               |
| 03.18m                                 | SA     | Surv   | ey abandon    | ed       |          |                                      |             |        | 8          | 9_9                                | o ─_///       |         | 27            |
|  |        |        |               |          |          |                                      |             |        |            |                                    |               | 3.18m   | n             |

#### Total grades for project



| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC5A | Image Provided - Ref: 89_0 |
| 01.31m | CUW  | Loss of vision, camera under water          | Image Provided - Ref: 89_1 |
| 03.07m | WL   | Water level: 20% Height/Diameter            | Image Provided - Ref: 89_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 03.18m | DER  | Settled deposits coarse: 40% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 89_3    |
| 03.18m | SA   | Survey abandoned<br>Unable To Proceed Into Chamber                  | Image Provided - Ref: 89_9999 |

## Total grades for project

0



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## Site: Mount Pleasant Road

Section 11

| CI   | ient:  |                          | Location (St |           |         | City/T   | own/Village | Cust   | Job Ref. | Surveyo                          | ors Name:     |              | Date: |  |
|--|--------|--------------------------|--------------|-----------|---------|----------|-------------|--------|----------|----------------------------------|---------------|--------------|-------|--|
|  |        |                          | Mount Plea   | isant Roa | ad      |          |             |        |          |                                  |               | 08/08        | /2018 |  |
| Start Node I<br>Start Node I<br>Start Node 0 | Depth: | th: 0 Finish Node Depth: |              |           |         |          | IC4A<br>(   |        | F        | Height/Dia:<br>Shape:<br>Cleaned | 150<br>C<br>N |              |       |  |
| Drain Type                                   | Lining | Туре                     | Lining Mat.  | Year Co   | onst. V | Veather  | Flow Cont.  | Length |          | F                                | Remarks       |              |       |  |
| А  |        |                          |              | D N 7.25  |         |          |             |        |          |                                  |               |              |       |  |
| Position                                     | Code   | Desc                     | ription      |           |         |          |             |        | CD Pi    | c Grade                          |               | Om           |       |  |
| 00.00m                                       |        |                          | node type,   | inspect   | tion ch | amber    |             |        | 90       | 0_0                              | o —/          |              |       |  |
| 02.08m                                       | DER    | Settle                   | ed deposits  | coarse    | 5%      |          |             |        | 90       | D_1 :                            | 3             | _            |       |  |
| 04.94m                                       | JN     | Junct                    | tion 2 : 150 | mm Dia    | amete   | r        |             |        | 90       | )_3                              | 0 —           |              | A     |  |
| 05.38m                                       | DER    | Settle                   | ed deposits  | coarse    | 10%     | )        |             |        | 90       | )_2                              | 3/            |              | 3     |  |
| 06.59m                                       | LRH    | Line                     | of drain/sew | er devi   | iates r | ight [ha | lf]         |        | 90       | 0_4                              | ₀ _ /         | $\mathbf{M}$ | E CON |  |
| 07.25m                                       | ICF    | Finisl                   | h node type  | , inspe   | ction c | hambe    | r           |        | 90       | )_9                              | 0 —//         | 7            |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  | N             | 7.25         | 100   |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               | 1.25         |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |
|  |        |                          |              |           |         |          |             |        |          |                                  |               |              |       |  |

#### Total grades for project



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC5A                        | Image Provided - Ref: 90_0 |
| 02.08m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 90_1 |
| 04.94m | JN   | Junction at 2 o'clock: 150mm Diameter                              | Image Provided - Ref: 90_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 05.38m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 90_2    |
| 06.59m | LRH  | Line of drain/sewer deviates right [half]                           | Image Provided - Ref: 90_4    |
| 07.25m | ICF  | Finish node type, inspection chamber<br>IC4A                        | Image Provided - Ref: 90_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

## Section 12

| C                                      | ient:  |      | Location (St<br>Mount Plea |     |          | City/T                               | own/Village | Cus    | t Job Ref. | Survey                          | ors Name:                              |           | Date<br>08/08/2 |               |
|--|--------|------|----------------------------|-----|----------|--------------------------------------|-------------|--------|------------|---------------------------------|--|-----------|-----------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate: | l,                         |     |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH4<br>C   | Direction:<br>Use:<br>Material: | D<br>C<br>VC                           | Shape     | :               | 100<br>C<br>N |
| Drain Type                             | Lining | Туре | Lining Mat.                | Yea | r Const. | Weather                              | Flow Cont.  | Length |            | l                               | Remarks                                |           |                 |               |
| A                                      |        |      |                            |     |          | D                                    | N           | 2.74   |            |                                 |  |           |                 |               |
| Position                               |        | Desc | ription                    |     |          |                                      |             |        | CD Pi      |                                 | e                                      | $\square$ | 0m              |               |
| 00.00m                                 |        |      | node type,                 |     |          |                                      |             |        |            | _                               | 0 —                                    |           |                 |               |
| 00.54m                                 |        |      | displaced n                |     |          |                                      |             |        |            | 1_1                             | 2                                      |           |                 |               |
| 01.20m                                 |        |      | displaced n                |     |          |                                      |             |        |            | 1_2                             | 2                                      |           |                 |               |
| 02.19m                                 |        |      | displaced n<br>h node type |     |          |                                      |             |        |            | I_3<br>I_9                      | $\begin{bmatrix} 2 \\ 0 \end{bmatrix}$ |           | FLOW            |               |
|  |        |      |                            |     |          |                                      |             |        |            |                                 |  |           | 2.74m           |               |

#### Total grades for project

0



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| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC6A | Image Provided - Ref: 91_0 |
| 00.54m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 91_1 |
| 01.20m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 91_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description                      | Image                         |
|--------|------|----------------------------------|-------------------------------|
| 02.19m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 91_3    |
| 02.74m | MHF  | Finish node type, manhole<br>MH4 | Image Provided - Ref: 91_9999 |

Total grades for project

| Grade 1 Defects |
|-----------------|
|-----------------|



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## Site: Mount Pleasant Road

## Section 13

| CI   | Client: Location (Street Name):<br>Mount Pleasant Road |                |   |       |        |                                      | City/Town/Village |                |        | Surveyo                             | ors Name: | Date<br>08/08/20        |               |
|--|--|----------------|---|-------|--------|--------------------------------------|-------------------|----------------|--------|-------------------------------------|-----------|-------------------------|---------------|
| Start Node I<br>Start Node I<br>Start Node ( | Depth:   | te:            | I   | 0     |        | ode Ref:<br>ode Depth:<br>ode Coordi |                   |                | G`     | Y Direction:<br>0 Use:<br>Material: | C Sha     | ght/Dia:<br>pe:<br>aned | 100<br>C<br>N |
| Drain Type                                   | Lining <sup>-</sup>                                    | Туре           | Lining Mat.   | Year  | Const. | Weather<br>D                         | Flow Cont.        | Length<br>1.97 |        | R                                   | Remarks   |                         |               |
| Position<br>00.00m<br>01.97m                 | IC<br>JD   | Start<br>Joint | ription<br>node type,<br>displaced r<br>n node type | nediı | um     |                                      |                   |                | 9<br>9 | _<br>2_1 2                          |           | 0m                      |               |

#### Total grades for project

0



| Pos    | Code | Description                                 | Image                         |
|--------|------|---|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC6A | Image Provided - Ref: 92_0    |
| 01.97m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 92_1    |
| 01.97m | GYF  | Finish node type Gully<br>GY                | Image Provided - Ref: 92_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |  | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|---|



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## Site: Mount Pleasant Road

Section 14

| CI                                     | Client: Location (Street Name):<br>Mount Pleasant Road |        |              | City/T | own/Village | Cust                                 | t Job Ref. | Surveyo | rs Name:    | Date<br>08/08/20 |               |                          |               |
|--|--|--------|--------------|--------|-------------|--------------------------------------|------------|---------|-------------|------------------|---------------|--------------------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth:   | ate:   |              | 900 F  | inish No    | ode Ref:<br>ode Depth:<br>ode Coordi |            |         | IC4<br>1000 |                  | C Sha         | ght/Dia:<br>ipe:<br>aned | 150<br>C<br>N |
| Drain Type                             | Lining   | Туре   | Lining Mat.  | Year ( | Const.      | Weather                              | Flow Cont. | Length  |             | R                | emarks        |                          |               |
| A                                      | Quala  | Deer   |              |        |             | D                                    | N          | 10.88   |             | in Oracila       |               | Om                       |               |
| Position<br>00.00m                     |  |        | node type,   | inspe  | ction c     | hamber                               |            |         | CD Pi       | ic Grade<br>_0 C |               |                          |               |
| 05.67m                                 |  |        | er level 5%  |        |             |                                      |            |         |             | _4 C             |               |                          |               |
| 09.81m                                 | LUH  | Line   | of drain/sew | ver de | viates      | up [half]                            |            |         | 1_          | _7 0             | -             |                          |               |
| 10.52m                                 | R  | Root   | S            |        |             |                                      |            |         | 1_          | _8 2             | <u>- // /</u> |                          |               |
| 10.76m                                 | DER  | Settle | ed deposits  | coars  | e 10        | %                                    |            |         | 1_          | _9 3             |               | ELOW                     |               |
|  |  |        |              |        |             |                                      |            |         |             |                  |               | 10.88n                   | n             |

#### Total grades for project

0



| Pos    | Code | Description                                | Image                     |
|--------|------|--|---------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC7 | Image Provided - Ref: 1_0 |
| 05.67m | WL   | Water level: 5% Height/Diameter            | Image Provided - Ref: 1_4 |
|        |      |  |                           |
| 09.81m | LUH  | Line of drain/sewer deviates up [half]     | Image Provided - Ref: 1_7 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 D | efects 54 Grade 4 Defects 3 Grade 5 Defects 0 |
|---|---|
|---|---|



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0

| Pos    | Code | Description   | Image                        |
|--------|------|---|------------------------------|
| 10.52m | R    | Roots - Grade 2   | Image Provided - Ref: 1_8    |
| 10.76m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 1_9    |
| 10.88m | ICF  | Finish node type, inspection chamber                                | Image Provided - Ref: 1_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|



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## Site: Mount Pleasant Road

Section 15

| CI   | ient:  |                           | Location (Street Name): City/Town/Village |              |                      |            | Cust   | t Job Re   | ef.      | Surve                         | eyors Name        | e:          | Date  | e:            |
|--|--------|---------------------------|---|--------------|----------------------|------------|--------|------------|----------|-------------------------------|-------------------|-------------|-------|---------------|
| Mount Pleasant Road                          |        |                           |   |              |                      |            |        |            |          |                               |                   | 08/08/2     | 2018  |               |
| Start Node I<br>Start Node I<br>Start Node ( | Depth: | oth: 0 Finish Node Depth: |   |              |                      |            |        | I          | C5A<br>0 | Direction<br>Use:<br>Material | C                 | -           |       | 150<br>C<br>N |
| Drain Type                                   | Lining | Туре                      | Lining Mat.                               | Year Const.  | Weather              | Flow Cont. | Length |            |          |                               | Remarks           |             |       |               |
| А  |        |                           |   |              | D                    | Ν          | 0.44   |            |          |                               |                   |             |       |               |
| Position                                     | Code   | Desc                      | ription                                   |              |                      |            |        | CD         | Pic      | Grad                          | de                | 1           | Om    |               |
| 00.00m                                       |        |                           | node type,                                | inspection c | hamber               |            |        |            | 11(      | 0_                            | 0 —               | ///         |       |               |
| 00.00m                                       | DES    | Settle                    | ed deposits                               | fine 5%      |                      |            |        |            | 11       | 0_                            | 2 —               | //          |       |               |
| 00.00m                                       | JN     | Junc                      | tion 12 : 0m                              | nm Diamete   | r                    |            |        |            | 11(      | 0_                            | 0 —               | /           |       |               |
| 00.02m                                       | DEE    | S1 A                      | ttached dep                               | osits, encru | station <sup>2</sup> | 12-12 5%   |        | <b>S</b> 1 | 11       | 0                             | <mark>з</mark> —/ |             |       |               |
| 00.37m                                       | DES    | S2 S                      | ettled depos                              | sits fine 50 | %                    |            |        | S2         | 11       | 0_                            | 2 —               |             | MO    |               |
| 00.44m                                       | DEE    | F1 At                     | ttached dep                               | osits, encru | station ?            | 2-12 5%    |        | F1         | 11       | 0_                            | 3 —               | $\setminus$ |       |               |
| 00.44m                                       | DES    | F2 S                      | ettled depos                              | sits fine 50 | %                    |            |        | F2         | 11       | 0_                            | 2 —               | //          |       |               |
| 00.44m                                       | SA     | Surve                     | ey abandon                                | ed           |                      |            |        |            | 11(      | 0_                            | 0 —               | Ľ           | 0.44m | i             |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |
|  |        |                           |   |              |                      |            |        |            |          |                               |                   |             |       |               |

### Total grades for project

0



Page 57

| Pos    | Code | Description  | Image                       |
|--------|------|--|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC10                      | Image Provided - Ref: 110_0 |
| 00.00m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 110_1 |
| 00.00m | JN   | Junction at 12 o'clock: 0mm Diameter                             | Image Provided - Ref: 110_2 |

## **Descriptive Report with Remarks and Observation Images**

### Total grades for project



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| Pos    | Code   | Description  | Image                       |
|--------|--------|--|-----------------------------|
| 00.02m | S1 DEE | Attached deposits, encrustation0.02m -<br>0.44m from 12 o'clock to 12 o'clock: 5%<br>Cross sectional area loss - Grade 3 | Image Provided - Ref: 110_4 |
| 00.37m | S2 DES | Settled deposits fine0.37m - 0.44m: 50%<br>Cross sectional area loss - Grade 2   | Image Provided - Ref: 110_3 |
| 00.44m | F1 DEE | Attached deposits, encrustationDefect End<br>from 12 o'clock to 12 o'clock: 5% Cross<br>sectional area loss - Grade 3    | Image Provided - Ref: 1104  |
| 00.44m | F2 DES | Settled deposits fineDefect End: 50% Cross sectional area loss - Grade 2   |                             |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                          |
|--------|------|---|--------------------------------|
| 00.44m | SA   | Survey abandoned<br>UNABLE TO CONTINUE DUE TO LEVEL<br>OF SILT WITHIN DRAIN | Image Provided - Ref: 110_9999 |

Total grades for project

0



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## Site: Mount Pleasant Road

Section 16

| CI                               | ient:  |       | Location (St<br>Mount Plea |             | City/T                                  | own/Village | Cust   | t Job Ref. |  | Surveyors Name: |    |   | Date:<br>08/08/2018 |               |
|----------------------------------|--------|-------|----------------------------|-------------|---|-------------|--------|------------|--|-----------------|----|---|---------------------|---------------|
| Start Node Start Node Start Node | Depth: | ate:  | 1                          |             | lode Ref:<br>lode Depth:<br>lode Coordi |             |        |            | IC9Direction:DHeight0Use:CShapeMaterial:VCCleane |                 |    |   |                     | 150<br>C<br>N |
| Drain Type                       | Lining | Туре  | Lining Mat.                | Year Const. | Weather                                 | Flow Cont.  | Length | Remarks    |  |                 |    |   |                     |               |
| A                                |        |       |                            |             | D                                       | N           | 9.3    |            |  |                 |    |   |                     |               |
| Position                         | Code   | Desc  | ription                    |             |   |             |        | CD F       | Pic  | Grade           | /  | / | 0m                  |               |
| 00.00m                           | IC     | Start | node type,                 | inspection  | chamber                                 |             |        | 1          | 111  | _ 0             | _/ |   |                     |               |
| 00.38m                           | REM    | Gene  | eral remark                |             |   |             |        |            | 111  |                 | _/ |   |                     |               |
| 01.36m                           |        |       | hed deposit                |             |   |             |        |            | 111  |                 |    |   |                     |               |
| 03.91m                           |        |       | hed deposit                |             |   |             |        |            | 111  |                 |    |   | 711                 |               |
| 08.02m<br>09.30m                 |        |       | hed deposit<br>n node type |             |   |             |        |            | 111<br>111                                       |                 |    |   | FLOW                | 7             |
|                                  |        |       |                            |             |   |             |        |            |  |                 |    |   | 9.3m                |               |

#### Total grades for project

0



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC10   | Image Provided - Ref: 111_0 |
| 00.38m | REM  | General remark<br>GENERAL ENCRUSTATION ON ENTIRE<br>LENGTH AND CIRCUMFIRENCE OF<br>DRAIN                    | Image Provided - Ref: 111_1 |
| 01.36m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 111_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description  | Image                          |
|--------|------|--|--------------------------------|
| 03.91m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3  | Image Provided - Ref: 111_3    |
| 08.02m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 10% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 111_4    |
| 09.30m | ICF  | Finish node type, inspection chamber<br>IC9  | Image Provided - Ref: 111_9999 |

## Total grades for project

0

| Grade 1 Defec | cts |  |
|---------------|-----|--|
|---------------|-----|--|



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## Site: Mount Pleasant Road

Section 17

| Cli  | ent:   |       | Location (Street Name):<br>Mount Pleasant Road |     |          | City/T                               | City/Town/Village |        | Cust Job Ref. |                               | Surveyors Name: |      | Date:<br>08/08/2018 |               |
|--|--------|-------|--|-----|----------|--------------------------------------|-------------------|--------|---------------|-------------------------------|-----------------|------|---------------------|---------------|
| Start Node F<br>Start Node I<br>Start Node ( | Depth: | ate:  |  |     |          | ode Ref:<br>ode Depth:<br>ode Coordi |                   | •      |               | 0 Directi<br>0 Use:<br>Materi | S               | Shap |                     | 100<br>C<br>N |
| Drain Type                                   | Lining | Туре  | Lining Mat.                                    | Yea | r Const. | Weather                              | Flow Cont.        | Length |               |                               | Remarks         |      |                     |               |
| A  |        |       |  |     |          | D                                    | N                 | 0      |               |                               |                 |      |                     |               |
| Position<br>00.00m<br>00.00m                 | IC     | Start | ription<br>node type,<br>h node type           |     |          | hamber                               |                   |        |               | ic Gra<br>3_0<br>3_9          | ade<br>0<br>0   |      | Om                  |               |
|  |        |       |  |     |          |                                      |                   |        |               |                               |                 |      |                     |               |

#### Total grades for project

0



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| Pos    | Code | Description                                  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC11  | Image Provided - Ref: 93_0    |
| 00.00m | ICF  | Finish node type, inspection chamber<br>IC10 | Image Provided - Ref: 93_9999 |

## **Descriptive Report with Remarks and Observation Images**

#### Total grades for project



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## Site: Mount Pleasant Road

Section 18

| CI                                     | ient:  |        | Location (Street Name):       City/Town/Village       Cust Job Ref.       Si         Mount Pleasant Road       Si       Si       Si |               |                                      |            | Surveyo | ors Name: | Date:<br>08/08/201 |          |       |              |
|--|--------|--------|---|---------------|--------------------------------------|------------|---------|-----------|--------------------|----------|-------|--------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   | I   |               | ode Ref:<br>ode Depth:<br>ode Coordi |            |         | ENE       |                    | S Sha    | -     | 00<br>C<br>N |
| Drain Type                             | Lining | Туре   | Lining Mat.   | Year Const.   | Weather                              | Flow Cont. | Length  |           | R                  | emarks   |       |              |
| А                                      |        |        |   |               | D                                    | N          | 9.77    |           |                    |          |       |              |
| Position                               | Code   | Desc   | ription   |               |                                      |            |         | CD P      | ic Grade           | /        | 0m    |              |
| 00.00m                                 | IC     | Start  | node type,  | inspection of | chamber                              |            |         | 9,        | 4_0 0              |          |       |              |
| 01.31m                                 | JD     | Joint  | displaced n   | nedium        |                                      |            |         | 9,        | 4_1 2              | 2        |       |              |
| 05.27m                                 | JD     | Joint  | displaced n   | nedium        |                                      |            |         | 9,        | 4_2 2              | 2 ~      | -     |              |
| 07.47m                                 | LRH    | Line   | of drain/sew  | ver deviates  | s right [ha                          | lf]        |         | 9,        | 4_3 0              | $\sim$ / |       |              |
| 09.55m                                 | DER    | Settle | ed deposits   | coarse 10     | %                                    |            |         | 9         | 4_4 3              | 3-7/     | FLOS  |              |
| 09.77m                                 | SA     | Surve  | ey abandon  | ed            |                                      |            |         | 9         | 4_9 C              | ,_//     | 9.77m |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |
|  |        |        |   |               |                                      |            |         |           |                    |          |       |              |

#### Total grades for project

0



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| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC11 | Image Provided - Ref: 94_0 |
| 01.31m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 94_1 |
| 05.27m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 94_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|---------------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|---------------------|----|-----------------|---|-----------------|---|



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0

| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 07.47m | LRH  | Line of drain/sewer deviates right [half]                                    | Image Provided - Ref: 94_3    |
| 09.55m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3          | Image Provided - Ref: 94_4    |
| 09.77m | SA   | Survey abandoned<br>LOSS OF VISION DUE TO SETTLED<br>DEPOSITS BLOCKING DRAIN | Image Provided - Ref: 94_9999 |

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects |
|-----------------------------------|----------------------------|-------------------|-----------------|
|-----------------------------------|----------------------------|-------------------|-----------------|



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## Site: Mount Pleasant Road

Section 19

| CI   | Client: Location (Street Name):<br>Mount Pleasant Road |       |             |      |          |                                      |            | t Job Ref. | Surve | vors Name: |                     | Date:<br>08/08/2018     |       |               |
|--|--|-------|-------------|------|----------|--------------------------------------|------------|------------|-------|------------|---------------------|-------------------------|-------|---------------|
| Start Node I<br>Start Node I<br>Start Node ( | Depth:   | ate:  | I           |      |          | ode Ref:<br>ode Depth:<br>ode Coordi |            |            | IC13  |            | s                   | Heigh<br>Shape<br>Clean | e:    | 150<br>C<br>N |
| Drain Type                                   | Lining   | Туре  | Lining Mat. | Yea  | r Const. | Weather                              | Flow Cont. | Length     |       |            | Remarks             |                         |       |               |
| A  |  |       |             |      |          | D                                    | N          | 6.48       |       |            |                     |                         |       |               |
| Position                                     | Code   | Desc  | ription     |      |          |                                      |            |            | CD Pi | c Grad     | е                   |                         | 0m    |               |
| 00.00m                                       | IC   | Start | node type,  | insp | ection c | hamber                               |            |            | 9     | 5_0        | 0 —                 |                         |       |               |
| 02.63m                                       |  |       | ed deposits |      |          |                                      |            |            |       | 5_2        | 2 ~                 |                         |       |               |
|  |  |       | ed deposits |      |          |                                      |            |            |       | 5_3        | 2                   | $\overline{\}$          |       |               |
|  |  |       | ed deposits |      | 80%      |                                      |            |            |       | 5_4        | $2 \longrightarrow$ | . 1                     |       |               |
| 06.48m                                       |  | Surve | ey abandon  | eu   |          |                                      |            |            | 3.    | 5_9        | 0                   |                         | FLOW  |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         | 6.48m |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |
|  |  |       |             |      |          |                                      |            |            |       |            |                     |                         |       |               |

#### Total grades for project

0



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC12                      | Image Provided - Ref: 95_0 |
| 02.63m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 95_2 |
| 06.48m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 95_3 |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 06.48m | DES  | Settled deposits fine: 80% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 95_4    |
| 06.48m | SA   | Survey abandoned<br>UNABLE TO PASS DEPOSITS IN PIPE               | Image Provided - Ref: 95_9999 |

Total grades for project



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## Site: Mount Pleasant Road

Section 20

| CI                                     | ient:  | Location (Street Name):<br>Mount Pleasant Road |                 |     |                        |                                      |            |        | t Job Ref. | Surveyo                             | ors Name:                  | Date:<br>08/08/2018   |  |
|--|--------|--|-----------------|-----|------------------------|--------------------------------------|------------|--------|------------|-------------------------------------|----------------------------|---|--|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   |                 | C13 | Finish No<br>Finish No | ode Ref:<br>ode Depth:<br>ode Coordi |            |        | IC13/      | A Direction:<br>0 Use:<br>Material: | D Heig<br>S Sha<br>VC Clea | ght/Dia: 150<br>pe: C   |  |
| Drain Type                             | Lining | Туре   | Lining Mat.     | Yea | r Const.               | Weather                              | Flow Cont. | Length |            | R                                   | Remarks                    |   |  |
| A                                      |        |  |                 |     |                        | D                                    | Ν          | 0.43   |            |                                     |                            |   |  |
| Position                               | Code   | Desc   | ription         |     |                        |                                      |            |        | CD P       | ic Grade                            | 1                          | Om  |  |
| 00.00m                                 |        |  | node type,      |     |                        |                                      |            |        |            |                                     | o ─/                       |   |  |
|  |        |  | ed deposits     | coa | rse 30'                | %                                    |            |        |            | _                                   | 3 —                        |   |  |
| 00.43m<br>00.43m                       |        | Root   | s<br>ey abandon | od  |                        |                                      |            |        |            |                                     | $\frac{2}{2}$              |   |  |
| 00.4311                                | 3A     | Surve  |                 | eu  |                        |                                      |            |        | 9          | 0_9 (                               |                            | FLOW  |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     | $\mathbb{N}$               | No and a second s |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     | N                          |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     | \                          | 0.43m   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |
|  |        |  |                 |     |                        |                                      |            |        |            |                                     |                            |   |  |

#### Total grades for project

0



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**Descriptive Report with Remarks and Observation Images** 

### Total grades for project

0



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| Pos    | Code | Description   | Image                         |  |  |  |  |
|--------|------|---|-------------------------------|--|--|--|--|
| 00.00m | IC   | Start node type, inspection chamber<br>IC13   | Image Provided - Ref: 96_0    |  |  |  |  |
| 00.00m | DER  | Settled deposits coarse: 30% Cross<br>sectional area loss - Grade 3                                     | Image Provided - Ref: 96_2    |  |  |  |  |
| 00.43m | R    | Roots - Grade 2   | Image Provided - Ref: 96_3    |  |  |  |  |
| 00.43m | SA   | Survey abandoned<br>SURVEY UNABLE TO BE CARRIED OUT<br>DUE TO EXCESSIVE FINE SILT AND<br>ROOTS IN DRAIN | Image Provided - Ref: 96_9999 |  |  |  |  |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 | ] |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|



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## Site: Mount Pleasant Road

Section 21

| CI   | ient:                                |   | Location (Street Name): City/Town/Village Cus<br>Mount Pleasant Road  |                          |                             |                                    |                          |        |    |  | Surveyo   | ors Name     |      | Date |                       |
|--|--------------------------------------|---|---|--------------------------|-----------------------------|------------------------------------|--------------------------|--------|----|--|---|--------------|------|------|-----------------------|
| Start Node<br>Start Node<br>Start Node   | Depth:                               | ate:  | I   | C14<br>860               | Finish N<br>Finish N        | ode Ref:<br>ode Depth<br>ode Coord |                          |        |    |  | Direction:<br>Use:<br>Material:                                 | U<br>C<br>VC | Shap |      | 2018<br>150<br>C<br>N |
| Drain Type   | Lining                               | Туре  | Lining Mat.   | Year                     | Const.                      | Weather                            | Flow Cont.               | Length |    |  | F   | Remarks      |      |      |                       |
| А  |                                      |   |   |                          |                             | D                                  | N                        | 29.12  |    |  |   |              |      |      |                       |
| Position<br>00.00m<br>03.78m<br>06.62m<br>22.45m<br>23.66m<br>25.97m<br>29.12m | IC<br>DEE<br>DEE<br>CXI<br>REM<br>WL | Start<br>Attac<br>Attac<br>Conr<br>Gene<br>Wate | ription<br>node type,<br>ched deposit<br>ched deposit<br>chection intru-<br>eral remark<br>er level 5%<br>h node type | ts, er<br>ts, er<br>ding | ncrusta<br>ncrusta<br>11 10 | tion 6-1:<br>tion 11-<br>% : 100n  | 2 5%<br>1 5%<br>nm Diame | er     | CD | Pic<br>0_(<br>0_2<br>0_4<br>0_5<br>0_5 | D     1       2     1       4     1       3     1       9     1 |              |      | 0m   |                       |

#### Total grades for project

0



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| Pos    | Code | Description  | Image                     |
|--------|------|--|---------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC14 - Steam Causing Poor Focus                                     | Image Provided - Ref: 0_0 |
| 03.78m | DEE  | Attached deposits, encrustation from 6<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 0_2 |
| 06.62m | DEE  | Attached deposits, encrustation from 11<br>o'clock to 1 o'clock: 5% Cross sectional area<br>loss - Grade 3 | Image Provided - Ref: 0_4 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                        |
|--------|------|---|------------------------------|
| 22.45m | СХІ  | Connection intruding at 11 o'clock: 10%<br>Intrusion : 100mm Diameter - Grade 2 | Image Provided - Ref: 0_8    |
| 23.66m | REM  | General remark<br>Deposit Within Drain Appears To Be<br>Vegetation              | Image Provided - Ref: 0_9    |
| 25.97m | WL   | Water level: 5% Height/Diameter   | Image Provided - Ref: 0_10   |
| 29.12m | ICF  | Finish node type, inspection chamber<br>IC7                                     | Image Provided - Ref: 0_9999 |

## Total grades for project

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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### Site: Mount Pleasant Road

Section 22

| CI   | ient:                       |                                | Location (St<br>Mount Plea |   |                      | City/T   | own/Village | Cust   | t Job Ref. | Survey | yors Name: |  | Date<br>08/08/20 |               |
|--|-----------------------------|--------------------------------|----------------------------|---|----------------------|----------|-------------|--------|------------|--------|------------|--|------------------|---------------|
| Start Node I<br>Start Node I<br>Start Node ( | Depth:                      | ate:                           |                            | IC15Finish Node Ref:MH3Direction:UHeight/Dia:1220Finish Node Depth:1300Use:CShape:Finish Node Coordinate:Material:VCCleaned |                      |          |             |        |            |        |            |  | e:               | 150<br>C<br>N |
| Drain Type                                   | Lining                      | Туре                           | Lining Mat.                | Yea   | r Const.             | Weather  | Flow Cont.  | Length |            |        | Remarks    |  |                  |               |
| A  | Cada                        | Dece                           | rintian                    |   |                      | D        | N           | 49.01  |            | Cred   |            |  | 0m               |               |
| 48.01m                                       | IC<br>R<br>WL<br>LUQ<br>LLH | Start<br>Roots<br>Wate<br>Line | node type,                 | ver c   | leviates<br>leviates | up [quar |             |        | 4_<br>4_   | _0     |            |  | 0m               | n             |
|  |                             |                                |                            |   |                      |          |             |        |            |        |            |  |                  |               |

#### Total grades for project

0



| Pos    | Code | Description   | Image                     |
|--------|------|---|---------------------------|
| 35.43m | IC   | Start node type, inspection chamber<br>IC15             | Image Provided - Ref: 4_0 |
| 35.93m | R    | Roots - Grade 2<br>Roots Growing Through Joint In Drain | Image Provided - Ref: 4_1 |
| 36.55m | WL   | Water level: 5% Height/Diameter                         | Image Provided - Ref: 4_3 |

# **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|--|---|-----------------|---|
|--|---|-----------------|---|



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| Pos    | Code | Description                               | Image                        |
|--------|------|---|------------------------------|
| 46.64m | LUQ  | Line of drain/sewer deviates up [quarter] | Image Provided - Ref: 4_4    |
| 48.01m | LLH  | Line of drain/sewer deviates left [half]  | Image Provided - Ref: 4_6    |
| 49.01m | MHF  | Finish node type, manhole<br>MH3          | Image Provided - Ref: 4_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 |  | G |
|-----------------|---|-----------------|-----|--|---|
|-----------------|---|-----------------|-----|--|---|



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## Site: Mount Pleasant Road

Section 23

| Cli  | ient:  |        | Location (St                       | reet Name | e):   | City/Town/Village Cust Jo |            |                                 | t Job Re     | f.   | Surveyors | Name          | :    | Date: |   |
|--|--------|--------|------------------------------------|-----------|-------|---------------------------|------------|---------------------------------|--------------|------|-----------|---------------|------|-------|---|
|  |        |        | Mount Plea                         |           |       |                           |            |                                 |              |      |           | 08/08/        | 2018 |       |   |
| Start Node F<br>Start Node I<br>Start Node 0 | Depth: | ate:   | I                                  | nate:     |       |                           | IC2<br>0   | Direction:<br>Use:<br>Material: | U<br>S<br>VC | Shap |           | 150<br>C<br>N |      |       |   |
| Drain Type                                   | Lining | Туре   | Lining Mat.                        | Year Co   | nst.  | Weather                   | Flow Cont. | Length                          |              |      | Rei       | marks         |      |       |   |
| А  |        |        |                                    |           |       | D                         | Ν          | 18.33                           |              |      |           |               |      |       |   |
| Position                                     | Code   | Desc   | ription                            |           |       |                           |            |                                 | CD           | Pic  | Grade     |               | /1   | 0m    |   |
| 00.00m                                       | MH     | Start  | node type,                         | manhol    | е     |                           |            |                                 |              | 8_(  | ) 0       |               | //   |       |   |
| 00.23m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_2  | 2 2       | _/            | //   |       |   |
| 00.47m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_3  | 3 2       | _/            | //   | 2     |   |
| 01.30m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_4  | 4 2       |               | //   |       |   |
| 03.78m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_6  | 6 2       |               | /    |       |   |
| 04.02m                                       | JN     | Junc   | tion 9:100                         | mm Dia    | mete  | er                        |            |                                 |              | 8_7  | 7 0       |               |      |       | 0 |
| 09.10m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_9  | 9 2       |               |      |       |   |
| 11.23m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_^  | 10 2      | $\overline{}$ |      |       |   |
| 13.95m                                       | DES    | Settle | ed deposits                        | fine 5%   | %     |                           |            |                                 |              | 8_^  | 1 2       | $\neg$        |      |       |   |
| 13.95m                                       | DEE    | Attac  | hed deposit                        | s, encru  | ustat | ion 12-1                  |            |                                 | 8_^          | 12 3 | ~         | $\sum$        |      |       |   |
| 14.19m                                       | JN     | Junc   | Junction 9 : 150mm Diameter 8_13 0 |           |       |                           |            |                                 |              |      |           |               | 2    |       |   |
| 14.78m                                       | JD     | Joint  | displaced la                       | arge      |       |                           |            |                                 |              | 8_^  | 14 3      | <u> </u>      |      |       |   |
| 16.08m                                       | JD     | Joint  | displaced n                        | nedium    |       |                           |            |                                 |              | 8_^  | 5 2       |               |      |       |   |
| 18.33m                                       | SA     | Surve  | ey abandon                         | ed        |       |                           |            |                                 |              | 8_9  | 99 0      | $\overline{}$ |      | 18.33 | m |

#### Total grades for project

0

54



| Pos    | Code | Description                      | Image                     |
|--------|------|----------------------------------|---------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC16 | Image Provided - Ref: 8_0 |
| 00.23m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 8_2 |
|        |      |                                  |                           |
| 00.47m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 8_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                           | Image                     |
|--------|------|---------------------------------------|---------------------------|
| 01.30m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 8_4 |
| 03.78m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 8_6 |
| 04.02m | JN   | Junction at 9 o'clock: 100mm Diameter | Image Provided - Ref: 8_7 |
| 09.10m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 8_9 |

| Grade 1 Defects 0 Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 11.23m | JDM  | Joint displaced medium - Grade 2   | Image Provided - Ref: 8_10 |
| 13.95m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2   | Image Provided - Ref: 8_11 |
| 13.95m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 10% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 8_12 |
| 14.19m | JN   | Junction at 9 o'clock: 150mm Diameter  | Image Provided - Ref: 8_13 |

## Total grades for project

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                        |
|--------|------|---|------------------------------|
| 14.78m | JDL  | Joint displaced large - Grade 3                       | Image Provided - Ref: 8_14   |
| 16.08m | JDM  | Joint displaced medium - Grade 2                      | Image Provided - Ref: 8_15   |
|        |      |   |                              |
| 18.33m | SA   | Survey abandoned<br>Drain Blocked With Large Deposits | Image Provided - Ref: 8_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

Section 24

| CI   | ient:  |        | Location (St  | reet Name):  | City/T    | own/Village | Cus    | st Job Ref. | Sur    | st Job Ref. Surveyors Name: |           |        | te:  |
|--|--------|--------|---|--------------|-----------|-------------|--------|-------------|--------|-----------------------------|-----------|--------|------|
|  |        |        | Mount Plea  | asant Road   |           |             |        |             |        |                             |           | 08/08/ | 2018 |
| Start Node I<br>Start Node I<br>Start Node ( | Depth: | ate:   | IC16       Finish Node Ref:       END       Direction:       U       Heigh         0       Finish Node Depth:       0       Use:       S       Shape         Finish Node Coordinate:       Material:       VC       Clean |              |           |             |        |             |        | 100<br>C<br>N               |           |        |      |
| Drain Type                                   | Lining | Туре   | Lining Mat.   | Year Const.  | Weather   | Flow Cont.  | Length |             |        | Rema                        | arks      |        |      |
| А  |        |        |   |              | D         | N           | 16.26  |             |        |                             |           |        |      |
| Position                                     | Code   | Desc   | ription   |              |           |             |        | CD P        | ic Gra | ade                         | 1         | 0m     |      |
| 00.00m                                       | MH     | Start  | node type,  | manhole      |           |             |        | 9           | 8_0    | 0 -                         | -//       | 1      |      |
| 00.10m                                       | JD     | Joint  | displaced n   | nedium       |           |             |        | 9           | 8_2    | 2 -                         | -//       |        |      |
| 01.53m                                       | JD     | Joint  | displaced n   | nedium       |           |             |        | 9           | 8_3    | 2 -                         | _/        | ι.     |      |
| 06.92m                                       | REM    | Gene   | eral remark   |              |           |             |        | 9           | 8_4    | 0 -                         |           |        |      |
| 10.87m                                       | DES    | Settle | ed deposits   | fine 5%      |           |             |        | 9           | 8_5    | 2 -                         |           |        |      |
| 12.41m                                       | LRH    | Line   | of drain/sew  | ver deviates | right [ha | alf]        |        | 9           | 8_6    | 0 -                         | /         |        | Ĩ.   |
| 14.28m                                       | LDQ    | Line   | of drain/sew  | ver deviates | down [q   | juarter]    |        | 9           | 8_7    | 0 -                         | $  \  / $ |        |      |
| 16.26m                                       | LRH    | Line   | of drain/sew  | ver deviates | right [ha | alf]        |        | 9           | 8_8    | 0 -                         | $\neg /$  |        |      |
| 16.26m                                       | MHF    | Finis  | h node type   | , manhole    |           |             |        | 9           | 8_9    | 0 -                         |           | 16.20  | Sm   |
|  |        |        |   |              |           |             |        |             |        |                             |           |        |      |
|  |        |        |   |              |           |             |        |             |        |                             |           |        |      |
|  |        |        |   |              |           |             |        |             |        |                             |           |        |      |
|  |        |        |   |              |           |             |        |             |        |                             |           |        |      |

#### Total grades for project



| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | IC16 |                                  | Image Provided - Ref: 98_0 |
| 00.10m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 98_2 |
| 01.53m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 98_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|---------------------------------------|--------------------|-------------------|-----------------|---|
|---------------------------------------|--------------------|-------------------|-----------------|---|



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0

| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 06.92m | REM  | General remark<br>FINE SETTLED DEPOSITS AND<br>POSSIBLY ROOTS WITHIN DRAIN | Image Provided - Ref: 98_4 |
| 10.87m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2           | Image Provided - Ref: 98_5 |
| 12.41m | LRH  | Line of drain/sewer deviates right [half]                                  | Image Provided - Ref: 98_6 |
| 14.28m | LDQ  | Line of drain/sewer deviates down [quarter]                                | Image Provided - Ref: 98_7 |

## Total grades for project

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|



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| Pos    | Code | Description                               | Image                         |
|--------|------|---|-------------------------------|
| 16.26m | LRH  | Line of drain/sewer deviates right [half] | Image Provided - Ref: 98_8    |
| 16.26m | MHF  | Finish node type, manhole<br>END          | Image Provided - Ref: 98_9999 |

Total grades for project

0



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## Site: Mount Pleasant Road

Section 25

| CI                           | ient:  |        | Location (St             | reet Name):                | City/T                 | Cus        | st Job Ref. | Surve                 | yors Name: |                    | Date:         |            |  |
|------------------------------|--------|--------|--------------------------|----------------------------|------------------------|------------|-------------|-----------------------|------------|--------------------|---------------|------------|--|
|                              |        |        | Mount Plea               | asant Road                 |                        |            |             |                       |            |                    | 0             | 08/08/2018 |  |
| Start Node I<br>Start Node I |        |        | I                        | C17 Finish N<br>0 Finish N | ode Ref:<br>ode Depth: |            |             | 2 Direction<br>0 Use: |            | Height/I<br>Shape: | Dia: 150<br>C |            |  |
| Start Node (                 |        | ate:   |                          |                            | ode Coordi             |            |             |                       | Material:  |                    | Cleaned       |            |  |
| Drain Type                   | Lining | Туре   | Lining Mat.              | Year Const.                | Weather                | Flow Cont. | Length      |                       |            | Remarks            |               |            |  |
| A                            |        |        |                          |                            | D                      | N          | 30.03       |                       |            |                    |               |            |  |
| Position                     | Code   | Desc   | ription                  |                            |                        |            |             | CD P                  | ic Grad    | le                 | Λ             | 0m         |  |
| 00.00m                       | IC     | Start  | node type,               | inspection of              | chamber                |            |             | 1                     | 07_        | 0 -/               | //            |            |  |
| 00.19m                       | JD     | Joint  | displaced n              | nedium                     |                        |            |             | 1                     | 07_        | 2 -/               |               |            |  |
| 00.74m                       | DEE    | Attac  | hed deposit              | ts, encrusta               | tion 9-3               | 5%         |             | 1                     | 07_        | 3 —                |               |            |  |
| 05.53m                       | DEE    | Attac  | hed deposit              | ts, encrusta               | tion 12-               | 12 5%      |             | 1                     | 07_        | 3 —                |               |            |  |
| 12.65m                       | JD     | Joint  | displaced n              | nedium                     |                        |            |             | 1                     | 07_        | 2 —                |               | 3          |  |
| 15.10m                       | DER    | Settle | ed deposits              | coarse 5%                  | ,<br>D                 |            |             | 1                     | 07_        | 3 —                |               | HOW        |  |
| 15.96m                       | WL     | Wate   | er level 5%              |                            |                        |            |             | 1                     | 07_        | 0                  |               |            |  |
| 23.31m                       | DES    | Settle | Settled deposits fine 5% |                            |                        |            |             |                       | 07_        | 2                  | _             | <b>_</b>   |  |
| 24.22m                       | WL     | Wate   | ater level 5%            |                            |                        |            |             |                       | 07_        | 0                  |               |            |  |
| 30.03m                       | ICF    | Finis  | h node type              | , inspection               | chambe                 | r          |             | 1                     | 07_        | 0 —                |               | 30.03m     |  |

#### Total grades for project

0



| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC17   | Image Provided - Ref: 107_0 |
| 00.19m | JDM  | Joint displaced medium - Grade 2  | Image Provided - Ref: 107_1 |
|        |      |   |                             |
| 00.74m | DEE  | Attached deposits, encrustation from 9<br>o'clock to 3 o'clock: 5% Cross sectional area<br>loss - Grade 3 | Image Provided - Ref: 107_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 | Grade 2 Defects 192 Grade | 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---------------------------|------------------------------|---|-----------------|---|
|-------------------|---------------------------|------------------------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 05.53m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 107_3 |
| 12.65m | JDM  | Joint displaced medium - Grade 2  | Image Provided - Ref: 107_4 |
| 15.10m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3  | Image Provided - Ref: 107_5 |
| 15.96m | WL   | Water level: 5% Height/Diameter   | Image Provided - Ref: 107_6 |

## Total grades for project

I

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-----------------------------------|----------------------------|-------------------|-----------------|---|
|-----------------------------------|----------------------------|-------------------|-----------------|---|



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0

| Pos    | Code | Description  | Image                          |
|--------|------|--|--------------------------------|
| 23.31m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 107_7    |
| 24.22m | WL   | Water level: 5% Height/Diameter                                  | Image Provided - Ref: 107_8    |
|        |      |  |                                |
| 30.03m | ICF  | Finish node type, inspection chamber<br>BIC2                     | Image Provided - Ref: 107_9999 |

| Grade 1 Defects 0 Grade 2 Defects | 192 Grade 3 Defects | 54 Grade 4 Defects | 3 Grade 5 Defects |  |
|-----------------------------------|---------------------|--------------------|-------------------|--|
|-----------------------------------|---------------------|--------------------|-------------------|--|



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### Site: Mount Pleasant Road

Section 26

| C                                      | ient:  |      | Location (St<br>Mount Plea |      |                        | City/T                               | own/Village | Cust | t Job Ref.   | Survey   | yors Name: | Date:<br>08/08/2018 |  |  |
|--|--------|------|----------------------------|------|------------------------|--------------------------------------|-------------|------|--|----------|------------|---------------------|--|--|
| Start Node<br>Start Node<br>Start Node | Depth: | ate: |                            |      | Finish No<br>Finish No | ode Ref:<br>ode Depth:<br>ode Coordi |             |      | MH3 Direction: D Height/Dia: 15<br>0 Use: C Shape:<br>Material: VC Cleaned |          |            |                     |  |  |
| Drain Type                             | Lining | Туре | Lining Mat.                |      |                        |                                      |             |      |  |          |            |                     |  |  |
| A                                      |        |      |                            |      |                        | D                                    | N           | 7.41 |  |          |            | 0m                  |  |  |
| Position<br>00.00m                     |        |      | node type,                 | insp | ection c               | hamber                               |             |      |  | Pic Grad |            | om                  |  |  |
|  |        |      | h node type                |      |                        |                                      |             |      |  | 06_      | 0          | 7.41m               |  |  |

#### Total grades for project

0



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| Pos    | Code | Description                                 | Image                          |
|--------|------|---|--------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC17 | Image Provided - Ref: 106_0    |
| 07.41m | MHF  | Finish node type, manhole<br>MH3            | Image Provided - Ref: 106_9999 |

## **Descriptive Report with Remarks and Observation Images**

#### Total grades for project

0

| ects |
|------|
|      |



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## Site: Mount Pleasant Road

Section 27

| Start Node Ref:       IC18       Finish Node Ref:       BIC1       Direction:       D       Height/Dia:       100         Start Node Coordinate:       0       Use:       C       Shape:       C         Drain Type       Lining Mat.       Year Const.       Weather Flow Cont.       Length       Remarks         A       D       N       6.48       Remarks       CD       Pice Grade       99.0       0         Position Code       Description       CD       Start Node type, inspection chamber       99.0       0       0       06.48m       ICF       Finish node type, inspection chamber       99.0       0       0       0       06.48m       ICF       Finish node type, inspection chamber       99.9       0 | CI                 | ient:  |       | Location (St<br>Mount Plea |   |          | City/T     | City/Town/Village Cust Job Ref |      |   |     | Surveyors | Name: |      | Date:<br>08/08/2018 |   |
|---|--------------------|--------|-------|----------------------------|---|----------|------------|--------------------------------|------|---|-----|-----------|-------|------|---------------------|---|
| A     D     N     6.48       Position Code Description     CD     Pic     Grade       00.00m IC     Start node type, inspection chamber     99_0     0       06.48m ICF     Finish node type, inspection chamber     99_9     0   | Start Node I       | Depth: | ate:  | I                          |   | Finish N | ode Depth: | ode Depth:                     |      |   | οιι | Jse:      | С     | Shap | e:                  | С |
| Position Code Description       CD Pic Grade         00.00m IC       Start node type, inspection chamber       99_0         06.48m ICF       Finish node type, inspection chamber       99_9         0       Image: CD Pic Grade       Image: CD Pic Grade         0       Image: CD Pic Grade       99_0         0       Image: CD Pic Grade       90_0         0       Image: CD Pic Grade       90_0                                   | Drain Type         | Lining | Туре  | Lining Mat.                | Lining Mat. Year Const. Weather Flow Cont. Length Remarks |          |            |                                |      |   |     |           |       |      |                     |   |
| 00.00m     IC     Start node type, inspection chamber     99_0     0       06.48m     ICF     Finish node type, inspection chamber     99_9     0   | Α                  |        |       |                            |   |          | D          | N                              | 6.48 |   |     |           |       |      |                     |   |
|   | Position<br>00.00m | IC     | Start | node type,                 |   |          | chamber    |                                |      | 9 | 9_0 | 0 0       |       |      | FLOW                |   |

#### Total grades for project

0



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC18                              | Image Provided - Ref: 99_0    |
| 06.48m | ICF  | Finish node type, inspection chamber<br>BIC1 - BURIED INSPECTION CHAMBER | Image Provided - Ref: 99_9999 |

## **Descriptive Report with Remarks and Observation Images**

#### Total grades for project

0



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## Site: Mount Pleasant Road

Section 28

|  |         | 08/08/2018  |
|--|---------|-------------|
| Start Node Ref:IC19Finish Node Ref:BIC1Direction:Start Node Depth:0Finish Node Depth:0Use:Start Node Coordinate:Finish Node Coordinate:Material: | S Sh    |             |
|  | Remarks |             |
| A D N 6.48   |         |             |
| PositionCDPicGrade00.00mICStart node type, inspection chamber100_004.94mDEEAttached deposits, encrustation 12-12 5%100_3                         |         | 0m<br>6.48m |

#### Total grades for project

0



| Pos    | Code | Description   | Image                          |
|--------|------|---|--------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC19   | Image Provided - Ref: 100_0    |
| 04.94m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3<br>GENERAL ENCRUSTED DEPOSITS<br>ALONG FULL LENGTH OF DRAIN | Image Provided - Ref: 100_1    |
| 06.48m | ICF  | Finish node type, inspection chamber<br>BIC1  | Image Provided - Ref: 100_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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## Site: Mount Pleasant Road

Section 29

| C                                      | ient:  |       | Location (St |              | City/T                               | own/Village | Cust | t Job Re | f.              | Survey                          | ors Name: |                               | ate:<br>5/2018 |
|--|--------|-------|--------------|--------------|--------------------------------------|-------------|------|----------|-----------------|---------------------------------|-----------|-------------------------------|----------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  | I            |              | ode Ref:<br>ode Depth:<br>ode Coordi |             |      |          |                 | Direction:<br>Use:<br>Material: | c s       | eight/Dia:<br>hape:<br>leaned | 100<br>C<br>N  |
| Drain Type                             | Lining | Туре  | Lining Mat.  | Year Const.  | Weather                              | Flow Cont.  | Ŭ    |          |                 |                                 | Remarks   |                               |                |
| A                                      |        |       |              |              | D                                    | N           | 3.62 |          |                 |                                 |           |                               |                |
| Position                               | Code   | Desc  | ription      |              |                                      |             |      | CD       | Pic             | Grad                            | e /       | 0m                            |                |
| 00.00m                                 | IC     | Start | node type,   | inspection c | hamber                               |             |      |          | 10 <sup>-</sup> | 1_                              | 0 -//     |                               |                |
| 00.00m                                 | R      | Root  | S            |              |                                      |             |      |          | 10              | 1_                              | 2 —//     |                               |                |
| 00.10m                                 | R      | S1 R  | oots         |              |                                      |             |      | S1       | 10              | 1_                              | 2 —/      |                               |                |
| 01.97m                                 | R      | F1 R  | oots         |              |                                      |             |      | F1       | 10              |                                 | 2         |                               |                |
|  |        |       | of drain/sew |              |                                      |             |      |          | 10              |                                 | 0         | -                             | FLOW           |
| 02.85m                                 |        |       | of drain/sew |              |                                      | -           |      |          | 101             |                                 | 0         |                               |                |
| 03.62m                                 | ICF    | Finis | h node type  | , inspection | chambe                               | r           |      |          | 101             | 1_                              | 0         |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 | 1         | 3.62                          | m              |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |
|  |        |       |              |              |                                      |             |      |          |                 |                                 |           |                               |                |

#### Total grades for project

0



| Pos    | Code | Description                                 | Image                       |
|--------|------|---|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC20 | Image Provided - Ref: 101_0 |
| 00.00m | R    | Roots - Grade 2                             | Image Provided - Ref: 101_1 |
| 00.10m | S1 R | Roots0.1m - 1.97m - Grade 2                 | Image Provided - Ref: 101_2 |
| 01.97m | F1 R | RootsDefect End - Grade 2                   |                             |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 | Grade 2 Defects | 192 Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|-----------------|---------------------|----|-----------------|---|-----------------|---|
|-------------------|-----------------|---------------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description                                 | Image                          |
|--------|------|---|--------------------------------|
| 02.30m | LUQ  | Line of drain/sewer deviates up [quarter]   | Image Provided - Ref: 101_4    |
| 02.85m | LLQ  | Line of drain/sewer deviates left [quarter] | Image Provided - Ref: 101_3    |
| 03.62m | ICF  | Finish node type, inspection chamber<br>IC2 | Image Provided - Ref: 101_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

### Section 30

| CI   | ient:                                      |  | Location (Street Name):     |  |         | own/Village | Cust      | t Job Ref.                             | Surveyors Name:  |   |  | Date:         |      |
|--|--|--|-----------------------------|--|---------|-------------|-----------|--|--|---|--|---------------|------|
|  |  |  | Mount Plea                  | asant Road                                       |         |             |           |  |  |   |  | 08/08/        | 2018 |
| Start Node   |  |  |                             | lode Ref:<br>lode Depth<br>lode Coord            |         |             | IC21<br>( |  | С  | Heig<br>Shap<br>Clea  |  | 150<br>C<br>N |      |
| Drain Type   | Lining                                     | Туре   | Lining Mat.                 | Year Const.                                      | Weather | Flow Cont.  | Length    |  |  | Remarks   |  |               |      |
| A  |  |  |                             |  | D       | N           | 33.06     |  |  |   |  |               |      |
| Position<br>00.00m<br>00.28m<br>04.68m<br>06.06m<br>17.86m<br>18.14m<br>22.26m<br>31.90m<br>33.06m | MH<br>JD<br>JD<br>JD<br>R<br>JN<br>JD<br>R | Start<br>Joint<br>Joint<br>Root<br>Junc<br>Joint<br>Root | tion 1 : 150<br>displaced n | nedium<br>nedium<br>nedium<br>mm Diame<br>nedium | ter     |             |           | 10<br>10<br>10<br>10<br>10<br>10<br>10 | ic Grad<br>05_<br>05_<br>05_<br>05_<br>05_<br>05_<br>05_<br>05_<br>05_ | e<br>0<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>0<br>2<br>2<br>0<br>2<br>2<br>0<br>0<br>2<br>0<br>0 |  | 0m            | īm   |

#### Total grades for project

0

3



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| Pos    | Code | Description                      | Image                       |
|--------|------|----------------------------------|-----------------------------|
| 00.00m | MH   | Start node type, manhole         | Image Provided - Ref: 105_0 |
|        |      | BIC2                             |                             |
| 00.28m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 105_2 |
|        |      |                                  |                             |
| 04.68m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 105_4 |
|        |      |                                  |                             |

## **Descriptive Report with Remarks and Observation Images**

#### Total grades for project

0

3



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| Pos    | Code | Description                           | Image                       |
|--------|------|---------------------------------------|-----------------------------|
| 06.06m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 105_5 |
| 17.86m | R    | Roots - Grade 2                       | Image Provided - Ref: 105_7 |
| 18.14m | JN   | Junction at 1 o'clock: 150mm Diameter | Image Provided - Ref: 105_8 |
| 22.26m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 105_9 |

| Grade 1 Defects 0 | Grade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---------------------|--------------------|-----------------|---|-----------------|---|
|-------------------|---------------------|--------------------|-----------------|---|-----------------|---|



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| Pos    | Code | Description  | Image                          |
|--------|------|--|--------------------------------|
| 31.90m | R    | Roots - Grade 2                                      | Image Provided - Ref: 105_10   |
| 33.06m | SA   | Survey abandoned<br>LINE OF DRAIN BLOCKED WITH ROOTS | Image Provided - Ref: 105_9999 |

### Total grades for project



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## Site: Mount Pleasant Road

Section 31

| Cl           | ient:    |                          | Location (Street Name):                      |      |           | City/T     | own/Village | Cus    | Cust Job Ref. |      | Surveyors | Name   | :          | Da            | te: |
|--------------|----------|--------------------------|--|------|-----------|------------|-------------|--------|---------------|------|-----------|--------|------------|---------------|-----|
|              |          |                          | Mount Pleasant Road                          |      |           |            |             |        |               |      |           | 08/08/ | 2018       |               |     |
| Start Node I | Ref:     |                          |  | C21  | Finish No | ode Ref:   |             |        | IC            | 9 Di | rection:  | U      | Heig       | ht/Dia:       | 150 |
| Start Node I | Depth:   |                          |  | 0    | Finish No | ode Depth: |             |        |               | 0 Us | se:       | С      | Shap       | be:           | С   |
| Start Node ( | Coordina | ate:                     |  |      | Finish No | ode Coordi | nate:       |        |               | M    | aterial:  | VC     | Clea       | ned           | Ν   |
| Drain Type   | Lining   | Туре                     | Lining Mat.                                  | Yea  | r Const.  | Weather    | Flow Cont.  | Length |               |      | Rem       | narks  |            |               |     |
| A            |          |                          |  |      |           | D          | N           | 13.52  |               |      |           |        |            |               |     |
| [            |          |                          |  |      |           |            |             |        |               |      |           |        |            | 0.000.00172.1 |     |
| Position     | Code     | Desc                     | ription                                      |      |           |            |             |        | CD P          | ic   | Grade     |        | $\Lambda$  | 0m            |     |
| 00.00m       | IC       | Start                    | node type,                                   | insp | ection c  | chamber    |             |        | 1             | 09_  | 0 -       |        |            |               |     |
| 00.00m       | DES      | Settle                   | ed deposits                                  | fine | 5%        |            |             |        | 1             | 09_  | 2 -       |        | //         |               |     |
| 00.53m       | REM      | Gene                     | eral remark                                  |      |           |            |             |        | 1             | 09_  | 0 -       | _/     | /          |               |     |
| 00.72m       | WL       | Wate                     | er level 5%                                  |      |           |            |             |        | 1             | 09_  | 0 -       |        |            |               |     |
| 04.68m       | R        | Root                     | S  |      |           |            |             |        | 1             | 09_  | 2 -       | _      |            |               |     |
| 05.30m       | DES      | Settle                   | ed deposits                                  | fine | 5%        |            |             |        | 1             | 09_  | 2 -       | _      | Ά          |               |     |
| 05.98m       | R        | Root                     | S  |      |           |            |             |        | 1             | 09_  | 2 -       |        | Λ          |               | 2   |
| 07.09m       | DES      | Settled deposits fine 5% |  |      |           |            | 1           | 09_    | 2 -           |      |           |        |            |               |     |
| 09.01m       | R        | Roots                    |  |      |           |            | 1           | 09_    | 2 -           |      |           |        |            |               |     |
| 10.15m       | DES      | Settle                   | ed deposits                                  | fine | 50%       |            |             |        | 1             | 09_  | 2 -       |        | $\frown$   |               |     |
| 13.25m       | LRQ      | Line                     | Line of drain/sewer deviates right [quarter] |      |           |            |             |        | 1             | 09_  | 0 -       |        |            |               |     |
| 13.52m       | ICF      | Finis                    | Finish node type, inspection chamber         |      |           |            |             |        | 1             | 09_  | 0 -       | ~      | $\nearrow$ | 13.52         | 2m  |

#### Total grades for project



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC21                         | Image Provided - Ref: 109_0 |
| 00.00m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2    | Image Provided - Ref: 109_2 |
| 00.53m | REM  | General remark<br>GENERAL SETTLED DEPOSITS ALONG<br>LENGTH OF DRAIN | Image Provided - Ref: 109_3 |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 | Grade 2 Defects | 192 Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|-----------------|---------------------|----|-----------------|---|-----------------|---|
|-------------------|-----------------|---------------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 00.72m | WL   | Water level: 5% Height/Diameter                               | Image Provided - Ref: 109_4 |
| 04.68m | R    | Roots - Grade 2   | Image Provided - Ref: 109_5 |
|        |      |   |                             |
| 05.30m | DES  | Settled deposits fine: 5% Cross sectional area loss - Grade 2 | Image Provided - Ref: 109_6 |
|        |      | area loss - Grade 2   |                             |
| 05.98m | R    | Roots - Grade 2   | Image Provided - Ref: 109_7 |

| Grade 1 Defects 0 | Grade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-------------------|---------------------|--------------------|-------------------|-------------------|
|-------------------|---------------------|--------------------|-------------------|-------------------|



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| Pos    | Code | Description   | Image                        |
|--------|------|---|------------------------------|
| 07.09m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2  | Image Provided - Ref: 109_8  |
| 09.01m | R    | Roots - Grade 2   | Image Provided - Ref: 109_9  |
| 10.15m | DES  | Settled deposits fine: 50% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 109_10 |
| 13.25m | LRQ  | Line of drain/sewer deviates right [quarter]                      | Image Provided - Ref: 109_11 |



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| Pos    | Code | Description                                 | Image                          |
|--------|------|---|--------------------------------|
| 13.52m | ICF  | Finish node type, inspection chamber<br>IC9 | Image Provided - Ref: 109_9999 |

Total grades for project



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### Site: Mount Pleasant Road

Section 32

| CI   | Client: |                        |                | Location (Street Name): City/Town/Village  |         |            | Cus    | t Job Ref.   | Surveyor                        | rs Name:                    | Date:      |
|--|---------|------------------------|----------------|--|---------|------------|--------|--------------|---------------------------------|-----------------------------|------------|
|  |         |                        | Mount Plea     | asant Road                                 |         |            |        |              |                                 |                             | 08/08/2018 |
| Start Node I<br>Start Node I<br>Start Node 0 | Depth:  | ate:                   |                | IC21 Finish N<br>I600 Finish N<br>Finish N |         |            |        | IC22<br>1300 | Direction:<br>Use:<br>Material: | U Heig<br>C Sha<br>PVC Clea |            |
| Drain Type                                   | Lining  | Туре                   | Lining Mat.    | Year Const.                                | Weather | Flow Cont. | Length |              | Re                              | emarks                      |            |
| A  |         |                        |                |  | D       | N          | 10.17  |              |                                 |                             |            |
| Position                                     | Code    | Desc                   | ription        |  |         |            |        | CD Pi        | c Grade                         | /                           | Om         |
| 00.00m                                       | IC      | Start                  | node type,     | inspection of                              | hamber  |            |        | 9_           | 0 0                             | -1                          |            |
| 00.47m                                       | JD      | Joint                  | displaced n    | nedium                                     |         |            |        | 9_           | 2 2                             | -11                         |            |
| 00.47m                                       | MC      | Mate                   | erial of drain | /sewer char                                | iges    |            |        | 9_           | 3 0                             | -//                         |            |
| 01.53m                                       | R       | Root                   | S              |  |         |            |        | 9_           | 5 2                             | -//                         |            |
| 01.89m                                       | JD      | Joint                  | displaced n    | nedium                                     |         |            |        | 9_           | 4 2                             | -//                         |            |
| 02.95m                                       | FL      | Fract                  | ture longitud  | dinal 4                                    |         |            |        | 9_           | 6 3                             | -//                         |            |
| 03.90m                                       | JD      | Joint                  | displaced la   | arge                                       |         |            |        | 9_           | 7 3                             | _/                          | No.        |
| 03.90m                                       | R       | Root                   | S              |  |         |            |        | 9_           | 8 2                             | -1                          |            |
| 05.67m                                       | R       | Root                   | S              |  |         |            |        | 9_           | 9 2                             | -//                         |            |
| 05.67m                                       | JD      | Joint                  | displaced la   | arge                                       |         |            |        | 9_           | 10 3                            | _//                         |            |
| 06.62m                                       | FM      | Fract                  | ture multiple  | 2-4  |         |            |        | 9_           | 11 4                            | _/                          |            |
| 07.57m                                       | JD      | Joint displaced medium |                |  |         |            |        | 9_           | 12 2                            |                             |            |
| 10.17m                                       | ICF     | Finis                  | h node type    | , inspection                               | chambe  | r          |        | 9_           | 99 0                            | $\overline{\ }$             | 10.17m     |

#### Total grades for project

0

54



# **Description** Pos Code Image Image Provided - Ref: 9\_0 00.00m IC Start node type, inspection chamber IC21 Image Provided - Ref: 9\_2 00.47m JDM Joint displaced medium - Grade 2 Image Provided - Ref: 9\_3 MCVC 00.47m Material of drain/sewer changes: Material Changes To Vitrified Clay (i.e. all clayware)

# **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects 54 Grade 4 Defects 3 Grade 5 |
|--|
|--|



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| Pos    | Code | Description                                  | Image                     |
|--------|------|--|---------------------------|
| 01.53m | R    | Roots - Grade 2                              | Image Provided - Ref: 9_5 |
| 01.89m | JDM  | Joint displaced medium - Grade 2             | Image Provided - Ref: 9_4 |
| 02.95m | FL   | Fracture longitudinal at 4 o'clock - Grade 3 | Image Provided - Ref: 9_6 |
| 03.90m | JDL  | Joint displaced large - Grade 3              | Image Provided - Ref: 9_7 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |  |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 03.90m | R    | Roots - Grade 2  | Image Provided - Ref: 9_8  |
| 05.67m | R    | Roots - Grade 2  | Image Provided - Ref: 9_9  |
| 05.67m | JDL  | Joint displaced large - Grade 3                            | Image Provided - Ref: 9_10 |
| 06.62m | FM   | Fracture multiple from 2 o'clock to 4 o'clock -<br>Grade 4 | Image Provided - Ref: 9_11 |

### Total grades for project

| Grade 1 Defects | 0 | Grade 2 Defects | 19 |
|-----------------|---|-----------------|----|
|-----------------|---|-----------------|----|



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| Pos    | Code | Description                                  | Image                        |
|--------|------|--|------------------------------|
| 07.57m | JDM  | Joint displaced medium - Grade 2             | Image Provided - Ref: 9_12   |
| 10.17m | ICF  | Finish node type, inspection chamber<br>IC22 | Image Provided - Ref: 9_9999 |

### Total grades for project

0



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# Site: Mount Pleasant Road

# Section 33

| Client:                                |        |       |              | reet Name):   | City/T                              | own/Village | Cust   | t Job Ref. |      | Surveyors                   | Name:         |                                 | ate:     |
|--|--------|-------|--------------|---------------|-------------------------------------|-------------|--------|------------|------|-----------------------------|---------------|---------------------------------|----------|
|  |        |       | Mount Plea   |               |                                     |             |        |            |      |                             |               |                                 | 8/2018   |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  | I            | 0 Finish N    | ode Ref:<br>ode Depthi<br>ode Coord |             |        | MH         | 0 U: | rection:<br>se:<br>aterial: | С             | Height/Dia<br>Shape:<br>Cleaned | 150<br>C |
| Drain Type                             | Lining | Туре  | Lining Mat.  | Year Const.   | Weather                             | Flow Cont.  | Length |            |      | Rer                         | narks         |                                 |          |
| A                                      |        |       |              |               | D                                   | N           | 52.08  |            |      |                             |               |                                 |          |
| Position                               | Code   | Desc  | ription      |               |                                     |             |        | CD I       | Pic  | Grade                       |               | 0m                              |          |
| 00.00m                                 | IC     | Start | node type,   | inspection of | chamber                             |             |        |            | 102_ | 0                           |               |                                 |          |
| 00.32m                                 | LRH    | Line  | of drain/sew | ver deviates  | s right [ha                         | alf]        |        |            | 102_ | 0                           | ∠,            |                                 |          |
| 09.23m                                 | R      | Root  | s            |               |                                     |             |        |            | 102_ | 2                           | _/            |                                 |          |
| 10.10m                                 | LLH    | Line  | of drain/sew | ver deviates  | s left [half                        | ]           |        |            | 102_ | 0                           |               |                                 | 2        |
| 28.59m                                 | LDQ    | Line  | of drain/sew | ver deviates  | s down [q                           | uarter]     |        |            | 102_ | 0                           |               | 7 1                             | FLOW     |
| 28.93m                                 | LDQ    | Line  | of drain/sew | ver deviates  | s down [q                           | uarter]     |        |            | 102_ | 0                           | ~/            |                                 |          |
| 28.93m                                 | LRQ    | Line  | of drain/sew | ver deviates  | s right [qu                         | uarter]     |        |            | 102_ | 0                           | _/            |                                 |          |
| 52.08m                                 | MHF    | Finis | h node type  | , manhole     |                                     |             |        |            | 102_ | 0                           | $\overline{}$ | 52.                             | 08m      |
|  |        |       |              |               |                                     |             |        |            |      |                             |               |                                 |          |
|  |        |       |              |               |                                     |             |        |            |      |                             |               |                                 |          |

#### Total grades for project



# Descriptive Report with Remarks and Observation Images

| Pos    | Code | Description                                 | Image                       |
|--------|------|---|-----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC21 | Image Provided - Ref: 102_0 |
| 00.32m | LRH  | Line of drain/sewer deviates right [half]   | Image Provided - Ref: 102_1 |
|        |      |   |                             |
| 09.23m | R    | Roots - Grade 2                             | Image Provided - Ref: 102_2 |
|        |      |   |                             |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description                                  | Image                       |
|--------|------|--|-----------------------------|
| 10.10m | LLH  | Line of drain/sewer deviates left [half]     | Image Provided - Ref: 102_3 |
| 28.59m | LDQ  | Line of drain/sewer deviates down [quarter]  | Image Provided - Ref: 102_6 |
| 28.93m | LDQ  | Line of drain/sewer deviates down [quarter]  | Image Provided - Ref: 102_7 |
| 28.93m | LRQ  | Line of drain/sewer deviates right [quarter] | Image Provided - Ref: 102_8 |

| Grade 1 Defects 0 Grade 2 Defects 1 | 192 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-------------------------------------|------------------------|-------------------|-----------------|---|
|-------------------------------------|------------------------|-------------------|-----------------|---|



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| Pos    | Code | Description                       | Image                          |
|--------|------|-----------------------------------|--------------------------------|
| 52.08m | MHF  | Finish node type, manhole<br>MH82 | Image Provided - Ref: 102_9999 |

Total grades for project

0



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# Site: Mount Pleasant Road

# Section 34

| CI                                     | ient:  |      | Location (St<br>Mount Plea |          |          | City/T                               | own/Village | Cus    | t Job Re | ef.      | Surveyors Name:                 |              |                        | Date<br>08/08/2 |               |
|--|--------|------|----------------------------|----------|----------|--------------------------------------|-------------|--------|----------|----------|---------------------------------|--------------|------------------------|-----------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate: | I                          | C21<br>0 |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | I        | C65<br>0 | Direction:<br>Use:<br>Material: | U<br>C<br>VC | Heigh<br>Shap<br>Clear |                 | 150<br>C<br>N |
| Drain Type                             | Lining | Туре | Lining Mat.                | Yea      | r Const. | Weather                              | Flow Cont.  | Length |          |          | R                               | emarks       |                        |                 |               |
| Α                                      |        |      |                            |          |          | D                                    | N           | 16.2   |          |          |                                 |              |                        |                 |               |
| Position                               | Code   | Desc | ription                    |          |          |                                      |             |        | CD       | Pic      | Grade                           |              | 1                      | 0m              |               |
| 00.00m                                 |        |      | node type,                 | insp     | ection o | hamber                               |             |        |          | 108      |                                 |              | $/\!/$                 |                 |               |
|  |        |      | ettled depos               | -        |          |                                      |             |        | S1       | 108      |                                 |              | /                      |                 |               |
| 00.00m                                 |        | Root |                            |          |          |                                      |             |        |          | 108      |                                 |              |                        |                 |               |
| 06.94m                                 | DES    |      | ettled depos               | sits f   | ine 30   | %                                    |             |        | F1       | 108      |                                 |              | _                      |                 |               |
|  |        |      | ed deposits                |          |          |                                      |             |        |          | 108      |                                 |              |                        | FLOW            |               |
| 16.20m                                 |        |      | h node type                |          |          | chambe                               | r           |        |          | 108      | 8_ C                            | · — `        | $\overline{\ }$        |                 | 1             |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 | 1            | X I                    |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              | $\backslash$           | 16.2m           |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              | λ                      | 10.211          |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |
|  |        |      |                            |          |          |                                      |             |        |          |          |                                 |              |                        |                 |               |

#### Total grades for project

0



| Pos    | Code   | Description   | Image                       |
|--------|--------|---|-----------------------------|
| 00.00m | IC     | Start node type, inspection chamber<br>IC21                                 | Image Provided - Ref: 108_0 |
| 00.00m | S1 DES | Settled deposits fine0m - 6.94m: 30% Cross<br>sectional area loss - Grade 2 | Image Provided - Ref: 108_1 |
| 00.00m | R      | Roots - Grade 2   | Image Provided - Ref: 108_2 |
| 06.94m | F1 DES | Settled deposits fineDefect End: 30% Cross sectional area loss - Grade 2    |                             |

# **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|



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| Pos    | Code | Description  | Image                          |
|--------|------|--|--------------------------------|
| 11.68m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 108_3    |
| 16.20m | ICF  | Finish node type, inspection chamber<br>IC65                     | Image Provided - Ref: 108_9999 |

#### Total grades for project

0

| Grade 1 Def |
|-------------|
|-------------|



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# Site: Mount Pleasant Road

# Section 35

| CI                                     | ient:  |        | Location (St | reet Name):  | City/T                               | own/Village | Cust   | Job Ref.    | Survey  | ors Name:     |                                 | Date:           |
|--|--------|--------|--------------|--------------|--------------------------------------|-------------|--------|-------------|---------|---------------|---------------------------------|-----------------|
|  |        |        | Mount Plea   | asant Road   |                                      |             |        |             |         |               | 08/0                            | 8/2018          |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   |              |              | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | END<br>1300 |         | U<br>C<br>PVC | Height/Dia<br>Shape:<br>Cleaned | : 100<br>C<br>N |
| Drain Type                             | Lining | Туре   | Lining Mat.  | Year Const.  | Weather                              | Flow Cont.  | Length |             | F       | Remarks       |                                 |                 |
| A                                      |        |        |              |              | R                                    | Ν           | 8.34   |             |         |               |                                 |                 |
| Position                               | Code   | Desc   | ription      |              |                                      |             |        | CD Pi       | c Grade | 9             | Om                              | ŕ               |
| 00.00m                                 | IC     | Start  | node type,   | inspection c | hamber                               |             |        | 10          | 0_0     | 0 —           |                                 |                 |
| 02.95m                                 | DER    | Settle | ed deposits  | coarse 5%    | D                                    |             |        | 10          | )_3     | 3 —           |                                 |                 |
| 04.13m                                 | R      | Root   | S            |              |                                      |             |        | 10          | )_4     | 2 —           |                                 |                 |
| 05.80m                                 | R      | Root   | S            |              |                                      |             |        | 10          | )_5     | 2 ~           | $\mathbf{N}$                    | 3               |
| 08.34m                                 | SA     | Surve  | ey abandon   | ed           |                                      |             |        | 10          | )_9     | ∘ ─∖`         | $\backslash$                    | FLOW            |
|  |        |        |              |              |                                      |             |        |             |         |               | 8.3                             | -4m             |

#### Total grades for project

0



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC22                        | Image Provided - Ref: 10_0 |
| 02.95m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 10_3 |
| 04.13m | R    | Roots - Grade 2<br>Small Root Growth Through Joint                 | Image Provided - Ref: 10_4 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



Page 125

| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 05.80m | R    | Roots - Grade 2                                      | Image Provided - Ref: 10_5    |
|        |      |  |                               |
| 08.34m | SA   | Survey abandoned                                     | Image Provided - Ref: 10_9999 |
|        |      | Loss Of Vision Due To Potential Blockage In<br>Drain |                               |

### Total grades for project



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# Site: Mount Pleasant Road

**Section 36** 

| Client: Location (Street Name): City/<br>Mount Pleasant Road |        |       |              | City/T | own/Village | Cust                                 | Job Ref.   | Survey | ors Name:   | Date<br>08/08/2 |                |                            |               |
|--|--------|-------|--------------|--------|-------------|--------------------------------------|------------|--------|-------------|-----------------|----------------|----------------------------|---------------|
| Start Node<br>Start Node<br>Start Node                       | Depth: | ate:  |              | 300    | Finish N    | ode Ref:<br>ode Depth:<br>ode Coordi |            |        | END<br>1300 |                 | C Sh           | ight/Dia:<br>ape:<br>eaned | 100<br>C<br>N |
| Drain Type   | Lining | Туре  | Lining Mat.  | Year   | Const.      | Weather                              | Flow Cont. | Length |             | F               | Remarks        |                            |               |
| А  |        |       |              |        |             | R                                    | Ν          | 10.17  |             |                 |                |                            |               |
| Position   | Code   | Desc  | ription      |        |             |                                      |            |        | CD Pi       | c Grade         | . /            | 0m                         |               |
| 00.00m   |        |       | node type,   | inspe  | ection o    | hamber                               |            |        | 11          | 1_0             | 0 —            |                            |               |
| 04.25m   | JD     | Joint | displaced n  | nediu  | ım          |                                      |            |        | 11          | 1_2             | 2 —            |                            |               |
| 06.15m   | JD     | Joint | displaced n  | nediu  | ım          |                                      |            |        | <b>1</b> 1  | 1_3             | 2 \            |                            |               |
| 06.15m   | LLQ    | Line  | of drain/sew | ver de | eviates     | left [qua                            | rter]      |        | 11          | 1_4             | 0 -/           | 2                          |               |
| 10.05m   | LUF    | Line  | of drain/sew | ver de | eviates     | up [full]                            |            |        | <b>1</b> 1  | 1_5             | 0 — <i>`</i> ' |                            |               |
| 10.17m   | SA     | Surve | ey abandon   | ed     |             |                                      |            |        | <b>1</b> 1  | 1_9             | 0 _//          |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 | //             |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 | 1              | 10.17                      | m             |
|  |        |       |              |        |             |                                      |            |        |             |                 |                | 1                          |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |
|  |        |       |              |        |             |                                      |            |        |             |                 |                |                            |               |

#### Total grades for project

0



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| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC22 | Image Provided - Ref: 11_0 |
| 04.25m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 11_2 |
| 06.15m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 11_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 06.15m | LLQ  | Line of drain/sewer deviates left [quarter]                 | Image Provided - Ref: 11_4    |
| 10.05m | LUF  | Line of drain/sewer deviates up [full]                      | Image Provided - Ref: 11_5    |
|        |      |   |                               |
| 10.17m | SA   | Survey abandoned<br>END - DEVIATES UP AND CANNOT<br>PROCEED | Image Provided - Ref: 11_9999 |

|                 |   |                 |     |                 |    |                 |   |                 |   | _ |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |   |



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# Site: Mount Pleasant Road

Section 37

| Cl   | ient:  |       | Location (St | reet Name):  | City/T                                 | own/Village | Cust   | ust Job Ref. |            | Surveyors Name:                 |              | :                    | Date: |               |
|--|--------|-------|--------------|--------------|--|-------------|--------|--------------|------------|---------------------------------|--------------|----------------------|-------|---------------|
|  |        |       | Mount Plea   | asant Road   |  |             |        |              |            |                                 |              |                      | 08/08 | /2018         |
| Start Node I<br>Start Node I<br>Start Node 0 | Depth: | ate:  |              | 300 Finish M | lode Ref:<br>lode Depth:<br>lode Coord |             |        |              | ND<br>300  | Direction:<br>Use:<br>Material: | U<br>C<br>VC | Shap                 |       | 100<br>C<br>N |
| Drain Type                                   | Lining | Туре  | Lining Mat.  | Year Const.  | Weather                                | Flow Cont.  | Length |              |            | F                               | Remarks      |                      |       |               |
| A  |        |       |              |              | R                                      | N           | 12.18  |              |            |                                 |              |                      |       |               |
| Position                                     | Code   | Desc  | ription      |              |  |             |        | CD           | Pic        | Grade                           | )            |                      | 0m    |               |
| 00.00m                                       | MH     | Start | node type,   | manhole      |  |             |        |              | 12         | _0 (                            | 0 —          | //                   |       |               |
| 00.47m                                       | LLH    | Line  | of drain/sew | ver deviate  | s left [half                           | ]           |        |              | 12         | _2 (                            | ₀ —/         | //                   |       |               |
| 00.59m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _3 _2                           | 2 —/         | /                    |       |               |
| 01.06m                                       | R      | S1 R  | oots         |              |  |             |        | S1           | 12         | _4                              | 2            |                      |       |               |
| 05.55m                                       | R      | F1 R  | oots         |              |  |             |        | F1           | 12         | 2                               | 2 —          |                      |       |               |
| 05.91m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _5 2                            | 2 —          | $\mathcal{N}$        | Ι.,   |               |
| 07.68m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _6 2                            | 2 —          |                      |       | 3             |
| 08.04m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _7 2                            | 2 —          | $\sum$               |       |               |
| 09.22m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _8 _2                           | 2 —          | $\backslash \rangle$ |       |               |
| 09.58m                                       | LRH    | Line  | of drain/sew | ver deviate  | s right [ha                            | alf]        |        |              | 12         | _9 (                            | 0 —          | $\sum$               |       | - 6           |
| 09.69m                                       | JD     | Joint | displaced n  | nedium       |  |             |        |              | 12         | _1 _2                           | 2 —          | $\overline{\prime}$  |       |               |
| 11.59m                                       | JD     | Joint | displaced la | arge         |  |             |        |              | 12         | _1 ;                            | 3 —          |                      |       |               |
| 11.59m                                       | LUF    | Line  | of drain/sew | ver deviate  | s up [full]                            |             |        |              | 12         | _1 (                            | 0 —          | $\sum$               |       |               |
| 12.18m                                       | SA     | Surve | ey abandon   | ed           |  |             |        |              | 12 <u></u> | _9 (                            | 0 —          |                      | 12.1  | 8m            |

#### Total grades for project

0



| Pos    | Code | Description                              | Image                      |
|--------|------|--|----------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC22         | Image Provided - Ref: 12_0 |
| 00.47m | LLH  | Line of drain/sewer deviates left [half] | Image Provided - Ref: 12_2 |
| 00.59m | JDM  | Joint displaced medium - Grade 2         | Image Provided - Ref: 12_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 | Grade 2 Defects 192 Grade | 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---------------------------|------------------------------|---|-----------------|---|
|-------------------|---------------------------|------------------------------|---|-----------------|---|



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| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 01.06m | S1 R | Roots1.06m - 5.55m - Grade 2     | Image Provided - Ref: 12_4 |
| 05.55m | F1 R | RootsDefect End - Grade 2        |                            |
| 05.91m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 12_5 |
| 07.68m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 12_6 |

| Grade 1 Defects 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |  |
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|



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| Pos    | Code | Description                               | Image                       |
|--------|------|---|-----------------------------|
| 08.04m | JDM  | Joint displaced medium - Grade 2          | Image Provided - Ref: 12_7  |
| 09.22m | JDM  | Joint displaced medium - Grade 2          | Image Provided - Ref: 12_8  |
| 09.58m | LRH  | Line of drain/sewer deviates right [half] | Image Provided - Ref: 12_9  |
| 09.69m | JDM  | Joint displaced medium - Grade 2          | Image Provided - Ref: 12_10 |

| Grade 1 Defects 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects |   | Grade 5 Defects |   |
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
| Glade I Delects 0 | Glade 2 Delects | 192 | Grade 3 Delects | 54 | Glade 4 Delects | 3 | Glade 5 Delects | U |



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 11.59m | JDL  | Joint displaced large - Grade 3                                  | Image Provided - Ref: 12_11   |
| 11.59m | LUF  | Line of drain/sewer deviates up [full]                           | Image Provided - Ref: 12_12   |
|        |      |  |                               |
| 12.18m | SA   | Survey abandoned<br>END - DRAIN DEVIATES UP UNABLE TO<br>PROCEED | Image Provided - Ref: 12_9999 |

|                 |   |                 |     |                 |    |                 |   |                 |   | _ |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |   |



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# Site: Mount Pleasant Road

Section 38

| C                                      | ient:  |       | Location (St            | reet l     | Name):   | City/T                               | own/Village | Cus    | t Job Ref.  | Surveyo | rs Name: | Da                               | Date:         |  |
|--|--------|-------|-------------------------|------------|----------|--------------------------------------|-------------|--------|-------------|---------|----------|----------------------------------|---------------|--|
|  |        |       | Mount Plea              | asant      | Road     |                                      |             |        |             |         |          | 08/08                            | /2018         |  |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |                         | C24<br>550 |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | IC28<br>550 |         | SS       | Height/Dia:<br>Shape:<br>Cleaned | 100<br>C<br>N |  |
| Drain Type                             | Lining | Туре  | Lining Mat. Year Const. |            |          | Weather                              | Flow Cont.  | Length |             | R       | emarks   |                                  |               |  |
| A                                      |        |       |                         |            |          | R                                    | N           | 18.93  |             |         |          |                                  |               |  |
| Position                               | Code   | Desc  | ription                 |            |          |                                      |             |        | CD Pi       | c Grade | 3        | 0m                               |               |  |
| 00.00m                                 |        |       | node type,              | insp       | ection o | hamber                               |             |        |             | 3_0 C   |          |                                  |               |  |
| 00.70m                                 | JD     | Joint | displaced n             | nedi       | um       |                                      |             |        | 13          | 3_2 2   |          |                                  |               |  |
| 05.08m                                 | JD     | Joint | displaced n             | nedi       | um       |                                      |             |        | 13          | 8_3 2   | $\sim$   |                                  |               |  |
| 06.74m                                 | JD     | Joint | displaced n             | nedi       | um       |                                      |             |        | 13          | 3_5 2   | $\sim$   |                                  |               |  |
| 10.17m                                 | CL     | Crac  | k, longitudin           | al 2       | 2        |                                      |             |        | 13          | 8_8 2   |          |                                  |               |  |
| 11.35m                                 | JD     | Joint | displaced n             | nedi       | um       |                                      |             |        | 13          | 8_9 2   |          |                                  | ž –           |  |
| 16.55m                                 | JD     | Joint | displaced n             | nedi       | um       |                                      |             |        | 13          | 3_1 2   |          | < 1 1                            |               |  |
| 18.93m                                 | SA     | Surve | ey abandon              | ed         |          |                                      |             |        | 13          | 8_9 C   | ) — (    | 18.9                             | 3m            |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |
|  |        |       |                         |            |          |                                      |             |        |             |         |          |                                  |               |  |

#### Total grades for project

0



| Pos                  | Code | Description                                 | Image                               |
|----------------------|------|---|-------------------------------------|
| <b>Pos</b><br>00.00m | IC   | Start node type, inspection chamber<br>IC24 | Image<br>Image Provided - Ref: 13_0 |
| 00.70m               | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 13_2          |
| 05.08m               | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 13_3          |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                                | Image                       |
|--------|------|--|-----------------------------|
| 06.74m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 13_5  |
| 10.17m | CL   | Crack, longitudinal at 2 o'clock - Grade 2 | Image Provided - Ref: 13_8  |
| 11.35m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 13_9  |
| 16.55m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 13_10 |

| Grade 1 Defects 0 | Grade 2 Defects 19 | 92 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-------------------|--------------------|-----------------------|-------------------|-------------------|
|-------------------|--------------------|-----------------------|-------------------|-------------------|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 18.93m | SA   | Survey abandoned   | Image Provided - Ref: 13_9999 |
|        |      | Drain Blocked At Approximately 19m With<br>Concrete Next To Gully. Potentially<br>Damaged Pipe |                               |

Total grades for project

0

| Glade I Delects | Grade | 1 | Defects |
|-----------------|-------|---|---------|
|-----------------|-------|---|---------|



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# Site: Mount Pleasant Road

Section 39

| C                                      | lient: |                               | Location (Street Name): City/T |              |                                     | own/Village | Cust   | t Job Ref |      | Surveyor                        | s Name        | :          | Date    | e:            |
|--|--------|-------------------------------|--------------------------------|--------------|-------------------------------------|-------------|--------|-----------|------|---------------------------------|---------------|------------|---------|---------------|
|  |        | Mount Pleasant Road           |                                |              |                                     |             |        |           |      |                                 |               |            | 08/08/2 | 2018          |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:                          |                                |              | ode Ref:<br>ode Depth:<br>ode Coord |             |        |           | 70 L | Direction:<br>Jse:<br>Material: | D<br>C<br>VC  | Shap       |         | 100<br>C<br>N |
| Drain Type                             | Lining | Туре                          | Lining Mat.                    | Year Const.  | Weather                             | Flow Cont.  | Length |           |      | Re                              | marks         |            |         |               |
| A                                      |        |                               |                                |              | R                                   | N           | 34.09  |           |      |                                 |               |            |         |               |
| Position                               | Code   | Desc                          | ription                        |              |                                     |             |        | CD        | Pic  | Grade                           |               | 1          | 0m      |               |
| 00.00m                                 | IC     | Start                         | node type,                     | inspection c | hamber                              |             |        |           | 14_( | 0 C                             | _             | //         |         |               |
| 00.00m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_: | 3 2                             |               | //         |         |               |
| 00.82m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_4 | 4 2                             | -/            |            |         |               |
| 00.94m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 5 2                             |               | 17         |         |               |
| 05.32m                                 | JD     | Joint displaced medium 14_6 2 |                                |              |                                     |             |        |           |      |                                 |               |            |         |               |
| 07.09m                                 | JN     | Junc                          | tion 3:100                     | mm Diamet    | er                                  |             |        |           | 14_7 | 7 0                             |               |            |         |               |
| 13.48m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_8 | 8 2                             | $\overline{}$ |            |         |               |
| 13.83m                                 | JN     | Junc                          | tion 3:100                     | mm Diamet    | er                                  |             |        |           | 14_9 | 9 0                             |               | $\geq$     |         |               |
| 13.83m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             | _             | //         |         | 4             |
| 14.66m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             |               |            |         |               |
| 15.37m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             |               |            | FLOW    | 27            |
| 18.81m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             |               |            |         |               |
| 19.30m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             |               |            | 1 2     |               |
| 20.27m                                 | JD     | Joint                         | Joint displaced medium         |              |                                     |             |        |           | 14_  | 1 2                             | _             | /          |         |               |
| 22.45m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             | _             | //         |         |               |
| 24.50m                                 | REM    | S1 G                          | eneral rema                    | ark          |                                     |             |        | S1        | 14_2 | 2 0                             |               | /          |         |               |
| 25.00m                                 | REM    | F1 G                          | eneral rema                    | ark          |                                     |             |        | F1        | 14   | - 0                             |               |            |         |               |
| 30.70m                                 | JD     | Joint                         | displaced n                    | nedium       |                                     |             |        |           | 14_  | 1 2                             |               |            |         |               |
| 33.00m                                 |        |                               | ched deposit                   |              |                                     |             |        |           | 14_' |                                 | $\overline{}$ |            |         |               |
| 34.09m                                 | ICF    | Finis                         | h node type                    | , inspection | chambe                              | r           |        |           | 14_9 | 9 0                             | $\overline{}$ | $\searrow$ | 34.09   | m             |
|  |        |                               |                                |              |                                     |             |        |           |      |                                 |               |            |         |               |

#### Total grades for project



| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC26 | Image Provided - Ref: 14_0 |
| 00.00m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 14_3 |
| 00.82m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 14_4 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                           | Image                      |  |  |  |
|--------|------|---------------------------------------|----------------------------|--|--|--|
| 00.94m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_5 |  |  |  |
| 05.32m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_6 |  |  |  |
| 07.09m | JN   | Junction at 3 o'clock: 100mm Diameter | Image Provided - Ref: 14_7 |  |  |  |
| 13.48m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_8 |  |  |  |

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-----------------------------------|----------------------------|-------------------|-------------------|
|-----------------------------------|----------------------------|-------------------|-------------------|



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| Pos    | Code | Description                           | Image                       |
|--------|------|---------------------------------------|-----------------------------|
| 13.83m | JN   | Junction at 3 o'clock: 100mm Diameter | Image Provided - Ref: 14_9  |
| 13.83m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_10 |
| 14.66m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_11 |
| 15.37m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 14_12 |

| Grade 1 Defects 0 Grade 2 Defect | 3 192 Grade 3 Defects | 54 Grade 4 Defects 3 | Grade 5 Defects 0 |
|----------------------------------|-----------------------|----------------------|-------------------|
|----------------------------------|-----------------------|----------------------|-------------------|



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| Pos    | Code | Description                      | Image                       |
|--------|------|----------------------------------|-----------------------------|
| 18.81m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 14_14 |
| 19.30m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 14_15 |
| 20.27m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 14_16 |
| 22.45m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 14_17 |

| Grade 1 Defects 0 | Grade 2 Defects | 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|-----------------|---------------------|--------------------|---|-----------------|---|
|-------------------|-----------------|---------------------|--------------------|---|-----------------|---|



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| Pos    | Code  | Description                                   | Image                       |
|--------|---|---|-----------------------------|
| 24.50m | S1 REM  | General remark24.5m - 25m<br>Position Of IC27 | Image Provided - Ref: 14_2  |
| 25.00m | F1 REM  | General remarkDefect End<br>Position Of IC27  |                             |
| 30.70m | JDM   | Joint displaced medium - Grade 2              | Image Provided - Ref: 14_18 |
| 33.00m | DEE Attached deposits, encrustation from 9<br>o'clock to 3 o'clock: 5% Cross sectional area |   | Image Provided - Ref: 14_19 |
|        |   | loss - Grade 3                                |                             |

| Grade 1 Defects 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |  |
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|--|



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| Pos    | Code | Description                                  | Image                         |
|--------|------|--|-------------------------------|
| 34.09m | ICF  | Finish node type, inspection chamber<br>IC29 | Image Provided - Ref: 14_9999 |

Total grades for project

0



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# Site: Mount Pleasant Road

Section 40

| Client:    |        |                                     | Location (St | lame): | City/T  | ity/Town/Village Cu           |   | Cust Job Ref.             |                           | Surveyors Name:   |                                 |            | Date:                     |         |          |
|------------|--------|-------------------------------------|--------------|--------|---------|-------------------------------|---|---------------------------|---------------------------|-------------------|---------------------------------|------------|---------------------------|---------|----------|
|            |        |                                     | Mount Plea   | isant  | Road    |                               |   |                           |                           |                   |                                 |            |                           | 08/08/2 | 2018     |
|            |        |                                     |              |        |         |                               | ode Ref:<br>ode Depth:<br>ode Coordinate: |                           |                           |                   | Direction:<br>Use:<br>Material: | Jse: S Sha |                           | e:      | 100<br>C |
| Drain Type | Lining | Type Lining Mat. Year Cons          |              |        |         | st. Weather Flow Cont. Length |   |                           |                           |                   | Remarks                         |            |                           |         |          |
| А          |        |                                     |              |        |         | D                             | Ν   | 40.41                     |                           |                   |                                 |            |                           |         |          |
| Position   | Code   | Desc                                | ription      |        |         |                               |   |                           | CD                        | Pic               | Grade                           |            | /                         | 0m      |          |
| 00.00m     |        | Start node type, inspection chamber |              |        |         |                               |   |                           |                           | 15_               |                                 | _/         |                           |         |          |
| 00.70m     | WL     | Water level 10%                     |              |        |         |                               |   |                           |                           | 15_               |                                 |            |                           |         |          |
| 06.03m     | JN     | Junction 3: 100mm Diameter          |              |        |         |                               |   |                           |                           |                   | _3 0                            |            |                           |         |          |
| 09.93m     | JD     | Joint                               | displaced n  |        | 15_     | _6 2                          | $\neg$                                    |                           |                           |                   |                                 |            |                           |         |          |
| 13.72m     | JN     | Junct                               | tion 3:100   |        | 15_     | _7 0                          | ~`  | $\setminus$               |                           |                   |                                 |            |                           |         |          |
| 14.90m     | JD     | Joint                               | displaced n  |        | 15_     | _9 2                          | -/  | $\langle \rangle$         |                           |                   |                                 |            |                           |         |          |
| 17.72m     | WL     | Wate                                | er level 10% |        | 15_     | _1 0                          | -   | $\langle \rangle$         |                           |                   |                                 |            |                           |         |          |
| 19.90m     | JD     | Joint displaced medium              |              |        |         |                               |   |                           |                           | 15_               | _1 2                            | -1/        | 14                        |         |          |
| 20.75m     | JN     | Junction 9: 100mm Diameter          |              |        |         |                               |   |                           |                           | 15_               | _1 0                            | -1         | $\langle \rangle \rangle$ |         |          |
| 26.57m     | JD     | Joint                               | displaced n  |        | 15_     | _1 2                          | $\neg$                                    | $\langle \rangle \rangle$ |                           |                   |                                 |            |                           |         |          |
| 28.03m     | JD     | Joint                               | displaced n  | um     |         |                               | 15_                                       | _1 2                      | -1                        | $\langle \rangle$ |                                 |            |                           |         |          |
| 31.42m     | JD     | Joint                               | displaced n  | um     |         | 15_                           | _1 2                                      | -11                       | $\langle \rangle \rangle$ |                   |                                 |            |                           |         |          |
| 32.03m     | JD     | Joint                               | displaced n  |        | 15_     | _2 2                          | -l'                                       | $\langle   \rangle$       |                           | 7                 |                                 |            |                           |         |          |
| 32.88m     | JD     | Joint                               | displaced n  | um     |         |                               | 15_                                       | _2 2                      |                           |                   | 2                               |            |                           |         |          |
| 35.55m     | JD     | Joint                               | displaced n  | um     |         |                               | 15_                                       | _2 2                      |                           | $\  \ $           | 1 1                             |            |                           |         |          |
| 36.18m     | JD     | Joint                               | displaced n  | um     |         | 15_                           | _2 2                                      | -1                        | (                         |                   |                                 |            |                           |         |          |
| 37.42m     | JD     | Joint displaced medium              |              |        |         |                               |   |                           |                           | 15_               | _2 2                            |            | (    )                    |         |          |
| 38.29m     | JD     | Joint displaced medium              |              |        |         |                               |   |                           |                           | 15_               | _2 2                            | -1         | $\ \ $                    |         |          |
| 38.29m     | R      | S1 Roots                            |              |        |         |                               |   |                           |                           | 15_               | _2 2                            | -//        | $\ \ $                    |         |          |
| 39.42m     | R      | F1 Roots                            |              |        |         |                               |   |                           |                           | 15_               | 2                               | -1         | /////                     |         |          |
| 40.16m     |        |                                     | er level 10% | 6      |         |                               |   |                           |                           | 15_               |                                 | N          |                           |         |          |
| 40.41m     |        | Roots                               |              |        |         |                               |   |                           |                           | 15_               |                                 | 1          | $\langle        $         |         |          |
| 40.41m     |        |                                     | of drain/sew |        |         | -                             | -   |                           |                           | 15_               |                                 | -/         |                           |         |          |
| 40.41m     | ICF    | Finisl                              | h node type  | , ins  | pection | chambe                        | r   |                           |                           | 15_               | _9 0                            | $\sim$     | M                         | 40.41   | m        |

#### Total grades for project



| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC28 | Image Provided - Ref: 15_0 |
| 00.70m | WL   | Water level: 10% Height/Diameter            | Image Provided - Ref: 15_1 |
| 06.03m | JN   | Junction at 3 o'clock: 100mm Diameter       | Image Provided - Ref: 15_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                           | Image                       |
|--------|------|---------------------------------------|-----------------------------|
| 09.93m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 15_6  |
| 13.72m | JN   | Junction at 3 o'clock: 100mm Diameter | Image Provided - Ref: 15_7  |
|        |      |                                       |                             |
| 14.90m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 15_9  |
| 17.72m | WL   | Water level: 10% Height/Diameter      | Image Provided - Ref: 15_13 |

| Grade 1 Defects 0 | Grade 2 Defects 19 | 92 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|--------------------|--------------------|--------------------|---|-----------------|---|



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| Pos    | Code | Description                           | Image                       |
|--------|------|---------------------------------------|-----------------------------|
| 19.90m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 15_14 |
| 20.75m | JN   | Junction at 9 o'clock: 100mm Diameter | Image Provided - Ref: 15_15 |
| 26.57m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 15_16 |
| 28.03m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 15_18 |

| Grade 1 Defects 0 | Grade 2 Defects | 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|-----------------|---------------------|--------------------|---|-----------------|---|
|-------------------|-----------------|---------------------|--------------------|---|-----------------|---|



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| Pos    | Code | Description                      | Image                       |
|--------|------|----------------------------------|-----------------------------|
| 31.42m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_19 |
| 32.03m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_20 |
| 32.88m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_21 |
| 35.55m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_22 |

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-----------------------------------|----------------------------|-------------------|-------------------|
|-----------------------------------|----------------------------|-------------------|-------------------|



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| Pos    | Code | Description                      | Image                       |
|--------|------|----------------------------------|-----------------------------|
| 36.18m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_23 |
| 37.42m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_24 |
|        |      |                                  | TONST-AN ICANS IN LAND      |
| 38.29m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 15_25 |
|        |      |                                  |                             |
| 38.29m | S1 R | Roots38.29m - 39.42m - Grade 2   | Image Provided - Ref: 15_26 |
|        |      |                                  |                             |

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-----------------------------------|----------------------------|-------------------|-------------------|
|-----------------------------------|----------------------------|-------------------|-------------------|



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| Pos    | Code | Description                              | Image                       |
|--------|------|--|-----------------------------|
| 39.42m | F1 R | RootsDefect End - Grade 2                |                             |
| 40.16m | WL   | Water level: 10% Height/Diameter         | Image Provided - Ref: 15_27 |
| 40.41m | R    | Roots - Grade 2                          | Image Provided - Ref: 15_28 |
| 40.41m | LDH  | Line of drain/sewer deviates down [half] | Image Provided - Ref: 15_29 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 40.41m | ICF  | Finish node type, inspection chamber<br>Unable To Proceed Beyond Drain Deviating<br>Down See Next Section For Completion To<br>IC30 | Image Provided - Ref: 15_9999 |

Total grades for project



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## Site: Mount Pleasant Road

Section 41

| C                                      | lient:  |               | Location (St | reet l | Name):   | City/T                               | own/Village | Cust   | t Job Ref. | Surve                       | eyors Name  | :                    | Date         | :             |
|--|---------|---------------|--------------|--------|----------|--------------------------------------|-------------|--------|------------|-----------------------------|-------------|----------------------|--------------|---------------|
|  |         |               | Mount Plea   | asant  | Road     |                                      |             |        |            |                             |             |                      | 08/08/2      | 018           |
| Start Node<br>Start Node<br>Start Node | Depth:  | ate:          | I            |        |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | IC3<br>77  |                             | S           | Heig<br>Shap<br>Clea |              | 100<br>C<br>N |
| Drain Type                             | Lining  | Туре          | Lining Mat.  | Yea    | r Const. | Weather                              | Flow Cont.  | Length |            |                             | Remarks     |                      |              |               |
| Α                                      |         |               |              |        |          | D                                    | Ν           | 41.16  | Con        | tinuation F                 | rom Drain D | eviati               | ng Down      |               |
| Position<br>40.79m<br>41.16m<br>41.16m | IC<br>R | Start<br>Root | node type,   |        |          | chamber                              |             |        | CD P<br>1  | ic Gra<br>6_0<br>6_1<br>6_9 |             |                      | 0m<br>41.16n |               |
|  |         |               |              |        |          |                                      |             |        |            |                             |             |                      |              |               |

#### Total grades for project

0



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| Pos    | Code                  | Description                                  | Image                         |
|--------|-----------------------|--|-------------------------------|
| 40.79m | IC                    | Start node type, inspection chamber<br>IC28  | Image Provided - Ref: 16_0    |
| 41.16m | 16m R Roots - Grade 2 |  | Image Provided - Ref: 16_1    |
|        |                       |  |                               |
| 41.16m | ICF                   | Finish node type, inspection chamber<br>IC30 | Image Provided - Ref: 16_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

Section 42

| Cl           | ent:   |        | Location (St                            | reet Name):  | City/T     | City/Town/Village Cust J |        |             | Job Ref. Surveyors Name: |         |                | Date:   |               |
|--------------|--|--------|---|--------------|------------|--------------------------|--------|-------------|--------------------------|---------|----------------|---------|---------------|
|              |  |        | Mount Plea                              | isant Road   |            |                          |        |             |                          |         |                | 08/08/2 | 2018          |
| Start Node I | Start Node Ref:IC29Finish NodeStart Node Depth:840Finish NodeStart Node Coordinate:Finish Node |        |   |              |            |                          |        | IC40<br>760 |                          | С       | -              |         | 100<br>C<br>N |
| Drain Type   | Lining   | Туре   | Lining Mat.                             | Year Const.  | Weather    | Flow Cont.               | Length |             |                          | Remarks |                |         |               |
| Α            |  |        |   |              | D          | N                        | 5.2    |             |                          |         |                |         |               |
| Position     |  |        | ription                                 | . ,.         |            |                          |        | CD Pi       |                          | . /     |                | 0m      |               |
| 00.00m       |  |        | node type,                              | •            |            |                          |        |             | <b>7_</b> 0              | 0       |                |         |               |
| 01.30m       |  |        | hed deposit                             |              | tion 12-7  | 12 5%                    |        |             | <b>′_2</b>               | 3       |                |         |               |
| 02.72m       | JD   | Joint  | displaced la                            | arge         |            |                          |        | 17          | <b>′_</b> 3              | 3 —     |                | 2       |               |
| 03.90m       | JD   | Joint  | displaced la                            | arge         |            |                          |        | 17          | ′_4                      | 3 ~     | $\overline{\}$ |         | 1             |
| 04.13m       | LLH  | Line   | of drain/sew                            | ver deviates | left [half | ]                        |        | 17          | ′_5                      | 0       | $\setminus$    | i te    | 7             |
| 04.13m       | JN   | Junct  | tion 3 : 100                            | mm Diamet    | er         |                          |        | 17          | 7_6                      | 0 —     | $\mathcal{I}$  |         | 7             |
| 05.20m       | FL   | Fract  | ure longitud                            | linal 9      |            |                          |        | 17          | <b>7_</b> 7              | 3 —     | le-e           |         | <u> </u>      |
| 05.20m       | ICF  | Finisl | hish node type, inspection chamber 17_9 |              |            |                          |        |             | <b>7_</b> 9              | 0 —     | $\sum$         | 5.2m    |               |
|              |  |        |   |              |            |                          |        |             |                          |         |                |         |               |
|              |  |        |   |              |            |                          |        |             |                          |         |                |         |               |
|              |  |        |   |              |            |                          |        |             |                          |         |                |         |               |
|              |  |        |   |              |            |                          |        |             |                          |         |                |         |               |
|              |  |        |   |              |            |                          |        |             |                          |         |                |         |               |

#### Total grades for project

0



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC29                      | Image Provided - Ref: 17_0 |
| 01.30m | DEE  | Attached deposits, encrustation from 12                          | Image Provided - Ref: 17_2 |
|        |      | o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3 |                            |
| 02.72m | JDL  | Joint displaced large - Grade 3                                  | Image Provided - Ref: 17_3 |
|        |      |  |                            |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                                  | Image                      |
|--------|------|--|----------------------------|
| 03.90m | JDL  | Joint displaced large - Grade 3              | Image Provided - Ref: 17_4 |
| 04.13m | LLH  | Line of drain/sewer deviates left [half]     | Image Provided - Ref: 17_5 |
|        |      |  |                            |
| 04.13m | JN   | Junction at 3 o'clock: 100mm Diameter        | Image Provided - Ref: 17_6 |
|        |      |  |                            |
| 05.20m | FL   | Fracture longitudinal at 9 o'clock - Grade 3 | Image Provided - Ref: 17_7 |

| Grade 1 Defects 0 Grade 2 Defects | 192 Grade 3 Defects | 54   Grade 4 Defects   3 | Grade 5 Defects 0 |
|-----------------------------------|---------------------|--------------------------|-------------------|
|-----------------------------------|---------------------|--------------------------|-------------------|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 05.20m | ICF  | Finish node type, inspection chamber<br>IC40 - Unable To Proceed As Could not<br>Feed Around Bend | Image Provided - Ref: 17_9999 |

Total grades for project



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## Site: Mount Pleasant Road

Section 43

| CI                                     | ient:  |        | Location (St | reet Name):                                 | City/T  | own/Village | Cus    | t Job Re   | ef.        | Survey | ors Name | :                 | Date    | e:            |
|--|--------|--------|--------------|---|---------|-------------|--------|------------|------------|--------|----------|-------------------|---------|---------------|
|  |        |        | Mount Plea   | asant Road                                  |         |             |        |            |            | 08/08/ |          |                   | 08/08/2 | 2018          |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:   |              | C30 Finish No<br>000 Finish No<br>Finish No |         |             |        |            | END<br>000 | ő      |          |                   | ):      | 225<br>C<br>N |
| Drain Type                             | Lining | Туре   | Lining Mat.  | Year Const.                                 | Weather | Flow Cont.  | Length |            |            | F      | Remarks  |                   |         |               |
| A                                      |        |        |              |   | D       | N           | 31.42  |            |            |        |          |                   |         |               |
| Position                               | Code   | Desc   | ription      |   |         |             |        | CD         | Pic        | Grade  | 9        | 1                 | 0m      |               |
| 00.00m                                 | IC     | Start  | node type,   | inspection o                                | hamber  |             |        |            | 18 <u></u> | _0     | 0 —      | 1/                |         |               |
| 00.00m                                 | R      | Root   | S            |   |         |             |        |            | 18         | _1     | 2 — /    |                   |         |               |
| 01.53m                                 | JN     | Junc   | tion 1 : 100 | mm Diamet                                   | er      |             |        |            | 18_        | _2     | o —/     |                   |         |               |
| 02.24m                                 | R      | S1 R   | oots         |   |         |             |        | <b>S</b> 1 | 18         | _3     | 2 — /    | //                |         |               |
| 06.15m                                 | R      | F1 R   | oots         |   |         |             |        | F1         | 18         |        | 2 —/     | //                |         |               |
| 06.38m                                 | R      | S2 R   | oots         |   |         |             |        | S2         | 18         | _4     | 2 —/     | /                 |         |               |
| 08.51m                                 | R      | F2 R   | oots         |   |         |             |        | F2         | 18         |        | 2        | - 1               |         |               |
| 21.84m                                 | JN     | Junc   | tion 12 : 10 | 0mm Diame                                   | eter    |             |        |            | 18         | _5     | 0 —      | . 1               |         |               |
| 24.63m                                 | DER    | Settle | ed deposits  | coarse 15                                   | %       |             |        |            | 18         | _6     | 3 — `    | $\mathbf{V}$      | 11      |               |
| 25.60m                                 | JN     | Junc   | tion 12 : 10 | 0mm Diame                                   | eter    |             |        |            | 18_        | _7     | 0 – /    | $\langle \rangle$ |         | 1             |
| 26.33m                                 | JD     | Joint  | displaced n  | nedium                                      |         |             |        |            | 18         | _8     | 2        | $\langle \rangle$ | 2       |               |
| 27.18m                                 | JD     | Joint  | displaced n  | nedium                                      |         |             |        |            | 18         | _9     | 2 ~      |                   |         |               |
| 28.63m                                 | JD     | Joint  | displaced n  | nedium                                      |         |             |        |            | 18         | _1     | 2 —      | //                |         |               |
| 29.48m                                 | JN     | Junc   | tion 12 : 10 | 0mm Diame                                   | eter    |             |        |            | 18         | _1     | 0 —      | N                 |         |               |
| 31.42m                                 | SA     | Surv   | ey abandon   | ed  |         |             |        |            | 18         | _9     | 0 —      |                   | 31.42   | m             |
|  |        |        |              |   |         |             |        |            |            |        |          |                   |         |               |

#### Total grades for project



| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC30  | Image Provided - Ref: 18_0 |
| 00.00m | R    | Roots - Grade 2  | Image Provided - Ref: 18_1 |
| 01.53m | JN   | Junction at 1 o'clock: 100mm Diameter<br>DRAIN AT JUNCTION INFILTRATING INTO<br>DRAIN LINE | Image Provided - Ref: 18_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description                            | Image                      |
|--------|------|--|----------------------------|
| 02.24m | S1 R | Roots2.24m - 6.15m - Grade 2           | Image Provided - Ref: 18_3 |
| 06.15m | F1 R | RootsDefect End - Grade 2              |                            |
| 06.38m | S2 R | Roots6.38m - 8.51m - Grade 2           | Image Provided - Ref: 18_4 |
| 08.51m | F2 R | RootsDefect End - Grade 2              |                            |
| 21.84m | JN   | Junction at 12 o'clock: 100mm Diameter | Image Provided - Ref: 18_5 |

| Grade 1 | Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 | ] |
|---------|---------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
|---------|---------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 24.63m | DER  | Settled deposits coarse: 15% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 18_6 |
| 25.60m | JN   | Junction at 12 o'clock: 100mm Diameter                              | Image Provided - Ref: 18_7 |
| 26.33m | JDM  | Joint displaced medium - Grade 2                                    | Image Provided - Ref: 18_8 |
| 27.18m | JDM  | Joint displaced medium - Grade 2                                    | Image Provided - Ref: 18_9 |

| Grade 1 Defects 0 | Grade 2 Defects 19 | 92 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects 0 |
|-------------------|--------------------|-----------------------|-------------------|-------------------|
|-------------------|--------------------|-----------------------|-------------------|-------------------|



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0

| Pos    | Code | Description                            | Image                         |
|--------|------|--|-------------------------------|
| 28.63m | JDM  | Joint displaced medium - Grade 2       | Image Provided - Ref: 18_10   |
| 29.48m | JN   | Junction at 12 o'clock: 100mm Diameter | Image Provided - Ref: 18_11   |
| 31.42m | SA   | Survey abandoned<br>END                | Image Provided - Ref: 18_9999 |

| Grade 1 Defects 0 Grade 2 Defects 15 | 92 Grade 3 Defects 54 | Grade 4 Defects 3 Grade | 5 Defects |
|--------------------------------------|-----------------------|-------------------------|-----------|
|--------------------------------------|-----------------------|-------------------------|-----------|



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## Site: Mount Pleasant Road

## Section 44

| Client:  | Location (Street Name): City/Town/Village Cust Job Ref. Surveyors |                                      | ors Name:  | :                       | Date       | e:                |   |   |  |               |             |      |
|--|---|--------------------------------------|--|-------------------------|------------|-------------------|---|---|--|---------------|-------------|------|
|  |   | Mount Plea                           | asant Road   |                         |            |                   |   |   |  |               | 08/08/2     | 2018 |
| Start Node Ref:<br>Start Node Depth:<br>Start Node Coordina  | ate:  | -                                    | 430Finish Node Depth:430Use:                           |                         |            |                   | D<br>S<br>VC                              | Shap  |  | 225<br>C<br>N |             |      |
| Drain Type Lining  | Туре  | Lining Mat.                          | Year Const.  | Weather                 | Flow Cont. | t. Length Remarks |   |   |  |               |             |      |
| А  |   |                                      |  | D                       | N          | 35.19             | 19 Continuation From Drain Deviating Down |   |  |               |             |      |
| Position         Code           00.00m         IC           04.13m         R           09.22m         JN           25.73m         R           25.73m         JN           26.94m         R           32.64m         LRH           34.34m         LLH           35.19m         SA | Start<br>Root<br>Junc<br>S1 R<br>Junc<br>F1 R<br>Line             | tion 2 : 100<br>oots<br>tion 3 : 100 | mm Diamet<br>mm Diamet<br>ver deviates<br>ver deviates | er<br>er<br>i right [ha | -          |                   | 1<br>1<br>S1 1<br>51 1<br>F1 1<br>1<br>1  | 9_4<br>9_5<br>9_7<br>9_8<br>9<br>9_9<br>9_1 |  |               | 0m<br>35.19 | m    |

#### Total grades for project



| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC30 | Image Provided - Ref: 19_0 |
| 04.13m | R    | Roots - Grade 2                             | Image Provided - Ref: 19_4 |
| 09.22m | JN   | Junction at 2 o'clock: 100mm Diameter       | Image Provided - Ref: 19_5 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects | 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|---|--------------------|---|-----------------|---|
|---|--------------------|---|-----------------|---|



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 25.73m | S1 R | Roots25.73m - 26.94m - Grade 2   | Image Provided - Ref: 19_7 |
| 25.73m | JN   | Junction at 3 o'clock: 100mm Diameter<br>From 3 O'clock on the drain there is either a<br>junction or damage through which the visible<br>roots are passing. | Image Provided - Ref: 19_8 |
| 26.94m | F1 R | RootsDefect End - Grade 2  |                            |
| 32.64m | LRH  | Line of drain/sewer deviates right [half]  | Image Provided - Ref: 19_9 |

| Grade 1 Defects 0 | Grade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-------------------|---------------------|--------------------|-------------------|-----------------|---|
|-------------------|---------------------|--------------------|-------------------|-----------------|---|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 34.34m | LLH  | Line of drain/sewer deviates left [half]             | Image Provided - Ref: 19_10   |
| 35.19m | SA   | Survey abandoned<br>End - Unable To Pass Any Further | Image Provided - Ref: 19_9999 |

Total grades for project

0

| Grade 1 Defects |
|-----------------|
|-----------------|



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## Site: Mount Pleasant Road

## Section 45

| CI  | ient:                |                                   | Location (St<br>Mount Plea |                            |          | City/T                               | own/Village | Cus      | st Job Ref.    | Surveyo                         | ors Name      | :    | Date<br>08/08/2 |               |
|---|----------------------|-----------------------------------|----------------------------|----------------------------|----------|--------------------------------------|-------------|----------|----------------|---------------------------------|---------------|------|-----------------|---------------|
| Start Node<br>Start Node<br>Start Node                          | Depth:               | ate:                              |                            |                            |          | ode Ref:<br>ode Depth:<br>ode Coordi |             | <b>I</b> | END<br>670     | Direction:<br>Use:<br>Material: | D<br>S<br>PVC | Shap |                 | 100<br>C<br>N |
| Drain Type  | Lining               | Туре                              | Lining Mat.                | Yea                        | r Const. | Weather                              | Flow Cont.  | Ŭ        |                | F                               | emarks        |      |                 |               |
| A<br>Position<br>00.00m<br>01.64m<br>02.85m<br>03.07m<br>03.18m | MH<br>R<br>DER<br>JN | Start<br>Roots<br>Settle<br>Junct | node type,                 | <mark>coa</mark> ı<br>n Di | rse 40'  | <u>D</u>                             | N           | 3.18     | 49<br>49<br>49 | 9_0<br>9_1 :<br>9_2 :<br>9_3 :  |               |      | 0m              |               |

#### Total grades for project



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | МН   | Start node type, manhole<br>IC32                                    | Image Provided - Ref: 49_0 |
| 01.64m | R    | Roots - Grade 2   | Image Provided - Ref: 49_1 |
| 02.85m | DER  | Settled deposits coarse: 40% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 49_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects     0     Grade 2 Defects     192     Grade 3 Defects     54     Grade 4 Defects     3     Grade 5 Defects | 0 |
|--|---|
|--|---|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 03.07m | JN   | Junction at 3 o'clock: 0mm Diameter  | Image Provided - Ref: 49_3    |
| 03.18m | SA   | Survey abandoned<br>UNABLE TO PROCEED DUE TO AMOUNT<br>OF DEPOSIT IN DRAIN | Image Provided - Ref: 49_9999 |

Total grades for project

0

| Grade i Delecis | Grade | 1 | Defects |
|-----------------|-------|---|---------|
|-----------------|-------|---|---------|



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## Site: Mount Pleasant Road

## Section 46

| Cli  | ient:     |                 | Location (St                                       |            |          | City/T                               | own/Village | Cust   | t Job Ref. | Survey                          | ors Name      | :    | Date    |               |
|--|-----------|-----------------|--|------------|----------|--------------------------------------|-------------|--------|------------|---------------------------------|---------------|------|---------|---------------|
|  |           |                 | Mount Plea   |            |          |                                      |             |        |            |                                 |               | -    | 08/08/2 |               |
| Start Node F<br>Start Node I<br>Start Node 0 | Depth:    | ate:            |  | C34<br>380 |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | END<br>380 | Direction:<br>Use:<br>Material: | D<br>S<br>PVC | Shap |         | 100<br>C<br>N |
| Drain Type                                   | Lining    | Туре            | Lining Mat.  | Yea        | r Const. |                                      | Flow Cont.  | Length |            | ł                               | Remarks       |      |         |               |
| A  |           |                 |  |            |          | D                                    | N           | 0.65   |            |                                 |               |      |         |               |
| Position<br>00.00m<br>00.21m<br>00.65m       | IC<br>DES | Start<br>Settle | ription<br>node type,<br>ed deposits<br>ey abandon | fine       |          |                                      |             |        | 51         | _0<br>_1                        |               |      | 0m      |               |
|  |           |                 |  |            |          |                                      |             |        |            |                                 |               |      |         |               |

#### Total grades for project

0



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC34                       | Image Provided - Ref: 51_0    |
| 00.21m | DES  | Settled deposits fine: 50% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 51_1    |
| 00.65m | SA   | Survey abandoned<br>BLOCKED                                       | Image Provided - Ref: 51_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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### Site: Mount Pleasant Road

## Section 47

| C                                      | lient:    |                 | Location (St<br>Mount Plea                         |             | City/T                                 | own/Village | Cust   | t Job Ref. | Surveyors                          | s Name: | Date<br>08/08/2            |               |
|--|-----------|-----------------|--|-------------|--|-------------|--------|------------|------------------------------------|---------|----------------------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth:    | ate:            | 1  |             | lode Ref:<br>lode Depth:<br>lode Coord |             |        | END<br>0   | Direction:<br>Use:<br>Material:    | S Sh    | ight/Dia:<br>ape:<br>eaned | 100<br>C<br>N |
| Drain Type                             | Lining    | Туре            | Lining Mat.  | Year Const. | Weather                                | Flow Cont.  | Length |            | Re                                 | marks   |                            |               |
| A                                      |           |                 |  |             | D                                      | N           | 3.62   |            |                                    |         |                            |               |
| Position<br>00.00m<br>02.74m<br>03.62m | MH<br>DER | Start<br>Settle | ription<br>node type,<br>ed deposits<br>ey abandon | coarse 30   | )%                                     |             |        | 10         | c Grade<br>03_ 0<br>03_ 3<br>03_ 0 |         | 0m                         |               |

#### Total grades for project

0



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0

| Pos    | Code | Description                        | Image                          |
|--------|------|------------------------------------|--------------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC34   | Image Provided - Ref: 103_0    |
| 02.74m | DER  | Settled deposits coarse: 30% Cross | Image Provided - Ref: 103_1    |
|        |      | sectional area loss - Grade 3      |                                |
| 03.62m | SA   | Survey abandoned<br>DRAIN BLOCKED  | Image Provided - Ref: 103_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 19 | 192 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects |  |
|--------------------------------------|------------------------|-------------------|-----------------|--|
|--------------------------------------|------------------------|-------------------|-----------------|--|



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## Site: Mount Pleasant Road

Section 48

| CI                                     | ient:  |       | Location (St<br>Mount Plea |      |          | City/T                               | own/Village | Cust   | t Job Ref.  | Surve       | eyors Name | :                 | Date<br>08/08/2 |               |
|--|--------|-------|----------------------------|------|----------|--------------------------------------|-------------|--------|-------------|-------------|------------|-------------------|-----------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |                            |      |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH4<br>1200 |             | С          |                   | e:              | 100<br>C<br>N |
| Drain Type                             | Lining | Туре  | Lining Mat.                | Yea  | r Const. | Weather                              | Flow Cont.  | Length |             |             | Remarks    |                   |                 |               |
| A                                      |        |       |                            |      |          | D                                    | Ν           | 14.31  |             |             |            |                   |                 |               |
| Position                               | Code   | Desc  | ription                    |      |          |                                      |             |        | CD Pi       | c Gra       | de         |                   | 0m              |               |
| 01.18m                                 |        |       | node type,                 | mar  | hole     |                                      |             |        | 24          | <b>I_</b> 0 | 0 —        |                   |                 |               |
| 05.08m                                 | JD     | Joint | displaced n                | nedi | um       |                                      |             |        | 24          | <b>I_</b> 4 | 2 —        |                   |                 |               |
| 06.62m                                 | JD     | Joint | displaced n                | nedi | um       |                                      |             |        | 24          | <b>I_</b> 5 | 2 —        | $\geq$            |                 |               |
| 12.18m                                 | JD     | Joint | displaced n                | nedi | um       |                                      |             |        | 24          | I_6         | 2          |                   |                 |               |
| 13.36m                                 | WL     | Wate  | er level 5%                |      |          |                                      |             |        | 24          | <b>\_</b> 7 | 0 -\/      | \.                | FLOW            | y             |
| 14.31m                                 | MHF    | Finis | h node type                | , ma | anhole   |                                      |             |        | 24          | <b>!_</b> 9 | 0 _/       | $\langle \rangle$ |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            | //                | 14.31r          | n             |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |
|  |        |       |                            |      |          |                                      |             |        |             |             |            |                   |                 |               |

#### Total grades for project



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0

| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 01.18m | MH   | Start node type, manhole<br>IC36 IS 1.18M FROM START OF VIDEO<br>TO MH4 | Image Provided - Ref: 24_0 |
| 05.08m | JDM  | Joint displaced medium - Grade 2  | Image Provided - Ref: 24_4 |
|        |      |   |                            |
| 06.62m | JDM  | Joint displaced medium - Grade 2  | Image Provided - Ref: 24_5 |
|        |      |   |                            |

## **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 Grade 2 Defect | 192   Grade 3 Defects   54 | Grade 4 Defects 3 Grade 5 Defects |  |
|----------------------------------|----------------------------|-----------------------------------|--|
|----------------------------------|----------------------------|-----------------------------------|--|



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0

| Pos                  | Code | Description                      | Image                               |
|----------------------|------|----------------------------------|-------------------------------------|
| <b>POS</b><br>12.18m | JDM  | Joint displaced medium - Grade 2 | Image<br>Image Provided - Ref: 24_6 |
| 13.36m               | WL   | Water level: 5% Height/Diameter  | Image Provided - Ref: 24_7          |
|                      |      |                                  | S.                                  |
| 14.31m               | MHF  | Finish node type, manhole<br>MH4 | Image Provided - Ref: 24_9999       |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |  |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|--|



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## Site: Mount Pleasant Road

Section 49

| Cli  | ent:      |               |  | treet Name):<br>asant Road | City/T                                 | own/Village | Cust   | Job Ref. | Surveyor  | 's Name: | Date:<br>08/08/2018              |
|--|-----------|---------------|--|----------------------------|--|-------------|--------|----------|---|----------|----------------------------------|
| Start Node F<br>Start Node I<br>Start Node 0 | Depth:    | ate:          |  |                            | lode Ref:<br>lode Depth:<br>lode Coord |             |        |          | <ul><li>36 Direction:</li><li>10 Use:<br/>Material:</li></ul> | C Sha    | ght/Dia: 100<br>upe: C<br>aned N |
| Drain Type                                   | Lining    | Туре          | Lining Mat.  | Year Const.                | Weather                                | Flow Cont.  | Length |          | Re  | emarks   |                                  |
| A  |           |               |  |                            | D                                      | N           | 1.18   |          |   |          |                                  |
| Position<br>00.00m<br>00.00m                 | MH<br>LLQ | Start<br>Line | ription<br>node type,<br>of drain/sew<br>h node type | ver deviates               | •                                      |             |        | 2        | Pic Grade<br>23_0 0<br>23_1 0<br>23_9 0                       |          | 0m<br>1.18m                      |
| Total grad                                   |           |               |  |                            |  |             |        |          |   |          |                                  |

192

Grade 3 Defects

Grade 1 Defects

0

Grade 2 Defects

54

3

Grade 5 Defects

0

Grade 4 Defects



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# Descriptive Report with Remarks and Observation Images

| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | МН   | Start node type, manhole<br>IC37 TO IC36 DOWNSTREAM TOWARDS<br>MH4 | Image Provided - Ref: 23_0    |
| 00.00m | LLQ  | Line of drain/sewer deviates left [quarter]                        | Image Provided - Ref: 23_1    |
|        |      |  |                               |
| 01.18m | MHF  | Finish node type, manhole<br>IC36                                  | Image Provided - Ref: 23_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

## Section 50

| CI                                     | ient:  |       | Location (St<br>Mount Plea |             | City/T                                  | own/Village | Cust   | t Job Ref. | Surveyor | s Name: | Date<br>08/08/2           |    |
|--|--------|-------|----------------------------|-------------|---|-------------|--------|------------|----------|---------|---------------------------|----|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |                            | 490 Finish  | Node Ref:<br>Node Depth:<br>Node Coordi |             |        | MH2<br>(   |          | C Sha   | ight/Dia:<br>ape:<br>aned | 10 |
| orain Type                             | Lining | Туре  | Lining Mat.                | Year Const  | . Weather                               | Flow Cont.  | Length |            | Re       | emarks  |                           |    |
| А                                      |        |       |                            |             | D                                       | N           | 9.46   |            |          |         |                           |    |
| Position                               | Code   | Desc  | ription                    |             |   |             |        | CD Pi      | c Grade  | /       | 0m                        |    |
| 00.00m                                 |        |       | node type,                 | inspectior  | chamber                                 |             |        | 2          | 5_0 0    |         |                           |    |
| 01.65m                                 | JD     | Joint | displaced n                | nedium      |   |             |        | 2          | 5_2 2    |         |                           |    |
| 06.15m                                 | JD     | Joint | displaced n                | nedium      |   |             |        | 2          | 5_4 2    | $\neg$  |                           |    |
| )7.45m                                 | LLH    | Line  | of drain/sew               | ver deviate | es left [half                           | ]           |        | 2          | 5_5 0    | -1/     |                           |    |
| )9.10m                                 | LLH    | Line  | of drain/sew               | ver deviate | es left [half                           | ]           |        | 2          | 5_6 0    | -1//    |                           |    |
| )9.46m                                 | MHF    | Finis | h node type                | , manhole   |   |             |        | 25         | 5_9 0    | _//     | )<br>9.46m                |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |
|  |        |       |                            |             |   |             |        |            |          |         |                           |    |

#### Total grades for project



| Pos    | Code | Description                                 | Image                      |  |  |  |
|--------|------|---|----------------------------|--|--|--|
| 00.00m | IC   | Start node type, inspection chamber<br>IC39 | Image Provided - Ref: 25_0 |  |  |  |
| 01.65m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 25_2 |  |  |  |
| 06.15m | JDM  | Joint displaced medium - Grade 2            | Image Provided - Ref: 25_4 |  |  |  |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 07.45m | LLH  | Line of drain/sewer deviates left [half]  | Image Provided - Ref: 25_5    |
| 09.10m | LLH  | Line of drain/sewer deviates left [half]<br>LINE OF SEWER DEVIATES TO LEFT  | Image Provided - Ref: 25_6    |
| 09.46m | MHF  | Finish node type, manhole<br>END - UNABLE TO PROCEED AS<br>CAMERA WILL NOT GO ANY FURTHER<br>AND UNABLE TO LIFT COVER | Image Provided - Ref: 25_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|---------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|---------|



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## Site: Mount Pleasant Road

## Section 51

| CI         | Client: Location (Street Name):   |   |   | City/T                       | City/Town/Village Cust Job Ref.            |           |            | Surveyors Name: |  |   | Da  | te:   |               |       |
|------------|---|---|---|------------------------------|--|-----------|------------|-----------------|--|---|---|-------|---------------|-------|
|            |   |   | Mount Plea  | Mount Pleasant Road          |  |           |            |                 |  |   |   |       | 08/08/        | /2018 |
| Start Node | IC39Finish Node Ref:tart Node Depth:490tart Node Coordinate:Finish Node Coordinate: |   |   |                              |  |           |            | ENC<br>(        | Directi<br>Use:<br>Materi              | C   | Shap  |       | 100<br>C<br>N |       |
| Drain Type | Lining  | Туре  | Lining Mat.   | Yea                          | r Const.                                   | Weather   | Flow Cont. | Length Remarks  |  |   |   |       |               |       |
| A          |   |   |   |                              |  | D         | N          | 4.96            |  | FROM  | IC39 TO DO                                  | WNPIF | PE            |       |
|            | IC<br>DEE<br>JD<br>JD<br>LLH  | Start<br>Attac<br>Joint<br>Joint<br>Line<br>Junc<br>Broke | ription<br>node type,<br>thed deposit<br>displaced n<br>displaced n<br>of drain/sew<br>tion 12 : 10<br>en pipe 9-9<br>h node type | nedi<br>nedi<br>ver c<br>0mr | ncrusta<br>um<br>um<br>Jeviates<br>n Diame | tion 12-1 | 11 5%      |                 | 20<br>20<br>20<br>20<br>20<br>20<br>20 | ic Gra<br>6_0<br>6_2<br>6_3<br>6_3<br>6_6<br>6_5<br>6_7<br>6_8<br>6_9 | ade<br>0<br>3<br>2<br>2<br>0<br>0<br>4<br>0 |       | 0m            | TOW   |

#### Total grades for project

0

54



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC39   | Image Provided - Ref: 26_0 |
| 02.24m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 11 o'clock: 5% Cross sectional<br>area loss - Grade 3<br>GENERAL ENCRUSTED DEPOSITS ON<br>DRAIN | Image Provided - Ref: 26_2 |
| 02.83m | JDM  | Joint displaced medium - Grade 2  | Image Provided - Ref: 26_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects     0     Grade 2 Defects     192     Grade 3 Defects     54     Grade 4 Defects     3     Grade 5 Defects | 0 |
|--|---|
|--|---|



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 03.66m | JDM  | Joint displaced medium - Grade 2                     | Image Provided - Ref: 26_6 |
| 04.13m | LLH  | Line of drain/sewer deviates left [half]             | Image Provided - Ref: 26_5 |
|        |      |  |                            |
| 04.13m | JN   | Junction at 12 o'clock: 100mm Diameter               | Image Provided - Ref: 26_7 |
|        |      |  |                            |
| 04.73m | В    | Broken pipe from 9 o'clock to 9 o'clock -<br>Grade 4 | Image Provided - Ref: 26_8 |

| Grade 1 Defects | 0 | Grade 2 Defects | 102 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects |   |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
| Glade I Delects | U | Glade 2 Delects | 192 | Glade 5 Delects | 54 | Oldue 4 Delects | 3 | Glade 5 Delects | 0 |



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 04.96m | MHF  | Finish node type, manhole<br>END - CAMERA UNABLE TO MOVE ANY<br>FURTHER | Image Provided - Ref: 26_9999 |

Total grades for project



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### Site: Mount Pleasant Road

## Section 52

| Cli  | ient:  |        | Location (St | n (Street Name): City/Town/Village Cust Job Ref. |          |         |            | Job Ref. | Surve | Dat     | e:        |                     |      |
|--|--------|--------|--------------|--|----------|---------|------------|----------|-------|---------|-----------|---------------------|------|
|  |        |        | Mount Plea   | asant  | Road     |         |            |          |       |         |           | 08/08/              | 2018 |
| Start Node F<br>Start Node I<br>Start Node ( | о<br>С |        |              |  |          |         |            |          |       |         | Shape:    | 100<br>C<br>N       |      |
| Drain Type                                   | Lining | Туре   | Lining Mat.  | Yea  | r Const. | Weather | Flow Cont. | Length   |       |         | Remarks   |                     |      |
| A  |        |        |              |  |          | D       | Ν          | 3.43     |       | FROM IC | 39 TO DOW | NPIPE               |      |
| Position                                     | Code   | Desc   | ription      |  |          |         |            |          | CD Pi | c Grad  | le        | 0m                  |      |
| 00.00m                                       | IC     | Start  | node type,   | insp   | ection c | hamber  |            |          | 27    | 7_0     | 0 -//     |                     |      |
| 00.01m                                       | JD     | Joint  | displaced n  | nedi   | um       |         |            |          | 27    | 7_2     | 2 —       |                     |      |
| 03.07m                                       | JN     | Junct  | tion 12 : 10 | 0mn  | n Diame  | eter    |            |          | 27    | 7_3     | 0         |                     |      |
| 03.43m                                       | MHF    | Finisl | h node type  | , ma   | inhole   |         |            |          | 27    | 7_9     | 0 _//     |                     |      |
|  |        |        |              |  |          |         |            |          |       |         | //        |                     | 27   |
|  |        |        |              |  |          |         |            |          |       |         | \         |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           | $\langle b \rangle$ |      |
|  |        |        |              |  |          |         |            |          |       |         |           | 3.43r               | n    |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |
|  |        |        |              |  |          |         |            |          |       |         |           |                     |      |

#### Total grades for project

0



Inspection Report Page 188

Descriptive Report with Remarks and Observation Images

#### Total grades for project

0



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC39  | Image Provided - Ref: 27_0    |
| 00.01m | JDM  | Joint displaced medium - Grade 2   | Image Provided - Ref: 27_2    |
| 03.07m | JN   | Junction at 12 o'clock: 100mm Diameter   | Image Provided - Ref: 27_3    |
| 03.43m | MHF  | Finish node type, manhole<br>END - DRAIN BLOCK OFF AT END WITH<br>POSSIBLY DOWN PIPE JOINT | Image Provided - Ref: 27_9999 |

| Grade 1 Defects 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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### Site: Mount Pleasant Road

## Section 53

| Mount Pleasant Road         00002018           Start Node Reft         IC41         Finish Node Reft         IC42         Direction:         C         Start Node Coordinate:         C         Start Node Coordinate:         C         Start Node Coordinate:         C         Start Node Coordinate:         C<   | Clie         | ent:   |       |              |       |           | City/T     | City/Town/Village C |        |      | Surve   | yors Name: | Dat    |            |
|--|--------------|--------|-------|--------------|-------|-----------|------------|---------------------|--------|------|---------|------------|--------|------------|
| Start Node Depth:       740       Finish Node Depth:       1360       Use:       C       Shape:       C         Start Node Coordinate:       VC       Cleaned       N         Drain Type       Lining Type       Lining Mat.       Year Const.       Weather       Flow Cont.       Length       Remarks         A       D       N       17.26       Remarks       O       O       O         Position       Code       Description       CD       N       17.26       CD       Pic       Grade       28_0       0         16.44m       JN       Junction 3 : 100mm       Diameter       28_7       0 </td <td></td> <td></td> <td></td> <td>Mount Plea</td> <td>isant</td> <td>Road</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>08/08/</td> <td>2018</td> |              |        |       | Mount Plea   | isant | Road      |            |                     |        |      |         |            | 08/08/ | 2018       |
| A     D     N     17.26       Position Code Description     CD     Pic     Grade       00.00m IC     Start node type, inspection chamber     28_0     0       16.44m JN     Junction 3 : 100mm Diameter     28_7     0       17.26m ICF     Finish node type, inspection chamber     28_9     0  | Start Node D | Depth: | ate:  |              |       | Finish No | ode Depth: | de Depth: 136       |        |      | Use:    | CS         | Shape: | С          |
| Position       Code       Description       CD       Pic       Grade         00.00m       IC       Start node type, inspection chamber       28_0       0         16.44m       JN       Junction 3 : 100mm Diameter       28_7       0         17.26m       ICF       Finish node type, inspection chamber       28_9       0  | Drain Type   | Lining | Туре  | Lining Mat.  | Yea   | r Const.  | Weather    | Flow Cont.          | Length |      |         | Remarks    |        |            |
| 00.00m     IC     Start node type, inspection chamber     28_0     0       16.44m     JN     Junction 3 : 100mm     Diameter     28_7     0       17.26m     ICF     Finish node type, inspection chamber     28_9     0   | A            |        |       |              |       |           | D          | N                   | 17.26  |      |         |            |        |            |
| 16.44m JN       Junction 3: 100mm Diameter       28_7       0         17.26m ICF       Finish node type, inspection chamber       28_9       0   | Position     | Code   | Desc  | ription      |       |           |            |                     |        | CD P | ic Grac | le /       | 0m     |            |
| 17.26m ICF Finish node type, inspection chamber 28_9 0   | 00.00m       | IC     | Start | node type,   | insp  | ection c  | hamber     |                     |        | 2    | 8_0     | 0          |        |            |
|  | 16.44m       | JN     | Junc  | tion 3 : 100 | mm    | Diamet    | er         |                     |        | 2    | 8_7     | 0          |        |            |
|  | 17.26m       | ICF    | Finis | h node type  | , ins | pection   | chambe     | r                   |        | 2    | 8_9     | 0          |        | <u>, e</u> |

#### Total grades for project



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| Pos    | Code | Description                                  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC41  | Image Provided - Ref: 28_0    |
| 16.44m | JN   | Junction at 3 o'clock: 100mm Diameter        | Image Provided - Ref: 28_7    |
| 17.26m | ICF  | Finish node type, inspection chamber<br>IC42 | Image Provided - Ref: 28_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-----------------------------------|----------------------------|-------------------|-----------------|---|
|-----------------------------------|----------------------------|-------------------|-----------------|---|



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### Site: Mount Pleasant Road

## Section 54

| Cl   | ient:  |      | Location (St<br>Mount Plea |  | City/T      | own/Village | Cust   | Job Ref. | Surveyors                       | s Name: |                                  | Date:<br>08/08/2018 |  |
|--|--------|------|----------------------------|--|-------------|-------------|--------|----------|---------------------------------|---------|----------------------------------|---------------------|--|
| Start Node I<br>Start Node I<br>Start Node (   | Depth: | ate: |                            | C42 Finish N<br>360 Finish N<br>Finish N | lode Depth: |             |        |          | Direction:<br>Use:<br>Material: | C       | Height/Dia:<br>Shape:<br>Cleaned | 100<br>C<br>N       |  |
| Drain Type   | Lining | Туре | Lining Mat.                | Year Const.                              | Weather     | Flow Cont.  | Length |          | Re                              | marks   |                                  |                     |  |
| A  |        |      |                            |  | D           | N           | 30.45  |          |                                 |         | Om Om                            |                     |  |
| Position<br>00.00m   |        |      | node type,                 | inspection                               | chamber     |             |        | CD Pie   | c Grade                         |         |                                  |                     |  |
| 24.03m   |        |      | hed deposit                |  |             |             |        |          | _<br>_1 3                       | $\neg$  |                                  |                     |  |
| 28.76m   | LRH    | Line | of drain/sew               | ver deviates                             | s right [ha | alf]        |        | 29       | _2 0                            | -/      |                                  |                     |  |
| 28.76m       LRH       Line of drain/sewer deviates right [half]       29_2         30.45m       ICF       Finish node type, inspection chamber       29_9 |        |      |                            |  |             |             |        |          |                                 |         | 30.45                            | ß                   |  |
|  |        |      |                            |  |             |             |        |          |                                 |         |                                  |                     |  |
|  |        |      |                            |  |             |             |        |          |                                 |         |                                  |                     |  |
|  |        |      |                            |  |             |             |        |          |                                 |         |                                  |                     |  |
|  |        |      |                            |  |             |             |        |          |                                 |         |                                  |                     |  |

#### Total grades for project

0



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Descriptive Report with Remarks and Observation Images

#### Total grades for project

0



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC42  | Image Provided - Ref: 29_0    |
| 24.03m | DEE  | Attached deposits, encrustation from 10  | Image Provided - Ref: 29_1    |
|        |      | o'clock to 2 o'clock: 5% Cross sectional area<br>loss - Grade 3<br>GENERAL DEPOSIT ON PIPE |                               |
| 28.76m | LRH  | Line of drain/sewer deviates right [half]  | Image Provided - Ref: 29_2    |
|        |      |  |                               |
| 30.45m | ICF  | Finish node type, inspection chamber<br>IC6 JJUST PAST IC UNABLE TO<br>PROCEED             | Image Provided - Ref: 29_9999 |

| Grade 1 Defects 0 Grade | rade 2 Defects 192 | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-------------------------|--------------------|--------------------|-------------------|-----------------|---|



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### Site: Mount Pleasant Road

## Section 55

| Client: Location (Street Name):<br>Mount Pleasant Road |        |        |              |        | City/T    | City/Town/Village                    |            |        | Surve | eyors Name:                       | Date:   |            |
|--|--------|--------|--------------|--------|-----------|--------------------------------------|------------|--------|-------|-----------------------------------|---------|------------|
|  |        |        |              |        |           |                                      |            |        |       |                                   |         | 08/08/2018 |
| Start Node I<br>Start Node I<br>Start Node (           | Depth: | ate:   |              | 0      | Finish No | ode Ref:<br>ode Depth:<br>ode Coordi |            |        |       | 2 Direction<br>0 Use:<br>Material | C Sha   |            |
| Drain Type   | Lining | Туре   | Lining Mat.  | Year   | Const.    | Weather                              | Flow Cont. | Length |       |                                   | Remarks |            |
| А  |        |        |              |        |           | D                                    | Ν          | 8.13   |       |                                   |         |            |
| Position   | Code   | Desc   | ription      |        |           |                                      |            |        | CD P  | vic Grad                          | de /    | 0m         |
| 00.00m   | IC     | Start  | node type,   | inspe  | ection c  | hamber                               |            |        | 1     | 04_                               | 0 —     |            |
| 02.08m   | DER    | Settle | ed deposits  | coars  | se 5%     | þ                                    |            |        | 1     | 04_                               | 3       |            |
| 06.81m   | LLQ    | Line   | of drain/sew | ver de | eviates   | left [qua                            | rter]      |        | 1     | 04_                               | 0       | -          |
| 08.13m   | ICF    | Finisl | h node type  | , insp | pection   | chambe                               | r          |        | 1     | 04_                               | 0       | 8.13m      |
|  |        |        |              |        |           |                                      |            |        |       |                                   |         |            |
|  |        |        |              |        |           |                                      |            |        |       |                                   |         |            |
|  |        |        |              |        |           |                                      |            |        |       |                                   |         |            |
|  |        |        |              |        |           |                                      |            |        |       |                                   |         |            |

#### Total grades for project

0



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Descriptive Report with Remarks and Observation Images

#### Total grades for project

0



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| Pos    | Code | Description  | Image                          |
|--------|------|--|--------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC45                        | Image Provided - Ref: 104_0    |
| 02.08m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 104_2    |
| 06.81m | LLQ  | Line of drain/sewer deviates left [quarter]                        | Image Provided - Ref: 104_3    |
| 08.13m | ICF  | Finish node type, inspection chamber<br>IC42                       | Image Provided - Ref: 104_9999 |

| ſ | Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | ( | 0 |
|---|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
| L |                 |   |                 |     |                 |    |                 |   |                 |   |   |



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## Site: Mount Pleasant Road

## Section 56

| CI                                     | ient:  |                           | Location (Street Name): City/Town<br>Mount Pleasant Road |  |          | own/Village | Cus        | Cust Job Ref. Surveyors Name: |    |     |                                 | Date:<br>08/08/2018 |             |               |               |
|--|--------|---------------------------|--|--|----------|-------------|------------|-------------------------------|----|-----|---------------------------------|---------------------|-------------|---------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:                      | I  | IC46 Finish Node Ref:<br>240 Finish Node Depth:<br>Finish Node Coordinate: |          |             |            |                               |    |     | Direction:<br>Use:<br>Material: | D<br>C<br>VC        |             | nt/Dia:<br>e: | 100<br>C<br>N |
| Drain Type                             | Lining | Туре                      | Lining Mat.  | Yea  | r Const. | Weather     | Flow Cont. | Length                        |    |     | Re                              | emarks              |             |               |               |
| A                                      |        |                           |  |  |          | D           | N          | 17.01                         |    |     |                                 |                     |             |               |               |
| Position                               | Code   | Desc                      | ription  |  |          |             |            |                               | CD | Pic | Grade                           |                     |             | 0m            |               |
| 00.00m                                 | IC     | Start                     | node type,   | insp   | ection o | chamber     |            |                               |    | 30_ | _0 0                            | $\square$           | $\square$   |               |               |
| 00.94m                                 | CL     | Cracl                     | k, longitudin  | al 1   | 2        |             |            |                               |    | 30_ | _2 2                            |                     |             |               |               |
| 02.95m                                 | DER    | Settle                    | ed deposits  | coa  | rse 10   | %           |            |                               |    | 30_ | _3 3                            |                     |             | 2.0           |               |
| 10.05m                                 | LLH    | Line                      | of drain/sew   | /er c  | leviates | left [half  | ]          |                               |    | 30_ | _4 0                            | $\overline{}$       |             |               |               |
| 11.11m                                 | JN     | S1 Ju                     | unction 9:   | 100r   | nm Dia   | meter       |            |                               | S1 | 30_ | _5 0                            | _                   | $\geq$      |               | 4             |
| 13.48m                                 | JD     | Joint                     | displaced n  | nedi   | um       |             |            |                               |    | 30_ | _6 2                            | $\overline{}$       |             |               |               |
| 17.01m                                 | MHF    | Finish node type, manhole |  |  |          |             |            |                               |    | 30_ | _9 0                            | $\neg$              |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     | $\setminus$ | 17.01         | m             |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     | N           |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |
|  |        |                           |  |  |          |             |            |                               |    |     |                                 |                     |             |               |               |

#### Total grades for project



| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC46                         | Image Provided - Ref: 30_0 |
| 00.94m | CL   | Crack, longitudinal at 12 o'clock - Grade 2                         | Image Provided - Ref: 30_2 |
| 02.95m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 30_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-----------------------------------|----------------------------|-------------------|-----------------|---|
|-----------------------------------|----------------------------|-------------------|-----------------|---|



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| Pos    | Code  | Description   | Image                         |
|--------|-------|---|-------------------------------|
| 10.05m | LLH   | Line of drain/sewer deviates left [half]                        | Image Provided - Ref: 30_4    |
| 11.11m | S1 JN | Junction11.11m - 0m at 9 o'clock: 100mm                         | Image Provided - Ref: 30_5    |
|        |       | Diameter<br>T JUNCTION TO JOIN PIPE RUNNING<br>FROM IC41 TO IC6 |                               |
| 13.48m | JDM   | Joint displaced medium - Grade 2                                | Image Provided - Ref: 30_6    |
|        |       |   |                               |
| 17.01m | MHF   | Finish node type, manhole                                       | Image Provided - Ref: 30_9999 |
|        |       | IC42  |                               |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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### Site: Mount Pleasant Road

## Section 57

| Cl   | ient:                                  |   | Location (St  | reet Name):  | City/T  | City/Town/Village |        | t Job Ref.                             | Surveyors Name:                |   | :                      | Date:   |               |
|--|--|---|---|--|---------|-------------------|--------|--|--------------------------------|---|------------------------|---------|---------------|
|  |  |   | Mount Pleasant Road   |  |         |                   |        |  |                                |   |                        | 08/08/2 | 2018          |
| Start Node I<br>Start Node I<br>Start Node 0   | Depth:                                 | ate:  | IC47 Finish Node Ref:<br>690 Finish Node Depth:<br>Finish Node Coordinate:  |  |         |                   |        |  | Direction<br>Use:<br>Material: | S   | Heigh<br>Shap<br>Clear |         | 100<br>C<br>N |
| Drain Type   | Lining                                 | Туре  | Lining Mat.   | Year Const.  | Weather | Flow Cont.        | Length |  |                                | Remarks                                   |                        |         |               |
| A  |  |   |   |  | D       | N                 | 6.97   |  |                                |   |                        |         |               |
| Position<br>00.00m<br>02.48m<br>02.48m<br>03.54m<br>04.13m<br>06.62m<br>06.86m<br>06.97m | MH<br>JD<br>CL<br>JN<br>B<br>JN<br>DER | Start<br>Joint<br>Crac<br>Junc<br>Broke<br>Junc<br>Settle | ription<br>node type,<br>displaced n<br>k, longitudin<br>tion 3 : 100<br>en pipe 1-6<br>tion 10 : 10<br>ed deposits<br>ey abandon | nedium<br>Ial 9<br>mm Diamet<br>0mm Diame<br>coarse 95 | eter    |                   |        | 3,<br>3,<br>3,<br>3,<br>3,<br>3,<br>3, | c Grad                         | e<br>0<br>2<br>2<br>0<br>4<br>0<br>3<br>0 |                        | 0m      |               |
|  |  |   |   |  |         |                   |        |  |                                |   |                        |         |               |

#### Total grades for project

0



Page 202

| Pos    | Code | Description                                | Image                      |
|--------|------|--|----------------------------|
| 00.00m | МН   | Start node type, manhole<br>IC47           | Image Provided - Ref: 31_0 |
| 02.48m | JDM  | Joint displaced medium - Grade 2           | Image Provided - Ref: 31_2 |
| 02.48m | CL   | Crack, longitudinal at 9 o'clock - Grade 2 | Image Provided - Ref: 31_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 03.54m | JN   | Junction at 3 o'clock: 100mm Diameter                               | Image Provided - Ref: 31_4 |
| 04.13m | В    | Broken pipe from 1 o'clock to 6 o'clock -<br>Grade 4                | Image Provided - Ref: 31_5 |
| 06.62m | JN   | Junction at 10 o'clock: 100mm Diameter                              | Image Provided - Ref: 31_6 |
| 06.86m | DER  | Settled deposits coarse: 95% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 31_7 |

| Grade 1 Defects 0 Grade 2 Defect | 192 G | Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|----------------------------------|-------|--------------------|-------------------|-----------------|---|
|----------------------------------|-------|--------------------|-------------------|-----------------|---|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 06.97m | SA   | Survey abandoned<br>PIPE BLOCKED UNABLE TO PROCEED | Image Provided - Ref: 31_9999 |

Total grades for project

0



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### Site: Mount Pleasant Road

## Section 58

| Cli  | ient:     |                 | Location (St                                       |            |           | City/T                               | own/Village | Cus    | t Job Ref. | Surveyors   | Name: | Date    | :   |
|--|-----------|-----------------|--|------------|-----------|--------------------------------------|-------------|--------|------------|---|-------|---------|-----|
|  |           |                 | Mount Plea   | asant      | Road      |                                      |             |        |            |   |       | 08/08/2 | 018 |
| Start Node F<br>Start Node I<br>Start Node 0 | Depth:    | ate:            |  | C47<br>690 |           | ode Ref:<br>ode Depth:<br>ode Coordi |             |        |            | ENDDirection:UHeight/Dia:690Use:SShape:Material:VCCleaned                               |       |         |     |
| Drain Type                                   | Lining    | Туре            | Lining Mat.  | Yea        | ır Const. | Weather                              | Flow Cont.  | Length |            | Rer   | marks |         |     |
| A  |           |                 |  |            |           | D                                    | N           | 5.32   |            |   |       |         |     |
| Position<br>00.00m<br>01.89m<br>05.32m       | MH<br>DER | Start<br>Settle | ription<br>node type,<br>ed deposits<br>ey abandon | coa        |           | %                                    |             |        | 32         | c         Grade           2_0         0           2_2         3           2_9         0 |       | 0m      |     |
|  |           |                 |  |            |           |                                      |             |        |            |   |       |         |     |

#### Total grades for project

0



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| Descriptive | Report | with | Remarks | and | Observation | Images |
|-------------|--------|------|---------|-----|-------------|--------|
|-------------|--------|------|---------|-----|-------------|--------|

| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC47 - HEAVY DEPOSITS             | Image Provided - Ref: 32_0    |
| 01.89m | DER  | Settled deposits coarse: 50% Cross                            | Image Provided - Ref: 32_2    |
|        |      | sectional area loss - Grade 3                                 |                               |
| 05.32m | SA   | Survey abandoned<br>UNABLE TO PROCEED DUE TO<br>BLOCKED DRAIN | Image Provided - Ref: 32_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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## Site: Mount Pleasant Road

Section 59

| Cl   | ient:   |   | Location (St   | reet Name):  | City/T                              | own/Village | Cus    | t Job Ref.                             | Surve   | yors Name:  | :    | Dat    | e:            |
|--|---|---|--|--|-------------------------------------|-------------|--------|--|---|---|------|--------|---------------|
|  |   |   | Mount Plea   | asant Road   |                                     |             |        |  |   |   |      | 08/08/ | 2018          |
| Start Node I<br>Start Node I<br>Start Node 0   | Depth:  | ate:  | I  | 0 Finish N   | ode Ref:<br>ode Depth:<br>ode Coord |             |        | END<br>(                               | Direction<br>Use:<br>Material   | S   | Shap |        | 225<br>C<br>N |
| Drain Type   | Lining  | Туре  | Lining Mat.  | Year Const.  | Weather                             | Flow Cont.  | Length |  |   | Remarks   |      |        |               |
| A  |   |   |  |  | D                                   | N           | 27.89  |  |   |   |      |        |               |
| Position<br>00.00m<br>00.87m<br>01.75m<br>04.83m<br>05.38m<br>09.44m<br>13.62m<br>13.73m<br>17.45m<br>21.93m | MH<br>DER<br>JD<br>JD<br>JD<br>JD<br>JD<br>DES<br>REM | Start<br>Settle<br>Joint<br>Joint<br>Joint<br>Joint<br>Settle<br>Gene | ription<br>node type,<br>ed deposits<br>displaced n<br>displaced n<br>displaced n<br>displaced n<br>displaced n<br>ed deposits<br>eral remark<br>displaced n | coarse 5%<br>nedium<br>nedium<br>nedium<br>nedium<br>fine 5% | ,<br>0                              |             |        | 1*<br>1*<br>1*<br>1*<br>1*<br>1*<br>1* | ic Grad<br>12_<br>12_<br>12_<br>12_<br>12_<br>12_<br>12_<br>12_<br>12_<br>12_ | de<br>0<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2 |      | Om     |               |
| 27.89m   |   |   | ey abandon   |  |                                     |             |        |  | 12_   | 0   |      | 27.89  | m             |

#### Total grades for project



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| Pos    | Code  | Description  | Image                       |
|--------|---|--|-----------------------------|
| 00.00m | 0m       MH       Start n<br>IC48         7m       DER       Settled<br>area lo | Start node type, manhole   | Image Provided - Ref: 112_0 |
| 00.87m | DER   | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 112_1 |
| 01.75m | JDM   | Joint displaced medium - Grade 2                                   | Image Provided - Ref: 112_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects | 192 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-----------------------------------|------------------------|-------------------|-----------------|---|
|-----------------------------------|------------------------|-------------------|-----------------|---|



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| Pos    | Code | Description                      | Image                       |
|--------|------|----------------------------------|-----------------------------|
| 04.83m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 112_3 |
| 05.38m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 112_4 |
| 09.44m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 112_5 |
| 13.62m | JDM  | Joint displaced medium - Grade 2 | Image Provided - Ref: 112_6 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                          |
|--------|------|---|--------------------------------|
| 13.73m | DES  | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2  | Image Provided - Ref: 112_8    |
| 17.45m | REM  | General remark<br>Possible Damage To Structure Of Drain At<br>Top | Image Provided - Ref: 112_7    |
| 21.93m | JDM  | Joint displaced medium - Grade 2                                  | Image Provided - Ref: 112_9    |
| 27.89m | SA   | Survey abandoned<br>Unable To Move Any Further With Camera        | Image Provided - Ref: 112_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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#### Site: Mount Pleasant Road

**Section 60** 

| Cli  | ient:  |        | Location (St |       |          | City/T                                       | own/Village | Cust   | Job Ref.     | Surve  | yors Name: |                        | Date    |               |
|--|--------|--------|--------------|-------|----------|--|-------------|--------|--------------|--------|------------|------------------------|---------|---------------|
|  |        |        | Mount Plea   | isant | Road     |  |             |        |              |        |            |                        | 08/08/2 | 018           |
| Start Node I<br>Start Node I<br>Start Node 0 | Depth: | ate:   |              |       |          | lode Ref:<br>lode Depth:<br>lode Coordinate: |             |        | IC49<br>2470 |        | s          | Heigh<br>Shap<br>Clear |         | 225<br>C<br>N |
| Drain Type                                   | Lining | Туре   | Lining Mat.  | Yea   | r Const. | Weather                                      | Flow Cont.  | Length |              |        | Remarks    |                        |         |               |
| А  |        |        |              |       |          | D  | Ν           | 30.17  |              |        |            |                        |         |               |
| Position                                     | Code   | Desc   | ription      |       |          |  |             |        | CD Pi        | c Grad | de         | Λ                      | 0m      |               |
| 00.00m                                       | IC     | Start  | node type,   | insp  | ection o | hamber                                       |             |        | 86           | 6_0    | 0 -        | 7                      |         |               |
| 00.00m                                       | DES    | Settle | ed deposits  | fine  | 0%       |  |             |        | 86           | 6_2    | 2 _/       |                        |         |               |
| 10.32m                                       | DER    | Settle | ed deposits  | coa   | rse 10   | %  |             |        | 86           | 6_4    | 3          |                        |         |               |
| 30.17m                                       | DER    | Settle | ed deposits  | coa   | rse 20   | %  |             |        | 86           | 6_6    | 3 —        | - 1                    |         |               |
| 30.17m                                       | SA     | Surve  | ey abandon   | ed    |          |  |             |        | 86           | 6_9    | 0 -//      |                        | FLOW    |               |
|  |        |        |              |       |          |  |             |        |              |        | /          |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            | $\mathbb{N}$           |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        | 30.17r  | n             |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
|  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |
| L  |        |        |              |       |          |  |             |        |              |        |            |                        |         |               |

#### Total grades for project

0



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC48                         | Image Provided - Ref: 86_0 |
| 00.00m | DES  | Settled deposits fine: 0% Cross sectional<br>area loss - Grade 2    | Image Provided - Ref: 86_2 |
| 10.32m | DER  | Settled deposits coarse: 10% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 86_4 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defe | s 192 Grade 3 Defects | 54 Grade 4 Defects 3 | Grade 5 Defects 0 |
|--------------------------------|-----------------------|----------------------|-------------------|
|--------------------------------|-----------------------|----------------------|-------------------|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 30.17m | DER  | Settled deposits coarse: 20% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 86_6    |
| 30.17m | SA   | Survey abandoned<br>Unable To Get CCTV Due To Deposits              | Image Provided - Ref: 86_9999 |

Total grades for project

0



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### Site: Mount Pleasant Road

Section 61

| Client:    |                     | Location (St | reet Name):                         | City/T        | own/Village | Cus        | ust Job Ref. Surveyors Name: |                            | Name:                       | Date  | ):<br>}:         |       |   |
|------------|---------------------|--------------|-------------------------------------|---------------|-------------|------------|------------------------------|----------------------------|-----------------------------|-------|------------------|-------|---|
|            | Mount Pleasant Road |              |                                     |               |             |            |                              |                            |                             |       | 08/08/2          | :018  |   |
|            |                     |              | ode Ref:<br>ode Depth:<br>ode Coord |               |             | IC         | 0 Us                         | rection:<br>e:<br>aterial: | U Heig<br>S Shat<br>VC Clea |       | 225<br>C<br>N    |       |   |
| Drain Type | Lining              | Туре         | Lining Mat.                         | Year Const.   | Weather     | Flow Cont. | Length                       |                            |                             | Rem   | arks             |       |   |
| A          |                     |              |                                     |               | D           | N          | 19.4                         |                            |                             | SOAK  | AWAY             |       |   |
| Position   | Code                | Desc         | ription                             |               |             |            |                              | CD                         | Pic                         | Grade | Λ                | 0m    |   |
| 00.00m     | IC                  | Start        | node type,                          | inspection of | chamber     |            |                              |                            | 55_0                        | 0 -   | -//              |       |   |
| 00.10m     | DER                 | S1 S         | ettled depos                        | sits coarse   | 5%          |            |                              | <b>S</b> 1                 | 55_1                        | 3     |                  |       |   |
| 03.95m     | JD                  | Joint        | displaced n                         | nedium        |             |            |                              |                            | 55_2                        | 2 -   |                  |       |   |
| 07.14m     | JD                  | Joint        | displaced n                         | nedium        |             |            |                              |                            | 55_3                        | 2 -   |                  |       |   |
| 08.68m     | DES                 | Settle       | ed deposits                         | fine 25%      |             |            |                              |                            | 55_4                        | 2 -   |                  | Ι.    |   |
| 11.09m     | JD                  | Joint        | displaced n                         | nedium        |             |            |                              |                            | 55_5                        | 2 -   | $  \  )$         |       |   |
| 14.83m     | JD                  | Joint        | displaced n                         | nedium        |             |            |                              |                            | 55_6                        | 2 -   | $\neg \setminus$ | FLOW  |   |
| 14.83m     | DES                 | Settle       | ed deposits                         | fine 25%      |             |            |                              |                            | 55_7                        | 2 -   | -// Ì            | μ.    | 1 |
| 17.34m     | DES                 | Settle       | ed deposits                         | fine 40%      |             |            |                              |                            | 55_8                        | 2 -   | $\neg \parallel$ |       |   |
| 18.26m     | DES                 | Settle       | ed deposits                         | fine 60%      |             |            |                              |                            | 55_9                        | 2 -   | _\               |       |   |
| 19.06m     | DES                 | Settle       | ed deposits                         | fine 70%      |             |            |                              |                            | 55_1                        | 2 -   | _///             |       |   |
| 19.40m     | DES                 | Settle       | ed deposits                         | fine 80%      |             |            |                              |                            | 55_1                        | 2 -   | _///             |       |   |
| 19.40m     | SA                  | Surve        | ey abandon                          | ed            |             |            |                              |                            | 55_9                        | 0 -   | M                | 19.4m | l |

#### Total grades for project



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| Pos    | Code   | Description   | Image                      |
|--------|--------|---|----------------------------|
| 00.00m | IC     | Start node type, inspection chamber<br>IC49                                 | Image Provided - Ref: 55_0 |
| 00.10m | S1 DER | Settled deposits coarse0.1m - 0m: 5% Cross<br>sectional area loss - Grade 3 | Image Provided - Ref: 55_1 |
| 03.95m | JDM    | Joint displaced medium - Grade 2  | Image Provided - Ref: 55_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 07.14m | JDM  | Joint displaced medium - Grade 2                                  | Image Provided - Ref: 55_3 |
| 08.68m | DES  | Settled deposits fine: 25% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 55_4 |
| 11.09m | JDM  | Joint displaced medium - Grade 2                                  | Image Provided - Ref: 55_5 |
| 14.83m | JDM  | Joint displaced medium - Grade 2                                  | Image Provided - Ref: 55_6 |

| Grade 1 Defects 0 Grade 2 | 2 Defects 192 Grade 3 Defects | 54   Grade 4 Defects   3 | Grade 5 Defects 0 |
|---------------------------|-------------------------------|--------------------------|-------------------|



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| Pos    | Code | Description   | Image                       |
|--------|------|---|-----------------------------|
| 14.83m | DES  | Settled deposits fine: 25% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 55_7  |
| 17.34m | DES  | Settled deposits fine: 40% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 55_8  |
| 18.26m | DES  | Settled deposits fine: 60% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 55_9  |
| 19.06m | DES  | Settled deposits fine: 70% Cross sectional<br>area loss - Grade 2 | Image Provided - Ref: 55_10 |

| Grade 1 Defects 0 Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------------------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 19.40m | DES  | Settled deposits fine: 80% Cross sectional<br>area loss - Grade 2               | Image Provided - Ref: 55_11   |
| 19.40m | SA   | Survey abandoned<br>Unable To Put Camera Any Further Along<br>Drain Due To Silt | Image Provided - Ref: 55_9999 |

Total grades for project



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# Site: Mount Pleasant Road

Section 62

| CI                                     | Client: Location (Street Name): City/Town/Village Cust Job Ref. Surveyors Name: Mount Pleasant Road |       |   |       |          |                                      |            | rs Name: | Date<br>08/08/2 |          |                   |        |    |  |  |
|--|---|-------|---|-------|----------|--------------------------------------|------------|----------|-----------------|----------|-------------------|--------|----|--|--|
| Start Node<br>Start Node<br>Start Node | Depth:  | ate:  |   |       |          | ode Ref:<br>ode Depth:<br>ode Coordi |            |          | IC51<br>200     | <u> </u> |                   |        |    |  |  |
| Drain Type                             | Lining  | Туре  | Lining Mat.                                   | Yea   | r Const. | Weather                              | Flow Cont. | Length   |                 | R        | emarks            |        |    |  |  |
| A                                      |   |       | D N 17.91                                     |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
| Position                               | Code  | Desc  | ription                                       |       |          |                                      |            |          | CD Pi           | c Grade  | /                 | 0m     |    |  |  |
| 00.00m                                 | IC  | Start | node type,                                    | insp  | ection c | hamber                               |            |          | 34              | 4_0 C    |                   |        |    |  |  |
| 07.57m                                 | LLH   | Line  | ne of drain/sewer deviates left [half] 34_3 0 |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
| 11.23m                                 | REM   | Gene  | General remark 34_5 0 —                       |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
| 14.90m                                 |   | Line  | of drain/sew                                  | -1/   |          |                                      |            |          |                 |          |                   |        |    |  |  |
| 17.91m                                 | ICF   | Finis | h node type                                   | , ins | 4_9 C    | , _/ / ,                             | FLOW       |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          | $\langle \rangle$ | 17.01- | 12 |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          | /                 | 17.91n | n  |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |
|  |   |       |   |       |          |                                      |            |          |                 |          |                   |        |    |  |  |

#### Total grades for project

0



| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC50                                     | Image Provided - Ref: 34_0 |
| 07.57m | LLH  | Line of drain/sewer deviates left [half]  | Image Provided - Ref: 34_3 |
| 11.23m | REM  | General remark<br>INSPECTION COVER BELIEVED TO HAVE<br>BEEN COVERED WITH TARMAC | Image Provided - Ref: 34_5 |

# **Descriptive Report with Remarks and Observation Images**



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 14.90m | LLH  | Line of drain/sewer deviates left [half]                                  | Image Provided - Ref: 34_6    |
| 17.91m | ICF  | Finish node type, inspection chamber<br>IC51 - COVER INSIDE "GARDEN ROOM" | Image Provided - Ref: 34_9999 |

#### Total grades for project



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# Site: Mount Pleasant Road

# Section 63

| Cli   | ient:     |               |                               | treet Name):<br>asant Road                   | City/T  | own/Village | Cust   | Job Ref.   | Surveyors                       | Name: |                                  | ate:<br>8/2018 |  |
|---|-----------|---------------|-------------------------------|--|---------|-------------|--------|------------|---------------------------------|-------|----------------------------------|----------------|--|
| Start Node I<br>Start Node I<br>Start Node (  | Depth:    | ate:          |                               | IC52 Finish No<br>420 Finish No<br>Finish No |         |             |        | END<br>420 | Direction:<br>Use:<br>Material: |       | Height/Dia:<br>Shape:<br>Cleaned | 100<br>C<br>N  |  |
| Drain Type                                    | Lining    | Туре          | Lining Mat.                   | Year Const.                                  | Weather | Flow Cont.  | Length |            | Rei                             | marks |                                  |                |  |
| A   |           |               | D N 0.11 FROM IC39 TO DOWNPIP |  |         |             |        |            |                                 |       |                                  |                |  |
| <b>Position</b><br>00.00m<br>00.11m<br>00.11m | MH<br>LDH | Start<br>Line | node type,                    | ver deviates                                 |         |             |        | 35         |                                 |       | Om                               | m              |  |

#### Total grades for project

0



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| Pos    | Code | Description                              | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | MH   | Start node type, manhole<br>IC52         | Image Provided - Ref: 35_0    |
| 00.11m | LDH  | Line of drain/sewer deviates down [half] | Image Provided - Ref: 35_1    |
| 00.11m | SA   | Survey abandoned<br>DRAIN BLOCKED        | Image Provided - Ref: 35_9999 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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# Site: Mount Pleasant Road

# Section 64

| CI                                     | ient:  |       | Location (St<br>Mount Plea |           |           | City/T                               | own/Village | Cus    | t Job Ref. | Survey  | :       | Date<br>08/08/2                         |       |   |  |  |
|--|--------|-------|----------------------------|-----------|-----------|--------------------------------------|-------------|--------|------------|---------|---------|---|-------|---|--|--|
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |                            | IC53<br>0 |           | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | JCT<br>(   |         | S       | D Height/Dia:<br>S Shape:<br>VC Cleaned |       |   |  |  |
| Drain Type                             | Lining | Туре  | Lining Mat.                | Yea       | r Const.  | Weather                              | Flow Cont.  | Length |            | l       | Remarks |   |       |   |  |  |
| A                                      |        |       |                            |           |           | D                                    | N           | 9.99   |            | S       | DAKAWAY | /                                       |       |   |  |  |
| Position                               | Code   | Desc  | ription                    |           |           |                                      |             |        | CD Pi      | c Grade | 9       | Λ                                       | 0m    |   |  |  |
| 00.00m                                 | IC     | Start | node type,                 | insp      | ection o  | chamber                              |             |        | 56         | 6_0     | 0 —     | 7                                       |       |   |  |  |
| 00.00m                                 | JD     | Joint | displaced r                | nedi      | um        |                                      |             | 56     | 6_1        | 2       |         |   |       |   |  |  |
| 02.74m                                 | DEE    | Attac | hed deposi                 | ts, e     | ncrusta   | tion 12-7                            |             | 56     | 6_2        | 3 —     |         | -                                       |       |   |  |  |
| 08.90m                                 | LLH    | Line  | of drain/sev               | ver c     | leviates  | left [half                           | ]           |        |            |         | 0 _     | - 1                                     |       |   |  |  |
| 09.99m                                 | WRF    | Finis | h node type                | , ma      | ajor coni | nection v                            | vithout ma  | nhole  | 56         | 6_9     | 0 _/    |   | FLOW  | 7 |  |  |
|  |        |       |                            |           |           |                                      |             |        |            |         |         |   | 9.99m | Î |  |  |

#### Total grades for project

0



| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC53  | Image Provided - Ref: 56_0 |
| 00.00m | JDM  | Joint displaced medium - Grade 2   | Image Provided - Ref: 56_1 |
| 02.74m | DEE  | Attached deposits, encrustation from 12<br>o'clock to 12 o'clock: 5% Cross sectional<br>area loss - Grade 3<br>Deposits Attached To Full Circumference Of<br>Drain Through Entire Length | Image Provided - Ref: 56_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 Defects 54 Grade 4 Defects 3 Grade 5 Defect | s 0 |
|---|-----|
|---|-----|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 08.90m | LLH  | Line of drain/sewer deviates left [half]   | Image Provided - Ref: 56_4    |
| 09.99m | WRF  | Finish node type, major connection without<br>manhole<br>Connection With Drain From IC49 To IC52 | Image Provided - Ref: 56_9999 |

Total grades for project

| Grade 1 Defects |
|-----------------|
|-----------------|



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#### Site: Mount Pleasant Road

# Section 65

| Mount Pleasant Road     08/08/24       Start Node Ref:     IC56     Direction:     D       Start Node Depth:     S20     Finish Node Depth:     S20       Start Node Coordinate:     D     Node     S20       Drain Type     Lining Mat.     Year Const.     Weather     Flow Cont     Length     Remarks       A     D     N     0     Node     O     Node     O  | CI                 | Client: Location (Street Name): |       |             |              |           | own/Village | Cust   | Job Ref. | Surveyo | Dat    | e:     |               |
|--|--------------------|---------------------------------|-------|-------------|--------------|-----------|-------------|--------|----------|---------|--------|--------|---------------|
| Start Node Depth:       620       Finish Node Depth:       620       Use:       F       Shape:       Cleaned         Drain Type       Lining Type       Lining Mat.       Year Const.       Weather       Flow Cont.       Length       Remarks         A       D       N       0       N       0       Om         Position       Code       Description       CD       Pic       Grade       Om         00.00m       IC       Start node type, inspection chamber       0       O       O       Om         00.00m       SA       Survey abandoned       0       O       Om       Om |                    |                                 |       | Mount Plea  | asant Road   |           |             |        |          |         |        | 08/08/ | 2018          |
| A     D     N     0       Position Code Description     CD Pic Grade       00.00m IC     Start node type, inspection chamber     0 —       00.00m SA     Survey abandoned     0 —  | Start Node         | Depth:                          | ate:  |             | 620 Finish N | ode Depth |             |        |          | Use:    | F      | Shape: | 100<br>C<br>N |
| Position       CD       Pic       Grade         00.00m       IC       Start node type, inspection chamber       0 —         00.00m       SA       Survey abandoned       0 —   | Drain Type         | Lining                          | Туре  | Lining Mat. | Year Const.  | Weather   | Flow Cont.  | Length |          | R       | emarks |        |               |
| 00.00m     IC     Start node type, inspection chamber     0 —       00.00m     SA     Survey abandoned     0 —   | A                  |                                 |       |             |              | D         | N           | 0      |          |         |        |        |               |
|  | Position<br>00.00m | IC                              | Start | node type,  |              |           | 1           |        | CD Pi    | C       | ) —    | FLOW   |               |

#### Total grades for project

0



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# **Descriptive Report with Remarks and Observation Images**

| Pos    | Code | Description                                | Image |
|--------|------|--|-------|
| 00.00m | IC   | Start node type, inspection chamber IC56   |       |
| 00.00m | SA   | Survey abandoned<br>UNABLE TO CCTV BLOCKED |       |

#### Total grades for project



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# Site: Mount Pleasant Road

# **Section 66**

| C                                      | ient:                 |                               | Location (St<br>Mount Plea  |             | City/T                               | own/Village | Cust           | Job Ref.       | Surveyors   | s Name: | Date<br>08/08/2          |               |
|--|-----------------------|-------------------------------|---|-------------|--------------------------------------|-------------|----------------|----------------|---|---------|--------------------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth:                | ate:                          |   |             | ode Ref:<br>ode Depth:<br>ode Coordi |             |                | IC56<br>560    | Direction:<br>Use:<br>Material:   | C Sha   | ght/Dia:<br>ape:<br>aned | 100<br>C<br>N |
| Drain Type                             | Lining                | Туре                          | Lining Mat.   | Year Const. | Weather<br>D                         | Flow Cont.  | Length<br>8.04 |                | Re  | marks   |                          |               |
| Position<br>00.00m<br>05.91m<br>06.86m | IC<br>WL<br>CU<br>REM | Start<br>Wate<br>Loss<br>Gene | ription<br>node type,<br>er level 209<br>of vision<br>eral remark<br>ey abandon | %           |                                      |             |                | 36<br>36<br>36 | c       Grade         5_0       0         5_1       0         5_2       0         5_3       0         5_9       0 |         | 0m                       |               |

#### Total grades for project



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| Pos    | Code | Description                                 | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC57 | Image Provided - Ref: 36_0 |
| 05.91m | WL   | Water level: 20% Height/Diameter            | Image Provided - Ref: 36_1 |
| 06.86m | CU   | Loss of vision<br>CAMERA IN WATER           | Image Provided - Ref: 36_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 | Grade 2 Defects 192 Grade | 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---------------------------|------------------------------|---|-----------------|---|
|-------------------|---------------------------|------------------------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 07.57m | REM  | General remark<br>CAMERA ENTER IC56                     | Image Provided - Ref: 36_3    |
| 08.04m | SA   | Survey abandoned<br>SURVEY ABANDONED DUE TO<br>BLOCKAGE | Image Provided - Ref: 36_9999 |

Total grades for project

0



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# Site: Mount Pleasant Road

# Section 67

| C                                      | ient:                   |                                 | Location (St<br>Mount Plea   |                          | City/T           | City/Town/Village Cust Job Ref.      |            |                | ef.            | Surveyors Name:  |          |         | Date<br>08/08/2 |    |  |
|--|-------------------------|---------------------------------|--|--------------------------|------------------|--------------------------------------|------------|----------------|----------------|--|----------|---------|-----------------|----|--|
| Start Node<br>Start Node<br>Start Node | Depth:                  | ate:                            | I  | C65<br>0                 | Finish N         | ode Ref:<br>ode Depth:<br>ode Coordi |            |                |                | C62 Direction: U Height/Dia:<br>0 Use: C Shape:<br>Material: PVC Cleaned |          |         |                 |    |  |
| Drain Type                             | Lining                  | Туре                            | Lining Mat.  | Yea                      | r Const.         | Weather<br>D                         | Flow Cont. | Length<br>3.11 |                |  | F        | Remarks |                 |    |  |
| 02.40m                                 | IC<br>DES<br>DES<br>DES | Start<br>S1 S<br>F1 S<br>Settle | ription<br>node type,<br>ettled depos<br>ed deposits<br>ey abandon | sits f<br>sits f<br>fine | ine 5%<br>ine 5% | 0<br>0                               |            |                | CD<br>S1<br>F1 | Pic<br>64<br>64<br>64<br>64  | _0<br>_1 |         |                 | 0m |  |

#### Total grades for project

0



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| Pos    | Code   | Description  | Image                      |
|--------|--------|--|----------------------------|
| 00.00m | IC     | Start node type, inspection chamber<br>IC63                                  | Image Provided - Ref: 64_0 |
| 00.52m | S1 DES | Settled deposits fine0.52m - 2.4m: 5% Cross<br>sectional area loss - Grade 2 | Image Provided - Ref: 64_1 |
| 02.40m | F1 DES | Settled deposits fineDefect End: 5% Cross sectional area loss - Grade 2      |                            |
| 03.11m | DES    | Settled deposits fine: 5% Cross sectional<br>area loss - Grade 2             | Image Provided - Ref: 64_2 |

# **Descriptive Report with Remarks and Observation Images**

#### Total grades for project

0



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 03.11m | SA   | Survey abandoned<br>UNABLE TO GET CAMERA FURTHER<br>ALONG DRAIN | Image Provided - Ref: 64_9999 |

Total grades for project

0



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# Site: Mount Pleasant Road

# Section 68

| С   | ient:                   |                               | Location (St<br>Mount Plea  |  | City/T                               | own/Village | Cust | t Job Ref.           | Surveyors Name:   |         | Date:<br>08/08/2018                |
|---|-------------------------|-------------------------------|---|--|--------------------------------------|-------------|------|----------------------|---|---------|------------------------------------|
| Start Node<br>Start Node<br>Start Node                | Depth:                  | ate:                          | I   |  | ode Ref:<br>ode Depth:<br>ode Coordi |             |      | IC63                 | <ul><li>B Direction:</li><li>D Use:</li><li>Material:</li></ul> | C Sh    | ight/Dia: 150<br>ape: C<br>eaned N |
| Drain Type  | Lining                  | Туре                          | Lining Mat.   | Year Const.                                  |                                      | Flow Cont.  | Ŭ    |                      | F   | Remarks |                                    |
| A<br>Position<br>00.00m<br>04.34m<br>04.45m<br>04.45m | IC<br>DES<br>LLH<br>DES | Start<br>S1 S<br>Line<br>F1 S | ription<br>node type,<br>ettled depos<br>of drain/sew<br>ettled depos<br>ey abandon | sits fine 10<br>ver deviates<br>sits fine 10 | %<br>left [half                      |             | 4.45 | S1 65<br>65<br>F1 65 | 5_0<br>5_1<br>5_2<br>5  |         | 0m<br>4.45m                        |

#### Total grades for project



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| Pos    | Code   | Description   | Image                      |
|--------|--------|---|----------------------------|
| 00.00m | IC     | Start node type, inspection chamber<br>IC64                                 | Image Provided - Ref: 65_0 |
| 00.00m | S1 DES | Settled deposits fine0m - 4.45m: 10% Cross<br>sectional area loss - Grade 2 | Image Provided - Ref: 65_1 |
| 04.34m | LLH    | Line of drain/sewer deviates left [half]                                    | Image Provided - Ref: 65_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defe |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|--------------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|--------------|



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| Pos    | Code   | Description   | Image                         |
|--------|--------|---|-------------------------------|
| 04.45m | F1 DES | Settled deposits fineDefect End: 10% Cross<br>sectional area loss - Grade 2 | Image Provided - Ref: 651     |
| 04.45m | SA     | Survey abandoned<br>SURVEY FINISHES AT BEND IN DRAIN<br>TO IC63             | Image Provided - Ref: 65_9999 |

Total grades for project



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# Site: Mount Pleasant Road

# Section 69

| Client: Location (Street Name):<br>Mount Pleasant Road |        |        |             | City/Town/Village Cust Jo |                      |                                      | t Job Ref. | Surveyor | s Name:   | Date:<br>08/08/2018             |                            |                      |
|--|--------|--------|-------------|---------------------------|----------------------|--------------------------------------|------------|----------|-----------|---------------------------------|----------------------------|----------------------|
| Start Node F<br>Start Node I<br>Start Node (           | Depth: | ate:   |             |                           | Finish N<br>Finish N | ode Ref:<br>ode Depth:<br>ode Coordi |            |          | IC64<br>0 | Direction:<br>Use:<br>Material: | U Heig<br>C Sha<br>VC Clea | ht/Dia: 150<br>pe: C |
| Drain Type   | Lining | Туре   | Lining Mat. | Yea                       | r Const.             | Weather                              | Flow Cont. |          |           | Re                              | marks                      |                      |
| A  |        |        |             |                           |                      | D                                    | N          | 4.8      |           |                                 |                            |                      |
| Position   | Code   | Desc   | ription     |                           |                      |                                      |            |          | CD Pi     | c Grade                         | /                          | 0m                   |
| 00.00m   | IC     | Start  | node type,  | insp                      | ection o             | chamber                              |            |          | 66        | 6_0 0                           |                            |                      |
| 02.75m   | DES    | Settle | ed deposits | fine                      | 5%                   |                                      |            |          | 66        | 6_1 2                           | $\neg$                     |                      |
| 04.80m   | ICF    | Finis  | h node type | , ins                     | pection              | chambe                               | r          |          | 66        | 6_9 0                           | $\neg \backslash$          | M                    |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            | FLOW                 |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 | $\backslash$               | 4.8m                 |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |
|  |        |        |             |                           |                      |                                      |            |          |           |                                 |                            |                      |

#### Total grades for project

0



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| Pos    | Code | Description                                 | Image                         |
|--------|------|---|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC65 | Image Provided - Ref: 66_0    |
| 02.75m | DES  | Settled deposits fine: 5% Cross sectional   | Image Provided - Ref: 66_1    |
|        |      | area loss <sup>'</sup> - Grade 2            |                               |
| 04.80m | ICF  | Finish node type, inspection chamber        | Image Provided - Ref: 66_9999 |

# **Descriptive Report with Remarks and Observation Images**

| Grade 1 Defects 0 Grade 2 Defects 192 Grade 3 I | efects 54 Grade 4 Defects 3 |
|---|-----------------------------|
|---|-----------------------------|



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# Site: Mount Pleasant Road

# Section 70

| CI                                     | ient:   |        | Location (St |               | : City/Town/Village Cust Jo |            |        |      | Surve   | yors Name:                      |                       | Date:  |
|--|---|--------|--------------|---------------|-----------------------------|------------|--------|------|---------|---------------------------------|-----------------------|--------|
|  |   |        | Mount Plea   | asant Road    |                             |            |        |      |         |                                 | 08/0                  | 8/2018 |
| Start Node<br>Start Node<br>Start Node | e Depth: 1910 Finish Node Depth: 1510 Use: F Shap |        |              |               |                             |            |        |      |         | Height/Dia<br>Shape:<br>Cleaned | : 225<br>C<br>N       |        |
| Drain Type                             | Lining  | Туре   | Lining Mat.  | Year Const.   | Weather                     | Flow Cont. | Length |      |         | Remarks                         |                       |        |
| A                                      |   |        |              |               | D                           | Ν          | 63.97  |      |         |                                 |                       |        |
| Position                               | Code  | Desc   | ription      |               |                             |            |        | CD P | ic Grac | le                              | 0m                    |        |
| 00.00m                                 | IC  | Start  | node type,   | inspection of | chamber                     |            |        | 3    | 7_0     | 0 —                             |                       |        |
| 14.72m                                 | WL  | Wate   | er level 5%  |               |                             |            |        | 3    | 7_2     | 0 —                             |                       |        |
| 62.10m                                 | JD  | Joint  | displaced n  | nedium        |                             |            |        | 3    | 7_4     | 2                               |                       | =      |
| 63.97m                                 | ICF   | Finisl | h node type  | , inspection  | chambe                      | r          |        | 3    | 7_9     | 0 _/                            |                       |        |
|  |   |        |              |               |                             |            |        |      |         | //                              |                       | FLOW   |
|  |   |        |              |               |                             |            |        |      |         |                                 | $\langle     \rangle$ |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       | 1      |
|  |   |        |              |               |                             |            |        |      |         |                                 | 63.                   | 97m    |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |
|  |   |        |              |               |                             |            |        |      |         |                                 |                       |        |

#### Total grades for project



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Descriptive Report with Remarks and Observation Images

#### Total grades for project

0



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| Pos    | Code | Description                                  | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC67  | Image Provided - Ref: 37_0    |
| 14.72m | WL   | Water level: 5% Height/Diameter              | Image Provided - Ref: 37_2    |
| 62.10m | JDM  | Joint displaced medium - Grade 2             | Image Provided - Ref: 37_4    |
| 63.97m | ICF  | Finish node type, inspection chamber<br>IC68 | Image Provided - Ref: 37_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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# Site: Mount Pleasant Road

Section 71

| CI   | ient:  |       | Location (St<br>Mount Plea |      |          | City/T                               | own/Village | Cust   | t Job Ref.  | Surveyor | rs Name:     | Date:<br>08/08/20        |               |
|--|--------|-------|----------------------------|------|----------|--------------------------------------|-------------|--------|-------------|----------|--------------|--------------------------|---------------|
| Start Node  <br>Start Node  <br>Start Node | Depth: | ate:  |                            |      |          | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | END<br>1510 |          | F Sha        | ght/Dia:<br>ipe:<br>aned | 225<br>C<br>N |
| Drain Type                                 | Lining | Туре  | Lining Mat.                | Yea  | r Const. | Weather                              | Flow Cont.  | Length |             | Re       | emarks       |                          |               |
| А  |        |       |                            |      |          | D                                    | Ν           | 21.24  |             |          |              |                          |               |
| Position                                   | Code   | Desc  | ription                    |      |          |                                      |             |        | CD Pi       | c Grade  | 1            | 0m                       |               |
| 00.00m                                     | MH     | Start | node type,                 | mar  | hole     |                                      |             |        | 38          | 3_0 0    | -//          |                          |               |
| 00.10m                                     | JD     | Joint | displaced n                | nedi | um       |                                      |             |        | 38          | 3_3 2    | -//          | 1                        |               |
| 01.31m                                     | WL     | Wate  | er level 5%                |      |          |                                      |             |        | 38          | 3_1 0    | -/           |                          |               |
| 04.28m                                     | WL     | Wate  | er level 5%                |      |          |                                      |             |        | 38          | 3_2 0    |              |                          |               |
| 10.87m                                     | JD     | Joint | displaced n                | nedi | um       |                                      |             |        | 38          | 3_4 2    | _            | FLOW                     | 7             |
| 21.24m                                     | MHF    | Finis | h node type                | , ma | anhole   |                                      |             |        | 38          | 3_9 0    |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          | $\backslash$ |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          | /            | 21.24m                   | л             |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |
|  |        |       |                            |      |          |                                      |             |        |             |          |              |                          |               |

#### Total grades for project



| Pos    | Code | Description                      | Image                      |
|--------|------|----------------------------------|----------------------------|
| 00.00m | МН   | Start node type, manhole<br>IC68 | Image Provided - Ref: 38_0 |
| 00.40  |      |                                  | Image Provided - Ref: 38_3 |
| 00.10m | JDM  | Joint displaced medium - Grade 2 | inage Flovided - Kel. 30_3 |
|        |      |                                  |                            |
| 01.31m | WL   | Water level: 5% Height/Diameter  | Image Provided - Ref: 38_1 |
|        |      |                                  |                            |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 Grade 2 Defects | 192 Grade 3 Defects 54 | Grade 4 Defects 3 | Grade 5 Defects | 0 |
|-----------------------------------|------------------------|-------------------|-----------------|---|
|-----------------------------------|------------------------|-------------------|-----------------|---|



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| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 04.28m | WL   | Water level: 5% Height/Diameter  | Image Provided - Ref: 38_2    |
| 10.87m | JDM  | Joint displaced medium - Grade 2<br>BELIEVED TO BE UNDER ADJACENT<br>PROPERTY GARDEN                 | Image Provided - Ref: 38_4    |
| 21.24m | MHF  | Finish node type, manhole<br>END - PASSED UNDER BOUNDARY<br>FENCE INTO ADJACENT PROPERTY<br>GARDENS. | Image Provided - Ref: 38_9999 |

| Grade 1 Defects     0     Grade 2 Defects     192     Grade 3 Defects     54     Grade 4 Defects     3     Grade 4 Defects | Grade 5 Defects | 0 |
|--|-----------------|---|
|--|-----------------|---|



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# Site: Mount Pleasant Road

Section 72

| CI                                     | Client: Location (Street Name): City/Town/Village<br>Mount Pleasant Road |       |  | ,          | City/T               | own/Village                          | Cust       | Job Ref. | Survey       | vors Name                      |                     | Date<br>08/08/2 |            |               |
|--|--|-------|--|------------|----------------------|--------------------------------------|------------|----------|--------------|--------------------------------|---------------------|-----------------|------------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth:   | ate:  | М  | H71<br>870 | Finish N<br>Finish N | ode Ref:<br>ode Depth:<br>ode Coordi |            |          | IC70<br>2900 | Direction<br>Use:<br>Material: | : D<br>S<br>PVC     | Height<br>Shape | /Dia:<br>: | 100<br>C<br>N |
| Drain Type                             | Lining   | Туре  | Lining Mat.                                  | Yea        | r Const.             | Weather                              | Flow Cont. | Length   |              |                                | Remarks             |                 |            |               |
| A                                      |  |       |  |            |                      | D                                    | N          | 9.66     | LINE OF      | DRAIN RI                       | JNS FROM<br>DAKAWAY |                 | TO IC7     | 70            |
| Position                               | Code   | Desc  | ription                                      |            |                      |                                      |            |          | CD Pi        | c Grad                         | e                   | 1               | Om         |               |
| 00.00m                                 | ΜН   | Start | node type,                                   | mar        | hole                 |                                      |            |          | 39           | 9_0                            | 0 -                 |                 |            |               |
| 00.10m                                 | JN   | Junc  | tion 9:100                                   | mm         | Diamet               | er                                   |            |          | 39           | 9_1                            | 0 -/                | ///             |            |               |
| 00.10m                                 | JD   | Joint | displaced n                                  | nedi       | um                   |                                      |            |          | 39           | 9_2                            | 2/                  | //              | 200        |               |
| 00.54m                                 | LDQ  | Line  | of drain/sew                                 | ver c      | leviates             | down [q                              | uarter]    |          | 39           | 9_3                            | 0 -/                | /               |            |               |
| 02.30m                                 | LDQ  | Line  | of drain/sew                                 | ver c      | leviates             | down [q                              | uarter]    |          | 39           | 9_4                            | 0 —/                | - 1             | FLOW       | 4             |
| 09.55m                                 | REM  | Gene  | General remark 39_6 0 —                      |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
| 09.66m                                 | ICF  | Finis | inish node type, inspection chamber 39_9 0 — |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     | $\mathcal{N}$   | 9.66m      |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     | x               |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |
|  |  |       |  |            |                      |                                      |            |          |              |                                |                     |                 |            |               |

#### Total grades for project



| Pos    | Code | Description                           | Image                      |
|--------|------|---------------------------------------|----------------------------|
| 00.00m | МН   | Start node type, manhole<br>MH71      | Image Provided - Ref: 39_0 |
| 00.10m | JN   | Junction at 9 o'clock: 100mm Diameter | Image Provided - Ref: 39_1 |
| 00.10m | JDM  | Joint displaced medium - Grade 2      | Image Provided - Ref: 39_2 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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0

| Pos    | Code | Description                                   | Image                      |
|--------|------|---|----------------------------|
| 00.54m | LDQ  | Line of drain/sewer deviates down [quarter]   | Image Provided - Ref: 39_3 |
| 02.30m | LDQ  | Line of drain/sewer deviates down [quarter]   | Image Provided - Ref: 39_4 |
| 09.55m | REM  | General remark<br>DRAIN ENDS AT IC70 SOAKAWAY | Image Provided - Ref: 39_6 |

| Grade 1 Defects 0 Grade 2 Defects | 192   Grade 3 Defects   54 | 4 Grade 4 Defects 3 Grade 5 Defects |  |
|-----------------------------------|----------------------------|-------------------------------------|--|
|-----------------------------------|----------------------------|-------------------------------------|--|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 09.66m | ICF  | Finish node type, inspection chamber<br>IC70 - DRAIN ENDS AT SOAKAWAY | Image Provided - Ref: 39_9999 |

#### Total grades for project

| Grade 1 Defects |
|-----------------|
|-----------------|



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# Site: Mount Pleasant Road

# Section 73

| Client:                      |          |                            | Location (St                                    | reet Name): | City/T     | own/Village | Cus    | t Job Ref. | Survey             | ors Name            | :              | Date          | ə:       |
|------------------------------|----------|----------------------------|---|-------------|------------|-------------|--------|------------|--------------------|---------------------|----------------|---------------|----------|
|                              |          |                            | Mount Plea                                      | asant Road  |            |             |        |            |                    |                     |                | 08/08/2018    |          |
| Start Node F<br>Start Node I |          |                            | MH71 Finish Node Ref:<br>870 Finish Node Depth: |             |            |             |        |            | Direction:<br>Use: | D<br>S              | Heigh<br>Shap  | nt/Dia:<br>e: | 100<br>C |
| Start Node (                 | Coordina | ate:                       |   | Finish No   | ode Coordi | nate:       |        |            | Material:          | PVC                 | Clear          | ned           | N        |
| Drain Type                   | Lining   | Туре                       | Lining Mat.                                     | Year Const. | Weather    | Flow Cont.  | Length |            | F                  | Remarks             |                |               |          |
| А                            |          |                            |   |             | D          | N           | 21.37  | LINE OF    | DRAIN RU<br>SC     | INS FROM<br>DAKAWAY |                | 1 TO IC       | 70       |
| Position                     | Code     | Desc                       | ription   |             |            |             |        | CD Pie     | c Grade            | 9                   | $\square$      | 0m            |          |
| 00.00m                       | MH       | Start                      | node type,                                      | manhole     |            |             |        | 40         | 0_0                | 0 —                 |                |               |          |
| 03.07m                       | DER      | Settle                     | ed deposits                                     | coarse 5%   | ,<br>D     |             |        | 40         | _2                 | 3 —                 | 2              |               |          |
| 04.06m                       | JN       | Junc                       | tion 3:100                                      | mm Diamet   | er         |             |        | 40         | _3                 | 0 —                 |                |               |          |
| 04.61m                       | DER      | Settle                     | ed deposits                                     | coarse 5%   | ,<br>D     |             |        | 40         | _4                 | 3 —/                |                |               |          |
| 11.09m                       | JD       | Joint                      | displaced n                                     | 40          | )_5        | 2 —         |        |            |                    |                     |                |               |          |
| 11.09m                       | DER      | Settled deposits coarse 5% |   |             |            |             |        |            | )_6                | 3 —                 | $\rightarrow$  |               |          |
| 12.74m                       | JN       | Junc                       | tion 11 : 10                                    | 40          | )_7        | 0 ——        |        |            | 7-                 |                     |                |               |          |
| 15.71m                       | JN       | Junc                       | tion 3 : 100                                    | mm Diamet   | 40         | _8          | 0 —    |            |                    | 6                   |                |               |          |
| 20.57m                       | WL       | Wate                       | er level 5%                                     |             |            |             |        | 40         | )_1                | 0 —                 |                |               |          |
| 21.37m                       | JN       | Junc                       | tion 3 : 100                                    | mm Diamet   | er         |             |        | 40         | _9                 | 0                   | $\setminus$    |               |          |
| 21.37m                       | SA       | Surv                       | ey abandon                                      | ed          |            |             |        | 40         | )_9                | 0 —                 | $\overline{/}$ | 21.37         | m        |

#### Total grades for project

0

54



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 00.00m | MH   | Start node type, manhole<br>MH71   | Image Provided - Ref: 40_0 |
| 03.07m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3<br>APPEARS TO BE STONES AND<br>CONCRETE ALONG LINE OF DRAIN | Image Provided - Ref: 40_2 |
| 04.06m | JN   | Junction at 3 o'clock: 100mm Diameter  | Image Provided - Ref: 40_3 |

# Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description  | Image                      |
|--------|------|--|----------------------------|
| 04.61m | DER  | Settled deposits coarse: 5% Cross sectional<br>area loss - Grade 3 | Image Provided - Ref: 40_4 |
| 11.09m | JDM  | Joint displaced medium - Grade 2                                   | Image Provided - Ref: 40_5 |
|        |      |  | HIRST-ES. HIROGERE MARKOUT |
| 11.09m | DER  | Settled deposits coarse: 5% Cross sectional                        | Image Provided - Ref: 40_6 |
|        |      | area loss - Grade 3  |                            |
| 12.74m | JN   | Junction at 11 o'clock: 100mm Diameter                             | Image Provided - Ref: 40_7 |
|        |      |  |                            |

| I                 | · · · · ·           | ¬                 |                 |                     |
|-------------------|---------------------|-------------------|-----------------|---------------------|
| Grade 1 Defects 0 | Grade 2 Defects 192 | Grade 3 Defects 5 | Grade 4 Defects | 3 Grade 5 Defects 0 |



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| Pos    | Code | Description                           | Image                         |
|--------|------|---------------------------------------|-------------------------------|
| 15.71m | JN   | Junction at 3 o'clock: 100mm Diameter | Image Provided - Ref: 40_8    |
| 20.57m | WL   | Water level: 5% Height/Diameter       | Image Provided - Ref: 40_10   |
| 21.37m | JN   | Junction at 3 o'clock: 100mm Diameter | Image Provided - Ref: 40_9    |
| 21.37m | SA   | Survey abandoned<br>BLOCKAGE IN DRAIN | Image Provided - Ref: 40_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 | ] |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|---|
|                 |   |                 |     |                 |    |                 |   |                 |   |   |



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### Site: Mount Pleasant Road

Section 74

| С                                      | lient: |       | Location (St | reet Name):                              | City/T      | own/Village | Cust   | t Job Ref.  | Surve | eyors Name | :                       | Date    | )]            |
|--|--------|-------|--------------|--|-------------|-------------|--------|-------------|-------|------------|-------------------------|---------|---------------|
|  |        |       | Mount Plea   | asant Road                               |             |             |        |             |       |            |                         | 08/08/2 | 018           |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |              | C72 Finish N<br>610 Finish N<br>Finish N |             |             |        | MH76<br>840 |       | S          | Heigh<br>Shape<br>Clean | e:      | 100<br>C<br>N |
| Drain Type                             | Lining | Туре  | Lining Mat.  | Year Const.                              | Weather     | Flow Cont.  | Length |             |       | Remarks    |                         |         |               |
| A                                      |        |       |              |  | D           | N           | 16.04  |             |       |            |                         |         |               |
| Position                               | Code   | Desc  | ription      |  |             |             |        | CD Pi       | c Gra | de         |                         | 0m      |               |
| 00.00m                                 |        |       | node type,   | inspection                               | chamber     |             |        | 4           | 1_0   | 0 —        |                         |         |               |
| 01.20m                                 | JN     | Junc  | tion 3:100   | mm Diame                                 | ter         |             |        | 4           | 1_1   | 0 —        | 5                       |         |               |
| 03.73m                                 | JN     | Junc  | tion 3 : 100 | mm Diame                                 | ter         |             |        | 4           | 1_2   | 0 —        | 5                       |         |               |
| 06.04m                                 | JN     | Junc  | tion 3:100   | mm Diame                                 | ter         |             |        | 4           | 1_3   | 0 —        |                         |         |               |
| 12.63m                                 | JD     | Joint | displaced n  | nedium                                   |             |             |        | 4           | 1_4   | 2 —        |                         | FEO     | 7             |
| 15.49m                                 | LRH    | Line  | of drain/sew | ver deviates                             | s right [ha | lf]         |        | 4           | 1_5   | 0 —        | $\setminus$             |         |               |
| 16.04m                                 | MHF    | Finis | h node type  | , manhole                                |             |             |        | 41          | 1_9   | 0 -        | ()                      |         |               |
|  |        |       |              |  |             |             |        |             |       |            | $\backslash \backslash$ | 16.04r  | n             |
|  |        |       |              |  |             |             |        |             |       |            | ×                       |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |
|  |        |       |              |  |             |             |        |             |       |            |                         |         |               |

#### Total grades for project

0



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| Pos    | Code | Description   | Image                      |
|--------|------|---|----------------------------|
| 00.00m | IC   | Start node type, inspection chamber<br>IC72                         | Image Provided - Ref: 41_0 |
| 01.20m | JN   | Junction at 3 o'clock: 100mm Diameter<br>ASSUMED JUNCTION FROM IC73 | Image Provided - Ref: 41_1 |
| 03.73m | JN   | Junction at 3 o'clock: 100mm Diameter<br>ASSUMED JUNCTION FROM IC74 | Image Provided - Ref: 41_2 |

### Descriptive Report with Remarks and Observation Images

| Grade 1 Defects ( | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-------------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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| Pos    | Code | Description   | Image                         |
|--------|------|---|-------------------------------|
| 06.04m | JN   | Junction at 3 o'clock: 100mm Diameter<br>ASSUMED JUNCTION FROM IC75 | Image Provided - Ref: 41_3    |
| 12.63m | JDM  | Joint displaced medium - Grade 2                                    | Image Provided - Ref: 41_4    |
| 15.49m | LRH  | Line of drain/sewer deviates right [half]                           | Image Provided - Ref: 41_5    |
| 16.04m | MHF  | Finish node type, manhole<br>MH76                                   | Image Provided - Ref: 41_9999 |

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|---|



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### Site: Mount Pleasant Road

### Section 75

| Cli  | ient:  |       | Location (St<br>Mount Plea           |             | City/T                               | own/Village | Cust   | Job Ref.     | Surveyor                        | s Name: | Date<br>08/08/20         |               |
|--|--------|-------|--------------------------------------|-------------|--------------------------------------|-------------|--------|--------------|---------------------------------|---------|--------------------------|---------------|
| Start Node F<br>Start Node I<br>Start Node ( | Depth: | ate:  |                                      |             | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH77<br>1010 | Direction:<br>Use:<br>Material: | F Sha   | ght/Dia:<br>ape:<br>aned | 100<br>C<br>N |
| Drain Type                                   | Lining | Туре  | Lining Mat.                          | Year Const. |                                      | Flow Cont.  | Length |              | Re                              | emarks  |                          |               |
| A  |        |       |                                      |             | D                                    | N           | 19.06  |              |                                 |         |                          |               |
| Position<br>00.00m                           | MH     | Start | ription<br>node type,<br>h node type |             |                                      |             | 19.06  |              | c Grade<br>2_0 0<br>2_9 0       |         | 0m                       |               |
|  |        |       |                                      |             |                                      |             |        |              |                                 |         |                          |               |

### Total grades for project

0



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| Pos    | Code | Description                       | Image                         |
|--------|------|-----------------------------------|-------------------------------|
| 00.00m | MH   | Start node type, manhole<br>MH76  | Image Provided - Ref: 42_0    |
| 19.06m | MHF  | Finish node type, manhole<br>MH77 | Image Provided - Ref: 42_9999 |

### **Descriptive Report with Remarks and Observation Images**

### Total grades for project

| Grade 1 De | fects |
|------------|-------|
|------------|-------|



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### Site: Mount Pleasant Road

Section 76

| C                                      | ient:  |       | Location (St | reet Na  | me):     | City/T                               | own/Village | Cus    | t Job Ref.   | Survey                             | ors Name | :                         | Date:   |               |  |
|--|--------|-------|--------------|----------|----------|--------------------------------------|-------------|--------|--------------|------------------------------------|----------|---------------------------|---------|---------------|--|
|  |        |       | Mount Plea   | asant Ro | oad      |                                      |             |        |              |                                    |          |                           | 08/08/2 | 018           |  |
| Start Node<br>Start Node<br>Start Node | Depth: | ate:  |              | 010 F    | inish No | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | MH8:<br>1310 | 2 Direction<br>0 Use:<br>Material: | С        | Height<br>Shape<br>Cleane | :       | 100<br>C<br>N |  |
| Drain Type                             | Lining | Туре  | Lining Mat.  | Year C   | Const.   | Weather                              | Flow Cont.  | Length |              |                                    | Remarks  |                           |         |               |  |
| А                                      |        |       |              |          |          | D                                    | Ν           | 22.97  |              |                                    |          |                           |         |               |  |
| Position                               | Code   | Desc  | ription      |          |          |                                      |             |        | CD P         | ic Grad                            | е        |                           | 0m      |               |  |
| 00.00m                                 | МН     | Start | node type,   | manh     | ole      |                                      |             |        | 4            | 3_0                                | 0 —      | Ę                         |         |               |  |
| 03.51m                                 | JN     | Junc  | tion 3 : 100 | mm D     | iamet    | er                                   |             |        | 4            | 3_3                                | 0 —      |                           |         |               |  |
| 12.85m                                 | DES    | S1 S  | ettled depos | sits fin | e 5%     | ,<br>D                               |             |        | S1 4         | 3_4                                | 2 -      | . 1                       | -       |               |  |
| 13.51m                                 | DES    | F1 S  | ettled depos | sits fin | e 5%     | D                                    |             |        | F1 4         | 3                                  | 2 —      | $\sum$                    |         |               |  |
| 13.51m                                 | JN     | Junc  | tion 3:100   | mm D     | iamet    | er                                   |             |        | 4            | 3_5                                | 0 —      |                           | FLOW    | 7             |  |
| 18.84m                                 | JN     | Junc  | tion 3:100   | mm D     | iamet    | er                                   |             |        | 4            | 3_6                                | 0 —      |                           | 2       |               |  |
| 22.97m                                 | MHF    | Finis | h node type  | , man    | hole     |                                      |             |        | 4            | 3_9                                | 0 —      | È                         |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          | $\mathbf{i}$              | 22.97r  | n             |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          | ~                         |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |
|  |        |       |              |          |          |                                      |             |        |              |                                    |          |                           |         |               |  |

### Total grades for project

0



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| Pos    | Code   | Description   | Image                      |
|--------|--------|---|----------------------------|
| 00.00m | MH     | Start node type, manhole<br>MH77  | Image Provided - Ref: 43_0 |
| 03.51m | JN     | Junction at 3 o'clock: 100mm Diameter<br>JUNCTION BELIEVED TO BE FROM IC78      | Image Provided - Ref: 43_3 |
| 12.85m | S1 DES | Settled deposits fine12.85m - 13.51m: 5%<br>Cross sectional area loss - Grade 2 | Image Provided - Ref: 43_4 |
| 13.51m | F1 DES | Settled deposits fineDefect End: 5% Cross sectional area loss - Grade 2         |                            |

### Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 8 |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|---------|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|---------|



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0

| Pos    | Code | Description  | Image                         |
|--------|------|--|-------------------------------|
| 13.51m | JN   | Junction at 3 o'clock: 100mm Diameter<br>JUNCTION BELIEVED TO BE FROM IC79 | Image Provided - Ref: 43_5    |
| 18.84m | JN   | Junction at 3 o'clock: 100mm Diameter                                      | Image Provided - Ref: 43_6    |
|        |      | JUNCTION BELIEVED TO BE FROM IC80  |                               |
| 22.97m | MHF  | Finish node type, manhole<br>MH82  | Image Provided - Ref: 43_9999 |

| Grade 1 Defects 0 Grade 2 Def | fects 192 Grade 3 Defects | 54 Grade 4 Defect | 3 3 | Grade 5 Defects |
|-------------------------------|---------------------------|-------------------|-----|-----------------|
|-------------------------------|---------------------------|-------------------|-----|-----------------|



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### Site: Mount Pleasant Road

Section 77

| CI                                     | ient:     |               | Location (St<br>Mount Plea                           |       |         | City/T                               | own/Village | Cust            | Job Ref.     | Survey     | ors Name: |                             | Date: |               |
|--|-----------|---------------|--|-------|---------|--------------------------------------|-------------|-----------------|--------------|------------|-----------|-----------------------------|-------|---------------|
| Start Node<br>Start Node<br>Start Node | Depth:    | ate:          |  | 010   |         | ode Ref:<br>ode Depth:<br>ode Coordi |             |                 | MH83<br>1950 |            | s         | Height/<br>Shape:<br>Cleane |       | 100<br>C<br>N |
| Drain Type<br>A                        | Lining    | Туре          | Lining Mat.  | Year  | Const.  | Weather<br>D                         | Flow Cont.  | Length<br>20.76 |              | F          | Remarks   |                             |       |               |
| Position<br>00.00m<br>19.84m<br>20.76m | MH<br>LLH | Start<br>Line | ription<br>node type,<br>of drain/sew<br>h node type | ver d | eviates | left [half                           | ]           |                 | 45           | 5_0<br>5_6 |           |                             | 0m    | 1             |

### Total grades for project

0



| Pos    | Code | Description                              | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | МН   | Start node type, manhole<br>MH77         | Image Provided - Ref: 45_0    |
| 19.84m | LLH  | Line of drain/sewer deviates left [half] | Image Provided - Ref: 45_6    |
| 20.76m | MHF  | Finish node type, manhole<br>MH83        | Image Provided - Ref: 45_9999 |

### Descriptive Report with Remarks and Observation Images

| Grade 1 Defects 0 | Grade 2 Defects 192 Grade | 3 Defects 54 Grade 4 Defects | 3 | Grade 5 Defects | 0 |
|-------------------|---------------------------|------------------------------|---|-----------------|---|
|-------------------|---------------------------|------------------------------|---|-----------------|---|



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### Site: Mount Pleasant Road

### Section 78

| Cli  | ient:        |              | Location (St  |           |           | City/T                               | own/Village | Cus    | t Job Ref. | Surveyor                        | s Name:     | Date                     |               |
|--|--------------|--------------|---|-----------|-----------|--------------------------------------|-------------|--------|------------|---------------------------------|-------------|--------------------------|---------------|
|  |              |              | Mount Plea  | asant     | Road      |                                      |             |        |            |                                 |             | 08/08/2                  | 2018          |
| Start Node F<br>Start Node I<br>Start Node 0 | Depth:       | :            | E   | BIC1<br>0 |           | ode Ref:<br>ode Depth:<br>ode Coordi |             |        | BIC2<br>0  | Direction:<br>Use:<br>Material: | C Sha       | ght/Dia:<br>ape:<br>aned | 100<br>C<br>N |
| Drain Type                                   | Lining Ty    | ре           | Lining Mat.   | Yea       | ır Const. | Weather                              | Flow Cont.  | Length |            | Re                              | emarks      |                          |               |
| A  |              |              |   |           |           | D                                    | Ν           | 3.95   |            | Inspection                      | Cover Burie | d                        |               |
| Position<br>00.00m<br>03.95m                 | MH S<br>CR C | tart<br>racl | ription<br>node type,<br><, radiates f<br>n node type | rom       | 12        | D                                    | N           | 3.95   | 87         |                                 |             | d<br>0m<br>3.95m         |               |
|  |              |              |   |           |           |                                      |             |        |            |                                 |             |                          |               |

#### Total grades for project

0



0

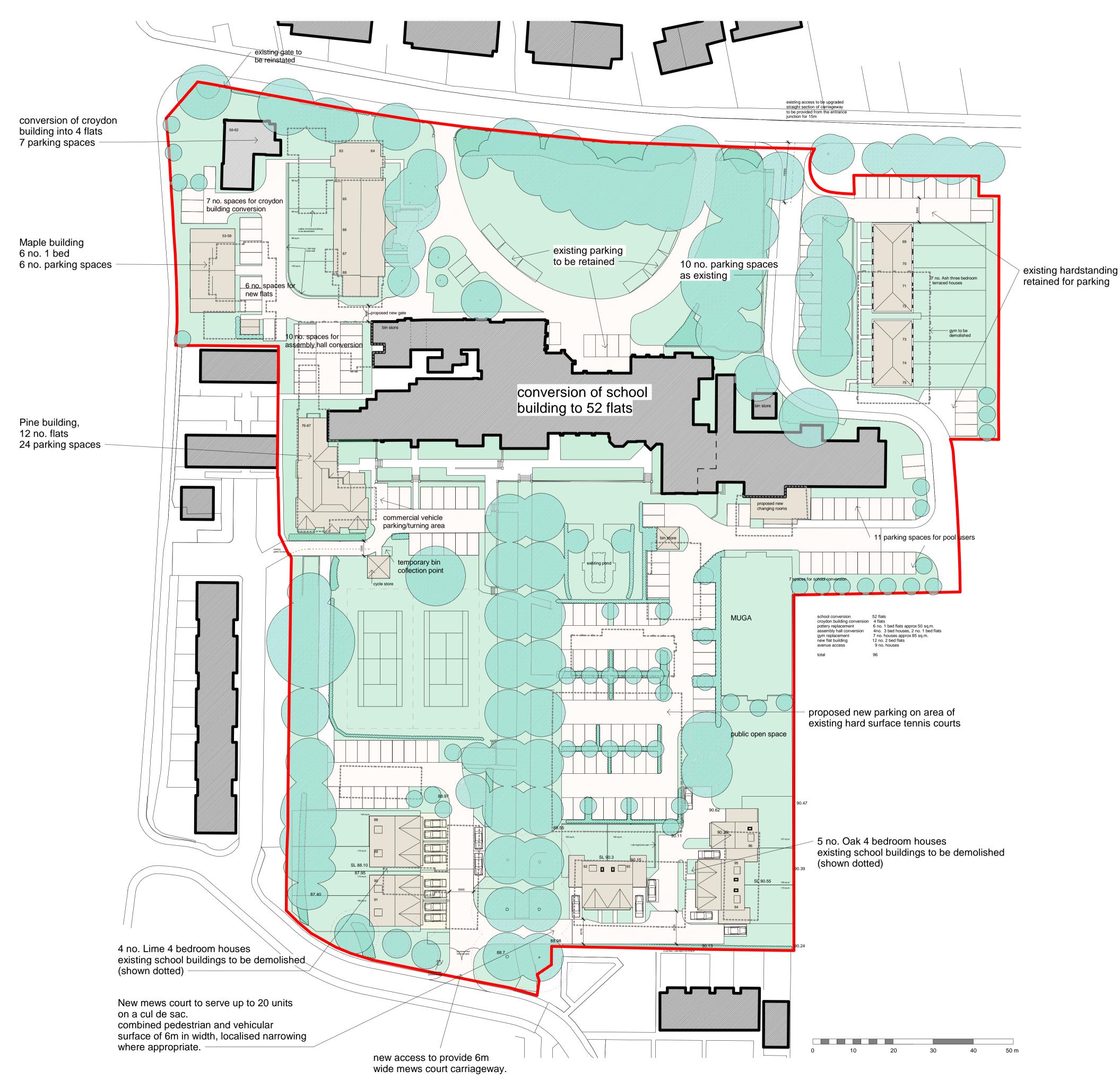
| Pos    | Code | Description                              | Image                         |
|--------|------|--|-------------------------------|
| 00.00m | MH   | Start node type, manhole<br>BIC1         | Image Provided - Ref: 87_0    |
| 03.95m | CR   | Crack, radiates from12 o'clock - Grade 3 | Image Provided - Ref: 87_1    |
| 03.95m | MHF  | Finish node type, manhole<br>BIC2        | Image Provided - Ref: 87_9999 |

### Descriptive Report with Remarks and Observation Images

| Grade 1 Defects | 0 | Grade 2 Defects | 192 | Grade 3 Defects | 54 | Grade 4 Defects | 3 | Grade 5 Defects | ][ |
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|----|
|-----------------|---|-----------------|-----|-----------------|----|-----------------|---|-----------------|----|



### APPENDIX E PROPOSALS





Chase New Homes Jasmine House 8 Parkway Welwyn Garden City AL8 6HG

Tel: 01707 660 660

The Excitement is Building

NOTES

11/03/2022 11:45:02

02/03/2022 22/02/2022 18/02/2022 18/02/2022 10/02/2022 14/01/2022 23/11/2021 23/11/2021 05/11/2021

DATE

revisions to bin store, new flats additional planting indicated

parking revisions

D Oak housetype revised

general revisions

B general revisions A general revisions

REV

Author

1:500

Checker TITLE

PROJECT

DRAWING NUMBER

21 0037-200 K

DRAWN BY

SCALE (@ A1)

CHECKED BY

parking provision updated

AMENDMENTS

I tracking revisions H revised boundaries to lime housetypes

revised annotations regarding existing parking

DATE

09/05/19

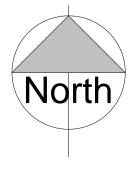
Project Number

APPROVED

Proposed site plan

Walden School, Saffron Walden

PROJECT NUMBER





## APPENDIX F INFILTRATION TESTING



4 Godalming Business Centre Woolsack Way, Godalming Surrey, GU7 1XW Telephone: 01483 310600 Fax: 01483 527285 cgl@cgl-uk.com www.cgl-uk.com

18 January 2019

Steve Hall Chase New Homes Jasmine House 8 Parkway Welwyn Garden City Hertfordshire AL8 6HG

Our ref: CG/28695

Please reply to: Adam Cadman / Fraser Chamley

Dear Steve

#### CNH005: Friends School, Mount Pleasant Road, Saffron Walden - Infiltration Testing

CGL has been instructed by Chase New Homes Limited to undertake preliminary soakaway testing to assess infiltration rates in the northern part of the playing fields at the Friends School site. This letter report presents the factual results from the infiltration test undertaken and the preliminary assessment of design infiltration rates.

#### **Background information**

The site consists of the former Friends School and associated playing fields and is a roughly inverted 'L' shaped parcel of land approximately 9.5 hectares located of Mount Pleasant Road, Saffron Walden, CB11 3EB. The coordinates of the approximate centre of the site are E554062, N237560. The northwest of the site currently comprises a number of buildings for the former school and the east and south of the site is occupied by playing fields surrounded by a strip of dense vegetation and trees along the site boundary.

#### **Site Works**

Three trial pits (TP1 to TP3) were excavated in the northern part of the playing fields within the reachable radius of a water tanker stationed on the hardstanding by the former swimming pool. The location of the three trial pits is shown on Figure 1.

In trial pits TP1 and TP2 the ground conditions encountered comprised topsoil to depths of 0.55m and 1.1m below ground level (m bgl), respectively, underlain by the Lewes Nodular Chalk Formation to the base of the two pits, at 2.2m and 3.3m bgl, respectively. The topsoil was composed of dark brown, gravelly, very silty clay and the chalk was composed of uncompact structureless gravelly silt (CIRIA Grade Dm). In TP3 the encountered ground conditions differed, topsoil was present to 1.1m bgl but was underlain by firm white and light brown clayey gravelly silt where the gravel was composed of flint and chalk – it is suspected that this material is superficial deposits (not mapped on the site by the BGS).

No groundwater was encountered in the trial pits during the excavation. Trial Pit TP3 remained stable during excavation and infiltration testing however the sides of TP1 and TP2 partially collapsed during the infiltration testing. The trial pit logs are included as Appendix A. The trial pit excavation and infiltration tests were supervised by a CGL engineer. Following completion of the infiltration tests the trial pits were backfilled with their arisings.





DIRECTORS Ian Marychurch MSc BSc CEng MICE CGeol FGS CMgr MCMI MIoD Dip IoD Nick Langdon MSc DIC BEng CEng CEnv FICE FGS FCMI MIoD

INVESTORS Gold





#### **Infiltration Tests**

The soakaway tests were undertaken in general accordance with BRE DG 365<sup>1</sup>. A single infiltration tests was undertaken in each of the three trial pits; the rate of drainage from the pits prevented repeat tests during the single day of testing. The infiltration tests in trial pits TP1 and TP2 were undertaken within the Lewes Nodular Chalk Formation and the test within TP3 was undertaken within the Superficial Deposits.

The results of the infiltration tests are presented in Appendix B and a summary of the results with the estimated infiltration rates are presented in Table 1 below. The rates for TP1 and TP2 are based on the D<sub>25</sub> and D<sub>75</sub> for the head of water recorded during the test. However, for TP3 the water level only decreased by 0.05m (5% of effective head) over 190 minutes and did not reach either the D<sub>75</sub> or D<sub>25</sub> depths before the trial pit had to be backfilled. An infiltration rate cannot therefore be calculated in accordance with BRE DG 365. Notwithstanding this, the drainage rate is significantly slower than in the pits within the chalk – we have estimated an infiltration rate based on the total change in head over the full duration of the test, however, this should be used as an indication of relative drainage characteristic and not for design.

| Table 1. Summary of Infiltration Test results | Table 1. | Summary o | f Infiltration | Test results |
|---|----------|-----------|----------------|--------------|
|---|----------|-----------|----------------|--------------|

| Trial Pit | Strata tested           | Effective water<br>head (m) | Duration of test (s)<br>[mins] | Estimated Infiltration<br>rate (m/s)        |
|-----------|-------------------------|-----------------------------|--------------------------------|---|
| TP1       | Structureless<br>Chalk  | 0.74                        | 18,720 [312]                   | 1.69 x 10 <sup>-5</sup>                     |
| TP2       | Structureless<br>Chalk  | 0.80                        | 15,720 [262]                   | 1.43 x 10 <sup>-5</sup>                     |
| ТРЗ       | Superficial<br>Deposits | 1.0                         | 11,400 [190]                   | 9.66 x 10 <sup>-7</sup><br>(see above text) |

Based on the infiltration testing undertaken, the underlying Lewes Nodular Chalk Formation has a infiltration rate of approximately  $1.5 \times 10^{-5}$  m/s – further testing will be required to confirm design values but the initial estimated values are within the range anticipated for a structureless chalk and indicate a medium degree of permeability. The estimated value for the Superficial Deposits indicates it has a low permeability and therefore conventional soakaways within the Superficial Deposits are not recommended, although permeable paving may be feasible subject to additional testing.

#### Closure

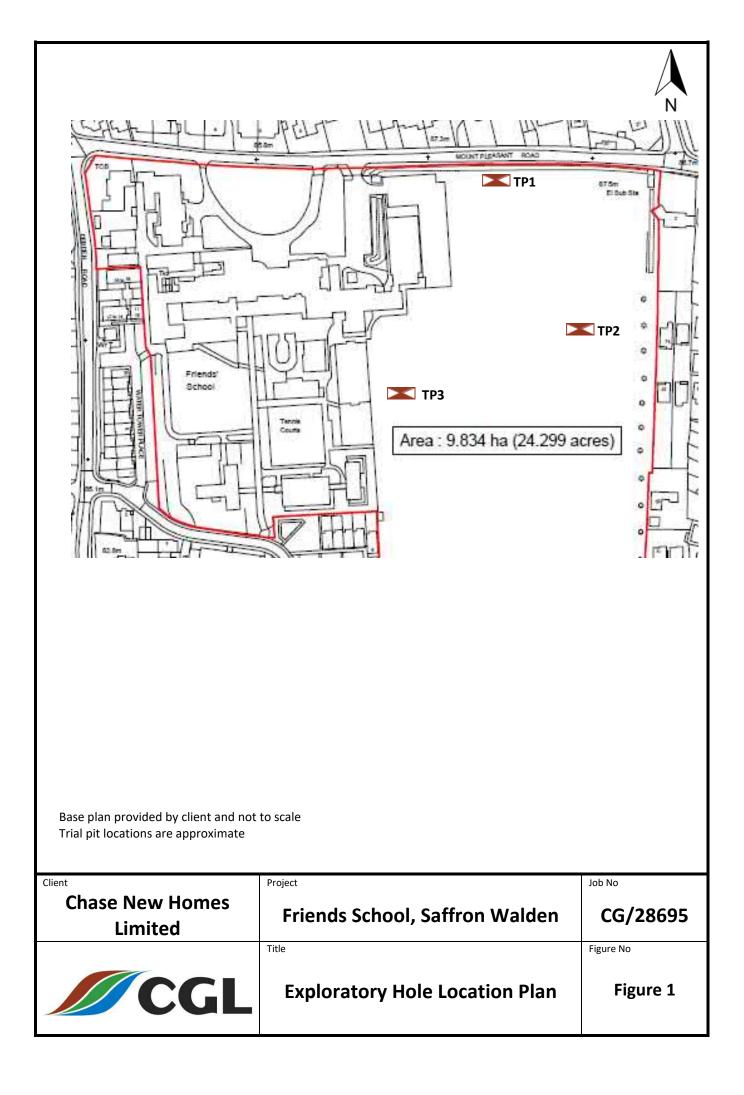
We trust that this letter provides sufficient information to aid in the preliminary design of the drainage for the site. However, if you have any queries please do not hesitate to contact ourselves.

Yours sincerely

Fraser Chamley, Senior Engineer Card Geotechnics Limited

**Enclosed** Figure 1 – Exploratory Hole Location Plan Appendix A – Trial Pit Logs Appendix B – Infiltration test results

<sup>&</sup>lt;sup>1</sup> Building Research Establishment. (2016). *Soakaway Design*. BRE DG 365 Revised 2016.



# **TRIAL PIT LOG**

| Project     Friends School, Mount Pleasant Road, Saffron Walden     TRIAL PIT No       CG228695     19-12-18     Ground Level (m)     Co-Ordinates (m)     TP1       Client     10-1     Sheet     1 of 1       SAMPLES & TESTS     Beduced used of the form of provely wey dity day. Gravel is subangular to the order of the no draft.     DESCRIPTION       0.20     E5/8     Esclared of the form of the to cashe of the no draft.     DESCRIPTION       0.20     E5/8     T     T     Grass over diff the to cashe of the no draft.       0.20     E5/8     T     T     T     Grass over diff the to cashe of the no draft.       0.20     E5/8     T     T     Grass over diff the to cashe of the no to cashe of the n   |              |         |        |        |                    | •       |                        |  |   |   | CG          |
|--|--------------|---------|--------|--------|--------------------|---------|------------------------|--|---|---|-------------|
| Dol No       Date       Ground Level (m)       Co-Ordinates (m)       IP1         CG/28695       19-12-18       Ground Level (m)       Co-Ordinates (m)       Sheet       1 of 1         SAMPLES & TESTS       Bergin       Test       Bergin       Test       Description       DESCRIPTION         0.20       E5/8       Es/8       Endearce       Co-Ordinates (m)       DESCRIPTION       DESCRIPTION         0.20       E5/8       Es/8       Endearce       Co-Ordinates (m)       DESCRIPTION       DESCRIPTION         1.20       E5/8       Es/8  | -            |         |        |        |                    |         |                        |  |   | Т   | RIAL PIT No |
| Out No     Deter     Of Unit Level (init)     Of Unit Level (init)       CG/28695     19-12-18     1 of 1       Cheet     1 of 1       Cheet     1 of 1       SAMPLES & TESTS     1 of 1       Depth     Treet     1 of 1       Color     Es/8     Feet (init)     Depth (init)       0.20     Es/8     Image: Color (init)     Depth (init)       0.20     Es/8     Image: Color (init)     Depth (init)       0.20     Es/8     Image: Color (init)     Depth (init)       1.20     Es/8     Image: Color (init)     Color (init)       1.20     Color (init)     Color   |              | nds Scł |        |        | t Pleasa           | ant Ro  |                        |  |   |   | TP1         |
| Client     Sheet       Chase New Homes     1 of 1       SAMPLES & TESTS     Beduced Legend (Thick ness)     Depth (Thick ness)       0.20     E5/8     Image: Strange of the coarse of finand chaik.       0.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8     Image: Strange of the coarse of finand chaik.       1.20     E5/8 <t< td=""><td></td><td>0605</td><td>Da</td><td></td><td>0 1 2 1 9</td><td>,</td><td>Ground Le</td><td>evel (m)</td><td>Co-Ordinates (m)</td><td></td><td>·· <b>-</b></td></t<>  |              | 0605    | Da     |        | 0 1 2 1 9          | ,       | Ground Le              | evel (m)   | Co-Ordinates (m)  |   | ·· <b>-</b> |
| 1 of 1       SAMPLES & TESTS       Depth (m)     Tree     Test     Bescher (m)     Tree       0.20     E5/8     Image: Colspan="2">Image: Colspan="2" Image:  |              | 8695    |        | T      | 9-12-18            | •       |                        |  |   | Shee  | <u>۰</u> †  |
| Depth (m)       Type       Result (seed egen Depth (m) (mess)       Depth (m) (mess)       DESCRIPTION         0.20       E5/8       E5/8       Escale (0.55)       Grass over dark brown gravely very sity (day. Gravel is subangular to subrounded fine to coarse of film and chaik.         1.20       E5/8       E5/8       Escale (0.55)       Structureless CHALK composed of uncompact, white gravely SIT with occasional cobles. Gravel and cables are very weak, low density, white and observery counce that and addites are very weak, low density, white and observery counce that adjust to subrounded fine to coarse gravels of film.         1.20       E5/8       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.65)         1.20       Escale (1.65)       Escale (1.65)       Escale (1.65)       Escale (1.  |              | se New  | / Home | es     |                    |         |                        |  |   |   |             |
| Depth (m)       Type (mess)       Beduced egend (mess)       Depth (m) (misc)       DESCRIPTION         0.20       E5/8       E5/8       E5/8       E5/8       Grass over dark brown gravely very sity day. Gravel is subangular to subrounded fine to coarse of fint and chuik.         1.20       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8         1.20       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8         1.20       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8         E5/8       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8         E5/8       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8       E5/8         E5/8 </td <td>SAMPL</td> <td>ES &amp; TI</td> <td>ESTS</td> <td>Γ.</td> <td></td> <td></td> <td></td> <td></td> <td>STRATA</td> <td></td> <td></td>  | SAMPL        | ES & TI | ESTS   | Γ.     |                    |         |                        |  | STRATA  |   |             |
| 0.20.       E5/8       E5/8       Grass over dark horwn gravelly very sity day. Gravel is subangular to subangul | Depth<br>(m) |         |        | Water  | Reducec<br>Level   | Legenc  | (Thick-                |  | DESCRIPTI   | ON  |             |
| 3.66m       1. All depths measured from ground level (mbgl).         2. No ground water encountered.       3. ES= environmental sample, B= bulk sample.         4. Trial pit backfiled with arising following compeltion of infiltration test.         Stability:       Collapsed to 1.94mbgl during soakage test         Method/       Field Crew       Logged By       Checked By  |              |         |        |        |                    |         | 0.55<br>0.55<br>(1.65) | subrounded f<br>[TOPSOIL]<br>Structureless<br>occasional cc<br>rounded. Fre<br>observed.<br>[LEWES NOD | Fine to coarse of flint and chall<br>CHALK composed of uncomp<br>bbles. Gravel and cobbles are<br>quent subangular to subround<br>ULAR CHALK- Grade Dm] | k.<br>act, white gravelly S<br>very weak, low der | SILT with   |
| <ul> <li>3.66m</li> <li>3.66m</li> <li>3.65m</li> <li>3.65m</li> <li>3.65m</li> <li>4. Trial pit backfiled with arising following compeltion of infiltration test.</li> <li>4. Trial pit backfiled with arising following compeltion of infiltration test.</li> <li>4. Trial pit backfiled with arising following compeltion of infiltration test.</li> </ul>  | Plan         |         |        |        |                    | •       |                        | General R  | emarks  |   |             |
|  | ↓            |         |        | • 1.94 | -<br>]<br>mbgl dur | ing soa | kage test              | 1. All depths<br>2. No ground  | measured from ground level (<br>water encountered.  |   | ation test. |
|  | Method/      |         |        |        |                    |         |                        | Field Crew   | Demeney   |   |             |

# **TRIAL PIT LOG**

| Project   |            |                       |           |                            |          |                  |   |   | Т  | RIAL PIT No                                   |
|---|------------|-----------------------|-----------|----------------------------|----------|------------------|---|---|--|---|
|   | nds Scł    |                       |           | t Pleasa                   | ant Roa  |                  | n Walden  | 1   |  | TP2   |
| Job No  |            | Dat                   |           |                            |          | Ground Le        | evel (m)  | Co-Ordinates (m)  |  | 11 2  |
| CG/2  | 8695       |                       | 19        | 9-12-18                    |          |                  |   |   | Char   |   |
| Client  |            | / Homes               | -         |                            |          |                  |   |   | Shee   | 1 of 1  |
|   |            |                       | >         | 1                          |          |                  |   |   |  |   |
| SAMPL   |            | ESTS<br>Test          | ter       |                            |          | Depth (m)        |   | STRATA  |  |   |
| Depth<br>(m)  | Type<br>No | Result<br>(N/kPa/ppm) | Water     | Reduced<br>Level           | Legend   | (Thick-<br>ness) |   | DESCRIPTI   | ION  |   |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | ES/B       |                       |           |                            |          | (1.10)           | [TOPSOIL]   | ark brown gravelly very silty cl<br>fine to coarse of flint and chal  |  |   |
|   | ES/B       |                       |           |                            |          |                  | rounded. Fre<br>observed.   | s CHALK composed of uncomp<br>obbles. Gravel and cobbles are<br>quent subangular to subround<br>OULAR CHALK- Grade Dm]    | act, white gravelly S<br>very weak, low den<br>ded fine to coarse gr | ILT with<br>sity, white and<br>avels of flint |
| 3.00  | ES/B       |                       |           |                            |          | <br><br>3.30     | 3.00 - 3.30 F   | requent cobbles of flint observ   | ved  |   |
| -<br>-<br>-<br>-<br>-                               |            |                       |           |                            |          | -                | (Pit termina  | ted at 3.3m)  |  |   |
| Plan  |            |                       |           |                            |          |                  | General R   | lemarks   |  |   |
| 0.75m<br>Stability:                                 |            | 55m                   | →<br>3.1m | -<br>]<br>]<br>]<br>]<br>] | ng soaka | age test         | 1. All depths<br>2. No ground<br>3. ES= envird<br>4. Trial pit ba | measured from ground level (<br>d water encountered.<br>onmental sample, B= bulk sam<br>ackfiled with arising following o | mbgl).<br>ple.<br>compeltion of infiltr                              | ation test.                                   |
| Method/<br>Plant Used                               |            |                       | 200       | /                          |          |                  | Field Crew  | Domonov   | Logged By  | Checked By                                    |
| Fiant Used  |            | JCB                   | 3C>       | (                          |          |                  |   | Demenex   | NDH  | ADC   |

CGL

# **TRIAL PIT LOG**

|                     |            |                       |             |                  |  |   |  |  |                      | CG          |
|---------------------|------------|-----------------------|-------------|------------------|--|---|--|--|----------------------|-------------|
| Project             |            |                       |             |                  |  |   |  |  | Т                    | RIAL PIT No |
|                     | nds Scl    |                       |             | t Pleasa         | ant Roa                                |   | n Walden                                       |  |                      | TP3         |
| Job No              |            | Da                    |             |                  |  | Ground Le   | evel (m)                                       | Co-Ordinates (m)   |                      | TF 5        |
| CG/2                | 8695       |                       | 1           | 9-12-18          | }                                      |   |  |  |                      |             |
| Client              |            |                       |             |                  |  |   |  |  | Shee                 |             |
|                     |            | / Home                | s           | 1                |  |   |  |  |                      | 1 of 1      |
| SAMPL               |            | ESTS<br>Test          | ter         |                  |  | Depth (m)   |  | STRATA   |                      |             |
| Depth<br>(m)        | Type<br>No | Result<br>(N/kPa/ppm) | Water       | Reduced<br>Level | Legend                                 | I (Thick-<br>ness)  | Cross over de                                  | DESCRIPTI  |                      | ulanta.     |
| 0.50                | ES/B       |                       |             |                  |  | (1.10)  | [TOPSOIL]                                      | ark brown gravelly very silty cl<br>ine to coarse of flint and chal<br>nd light brown clayey gravelly<br>ine to coarse of flint and chal<br>. Deposits?] | SILT. Gravel is suba | ngular to   |
| 2.50                | B<br>ES/B  |                       |             |                  | × × × × × × × × × × × × × × × × × × ×  | *<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>* |  |  |                      |             |
|                     |            |                       |             |                  | × ×<br>× ×<br>× ×<br>× ×<br>× ×<br>× × | *<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>*<br>* | (Pit terminat                                  | red at 3.6m)   |                      |             |
| Plan                |            |                       | <u> </u>    |                  |  | L   | General R                                      | emarks   |                      |             |
| 0.70m<br>Stability: | 3.<br>     | 70m                   | <b>&gt;</b> | -                |  |   | 1. All depths<br>2. No ground<br>3. ES= enviro | emarks<br>measured from ground level (<br>water encountered.<br>nmental sample, B= bulk sam<br>ckfiled with arising following o                          | ple.                 | ation test. |
| Method/             |            | -                     |             |                  |  |   | Field Crew                                     |  | Logged By            | Checked By  |
| Plant Used          |            | JCE                   | 3 3 C)      | X                |  |   |  | Demenex  | NDH                  | ADC         |

### **Soil Infiltration Test**



ADC

18.01.19

FJC Checker:

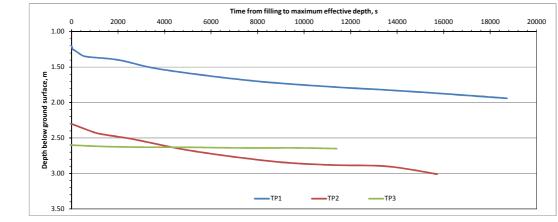
to

16.01.19

Based on BRE 365 Soakaway Design

| Project: | Friends School, Mount Pleasant Road |
|----------|-------------------------------------|
| Client:  | Chase New Homes                     |
| Project: | CG/28695                            |

#### Location: Playing Fields



Eng:

Date:

| <u>TP1</u>      |      |
|-----------------|------|
| Pit Length (m): | 1.90 |
| Pit Width (m):  | 0.65 |
| Pit Depth (m):  | 1.94 |

| Effective Depth (m)                   | 0.74 |
|---------------------------------------|------|
| D <sub>75</sub> (m)                   | 1.39 |
| D <sub>25</sub> (m)                   | 1.76 |
| V <sub>p75-25</sub> (m <sup>3</sup> ) | 0.46 |

| Infiltration Rate (m/s): |  | 1.688E-05 |
|--------------------------|--|-----------|
|                          |  |           |
| a <sub>p50</sub> (m²)    |  | 3.122     |
| t <sub>p75-25</sub> (s)  |  | 8672      |
| t <sub>25</sub> (s)      |  | 10280     |
| t <sub>75</sub> (s)      |  | 1608      |

| Time (m) | Time (s) | Depth (m) |
|----------|----------|-----------|
| 0.00     | 0        | 1.20      |
| 1.00     | 60       | 1.25      |
| 2.00     | 120      | 1.26      |
| 5.00     | 300      | 1.30      |
| 10.00    | 600      | 1.35      |
| 34.00    | 2040     | 1.40      |
| 64.00    | 3840     | 1.53      |
| 128.00   | 7680     | 1.69      |
| 188.00   | 11280    | 1.78      |
| 224.00   | 13440    | 1.82      |
| 263.00   | 15780    | 1.87      |
| 312.00   | 18720    | 1.94      |
|          |          |           |

| <u>TP2</u>      |      |
|-----------------|------|
| Pit Length (m): | 1.90 |
| Pit Width (m):  | 0.75 |
| Pit Depth (m):  | 3.10 |

| Effective Depth (m)                   | 0.80 |
|---------------------------------------|------|
| D <sub>75</sub> (m)                   | 2.50 |
| D <sub>25</sub> (m)                   | 2.90 |
| V <sub>p75-25</sub> (m <sup>3</sup> ) | 0.57 |

| Infiltration Rate (m/s): |  | 1.431E-05 |
|--------------------------|--|-----------|
| a <sub>p50</sub> (m²)    |  | 3.545     |
| t <sub>p75-25</sub> (s)  |  | 11235     |
| t <sub>25</sub> (s)      |  | 13560     |
| t <sub>75</sub> (s)      |  | 2325      |

| Time (m) | Time (s) | Depth (m) |
|----------|----------|-----------|
| 0.00     | 0        | 2.30      |
| 12.00    | 720      | 2.39      |
| 20.00    | 1200     | 2.44      |
| 45.00    | 2700     | 2.52      |
| 86.00    | 5160     | 2.68      |
| 144.00   | 8640     | 2.83      |
| 185.00   | 11100    | 2.88      |
| 226.00   | 13560    | 2.90      |
| 262.00   | 15720    | 3.01      |
|          |          |           |
|          |          |           |
|          |          |           |
|          |          |           |

| <u>TP3</u>      |      |
|-----------------|------|
| Pit Length (m): | 2.20 |
| Pit Width (m):  | 0.76 |
| Pit Depth (m):  | 3.60 |

| Effective Depth (m)                   | 1     |
|---------------------------------------|-------|
| D <sub>75</sub> (m)                   | 2.85  |
| D <sub>25</sub> (m)                   | 3.35  |
| V <sub>p75-25</sub> (m <sup>3</sup> ) | 0.836 |

| Change in head (m)                    | 0.05             |
|---------------------------------------|------------------|
| Volume change (m <sup>3</sup> )       | 0.08             |
| Surface area of pit (m <sup>2</sup> ) | 7.59             |
|                                       |                  |
|                                       |                  |
| Infiltration Rate (m/s):              | <u>9.659E-07</u> |

| Time (m) | Time (s) | Depth (m) |
|----------|----------|-----------|
| 0.00     | 0        | 2.60      |
| 23.00    | 1380     | 2.62      |
| 54.00    | 3240     | 2.63      |
| 79.00    | 4740     | 2.63      |
| 123.00   | 7380     | 2.64      |
| 163.00   | 9780     | 2.64      |
| 190.00   | 11400    | 2.65      |
|          |          |           |
|          |          |           |
|          |          |           |
|          |          |           |
|          |          |           |
|          |          |           |



### APPENDIX G GREENFIELD RUNOFF



Sophie Thorpe

Saffron Walden

Former Friends School

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 basis for setting consents for the drainage of surface water runoff from sites.

the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may

Calculated by:

Site name:

be

Site location:

## Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

#### Site Details

| Latitude:  | 52.01615° N       |
|------------|-------------------|
| Longitude: | 0.24219° E        |
| Reference: | 3226825072        |
| Date:      | Aug 09 2021 16:34 |

| Runoff estimation approach   |         | IH124   |   |   |  |  |  |  |
|--|---------|---------|---|---|--|--|--|--|
| Site characteristics   |         |         |   | Notes   |  |  |  |  |
| Total site area (ha):  |         | 3.28    |   | (1) Is Q <sub>BAR</sub> < 2.0 I/s/ha?   |  |  |  |  |
| Methodology  |         |         |   |   |  |  |  |  |
| QBAR estimation method:Calculate from SPR and SAARSPR estimation method:Calculate from SOIL type |         |         | When $Q_{BAR}$ is < 2.0 I/s/ha then limiting discharge rates are set at 2.0 I/s/ha. |   |  |  |  |  |
|  |         |         | е   |   |  |  |  |  |
| Soil characteristics   |         | Default | Edited  |   |  |  |  |  |
| SOIL type:   |         | 1       | 1   | (2) Are flow rates < 5.0 l/s?   |  |  |  |  |
| HOST class:  |         | N/A     | N/A   | Where flow rates are less than 5.0 l/s consent for discharge is   |  |  |  |  |
| SPR/SPRHOST:   |         | 0.1     | 0.1   | usually set at 5.0 l/s if blockage from vegetation and other  |  |  |  |  |
| Hydrological characte  | ristics | Default | Edited  | materials is possible. Lower consent flow rates may be set where<br>the blockage risk is addressed by using appropriate drainage<br>elements. |  |  |  |  |
| SAAR (mm): 593   |         | 593     | 593   |   |  |  |  |  |
| Hydrological region:   |         | 5       | 5   | (3) Is SPR/SPRHOST ≤ 0.3?   |  |  |  |  |
| Growth curve factor 1 year:  |         | 0.87    | 0.87  | Where groundwater levels are low enough the use of soakaways  |  |  |  |  |
| Growth curve factor 30 years:  |         | 2.45    | 2.45  | to avoid discharge offsite would normally be preferred for disposal of surface water runoff.  |  |  |  |  |
| Growth curve factor 100 yes  | ars:    | 3.56    | 3.56  |   |  |  |  |  |
| Growth curve factor 200 yes  | ars:    | 4.21    | 4.21  |   |  |  |  |  |

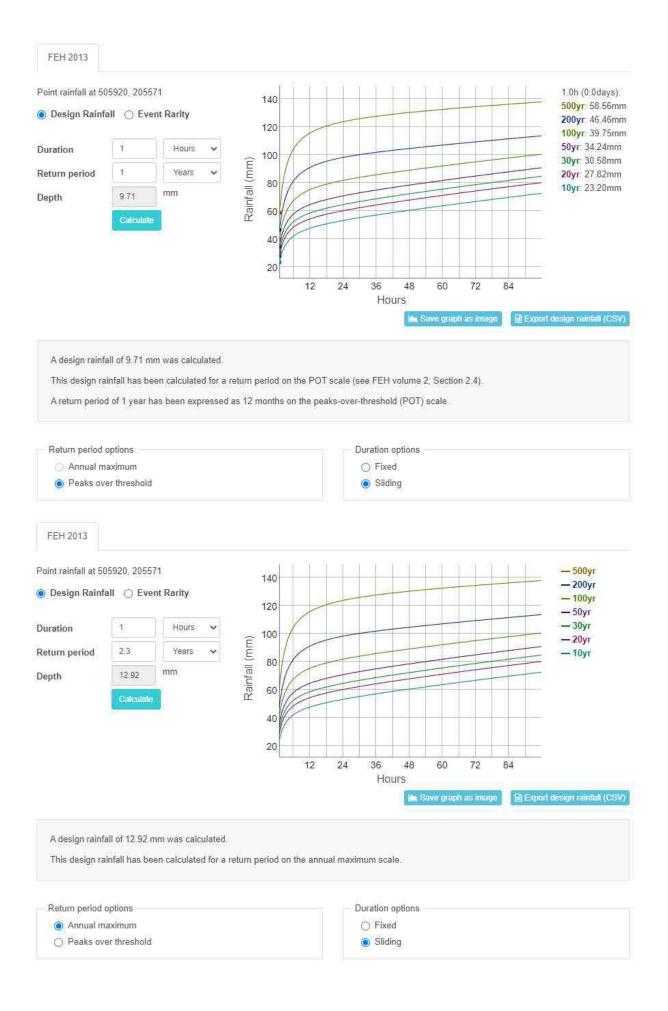
### Greenfield runoff rates

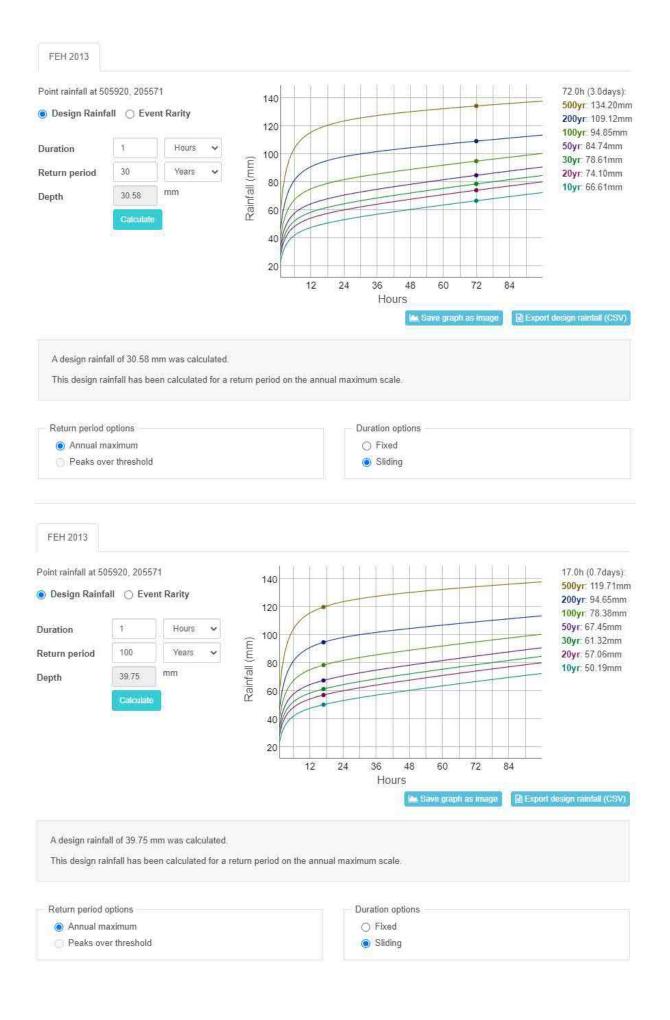
|                               | Default | Edited |
|-------------------------------|---------|--------|
| Q <sub>BAR</sub> (I/s):       | 0.45    | 0.45   |
| 1 in 1 year (I/s):            | 0.39    | 0.39   |
| 1 in 30 years (I/s):          | 1.11    | 1.11   |
| 1 in 100 year ( <b>I</b> /s): | 1.62    | 1.62   |
| 1 in 200 years (I/s):         | 1.91    | 1.91   |

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



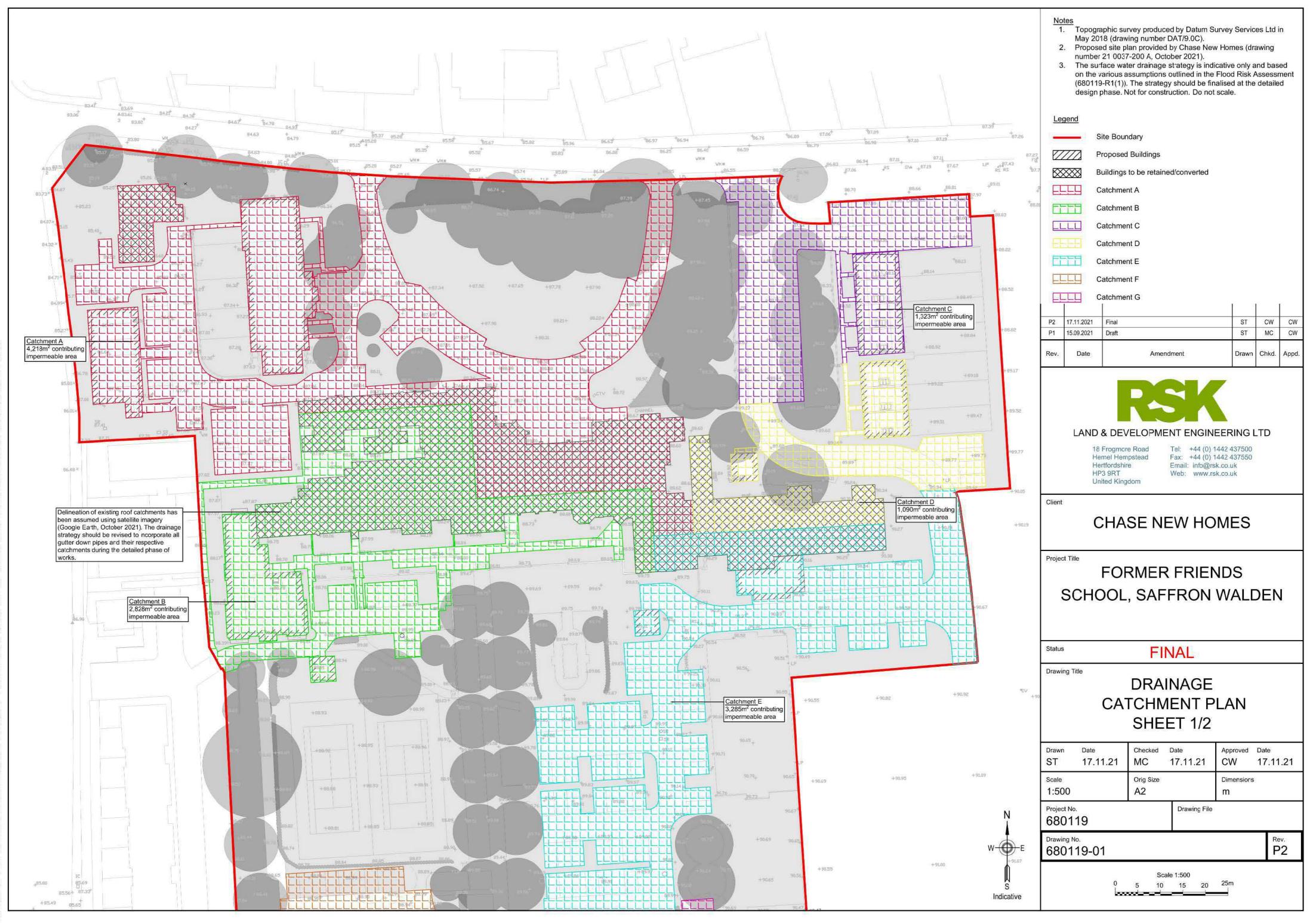
## APPENDIX H FEH RAINFALL DATA

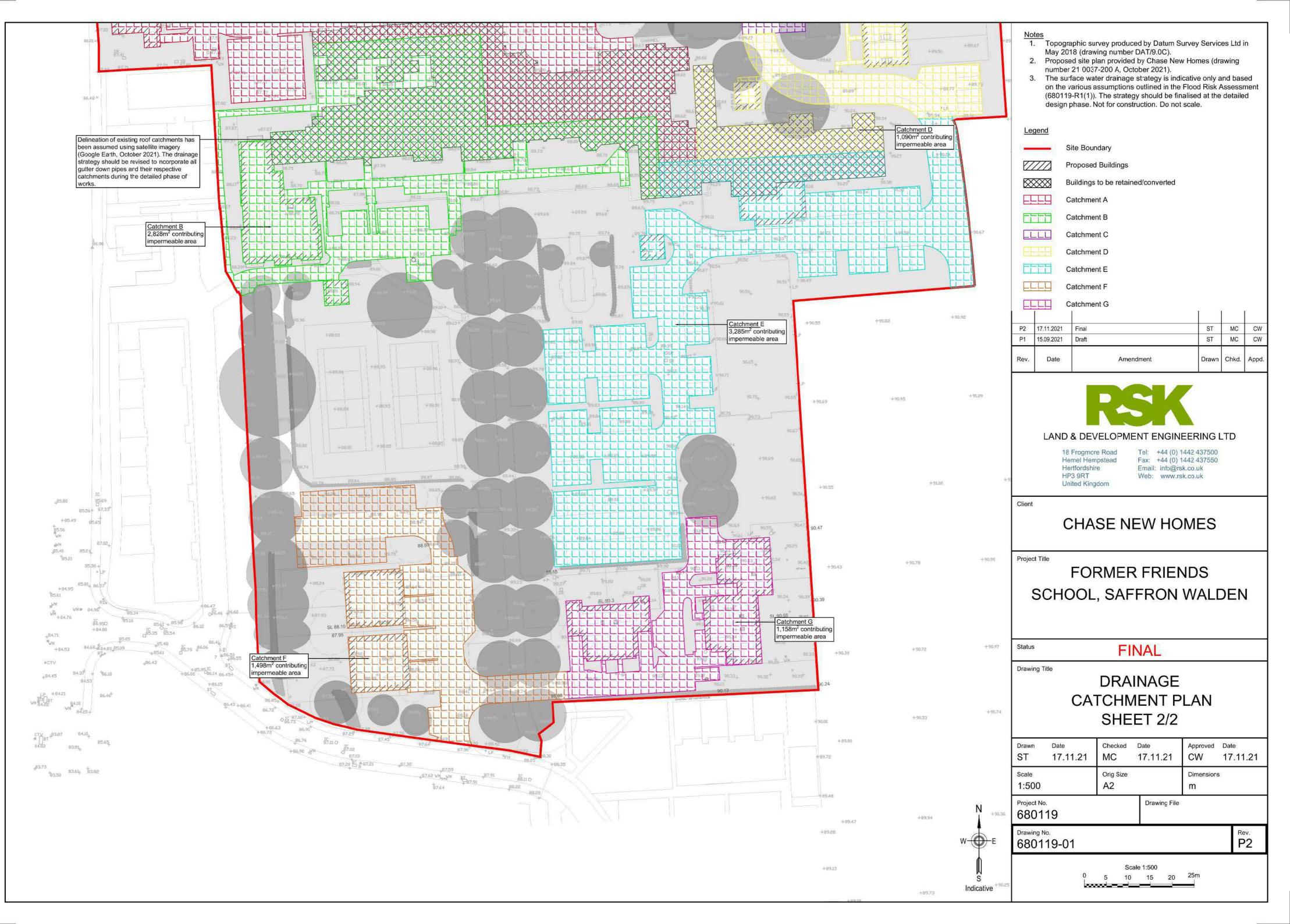






### APPENDIX I CATCHMENT PLANS

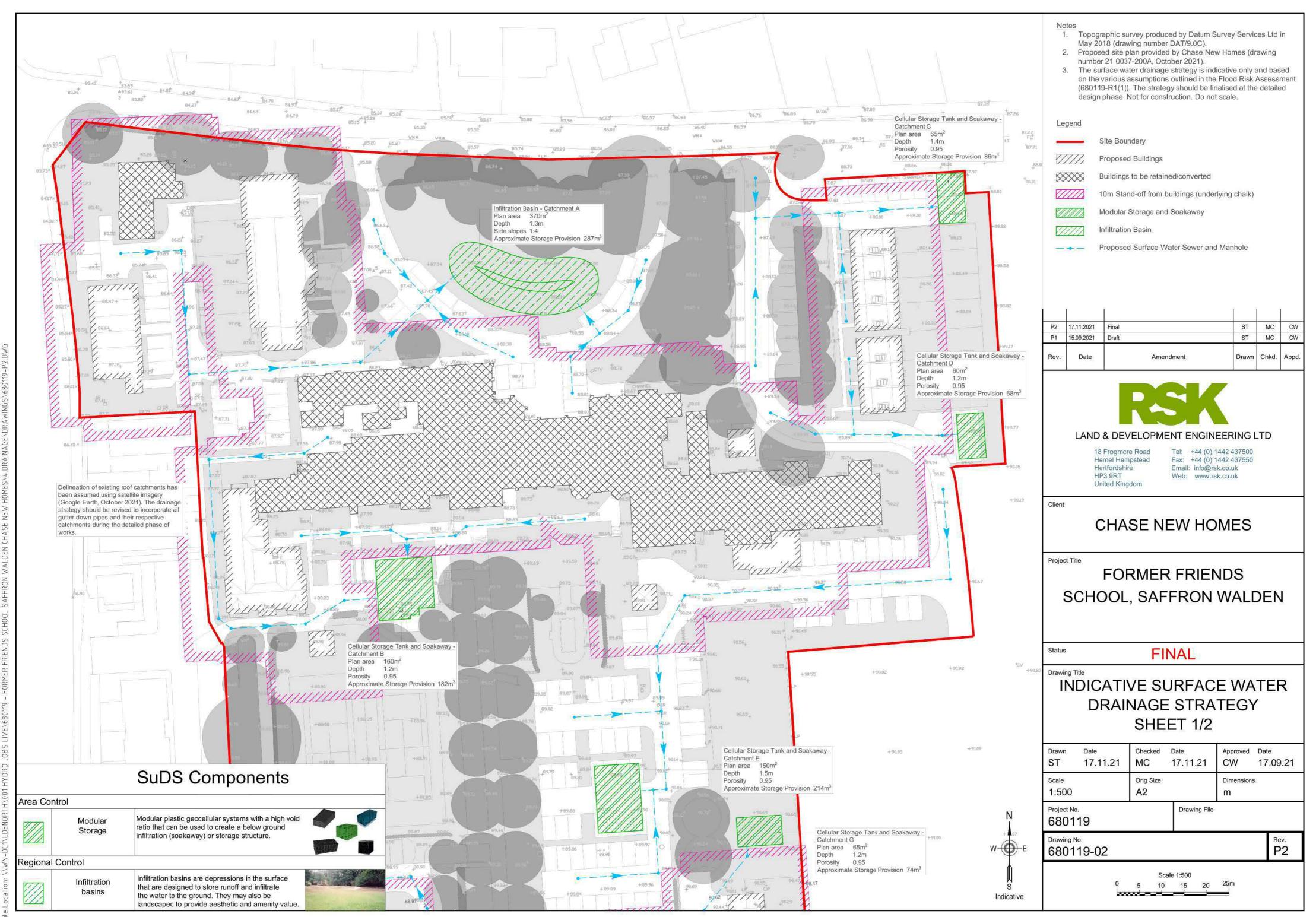


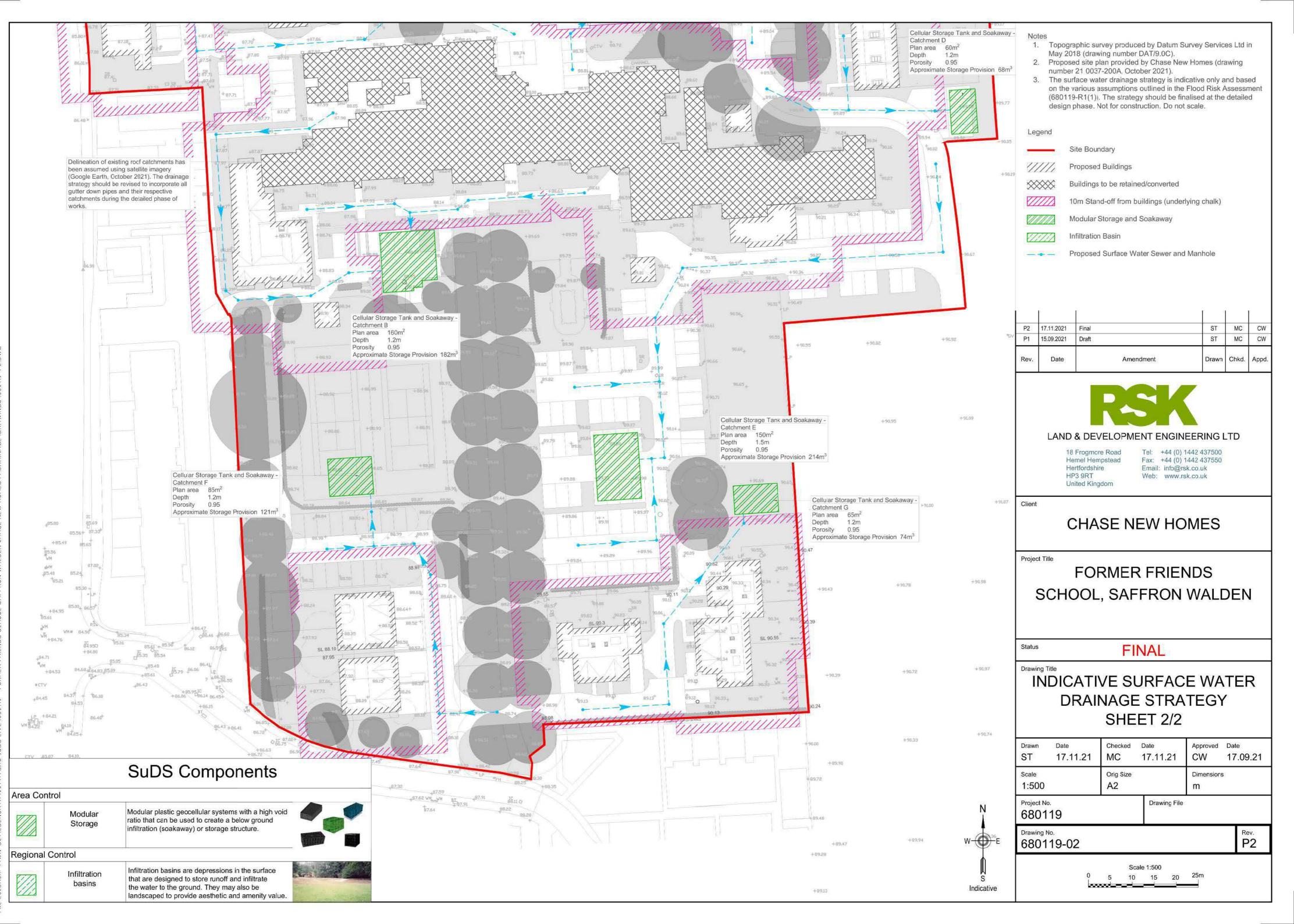


LL.



### APPENDIX J INDICATIVE SURFACE WATER DRAINAGE STRATEGY







## APPENDIX K DRAINAGE CALCULATIONS

| RSK LDE                          |                  |         |                  |            | Page         | e 1                      |          |
|----------------------------------|------------------|---------|------------------|------------|--------------|--------------------------|----------|
| 18 Frogmore Road                 |                  |         |                  |            |              |                          |          |
| Hemel Hempstead                  |                  |         |                  |            |              |                          | <u> </u> |
| Hertfordshire HP3 9RT            |                  |         |                  |            |              | L GLO                    | <u> </u> |
| Date 17/11/2021 08:34            | Desig            | ned By  | SThorpe          | 9          |              | )penne                   | R        |
| File A Basin Soakaway            | Check            | _       | T                |            |              | <u>Reille</u>            | C C C C  |
| XP Solutions                     |                  | -       | rol W.12         | 2 5        |              |                          |          |
|                                  | DOULC            | e cone  | 101 11.12        |            |              |                          |          |
| Summary of Re                    | sults            | for 10  | 0 vear 1         | Retur      | n Perio      | od (+40%)                |          |
|                                  | 04200            | 202 20  | <u> </u>         |            | 11 1011      | <u>50 (+ 100)</u>        |          |
|                                  | Half Dr          | ain Tim | e : 890 n        | ninute     | s.           |                          |          |
| Storm                            | Max              | Max     | Max              |            | Max          | Status                   |          |
| Event                            | Level            | Depth   | Infiltra         | tion       | Volume       |                          |          |
|                                  | (m)              | (m)     | (1/s             | )          | (m³)         |                          |          |
| 15 min Summer                    | 87.002           | 0.702   |                  | 1.8        | 111.1        | ОК                       |          |
| 30 min Summer                    |                  |         |                  | 2.1        | 142.7        | 0 K                      |          |
| 60 min Summer                    |                  |         |                  | 2.3        | 173.2        | ОК                       |          |
| 120 min Summer                   | 87.344           | 1.044   |                  | 2.5        | 200.7        | Flood Risk               |          |
| 180 min Summer                   |                  |         |                  | 2.6        |              | Flood Risk               |          |
| 240 min Summer                   |                  |         |                  | 2.7        |              | Flood Risk               |          |
| 360 min Summer                   |                  |         |                  | 2.7        |              | Flood Risk               |          |
| 480 min Summer                   |                  |         |                  | 2.7        |              | Flood Risk               |          |
| 600 min Summer<br>720 min Summer |                  |         |                  | 2.7<br>2.7 |              | Flood Risk<br>Flood Risk |          |
| 960 min Summer                   |                  |         |                  | 2.7        |              | Flood Risk               |          |
| 1440 min Summer                  |                  |         |                  | 2.6        |              | Flood Risk               |          |
| 2160 min Summer                  | 87.342           |         |                  | 2.5        |              | Flood Risk               |          |
| 2880 min Summer                  |                  |         |                  | 2.4        | 186.6        | O K                      |          |
| 4320 min Summer                  | 87.213           | 0.913   |                  | 2.2        | 163.2        | O K                      |          |
| 5760 min Summer                  | 87.142           | 0.842   |                  | 2.1        | 144.5        | O K                      |          |
| 7200 min Summer                  |                  | 0.778   |                  | 2.0        | 128.7        | O K                      |          |
| 8640 min Summer                  | 87.021           | 0.721   |                  | 1.9        | 115.4        | 0 K                      |          |
|                                  | Stor             | m       | Rain             | Time       | -Peak        |                          |          |
|                                  | Even             | t       | (mm/hr)          | (mi        | ns)          |                          |          |
|                                  | 15 min           | Summer  | 142.829          |            | 26           |                          |          |
|                                  | 30 min           | Summer  | 92.260           |            | 41           |                          |          |
|                                  | 60 min           |         | 56.713           |            | 70           |                          |          |
|                                  | 20 min           |         | 33.709           |            | 128          |                          |          |
|                                  | 80 min           |         | 24.562           |            | 188          |                          |          |
|                                  | 40 min<br>60 min |         | 19.521<br>14.048 |            | 246<br>364   |                          |          |
|                                  | 80 min           |         | 11.131           |            | 482          |                          |          |
|                                  | 00 min           |         | 9.286            |            | 590          |                          |          |
|                                  | 20 min           |         | 8.005            |            | 632          |                          |          |
| 9                                | 60 min           | Summer  | 6.329            |            | 758          |                          |          |
|                                  | 40 min           |         | 4.539            |            | 1014         |                          |          |
|                                  | 60 min           |         | 3.251            |            | 1432         |                          |          |
|                                  | 80 min           |         | 2.564            |            | 1844         |                          |          |
|                                  | 20 min<br>60 min |         | 1.832<br>1.442   |            | 2644<br>3456 |                          |          |
|                                  | 00 min           |         | 1.442            |            | 4248         |                          |          |
|                                  | 40 min           |         | 1.029            |            | 5008         |                          |          |
|                                  |                  |         |                  |            |              |                          |          |
|                                  |                  |         |                  |            |              |                          |          |
|                                  |                  |         |                  |            |              |                          |          |
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| ©1                               | 982-20           | )10 Mic | ro Drai          | nage       | Ltd          |                          |          |
|                                  |                  |         |                  |            |              |                          |          |

| RSK LDE               |                    |                |                 |       | Page         | 2  |          |
|-----------------------|--------------------|----------------|-----------------|-------|--------------|--|----------|
| 18 Frogmore Road      |                    |                |                 |       |              |  |          |
| Hemel Hempstead       |                    |                |                 |       | $\sum$       | ിന്നം  | 1~~      |
| Hertfordshire HP3 9RT |                    |                |                 |       |              |  | $\smile$ |
| Date 17/11/2021 08:34 | Desigr             | ned By         | SThorpe         | 5     | D _          | Dell'action de la compaction de la compa | 72       |
| File A_Basin_Soakaway | Checke             | ed By          |                 |       |              |  |          |
| XP Solutions          | Source             | e Conti        | col W.12        | 2.5   | I            |  |          |
|                       |                    |                |                 |       |              |  |          |
| Summary of Re         | esults i           | <u>for 100</u> | ) year F        | Retur | n Peric      | od (+40%)  |          |
| Storm                 | Max Max            |                | Max             |       | Max          | Status   |          |
| Event                 | Level              | Depth          |                 |       |              |  |          |
|                       | (m)                | (m)            | (1/s            | )     | (m³)         |  |          |
| 10080 min Summer      | 86.970             | 0.670          |                 | 1.8   | 103.9        | ОК   |          |
| 15 min Winter         |                    |                |                 | 1.9   |              | 0 K  |          |
| 30 min Winter         |                    |                |                 | 2.2   | 160.1        | 0 K  |          |
| 60 min Winter         |                    |                |                 | 2.5   | 194.5        | Flood Risk   |          |
| 120 min Winter        | 87.424             | 1.124          |                 | 2.7   | 225.9        | Flood Risk   |          |
| 180 min Winter        |                    |                |                 | 2.8   |              | Flood Risk   |          |
| 240 min Winter        |                    |                |                 | 2.9   |              | Flood Risk   |          |
| 360 min Winter        |                    |                |                 | 2.9   |              | Flood Risk   |          |
| 480 min Winter        |                    |                |                 | 3.0   |              | Flood Risk   |          |
| 600 min Winter        |                    |                |                 | 3.0   |              | Flood Risk   |          |
| 720 min Winter        |                    | 1.225          |                 | 2.9   |              | Flood Risk   |          |
| 960 min Winter        |                    |                |                 | 2.9   |              | Flood Risk   |          |
| 1440 min Winter       |                    |                |                 | 2.8   |              | Flood Risk   |          |
| 2160 min Winter       |                    |                |                 | 2.7   |              | Flood Risk   |          |
| 2880 min Winter       |                    |                |                 | 2.6   |              | Flood Risk   |          |
| 4320 min Winter       |                    |                |                 | 2.3   |              | O K  |          |
| 5760 min Winter       |                    |                |                 | 2.1   |              |  |          |
| 7200 min Winter       |                    |                |                 | 2.0   |              | 0 K  |          |
| 8640 min Winter       |                    |                |                 | 1.8   | 109.1        | 0 K  |          |
|                       |                    |                |                 |       |              |  |          |
|                       | Storn<br>Event     |                | Rain<br>(mm/hr) |       | -Peak<br>ns) |  |          |
| 10                    | 080 min            | Summer         | 0.904           |       | 5752         |  |          |
| 10                    |                    |                | 142.829         |       | 26           |  |          |
|                       | 30 min             |                | 92.260          |       | 41           |  |          |
|                       |                    |                | 56.713          |       | 70           |  |          |
|                       | 120 min            |                |                 |       | 126          |  |          |
|                       | 120 min<br>180 min |                |                 |       | 184          |  |          |
|                       | 240 min            |                |                 |       | 242          |  |          |
|                       | 360 min            |                |                 |       | 242<br>356   |  |          |
|                       | 480 min            |                |                 |       | 336<br>470   |  |          |
|                       | 480 min<br>600 min |                |                 |       | 470<br>578   |  |          |
|                       | 720 min            |                |                 |       |              |  |          |
|                       |                    |                | 8.005<br>6.329  |       | 684<br>784   |  |          |
|                       |                    |                |                 |       | 784          |  |          |
|                       | 440 min            |                |                 |       | 1084         |  |          |
|                       | 160 min            |                |                 |       | 1540         |  |          |
|                       | 880 min            |                |                 |       | 1988         |  |          |
|                       | 320 min            |                |                 |       | 2852         |  |          |
|                       |                    |                | 1.442           |       | 3640         |  |          |
|                       | 200 min            |                |                 |       | 4464         |  |          |
| 8                     | 640 min            | winter         | 1.029           |       | 5200         |  |          |
|                       |                    |                |                 |       |              |  |          |
|                       |                    |                |                 |       |              |  |          |
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| Ô                     | 1982-20            | 10 Mic         | ro Drai         | nage  | Ltd          |  |          |

| RSK LDE               |                |        |                |                  | Page             | 3             |            |
|-----------------------|----------------|--------|----------------|------------------|------------------|---------------|------------|
| 18 Frogmore Road      |                |        |                |                  | Lage             | -             |            |
| Hemel Hempstead       |                |        |                |                  |                  | 0             | <u> </u>   |
| Hertfordshire HP3 9RT |                |        |                |                  | ) <sub>v</sub> ( | <u>й сг</u>   | $\bigcirc$ |
|                       | Desimu         |        |                |                  |                  |               | R          |
| Date 17/11/2021 08:34 | Designe        |        | Inorpe         |                  |                  | <u>10 0 0</u> | 1663       |
| File A_Basin_Soakaway |                |        |                |                  |                  |               |            |
| XP Solutions          | Source         | Contro | 1 W.12         | .5               |                  |               |            |
| Summary of Re         | esults fo      | r 100  | year R         | eturn            | Period           | (+40%)        |            |
| Storm                 | Max            | Max    | Ма             | ax               | Max              | Status        |            |
| Event                 | Level          |        |                |                  | Volume           |               |            |
|                       | (m)            | (m)    | (1/            | s)               | (m³)             |               |            |
| 10080 min Wint        | er 86.926      | 0.626  |                | 1.7              | 94.6             | ОК            |            |
|                       | Storm<br>Event |        | Rain<br>mm/hr) | Time-Pe<br>(mins |                  |               |            |
|                       | 1000 min mi    | ntor   | 0 004          | E /              | 960              |               |            |
|                       | 080 min Wi     | IILEL  | 0.904          | 55               | 000              |               |            |
|                       |                |        |                |                  |                  |               |            |
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|                       | 1000 0010      | ) M-   | Der '          |                  | ⊢d               |               |            |
| C C                   | 1982-2010      | MICTO  | urain          | lage Li          | ια               |               |            |

| RSK LDE               |         |           |         |           | Page 4                      |   |  |  |  |  |
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| 18 Frogmore Road      |         |           |         |           |                             |   |  |  |  |  |
| Hemel Hempstead       |         |           |         |           |                             |   |  |  |  |  |
| Hertfordshire HP3 9RT |         |           |         |           | Lills                       |   |  |  |  |  |
| Date 17/11/2021 08:34 | Design  | ed By S   | SThorp  | e         |                             | f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f<br>f |  |  |  |  |
| File A_Basin_Soakaway |         |           |         | -         |                             |   |  |  |  |  |
| XP Solutions          |         | Contro    | ol W.1  | 2.5       |                             |   |  |  |  |  |
|                       |         |           |         |           |                             |   |  |  |  |  |
|                       | Ra      | infall    | Detai   | <u>ls</u> |                             |   |  |  |  |  |
| Rainfall Mod          | el      |           | FSR     | 7         | Winter Storms               | Yes   |  |  |  |  |
| Return Period (year   |         |           | 100     |           | Cv (Summer)                 |   |  |  |  |  |
| Regi<br>M5-60 (m      |         | and and N |         |           | Cv (Winter)<br>Storm (mins) |   |  |  |  |  |
| Ratio                 |         |           |         |           | Storm (mins)                |   |  |  |  |  |
| Summer Stor           | ms      |           | Yes     |           | mate Change %               |   |  |  |  |  |
| Time / Area Diagram   |         |           |         |           |                             |   |  |  |  |  |
|                       | Tot     | al Area   | (ha) 0. | 422       |                             |   |  |  |  |  |
| Time                  |         |           | Area    |           | Area                        |   |  |  |  |  |
| (mins)                | (ha)    | (mins)    | (ha)    | (mins)    | (ha)                        |   |  |  |  |  |
| 0-4                   | 0.141   | 4-8       | 0.141   | 8-12      | 0.141                       |   |  |  |  |  |
|                       |         |           |         |           |                             |   |  |  |  |  |
|                       |         |           |         |           |                             |   |  |  |  |  |
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| C)                    | 1982-20 | 10 Micr   | o Drai  | inage L   | td                          |   |  |  |  |  |

| RSK LDE               |                       | Page 5    |
|-----------------------|-----------------------|-----------|
| 18 Frogmore Road      |                       |           |
| Hemel Hempstead       |                       |           |
| Hertfordshire HP3 9RT |                       | LILLELE C |
| Date 17/11/2021 08:34 | Designed By SThorpe   | DETERTINE |
| File A_Basin_Soakaway | Checked By            |           |
| XP Solutions          | Source Control W.12.5 |           |

#### Model Details

Storage is Online Cover Level (m) 87.600

## Infiltration Basin Structure

Invert Level (m) 86.300 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.05148 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.05148

| Depth (m) | Area (m²) |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           |           |           |           |           |           |           |           |
| 0.000     | 100.0     | 0.700     | 223.9     | 1.400     | 0.0       | 2.100     | 0.0       |
| 0.100     | 114.7     | 0.800     | 245.6     | 1.500     | 0.0       | 2.200     | 0.0       |
| 0.200     | 130.4     | 0.900     | 268.3     | 1.600     | 0.0       | 2.300     | 0.0       |
| 0.300     | 147.1     | 1.000     | 292.1     | 1.700     | 0.0       | 2.400     | 0.0       |
| 0.400     | 164.8     | 1.100     | 316.8     | 1.800     | 0.0       | 2.500     | 0.0       |
| 0.500     | 183.5     | 1.200     | 342.5     | 1.900     | 0.0       |           |           |
| 0.600     | 203.2     | 1.300     | 369.3     | 2.000     | 0.0       |           |           |

| RSK LDE           |                        |                               |        |                  |                   | Page           | 1          |     |
|-------------------|------------------------|-------------------------------|--------|------------------|-------------------|----------------|------------|-----|
| 18 Frogmore Road  |                        |                               |        |                  |                   |                |            |     |
| Hemel Hempstead   |                        |                               |        |                  |                   |                | icho /     | X ~ |
| Hertfordshire HP  |                        |                               |        |                  |                   |                |            |     |
| Date 16/11/2021 1 |                        | Designe                       |        | SThorp           | <b> </b> Þ ),     | Panpar         |            |     |
| File B_ModStorage | _Soak                  | Checked                       | Ву     |                  |                   |                |            |     |
| XP Solutions      |                        | Source                        | Contro | ) W.1            | 2.5               |                |            |     |
| <u>Summa</u>      | ary of Re              | <u>sults fo</u><br>Half Drain |        | _                |                   |                | (+40%)     |     |
|                   | Storm<br>Event         | Max<br>Level                  | -      | Infil            | fax<br>tration    |                | Status     |     |
|                   |                        | (m)                           | (m)    | (1               | /s)               | (m³)           |            |     |
| 15                | min Summe              | r 87.589                      | 0.489  |                  | 1.3               | 74.3           | O K        |     |
| 30                | min Summe              | r 87.727                      | 0.627  |                  | 1.4               | 95.4           | O K        |     |
|                   | min Summe              |                               |        |                  | 1.4               | 115.6          | O K        |     |
|                   | min Summe              |                               |        |                  | 1.5               | 133.9          | O K        |     |
|                   | min Summe              |                               |        |                  | 1.5               | 142.7          | O K        |     |
|                   | min Summe              |                               |        |                  | 1.5               | 147.5          | OK         |     |
|                   | min Summe<br>min Summe |                               |        |                  | 1.5<br>1.5        | 151.6<br>152.7 |            |     |
|                   | min Summe<br>min Summe |                               |        |                  | 1.5               | 152.7          | ОК         |     |
|                   | min Summe              |                               |        |                  | 1.5               | 149.8          | 0 K        |     |
|                   | min Summe              |                               |        |                  | 1.5               | 144.8          | O K        |     |
|                   | min Summe              |                               |        |                  | 1.5               | 135.5          | O K        |     |
| 2160              | min Summe              | r 87.914                      | 0.814  |                  | 1.4               | 123.7          | O K        |     |
|                   | min Summe              |                               |        |                  | 1.4               | 113.4          | O K        |     |
|                   | min Summe              |                               |        |                  |                   | 95.1           | O K        |     |
|                   | min Summe              |                               |        |                  |                   | 79.1           | ОК         |     |
|                   | min Summe<br>min Summe |                               |        |                  |                   | 65.1<br>52.8   | O K<br>O K |     |
| 0040              | mini Summe             |                               |        |                  |                   |                |            |     |
|                   |                        | Storm<br>Event                |        | Rain<br>mm/hr)   | Time-Pe<br>(mins) |                |            |     |
|                   |                        | 15 min Su                     | mmer 1 | 42.943           |                   | 26             |            |     |
|                   |                        | 30 min Su                     |        |                  |                   | 41             |            |     |
|                   |                        | 60 min Su                     |        | 56.713           |                   | 70             |            |     |
|                   |                        | 20 min Su                     |        | 33.696           |                   | 30             |            |     |
|                   |                        | 80 min Su<br>40 min Su        |        | 24.548<br>19.508 |                   | 88<br>48       |            |     |
|                   |                        | 60 min Su                     |        | 14.036           |                   | 66             |            |     |
|                   |                        | 80 min Su                     |        | 11.119           |                   | 84             |            |     |
|                   | 6                      | 00 min Su                     |        | 9.275            |                   | 02             |            |     |
|                   | 7                      | 20 min Su                     | mmer   | 7.995            |                   | 20             |            |     |
|                   |                        | 60 min Su                     |        | 6.320            |                   | 28             |            |     |
|                   |                        | 40 min Su                     |        | 4.532            |                   | 72             |            |     |
|                   |                        | 60 min Su                     |        | 3.246            |                   | 76             |            |     |
|                   |                        | 80 min Su<br>20 min Su        |        | 2.559<br>1.828   |                   | 80<br>88       |            |     |
|                   |                        | 60 min Su                     |        | 1.439            |                   | 64             |            |     |
|                   |                        | 00 min Su                     |        | 1.195            |                   | 48             |            |     |
|                   |                        | 40 min Su                     |        | 1.026            |                   | 44             |            |     |
|                   |                        |                               |        |                  |                   |                |            |     |
|                   |                        |                               |        |                  |                   |                |            |     |
|                   |                        |                               |        |                  |                   |                |            |     |
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|                   | ©1                     | 982-2010                      | ) Micr | o Drai           | Lnage Li          | td             |            |     |

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|---------------------------------|------------------------|---------|--------|---------|--------------|-------------|---------|
| Frogmore Road                   |                        |         |        |         |              | 0           | <u></u> |
| el Hempstead                    |                        |         |        |         |              | <u>Mano</u> |         |
| fordshire HP3 9RT               |                        |         |        |         |              |             |         |
| e 16/11/2021 15:28              | Designe                |         | Thorpe | e       | PE           | Je I I P    |         |
| e B_ModStorage_Soak             |                        |         |        |         |              |             |         |
| Solutions                       | Source                 | Contro  | 1 W.12 | 2.5     |              |             |         |
|                                 | 1.                     | 1.0.0   |        |         |              | (           |         |
| Summary of Res                  | sults fo               | r 100   | year 1 | Return  | Period       | (+40%)      |         |
| Storm                           | Max                    | Max     | N      | lax     | Max          | Status      |         |
| Event                           | Level                  |         |        | tration |              | 000000      |         |
|                                 | (m)                    | (m)     | (1     | L/s)    | (m³)         |             |         |
| 10000 min Gumma                 |                        | 0 0 7 0 |        | 1 0     | 40.4         | 0 7         |         |
| 10080 min Summe<br>15 min Winte |                        |         |        | 1.2     | 42.4<br>83.3 | ОК<br>ОК    |         |
| 30 min Winte                    |                        |         |        |         | 107.1        | ок          |         |
| 60 min Winte                    |                        |         |        | 1.5     | 130.1        | 0 K         |         |
| 120 min Winte                   |                        |         |        | 1.5     | 151.1        | 0 K         |         |
| 180 min Winte                   |                        |         |        | 1.5     | 161.5        | ОК          |         |
| 240 min Winte                   |                        |         |        |         | 167.4        | 0 K         |         |
| 360 min Winte                   |                        |         |        | 1.6     |              | 0 K         |         |
| 480 min Winte                   |                        |         |        | 1.6     |              | ОК          |         |
| 600 min Winte                   |                        |         |        | 1.6     | 175.5        | ОК          |         |
| 720 min Winte                   | r 88.247               | 1.147   |        | 1.6     | 174.3        | 0 K         |         |
| 960 min Winte                   | r 88.216               | 1.116   |        | 1.5     | 169.6        | O K         |         |
| 1440 min Winte                  |                        |         |        | 1.5     | 157.9        | O K         |         |
| 2160 min Winte                  |                        |         |        |         | 142.4        | O K         |         |
| 2880 min Winte                  |                        |         |        |         | 127.7        | ΟK          |         |
| 4320 min Winte                  |                        |         |        | 1.4     | 100.9        | ΟK          |         |
| 5760 min Winte                  |                        |         |        | 1.3     | 77.6         | ОК          |         |
| 7200 min Winte                  |                        |         |        | 1.3     |              | ОК          |         |
| 8640 min Winte                  | r 87.369               | 0.269   |        | 1.2     | 40.8         | ОК          |         |
|                                 | Storm                  |         | Rain   | Time-Pe | ak           |             |         |
|                                 | Event                  |         | mm/hr) | (mins   |              |             |         |
| 1.00                            | )80 min Su             |         | 0 000  | E       | 556          |             |         |
| TOC                             | 15 min Su<br>15 min Wi |         |        | 56      | 26           |             |         |
|                                 | 30 min Wi              |         | 92.297 |         | 41           |             |         |
|                                 | 60 min Wi              |         | 56.713 |         | 70           |             |         |
| 1                               | .20 min Wi             |         | 33.696 |         | .28          |             |         |
|                                 | .80 min Wi             |         | 24.548 |         | .84          |             |         |
|                                 | 240 min Wi             |         | 19.508 |         | 242          |             |         |
| 3                               | 360 min Wi             |         | 14.036 |         | 358          |             |         |
| 4                               | 180 min Wi             |         | 11.119 |         | 174          |             |         |
| e                               | 500 min Wi             | nter    | 9.275  | 5       | 586          |             |         |
| 5                               | 20 min Wi              | nter    | 7.995  | 6       | 598          |             |         |
| 2                               | 960 min Wi             | nter    | 6.320  |         | 912          |             |         |
|                                 | 140 min Wi             |         | 4.532  |         | 38           |             |         |
|                                 | .60 min Wi             |         | 3.246  |         | 500          |             |         |
|                                 | 380 min Wi             |         | 2.559  |         | )48          |             |         |
|                                 | 320 min Wi             |         | 1.828  |         | 900          |             |         |
|                                 | 760 min Wi             |         | 1.439  |         | 704          |             |         |
|                                 | 200 min Wi             |         | 1.195  |         | 172          |             |         |
| 86                              | 540 min Wi             | nter    | 1.026  | 51      | .92          |             |         |
|                                 |                        |         |        |         |              |             |         |
|                                 |                        |         |        |         |              |             |         |
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|                                 | 982-2010               |         |        |         |              |             |         |

| BSK LDB       Page 3         18 Frogmore Road<br>Hertfordshire HP3 9RT       Designed By SThorpe<br>The Refult/2021 IS: 2       Designed By SThorpe<br>Checked By         ZY Solution       Source Control W.12.5       Source Control W.12.5         Colspan="2"   | RSK LDE      |       |           |              |               |         | Daga   | 3      |                         |    |
|---|--------------|-------|-----------|--------------|---------------|---------|--------|--------|-------------------------|----|
|   |              |       |           |              |               |         | rage   | ى<br>ا |                         |    |
| <pre>Hertfordshire HP3 9R7 Date 16/11/2021 15:28 Designed By SThorpe Lie B_MdStorage_Sosk Checked By Source Control W.12.5  Cummary of Results for 100 year Return Period (4403) Converting the Brook of the Brook</pre> |              |       |           |              |               |         |        | 0      |                         |    |
| Bate 16/11/2021 15:28       Pesigned By Sthorpe       Decine (not compared by Sthorpe Checked By         XF Solutions       Source Control W.12.3         Summary of Results for 100 year Return Period (4408)         Storm       Max       Max         General Control W.12.3       Max       Status         Storm       Max       Max       Max         General Control W.12.3       Max       Status         Storm       Max       Max       Max         General Control W.12.3       Max       Status         Storm       Max       Max       Max         General Control W.12.3       1.2       27.0       0.8         Storm       Rain Time-Peak       Max       Status         10080 min Winter       0.902       5848       5848   |              |       |           |              |               |         |        | йæг    | $\overline{\mathbf{O}}$ |    |
| File B_ModStorage_Soak       Checked By         XP Solutions       Source Control W.12.5         Summary of Results for 100 year Return Period (4408)         Event       Max       Max       Max       Max       Status         Break       Level Depth Infiltration Volume       Status       Infiltration Volume         Break       Level Depth Infiltration Volume       Status       Infiltration Volume         Break       Level Depth Infiltration Volume       Infiltration Volume         10080 min Winter 87,278 0.178       1.2       27.0       0 K         Storm       Rain Time-Peak       Event       (mm/hr)       Infiltration Volume         10080 min Winter 0.302       5848       5848       Infiltration Volume   |              |       |           |              |               |         |        |        |                         | R  |
| XP Solutions       Source Control W.12.5         Summary of Results for 100 year Return Period (+40%)         Storm       Max       Max       Max       Max       Status         Event       Level Depth Infiltration Volume<br>(m)       (L/s)       (m*)         10080 min Winter 87.278       0.178       1.2       27.0       0 K         Storm       Rain Time-Peak<br>(m)/hr)       (mins)       10080 min Winter       0.902       5948         10080 min Winter       0.902       5948       10080 min Winter       0.902       10080   |              |       |           |              | Thorpe        |         |        | الاچر  | 166                     | 30 |
| Storm       Max       Max <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>   |              |       |           |              |               |         |        |        |                         |    |
| StormMax<br>(m)Max<br>peth<br>(m)Max<br>filtration<br>(L/g)Max<br>volume<br>(m')10000 min Winter87.2780.1781.227.00.8StormRain<br>(ms/hr)Time-Peak<br>(mine)10000 min Winter0.9025848   | XP Solutions | S     | ource (   | Contro       | 1 W.12        | .5      |        |        |                         |    |
| StormMax<br>(m)Max<br>peth<br>(m)Max<br>filtration<br>(L/g)Max<br>volume<br>(m')10000 min Winter87.2780.1781.227.00.8StormRain<br>(ms/hr)Time-Peak<br>(mine)10000 min Winter0.9025848   |              |       |           |              |               |         |        |        |                         |    |
| EventLevelDepthInfiltrationVolume(m)(m)(1/s)(m*)10000 min Winter87.2780.1781.227.00.KStormRainTime-Peak(me/hr)(me/hr)(me/hr)100010000 min Winter0.9025848   | Summary of   | Resu  | lts for   | <u>r 100</u> | <u>year R</u> | leturn  | Period | (+40%) |                         |    |
| EventLevelDepthInfiltrationVolume(m)(m)(1/s)(m*)10000 min Winter87.2780.1781.227.00.8StormRainTime-Peak(m)/D(m)/D584810080 min Winter0.9025848  | Storm        |       | More      | More         | м             | ~       | More   | Status |                         |    |
| (m)     (l/s)     (m²)       10000 min Winter 87.278     0.178     1.2     27.0     0.6       Event     Rain     Time-Peak       Event     0.902     5849   |              |       |           |              |               |         |        | Status |                         |    |
| Storm<br>EventRain<br>(mm/h)Time-Peak<br>(mins)10080 min Winter0.9025848  |              |       |           |              |               |         |        |        |                         |    |
| Storm<br>EventRain<br>(mm/h)Time-Peak<br>(mins)10080 min Winter0.9025848  |              |       |           |              |               |         |        |        |                         |    |
| Event         (mm/hr)         (mine)           10080 min Winter         0.902         5848  | 10080 min Wi | nter  | 87.278    | 0.178        |               | 1.2     | 27.0   | ОК     |                         |    |
| Event         (mm/hr)         (mine)           10080 min Winter         0.902         5848  |              |       | Storm     |              | Rain          | Time-Pe | eak    |        |                         |    |
| 10080 min Winter 0.902 5848   |              |       |           |              |               |         |        |        |                         |    |
|   |              |       |           |              |               |         |        |        |                         |    |
| ©1982-2010 Micro Drainage Ltd   |              | 10080 | ) min Wir | nter         | 0.902         | 58      | 848    |        |                         |    |
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| RSK LDE                |          |           |              |           | Page 4                     |            |
|------------------------|----------|-----------|--------------|-----------|----------------------------|------------|
| 18 Frogmore Road       |          |           |              |           |                            |            |
| Hemel Hempstead        |          |           |              |           |                            |            |
| Hertfordshire HP3 9RT  |          |           |              |           | LULG                       | ro m       |
| Date 16/11/2021 15:28  | Design   | ed By S   | SThorp       | e         |                            | ที่กิลเกาะ |
| File B_ModStorage_Soak | Checke   | ed By     |              |           |                            |            |
| XP Solutions           | Source   | e Contro  | ol W.1       | 2.5       |                            |            |
|                        |          |           |              |           |                            |            |
|                        | Ra       | infall    | Detai        | <u>ls</u> |                            |            |
| Rainfall Mod           |          |           |              | -         | Winter Storms              |            |
| Return Period (year    |          |           | FSR<br>100   |           | Cv (Summer)                |            |
|                        | on Engla | and and W |              |           | Cv (Winter)                |            |
| M5-60 (m               |          |           |              |           | Storm (mins)               |            |
| Ratio<br>Summer Stor   |          | (         | ).441<br>Yes |           | Storm (mins) mate Change % |            |
| Summer Stor            | 1113     |           | 162          | 0111      | liace change .             | 140        |
|                        | Tim      | e / Are   | a Diac       | gram      |                            |            |
|                        |          |           |              |           |                            |            |
|                        | Tot      | al Area   | (ha) 0.      | 283       |                            |            |
| Time                   | Area     | Time      | Area         | Time      | Area                       |            |
|                        | (ha)     | (mins)    |              | (mins)    |                            |            |
|                        | 4 0.094  | 4.0       | 0.094        | 0.10      | 0.004                      |            |
| 0-4                    | 4 0.094  | 4-8       | 0.094        | 8-12      | 0.094                      |            |
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| RSK LDE          |             |                      |                  | Page         | 2 5            |
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| 18 Frogmore Road | 3           |                      |                  | - 5 -        |                |
| Hemel Hempstead  | ~           |                      |                  |              |                |
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| Hertfordshire H  |             |                      |                  |              |                |
| Date 16/11/2021  |             | Designed By          | SThorpe          |              |                |
| File B_ModStorag | je_Soak     |                      |                  |              |                |
| XP Solutions     |             | Source Contr         | ol W.12.5        |              |                |
|                  |             |                      |                  |              |                |
|                  |             | <u>Model I</u>       | Details          |              |                |
|                  | Storad      | ge is Online C       | over Level       | (m) 88.900   |                |
|                  | btora       |                      | over hever       | (117) 00.000 |                |
|                  |             | <u>Cellular Stor</u> | age Struc        | <u>ture</u>  |                |
|                  |             | Invert Level         | (m) <u>87</u> 10 |              | Factor 20      |
| Infilt           | ration Coef | ficient Base (m/     |                  | -            | rosity 0.95    |
|                  |             | ficient Side (m/     |                  |              |                |
|                  |             |                      |                  |              |                |
| Depth (m)        | Area (m²)   | Inf. Area (m²)       | Depth (m)        | Area (m²)    | Inf. Area (m²) |
| 0.000            | 160.0       | 160.0                | 1.300            | 0.0          | 223.2          |
| 0.100            | 160.0       | 165.1                | 1.400            | 0.0          | 223.2          |
| 0.200            | 160.0       | 170.1                | 1.500            | 0.0          | 223.2          |
| 0.300            | 160.0       | 175.2                | 1.600            | 0.0          | 223.2          |
| 0.400            | 160.0       | 180.2                | 1.700            | 0.0          | 223.2          |
| 0.500            | 160.0       | 185.3                | 1.800            | 0.0          | 223.2          |
| 0.600            | 160.0       | 190.4                | 1.900            | 0.0          | 223.2          |
| 0.700            |             | 195.4                |                  |              | 223.2          |
| 0.800            | 160.0       | 200.5                | 2.100            | 0.0          | 223.2          |
| 0.900            | 160.0       | 205.5                | 2.200            | 0.0          | 223.2          |
| 1.000            | 160.0       | 210.6                | 2.300            | 0.0          | 223.2          |
| 1.100            |             | 215.7                |                  |              | 223.2          |
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| RSK LDE                |                                  |                       | Page 1              |                  |
|------------------------|----------------------------------|-----------------------|---------------------|------------------|
| 18 Frogmore Road       |                                  |                       |                     |                  |
| Hemel Hempstead        |                                  |                       |                     |                  |
| Hertfordshire HP3 9RT  |                                  |                       |                     | 50               |
| Date 17/11/2021 08:44  | Designed By S                    | Thorpe                | I Draf              | R                |
|                        | 2 1                              |                       | L'LG                | <u>- Ker Jeo</u> |
| File C_ModStorage_Soak | Checked By                       |                       |                     |                  |
| XP Solutions           | Source Contro                    | W.12.5                |                     |                  |
|                        | 1                                |                       |                     | 、<br>、           |
| Summary of Re          | sults for 100                    | <u>year Return</u>    | <u>Period (+40%</u> | <u>)</u>         |
|                        | Half Drain Time                  | : 1005 minutes.       |                     |                  |
| Storm                  | Max Max                          | Max                   | Max Status          |                  |
| Event                  | Level Depth<br>(m) (m)           | Infiltration<br>(1/s) | Volume<br>(m³)      |                  |
|                        | (11) (11)                        | (1/3)                 | (                   |                  |
|                        | 6.561 0.561                      | 0.6                   | 34.7 ОК             |                  |
| 30 min Summe:          |                                  | 0.6                   | 44.5 ОК             |                  |
|                        | 86.875 0.875                     | 0.7                   | 54.0 OK             |                  |
|                        | r 87.013 1.013<br>r 87.080 1.080 | 0.7<br>0.7            | 62.6 ОК<br>66.7 ОК  |                  |
|                        | c 87.117 1.117                   | 0.7                   | 69.0 OK             |                  |
|                        | c 87.149 1.149                   | 0.7                   | 71.0 OK             |                  |
|                        | 87.159 1.159                     | 0.7                   | 71.5 ОК             |                  |
|                        | r 87.153 1.153                   | 0.7                   | 71.2 ОК             |                  |
|                        | r 87.139 1.139                   | 0.7                   | 70.3 ОК             |                  |
|                        | 87.105 1.105                     | 0.7                   | 68.3 O K            |                  |
|                        | e 87.041 1.041                   | 0.7                   | 64.3 OK             |                  |
|                        | r 86.955 0.955<br>r 86.881 0.881 | 0.7<br>0.7            | 59.0 ОК<br>54.4 ОК  |                  |
|                        | e 86.752 0.752                   | 0.6                   | 46.4 OK             |                  |
|                        | 86.640 0.640                     | 0.6                   | 39.5 ОК             |                  |
|                        | 86.542 0.542                     | 0.6                   | 33.5 ОК             |                  |
| 8640 min Summe:        | 86.455 0.455                     | 0.6                   | 28.1 ОК             |                  |
|                        |                                  | Rain Time-Pe          | ak                  |                  |
|                        | Event (                          | mm/hr) (mins)         |                     |                  |
|                        | 15 min Summer 1                  | 42.829                | 26                  |                  |
|                        |                                  |                       | 41                  |                  |
|                        |                                  |                       | 70                  |                  |
|                        |                                  |                       | 30<br>88            |                  |
|                        |                                  |                       | 88<br>48            |                  |
|                        |                                  |                       | 66                  |                  |
|                        |                                  |                       | 84                  |                  |
| 6                      | 00 min Summer                    | 9.286 6               | 02                  |                  |
|                        | 20 min Summer                    |                       | 10                  |                  |
|                        | 60 min Summer                    |                       | 14                  |                  |
|                        | 40 min Summer<br>60 min Summer   | 4.539 10              |                     |                  |
|                        | 80 min Summer                    | 3.251 14<br>2.564 18  |                     |                  |
|                        | 20 min Summer                    | 1.832 26              |                     |                  |
|                        | 60 min Summer                    | 1.442 34              |                     |                  |
| 72                     | 00 min Summer                    | 1.198 42              | 56                  |                  |
| 86                     | 40 min Summer                    | 1.029 50              | 16                  |                  |
|                        |                                  |                       |                     |                  |
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|                        | 000-0010 ***                     | o Drainant I          | - d                 |                  |
| (C)                    | 982-2010 Micr                    | o prainage Lt         | Lu                  |                  |

| 18 Frogmore Road<br>Hemel Hempstead<br>Hertfordshire HP3 9RT<br>Date 17/11/2021 08:44<br>File C_ModStorage_Soak<br>XP Solutions | Designed                 | d By S  |                  |            |              |            |        |
|---|--------------------------|---------|------------------|------------|--------------|------------|--------|
| Hertfordshire HP3 9RT<br>Date 17/11/2021 08:44<br>File C_ModStorage_Soak<br>XP Solutions  |                          | d By S  |                  |            |              |            |        |
| Date 17/11/2021 08:44<br>File C_ModStorage_Soak<br>XP Solutions   |                          | d By S  |                  |            |              |            |        |
| File C_ModStorage_Soak<br>XP Solutions  |                          | d By S  |                  |            |              | JEL        |        |
| XP Solutions  | Checked                  | ~ _1 ~  | Thorpe           | 9          |              | Pentr      | പ്രവല് |
|   |                          | Ву      |                  |            |              |            |        |
| Summary of Re   | Source (                 | Contro  | l W.12           | 2.5        |              |            |        |
| Summary of Re   |                          |         |                  |            |              |            |        |
| <u>Summary Of Re</u>  | sults fo                 | r 100   | year 1           | Return     | Period       | (+40응)     |        |
| Storm   | Max                      | Max     |                  | ſax        | Max          | Status     |        |
| Event   | Level                    |         |                  | tration    |              | Status     |        |
|   | (m)                      | (m)     |                  | L/s)       | (m³)         |            |        |
| 10080 min Summe   | ~~ 96 390                | 0 300   |                  | 0.6        | 23 5         | ΟK         |        |
| 15 min Winte  |                          |         |                  | 0.6<br>0.6 | 23.5<br>38.9 | ОК         |        |
| 30 min Winte  |                          |         |                  | 0.7        | 50.0         | 0 K        |        |
| 60 min Winte  | er 86.983                | 0.983   |                  | 0.7        | 60.7         | ΟK         |        |
| 120 min Winte   | er 87.143                | 1.143   |                  | 0.7        | 70.6         | O K        |        |
| 180 min Winte   |                          |         |                  | 0.7        | 75.4         |            |        |
| 240 min Winte   |                          |         |                  | 0.8        | 78.2         | ОК         |        |
| 360 min Winte   |                          |         |                  | 0.8        | 80.9         |            |        |
| 480 min Winte<br>600 min Winte  |                          |         |                  | 0.8<br>0.8 | 82.0<br>82.1 | O K<br>O K |        |
| 720 min Winte   |                          |         |                  | 0.8        | 82.1         | O K        |        |
| 960 min Winte   |                          |         |                  | 0.8        | 79.5         | ОК         |        |
| 1440 min Winte  |                          |         |                  | 0.7        | 74.6         | ΟK         |        |
| 2160 min Winte  | er 87.096                | 1.096   |                  | 0.7        | 67.7         | ΟK         |        |
| 2880 min Winte  | er 86.992                | 0.992   |                  | 0.7        | 61.2         | O K        |        |
| 4320 min Winte  |                          |         |                  | 0.7        | 49.7         | O K        |        |
| 5760 min Winte  |                          |         |                  | 0.6        | 39.8         |            |        |
| 7200 min Winte  |                          |         |                  | 0.6        | 31.2         | ОК         |        |
| 8640 min Winte  | er 86.388                | 0.388   |                  | 0.6        | 23.9         | ОК         |        |
|   | Storm                    |         | Rain             | Time-Pe    | ak           |            |        |
|   | Event                    | (       | mm/hr)           | (mins      | )            |            |        |
| 10  | 080 min Su               | mmer    | 0.904            | 57         | 752          |            |        |
|   | 15 min Wi                | nter 1  | 42.829           |            | 26           |            |        |
|   | 30 min Wi                |         | 92.260           |            | 41           |            |        |
|   | 60 min Wi                |         | 56.713           |            | 70           |            |        |
|   | 120 min Wi               |         | 33.709           |            | 128          |            |        |
|   | 180 min Wi<br>240 min Wi |         | 24.562           |            | 184          |            |        |
|   | 240 min Wi<br>360 min Wi |         | 19.521<br>14.048 |            | 242<br>358   |            |        |
|   | 480 min Wi               |         | 11.131           |            | 172          |            |        |
|   | 600 min Wi               |         |                  |            | 584          |            |        |
|   | 720 min Wi               |         |                  |            | 594          |            |        |
|   | 960 min Wi               |         |                  |            | 904          |            |        |
|   | 440 min Wi               |         |                  |            | 24           |            |        |
|   | 160 min Wi               |         | 3.251            |            | 584          |            |        |
|   | 880 min Wi               |         |                  |            | )44          |            |        |
|   | 320 min Wi               |         |                  |            | 900          |            |        |
| 5   | 760 min Wi<br>200 min Wi | nter    |                  |            | 744<br>536   |            |        |
|   | 200 min Wi<br>640 min Wi |         | 1.198<br>1.029   |            | 536<br>272   |            |        |
| 0   | 010 mtii WT              |         | 1.029            | 52         |              |            |        |
|   |                          |         |                  |            |              |            |        |
|   |                          |         |                  |            |              |            |        |
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| ©`  | 1982-2010                | ) Micro | o Drai           | nage Lt    | zd           |            |        |
|   |                          |         |                  | -          |              |            |        |

| RSK LDE           |             |                |        |                |                  | Page   | 3      |                 |
|-------------------|-------------|----------------|--------|----------------|------------------|--------|--------|-----------------|
| 18 Frogmore Road  |             |                |        |                |                  | 1 ago  |        |                 |
| Hemel Hempstead   |             |                |        |                |                  |        | 0      |                 |
| Hertfordshire HE  | 23 9RT      |                |        |                |                  |        | Л(с¦Г  | $\bigcirc$      |
| Date 17/11/2021 0 |             | Designed       | 1 BV S | Thorne         | 2                |        | ວລາດ   |                 |
| File C_ModStorage |             | Checked        |        | inorpe         | -                |        | 56.00  | <u>l Cicles</u> |
| XP Solutions      |             | Source (       |        | 1 1 1 2        | ۰<br>۲           |        |        |                 |
|                   |             | bource (       |        |                | •••              |        |        |                 |
| Summa             | ary of Res  | sults for      | r 100  | year F         | Return           | Period | (+40%) |                 |
|                   | -           |                |        | -              |                  |        |        |                 |
|                   | Storm       | Max            | Max    |                | ax               | Max    | Status |                 |
|                   | Event       | Level          |        |                |                  | Volume |        |                 |
|                   |             | (m)            | (m)    | (1             | /s)              | (m³)   |        |                 |
| 1008              | 0 min Winte | r 86.287       | 0.287  |                | 0.5              | 17.7   | O K    |                 |
|                   |             | Storm<br>Event |        | Rain<br>mm/hr) | Time-Po<br>(mins |        |        |                 |
|                   |             |                |        |                |                  | ,      |        |                 |
|                   | 100         | 80 min Wi      | nter   | 0.904          | 5                | 960    |        |                 |
|                   |             |                |        |                |                  |        |        |                 |
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|                   | ©1          | 982-2010       | Micro  | Drai           | nage L           | τα     |        |                 |

| RSK LDE                |              |                |         |                | Page 4                       |                       |
|------------------------|--------------|----------------|---------|----------------|------------------------------|-----------------------|
| 18 Frogmore Road       |              |                |         |                |                              |                       |
| Hemel Hempstead        |              |                |         |                |                              |                       |
| Hertfordshire HP3 9RT  |              |                |         |                | LUCS                         | ro m                  |
| Date 17/11/2021 08:44  | Design       | ied By S       | Thorp   | e              |                              | 1<br>m<br>e<br>o<br>e |
| File C ModStorage Soak | Checke       | ed By          |         |                |                              |                       |
| XP Solutions           | Source       | Contro         | ol W.1  | 2.5            |                              |                       |
|                        |              |                |         |                |                              |                       |
|                        | <u>Ra</u>    | ainfall        | Detai   | <u>ls</u>      |                              |                       |
| Rainfall Mode          | 1            |                | FSR     |                | Winter Storms                | Yes                   |
| Return Period (years   |              |                | 100     |                | Cv (Summer)                  |                       |
|                        |              | and and W      |         |                | Cv (Winter)                  |                       |
| M5-60 (mm<br>Ratio     |              |                |         |                | Storm (mins)<br>Storm (mins) |                       |
| Summer Storm           |              |                | Yes     |                | mate Change %                |                       |
|                        |              | - / -          |         |                |                              |                       |
|                        | <u>'1'1m</u> | e / Are        | a Diac  | <u>iram</u>    |                              |                       |
|                        | Tot          | al Area        | (ha) 0. | 132            |                              |                       |
| Time                   | Area<br>(ha) | Time<br>(mins) | Area    | Time<br>(mins) | Area                         |                       |
|                        |              |                |         |                |                              |                       |
| 0-4                    | 0.044        | 4-8            | 0.044   | 8-12           | 0.044                        |                       |
|                        |              |                |         |                |                              |                       |
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|                        |              |                |         |                |                              |                       |
|                        |              |                |         |                |                              |                       |
| <u> </u>               | 982-20       | 10 Micr        | o Drai  | nage T.        | td                           |                       |

| RSK LDE                        |                         |                  | Page 5                      |           |  |  |  |  |
|--------------------------------|-------------------------|------------------|-----------------------------|-----------|--|--|--|--|
| 18 Frogmore Road               |                         |                  |                             |           |  |  |  |  |
| Hemel Hempstead                |                         |                  |                             |           |  |  |  |  |
| Hertfordshire HP3 9RT          |                         |                  | LULGU                       | $\odot$   |  |  |  |  |
| Date 17/11/2021 08:44          | Designed By STh         | lorpe            | Draft                       | De la com |  |  |  |  |
| File C ModStorage Soak.        |                         | 1                |                             |           |  |  |  |  |
| XP Solutions                   | Source Control          | W 12 5           |                             |           |  |  |  |  |
|                                |                         |                  |                             |           |  |  |  |  |
|                                | <u>Model Det</u>        | ails             |                             |           |  |  |  |  |
|                                | <u>110401 Dec</u>       | 4110             |                             |           |  |  |  |  |
| Sto                            | age is Online Cover     | Level (m)        | 88.000                      |           |  |  |  |  |
|                                |                         | . /              |                             |           |  |  |  |  |
|                                | <u>Cellular Storage</u> | <u>Structure</u> |                             |           |  |  |  |  |
|                                |                         |                  |                             |           |  |  |  |  |
|                                | Invert Level (m)        | 86.000 Sa        | afety Factor 2.             | .0        |  |  |  |  |
|                                | efficient Base (m/hr)   |                  | Porosity 0.9                | 95        |  |  |  |  |
| Infiltration Co                | efficient Side (m/hr)   | 0.05148          |                             |           |  |  |  |  |
| Depth (m) Area (m <sup>2</sup> | ) Inf. Area (m²)   De   | pth (m) Area     | (m <sup>2</sup> ) Inf. Area | a (m²)    |  |  |  |  |
|                                | , ,,,                   |                  |                             | - ( )     |  |  |  |  |
| 0.000 65.                      | 0 65.0                  | 1.300            | 65.0                        | 106.9     |  |  |  |  |
| 0.100 65.                      |                         | 1.400            | 65.0                        | 110.1     |  |  |  |  |
| 0.200 65.                      |                         | 1.500            | 0.0                         | 111.8     |  |  |  |  |
| 0.300 65.                      |                         | 1.600            | 0.0                         | 111.8     |  |  |  |  |
| 0.400 65.                      |                         | 1.700            | 0.0                         | 111.8     |  |  |  |  |
| 0.500 65.                      |                         | 1.800            | 0.0                         | 111.8     |  |  |  |  |
| 0.600 65.                      | 0 84.3                  | 1.900            | 0.0                         | 111.8     |  |  |  |  |
| 0.700 65.                      |                         | 2.000            | 0.0                         | 111.8     |  |  |  |  |
| 0.800 65.                      | 90.8                    | 2.100            | 0.0                         | 111.8     |  |  |  |  |
| 0.900 65.                      | 94.0                    | 2.200            | 0.0                         | 111.8     |  |  |  |  |
| 1.000 65.                      | 97.2                    | 2.300            | 0.0                         | 111.8     |  |  |  |  |
| 1.100 65.                      | 0 100.5                 | 2.400            | 0.0                         | 111.8     |  |  |  |  |
| 1.200 65.                      | 0 103.7                 | 2.500            | 0.0                         | 111.8     |  |  |  |  |
|                                |                         |                  |                             |           |  |  |  |  |
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| RSK LDE                          |                                   |                      | Page         | 1          |       |  |
|----------------------------------|-----------------------------------|----------------------|--------------|------------|-------|--|
| 18 Frogmore Road                 |                                   |                      |              |            |       |  |
| Hemel Hempstead                  |                                   |                      | $\int $      | 9          |       |  |
| Hertfordshire HP3 9RT            |                                   |                      |              |            | - Um  |  |
| Date 17/11/2021 08:47            | Designed By S                     | Thorpe               |              | nadene     | R     |  |
|                                  |                                   |                      |              |            | SC Co |  |
|                                  | File D_ModStorage_Soak Checked By |                      |              |            |       |  |
| XP Solutions                     | Source Contro                     | 51 W.12.5            |              |            |       |  |
|                                  |                                   |                      |              |            |       |  |
| Summary of Rea                   | <u>sults for 100</u>              | <u>year Return</u>   | Period       | (+40%)     |       |  |
|                                  |                                   |                      |              |            |       |  |
|                                  | Half Drain Time                   | : 909 minutes.       |              |            |       |  |
| Storm                            | Max Max                           | Max                  | Max          | Status     |       |  |
| Event                            | Level Depth                       | Infiltration         | Volume       |            |       |  |
|                                  | (m) (m)                           | (1/s)                | (m³)         |            |       |  |
| 15 1 0                           | 00 401 0 501                      | 0.5                  | 00 6         | o <b>T</b> |       |  |
|                                  | 88.401 0.501                      | 0.5                  | 28.6         | O K        |       |  |
|                                  | r 88.543 0.643<br>r 88.680 0.780  | 0.6<br>0.6           | 36.7<br>44.4 | ОК<br>ОК   |       |  |
|                                  | c 88.801 0.901                    | 0.6                  | 51.4         | 0 K        |       |  |
|                                  | 88.858 0.958                      | 0.6                  | 54.6         | 0 K        |       |  |
| 240 min Summer                   | £ 88.889 0.989                    | 0.6                  | 56.4         | O K        |       |  |
|                                  | r 88.912 1.012                    | 0.7                  | 57.7         | O K        |       |  |
|                                  | 88.915 1.015                      | 0.7                  | 57.9         | O K        |       |  |
| 600 min Summer<br>720 min Summer | r 88.906 1.006<br>r 88.890 0.990  | 0.7<br>0.6           | 57.3<br>56.4 | ОК<br>ОК   |       |  |
|                                  | 2 88.858 0.958                    | 0.6                  | 54.6         | 0 K        |       |  |
| 1440 min Summer                  |                                   | 0.6                  | 51.1         | 0 K        |       |  |
| 2160 min Summer                  | e 88.717 0.817                    | 0.6                  | 46.6         | O K        |       |  |
|                                  | 88.647 0.747                      | 0.6                  | 42.6         | O K        |       |  |
|                                  | 88.525 0.625                      | 0.6                  | 35.6         | O K        |       |  |
|                                  | c 88.420 0.520<br>c 88.329 0.429  | 0.5<br>0.5           | 29.6<br>24.5 | ОК<br>ОК   |       |  |
|                                  | c 88.251 0.351                    | 0.5                  | 24.5         | 0 K        |       |  |
|                                  |                                   |                      |              |            |       |  |
|                                  | Storm                             | Rain Time-Pe         | ak           |            |       |  |
|                                  | Event (                           | mm/hr) (mins)        |              |            |       |  |
|                                  | 15 min Cummon 1                   | 42 020               | 26           |            |       |  |
|                                  | 15 min Summer 1<br>30 min Summer  |                      | 26<br>41     |            |       |  |
|                                  |                                   |                      | 70           |            |       |  |
| 1                                | 20 min Summer                     |                      | 28           |            |       |  |
|                                  |                                   |                      | 88           |            |       |  |
|                                  |                                   |                      | 46           |            |       |  |
|                                  |                                   |                      | 64<br>82     |            |       |  |
|                                  | 00 min Summer                     |                      | 82<br>00     |            |       |  |
|                                  | 20 min Summer                     |                      | 74           |            |       |  |
| 9                                | 60 min Summer                     |                      | 82           |            |       |  |
|                                  | 40 min Summer                     | 4.539 10             |              |            |       |  |
|                                  | 60 min Summer                     | 3.251 14             |              |            |       |  |
|                                  | 80 min Summer<br>20 min Summer    | 2.564 18<br>1.832 26 |              |            |       |  |
|                                  | 60 min Summer                     | 1.442 34             |              |            |       |  |
|                                  | 00 min Summer                     | 1.198 41             |              |            |       |  |
| 86                               | 40 min Summer                     | 1.029 49             | 36           |            |       |  |
|                                  |                                   |                      |              |            |       |  |
|                                  |                                   |                      |              |            |       |  |
|                                  |                                   |                      |              |            |       |  |
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|                                  | 082_2010 Mi ~~                    | o Drainara It        | - d          |            |       |  |
| 01                               | .982-2010 Micr                    | o prarmaye Lt        | Ju           |            |       |  |

| RSK LDE            |                 |              |                  |                  |                  | Page   | 2      |            |
|--------------------|-----------------|--------------|------------------|------------------|------------------|--|--------|------------|
| 18 Frogmore Road   |                 |              |                  |                  |                  |  |        |            |
| Hemel Hempstead    |                 |              |                  |                  |                  | $\left  \begin{array}{c} \nabla \end{array} \right $ |        |            |
| Hertfordshire HP3  | 3 9RT           |              |                  |                  |                  |  | JEIU   | 0          |
| Date 17/11/2021 08 | 8:47            | Desig        | ned By           | SThorp           | e                |  | pende  | 1 Solor    |
| File D ModStorage  |                 |              |                  | -                |                  | <u>L</u>   |        | <u>unc</u> |
| XP Solutions       | _               |              | e Conti          | col W.1          | 2.5              |  |        |            |
|                    |                 |              |                  |                  |                  |  |        |            |
| Summa              | <u>ry of Re</u> | sults        | for 100          | ) year           | Return           | Period   | (+40%) |            |
|                    | Storm           | Ma           | x Max            | : 1              | Max              | Max  | Status |            |
|                    | Event           | Lev          | el Dept          | h Infil          | tration          | Volume   |        |            |
|                    |                 | (m           | ) (m)            | (                | 1/s)             | (m³)   |        |            |
| 10080              | min Summe       | er 88.1      | 184 0.28         | 4                | 0.5              | 16.2   | ОК     |            |
|                    | min Winte       |              |                  |                  | 0.6              | 32.1   | ОК     |            |
|                    | min Winte       |              |                  | 2                | 0.6              | 41.2   | O K    |            |
|                    | min Winte       |              |                  |                  | 0.6              | 50.0   | O K    |            |
|                    | min Winte       |              |                  |                  | 0.7              | 58.0   | O K    |            |
|                    | min Winte       |              |                  |                  | 0.7              | 61.8   | ОК     |            |
|                    | min Winte       |              |                  |                  | 0.7              | 64.0   | ОК     |            |
|                    | min Winte       |              |                  |                  | 0.7              | 65.9   |        |            |
|                    | min Winte       |              |                  |                  | 0.7<br>0.7       | 66.5<br>66.3   |        |            |
|                    | min Winte       |              |                  |                  | 0.7              | 65.7   | 0 K    |            |
|                    | min Winte       |              |                  |                  | 0.7              | 63.5   | ОК     |            |
|                    | min Winte       |              |                  |                  | 0.7              | 59.2   | ОК     |            |
| 2160               | min Winte       | er 88.8      | 332 0.93         | 2                | 0.6              | 53.1   | ОК     |            |
| 2880               | min Winte       | er 88.7      | 732 0.83         | 2                | 0.6              | 47.4   | O K    |            |
|                    | min Winte       |              |                  |                  | 0.6              | 37.3   |        |            |
|                    | min Winte       |              |                  |                  | 0.5              | 28.8   |        |            |
|                    | min Winte       |              |                  |                  | 0.5              | 21.5   |        |            |
| 8640               | min Winte       | er 88.1      | 1/2 0.21         | 2                | 0.5              | 15.5   | ОК     |            |
|                    |                 | Stor<br>Ever |                  | Rain<br>(mm/hr)  | Time-Pe<br>(mins |  |        |            |
|                    |                 |              |                  |                  |                  |  |        |            |
|                    | 10              |              | Summer           |                  |                  | 548  |        |            |
|                    |                 |              | Winter<br>Winter |                  |                  | 26<br>41   |        |            |
|                    |                 |              | Winter           | 92.260<br>56.713 |                  | 41<br>70   |        |            |
|                    |                 |              | Winter           |                  |                  | 70<br>L26  |        |            |
|                    |                 |              | Winter           |                  |                  | 184  |        |            |
|                    |                 |              | Winter           |                  |                  | 242  |        |            |
|                    |                 | 360 min      | Winter           |                  |                  | 358  |        |            |
|                    |                 |              | Winter           |                  |                  | 172  |        |            |
|                    |                 |              | Winter           |                  |                  | 582  |        |            |
|                    |                 |              | Winter           |                  |                  | 592  |        |            |
|                    |                 |              | Winter           |                  |                  | 390  |        |            |
|                    |                 |              | Winter<br>Winter |                  |                  | L06<br>564   |        |            |
|                    |                 |              | Winter           |                  |                  | )20  |        |            |
|                    |                 |              | Winter           |                  |                  | 360  |        |            |
|                    |                 |              | Winter           |                  |                  | 588  |        |            |
|                    | 7.              | 200 min      | Winter           | 1.198            |                  | 108  |        |            |
|                    | 8               | 640 min      | Winter           | 1.029            | 51               | 84   |        |            |
|                    |                 |              |                  |                  |                  |  |        |            |
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|                    |                 | 982-2        | 010 Mia          | ro Dra           | inage Lt         | d  |        |            |

| RSK LDE          |                   |                |        |                |                  | Page   | 3      |   |
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| 18 Frogmore Road |                   |                |        |                |                  | 1 ago  |        |   |
| Hemel Hempstead  |                   |                |        |                |                  |        | 0      |   |
| Hertfordshire H  | P3 9RT            |                |        |                |                  |        | Л(с¦Г  | $\bigcirc$  |
| Date 17/11/2021  |                   | Designed       | 1 BV S | Thorne         | 2                |        | ວລາດ   | D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D |
| File D_ModStorag |                   | Checked        |        | inorpe         | -                |        | 56.00  | <u>lette</u>  |
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| Summ             | <u>ary of Res</u> | sults for      | r 100  | year R         | Return           | Period | (+40응) |   |
|                  | -                 |                |        | -              |                  |        |        |   |
|                  | Storm             | Max            | Max    |                | ax               | Max    | Status |   |
|                  | Event             | Level          |        |                |                  | Volume |        |   |
|                  |                   | (m)            | (m)    | (1             | /s)              | (m³)   |        |   |
| 1008             | 30 min Winte      | r 88.085       | 0.185  |                | 0.5              | 10.6   | O K    |   |
|                  |                   | Storm<br>Event |        | Rain<br>mm/hr) | Time-Po<br>(mins |        |        |   |
|                  |                   |                |        |                |                  |        |        |   |
|                  | 100               | 80 min Wi      | nter   | 0.904          | 5                | 848    |        |   |
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| RSK LDE                             |             |           |              |           | Page 4                                  |
|-------------------------------------|-------------|-----------|--------------|-----------|---|
| 18 Frogmore Road                    |             |           |              |           |   |
| Hemel Hempstead                     |             |           |              |           |   |
| Hertfordshire HP3 9RT               |             |           |              |           | Treate .                                |
| Date 17/11/2021 08:47               | Design      | ed By S   | SThorp       | e         | Drangeog                                |
| File D ModStorage Soak              | Checke      | d By      |              |           |   |
| XP Solutions                        | Source      | Contro    | ) W.1        | 2.5       |   |
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|                                     | <u>Ra</u>   | infall    | Detai        | <u>ls</u> |   |
|                                     | 2           |           |              | -         |   |
| Rainfall Mod<br>Return Period (year |             |           | FSR<br>100   |           | Winter Storms Yes<br>Cv (Summer) 0.750  |
|                                     | on Engla    | ind and W |              |           | Cv (Winter) 0.840                       |
| M5-60 (m                            |             |           |              |           | Storm (mins) 15                         |
| Ratio<br>Summer Stor                |             | (         | ).440<br>Yes |           | Storm (mins) 10080<br>mate Change % +40 |
| Summer Stor                         | 1115        |           | 163          | CIII      |   |
|                                     | <u>Time</u> | e / Are   | a Diac       | gram      |   |
|                                     | Tota        | al Area   | (ha) 0.      | 109       |   |
| Time                                | Area        | Time      | Area         |           | Area                                    |
| (mins)                              | (ha)        | (mins)    | (ha)         | (mins)    | (ha)                                    |
| 0-4                                 | 1 0.036     | 4-8       | 0.036        | 8-12      | 0.036                                   |
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| RSK LDE          |             |                      |                | Page 5         |             |
|------------------|-------------|----------------------|----------------|----------------|-------------|
| 18 Frogmore Road |             |                      |                |                |             |
| Hemel Hempstead  |             |                      |                |                |             |
| Hertfordshire H  | P3 9RT      |                      |                | ا کر لار       | SHO M       |
| Date 17/11/2021  |             | Designed By          | Supervo        |                |             |
|                  |             |                      | SINOIPE        |                |             |
| File D_ModStorag | e_Soak      |                      |                |                |             |
| XP Solutions     |             | Source Contr         | ol W.12.5      |                |             |
|                  |             | Madal                |                |                |             |
|                  |             | Model I              | <u>Details</u> |                |             |
|                  | Storad      | ge is Online Co      | wer Level      | (m) 89 700     |             |
|                  | bcorac      | ,0 10 001100 00      | SACT DEVEL     | (, 05.,00      |             |
|                  |             | <u>Cellular Stor</u> | age Struct     | ture           |             |
|                  |             | <u>ectrurur beer</u> | age berae      | <u>curc</u>    |             |
|                  |             | Invert Level         | (m) 87.90      | 0 Safety Facto | or 2.0      |
| Infilt           | ration Coef | ficient Base (m/     |                | -              | zy 0.95     |
|                  |             | ficient Side (m/     |                |                | -           |
|                  |             |                      |                |                |             |
| Depth (m)        | Area (m²)   | Inf. Area (m²)       | Depth (m)      | Area (m²) Inf  | . Area (m²) |
| 0.000            | 60.0        | 60.0                 | 1.300          | 0.0            | 98.7        |
| 0.100            | 60.0        | 63.1                 | 1.400          | 0.0            | 98.7        |
| 0.200            | 60.0        | 66.2                 | 1.500          | 0.0            | 98.7        |
| 0.300            | 60.0        | 69.3                 | 1.600          | 0.0            | 98.7        |
| 0.400            | 60.0        | 72.4                 | 1.700          | 0.0            | 98.7        |
| 0.500            | 60.0        | 75.5                 | 1.800          | 0.0            | 98.7        |
| 0.600            | 60.0        | 78.6                 | 1.900          | 0.0            | 98.7        |
| 0.700            | 60.0        | 81.7                 | 2.000          | 0.0            | 98.7        |
| 0.800            | 60.0        | 84.8                 | 2.100          | 0.0            | 98.7        |
| 0.900            | 60.0        | 87.9                 | 2.200          | 0.0            | 98.7        |
| 1.000            | 60.0        | 91.0                 | 2.300          | 0.0            | 98.7        |
| 1.100            | 60.0        | 94.1                 | 2.400          | 0.0            | 98.7        |
| 1.200            | 60.0        | 97.2                 | 2.500          | 0.0            | 98.7        |
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| RSK LDE                |                                  |                 | Page 1            |  |  |  |
|------------------------|----------------------------------|-----------------|-------------------|--|--|--|
| 18 Frogmore Road       |                                  |                 |                   |  |  |  |
| Hemel Hempstead        |                                  |                 |                   |  |  |  |
| Hertfordshire HP3 9RT  |                                  |                 |                   |  |  |  |
| Date 17/11/2021 09:03  | Designed By                      | SThorpo         |                   | her and the second seco |  |  |
|                        |                                  |                 |                   |  |  |  |
| File E_ModStorage_Soak | — — — —                          |                 |                   |  |  |  |
| XP Solutions           | Source Contr                     | ol W.12.5       |                   |  |  |  |
|                        |                                  |                 |                   |  |  |  |
| Summary of Rea         | sults for 100                    | year Return     | Period (+4        | <u>0%)</u>   |  |  |
|                        |                                  |                 |                   |  |  |  |
| 1                      | Half Drain Time                  | : 1226 minutes. |                   |  |  |  |
| Storm                  | Max Max                          | Max             | Max Stat          |  |  |  |
| Event                  |                                  | Infiltration    |                   | .45  |  |  |
|                        | (m) (m)                          | (1/s)           | (m <sup>3</sup> ) |  |  |  |
|                        |                                  |                 |                   |  |  |  |
| 15 min Summer          |                                  |                 |                   | ) K  |  |  |
| 30 min Summer          |                                  |                 |                   | ) K  |  |  |
|                        | 88.749 0.949                     |                 |                   | ) K  |  |  |
| 120 min Summer         | r 88.904 1.104<br>r 88.981 1.181 |                 |                   | ) K  |  |  |
|                        | 2 88.981 1.181<br>2 89.026 1.226 |                 |                   | ) K  |  |  |
|                        | 2 89.026 1.226<br>2 89.070 1.270 |                 |                   | ) K<br>) K   |  |  |
|                        | £ 89.089 1.289                   |                 |                   | ) K  |  |  |
|                        | s 89.092 1.292                   |                 |                   | ) K  |  |  |
|                        | 89.085 1.285                     |                 |                   | ) K  |  |  |
|                        | 89.053 1.253                     |                 |                   | ) K  |  |  |
| 1440 min Summer        | 88.986 1.186                     | 1.5             | 169.0 C           | ) K  |  |  |
| 2160 min Summer        | 88.895 1.095                     | 1.5             | 156 <b>.</b> 1 C  | ) К  |  |  |
| 2880 min Summer        | 88.819 1.019                     | 1.4             | 145.3 C           | ) K  |  |  |
|                        | 88.687 0.887                     |                 | 126.3 C           | ) K  |  |  |
| 5760 min Summer        |                                  |                 |                   | ) K  |  |  |
|                        | 88.464 0.664                     |                 |                   | ) K  |  |  |
| 8640 min Summer        | 88.370 0.570                     | 1.3             | 81.2 C            | ) K  |  |  |
|                        | Storm                            | Rain Time-Pe    | - k               |  |  |  |
|                        |                                  | (mm/hr) (mins)  |                   |  |  |  |
|                        |                                  |                 |                   |  |  |  |
|                        | 15 min Summer 3                  | L42.829         | 27                |  |  |  |
|                        | 30 min Summer                    |                 | 41                |  |  |  |
|                        | 60 min Summer                    |                 | 70                |  |  |  |
|                        | 20 min Summer                    |                 | 30                |  |  |  |
|                        | 80 min Summer                    |                 | 88                |  |  |  |
|                        | 40 min Summer<br>60 min Summer   |                 | 48<br>66          |  |  |  |
|                        | 80 min Summer                    |                 | 84                |  |  |  |
|                        | 00 min Summer                    |                 | 04                |  |  |  |
|                        | 20 min Summer                    |                 | 22                |  |  |  |
|                        | 60 min Summer                    |                 | 14                |  |  |  |
| 14                     | 40 min Summer                    | 4.539 11        | 38                |  |  |  |
| 21                     | 60 min Summer                    | 3.251 15        | 20                |  |  |  |
|                        | 80 min Summer                    | 2.564 19        |                   |  |  |  |
|                        | 20 min Summer                    | 1.832 27        |                   |  |  |  |
|                        | 60 min Summer                    | 1.442 35        |                   |  |  |  |
|                        | 00 min Summer                    | 1.198 43        |                   |  |  |  |
| 86                     | 40 min Summer                    | 1.029 51        | 04                |  |  |  |
|                        |                                  |                 |                   |  |  |  |
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| ©1                     | 982-2010 Mici                    | ro Drainage Lt  | -d                |  |  |  |
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| RSK LDE                        |                              |                 |                   | Page   | 2                 |      |
|--------------------------------|------------------------------|-----------------|-------------------|--|-------------------|------|
| 18 Frogmore Road               |                              |                 |                   |  |                   |      |
| Hemel Hempstead                |                              |                 |                   | $\left\  \mathbf{\nabla} \mathbf{\nabla} \right\ $ |                   |      |
| Hertfordshire HP3 9RT          |                              |                 |                   |  | JELG              | ) () |
| Date 17/11/2021 09:03          | Designed                     | By SThe         | orpe              | 1 D ) -  | pentra            | പ്രവ |
| File E_ModStorage_Soak         | Checked                      | Ву              |                   |  |                   |      |
| XP Solutions                   | Source C                     | ontrol M        | 1.12.5            |  |                   |      |
|                                |                              |                 |                   |  |                   |      |
| Summary of Re                  | esults for                   | <u>100 yea</u>  | ar Return         | Period   | (+40%)            |      |
| <b>2</b> h                     |                              |                 | <b>M</b> =        |  | <b>O</b> has have |      |
| Storm<br>Event                 | Max<br>Level                 | Max<br>Depth In | Max<br>filtration | Max<br>Volume                                      | Status            |      |
|                                | (m)                          | (m)             | (1/s)             | (m <sup>3</sup> )                                  |                   |      |
| 10000                          |                              | 0 405           | 1 0               | <u> </u>   | 0.14              |      |
| 10080 min Summ<br>15 min Wint  |                              | 0.485           | 1.2               | 69.2<br>97.1                                       | ок<br>ок          |      |
|                                | er 88.677                    |                 | 1.4               | 124.9  |                   |      |
| 60 min Wint                    | er 88.867                    | 1.067           | 1.4               | 152.0  | ΟK                |      |
| 120 min Wint                   | er 89.044                    | 1.244           | 1.5               | 177.3  | O K               |      |
| 180 min Wint                   |                              |                 | 1.5               | 190.1  | ОК                |      |
| 240 min Wint                   |                              |                 | 1.6               | 197.8  |                   |      |
| 360 min Wint                   |                              | 1.445           | 1.6               | 205.9  |                   |      |
| 480 min Wint<br>600 min Wint   |                              |                 | 1.6<br>1.6        | 210.1<br>211.6                                     | O K               |      |
| 720 min Wint                   |                              |                 | 1.6               | 211.6  | 0 K               |      |
| 960 min Wint                   |                              |                 | 1.6               | 208.6  | 0 K               |      |
| 1440 min Wint                  |                              |                 | 1.6               | 197.0  | ОК                |      |
| 2160 min Wint                  | er 89.071                    | 1.271           | 1.5               | 181.1  | O K               |      |
| 2880 min Wint                  |                              |                 | 1.5               | 166.3  | 0 K               |      |
| 4320 min Wint                  |                              |                 | 1.4               | 139.0  |                   |      |
| 5760 min Wint                  |                              |                 | 1.4               | 114.6  | ОК                |      |
| 7200 min Wint<br>8640 min Wint |                              | 0.653           | 1.3<br>1.3        | 93.0<br>74.0                                       | ок<br>ок          |      |
|                                | 00.019                       | 0.010           | 1.0               | , 1.0  | 0 10              |      |
|                                | Storm<br>Event               | Rai<br>(mm/)    |                   |  |                   |      |
| 10                             | )080 min Sum                 | mor             | 904 5             | 0 1 0  |                   |      |
| 10                             | 15 min Win                   |                 |                   | 848<br>26  |                   |      |
|                                | 30 min Win                   |                 |                   | 41   |                   |      |
|                                | 60 min Win                   |                 |                   | 70   |                   |      |
|                                | 120 min Win                  | ter 33.         | 709               | 128  |                   |      |
|                                | 180 min Win                  | ter 24.         | 562               | 186  |                   |      |
|                                | 240 min Win                  |                 |                   | 244  |                   |      |
|                                | 360 min Win                  |                 |                   | 360  |                   |      |
|                                | 480 min Win<br>600 min Win   |                 |                   | 476<br>590   |                   |      |
|                                | 720 min Win                  |                 |                   | 702  |                   |      |
|                                | 960 min Win                  |                 |                   | 922  |                   |      |
| 1                              | .440 min Win                 |                 |                   | 210  |                   |      |
|                                | 2160 min Win                 | ter 3.          |                   | 632  |                   |      |
|                                | 880 min Win                  |                 |                   | 100  |                   |      |
|                                | 320 min Win                  |                 |                   | 984  |                   |      |
|                                | 5760 min Win                 |                 |                   | B16  |                   |      |
|                                | /200 min Win<br>3640 min Win |                 |                   | 616<br>376   |                   |      |
| c                              | UTA UTU ALU                  |                 | J. J.             | 570  |                   |      |
|                                |                              |                 |                   |  |                   |      |
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| RSK LDE      |                |                |         |                |                  | Page   | 3      |   |
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| 18 Frogmore  | Road           |                |         |                |                  | 1 ago  |        |   |
| Hemel Hempst |                |                |         |                |                  |        | 0      |   |
| Hertfordshir |                |                |         |                |                  |        | L(CL)  | $\bigcirc \qquad \bigcirc \qquad$ |
| Date 17/11/2 |                | Designe        | d By S  | Thorpe         |                  |        | ກລາດ   |   |
|              | orage_Soak     |                |         | inorpe         |                  |        | 56.00  | <u>lette</u>  |
| XP Solutions |                | Source         |         | 1 ₩ 12         | 5                |        |        |   |
|              | ,              | Dource         | CONCLO  |                | • 0              |        |        |   |
|              | Summary of Re  | esults fo      | r 100   | year R         | eturn            | Period | (+40%) |   |
|              |                |                |         | -              |                  |        |        |   |
|              | Storm          | Max            |         |                | ax               | Max    | Status |   |
|              | Event          | Level          |         |                |                  | Volume |        |   |
|              |                | (m)            | (m)     | (1)            | /s)              | (m³)   |        |   |
|              | 10080 min Wint | er 88.203      | 0.403   |                | 1.2              | 57.4   | O K    |   |
|              |                | Storm<br>Event |         | Rain<br>mm/hr) | Time-Po<br>(mins |        |        |   |
|              |                |                |         |                |                  |        |        |   |
|              | 10             | 0080 min Wi    | nter    | 0.904          | 6                | 152    |        |   |
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| RSK LDE                             |          |         |              |           | Page 4                       |        |
|-------------------------------------|----------|---------|--------------|-----------|------------------------------|--------|
| 18 Frogmore Road                    |          |         |              |           |                              |        |
| Hemel Hempstead                     |          |         |              |           |                              |        |
| Hertfordshire HP3 9RT               |          |         |              |           | LUB                          | ro m   |
| Date 17/11/2021 09:03               | Design   | ed By S | SThorp       | e         |                              | ingo g |
| File E_ModStorage_Soak              | Checke   | d By    |              |           |                              |        |
| XP Solutions                        | Source   | Contro  | ol W.1       | 2.5       |                              |        |
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|                                     | Ra       | infall  | Detai        | <u>ls</u> |                              |        |
| Deinfell Med                        | - 1      |         | EGD          |           | Ninton Ctowno                | Ve e   |
| Rainfall Mod<br>Return Period (year |          |         | FSR<br>100   |           | Winter Storms<br>Cv (Summer) |        |
| Regi                                | on Engla |         | Wales        |           | Cv (Winter)                  | 0.840  |
| M5-60 (m                            |          |         |              |           | Storm (mins)                 |        |
| Ratio<br>Summer Store               |          |         | 0.440<br>Yes |           | Storm (mins) mate Change %   |        |
|                                     |          |         |              |           |                              |        |
|                                     | Time     | e / Are | a Diac       | gram      |                              |        |
|                                     | Tot      | al Area | (ha) 0.      | 329       |                              |        |
| Time                                | Area     | Time    | Area         | Time      | Area                         |        |
| (mins)                              | (ha)     | (mins)  | (ha)         | (mins)    | (ha)                         |        |
| 0-4                                 | 0.110    | 4-8     | 0.110        | 8-12      | 0.110                        |        |
|                                     | 0.110    | 1 0     | 0.110        | 0 12      | 0.110                        |        |
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| RSK LDE          |             |                                  |                       | Page 5          | 5  |  |  |  |  |  |
|------------------|-------------|----------------------------------|-----------------------|-----------------|--|--|--|--|--|--|
| 18 Frogmore Road |             |                                  |                       |                 |  |  |  |  |  |  |
| Hemel Hempstead  |             |                                  |                       |                 |  |  |  |  |  |  |
| Hertfordshire H  | P3 9RT      |                                  |                       |                 |  |  |  |  |  |  |
| Date 17/11/2021  | 09:03       | Designed By                      | SThorpe               |                 | en e |  |  |  |  |  |
| File E ModStorag |             | Checked By                       | oincipe               |                 |  |  |  |  |  |  |
|                  | e_50ak      | -                                | Source Control W.12.5 |                 |  |  |  |  |  |  |
| XP Solutions     |             | Source Contr                     | OI W.12.5             |                 |  |  |  |  |  |  |
|                  |             |                                  |                       |                 |  |  |  |  |  |  |
|                  |             | <u>Model</u>                     | <u>Details</u>        |                 |  |  |  |  |  |  |
|                  | Ch arrest   | a is Osling C                    |                       | (m) 80 000      |  |  |  |  |  |  |
|                  | Storag      | ge is Online Co                  | over Level            | (m) 89.900      |  |  |  |  |  |  |
|                  |             | Collulon Ctor                    |                       | +               |  |  |  |  |  |  |
|                  |             | <u>Cellular Stor</u>             | age Struc             | ture            |  |  |  |  |  |  |
|                  |             | T                                | () 07.00              | 0 0 5 5 5 5 7 7 |  |  |  |  |  |  |
| Tnfilt           | ration Coef | Invert Level<br>ficient Base (m/ |                       | -               | ctor 2.0<br>sity 0.95                    |  |  |  |  |  |
|                  |             | ficient Side (m/                 | ,                     |                 | 51Cy 0.93                                |  |  |  |  |  |
|                  |             | (,                               | ,                     | -               |  |  |  |  |  |  |
| Depth (m)        | Area (m²)   | Inf. Area (m²)                   | Depth (m)             | Area (m²) I     | nf. Area (m²)                            |  |  |  |  |  |
| 0.000            | 150.0       | 150.0                            | 1.300                 | 150.0           | 213.7                                    |  |  |  |  |  |
| 0.100            | 150.0       | 154.9                            | 1.400                 |                 | 218.6                                    |  |  |  |  |  |
| 0.200            | 150.0       | 159.8                            | 1.500                 | 150.0           | 223.5                                    |  |  |  |  |  |
| 0.300            | 150.0       | 164.7                            | 1.600                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.400            | 150.0       | 169.6                            | 1.700                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.500            | 150.0       | 174.5                            | 1.800                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.600            | 150.0       | 179.4                            | 1.900                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.700            | 150.0       | 184.3                            | 2.000                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.800            | 150.0       | 189.2                            | 2.100                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 0.900            | 150.0       | 194.1                            | 2.200                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 1.000            | 150.0       | 199.0                            | 2.300                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 1.100            | 150.0       | 203.9                            | 2.400                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 1 000            |             |                                  |                       |                 |  |  |  |  |  |  |
| 1.200            | 150.0       | 208.8                            | 2.500                 | 0.0             | 225.9                                    |  |  |  |  |  |
| 1.200            | 150.0       | 208.8                            | 2.500                 | 0.0             | 225.9                                    |  |  |  |  |  |

| RSK LDE                          |   |                       | Page 1              |              |
|----------------------------------|---|-----------------------|---------------------|--------------|
| 18 Frogmore Road                 |   |                       |                     |              |
| Hemel Hempstead                  |   |                       |                     |              |
| Hertfordshire HP3 9RT            |   |                       | The Rep             | $\odot$      |
| Date 17/11/2021 08:49            | Designed By STh                         | orpe                  | DESENT              |              |
| File F ModStorage Soak           | Checked By                              |                       |                     | <u>lecto</u> |
| XP Solutions                     | Source Control                          | w 12 5                |                     |              |
|                                  | Source concror                          | M.IZ.J                |                     |              |
| Summary of Re                    | <u>sults for 100 ye</u>                 | ar Beturn P           | eriod $(+40\%)$     |              |
|                                  | <u> </u>                                |                       | <u>criou (+408)</u> |              |
|                                  | Half Drain Time : 9                     | 21 minutes.           |                     |              |
|                                  |   |                       |                     |              |
| Storm                            | Max Max                                 | Max                   | Max Status          |              |
| Event                            | Level Depth In<br>(m) (m)               | filtration V<br>(1/s) | olume<br>(m³)       |              |
|                                  | (111) (111)                             | (1/5)                 | (                   |              |
| 15 min Summe:                    | £ 87.487 0.487                          | 0.7                   | 39.3 ОК             |              |
| 30 min Summe:                    |   | 0.8                   | 50.5 ОК             |              |
|                                  | 87.758 0.758                            | 0.8                   | 61.2 ОК             |              |
| 120 min Summe:<br>180 min Summe: | c 87.876 0.876<br>c 87.932 0.932        | 0.8<br>0.9            | 70.7 ОК<br>75.2 ОК  |              |
| 240 min Summe:                   |   | 0.9                   | 75.2 ОК<br>77.6 ОК  |              |
|                                  | c 87.985 0.985                          | 0.9                   | 79.5 ОК             |              |
| 480 min Summe:                   |   | 0.9                   | 79.9 ОК             |              |
| 600 min Summe:                   |   | 0.9                   | 79.2 ОК             |              |
|                                  | 87.965 0.965                            | 0.9                   | 77.9 ОК             |              |
|                                  | c 87.933 0.933                          | 0.9                   | 75.3 OK             |              |
| 1440 min Summe<br>2160 min Summe | c 87.872 0.872<br>c 87.794 0.794        | 0.8<br>0.8            | 70.4 ОК<br>64.1 ОК  |              |
|                                  | 87.726 0.726                            | 0.8                   | 58.6 OK             |              |
|                                  | 87.605 0.605                            | 0.8                   | 48.9 ОК             |              |
| 5760 min Summe:                  |   | 0.7                   | 40.5 ОК             |              |
| 7200 min Summe:                  |   | 0.7                   | 33.2 ОК             |              |
| 8640 min Summe:                  | £ 87.333 0.333                          | 0.7                   | 26.9 ОК             |              |
|                                  | Storm Rai                               | n Time-Peal           | k                   |              |
|                                  | Event (mm/)                             | hr) (mins)            |                     |              |
|                                  | 15 1 2 140                              |                       | c                   |              |
|                                  | 15 min Summer 142.<br>30 min Summer 92. |                       |                     |              |
|                                  | 60 min Summer 56.                       |                       |                     |              |
| 1                                | 20 min Summer 33.                       |                       |                     |              |
| 1                                | 80 min Summer 24.                       |                       | 8                   |              |
|                                  | 40 min Summer 19.                       |                       |                     |              |
|                                  | 60 min Summer 14.                       |                       |                     |              |
|                                  | 80 min Summer 11.<br>00 min Summer 9.   | 119 48:<br>275 60     |                     |              |
|                                  |   | 995 69                |                     |              |
|                                  |   | 320 79                |                     |              |
|                                  |   | 532 104               |                     |              |
|                                  |   | 246 145               |                     |              |
|                                  |   | 559 185<br>828 268    |                     |              |
|                                  |   | 828 2680<br>439 3450  |                     |              |
|                                  |   | 195 418               |                     |              |
| 86                               |   | 026 493               | 6                   |              |
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| <br>∩1                           | .982-2010 Micro D                       | )rainage I.+/         | 7                   |              |
|                                  | JUZ ZUIU MICIU L                        | Lainaye ill           | ۸<br>               |              |

| RSK LDE                        |                            |                  |                  | Page              | 2      |      |
|--------------------------------|----------------------------|------------------|------------------|-------------------|--------|------|
| 18 Frogmore Road               |                            |                  |                  |                   |        |      |
| Hemel Hempstead                |                            |                  |                  | $\sum \sqrt{1}$   | lanc   |      |
| Hertfordshire HP3 9RT          |                            |                  |                  |                   |        |      |
| Date 17/11/2021 08:49          | Designed                   | l By STho        | rpe              | 1 D),             | Sente  | RACE |
| File F_ModStorage_Soak         | Checked                    | Ву               |                  |                   |        |      |
| XP Solutions                   | Source C                   | Control W        | .12.5            |                   |        |      |
|                                |                            |                  |                  |                   |        |      |
| Summary of R                   | esults for                 | <u>100 yea</u>   | r Return         | Period            | (+40응) |      |
| Storm                          | More                       | More             | Mou              | Marr              | Status |      |
| Event                          | Max<br>Level               | Max<br>Depth Inf | Max<br>iltration | Max<br>Volume     | Status |      |
|                                | (m)                        | (m)              | (1/s)            | (m <sup>3</sup> ) |        |      |
|                                |                            | 0.065            | 0 5              |                   |        |      |
| 10080 min Summ                 | er 87.267<br>er 87.547     |                  | 0.7<br>0.8       | 21.6              | O K    |      |
|                                | er 87.547<br>er 87.702     | 0.547            | 0.8              | 44.1<br>56.7      | ОК     |      |
|                                | er 87.852                  | 0.852            | 0.8              | 68.8              | 0 K    |      |
| 120 min Wint                   |                            |                  | 0.9              | 79.8              |        |      |
| 180 min Wint                   |                            |                  | 0.9              | 85.2              | ОК     |      |
| 240 min Wint                   | er 88.092                  | 1.092            | 0.9              | 88.2              | O K    |      |
| 360 min Wint                   |                            |                  | 0.9              | 90.9              | O K    |      |
| 480 min Wint                   |                            |                  | 0.9              | 91.8              | O K    |      |
| 600 min Wint                   |                            |                  | 0.9              | 91.6              | O K    |      |
| 720 min Wint                   |                            |                  | 0.9              | 90.7              | ОК     |      |
| 960 min Wint                   |                            |                  | 0.9              | 87.8              | ОК     |      |
| 1440 min Wint<br>2160 min Wint |                            | 1.013            | 0.9              | 81.8              | ОК     |      |
| 2880 min Wint                  |                            |                  | 0.8<br>0.8       | 73.3<br>65.4      |        |      |
| 4320 min Wint                  |                            |                  | 0.8              | 51.3              |        |      |
| 5760 min Wint                  |                            |                  | 0.7              | 39.2              |        |      |
| 7200 min Wint                  |                            | 0.358            | 0.7              | 28.9              |        |      |
| 8640 min Wint                  | er 87.253                  | 0.253            | 0.7              | 20.4              | O K    |      |
|                                | Storm                      | Rair             | n Time-Pe        | ak                |        |      |
|                                | Event                      | (mm/h            |                  |                   |        |      |
| 11                             | )080 min Sun               | nmer 0.9         | 02 56            | 548               |        |      |
| 1                              |                            | nter 142.9       |                  | 26                |        |      |
|                                | 30 min Wir                 |                  |                  | 41                |        |      |
|                                | 60 min Wir                 | nter 56.7        |                  | 70                |        |      |
|                                | 120 min Wir                | nter 33.6        | 96 1             | 26                |        |      |
|                                | 180 min Wir                | nter 24.5        | 48 1             | 84                |        |      |
|                                | 240 min Wir                |                  |                  | 242               |        |      |
|                                | 360 min Wir                |                  |                  | 358               |        |      |
|                                | 480 min Wir                |                  |                  | 172<br>504        |        |      |
|                                | 600 min Wir<br>720 min Wir | nter 9.2         | 75 5<br>95 4     | 584<br>594        |        |      |
|                                | 960 min Wir                |                  |                  | 394<br>398        |        |      |
|                                | 1440 min Wir               |                  |                  | 14                |        |      |
|                                | 2160 min Wir               |                  |                  | 576               |        |      |
|                                | 2880 min Wir               |                  |                  | )24               |        |      |
|                                | 1320 min Wir               |                  |                  | 364               |        |      |
|                                | 5760 min Wir               |                  |                  | 588               |        |      |
|                                | 7200 min Wir               |                  |                  | 164               |        |      |
|                                | 3640 min Wir               | nter 1.0         | 26 51            | 84                |        |      |
|                                |                            |                  |                  |                   |        |      |
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| RSK LDE             |            |                |        |                |                  | Page    | 3      |             |
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| 18 Frogmore Road    |            |                |        |                |                  | 2 4 9 0 |        |             |
| Hemel Hempstead     |            |                |        |                |                  |         | 0      |             |
| Hertfordshire HP3   | 9RT        |                |        |                |                  |         | N(SF)  | $\bigcirc$  |
| Date 17/11/2021 08  |            | Designed       | BVS    | Thorne         | 2                |         |        |             |
| File F_ModStorage_S |            | Checked        |        | inorpe         | -                |         |        | <u>laje</u> |
| XP Solutions        |            | Source (       |        | 1 1 1 2        | 5                |         |        |             |
|                     |            | bouree (       | Jonero |                |                  |         |        |             |
| Summar              | y of Res   | ults for       | r 100  | year F         | Return           | Period  | (+40%) |             |
|                     | -          |                |        | -              |                  |         |        |             |
| s                   | torm       | Max            | Max    |                | ax               | Max     | Status |             |
| E                   | vent       | Level          |        |                |                  | Volume  |        |             |
|                     |            | (m)            | (m)    | (1             | /s)              | (m³)    |        |             |
| 10080 r             | min Winter | 87.167         | 0.167  |                | 0.7              | 13.5    | O K    |             |
|                     |            | Storm<br>Event |        | Rain<br>mm/hr) | Time-Po<br>(mins |         |        |             |
|                     |            |                |        |                |                  |         |        |             |
|                     | 1008       | 30 min Wi      | nter   | 0.902          | 5                | 840     |        |             |
|                     |            |                |        |                |                  |         |        |             |
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|                     | ©19        | 82-2010        | Micro  | Drai           | nage L           | τα      |        |             |

| RSK LDE                                  |              |                |              |                | Page 4                       |              |
|--|--------------|----------------|--------------|----------------|------------------------------|--------------|
| 18 Frogmore Road                         |              |                |              |                | raye 4                       |              |
|  |              |                |              |                |                              | <u> </u>     |
| Hemel Hempstead<br>Hertfordshire HP3 9RT |              |                |              |                |                              | Ro           |
| Date 17/11/2021 08:49                    | Dogiar       | ied By S       | mborn        |                |                              | 9            |
| File F ModStorage Soak                   |              |                | binorb       | e              | LIG                          | <u>ueces</u> |
| XP Solutions                             |              | e Contro       | 1 147 1      | 2 E            |                              |              |
| XP Solutions                             | Source       | Contro         | DI W.I       | 2.3            |                              |              |
|  | Ra           | infall         | Detai        | <u>ls</u>      |                              |              |
| Rainfall Mod                             | el           |                | FSR          | 7              | Winter Storms                | Yes          |
| Return Period (year                      |              |                | 100          |                | Cv (Summer)                  |              |
|  |              | and and W      |              |                | Cv (Winter)                  |              |
| M5-60 (m<br>Ratio                        |              |                |              |                | Storm (mins)<br>Storm (mins) |              |
| Summer Stor                              |              |                | Yes          |                | mate Change %                |              |
|  |              | 0 / 7          |              |                |                              |              |
|  |              | <u>e / Are</u> |              |                |                              |              |
|  |              | al Area        |              |                |                              |              |
| Time<br>(mins)                           | Area<br>(ha) | Time<br>(mins) | Area<br>(ha) | Time<br>(mins) | Area<br>(ha)                 |              |
| 0-4                                      | 4 0.050      | 4-8            | 0.050        | 8-12           | 0.050                        |              |
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| RSK LDE           |                        |                      |                | Page                            | 5                           |
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| 18 Frogmore Road  |                        |                      |                |                                 |                             |
| Hemel Hempstead   |                        |                      |                |                                 | 79000                       |
| Hertfordshire HE  | 23 9RT                 |                      |                |                                 |                             |
| Date 17/11/2021 0 |                        | Designed By          | SThorpe        |                                 | naina a                     |
|                   |                        |                      | Sinoipe        |                                 | <u>re reces</u>             |
| File F_ModStorage | e_Soak                 |                      |                |                                 |                             |
| XP Solutions      |                        | Source Contr         | ol W.12.5      |                                 |                             |
|                   |                        | Model 1              | <u>Details</u> |                                 |                             |
|                   | Storad                 | ge is Online Co      | over Level     | (m) 88.800                      |                             |
|                   |                        | 5                    |                | (,                              |                             |
|                   |                        | <u>Cellular Stor</u> | age Struc      | ture                            |                             |
|                   |                        |                      |                |                                 |                             |
|                   |                        | Invert Level         | (m) 87.00      | 0 Safety F                      | actor 2.0                   |
| Infiltr           | ation Coef             | ficient Base (m/     | 'hr) 0.0514    | l8 Por                          | cosity 0.95                 |
| Infiltr           | ation Coef             | ficient Side (m/     | 'hr) 0.0514    | 8                               |                             |
| Death (a)         | <b>1</b>               |                      | Doubh (m)      | <b>A</b> maga (m <sup>2</sup> ) |                             |
| Depch (m)         | Area (m <sup>-</sup> ) | Inf. Area (m²)       | Depth (m)      | Area (III-)                     | III. Area (m <sup>-</sup> ) |
| 0.000             | 85.0                   | 85.0                 | 1.300          | 0.0                             | 131.1                       |
| 0.100             | 85.0                   | 88.7                 | 1.400          | 0.0                             | 131.1                       |
| 0.200             | 85.0                   | 92.4                 | 1.500          | 0.0                             | 131.1                       |
| 0.300             | 85.0                   | 96.1                 | 1.600          | 0.0                             | 131.1                       |
| 0.400             | 85.0                   | 99.8                 | 1.700          | 0.0                             | 131.1                       |
| 0.500             | 85.0                   | 103.4                | 1.800          | 0.0                             | 131.1                       |
| 0.600             | 85.0                   | 107.1                | 1.900          | 0.0                             | 131.1                       |
| 0.700             | 85.0                   | 110.8                | 2.000          | 0.0                             | 131.1                       |
| 0.800             | 85.0                   | 114.5                | 2.100          |                                 | 131.1                       |
| 0.900             | 85.0                   | 118.2                | 2.200          | 0.0                             | 131.1                       |
| 1.000             | 85.0                   | 121.9                | 2.300          | 0.0                             | 131.1                       |
| 1.100             | 85.0                   | 125.6                | 2.400          | 0.0                             | 131.1                       |
| 1.200             | 85.0                   | 129.3                | 2.500          | 0.0                             | 131.1                       |
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| RSK LDE                |                                |                | Page 1       | L        |                      |
|------------------------|--------------------------------|----------------|--------------|----------|----------------------|
| 18 Frogmore Road       |                                |                |              |          |                      |
| Hemel Hempstead        |                                |                |              | 9        |                      |
| Hertfordshire HP3 9RT  |                                |                |              | 1 CLO    | <u> </u>             |
| Date 17/11/2021 08:51  | Designed By                    | SThorne        |              | alma     | R                    |
|                        | Checked By                     | 011101 PC      |              |          | م <mark>ہ ک</mark> ر |
| File G_ModStorage_Soak | -                              | 1 1 10 5       |              |          |                      |
| XP Solutions           | Source Contr                   | OI W.12.5      |              |          |                      |
|                        |                                | _              |              |          |                      |
| Summary of Re          | <u>sults for 100</u>           | year Return    | Period       | (+40%)   |                      |
|                        | Half Drain Time                | 010            |              |          |                      |
|                        | Hali Drain Time                | : 910 minutes. |              |          |                      |
| Storm                  | Max Max                        | Max            | Max          | Status   |                      |
| Event                  | Level Depth                    | Infiltration   | Volume       |          |                      |
|                        | (m) (m)                        | (1/s)          | (m³)         |          |                      |
| 15 min Cummo           | c 89.392 0.492                 | 0 6            | 20 1         | O V      |                      |
| 30 min Summe:          |                                |                | 30.4<br>39.0 | ок<br>ок |                      |
|                        | £ 89.666 0.766                 |                | 47.3         | 0 K      |                      |
|                        | £ 89.785 0.885                 |                | 54.6         | O K      |                      |
| 180 min Summe:         |                                |                | 58.1         | O K      |                      |
|                        | c 89.871 0.971                 |                | 59.9         | 0 K      |                      |
|                        | £ 89.894 0.994                 |                | 61.4         | 0 K      |                      |
| 480 min Summe:         |                                |                | 61.5         | ОК       |                      |
| 600 min Summe:         |                                |                | 61.0         | O K      |                      |
| 720 min Summe          | c 89.871 0.971                 | 0.7            | 60.0         | O K      |                      |
| 960 min Summe          | £ 89.839 0.939                 | 0.7            | 58.0         | O K      |                      |
| 1440 min Summe:        | £ 89.779 0.879                 | 0.7            | 54.2         | O K      |                      |
| 2160 min Summe:        | £ 89.700 0.800                 | 0.6            | 49.4         | O K      |                      |
| 2880 min Summe:        | r 89.631 0.731                 | 0.6            | 45.1         | 0 K      |                      |
|                        | r 89.510 0.610                 |                | 37.7         | O K      |                      |
|                        | 89.406 0.506                   |                | 31.2         | 0 K      |                      |
|                        | c 89.316 0.416                 |                | 25.7         | O K      |                      |
| 8640 min Summe:        | 89.238 0.338                   | 0.5            | 20.9         | 0 K      |                      |
|                        | Storm                          | Rain Time-Pe   | ak           |          |                      |
|                        |                                | (mm/hr) (mins) |              |          |                      |
|                        |                                |                |              |          |                      |
|                        | 15 min Summer 1                |                | 26           |          |                      |
|                        | 30 min Summer                  |                | 41           |          |                      |
| 1                      | 60 min Summer                  |                | 70           |          |                      |
|                        | 20 min Summer<br>80 min Summer |                | 28<br>88     |          |                      |
|                        | 40 min Summer<br>40 min Summer |                | 88<br>46     |          |                      |
|                        | 60 min Summer                  |                | 40<br>64     |          |                      |
|                        | 80 min Summer                  |                | 82           |          |                      |
|                        | 00 min Summer                  |                | 00           |          |                      |
|                        | 20 min Summer                  |                | 74           |          |                      |
|                        | 60 min Summer                  |                | 84           |          |                      |
| 14                     | 40 min Summer                  | 4.539 10       | 38           |          |                      |
| 21                     | 60 min Summer                  | 3.251 14       | 48           |          |                      |
| 28                     | 80 min Summer                  | 2.564 18       | 52           |          |                      |
| 43                     | 20 min Summer                  | 1.832 26       | 48           |          |                      |
|                        | 60 min Summer                  | 1.442 34       |              |          |                      |
|                        | 00 min Summer                  | 1.198 41       |              |          |                      |
| 86                     | 40 min Summer                  | 1.029 49       | 28           |          |                      |
|                        |                                |                |              |          |                      |
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| ©1                     | 982-2010 Micr                  | to Drainage Lt | td           |          |                      |
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| RSK LDE            |                        |                        |                  |               |            | Page                 | 2        |            |
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| 18 Frogmore Road   |                        |                        |                  |               |            |                      |          |            |
| Hemel Hempstead    |                        |                        |                  |               |            | $\int \sqrt{\gamma}$ |          |            |
| Hertfordshire HP3  | 3 9RT                  |                        |                  |               |            |                      | JEL      | 0          |
| Date 17/11/2021 08 | 8:51                   | Design                 | ned By S         | SThorp        | e          |                      | වදාර්ග   | n En Co Ce |
| File G ModStorage  | Soak                   |                        |                  |               |            |                      |          |            |
| XP Solutions       | _                      | Source                 | Contro           | ol W.1        | 2.5        |                      |          |            |
|                    |                        |                        |                  |               |            |                      |          |            |
| <u>Summa</u>       | ry of Re               | sults f                | for 100          | year          | Return     | Period               | (+40%)   |            |
|                    | Storm                  | Max                    | Max              |               | Max        | Max                  | Status   |            |
|                    | Event                  | Leve                   |                  |               | tration    |                      | 000000   |            |
|                    |                        | (m)                    | (m)              | (             | l/s)       | (m³)                 |          |            |
| 10080              | min Summe              | r 89 15                | 12 0 272         |               | 0.5        | 16.8                 | ОК       |            |
|                    | min Winte              |                        |                  |               | 0.6        | 34.1                 | ОК       |            |
|                    | min Winte              |                        |                  |               | 0.6        | 43.8                 | ОК       |            |
| 60                 | min Winte              | er 89.76               | 51 0.861         |               | 0.7        | 53.2                 | ΟK       |            |
| 120                | min Winte              | er 89.89               | 99 0.999         |               | 0.7        | 61.7                 | O K      |            |
|                    | min Winte              |                        |                  |               | 0.7        | 65.8                 | O K      |            |
|                    | min Winte              |                        |                  |               | 0.7        | 68.1                 | O K      |            |
|                    | min Winte              |                        |                  |               | 0.7        | 70.1                 | ОК       |            |
|                    | min Winte              |                        |                  |               | 0.7        | 70.8                 | O K      |            |
|                    | min Winte              |                        |                  |               | 0.7        | 70.5                 | 0 K      |            |
|                    | min Winte<br>min Winte |                        |                  |               | 0.7<br>0.7 | 69.8<br>67.5         | ОК<br>ОК |            |
|                    | min Winte              |                        |                  |               | 0.7        | 62.9                 |          |            |
|                    | min Winte              |                        |                  |               | 0.7        | 56.3                 |          |            |
|                    | min Winte              |                        |                  |               | 0.7        | 50.2                 | ОК       |            |
|                    | min Winte              |                        |                  |               | 0.6        | 39.4                 |          |            |
|                    | min Winte              |                        |                  |               | 0.6        | 30.2                 | ОК       |            |
| 7200               | min Winte              | er 89.26               | 53 0.363         |               | 0.5        | 22.4                 | ΟK       |            |
| 8640               | min Winte              | er 89.15               | 0.259            |               | 0.5        | 16.0                 | O K      |            |
|                    |                        | Storm                  | ı                | Rain          | Time-Pe    | eak                  |          |            |
|                    |                        | Event                  | :                | (mm/hr)       | (mins      | )                    |          |            |
|                    | 10                     | 080 min                | Summer           | 0.904         | 56         | 548                  |          |            |
|                    |                        | 15 min 1               | Winter 1         | 42.829        |            | 26                   |          |            |
|                    |                        | 30 min 1               |                  | 92.260        |            | 41                   |          |            |
|                    |                        |                        | Winter           |               |            | 70                   |          |            |
|                    |                        | 120 min 1              |                  | 33.709        |            | L26                  |          |            |
|                    |                        | 180 min '<br>240 min ' |                  | 24.562 19.521 |            | L84<br>242           |          |            |
|                    |                        | 240 min<br>360 min '   |                  | 19.521        |            | 242<br>358           |          |            |
|                    |                        | 480 min                |                  | 11.131        |            | 172                  |          |            |
|                    |                        |                        | Winter           |               |            | 582                  |          |            |
|                    |                        |                        | Winter           |               |            | 592                  |          |            |
|                    |                        |                        | Winter           |               |            | 392                  |          |            |
|                    |                        |                        | Winter           |               |            | L06                  |          |            |
|                    |                        | 160 min 1              |                  | 3.251         |            | 564                  |          |            |
|                    |                        |                        | Winter           |               |            | )20                  |          |            |
|                    |                        |                        | Winter           |               |            | 360                  |          |            |
|                    | 5                      | /60 min 1              | Winter<br>Winter |               |            | 580                  |          |            |
|                    |                        |                        | Winter<br>Winter | 1.198         |            | 108<br>L12           |          |            |
|                    | 0                      | IILIN OFO              | CT               | 1.029         | 51         |                      |          |            |
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| RSK LDE                |            |        |               |         | Page   | 3          |            |
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| 18 Frogmore Road       |            |        |               |         |        | 0          | <u> </u>   |
| Hemel Hempstead        |            |        |               |         |        | <u>Mar</u> | $\bigcirc$ |
| Hertfordshire HP3 9RT  |            | 1      |               |         |        |            |            |
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| File G_ModStorage_Soak |            |        |               |         |        |            |            |
| XP Solutions           | Source     | Contro | 1 W.12        | .5      |        |            |            |
| Summary of Re          | esults fo  | r 100  | <u>year R</u> | eturn   | Period | (+40%)     |            |
| Storm                  | Max        | Max    | Ma            | ax      | Max    | Status     |            |
| Event                  | Level      |        |               |         | Volume |            |            |
|                        | (m)        | (m)    |               | /s)     | (m³)   |            |            |
| 10080 min Wint         | er 89.073  | 0.173  |               | 0.5     | 10.7   | ОК         |            |
|                        | Storm      |        | Rain          | Time-Pe |        |            |            |
|                        | Event      |        | mm/hr)        |         |        |            |            |
| 10                     | 080 min Wi | nter   | 0.904         | 58      | 848    |            |            |
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| C                      | 1982-2010  | Micro  | Drair         | nage L  | τα     |            |            |

| RSK LDE                |                |                |              |                | Page 4                               |
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| 18 Frogmore Road       |                |                |              |                |                                      |
| Hemel Hempstead        |                |                |              |                |                                      |
| Hertfordshire HP3 9RT  |                |                |              |                | TTATERO M                            |
| Date 17/11/2021 08:51  | Design         | ed By S        | SThorp       | е              | Dranaco                              |
| File G_ModStorage_Soak | Checke         | d By           |              |                |                                      |
| XP Solutions           |                | Contro         | ol W.1       | 2.5            |                                      |
|                        |                |                |              |                |                                      |
|                        | Ra             | infall         | Detai        | <u>ls</u>      |                                      |
| Rainfall Mod           | el             |                | FSR          | 1              | Winter Storms Yes                    |
| Return Period (year    |                |                | 100          |                | Cv (Summer) 0.750                    |
| M5-60 (m               | on Engla<br>m) |                |              |                | Cv (Winter) 0.840<br>Storm (mins) 15 |
| Ratio                  |                |                |              |                | Storm (mins) 10080                   |
| Summer Stor            | ms             |                | Yes          | Cli            | mate Change % +40                    |
|                        | Time           | e / Are        | a Diag       | gram           |                                      |
|                        | Tot            | al Area        | (ha) 0.      | 116            |                                      |
| Time<br>(mins)         | Area<br>(ha)   | Time<br>(mins) | Area<br>(ha) | Time<br>(mins) | Area<br>(ha)                         |
| 0-4                    | 4 0.039        | 4-8            | 0.039        | 8-12           | 0.039                                |
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| RSK LDE  |   |  | Page 5   |   |
|--|---|--|--|---|
| 18 Frogmore Road   |   |  |  |   |
| Hemel Hempstead  |   |  |  |   |
| Hertfordshire HP3 9RT  |   |  |  |   |
| Date 17/11/2021 08:51  | Designed By SI  | horpo  |  |   |
|  |   | потре  | LUC  | <u> </u>  |
| File G_ModStorage_Soak   |   |  |  |   |
| XP Solutions   | Source Control  | W.12.5   |  |   |
|  | <u>Model De</u>   | taila  |  |   |
|  | MODEL DE  | Lalls  |  |   |
| Stor   | age is Online Cove  | er Level (m)   | 90.700   |   |
| 5001   | age 10 Onitine COV  | er never (m)   | 20.700   |   |
|  | <u>Cellular Stora</u>   | e Structure  | 2  |   |
|  | <u>COTTATAT DECIDE</u>  | Je Seruccure   | <u>~</u>   |   |
|  | Invert Level (m   | n) 88.900 S  | afety Factor   | 2.0   |
| Infiltration Coe   | fficient Base (m/hr   |  | Porosity   |   |
| Infiltration Coe   | fficient Side (m/hr   | c) 0.05148   | -  |   |
|  |   |  |  |   |
| Depth (m) Area (m <sup>2</sup> )   | T=£ 3=== (=2)   |  |  |   |
|  | INI. Area (m <sup>-</sup> ) D   | epth (m) Area  | a (m²) Inf.  | Area (m²)   |
| 0.000 65.0   |   | 1.300  | a (m²) Inf.<br>0.0   | Area (m <sup>2</sup> )<br>105.3   |
|  | 65.0  | -  |  |   |
| 0.000 65.0   | 65.0<br>68.2  | 1.300  | 0.0  | 105.3   |
| 0.000 65.0   | 65.0<br>68.2<br>71.4  | 1.300<br>1.400   | 0.0  | 105.3<br>105.3  |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0   | 65.0<br>68.2<br>71.4<br>74.7  | 1.300<br>1.400<br>1.500  | 0.0<br>0.0<br>0.0  | 105.3<br>105.3<br>105.3   |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9  | 1.300<br>1.400<br>1.500<br>1.600   | 0.0<br>0.0<br>0.0<br>0.0   | 105.3<br>105.3<br>105.3<br>105.3  |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1  | 1.300<br>1.400<br>1.500<br>1.600<br>1.700  | 0.0<br>0.0<br>0.0<br>0.0<br>0.0                                    | 105.3<br>105.3<br>105.3<br>105.3<br>105.3   |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3  | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800   | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                             | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3  |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6                                  | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900  | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                      | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3   |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8                          | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000                                     | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0               | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3  |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0   | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0                  | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100                            | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0        | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3                                     |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0<br>0.900 65.0                             | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0<br>97.2          | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100<br>2.200                   | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3                   |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0<br>0.900 65.0<br>1.000 65.0               | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0<br>97.2<br>100.5 | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100<br>2.200<br>2.300          | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3                   |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0<br>0.900 65.0<br>1.000 65.0<br>1.100 65.0 | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0<br>97.2<br>100.5 | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100<br>2.200<br>2.300<br>2.400 | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3 |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0<br>0.900 65.0<br>1.000 65.0<br>1.100 65.0 | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0<br>97.2<br>100.5 | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100<br>2.200<br>2.300<br>2.400 | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3 |
| 0.000 65.0<br>0.100 65.0<br>0.200 65.0<br>0.300 65.0<br>0.400 65.0<br>0.500 65.0<br>0.600 65.0<br>0.700 65.0<br>0.800 65.0<br>0.900 65.0<br>1.000 65.0<br>1.100 65.0 | 65.0<br>68.2<br>71.4<br>74.7<br>77.9<br>81.1<br>84.3<br>87.6<br>90.8<br>94.0<br>97.2<br>100.5 | 1.300<br>1.400<br>1.500<br>1.600<br>1.700<br>1.800<br>1.900<br>2.000<br>2.100<br>2.200<br>2.300<br>2.400 | 0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3<br>105.3 |



## APPENDIX L COMPLETED ESSEX COUNTY COUNCIL SUDS PROFORMA

## Introduction

This proforma identifies the information required by Essex LLFA to enable technical assessment the Designers approach to water quantity and water quality as part of SuDS design approach in compliance with Essex SuDS Design Guide.

Completion of the proforma will also allow for technical assessment against Non-statutory technical standards (NSTS) for Sustainable Drainage. The proforma will accompany the site specific Flood Risk Assessment and Drainage Strategy submitted as part of the planning application.

Please complete this form in full for full applications and the coloured sections for outline applications. This will help us identify what information has been included and will assist with a smoother and quicker application.

## Instructions for use

Use the units defined for input of figures Numbers in brackets refer to accompanying notes.

Where  $\dots m^3$   $\dots m^3/m^2$  are noted – both values should be filled in.

## Site details

- 1.1 Planning application reference (if known)
- 1.2 Site name
- Total application site area (1) 1.3 ha Predevelopment use <sup>(4)</sup> 1.4 1.5 Post development use 1.6 Urban creep applicable 1.7 Proposed design life / planning application life Method(s) of discharge: (5) 1.8 Storm sewer Combined sewer Waterbody Reuse Is discharge direct to estuary / sea 1.9
- 1.10 Have agreements in principle (where applicable) for discharge been provided



## Calculation inputs

| 2.1 | Area within site which is drained by SuDS <sup>(2)</sup> | 14,400            | m <sup>2</sup> |
|-----|--|-------------------|----------------|
| 2.2 | Impermeable area drained pre development (3)             | 18,821            | m <sup>2</sup> |
| 2.3 | Impermeable area drained post development (3)            | 14,400            | m <sup>2</sup> |
| 2.4 | Additional impermeable area (2.3 minus 2.2)              | -4,421            | m <sup>2</sup> |
| 2.5 | Method for assessing greenfield runoff rate              | loH124            |                |
| 2.6 | Method for assessing brownfield runoff rate              | Modified Rational | Method         |
| 2.7 | Coefficient of runoff (Cv) (6)                           | 0.95              |                |
| 2.8 | Source of rainfall data (FEH Preferred)                  | FEH               |                |
| 2.9 | Climate change factor applied 40                         | %                 |                |

## Attenuation (positive outlet)

2.10 Drainage outlet at risk of drowning (tidal locking, elevated water levels in watercourse/sewer) Note: Vortex controls require conditions of free discharge to operate as per manufacturers specification.

| 2.11       | Invert level at final outlet                  | mAOD                    |                        |         |
|------------|---|-------------------------|------------------------|---------|
| 2.12       | Design level used for surcharge water le      | evel at point of discha | ırge <sup>(16)</sup>   | mAOD    |
| Infiltrati | ion (Discharge to Ground)                     |                         |                        |         |
| 2.13       | Have infiltration tests been undertaken       | Partial                 |                        |         |
| 2.14       | If yes, which method has been used            | BRE DG 365              |                        |         |
| 2.15       | Infiltration rate (where applicable)          | 4.43 x 10-5             | m/s                    |         |
| 2.16       | Depth to highest known ground water t         | able                    | mAOD                   |         |
| 2.17       | If there are multiple infiltration features   | please specify where    | e they can be found in | the FRA |
| 2.18       | Depth of infiltration feature                 |                         | mAOD                   |         |
| 2.19       | Factor of safety used for sizing infiltration | on storage              |                        |         |



**Calculation outputs** Sections 3 and 4 refer to site where storage is provided by full attenuation or partial infiltration. Where all flows are infiltrated to ground go straight to Section 6.

| <b>3</b> .0 | Greenfield runoff rates (incl. Urban Creep)   |         |                |                                |  |  |  |  |
|-------------|---|---------|----------------|--------------------------------|--|--|--|--|
| 3.1         | 1 in 1 year rainfall  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 3.2         | 1 in 30 year rainfall   | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 3.3         | 1 in 100 year rainfall + CCA  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 4.0         | Brownfield runoff rates (incl. Urban Creep)   |         |                |                                |  |  |  |  |
| 4.1         | 1 in 1 year rainfall  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 4.2         | 1 in 30 year rainfall   | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 4.3         | 1 in 100 year rainfall + CCA  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| <b>5</b> .0 | <sup>5.0</sup> Proposed maximum rate of runoff from site (incl. Urban Creep) <sup>(7)</sup>               |         |                |                                |  |  |  |  |
| 5.1         | 1 in 1 year rainfall  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 5.2         | 1 in 30 year rainfall   | l/s/ha, |                | I/s for the site               |  |  |  |  |
| 5.3         | 1 in 100 year rainfall + CCA  | l/s/ha, |                | I/s for the site               |  |  |  |  |
| <b>6</b> .0 | Attenuation storage to manage flow rates from site (incl. Climate Change Allowance (CCA) and Urban Creep) |         |                |                                |  |  |  |  |
| 6.1         | Storage - 1 in 100 year + CCA <sup>(9)</sup>  |         | m <sup>3</sup> | m <sup>3</sup> /m <sup>2</sup> |  |  |  |  |
| 6.2         | 50% storage drain down time 1 in 30 yea   | rs      |                |                                |  |  |  |  |
| 7.0         | Controlling volume of runoff from the site $(10)$   |         |                |                                |  |  |  |  |
| 7.1         | Pre development runoff volume <sup>(12)</sup> (development area)  |         |                | m <sup>3</sup> for the site    |  |  |  |  |
| 7.2         | Post development runoff volume (unmitigated) <sup>(12)</sup>  |         |                | m <sup>3</sup> for the site    |  |  |  |  |
| 7.3         | Volume to be controlled (5.2 - 5.1)   |         |                | m <sup>3</sup> for the site    |  |  |  |  |



| -   |   | m <sup>3</sup><br>m <sup>3</sup><br>m <sup>3</sup> |                |   |  |  |  |
|---|---|--|----------------|---|--|--|--|
|   | Attenuation   | m <sup>3</sup> (15)                                |                | m <sup>3</sup>                            |  |  |  |
| -   | - Separate volume designated as long term storage <sup>(15)</sup> |  |                | m   |  |  |  |
| 7.5   | Total volume control (sum of inputs for 5.4)                      |  |                | m <sup>3</sup> (17)                       |  |  |  |
| 8.0 Site storage volumes (full infiltration only) |   |  |                |   |  |  |  |
| 8.1   | Storage - 1in 30 year + CCA <sup>(8)</sup>                        |  | m <sup>3</sup> | $m^3/m^2$ (of developed impermeable area) |  |  |  |
| 8.2   | Storage - 1 in 100 year + CCA (11)                                |  | m <sup>3</sup> | m <sup>3</sup> /m <sup>2</sup>            |  |  |  |

## **Design Inputs**

Proposed site use Residential

# Pollution hazard category (see C753 Table 26.2) Very Low - Low

High risk area defined as area storing fuels chemicals, refuelling area, washdown area, loading bay.

## **Design Outputs**

List order of SuDS techniques proposed for treatment

Note that gully pots, pipes and tanks are not accepted by Essex LLFA as a form of treatment (for justification see C753 Section 4.1, Table 26.15 and Box B.2)

Are very high pollution risk areas drained separate from SuDS to foul system Please select

## Other

Please include any other information that is relevant to your application



## Notes

- 1. All area with the proposed application site boundary to be included.
- The site area which is positively drained includes all green areas which drain to the SuDS system and area of surface SuDS features. It excludes large open green spaces which do not drain to the SuDS system.
- 3. Impermeable area should be measured pre and post development. Impermeable surfaces include, roofs, pavements, driveways and paths where runoff is conveyed to the drainage system.
- 4. Predevelopment use may impact on the allowable discharge rate. The LLFA will seek for reduction in flow rates to GF (Essex SuDS Design Guide).
- 5. Runoff may be discharge via one or more methods.
- 6. Sewers for Adoption 6<sup>th</sup> Edition recommends a Cv of 100% when designing drainage for impermeable area (assumes no loss of runoff from impermeable surfaces) and 0% for permeable areas. Where lower Cv's are used the applicant should justify the selection of Cv.
- 7. It is Essex County Council's preference that discharge rates for all events up to the 1 in 100 year event plus climate change are limited to the 1 in 1 greenfield rate. This is also considered to mitigate the increased runoff volumes that occur with the introduction of impermeable surfaces. If discharge rates are limited to a range of matched greenfield flows then it is necessary to provide additional mitigation of increased runoff volumes by the provision of Long-term Storage.
- 8. Storage for the 1 in 30 year must be fully contained within the SuDS components. Note that standing water within SuDS components such as ponds, basins and swales is not classified as flooding. Storage should be calculated for the critical duration rainfall event.
- 9. Runoff generated from rainfall events up to the 1 in 100 year will not be allowed to leave the site in an uncontrolled way. Temporary flooding of designated areas to shallow depths and velocities may be acceptable.
- 10. The following information should only be provided if increased runoff volumes are not mitigated by limiting all discharge rates back to the greenfield 1 in 1 year rate.
- 11. Climate change is specified as 40% increase to rainfall intensity, unless otherwise agreed with the LLFA / EA.
- 12. To be determined using the 100 year return period 6 hour duration winter rainfall event.
- 13. Where Source Control is provided Interception losses will occur. An allowance of <u>5mm rainfall depth</u> can be subtracted from the net inflow to the storage calculation where interception losses are demonstrated. The Applicant should demonstrate use of subcatchments and source control techniques. Further information is available in the SuDS Design Guide.
- 14. Please refer to Rain harvesting BS for guidance on available storage.
- 15. Flows within long term storage areas should be infiltrated to the ground or discharged at low flow rate of maximum 2 l/s/ha.
- 16. Careful consideration should be used for calculations where flow control / storage is likely to be influenced by surcharged sewer or peak levels within a watercourse. Outlets can be tidally locked where discharge is direct to estuary or sea. Calculations should demonstrate that risk of downed outlet has been taken into consideration. Vortex controls require conditions of free discharge to operate as per specification.
- 17. In controlling the volume of runoff the total volume from mitigation measures should be greater than or equal to the additional volume generated.