



Toynbee Road and Romsey Close, Eastleigh

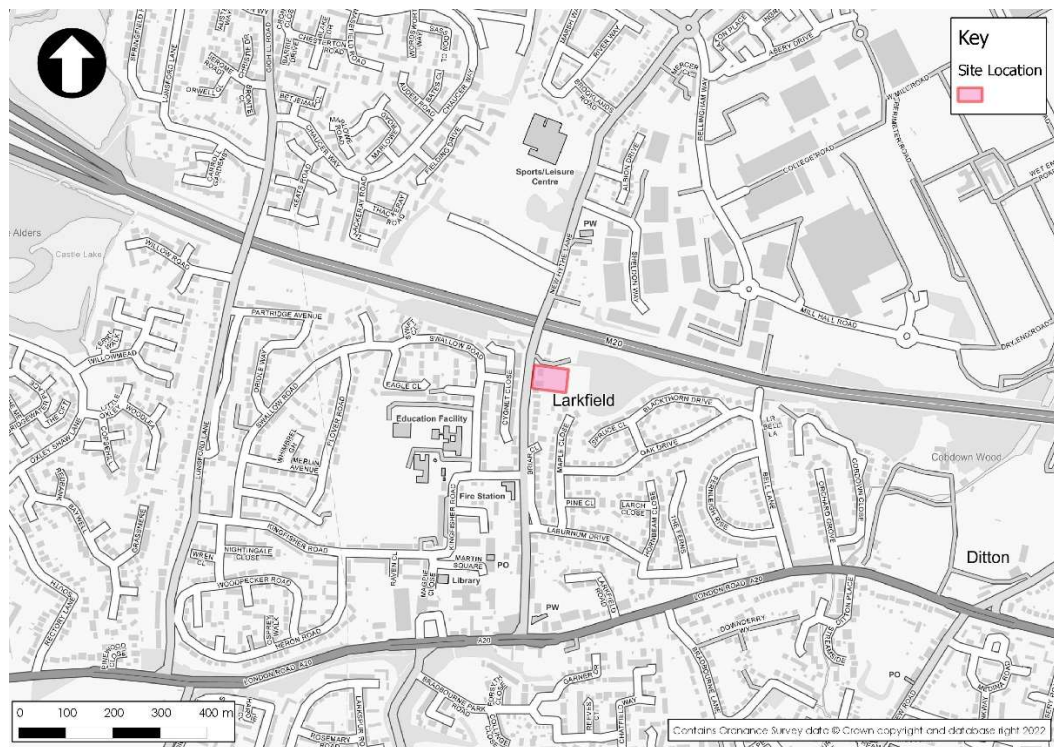
Flood Risk & Drainage Technical Note

Project No.	1373
Revision	C
Date	27 th April 2023
Client	Churchill Retirement Living
Prepared	J Blyth
Checked	C Yalden
Authorised	C Yalden
File Ref.	P:\1373 Toynbee Road, Eastleigh\C Documents\Reports\1373 Toynbee Road, Eastleigh - Flood Risk and Drainage Technical Note.docx

1 Introduction

Introduction & Background

- 1.1 Awcock Ward Partnership has been commissioned by Churchill Retirement Living to prepare a Flood Risk and Drainage Technical Note in support of a full planning application for the redevelopment of land at Toynbee Road and Romsey Close, Eastleigh, Hampshire, SO50 9DP.
- 1.2 The redevelopment is proposed to provide retirement apartments and associated communal areas, parking and amenities.
- 1.3 The site is within a residential area and is bound by Toynbee Road to the west, Romsey Road to the east, residential properties to the south and a footpath to the north with residential properties beyond.
- 1.4 The location of the site in relation to its surroundings can be seen within Figure 1.1.

Figure 1.1 – Site Location Plan

1.5 This technical note has been prepared with reference to the below guidance and resources:

- Hampshire County Council (HCC) Local Strategy Flood and Water Management (available online, downloaded April 2022).
- Surface Water and Sustainable Drainage, Guidelines for Developers, Designers and Planners (HCC, November 2015), and associated Surface Water Checklist Guidance (available online).
- Hampshire Groundwater Management Plan (GWMP) (Final Draft, October 2013).
- Eastleigh Surface Water Management Plan (SWMP) (Draft, Dec 2012).
- Utility Surveys Ltd (April 2022) - CCTV Drainage Survey Report.
- D&H Surveys Ltd (April 2022) - Topographical Survey, Drawing SU01.

1.6 This document sets out the existing baseline conditions in Section 2, the development proposal in Section 3. The proposed surface water management plan and foul water strategy that will serve the development is discussed in Sections 4 and 5 respectively, with Section 6 providing the Ownership and Maintenance information before concluding in Section 7.

2 Existing Baseline Conditions

Existing Site

- 2.1 Topographic information available for the site shows it as being relatively flat, typically around 16.3mAOD, but with lowest levels c.15.8mAOD to the south-east and highest levels generally along the northern boundary c.16.5mAOD.
- 2.2 Ground levels are mostly at or above the adjacent Toynbee Road and Romsey Close highway levels.
- 2.3 A copy of the topographic survey for the site can be seen as Appendix A.

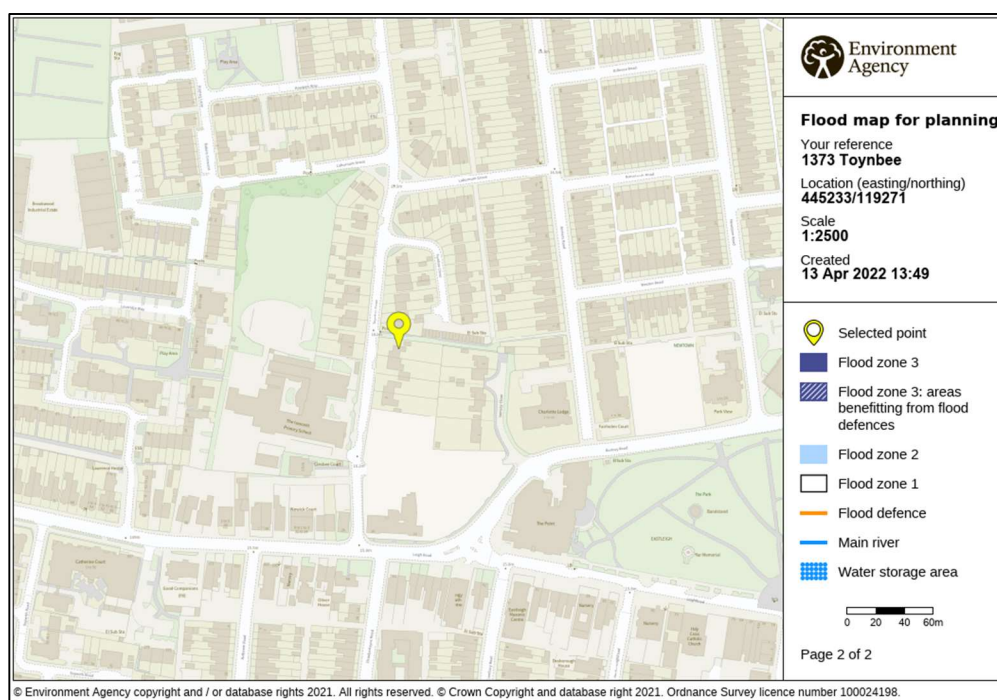
Existing Flood Risk

- 2.4 We have carried out a desktop assessment of potential flood risks to the site using the Environment Agency's (EA) Flood Information Service.

Fluvial sources (River flooding)

An extract of the 'Flood Map for Planning' has been reproduced as Figure 2.1 and shows the site as being entirely within 'Flood Zone 1', as land assessed as having less than 1 in 1,000 annual probability of flooding from fluvial sources (<0.1%).

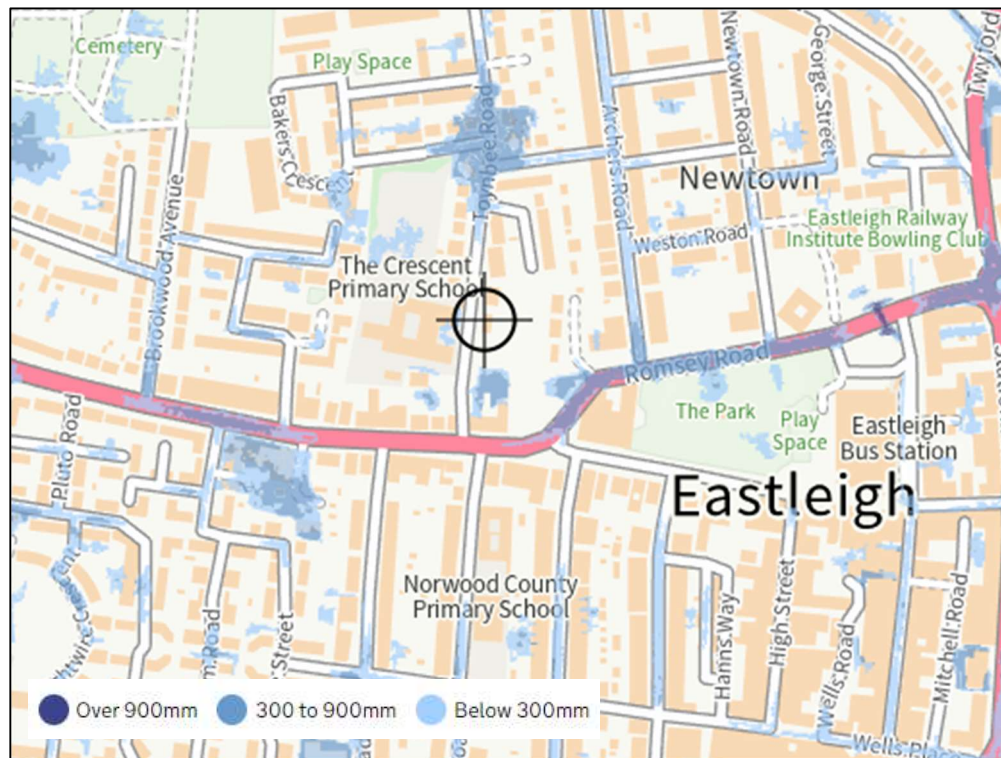
Figure 2.1 – EA Flood Map for Planning



Pluvial sources (surface water flooding)

- 2.5 The EA's 'Flooding from Surface Water' map has been reproduced as Figure 2.2 and shows the site at 'very low risk' of flooding from surface water (<0.1% annual probability of flooding).

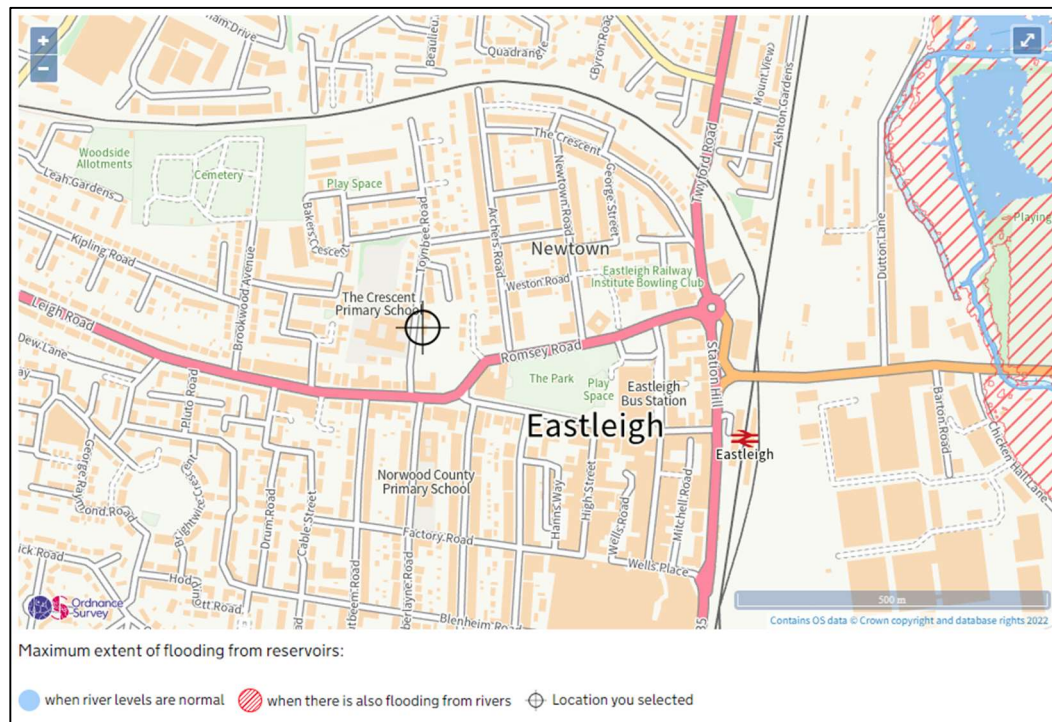
Figure 2.2 – EA Extent Flooding from Surface Water (Low Risk).



- 2.6 The EA's mapping ignores the presence of existing drainage infrastructure, which might otherwise serve the site and surrounding developments and therefore we do not anticipate that surface water flooding will impact the site.

Artificial Sources of Flooding

- 2.7 An extract of the EA's reservoir flood map can be seen as Figure 2.3 and shows the site as being outside the maximum extents of flooding from reservoirs, in combination with fluvial flooding.

Figure 2.3 – Reservoir Flood Mapping

Ground Conditions

- 2.8 An intrusive site investigation has been undertaken within the site by Crossfield Consulting, dated June 2022, and includes an assessment of the likely effectiveness of infiltration. The Site Investigation report states;
- 2.9 *"Groundwater is expected to be present at relatively shallow depth (from around 2.5 m depth). Strata above this level generally comprise clays, classified in CIRIA C750 (2016) as very low permeability to practically impermeable. On this basis, it is considered unlikely that soakaways will provide a suitable drainage solution, such that an alternative SuDS drainage system appears to be necessary."*
- 2.10 Extracts from the ground investigation are included in Appendix B.

Existing Site Drainage

- 2.11 The Southern Water (SW) sewer records identify an adopted 525mm diameter surface water sewer routing south beneath Toynbee Road, to the west of the site. This network continues east beneath the A335, with a manhole in the junction with Romsey Close.
- 2.12 The SW sewer records identify a 225mm diameter adopted foul sewer running south-north to the rear of the existing properties on Toynbee Road. The adopted foul sewer traverses the site near the northern boundary and

routes south within the front gardens of properties on Romsey Close, prior to discharging to a further adopted sewer to that runs north-south near the eastern boundary.

- 2.13 An extract from SW's asset records can be seen as Figure 2.3 and are included in Appendix C.

Figure 2.3 – Southern Water Asset Records



- 2.14 A CCTV drainage survey has been undertaken and confirms that the existing network is in a fairly reasonable condition, with only Grade B defects present and mostly comprising attached deposits.
- 2.15 Additional to the mapped adopted sewers, there is also a foul system which receives connections from the rear of properties on Romsey Close. This system would have been transferred to SW on 1 October 2011 under the Private Sewer Transfer Regulations so should now be considered as an adopted sewer.

- 2.16 The adopted foul connections serving No.1 Romsey Close will need to be maintained and the sewer from the rear of property diverted to facilitate the development.
- 2.17 Any proposed development within the site should consider the abandonment of existing redundant adopted sewers, or where retained must exclude buildings within the sewer easement, or otherwise promote diversion of the adopted sewer. Whilst existing sewer easements are typically 3.0m from the centreline of the sewer (6m overall width), we anticipate that a reduced easement could be agreed in line with the latest Design Construction Guidance for a new sewer diversion (whereby sewers can be installed within 1.2m from a building).
- 2.18 The on-site CCTV survey identified that rainwater downpipes predominantly discharge on-to existing ground (driveways, patios, gardens etc), with runoff likely to drain towards areas of landscaping and the adopted highway of Toynbee Road and Romsey Close. There is no evidence of interception at the back edge of adopted highway and therefore greenfield and brownfield runoff from the site would likely reach the highway drainage system.
- 2.19 A copy of the CCTV survey is included within Appendix D.

Existing surface water runoff

- 2.20 The existing site is partially brownfield, of residential character and use. It comprises dwellings with associated hard paved areas and residual green space.
- 2.21 The existing site runoff has been assessed by calculating the runoff rates from areas of brownfield using the modified rational method (0.116ha – houses, drives and garaging only), and the runoff rates from areas of greenfield using the FEH methodology (0.296ha – includes patios, sheds, decking to remain conservative). The outputs of these assessments can be seen summarised within Table 2.1 below, with copies of our respective calculation sheets within Appendix E of this report.

Table 2.1 – Existing Site Runoff Rates

Return Period	Brownfield Rates 0.116ha (l/s)	Greenfield Rates 0.296ha (l/s)	Total Combined Runoff (l/s)
2 year	14.3	1.0	15.3
30 years	39.0	2.8	41.8
100 years	51.9	3.7	55.6

- 2.22 In terms of discharge rates HCC LFWMS SuDS Policy 1 states that the discharge hierarchy is underlined by the need to control both discharge rates, and discharge volumes: *"Underlying these options is the requirement to ensure that, post development, no greater volume of surface water leaves the site and/or no surface water leaves the site at a faster rate than occurred pre-development or, preferably, the discharge rate is limited to greenfield runoff rates. The County Council will object to planning developments if the net effect on the flood risk in an area is too great."*
- 2.23 In line with the above guidance, the equivalent greenfield runoff rates for the site (0.412 ha) have also been calculated using FEH, with the results summarised within Table 2.2 and the calculation sheet included within Appendix E of this report.

Table 2.2 – Equivalent Greenfield Runoff Rates (0.412ha)

Return Period	Greenfield Rate (l/s)
2 year	1.4
30 years	3.8
100 years	5.1

- 2.24 It is proposed that peak rates of discharge from any new development at this site seek to achieve the equivalent greenfield rates as far as practicable (based on minimum 100mm control diameter, as per the Design and Construction Guidance). This is partly influenced by the above HCC guidance, but also considers that the development will rely on a new connection to the nearest available surface water sewer.

3 Development Proposal

- 3.1 The development proposes to redevelop the partially brownfield site to a single block of retirement apartments, with associated parking, access and landscaped amenity space.
- 3.2 A copy of the proposed site layout has been included within Appendix F of this report.

4 Surface Water Management Plan

- 4.1 The site is less than 1ha (0.412ha) and is located within Flood Zone 1, therefore a Flood Risk Assessment is not required. This technical note has been prepared to assess any relevant flood risks and drainage constraints and to identify an appropriate drainage strategy for the proposed development.

- 4.2 To ensure the development is safe throughout its lifetime, the surface water strategy accounts for runoff in up to the 100 year return period.
- 4.3 The strategy also safeguards against the upper end allowances for climate change (45%) as stipulated for the Test and Itchen Management Catchment, providing betterment over existing conditions, where the rate and volume of runoff would continue to increase due to climate change.
- 4.4 On-site intrusive site investigation has concluded that infiltration is unlikely to be viable for this site.
- 4.5 There are no nearby watercourses and therefore the development proposes to discharge attenuated flows to the adopted surface water sewer beneath Toynbee Road (a pre-planning enquiry has been submitted to SW to seek agreement for this connection).
- 4.6 The peak rates of discharge will be limited to the sites equivalent greenfield rates as far as is practicable, based on a minimum 100mm diameter control diameter as per the Design and Construction Guidance. By review it is concluded that a peak flow of 3.8 l/s can be achieved with a 100mm diameter vortex flow control.
- 4.7 Table 4.1 provides a summary of the proposed discharge rates and demonstrates that the scheme will offer up to 90% betterment compared to existing conditions.

Table 4.1 – Proposed Discharge Summary

Return Period	Existing Site Runoff (l/s)	Future Site Runoff, inc. 45% CC (l/s)	Percentage Betterment
2 year	15.3	3.8	75%
30 years	41.8	4.3	89%
100 years	55.6	5.1	90%

- 4.8 Runoff generated by the proposed building, access road and external hard paving will be collected and drained towards a new cellular attenuation tank beneath the proposed access drive and parking area.
- 4.9 All chambers immediately upstream of the tank will include silt traps, whilst the tank itself will include vented covers or a high-level vent pipe to mitigate air-locks.

Causeway Flow has been used to determine the storage requirements for the development in the context of a wider drainage network. The output of

this exercise has been summarised within Table 4.2, with copies of the modelling outputs included within Appendix G

Table 4.2 – Attenuation Storage Volumes Requirements

Attenuation Feature	Attenuation Volume
Cellular Attenuation Tank	116.9m ³
TOTAL	116.9.8m³

- 4.10 Runoff from the tank will pass through a new flow control chamber prior to discharging to the existing surface water sewer within Toynbee Road, at a peak rate ranging from 3.8-5.1 l/s.
- 4.11 A copy of the preliminary drainage layout can be found as drawing 1373-01-PDL-1001 within Appendix H.

Exceedance Measures

- 4.12 Finished Floor Levels (FFLs) and external levels should be set such that should the drainage block, or experience an event beyond the 100-year critical storm, exceedance runoff will be directed away from buildings and towards any areas of open space or parking. Typically, FFLs should be 150mm above external levels.
- 4.13 Beyond the capacity of the site, flows would continue off-site as per existing brownfield conditions, albeit to a lesser frequency and extent.

Long-Term Storage (LTS)

- 4.14 The proposed development has an impermeable area of just 0.277ha and therefore the application of LTS, with a limited discharge of just 2 l/s/ha, would result in an impractical rate of discharge.
- 4.15 It has been considered that the provision of LTS is not feasible, and furthermore volumetric control is achieved by limiting flows from the brownfield site as close to equivalent greenfield rates as reasonably practicable.

5 Foul Water Strategy

- 5.1 Foul flows generated by the proposed development will drain through a new private gravity foul network and will use a new foul connection to the SW adopted foul sewer network, located inside the eastern edge of site.

- 5.2 Subject to further assessment, it may be possible to secure the re-use of any existing foul connections, however it is anticipated this would require remedial works or replacement.
- 5.3 The existing foul drainage which enters the southern boundary of the site from the rear of No.1 Romsey Close should be considered as an adopted sewer (transferred as part of the 2011 Private Sewer Transfer Regulations). This sewer will need to be diverted within the southern edge of site and may provide another opportunity for foul water connectivity (subject to final design levels).
- 5.4 Any redundant adopted foul sewers within the site would be formally abandoned.
- 5.5 A foul capacity enquiry has been submitted to SW to confirm connection to their existing network inside the eastern boundary of the site.
- 5.6 The proposed foul drainage arrangements can be seen on the preliminary drainage layout drawing 1373-01-PDL-1001 within Appendix H.

6 Ownership & Maintenance

- 6.1 Other than the proposed diversion to the adopted foul sewer within the southern boundary of site, all new on-site drainage will remain private and will be designed in accordance with Building Regulations Part H and will become the responsibility of the appointed management company, 'Churchill Estates Management'.
- 6.2 The proposed attenuation will also be retained under private ownership and will be operated and maintained by 'Churchill Estates Management' in accordance with CIRIA C753 and any manufacturer specific guidance.
- 6.3 At the detailed design stage, a 'Drainage Maintenance Plan' will be prepared in accordance with CIRIA C753 Chapter 32. The Plan will set out maintenance tasks, responsibilities and frequencies for the entire drainage network.

7 Conclusion

- 7.1 The proposed development has been assessed in line with the National Planning Policy Framework, to allow the planning application to be progressed and to show that the development can be undertaken in an acceptable manner from a flood risk perspective.

- 7.2 The proposed development is located within Flood Zone 1 and is not known to be susceptible to flooding from pluvial, groundwater, infrastructure or artificial sources.
- 7.3 To ensure the development is safe throughout its lifetime, the surface water strategy accounts for runoff in up to the 1 in 100 year return period.
- 7.4 The strategy also safeguards against climate change (45%), providing betterment over existing conditions, where the rate and volume of runoff would continue to increase due to climate change.
- 7.5 The existing ground conditions are not suitable for the implementation of infiltration drainage, and the site is not near a watercourse. Instead, surface water runoff will be attenuated on-site and discharged to the adopted surface water sewer in Toynbee Road, at a peak rate ranging from 3.8-5.1 l/s. This provides up to 90% betterment compared to the existing site runoff rates.
- 7.6 Runoff from the site will be intercepted by a new private network and will drain to a new cellular attenuation tank. Flows from the tank will pass through a flow control chamber prior to discharging to the proposed point of connection on the adopted surface water sewer.
- 7.7 Beyond the 100-year critical storm, exceedance runoff will be directed away from the building and towards any residual areas of open space or parking, where aboveground storage can be utilised. Beyond the capacity of the site exceedance flows would discharge from the site as per existing conditions, albeit at a reduced frequency and extent.
- 7.8 Foul flows generated by the proposed development will be served by a new private gravity network, with connectivity to the SW foul sewer network inside the eastern boundary of the site.
- 7.9 The existing adopted foul sewer which enters the site from the rear of No.1 Romsey Close will be diverted inside the southern boundary of the site. All redundant adopted drainage within the site will be abandoned.
- 7.10 With the exception of the foul sewer diversion, all proposed on-site drainage will remain private and will be designed in accordance with Building Regulations Part H and CIRIA C753 and will become the responsibility of the appointed management company.
- 7.11 As the development will be safe from flooding throughout its lifetime and will actively reduce the flood risk to properties within the downstream

catchment, it is recommended that the Local Planning Authority confirm they have no objections to the proposed development.

Appendix A Topographic Survey



D&H

Surveys

Ltd

The Manor Stables, Great Somerford, Chipping Norton, SN15 5JH

Tel 01249 720445

Web: www.dh-surveys.co.uk

Email: admin@dh-surveys.co.uk

Fax 01249 721124

Topographic Surveys

Elevation Surveys

Floor Plan Surveys

Volumetric Surveys

As Built Drainage Surveys

Coordination Of Site Layouts

Rectified Photo Elevations

CAD Plotting Bureau

Project Name:

Romsey Close / Toynbee Road

Eastleigh

Drawing Title:

Combined Topographic Survey

Client:

Churchill Retirement Living

Agent:

Date:

July 2022

Scale:

A0 @ 1:200

Drawn

Surveyor

Dwg No

Revision

KJH

GH

SU 01-C

Site Datum

OSBM Ref

OS 15

Grid Orientation

Sheet ID

CHURCHILL-Eastleigh-Romsey-Toynbee

Disclaimer

D & H Surveys will guarantee that this

Survey Data & Station Coordinates are correct to the Indicated Scale ONLY

Copyright of this Drawing Remains With D & H Surveys.

Appendix B Ground Investigation (Extracts)

CHURCHILL RETIREMENT LIVING

LAND AT TOYNBEE ROAD, EASTLEIGH, SO50 9DP

GROUND INVESTIGATION REPORT

Revision 1

The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

June 2022
Report No. CCLo3552.CQ14-R1

www.crossfield-consulting.co.uk

Tel: 01926 815678
Fax: 01926 815222
mail@crossfield-consulting.co.uk

With reference to the available ground investigation records included in the Desk Study Appraisal report, as relating to the former police station immediately to the south of the site, the recorded natural strata comprise 'firm' silts to approximately 1.4 m, underlain by medium dense and dense clayey sand and gravels, as indicated to approximately 4.2 m. These strata are classified as River Terrace Deposits. Below this, 'stiff' and 'very stiff' clays were reported to the base of the exploratory holes at approximately 11 m. In addition to these natural strata, Made Ground is also recorded, as likely to relate to the former police station development. Groundwater appears to have been recorded below 1.5 m, although it is unclear if these observations are representative of longer-term conditions.

The data on deeper strata, as provided by the BGS borehole data, indicates the predominantly clayey strata of the London Clay and underlying Eocene sequence extend a depth of approximately 128 m (420 ft), below which chalk strata are recorded. This record relates to a former well, associated with a water level (when not pumping) at approximately 3 m below surface.

5. GROUND CONDITIONS AND GEOLOGICAL MODEL

5.1 Ground Investigation

Details of the rationale and scope of the ground investigation and laboratory testing, together with exploratory hole logs, monitoring, in situ and laboratory test results, are given in Appendix I. The investigation has identified the presence of the following, below the western part of site. Within the eastern section of the site, access was not available and the ground conditions remain to be confirmed.

5.2 Buried Foundations and Services

No buried obstructions or services were encountered during the ground investigation. However, foundations, services and associated structures will be associated with the current residential properties. In addition, a drain is understood to extend within the northern and eastern margins of the site.

5.3 Strata Encountered

Topsoil/Made Ground

Topsoil (and disturbed subsoil) was encountered in all garden/landscaping areas that were investigated and recorded to a typical depth of 0.5 m. The material comprises a dark brown, sandy silt/clay with rootlets. Locally, brick fragments were noted in the topsoil.

River Terrace Deposits

Below the Topsoil/Made Ground River Terrace deposits were encountered within all exploratory holes. The River Terrace deposits strata typically comprise an upper horizon of firm to stiff and stiff consistency gravelly clays/medium dense to dense clayey gravels, as indicated to depths of approximately 1.5 m, overlying dense to very dense clayey sand and gravels. These strata have been proven to 4.0 m depth in the northern section of the site. In the vicinity of the southern part of the site, these strata are indicated to depths of approximately 3.5 m to 4.5 m, and also include medium dense/'firm silts' (as indicated in the exploratory hole data for the adjoining site).

Standard penetration tests (SPTs) undertaken in the River Terrace strata recorded 'N' values of 18 to greater than 50.

Wittering Formation

Wittering Formation strata are indicated below the River Terrace Deposits, as observed in the northern section of the site (in DS2) at 4.0 m depth to a maximum depth of 5.0 m. These strata comprise very stiff consistency (high strength) silty clays. With reference to the available data, these strata are recorded to depths in excess of 10.5 m, and generally increase in strength with depth.

5.4 Groundwater

Groundwater was not encountered to the depth investigated (maximum depth of 5.0 m) during the recent ground investigation works at the site. The data for the adjoining site appears to indicate groundwater at depths of between 2.5 m to 3 m.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

6. PROPOSED DEVELOPMENT

The proposed development comprises a three to four-storey block of apartments with car parking and areas of managed soft landscaping. The residents will be of retirement age. An indicative proposed development plan is presented as Figure 4.

7. ASSESSMENT OF POTENTIAL CONTAMINATION AND GROUND GASES

7.1 Assessment Criteria

Assessment of potential contamination and ground gases has been undertaken using a risk assessment based approach, as recommended within the Environmental Protection Act (1990) (and subsequent amendments), Environment Agency LCRM (2020), CLEA Model (2004-2009), BS 10175:2011+A2:2017, CIRIA C552 (2001) and NHBC R&D Report 66 (2008). This approach considers the likely source of contamination, given the history and location of the site, and the possible migration pathways by which these potentially hazardous substances may reach likely receptors, such as end users of the site, controlled waters or the wider environment, in the context of the proposed development.

Part IIA of the Environmental Protection Act (1990) states that

‘Contaminated Land is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

- (a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- (b) significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused;’

All risk assessments carried out as part of this investigation have been carried out with respect to the definition of ‘contaminated land’ within Part IIA of the Environmental Protection Act (1990) and have considered the site both before and on completion of the development. The basis of the risk assessment is the Conceptual Site Model, which is derived from the desk study and initial information and identifies potential contaminant linkages that could affect receptors relevant to the site and the wider environment. The Conceptual Site Model is presented in Table 1.

9.3 Floor Slab Recommendations

Due to potential for disturbance of the shallow ground beneath the site during demolition of existing structures, it is recommended that an allowance be made for suspended ground floor slabs for the proposed new buildings. Within influencing distance of trees, allowance should be included for a suitable underfloor void, in accordance with NHBC Standards (2022), due to the presence of volume change potential clays.

9.4 General Construction Advice

All formations should be cleaned, and subsequently inspected by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Care should be taken to ensure that any existing services encountered are carefully and satisfactorily blocked to prevent water seeping through the drains and into any excavations.

10. TEMPORARY WORKS

Conventional plant is considered appropriate for shallow excavation works at the site. However, the use of hydraulic breakers may be required to break up floor slabs, concrete surfacing, foundations and any buried concrete structures.

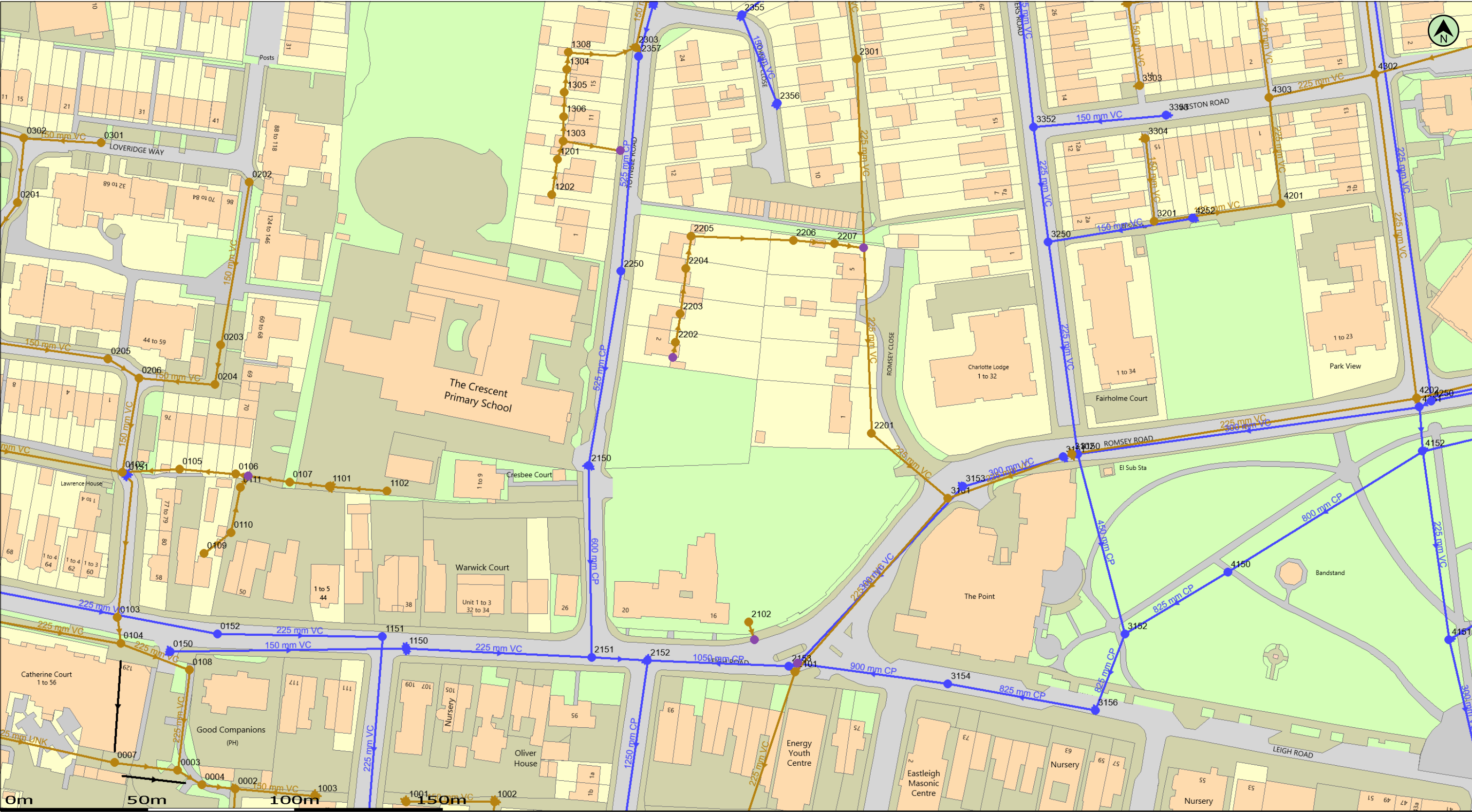
Shallow excavations may remain stable in the short term where excavations do not encounter groundwater. However, instability may occur in excavations left open for extended periods of time. Support should be provided, or the sides battered back, in any excavations requiring man entry in compliance with the relevant risk assessment.

Groundwater is, based on current data, expected to be present at depths at least below 2.0 m. However, perched water may locally be encountered. If perched water does enter excavations, pumping from screened sumps may be required.

11. ASSESSMENT OF SOAKAWAY DRAINAGE

Groundwater is expected to be present at relatively shallow depth (from around 2.5 m depth). Strata above this level generally comprise clays, classified in CIRIA C750 (2016) as very low permeability to practically impermeable. On this basis, it is considered unlikely that soakaways will provide a suitable drainage solution, such that an alternative SuDS drainage system appears to be necessary.

Appendix C Southern Water Asset Records and Correspondence

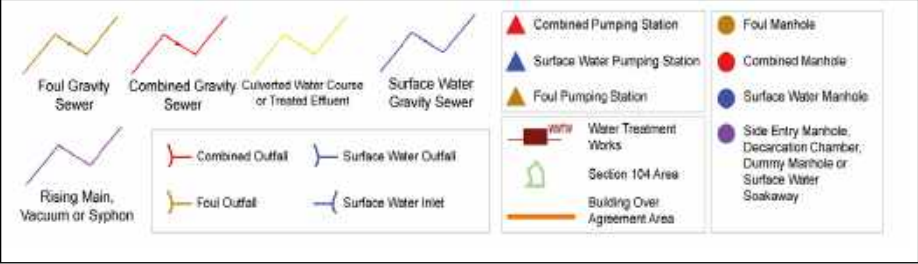


(c) Crown copyright and database rights 2022 Ordnance Survey 100031673 Date: 08/04/22 Scale: 1:1250 Map Centre: 445252,119214 Data updated: 21/03/22 Our Ref: 827378 - 3 Wastewater Plan A3

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



john.duncan@nrswa.net
Eastleigh



Appendix D CCTV Survey



CCTV SURVEYS



**HIGH PRESSURE
JETTING**



**MAN ENTRY
SURVEYS**



RELINING & REPAIRS



PILING SURVEYS



CHIMNEY SURVEYS



**5 SUFFOLK ROAD
MALDON
ESSEX
CM9 6AX**

Telephone: 07971 910370

CCTV REPORT

CLIENT	CHURCHILL RETIREMENT LIVING
LOCATION	TOYNBEE ROAD EASTLEIGH HAMPSHIRE SO50 9DP
DATE	28/04/2022
REF	071451

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REGISTER OF APPENDICES

- A. MANHOLE INSPECTION REPORT
- B. COPIES OF SITE HAND WRITTEN DAILY RECORD SHEETS
- C. ANNOTATED SITE DRAWINGS

GENERAL INFORMATION

Utility Surveys Ltd have been appointed by Churchill Retirement Living to undertake a Sewer Condition Survey at the location identified. This survey commenced on 28 April 2022.

CONTACT INFORMATION

SITE ADDRESS: 2, 4, 6 & 8 TOYNBEE ROAD EASTLEIGH HAMPSHIRE SO50 9DP	SITE CONTACT: N/A CONTACT NO: EMAIL:
CLIENT DETAILS: CHURCHILL RETIREMENT LIVING CHURCHILL HOUSE PARKSIDE RINGWOOD BH24 3SG	CONTACT: WES SANDERSON CONTACT NO: 01425 462303 EMAIL:

UTILITY SURVEYS LTD CONTACT DETAILS

OFFICE	SIMON GARDINER 07971 910370 simon@utilitysurveysltd.co.uk
RIG MANAGER	SIMON GARDINER

SITE DESCRIPTION

Site Description

DEVELOPMENT SITE

Site Boundaries

CLEARLY DEFINED ON SUPPLIED DRAWINGS

SURVEY BRIEF

Sewer Condition Inspection Survey

The Purpose of the Sewer Condition Inspection Survey was to establish the location and extent of foul and/ or surface water drainage systems and to document their condition prior to any further works.

- A full condition survey can only be produced if precleansing / jetting is carried out in conjunction with the CCTV survey.
- If precleansing is not carried out at the time of the survey further faults and conditional defects may be present but not recorded in this report.

In addition Utility Surveys Ltd have;

- Attempted to investigate all agreed areas, although if not all could be fully accessed (see Daily Record Sheet).
- Produced a report to establish the location and extent of foul and surface water drainage systems and to document their condition prior to any further works.
- Provided the basic information from which a remediation or management plan can be instigated.
- Highlighted the requirement for urgent action to repair or remediation works to the surveyed drainage system.
- Incorporated in the results any additional manholes/ drainage found, which may have been buried, obscured or not identified in the original scope of works.

Agreed Restrictions and Exclusions

This report is based upon a Sewer Condition Inspection Survey of an unfamiliar site.

During the course of the survey all reasonable efforts were made to identify and access all Manholes and foul/ surface drainage/ outfall, throughout the site.

Some installations/ areas may not have been inspected due to access and or safety reasons (e.g. Wet Wells, Large Unventilated Tanks, Traffic Management Situations). Unless an accepted safe system of work has been devised.

Access may not have been gained to several areas of the site due to conditions outside the control of the client or contractor, any such areas have been documented within this report (see Daily Record Sheet).

Any diagrams/ CAD drawings in the report are not to be scaled and are illustrative only to indicate approximate locations.

Manhole covers will not be lifted if:

- a) There is a danger of damaging surrounding flooring or finishes.
- b) They are covered, i.e. under fitted carpets, flooring, tiling or paving etc.
- c) Under fittings, fixtures, fencing, equipment etc.

Buried manholes will be located, if possible, position marked. If instructed, excavated in soft ground only up to a depth of 350mm with temporary reinstatement.

No allowance has been made for any precleansing unless stated in the quotation.

Full and free access to all areas affected is to be arranged by the instructing party.

SURVEY TECHNIQUES

The areas set out within the survey brief underwent inspection for a Sewer Condition Inspection Survey each area within the agreed scope of works was surveyed for location extent and condition of foul and/ or surface water drainage systems and CCTV footage gathered for confirmation. Every reasonable effort was made to investigate all aspects of the drainage system. Additional photographs were taken where relevant to the inspection.

There were no deviations from the agreed scope of works.

This Sewer Condition Inspection Survey was carried out in accordance with the Utility Surveys Ltd documented 'in-house' procedure 820 'Code of Working Practice' based on National Sewerage Association guidance. The Sewer Condition Inspection Survey Report states information recorded at the time of survey only, based on visual and CCTV assessment in accordance with sewer classification codings issued by WRC, incorporating the following inspection criteria:

CONDITION of pipe work
LOCATION of pipe work
EXTENT of the pipe work

A defect grade description has been provided for the identification of defective pipe work.

Changes to any of the above criteria shall necessitate the need for reassessment

These gradings and the reports can be used to form the basis of a planned preventative maintenance programme. This can be the subject of further discussions with our technical support team.

Drainage Report



Prepared For
CHURCHILL RETIREMENT LIVING
CHURCHILL HOUSE
PARKSIDE
RINGWOOD
BH24 3SG

Site
EASTLEIGH
2, 4, 6 & 8 TOYNBEE ROAD
EASTLEIGH
HAMPSHIRE
SO50 9DP



UTILITY SURVEYS LIMITED
Surveyor: Simon Gardiner
simon@utilitysurveysltd.co.uk

Total Defects for Project



Total DRB Grades for Project



071451 Toynbee Road Eastleigh - CCTV Survey Report : 28/04/22

Name :	UTILITY SURVEYS LIMITED
Contact :	SIMON GARDINER
Location :	5 SUFFOLK ROAD
Town :	MALDON
Region :	ESSEX
Postcode :	CM9 6AX
Email :	simon@utilitysurveysltd.co.uk
Contact Number :	
Surveyor :	Simon Gardiner
Valid Certification No :	L1103

Client Information

Name :	CHURCHILL RETIREMENT LIVING
Contact :	WES SANDERSON
Location :	CHURCHILL HOUSE
Town :	PARKSIDE
Region :	RINGWOOD
Postcode :	BH24 3SG
Tel :	01425 462303
Mobile :	
Email :	
Fax :	

Site Information

Name :	EASTLEIGH
Contact :	
Location :	2, 4, 6 & 8 TOYNBEE ROAD
Town :	EASTLEIGH
Region :	HAMPSHIRE
Postcode :	SO50 9DP
Tel :	
Mobile :	
Email :	
Fax :	

Total Defects for Project



Total DRB Grades for Project



Report interpretation.

Overview:

Each section of the drainage system is allocated a score indicating areas that require attention. These areas are detailed in the Overview section on the following page and also at the bottom right of the first few pages. We use colour coding as an indicator of severity. Additional information concerning rehabilitation options/recommendations is included in the Overview page, which can also be used as an, "at a glance" indication of system condition. More in depth information for each section, including images can be found later in the report. Grade indicators are as follows:

Grade A: Drain is serviceable no recommendations required

Grade B: There is an issue that might require remedial works

Grade C: There is a defect that requires remedial works, the drain is not serviceable.

Observations:

Each section of drainage reported on (manhole to manhole for example), contains detailed information about that drain and any observations made concerning condition are detailed below the header section. The observations are colour coded and given a severity score, with more significant defects being given a higher score, using a scale from 1 to 5 as detailed below:

Severity 1 to 2: These defects may require remedial monitoring

Severity 3: These defects probably require some form of remedial works

Severity 4 to 5: Defects that will require remedial repair or replacement

General:

The information provided is relevant at the time of survey. The coding system in this report is based on the Manual of Sewer Condition Classification, 5th edition (MSCC5) domestic codes (BS EN 13508-1:2003). This is the official standard for the water industry.

The severity system is based on significant experience in general practice and the 1 -5 grades represent the severity of individual defects: 5 representing a more serious defect.

Please feel free to contact us for further explanation or pricing for remedial works required.

Total Defects for Project



Total DRB Grades for Project



Overview

Section: 1 From: F1 To: F2	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 2 From: F2 To: F3	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 3 From: F3 To: F4	Grade B	DRB Grade: B Pipe Size: 100 Material: Polyvinyl Chloride Use: Foul
Section: 4 From: F3 To: F5	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 5 From: F5 To: F6	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 6 From: F6 To: F5	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 7 From: F6 To: F7	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 8 From: F6 To: F8	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 9 From: F8 To: F9	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 10 From: F9 To: F10	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 11 From: F10 To: F11	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 1

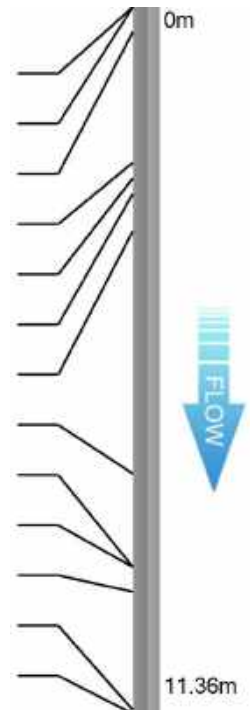
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: Start Node Depth: Start Node Coordinate:	F1 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	F2 0.00	Direction: Use: Material:	D F VC	Height/Dia: Shape: Cleaned	100 C N
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Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	11.36	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 5%	S1		0:00:09	
02.50m	WL	Water level 10%			0:00:28	
02.75m	WL	Water level 20%			0:00:31	
03.00m	WL	Water level 30%			0:00:36	
03.60m	CUW	S2 Loss of vision, camera under water	S2		0:01:20	
07.50m	CUW	F2 Loss of vision, camera under water	F2		0:01:20	
09.00m	WL	Water level 20%			0:02:13	
09.00m	CU	Loss of vision			0:02:49	
09.40m	WL	Water level 10%			0:02:19	
11.30m	DEG	F1 Attached deposits, grease 06-06 5%	F1		0:00:09	
11.36m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 1

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F1	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:09	S1 DEG	Attached deposits, grease 0.4m - 11.3m from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
02.50m	0:00:28	WL	Water level: 10% Height/Diameter	
02.75m	0:00:31	WL	Water level: 20% Height/Diameter	
03.00m	0:00:36	WL	Water level: 30% Height/Diameter	
03.60m	0:01:20	S2 CUW	Loss of vision, camera under water 3.6m - 7.5m	
07.50m	0:01:20	F2 CUW	Loss of vision, camera under water Defect End	
09.00m	0:02:13	WL	Water level: 20% Height/Diameter	
09.00m	0:02:49	CU	Loss of vision GREASE OVER LENS	
09.40m	0:02:19	WL	Water level: 10% Height/Diameter	
11.30m	0:00:09	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
11.36m		MHF	Finish node type, manhole F2	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 2

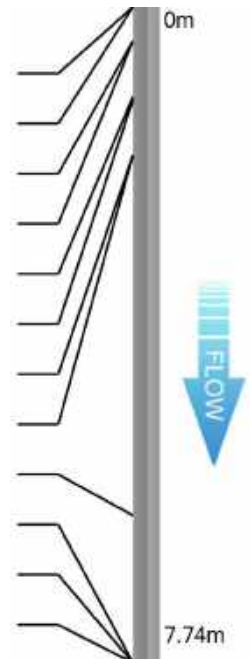
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: Start Node Depth: Start Node Coordinate:	F2 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	F3 0.00	Direction: Use: Material:	D F VC	Height/Dia: Shape: Cleaned	100 C N
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Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	7.74	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	CU	S1 Loss of vision	S1		0:00:00	
00.40m	DEG	S2 Attached deposits, grease 06-06 5%	S2		0:00:00	
01.06m	JDM	Joint displaced medium			0:00:13	
01.10m	WL	Water level 10%			0:00:16	
01.75m	FCJ	Fracture circumferential 07-05 at joint			0:00:23	
01.75m	WL	Water level 5%			0:00:28	
06.00m	DEG	Attached deposits, grease 06-09 20%			0:01:20	
07.74m	DEG	F2 Attached deposits, grease 06-06 5%	F2		0:00:00	
07.74m	CU	F1 Loss of vision	F1		0:00:00	
07.74m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 2

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F2	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 CU	Loss of vision 0.4m - 7.74m GREASE OVER LENS	
00.40m	0:00:00	S2 DEG	Attached deposits, grease 0.4m - 7.74m from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
01.06m	0:00:13	JDM	Joint displaced medium - Severity 3	
01.10m	0:00:16	WL	Water level: 10% Height/Diameter	
01.75m	0:00:23	FCJ	Fracture circumferential from 07 o'clock to 05 o'clock at joint - Severity 3	
01.75m	0:00:28	WL	Water level: 5% Height/Diameter	
06.00m	0:01:20	DEG	Attached deposits, grease from 06 o'clock to 09 o'clock: 20% Cross sectional area loss - Severity 3	
07.74m	0:00:00	F2 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
07.74m	0:00:00	F1 CU	Loss of vision Defect End GREASE OVER LENS	
07.74m		MHF	Finish node type, manhole F3	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 3

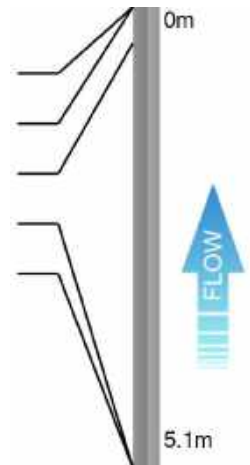
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F3	Finish Node Ref: F4	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: PVC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	5.1	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 5%	S1		0:00:26	
05.10m	DEG	F1 Attached deposits, grease 06-06 5%	F1		0:00:26	
05.10m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 3

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F3	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:26	S1 DEG	Attached deposits, grease 0.4m - 5.1m from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
05.10m	0:00:26	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
05.10m		MHF	Finish node type, manhole F4	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 4

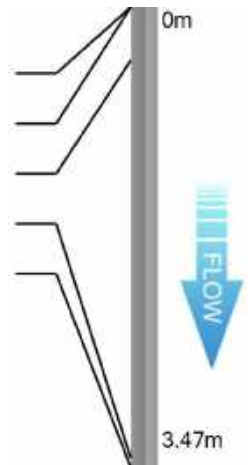
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F3	Finish Node Ref: F5	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	3.47	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole			
00.00m	WL	Water level 5%			0:00:00
00.40m	DEG	S1 Attached deposits, grease 06-06 10%	S1		0:00:00
03.40m	DEG	F1 Attached deposits, grease 06-06 10%	F1		0:00:00
03.47m	MHF	Finish node type, manhole			



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 4

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F3	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 3.4m from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
03.40m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
03.47m		MHF	Finish node type, manhole F5	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 5

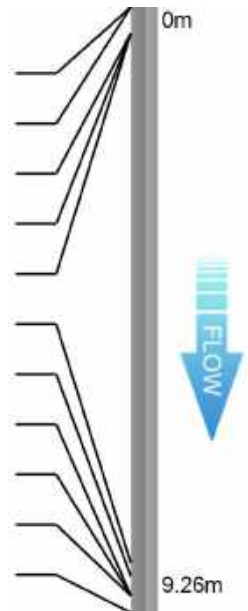
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F5	Finish Node Ref: F6	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	9.26	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	LRQ	Line of drain/sewer deviates right [quarter]			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 10%	S1		0:00:00	
00.40m	DEE	S2 Attached deposits, encrustation 05-07 5%	S2		0:01:09	
08.50m	WL	Water level 10%			0:01:38	
08.70m	WL	Water level 20%			0:01:38	
09.00m	DEE	F2 Attached deposits, encrustation 05-07 5%	F2		0:01:09	
09.00m	DEG	F1 Attached deposits, grease 06-06 10%	F1		0:00:00	
09.00m	DEE	Attached deposits, encrustation 03-10 40%		4_7	0:01:38	
09.26m	SA	Survey abandoned				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 5

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F5	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	LRQ	Line of drain/sewer deviates right [quarter]	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 9m from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
00.40m	0:01:09	S2 DEE	Attached deposits, encrustation 0.4m - 9m from 05 o'clock to 07 o'clock: 5% Cross sectional area loss - Severity 3	
08.50m	0:01:38	WL	Water level: 10% Height/Diameter	
08.70m	0:01:38	WL	Water level: 20% Height/Diameter	
09.00m	0:01:09	F2 DEE	Attached deposits, encrustation Defect End from 05 o'clock to 07 o'clock: 5% Cross sectional area loss - Severity 3	
09.00m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
09.00m	0:01:38	DEE	Attached deposits, encrustation from 03 o'clock to 10 o'clock: 40% Cross sectional area loss - Severity 3	Image Provided - Ref: 4_7 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
09.26m		SA	Survey abandoned UNABLE TO PASS ENCrustATION	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 6

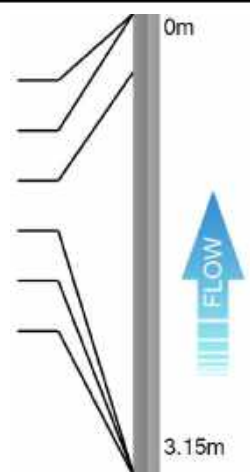
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F6	Finish Node Ref: F5	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	3.15	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 10%	S1		0:00:00	
03.13m	DEG	F1 Attached deposits, grease 06-06 10%	F1		0:00:00	
03.13m	DEE	Attached deposits, encrustation 02-09 40%	5_3		0:00:30	
03.15m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 6

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F6	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 3.13m from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
03.13m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
03.13m	0:00:30	DEE	Attached deposits, encrustation from 02 o'clock to 09 o'clock: 40% Cross sectional area loss - Severity 3	Image Provided - Ref: 5_3 
03.15m		MHF	Finish node type, manhole F5	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 7

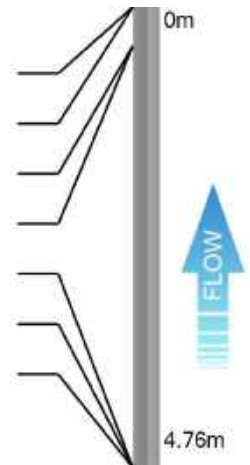
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F6	Finish Node Ref: F7	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	4.76	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 10%	S1		0:00:00	
00.40m	DEE	S2 Attached deposits, encrustation 04-08 10%	S2		0:00:11	
04.76m	DEE	F2 Attached deposits, encrustation 04-08 10%	F2		0:00:11	
04.76m	DEG	F1 Attached deposits, grease 06-06 10%	F1		0:00:00	
04.76m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 7

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F6	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 4.76m from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
00.40m	0:00:11	S2 DEE	Attached deposits, encrustation 0.4m - 4.76m from 04 o'clock to 08 o'clock: 10% Cross sectional area loss - Severity 3	
04.76m	0:00:11	F2 DEE	Attached deposits, encrustation Defect End from 04 o'clock to 08 o'clock: 10% Cross sectional area loss - Severity 3	
04.76m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
04.76m		MHF	Finish node type, manhole F7	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 8

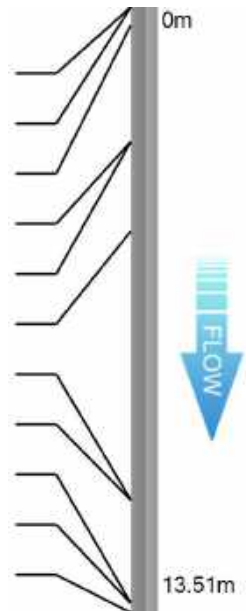
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F6	Finish Node Ref: F8	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	13.51	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 5%	S1		0:00:00	
03.00m	DEG	F1 Attached deposits, grease 06-06 5%	F1		0:00:00	
03.00m	DEG	S2 Attached deposits, grease 06-06 10%	S2		0:00:46	
05.00m	DEE	S3 Attached deposits, encrustation 04-08 5%	S3		0:00:55	
11.00m	DEE	F3 Attached deposits, encrustation 04-08 5%	F3		0:00:55	
11.00m	DEE	S4 Attached deposits, encrustation 04-08 10%	S4		0:02:28	
13.30m	DEE	F4 Attached deposits, encrustation 04-08 10%	F4		0:02:28	
13.30m	DEG	F2 Attached deposits, grease 06-06 10%	F2		0:00:46	
13.51m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 8

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F6	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 3m from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
03.00m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
03.00m	0:00:46	S2 DEG	Attached deposits, grease 3m - 13.3m from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
05.00m	0:00:55	S3 DEE	Attached deposits, encrustation 5m - 11m from 04 o'clock to 08 o'clock: 5% Cross sectional area loss - Severity 3	
11.00m	0:00:55	F3 DEE	Attached deposits, encrustation Defect End from 04 o'clock to 08 o'clock: 5% Cross sectional area loss - Severity 3	
11.00m	0:02:28	S4 DEE	Attached deposits, encrustation 11m - 13.3m from 04 o'clock to 08 o'clock: 10% Cross sectional area loss - Severity 3	
13.30m	0:02:28	F4 DEE	Attached deposits, encrustation Defect End from 04 o'clock to 08 o'clock: 10% Cross sectional area loss - Severity 3	
13.30m	0:00:46	F2 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 10% Cross sectional area loss - Severity 3	
13.51m		MHF	Finish node type, manhole F8	

Total Defects for section

DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 9

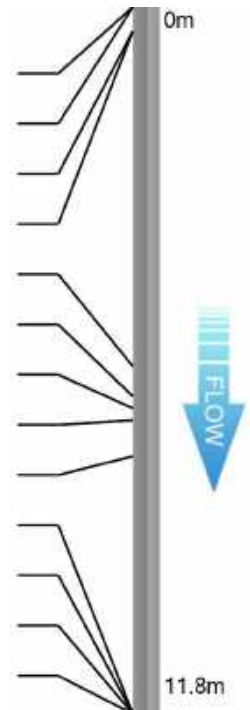
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F8	Finish Node Ref: F9	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	11.8	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 07-05 5%	S1		0:00:00	
00.40m	DEE	S2 Attached deposits, encrustation 05-07 10%	S2		0:00:00	
06.00m	WL	Water level 10%			0:01:07	
06.50m	WL	Water level 20%			0:01:07	
06.70m	WL	Water level 30%			0:01:14	
06.90m	DEE	Attached deposits, encrustation 03-10 30%	8_7		0:01:19	
07.50m	WL	Water level 5%			0:02:33	
11.80m	DEE	F2 Attached deposits, encrustation 05-07 10%	F2		0:00:00	
11.80m	DEG	F1 Attached deposits, grease 07-05 5%	F1		0:00:00	
11.80m	REM	General remark	8_9		0:03:01	
11.80m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 9

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F8	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 11.8m from 07 o'clock to 05 o'clock: 5% Cross sectional area loss - Severity 3	
00.40m	0:00:00	S2 DEE	Attached deposits, encrustation 0.4m - 11.8m from 05 o'clock to 07 o'clock: 10% Cross sectional area loss - Severity 3	
06.00m	0:01:07	WL	Water level: 10% Height/Diameter	
06.50m	0:01:07	WL	Water level: 20% Height/Diameter	
06.70m	0:01:14	WL	Water level: 30% Height/Diameter	
06.90m	0:01:19	DEE	Attached deposits, encrustation from 03 o'clock to 10 o'clock: 30% Cross sectional area loss - Severity 3	Image Provided - Ref: 8_7 
07.50m	0:02:33	WL	Water level: 5% Height/Diameter	
11.80m	0:00:00	F2 DEE	Attached deposits, encrustation Defect End from 05 o'clock to 07 o'clock: 10% Cross sectional area loss - Severity 3	

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
11.80m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 07 o'clock to 05 o'clock: 5% Cross sectional area loss - Severity 3	
11.80m	0:03:01	REM	General remark ROOTS IN MANHOLE	Image Provided - Ref: 8_9 
11.80m		MHF	Finish node type, manhole F9	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 10

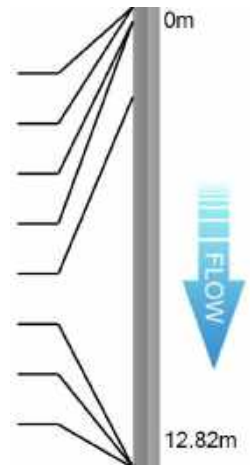
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F9	Finish Node Ref: F10	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	12.82	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 07-05 10%	S1		0:00:00	
00.40m	DEE	S2 Attached deposits, encrustation 05-07 5%	S2		0:00:25	
02.50m	WL	Water level 10%			0:00:38	
12.80m	DEE	F2 Attached deposits, encrustation 05-07 5%	F2		0:00:25	
12.80m	DEG	F1 Attached deposits, grease 07-05 10%	F1		0:00:00	
12.82m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 10

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F9	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 12.8m from 07 o'clock to 05 o'clock: 10% Cross sectional area loss - Severity 3	
00.40m	0:00:25	S2 DEE	Attached deposits, encrustation 0.4m - 12.8m from 05 o'clock to 07 o'clock: 5% Cross sectional area loss - Severity 3	
02.50m	0:00:38	WL	Water level: 10% Height/Diameter	
12.80m	0:00:25	F2 DEE	Attached deposits, encrustation Defect End from 05 o'clock to 07 o'clock: 5% Cross sectional area loss - Severity 3	
12.80m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 07 o'clock to 05 o'clock: 10% Cross sectional area loss - Severity 3	
12.82m		MHF	Finish node type, manhole F10	

Total Defects for section



DRB Grade for Section



Site: 2, 4, 6 & 8 TOYNBEE ROAD, EASTLEIGH

Section 11

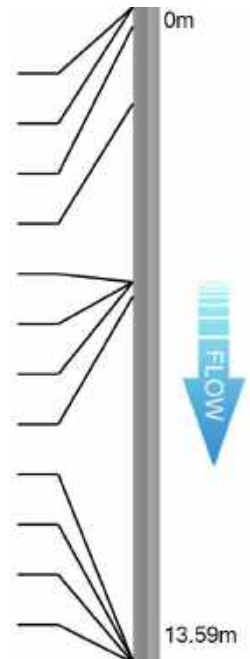
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): 2, 4, 6 & 8 TOYNBEE ROAD	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 28/04/2022
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Start Node Ref: F10	Finish Node Ref: F11	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	13.59	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEE	S1 Attached deposits, encrustation 05-07 10%	S1		0:00:00	
02.00m	DEG	S2 Attached deposits, grease 07-05 10%	S2		0:01:35	
05.70m	FL	Fracture longitudinal 12		10_3	0:00:54	
05.70m	R	Roots			0:00:54	
05.70m	DES	Settled deposits fine 10%			0:00:57	
06.00m	RJ	Roots at joint		10_6	0:00:58	
13.55m	DEG	F2 Attached deposits, grease 07-05 10%	F2		0:01:35	
13.55m	DEE	F1 Attached deposits, encrustation 05-07 10%	F1		0:00:00	
13.59m	REM	General remark		10_8	0:02:31	
13.59m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 11

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F10	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEE	Attached deposits, encrustation 0.4m - 13.55m from 05 o'clock to 07 o'clock: 10% Cross sectional area loss - Severity 3	
02.00m	0:01:35	S2 DEG	Attached deposits, grease 2m - 13.55m from 07 o'clock to 05 o'clock: 10% Cross sectional area loss - Severity 3	
05.70m	0:00:54	FL	Fracture longitudinal at 12 o'clock - Severity 3	Image Provided - Ref: 10_3 
05.70m	0:00:54	R	Roots - Severity 3 ROOT MASS	
05.70m	0:00:57	DES	Settled deposits fine: 10% Cross sectional area loss - Severity 3	
06.00m	0:00:58	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	Image Provided - Ref: 10_6 

Total Defects for section

DRB Grade for Section



Pos	Video Ref	Code	Description	Image
13.55m	0:01:35	F2 DEG	Attached deposits, grease Defect End from 07 o'clock to 05 o'clock: 10% Cross sectional area loss - Severity 3	
13.55m	0:00:00	F1 DEE	Attached deposits, encrustation Defect End from 05 o'clock to 07 o'clock: 10% Cross sectional area loss - Severity 3	
13.59m	0:02:31	REM	General remark ENTERS MANHOLE	Image Provided - Ref: 10_8 
13.59m		MHF	Finish node type, manhole F11	

Total Defects for section



DRB Grade for Section

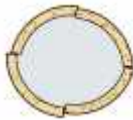


A guide to defects and other observations in drainage systems

More detailed information can be found in the National Standard (BS EN 13508-1:2003) and in the Manual of Sewer Condition Classification (MSCC) 5th Edition, written by the Water Research Centre (WRc).

Use	
Code	Description
C	Combined
F	Foul
S	Surface Water
T	Trade Effluent
W	Culverted Watercourse
Z	Other
Common Materials	
Code	Description
VC	Vitrified Clay
PVC	Polyvinyl Chloride
CO	Concrete
CI	Cast Iron
PF	Pitch Fibre
PE	Polyethylene
DI	Ductile Iron

Start Node	Description	Finish Node
MH	Manhole	MHF
IC	Inspection Chamber	ICF
GY	Gulley	GYF
RE	Rodding Eye	REF
SK	Soakaway	SKF
BN	Buchan Trap	BNF
BR	Major Connection without Ref	BRF
CP	Catch Pit	CPF
OC	Other Special Chamber	OCF
OF	Outfall	OFF
OS	Oil Separator	OSF
WR	Major Connection without mh	WRF
LH	Lamphole	LHF

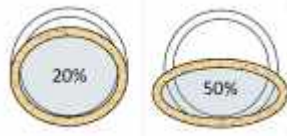
Code	Observation	Description	Attributes	
B	Broken	Pieces pipe have visibly moved	Defined by clock references. Associated with deformity in rigid pipe	
CC CL CM CR	Cracks	Cracks are break lines that are not visibly open	Defined by clock reference position/s. Longitudinal and radiating cracks attract only one clock reference	
CN	Connection	Lateral pipe has been connected after original construction	Described by clock reference position and diameter	

Total Defects for section



DRB Grade for Section

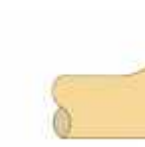
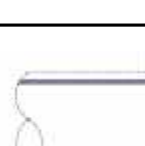
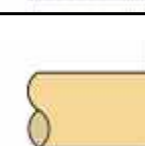
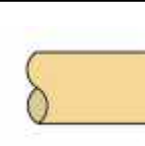
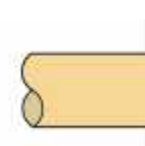
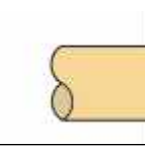


CX(I)	Defective Connection (Intruding)	Defective by intrusion or damage due to factors including: cracks, fractures, obstruction, position etc	Described by clock reference position and diameter (+ % intrusion)	
CU	Loss of Vision	Lens of camera is obscured by debris, water etc. Operator is unable to see drain clearly	'W' can be added if loss of vision is due to water	
D	Deformed	Pipe has lost its structure	Described by percentage loss of height or width. Recorded in 5% increments	
DEE	Deposits Encrustation	Eg. Attached scale deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DEG	Deposits Grease	Attached grease deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DER DES	Deposits Coarse/Fine	Settled deposits on the invert of the pipe.	Described by percentage loss of height or diameter. Recorded in 5% increments.	
FC FL FM FR	Fractures	Fractures are visibly open. Pieces of pipe have not moved	Defined by clock reference position/s. Longitudinal and radiating fractures attract only one clock reference	
H	Holes	Section of pipe fabric is missing	Defined by clock reference location. Normally two clock references	
I	Infiltration	Water is infiltrating the pipe, normally via a joint but could be via another defect	Can be described in Remarks using terms such as Seeper, Dripper and Runner	
JDL	Joint Displaced Large	Pipe has moved at joint, perpendicular to axis of pipe	More than 1.5 times the pipe wall thickness must be visible	

Total Defects for section

DRB Grade for Section

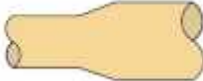


JDM	Joint Displaced Medium	Pipe has moved at joint, perpendicular to axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
JN	Junction	Lateral pipe was installed at construction	Described by clock reference position and diameter	
JX	Defective Junction	Lateral pipe was installed at construction but is defective in some way	Joint can be defective due to factors including: cracks, fractures, obstruction, position etc	
LD LU LL LR	Line Deviation	LD = Line Down, LU = Line Up, LL = Line Left, LR = Line Right. Not related to CIPP lining.	Additional modifiers are added: Q = Quarter (22.5), H = Half (45), F = Full (90). In degrees.	
LC	Lining Changes	If the drain is lined, the lining material has changed	Position of lining material change	
MC	Material Change	The pipe material has changed	Position of change is noted. Type of material change can be defined	
OB	Obstruction/Obstacle	An obstruction or obstacle is affecting the flow through the pipe	Described in percentage loss of cross-sectional area	
OJL	Open Joint Large	Pipe has moved at joint, along the axis of pipe	More than 1.5 times the pipe wall thickness must be visible	
OJM	Open Joint Medium	Pipe has moved at joint, along the axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
PC	Pipe Length Changes	Length of individual pipe changes	New length described at this position	

Total Defects for section

DRB Grade for Section



R	Roots	Evidence of root ingress	Roots will normally infiltrate via bad joints, cracks, fractures, breaks etc	
REM	Remark	General remark	Used for additional information	
S	Surface Damage	This might include corrosion, spalling and chemical attack	Position only. Additional information can be added in Remarks	
SA	Survey Abandoned	Used when a survey cannot continue for any reason	The reason for abandoning a survey should be noted in the remarks area	
SC	Shape Changes	Dimension of drain changes	Diameter dimension change recorded. Second dimension is recorded for no circular pipe changes	
SR	Sealing Ring	Sealing ring intrudes into pipe at joint	Described by clock reference position	
V	Vermin	Evidence of Vermin in pipe	Can also be used for evidence within manhole etc	
WL	Water Level	Used to record changes in water level. Always shown at the beginning of every survey, if dry noted as 00.	Described by percentage of height or diameter. Recorded in 5% increments	
XP	Collapsed	Drain is suffering from complete loss of structural integrity. Always followed by SA - Survey Abandoned	Percentage loss of cross-sectional area is recorded. Other related structural defects are not recorded	

REGISTER OF APPENDICES

- A. MANHOLE INSPECTION REPORT
- B. COPIES OF SITE HAND WRITTEN DAILY RECORD SHEETS
- C. ANNOTATED SITE DRAWINGS

UTILITY SURVEYS LTD

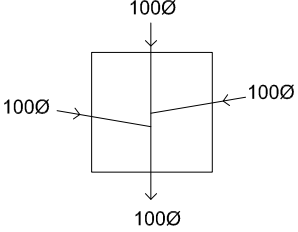
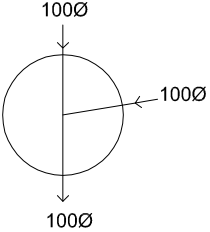
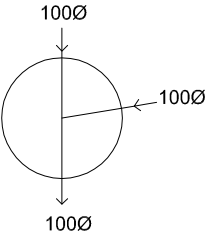
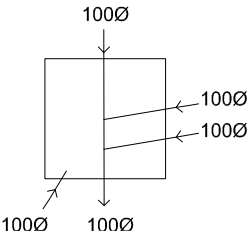
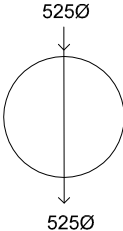
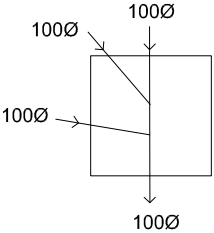
5 SUFFOLK ROAD
MALDON
ESSEX
CM9 6AX

LOCATION: TOYNBEE ROAD EASTLEIGH HAMPSHIRE

JOB REF: 071451

CLIENT: CHURCHILL RETIREMENT LIVING

DATE: 28/04/2022

MH No. F1 DEPTH. 0.66 COVER. RM CONSTRUCTION. Br REMARKS.		MH No. F7 DEPTH. COVER. CONSTRUCTION. REMARKS.	INTERNAL MANHOLE NO ACCESS
MH No. F2 DEPTH. COVER. CONSTRUCTION. REMARKS.	INTERNAL MANHOLE UNDER FLOOR COVERING	MH No. F8 DEPTH. COVER. CONSTRUCTION. REMARKS.	BURIED IN DENSE VEGETATION
MH No. F3 DEPTH. 0.86 COVER. CL CONSTRUCTION. Plastic REMARKS.		MH No. F9 DEPTH. COVER. CONSTRUCTION. REMARKS.	OFF SITE IN PRIVATE GARDEN NO ACCESS
MH No. F4 DEPTH. 0.38 COVER. CL CONSTRUCTION. Plastic REMARKS.		MH No. F10 DEPTH. COVER. CONSTRUCTION. REMARKS.	OFF SITE IN PRIVATE GARDEN NO ACCESS
MH No. F5 DEPTH. 0.99 COVER. RM CONSTRUCTION. Br REMARKS. INTERNAL MANHOLE		MH No. 2250 DEPTH. 2.27 COVER. SH CONSTRUCTION. Co Ring REMARKS.	
MH No. F6 DEPTH. 1.41 COVER. RM CONSTRUCTION. Br REMARKS.			
KEY: C - Circular S - Square T - Triangular L - Light Duty M - Medium Duty H - Heavy Duty Co - Concrete Br - Brick R - Rectangular			

CCTV Sewer Survey – Daily Record Sheet

Date	28/04/2022	Job No	071451
Client	CHURCHILL RETIREMENT LIVING		
Site Address	TOYNBEE ROAD EASTLEIGH HAMPSHIRE SO50 9DP		
Rig Manager	S. GARDINER	Operative	M. CAMPBELL



UTILITYSURVEYS LTD.

5 Suffolk Road
Maldon
Essex
CM9 6AX

Tel: 07971910370

Manhole		Sewer dia.	Recorded Metreage	Survey Abandoned	Remarks
Start	Finish				
F1	F2	100	11-36		
F2	F3	100	7-74		
F3	F4	106	5-10		
F3	F5	100	3-47		ENCrustation
F5	F6	100	9-26		ENCrustation
F6	F5	100	3-15		ENCrustation
F6	F7	100	4-76		
F6	F8	100	13-51		
F8	F9	100	11-80		
F9	F10	100	12-82		
F10	F11	100	13-59		
TOTAL					

Standing Time		Meterage check	X	Length	OK
---------------	--	----------------	---	--------	----

Reason for standing time

Remarks MH F8 BURIED, MH'S F9, F10 & F11 OFFSITE IN PRIVATE GARDENS
UNABLE TO PUSH THROUGH MH F11 (RUNNING TRAP)

Special Instructions; Site Contact --





CCTV SURVEYS



**HIGH PRESSURE
JETTING**



**MAN ENTRY
SURVEYS**



RELINING & REPAIRS



PILING SURVEYS



CHIMNEY SURVEYS



**5 SUFFOLK ROAD
MALDON
ESSEX
CM9 6AX**

Telephone: 07971 910370

CCTV REPORT

CLIENT	CHURCHILL RETIREMENT LIVING
LOCATION	ROMSEY CLOSE EASTLEIGH HAMPSHIRE SO50 9AP
DATE	25/07/2022
REF	071461

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REGISTER OF APPENDICES

- A. MANHOLE INSPECTION REPORT
- B. COPIES OF SITE HAND WRITTEN DAILY RECORD SHEETS
- C. ANNOTATED SITE DRAWINGS

GENERAL INFORMATION

Utility Surveys Ltd have been appointed by Churchill Retirement Living to undertake a Sewer Condition Survey at the location identified. This survey commenced on 25 July 2022.

CONTACT INFORMATION

SITE ADDRESS: ROMSEY CLOSE EASTLEIGH HAMPSHIRE SO50 9AP	SITE CONTACT: N/A CONTACT NO: EMAIL:
CLIENT DETAILS: CHURCHILL RETIREMENT LIVING CHURCHILL HOUSE PARKSIDE RINGWOOD BH24 3SG	CONTACT: WES SANDERSON CONTACT NO: 01425 462303 EMAIL:

UTILITY SURVEYS LTD CONTACT DETAILS

OFFICE	SIMON GARDINER 07971 910370 simon@utilitysurveysltd.co.uk
RIG MANAGER	SIMON GARDINER

SITE DESCRIPTION

Site Description

DEVELOPMENT SITE

Site Boundaries

CLEARLY DEFINED ON SUPPLIED DRAWINGS

SURVEY BRIEF

Sewer Condition Inspection Survey

The Purpose of the Sewer Condition Inspection Survey was to establish the location and extent of foul and/ or surface water drainage systems and to document their condition prior to any further works.

- A full condition survey can only be produced if precleansing / jetting is carried out in conjunction with the CCTV survey.
- If precleansing is not carried out at the time of the survey further faults and conditional defects may be present but not recorded in this report.

In addition Utility Surveys Ltd have;

- Attempted to investigate all agreed areas, although if not all could be fully accessed (see Daily Record Sheet).
- Produced a report to establish the location and extent of foul and surface water drainage systems and to document their condition prior to any further works.
- Provided the basic information from which a remediation or management plan can be instigated.
- Highlighted the requirement for urgent action to repair or remediation works to the surveyed drainage system.
- Incorporated in the results any additional manholes/ drainage found, which may have been buried, obscured or not identified in the original scope of works.

Agreed Restrictions and Exclusions

This report is based upon a Sewer Condition Inspection Survey of an unfamiliar site.

During the course of the survey all reasonable efforts were made to identify and access all Manholes and foul/ surface drainage/ outfall, throughout the site.

Some installations/ areas may not have been inspected due to access and or safety reasons (e.g. Wet Wells, Large Unventilated Tanks, Traffic Management Situations). Unless an accepted safe system of work has been devised.

Access may not have been gained to several areas of the site due to conditions outside the control of the client or contractor, any such areas have been documented within this report (see Daily Record Sheet).

Any diagrams/ CAD drawings in the report are not to be scaled and are illustrative only to indicate approximate locations.

Manhole covers will not be lifted if:

- a) There is a danger of damaging surrounding flooring or finishes.
- b) They are covered, i.e. under fitted carpets, flooring, tiling or paving etc.
- c) Under fittings, fixtures, fencing, equipment etc.

Buried manholes will be located, if possible, position marked. If instructed, excavated in soft ground only up to a depth of 350mm with temporary reinstatement.

No allowance has been made for any precleansing unless stated in the quotation.

Full and free access to all areas affected is to be arranged by the instructing party.

SURVEY TECHNIQUES

The areas set out within the survey brief underwent inspection for a Sewer Condition Inspection Survey each area within the agreed scope of works was surveyed for location extent and condition of foul and/ or surface water drainage systems and CCTV footage gathered for confirmation. Every reasonable effort was made to investigate all aspects of the drainage system. Additional photographs were taken where relevant to the inspection.

There were no deviations from the agreed scope of works.

This Sewer Condition Inspection Survey was carried out in accordance with the Utility Surveys Ltd documented 'in-house' procedure 820 'Code of Working Practice' based on National Sewerage Association guidance. The Sewer Condition Inspection Survey Report states information recorded at the time of survey only, based on visual and CCTV assessment in accordance with sewer classification codings issued by WRC, incorporating the following inspection criteria:

CONDITION of pipe work
LOCATION of pipe work
EXTENT of the pipe work

A defect grade description has been provided for the identification of defective pipe work.

Changes to any of the above criteria shall necessitate the need for reassessment

These gradings and the reports can be used to form the basis of a planned preventative maintenance programme. This can be the subject of further discussions with our technical support team.

Drainage Report



Prepared For

**CHURCHILL RETIREMENT LIVING
CHURCHILL HOUSE
PARKSIDE
RINGWOOD
BH24 3SG**

Site

**EASTLEIGH
ROMSEY CLOSE
EASTLEIGH
HAMPSHIRE
SO50 9AP**



UTILITY SURVEYS LIMITED
Surveyor: Simon Gardiner
simon@utilitysurveysltd.co.uk

Total Defects for Project



Total DRB Grades for Project



071461 Romsey Close Eastleigh - CCTV Survey Report : 25/07/22

Name :	UTILITY SURVEYS LIMITED
Contact :	SIMON GARDINER
Location :	5 SUFFOLK ROAD
Town :	MALDON
Region :	ESSEX
Postcode :	CM9 6AX
Email :	simon@utilitysurveysltd.co.uk
Contact Number :	
Surveyor :	Simon Gardiner
Valid Certification No :	L1103

Client Information

Name :	CHURCHILL RETIREMENT LIVING
Contact :	WES SANDERSON
Location :	CHURCHILL HOUSE
Town :	PARKSIDE
Region :	RINGWOOD
Postcode :	BH24 3SG
Tel :	01425 462303
Mobile :	
Email :	
Fax :	

Site Information

Name :	EASTLEIGH
Contact :	
Location :	ROMSEY CLOSE
Town :	EASTLEIGH
Region :	HAMPSHIRE
Postcode :	SO50 9AP
Tel :	
Mobile :	
Email :	
Fax :	

Total Defects for Project



Total DRB Grades for Project



Report interpretation.

Overview:

Each section of the drainage system is allocated a score indicating areas that require attention. These areas are detailed in the Overview section on the following page and also at the bottom right of the first few pages. We use colour coding as an indicator of severity. Additional information concerning rehabilitation options/recommendations is included in the Overview page, which can also be used as an, "at a glance" indication of system condition. More in depth information for each section, including images can be found later in the report. Grade indicators are as follows:

Grade A: Drain is serviceable no recommendations required

Grade B: There is an issue that might require remedial works

Grade C: There is a defect that requires remedial works, the drain is not serviceable.

Observations:

Each section of drainage reported on (manhole to manhole for example), contains detailed information about that drain and any observations made concerning condition are detailed below the header section. The observations are colour coded and given a severity score, with more significant defects being given a higher score, using a scale from 1 to 5 as detailed below:

Severity 1 to 2: These defects may require remedial monitoring

Severity 3: These defects probably require some form of remedial works

Severity 4 to 5: Defects that will require remedial repair or replacement

General:

The information provided is relevant at the time of survey. The coding system in this report is based on the Manual of Sewer Condition Classification, 5th edition (MSCC5) domestic codes (BS EN 13508-1:2003). This is the official standard for the water industry.

The severity system is based on significant experience in general practice and the 1 -5 grades represent the severity of individual defects: 5 representing a more serious defect.

Please feel free to contact us for further explanation or pricing for remedial works required.

Total Defects for Project



Total DRB Grades for Project



Overview

Section: 1 From: F12 To: LAT A	Grade A	DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 2 From: F12 To: LAT B	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 3 From: F12 To: F13	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 4 From: F13 To: F14	Grade C	DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 5 From: F13 To: F15	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 6 From: F16 To: F15	Grade A	DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 7 From: F15 To: F10	Grade B	DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 8 From: 221D To: F11	Grade B	DRB Grade: B Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 9 From: 221D To: 2210	Grade B	DRB Grade: B Pipe Size: 225 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 10 From: 2201 To: 3101	Grade B	DRB Grade: B Pipe Size: 225 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Site: ROMSEY CLOSE, EASTLEIGH

Section 1

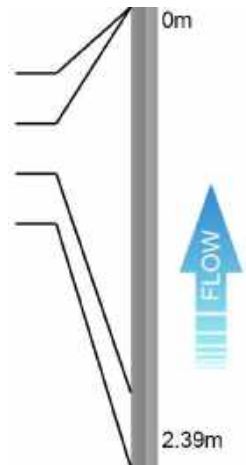
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F12	Finish Node Ref: LAT A	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

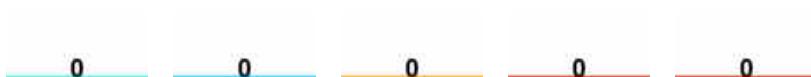
Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	2.39	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole			
00.00m	WL	Water level 5%			0:00:00
02.00m	LUF	Line of drain/sewer deviates up [full]			0:00:23
02.39m	SA	Survey abandoned			



Total Defects for section

DRB Grade for Section

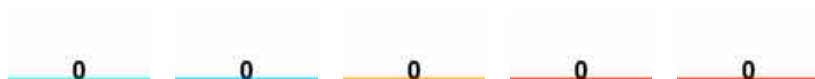


Descriptive Report with Remarks and Observation Images

Section 1

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F12	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
02.00m	0:00:23	LUF	Line of drain/sewer deviates up [full]	
02.39m		SA	Survey abandoned SHARP BEND UP	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 2

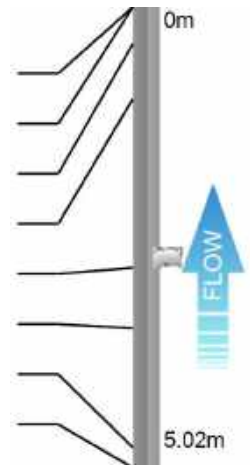
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F12	Finish Node Ref: LAT B	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	5.02	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 0%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 07-05 5%	S1		0:00:09	
01.00m	LLQ	Line of drain/sewer deviates left [quarter]			0:00:09	
02.84m	JN	Junction 10 : 100mm Diameter			0:00:24	
03.50m	DEG	F1 Attached deposits, grease 07-05 5%	F1		0:00:09	
04.80m	LUF	Line of drain/sewer deviates up [full]			0:00:47	
05.02m	SA	Survey abandoned				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 2

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F12	
00.00m	0:00:00	WL	Water level: 0% Height/Diameter	
00.40m	0:00:09	S1 DEG	Attached deposits, grease 0.4m - 3.5m from 07 o'clock to 05 o'clock: 5% Cross sectional area loss - Severity 3	
01.00m	0:00:09	LLQ	Line of drain/sewer deviates left [quarter]	
02.84m	0:00:24	JN	Junction at 10 o'clock: 100mm Diameter	
03.50m	0:00:09	F1 DEG	Attached deposits, grease Defect End from 07 o'clock to 05 o'clock: 5% Cross sectional area loss - Severity 3	
04.80m	0:00:47	LUF	Line of drain/sewer deviates up [full]	
05.02m		SA	Survey abandoned SHARP BEND UP	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 3

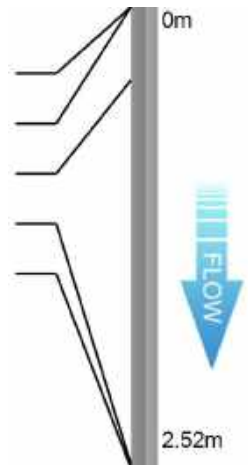
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
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Start Node Ref: F12	Finish Node Ref: F13	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	2.52	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 06-06 5%	S1		0:00:00	
02.50m	DEG	F1 Attached deposits, grease 06-06 5%	F1		0:00:00	
02.52m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 3

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F12	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 2.5m from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
02.50m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
02.52m		MHF	Finish node type, manhole F13	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 4

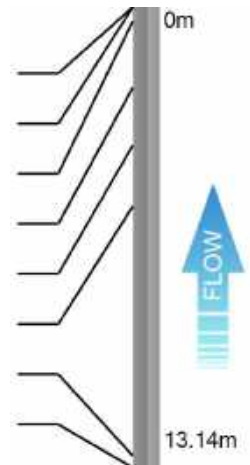
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F13	Finish Node Ref: F14	Direction: U	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	13.14	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole			
00.00m	WL	Water level 5%			0:00:00
00.40m	DEG	Attached deposits, grease 06-06 5%			0:00:00
02.29m	CCJ	Crack, circumferential 06-06 at joint			0:00:19
03.94m	CCJ	Crack, circumferential 09-12 at joint			0:00:34
05.68m	CCJ	Crack, circumferential 06-04 at joint			0:00:48
12.80m	FM	Fracture multiple 06-06	3_6		0:01:54
13.14m	MHF	Finish node type, manhole			



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 4

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F13	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.40m	0:00:00	DEG	Attached deposits, grease from 06 o'clock to 06 o'clock: 5% Cross sectional area loss - Severity 3	
02.29m	0:00:19	CCJ	Crack, circumferential from 06 o'clock to 06 o'clock at joint - Severity 1	
03.94m	0:00:34	CCJ	Crack, circumferential from 09 o'clock to 12 o'clock at joint - Severity 1	
05.68m	0:00:48	CCJ	Crack, circumferential from 06 o'clock to 04 o'clock at joint - Severity 1	
12.80m	0:01:54	FM	Fracture multiple from 06 o'clock to 06 o'clock - Severity 4	Image Provided - Ref: 3_6 
13.14m		MHF	Finish node type, manhole F14	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 5

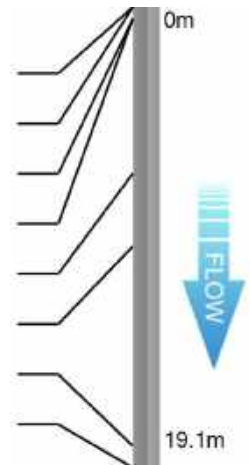
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F13	Finish Node Ref: F15	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	19.1	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole			
00.00m	WL	Water level 5%			0:00:00
00.48m	CCJ	Crack, circumferential 07-05 at joint			0:00:04
00.48m	R	Roots	4_3		0:00:04
06.90m	RJ	Roots at joint	4_4		0:01:04
09.92m	R	Roots	4_5		0:01:32
18.20m	CMJ	Cracks, multiple 07-05 at joint			0:03:04
19.10m	MHF	Finish node type, manhole			



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 5

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F13	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
00.48m	0:00:04	CCJ	Crack, circumferential from 07 o'clock to 05 o'clock at joint - Severity 1	
00.48m	0:00:04	R	Roots - Severity 3 FINE ROOTS	Image Provided - Ref: 4_3 
06.90m	0:01:04	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	Image Provided - Ref: 4_4 
09.92m	0:01:32	R	Roots - Severity 3 MASS ROOTS AT JOINT	Image Provided - Ref: 4_5 

Total Defects for section

DRB Grade for Section



Pos	Video Ref	Code	Description	Image
18.20m	0:03:04	CMJ	Cracks, multiple from 07 o'clock to 05 o'clock at joint - Severity 2	
19.10m		MHF	Finish node type, manhole F15	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 6

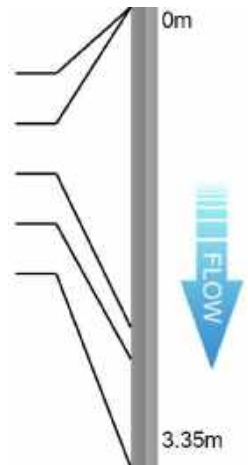
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F16	Finish Node Ref: F15	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

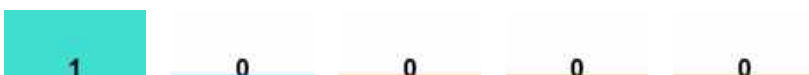
Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	3.35	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole			
00.00m	WL	Water level 5%			0:00:00
02.33m	CCJ	Crack, circumferential 08-04 at joint			0:00:19
02.56m	JN	Junction 06 : 100mm Diameter			0:00:21
03.35m	MHF	Finish node type, manhole			



Total Defects for section

DRB Grade for Section

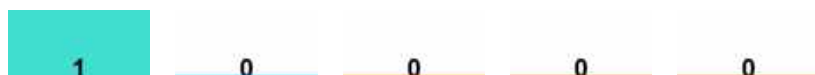


Descriptive Report with Remarks and Observation Images

Section 6

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F16	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
02.33m	0:00:19	CCJ	Crack, circumferential from 08 o'clock to 04 o'clock at joint - Severity 1	
02.56m	0:00:21	JN	Junction at 06 o'clock: 100mm Diameter BACKDROP AT MANHOLE	
03.35m		MHF	Finish node type, manhole F15	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 7

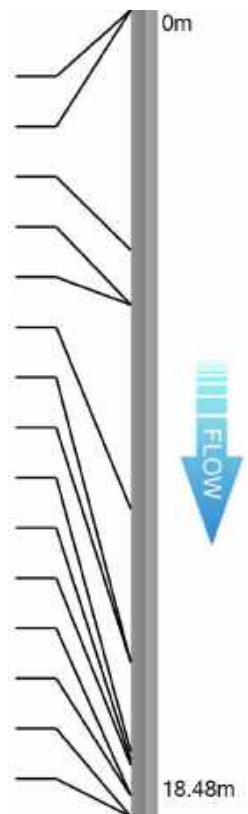
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref: F15	Finish Node Ref: F10	Direction: D	Height/Dia: 100
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C
Start Node Coordinate:	Finish Node Coordinate:	Material: VC	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	18.48	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 5%			0:00:00	
05.50m	CCJ	Crack, circumferential 08-04 at joint			0:00:48	
06.75m	RJ	Roots at joint			0:00:59	
06.75m	CCJ	Crack, circumferential 07-05 at joint			0:00:59	
11.43m	RJ	Roots at joint	6_5		0:01:40	
14.95m	RJ	Roots at joint			0:02:21	
14.95m	CCJ	Crack, circumferential 07-05 at joint			0:02:21	
17.00m	DEG	Attached deposits, grease 03-09 10%			0:02:43	
17.20m	WL	Water level 10%			0:02:47	
17.30m	WL	Water level 20%			0:02:47	
18.00m	JDM	Joint displaced medium			0:03:02	
18.00m	MC	Material of drain/sewer changes			0:03:05	
18.48m	REM	General remark			0:03:15	
18.48m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 7

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole F15	
00.00m	0:00:00	WL	Water level: 5% Height/Diameter	
05.50m	0:00:48	CCJ	Crack, circumferential from 08 o'clock to 04 o'clock at joint - Severity 1	
06.75m	0:00:59	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	
06.75m	0:00:59	CCJ	Crack, circumferential from 07 o'clock to 05 o'clock at joint - Severity 1	
11.43m	0:01:40	RJ	Roots at joint - Severity 3 MASS ROOTS AT JOINT	Image Provided - Ref: 6_5 
14.95m	0:02:21	RJ	Roots at joint - Severity 3 ROOTS AT JOINT	
14.95m	0:02:21	CCJ	Crack, circumferential from 07 o'clock to 05 o'clock at joint - Severity 1	
17.00m	0:02:43	DEG	Attached deposits, grease from 03 o'clock to 09 o'clock: 10% Cross sectional area loss - Severity 3	
17.20m	0:02:47	WL	Water level: 10% Height/Diameter	
17.30m	0:02:47	WL	Water level: 20% Height/Diameter	
18.00m	0:03:02	JDM	Joint displaced medium - Severity 3	

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
18.00m	0:03:05	MCCI	Material of pipe changes to Cast Iron	
18.48m	0:03:15	REM	General remark CAST IRON INTERNAL BACKDROP	
18.48m		MHF	Finish node type, manhole F10	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 8

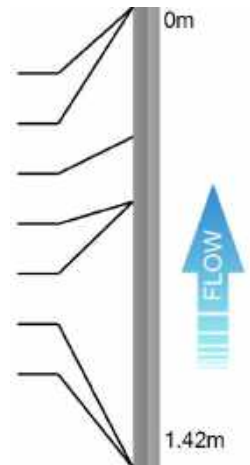
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref:	221D	Finish Node Ref:	F11	Direction:	U	Height/Dia:	150
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	F	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	VC	Cleaned	N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.42	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 10%			0:00:00	
00.40m	DEG	Attached deposits, grease 04-08 10%			0:00:00	
00.60m	DEG	Attached deposits, grease 04-08 20%			0:00:20	
00.60m	WL	Water level 20%			0:00:20	
01.42m	REM	General remark		7_5	0:00:29	
01.42m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 8

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole 221D	
00.00m	0:00:00	WL	Water level: 10% Height/Diameter	
00.40m	0:00:00	DEG	Attached deposits, grease from 04 o'clock to 08 o'clock: 10% Cross sectional area loss - Severity 3	
00.60m	0:00:20	DEG	Attached deposits, grease from 04 o'clock to 08 o'clock: 20% Cross sectional area loss - Severity 3	
00.60m	0:00:20	WL	Water level: 20% Height/Diameter	
01.42m	0:00:29	REM	General remark RUNNING TRAP	Image Provided - Ref: 7_5 
01.42m		MHF	Finish node type, manhole F11	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 9

Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref:	221D	Finish Node Ref:	2210	Direction:	D	Height/Dia:	225
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	F	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	VC	Cleaned	N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	53	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 10%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 03-09 10%	S1		0:00:15	
02.00m	WL	Water level 20%			0:00:31	
02.00m	REM	S2 General remark	S2		0:01:27	
03.98m	RJ	Roots at joint			0:00:31	
08.49m	RJ	Roots at joint			0:01:02	
18.00m	JN	Junction 10 : 150mm Diameter		8_7	0:02:08	
19.70m	RJ	Roots at joint			0:02:23	
53.00m	REM	F2 General remark	F2		0:01:27	
53.00m	DEG	F1 Attached deposits, grease 03-09 10%	F1		0:00:15	
53.00m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 9

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole 221D	
00.00m	0:00:00	WL	Water level: 10% Height/Diameter	
00.40m	0:00:15	S1 DEG	Attached deposits, grease 0.4m - 53m from 03 o'clock to 09 o'clock: 10% Cross sectional area loss - Severity 3	
02.00m	0:00:31	WL	Water level: 20% Height/Diameter	
02.00m	0:01:27	S2 REM	General remark 2m - 53m GREASE OVER LENS	
03.98m	0:00:31	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	
08.49m	0:01:02	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	
18.00m	0:02:08	JN	Junction at 10 o'clock: 150mm Diameter	Image Provided - Ref: 8_7 
19.70m	0:02:23	RJ	Roots at joint - Severity 3 FINE ROOTS AT JOINT	
53.00m	0:01:27	F2 REM	General remark Defect End GREASE OVER LENS	
53.00m	0:00:15	F1 DEG	Attached deposits, grease Defect End from 03 o'clock to 09 o'clock: 10% Cross sectional area loss - Severity 3	
53.00m		MHF	Finish node type, manhole 2210	

Total Defects for section



DRB Grade for Section



Site: ROMSEY CLOSE, EASTLEIGH

Section 10

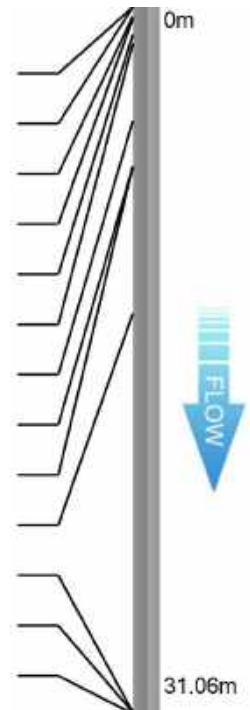
Client: CHURCHILL RETIREMENT LIVING	Location (Street Name): ROMSEY CLOSE	City/Town/Village EASTLEIGH	Cust Job Ref.	Surveyors Name: Simon Gardiner	Date: 25/07/2022
---	---	--------------------------------	---------------	-----------------------------------	---------------------

Start Node Ref:	2201	Finish Node Ref:	3101	Direction:	D	Height/Dia:	225
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	F	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	VC	Cleaned	N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	31.06	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole				
00.00m	WL	Water level 10%			0:00:00	
00.40m	DEG	S1 Attached deposits, grease 04-08 5%	S1		0:00:00	
00.50m	RJ	Roots at joint			0:00:05	
01.20m	RJ	Roots at joint		9_4	0:00:07	
01.60m	RJ	Roots at joint		9_5	0:00:11	
05.00m	DEG	S2 Attached deposits, grease 10-02 5%	S2		0:01:00	
07.00m	CCJ	Crack, circumferential 07-12 at joint			0:00:45	
07.00m	CMJ	Cracks, multiple 07-05 at joint			0:00:48	
13.46m	RJ	Roots at joint			0:01:23	
31.00m	DEG	F2 Attached deposits, grease 10-02 5%	F2		0:01:00	
31.00m	DEG	F1 Attached deposits, grease 04-08 5%	F1		0:00:00	
31.06m	MHF	Finish node type, manhole				



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 10

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole 2201	
00.00m	0:00:00	WL	Water level: 10% Height/Diameter	
00.40m	0:00:00	S1 DEG	Attached deposits, grease 0.4m - 31m from 04 o'clock to 08 o'clock: 5% Cross sectional area loss - Severity 3	
00.50m	0:00:05	RJ	Roots at joint - Severity 3 ROOTS AT JOINT	
01.20m	0:00:07	RJ	Roots at joint - Severity 3 MASS ROOTS AT JOINT	Image Provided - Ref: 9_4 
01.60m	0:00:11	RJ	Roots at joint - Severity 3 MASS ROOTS AT JOINT	Image Provided - Ref: 9_5 
05.00m	0:01:00	S2 DEG	Attached deposits, grease 5m - 31m from 10 o'clock to 02 o'clock: 5% Cross sectional area loss - Severity 3	
07.00m	0:00:45	CCJ	Crack, circumferential from 07 o'clock to 12 o'clock at joint - Severity 1	

Total Defects for section

DRB Grade for Section



Pos	Video Ref	Code	Description	Image
07.00m	0:00:48	CMJ	Cracks, multiple from 07 o'clock to 05 o'clock at joint - Severity 2	
13.46m	0:01:23	RJ	Roots at joint - Severity 3 ROOTS AT JOINT	
31.00m	0:01:00	F2 DEG	Attached deposits, grease Defect End from 10 o'clock to 02 o'clock: 5% Cross sectional area loss - Severity 3	
31.00m	0:00:00	F1 DEG	Attached deposits, grease Defect End from 04 o'clock to 08 o'clock: 5% Cross sectional area loss - Severity 3	
31.06m		MHF	Finish node type, manhole 3101	

Total Defects for section



DRB Grade for Section

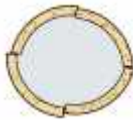


A guide to defects and other observations in drainage systems

More detailed information can be found in the National Standard (BS EN 13508-1:2003) and in the Manual of Sewer Condition Classification (MSCC) 5th Edition, written by the Water Research Centre (WRC).

Use	
Code	Description
C	Combined
F	Foul
S	Surface Water
T	Trade Effluent
W	Culverted Watercourse
Z	Other
Common Materials	
Code	Description
VC	Vitrified Clay
PVC	Polyvinyl Chloride
CO	Concrete
CI	Cast Iron
PF	Pitch Fibre
PE	Polyethylene
DI	Ductile Iron

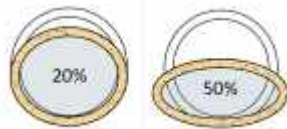
Start Node	Description	Finish Node
MH	Manhole	MHF
IC	Inspection Chamber	ICF
GY	Gulley	GYF
RE	Rodding Eye	REF
SK	Soakaway	SKF
BN	Buchan Trap	BNF
BR	Major Connection without Ref	BRF
CP	Catch Pit	CPF
OC	Other Special Chamber	OCF
OF	Outfall	OFF
OS	Oil Separator	OSF
WR	Major Connection without mh	WRF
LH	Lamphole	LHF

Code	Observation	Description	Attributes	
B	Broken	Pieces pipe have visibly moved	Defined by clock references. Associated with deformity in rigid pipe	
CC CL CM CR	Cracks	Cracks are break lines that are not visibly open	Defined by clock reference position/s. Longitudinal and radiating cracks attract only one clock reference	
CN	Connection	Lateral pipe has been connected after original construction	Described by clock reference position and diameter	

Total Defects for section

DRB Grade for Section

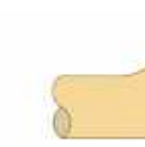
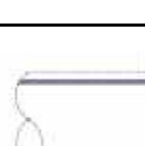
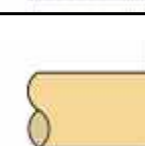
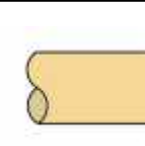
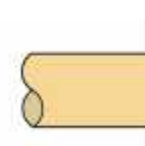
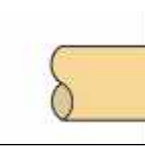


CX(I)	Defective Connection (Intruding)	Defective by intrusion or damage due to factors including: cracks, fractures, obstruction, position etc	Described by clock reference position and diameter (+ % intrusion)	
CU	Loss of Vision	Lens of camera is obscured by debris, water etc. Operator is unable to see drain clearly	'W' can be added if loss of vision is due to water	
D	Deformed	Pipe has lost its structure	Described by percentage loss of height or width. Recorded in 5% increments	
DEE	Deposits Encrustation	Eg. Attached scale deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DEG	Deposits Grease	Attached grease deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DER DES	Deposits Coarse/Fine	Settled deposits on the invert of the pipe.	Described by percentage loss of height or diameter. Recorded in 5% increments.	
FC FL FM FR	Fractures	Fractures are visibly open. Pieces of pipe have not moved	Defined by clock reference position/s. Longitudinal and radiating fractures attract only one clock reference	
H	Holes	Section of pipe fabric is missing	Defined by clock reference location. Normally two clock references	
I	Infiltration	Water is infiltrating the pipe, normally via a joint but could be via another defect	Can be described in Remarks using terms such as Seeper, Dripper and Runner	
JDL	Joint Displaced Large	Pipe has moved at joint, perpendicular to axis of pipe	More than 1.5 times the pipe wall thickness must be visible	

Total Defects for section

DRB Grade for Section

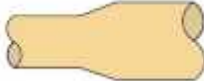


JDM	Joint Displaced Medium	Pipe has moved at joint, perpendicular to axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
JN	Junction	Lateral pipe was installed at construction	Described by clock reference position and diameter	
JX	Defective Junction	Lateral pipe was installed at construction but is defective in some way	Joint can be defective due to factors including: cracks, fractures, obstruction, position etc	
LD LU LL LR	Line Deviation	LD = Line Down, LU = Line Up, LL = Line Left, LR = Line Right. Not related to CIPP lining.	Additional modifiers are added: Q = Quarter (22.5), H = Half (45), F = Full (90). In degrees.	
LC	Lining Changes	If the drain is lined, the lining material has changed	Position of lining material change	
MC	Material Change	The pipe material has changed	Position of change is noted. Type of material change can be defined	
OB	Obstruction/Obstacle	An obstruction or obstacle is affecting the flow through the pipe	Described in percentage loss of cross-sectional area	
OJL	Open Joint Large	Pipe has moved at joint, along the axis of pipe	More than 1.5 times the pipe wall thickness must be visible	
OJM	Open Joint Medium	Pipe has moved at joint, along the axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
PC	Pipe Length Changes	Length of individual pipe changes	New length described at this position	

Total Defects for section

DRB Grade for Section



R	Roots	Evidence of root ingress	Roots will normally infiltrate via bad joints, cracks, fractures, breaks etc	
REM	Remark	General remark	Used for additional information	
S	Surface Damage	This might include corrosion, spalling and chemical attack	Position only. Additional information can be added in Remarks	
SA	Survey Abandoned	Used when a survey cannot continue for any reason	The reason for abandoning a survey should be noted in the remarks area	
SC	Shape Changes	Dimension of drain changes	Diameter dimension change recorded. Second dimension is recorded for no circular pipe changes	
SR	Sealing Ring	Sealing ring intrudes into pipe at joint	Described by clock reference position	
V	Vermin	Evidence of Vermin in pipe	Can also be used for evidence within manhole etc	
WL	Water Level	Used to record changes in water level. Always shown at the beginning of every survey, if dry noted as 00.	Described by percentage of height or diameter. Recorded in 5% increments	
XP	Collapsed	Drain is suffering from complete loss of structural integrity. Always followed by SA - Survey Abandoned	Percentage loss of cross-sectional area is recorded. Other related structural defects are not recorded	

REGISTER OF APPENDICES

- A. MANHOLE INSPECTION REPORT
- B. COPIES OF SITE HAND WRITTEN DAILY RECORD SHEETS
- C. ANNOTATED SITE DRAWINGS

UTILITY SURVEYS LTD

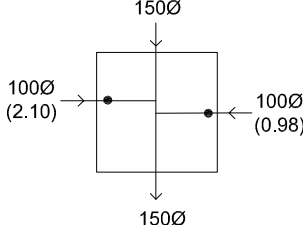
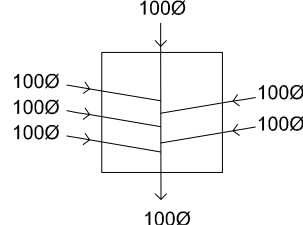
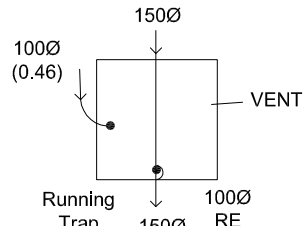
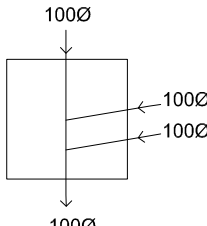
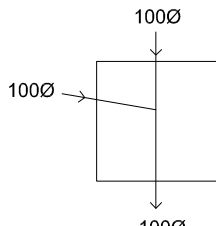
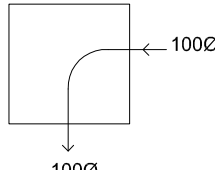
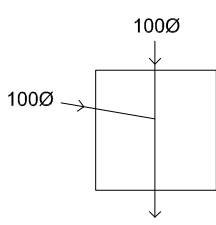
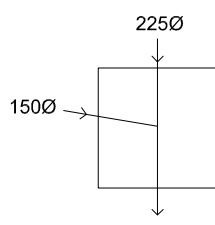
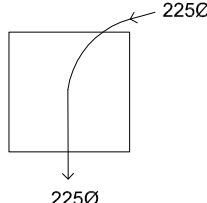
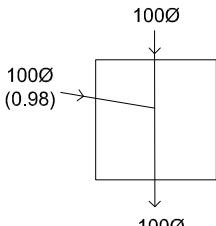
5 SUFFOLK ROAD
MALDON
ESSEX
CM9 6AX

LOCATION: ROMSEY CLOSE EASTLEIGH HAMPSHIRE

JOB REF: 071461

CLIENT: CHURCHILL RETIREMENT LIVING

DATE: 25/07/2022

MH No. F10 DEPTH. 2.78 COVER. RM CONSTRUCTION. Br REMARKS.		MH No. F16 DEPTH. 0.70 COVER. RL CONSTRUCTION. Co REMARKS.	
MH No. F11 DEPTH. 3.03 COVER. RL CONSTRUCTION. Br REMARKS.		MH No. F17 DEPTH. 0.80 COVER. RL CONSTRUCTION. Br REMARKS. REDUNDANT	
MH No. F12 DEPTH. 0.83 COVER. RL CONSTRUCTION. Br REMARKS.		MH No. F18 DEPTH. 0.88 COVER. RL CONSTRUCTION. Br REMARKS. REDUNDANT	
MH No. F13 DEPTH. 1.04 COVER. RL CONSTRUCTION. Br REMARKS.		MH No. 221D DEPTH. 3.27 COVER. CH CONSTRUCTION. Br REMARKS.	
MH No. F14 DEPTH. COVER. CONSTRUCTION. REMARKS.	OFF SITE	MH No. 2210 DEPTH. 3.49 COVER. CH CONSTRUCTION. Br REMARKS.	
MH No. F15 DEPTH. 1.56 COVER. RL CONSTRUCTION. Br REMARKS.		MH No. 3101 DEPTH. COVER. CONSTRUCTION. REMARKS.	UNABLE TO LIFT IN ROAD
KEY: C - Circular S - Square T - Triangular L - Light Duty M - Medium Duty H - Heavy Duty Co - Concrete Br - Brick R - Rectangular			



MH2201



MH 2201 (CLOSE UP)

CCTV Sewer Survey – Daily Record Sheet

Date 25/07/2022 Job No 071461

Client CHURCHILL RETIREMENT LIVING

Site Address Romsey Close

ENGSTZEH

So 50 9AP

Rig Manager	S. GARDINER	Operative	M. CAMPBELL
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5 Suffolk Road
Maldon
Essex
CM9 6AX

Tel: 07971910370

Manhole		Sewer dia.	Recorded Metreage	Survey Abandoned	Remarks
Start	Finish				
F12	LATA	100	2-39	—	BEND UP
F12	LATB	100	3-02	/	BEND UP
F12	F13	100	2-52		
F13	F14	100	13-14		
F13	F15	100	19-10		
F16	F15	100	3-35		
F19	F10	100	18-48		
2210	F11	150	1-42		
2210	2210	225	53-00		
2201	3101	225	31-06		
TOTAL					

Standing Time	
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Meterage check	X
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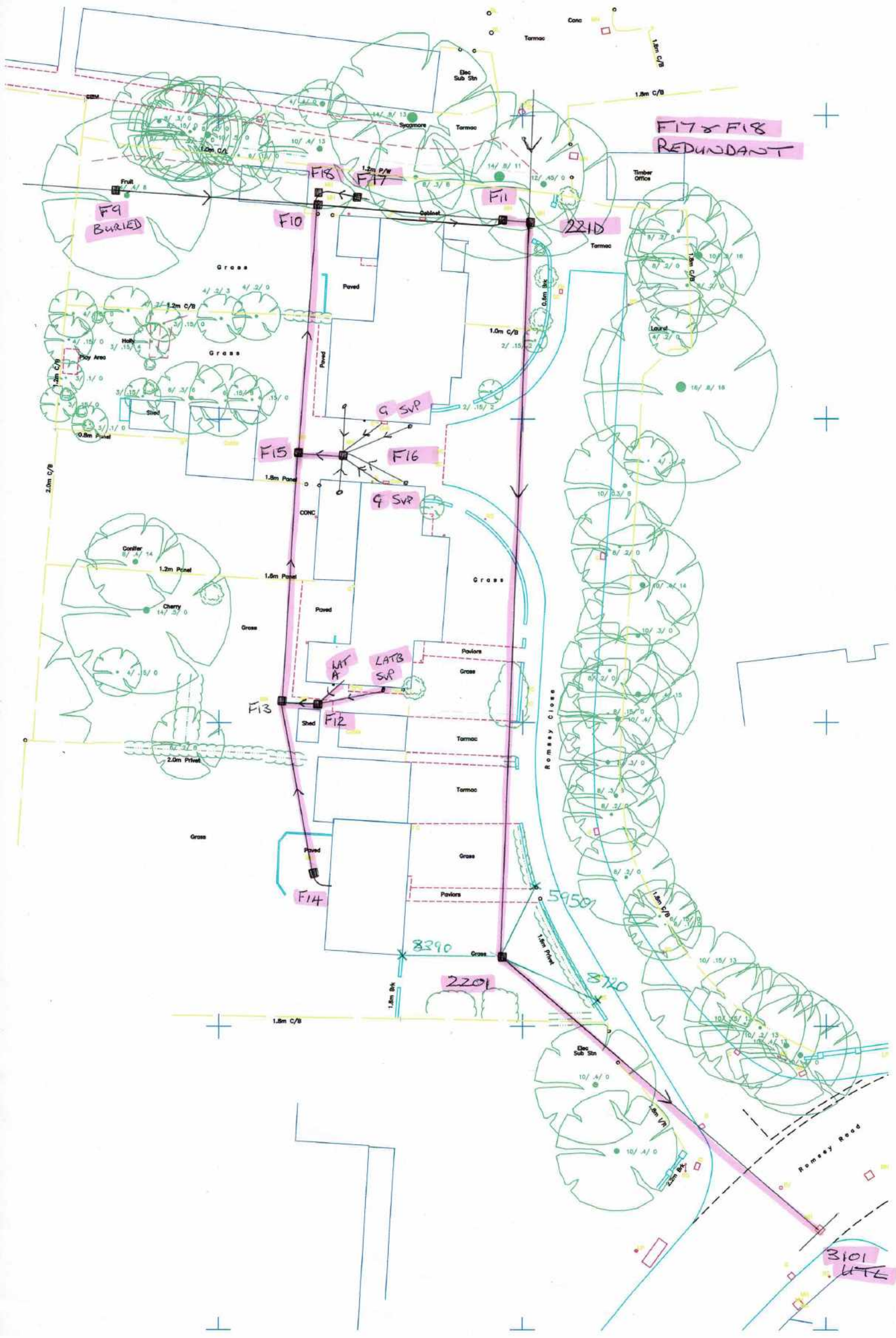
Length	OK
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Reason for standing time

Remarks RWP'S INTO GROUND/GULLY'S ASSUMED
GARDEN SOAKAWAYS

F17 & F18 now REDUNDANT

Special Instructions; Site Contact –



Appendix E Runoff Calculations

**Simulation Settings**

Rainfall Methodology	FEH-13	Skip Steady State	x	2 year (l/s)	0.0
Summer CV	0.750	Drain Down Time (mins)	1440	30 year (l/s)	0.0
Winter CV	0.840	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	0.0
Analysis Speed	Detailed	Check Discharge Rate(s)	✓	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	45	0	0
30	45	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	FEH	Growth Factor 100 year	3.19
Positively Drained Area (ha)	0.412	Betterment (%)	0
SAAR (mm)	787	QMed	1.4
Host	1	QBar	1.6
BFIHost	0.544	Q 2 year (l/s)	1.4
Region	7	Q 30 year (l/s)	3.8
QBar/QMed conversion factor	1.136	Q 100 year (l/s)	5.1
Growth Factor 2 year	0.88		

**Simulation Settings**

Rainfall Methodology	FEH-13	Skip Steady State	x	2 year (l/s)	0.0
Summer CV	0.750	Drain Down Time (mins)	1440	30 year (l/s)	0.0
Winter CV	0.840	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	0.0
Analysis Speed	Detailed	Check Discharge Rate(s)	✓	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	45	0	0
30	45	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	FEH	Growth Factor 100 year	3.19
Positively Drained Area (ha)	0.296	Betterment (%)	0
SAAR (mm)	787	QMed	1.0
Host	1	QBar	1.2
BFIHost	0.544	Q 2 year (l/s)	1.0
Region	7	Q 30 year (l/s)	2.8
QBar/QMed conversion factor	1.136	Q 100 year (l/s)	3.7
Growth Factor 2 year	0.88		

Colebrook-White Pipe Capacity Analysis

Project No.	1373	
Project Title	Toynbee Road and Romsey Road	
Client	Planning Issues Ltd	
Sheet Ref	P:\1373 Toynbee Road, Eastleigh\D Design and Analysis\SPREADSHEETS\01 Drainage\03 Sewer Design\[Colebrook White Equation (pipe velocity & capacity).xlsx]Colebrook-White	

Calcs by	CY
Checked by	CY
Approved by	CY
Date	17.11.2022
Revision	A

Catchment area analysis based on Modified Rational Method equation (HR Wallingford, 1990);

$$Q_{BAR} = 2.78 \cdot i \cdot A$$

Hydrological Region:

7

 *see map

Where: Q_{BAR} Average discharge (l/s)
 i Rainfall intensity (mm/hr) i

50.4

 mm/hr *see map
 A Catchment area (m²)

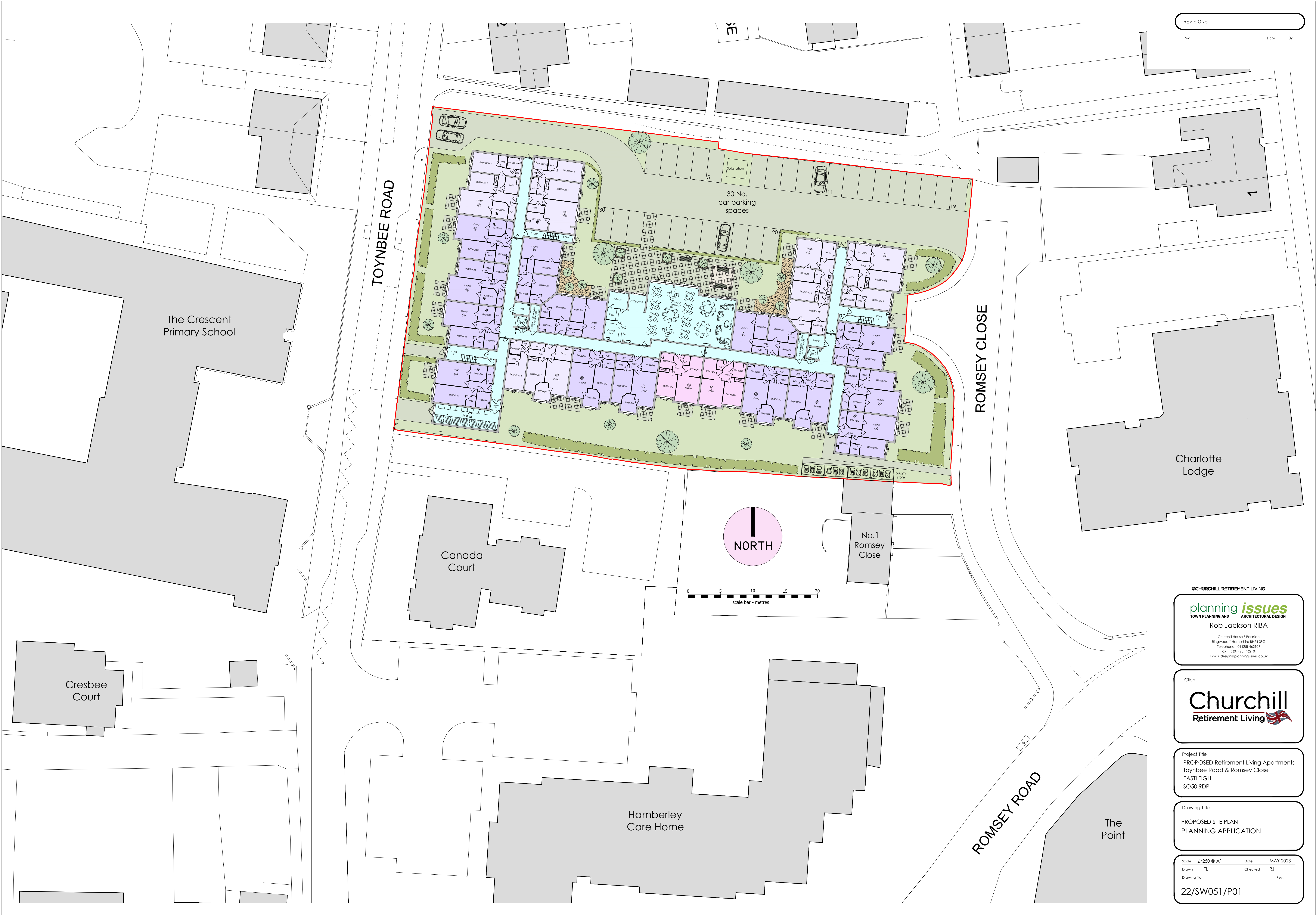
Return Period	2yr	30yr	100yr
Growth Factor (Q/QBAR)	0.88	2.4	3.19
Critical Area (ha)	0.1440	0.0528	0.0397

(area that can freely drain)

Brownfield flow rate analysis based on Modified Rational Method (HR Wallingford, 1990);

	2yr	30yr	100yr	QBAR
Area (ha): 0.116	14.30	39.01	51.85	16.25

Appendix F Proposed Site Plan



REVISIONS		
Rev.	Date	By

©CHURCHILL RETIREMENT LIVING

planning issues
TOWN PLANNING AND ARCHITECTURAL DESIGN

Rob Jackson RIBA

Churchill House * Parkside
Ringwood * Hampshire BH24 3SG
Telephone: (01423) 462109
Fax: (01423) 462101
Email: design@planningissues.co.uk

Client

Churchill Retirement Living

Project Title

PROPOSED Retirement Living Apartments
Toynbee Road & Romsey Close
EASTLEIGH
SO50 9DP

Drawing Title

PROPOSED SITE PLAN
PLANNING APPLICATION

Scale	1:250 @ A1	Date	MAY 2023
Drawn	TL	Checked	RJ
Drawing No.	22/SW051/P01		

Appendix G Causeway Flow Modelling Outputs

**Design Settings**

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

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

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.014	4.00	16.300	450	445292.131	119227.783	0.750
2			16.300	450	445293.687	119239.468	0.867
3			16.300	450	445291.424	119239.769	0.890
4	0.020	4.00	16.300	450	445293.944	119257.837	1.071
5			16.300	450	445294.212	119260.043	1.169
Tank 2			16.300	450	445278.628	119264.846	1.181
7	0.050	4.00	16.300	450	445277.547	119264.979	1.223
8			16.300	450	445272.449	119265.606	1.419
9			16.300	450	445271.195	119265.761	1.467
Tank 1	0.018	4.00	16.300	600	445250.924	119264.815	1.469
10	0.026	4.00	16.300	450	445242.082	119255.464	0.825
11	0.042	4.00	16.300	450	445273.743	119251.248	1.014
12			16.300	450	445274.824	119259.368	1.063
13			16.300	450	445271.560	119259.774	1.083
14	0.010	4.00	16.300	450	445270.468	119259.910	1.090
16			16.300	1200	445249.843	119264.949	1.467
17			16.300	1200	445243.451	119265.744	1.487
18	0.037	4.00	16.300	1200	445244.294	119272.078	1.507
19			16.300	1200	445222.641	119274.961	1.575
20			16.300	450	445274.219	119227.987	0.825
21	0.026	4.00	16.300	450	445231.345	119233.696	1.080
22			16.300	450	445230.609	119228.170	1.113
23			16.300	450	445216.657	119230.028	1.196
Hydrobrake			16.300	1200	445220.562	119259.352	1.750
24_OUT			16.300	1200	445214.466	119260.259	1.865

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	11.788	0.600	15.550	15.433	0.117	100.8	150	4.20	50.0
1.001	2	3	2.283	0.600	15.433	15.410	0.023	99.3	150	4.23	50.0
1.002	3	4	18.243	0.600	15.410	15.229	0.181	100.8	150	4.54	50.0
1.003	4	5	2.222	0.600	15.229	15.206	0.023	96.6	150	4.57	50.0
Dummy 1	5	Tank 2	16.307	0.600	15.131	15.119	0.012	1358.9	225	5.36	50.0
1.005	Tank 2	7	1.089	0.600	15.119	15.077	0.042	26.2	225	5.37	50.0
1.006	7	8	5.136	0.600	15.077	14.881	0.196	26.2	225	5.40	50.0
1.007	8	9	1.264	0.600	14.881	14.833	0.048	26.2	225	5.41	50.0
Dummy 3	9	Tank 1	20.293	0.600	14.833	14.831	0.002	9999.0	225	8.18	44.3
1.009	Tank 1	16	1.089	0.600	14.838	14.833	0.005	217.9	375	8.20	44.2
2.000	10	11	31.940	0.600	15.475	15.286	0.189	169.0	225	4.53	50.0
2.001	11	12	8.192	0.600	15.286	15.237	0.049	167.2	225	4.67	50.0
2.002	12	13	3.289	0.600	15.237	15.217	0.020	164.5	225	4.72	50.0
2.003	13	14	1.100	0.600	15.217	15.210	0.007	157.2	225	4.74	50.0
Dummy 2	14	Tank 1	20.150	0.600	15.210	15.000	0.210	96.0	225	4.99	50.0
1.010	16	17	6.441	0.600	14.833	14.813	0.020	322.1	375	8.30	43.9
1.011	17	18	6.390	0.600	14.813	14.793	0.020	319.5	375	8.41	43.7
1.012	18	19	21.844	0.600	14.793	14.725	0.068	321.2	375	8.77	42.7
1.013	19	Hydrobrake	15.747	0.600	14.725	14.550	0.175	90.0	375	8.91	42.3
3.000	20	21	43.252	0.600	15.475	15.220	0.255	169.6	225	4.72	50.0
3.001	21	22	5.575	0.600	15.220	15.187	0.033	168.9	225	4.81	50.0
3.002	22	23	14.075	0.600	15.187	15.104	0.083	169.6	225	5.05	50.0
3.003	23	Hydrobrake	29.583	0.600	15.104	14.826	0.278	106.4	225	5.44	50.0
1.004	Hydrobrake	24_OUT	6.163	0.600	14.550	14.435	0.115	53.6	150	5.54	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.001	17.7	1.9	0.600	0.717	0.014	0.0	33	0.654
1.001	1.008	17.8	1.9	0.717	0.740	0.014	0.0	33	0.659
1.002	1.001	17.7	1.9	0.740	0.921	0.014	0.0	33	0.653
1.003	1.022	18.1	4.6	0.921	0.944	0.034	0.0	52	0.858
Dummy 1	0.346	13.8	4.6	0.944	0.956	0.034	0.0	89	0.311
1.005	2.566	102.0	11.4	0.956	0.998	0.084	0.0	51	1.709
1.006	2.566	102.0	11.4	0.998	1.194	0.084	0.0	51	1.709
1.007	2.566	102.0	11.4	1.194	1.242	0.084	0.0	51	1.709
Dummy 3	0.122	4.8	10.1	1.242	1.244	0.084	0.0	225	0.124
1.009	1.223	135.1	20.4	1.087	1.092	0.170	0.0	98	0.889
2.000	1.003	39.9	3.5	0.600	0.789	0.026	0.0	45	0.624
2.001	1.008	40.1	9.2	0.789	0.838	0.068	0.0	73	0.823
2.002	1.017	40.4	9.2	0.838	0.858	0.068	0.0	73	0.825
2.003	1.040	41.4	9.2	0.858	0.865	0.068	0.0	72	0.838
Dummy 2	1.335	53.1	9.2	0.865	1.075	0.068	0.0	63	1.003
1.010	1.004	110.9	20.2	1.092	1.112	0.170	0.0	108	0.770
1.011	1.008	111.3	20.1	1.112	1.132	0.170	0.0	107	0.770
1.012	1.005	111.0	20.8	1.132	1.200	0.180	0.0	109	0.777
1.013	1.910	211.0	24.9	1.200	1.375	0.217	0.0	86	1.295
3.000	1.001	39.8	3.0	0.600	0.855	0.022	0.0	42	0.593
3.001	1.003	39.9	6.5	0.855	0.888	0.048	0.0	61	0.741
3.002	1.001	39.8	6.5	0.888	0.971	0.048	0.0	61	0.740
3.003	1.267	50.4	10.0	0.971	1.249	0.074	0.0	68	0.995
1.004	1.377	24.3	39.4	1.600	1.715	0.291	0.0	150	1.403

**Simulation Settings**

Rainfall Methodology	FEH-13	Skip Steady State	x	2 year (l/s)	1.4
Summer CV	0.750	Drain Down Time (mins)	1440	30 year (l/s)	3.8
Winter CV	0.840	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	5.1
Analysis Speed	Detailed	Check Discharge Rate(s)	✓	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	45	0	0
30	45	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	FEH	Growth Factor 100 year	3.19
Positively Drained Area (ha)	0.412	Betterment (%)	0
SAAR (mm)	787	QMed	1.4
Host	1	QBar	1.6
BFIHost	0.544	Q 2 year (l/s)	1.4
Region	7	Q 30 year (l/s)	3.8
QBar/QMed conversion factor	1.136	Q 100 year (l/s)	5.1
Growth Factor 2 year	0.88		

Node Hydrobrake Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	14.550	Product Number	CTL-SHE-0100-3800-0500-3800
Design Depth (m)	0.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.8	Min Node Diameter (mm)	1200

Node 14 Online Orifice Control

Flap Valve	x	Invert Level (m)	15.210	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.600		

Node 9 Online Orifice Control

Flap Valve	x	Invert Level (m)	14.833	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.600		

Node 5 Online Orifice Control

Flap Valve	x	Invert Level (m)	15.131	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.600		

**Node Tank 2 Soakaway Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	15.119	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	84	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	19.500	Number Required	1
Porosity	0.95	Pit Length (m)	4.500		

Node Tank 1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	14.838	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	394	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	10.000	Number Required	1
Porosity	0.95	Pit Length (m)	22.000		

**Results for 2 year +45% CC Critical Storm Duration. Lowest mass balance: 97.28%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	15.593	0.043	3.1	0.0069	0.0000	OK
15 minute winter	2	10	15.486	0.053	3.1	0.0084	0.0000	OK
15 minute winter	3	10	15.452	0.042	3.1	0.0067	0.0000	OK
15 minute winter	4	10	15.307	0.078	7.4	0.0124	0.0000	OK
15 minute winter	5	11	15.182	0.051	7.4	0.0081	0.0000	OK
15 minute winter	Tank 2	13	15.172	0.053	18.3	4.4103	0.0000	OK
15 minute winter	7	13	15.125	0.048	10.2	0.0077	0.0000	OK
240 minute winter	8	184	15.004	0.123	3.7	0.0195	0.0000	OK
240 minute winter	9	188	15.004	0.171	12.6	0.0272	0.0000	OK
240 minute winter	Tank 1	188	15.002	0.171	15.5	34.4445	0.0000	OK
15 minute winter	10	10	15.532	0.057	5.7	0.0091	0.0000	OK
15 minute winter	11	10	15.404	0.118	15.0	0.0188	0.0000	OK
15 minute winter	12	10	15.344	0.107	14.8	0.0170	0.0000	OK
15 minute winter	13	10	15.309	0.092	14.7	0.0146	0.0000	OK
15 minute winter	14	10	15.275	0.065	14.6	0.0103	0.0000	OK
240 minute winter	16	188	15.002	0.169	3.2	0.1913	0.0000	OK
240 minute winter	17	188	15.002	0.189	3.2	0.2138	0.0000	OK
240 minute winter	18	188	15.002	0.209	3.2	0.2363	0.0000	OK
240 minute winter	19	188	15.002	0.277	3.3	0.3131	0.0000	OK
15 minute winter	20	10	15.528	0.053	4.9	0.0084	0.0000	OK
15 minute winter	21	10	15.313	0.093	10.5	0.0148	0.0000	OK
15 minute winter	22	10	15.271	0.084	10.2	0.0134	0.0000	OK
15 minute summer	23	10	15.194	0.090	15.6	0.0142	0.0000	OK
240 minute winter	Hydrobrake	188	15.002	0.452	6.0	0.5111	0.0000	SURCHARGED
60 minute summer	24_OUT	172	14.475	0.040	3.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	3.1	0.646	0.175	0.0575	
15 minute winter	2	1.001	3	3.1	0.647	0.173	0.0109	
15 minute winter	3	1.002	4	3.0	0.466	0.172	0.1214	
15 minute winter	4	1.003	5	7.4	0.875	0.407	0.0187	
15 minute winter	5	Orifice	Tank 2	7.3				
15 minute winter	Tank 2	1.005	7	10.2	1.530	0.100	0.0072	
15 minute winter	7	1.006	8	10.2	1.487	0.100	0.0356	
240 minute winter	8	1.007	9	12.6	0.640	0.124	0.0344	
240 minute winter	9	Orifice	Tank 1	12.2				
240 minute winter	Tank 1	1.009	16	3.2	0.392	0.023	0.0515	
15 minute winter	10	2.000	11	5.7	0.402	0.142	0.4622	
15 minute winter	11	2.001	12	14.8	0.745	0.368	0.1624	
15 minute winter	12	2.002	13	14.7	0.870	0.363	0.0555	
15 minute winter	13	2.003	14	14.6	1.195	0.353	0.0135	
15 minute winter	14	Orifice	Tank 1	14.6				
240 minute winter	16	1.010	17	3.2	0.364	0.029	0.3344	
240 minute winter	17	1.011	18	3.2	0.367	0.029	0.3793	
240 minute winter	18	1.012	19	3.3	0.434	0.030	1.6418	
240 minute winter	19	1.013	Hydrobrake	3.5	0.243	0.017	1.5553	
15 minute winter	20	3.000	21	4.8	0.439	0.122	0.4863	
15 minute winter	21	3.001	22	10.2	0.704	0.256	0.0808	
15 minute winter	22	3.002	23	10.1	0.743	0.254	0.1987	
15 minute summer	23	3.003	Hydrobrake	15.7	1.005	0.312	0.5681	
240 minute winter	Hydrobrake	1.004	24_OUT	3.8	0.953	0.156	0.0246	76.5

**Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 97.28%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	15.623	0.073	7.5	0.0115	0.0000	OK
15 minute winter	2	10	15.523	0.090	7.5	0.0143	0.0000	OK
15 minute winter	3	10	15.478	0.068	7.5	0.0108	0.0000	OK
15 minute winter	4	10	15.390	0.161	18.1	0.0256	0.0000	SURCHARGED
120 minute winter	5	120	15.246	0.115	5.4	0.0183	0.0000	OK
120 minute winter	Tank 2	118	15.245	0.126	13.3	10.5594	0.0000	OK
120 minute winter	7	96	15.251	0.174	12.9	0.0277	0.0000	OK
120 minute winter	8	118	15.245	0.364	12.8	0.0579	0.0000	SURCHARGED
120 minute winter	9	118	15.251	0.418	24.1	0.0664	0.0000	SURCHARGED
120 minute winter	Tank 1	118	15.238	0.407	47.9	83.8913	0.0000	SURCHARGED
15 minute winter	10	10	15.565	0.090	13.8	0.0144	0.0000	OK
15 minute winter	11	10	15.526	0.240	36.2	0.0382	0.0000	SURCHARGED
15 minute winter	12	10	15.435	0.198	35.9	0.0315	0.0000	OK
15 minute winter	13	10	15.376	0.159	35.7	0.0252	0.0000	OK
15 minute winter	14	10	15.327	0.117	35.6	0.0187	0.0000	OK
180 minute winter	16	164	15.239	0.406	8.0	0.4594	0.0000	SURCHARGED
180 minute winter	17	164	15.244	0.431	8.4	0.4875	0.0000	SURCHARGED
180 minute winter	18	168	15.245	0.452	9.2	0.5107	0.0000	SURCHARGED
120 minute winter	19	116	15.238	0.513	13.3	0.5806	0.0000	SURCHARGED
15 minute winter	20	10	15.558	0.083	11.7	0.0131	0.0000	OK
15 minute winter	21	10	15.390	0.170	25.5	0.0271	0.0000	OK
15 minute winter	22	11	15.341	0.154	24.8	0.0245	0.0000	OK
15 minute winter	23	11	15.291	0.187	38.1	0.0298	0.0000	OK
180 minute winter	Hydrobrake	168	15.241	0.691	8.5	0.7821	0.0000	SURCHARGED
180 minute winter	24_OUT	172	14.478	0.043	4.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	7.5	0.777	0.425	0.1145	
15 minute winter	2	1.001	3	7.5	0.800	0.421	0.0214	
15 minute winter	3	1.002	4	7.5	0.544	0.422	0.2311	
15 minute winter	4	1.003	5	17.8	1.034	0.987	0.0367	
120 minute winter	5	Orifice	Tank 2	5.4				
120 minute winter	Tank 2	1.005	7	12.9	1.635	0.127	0.0299	
120 minute winter	7	1.006	8	12.8	1.303	0.126	0.1870	
120 minute winter	8	1.007	9	24.1	0.866	0.236	0.0503	
120 minute winter	9	Orifice	Tank 1	22.5				
120 minute winter	Tank 1	1.009	16	-11.9	-0.400	-0.088	0.1201	
15 minute winter	10	2.000	11	13.8	0.462	0.346	0.8733	
15 minute winter	11	2.001	12	35.9	0.909	0.895	0.3146	
15 minute winter	12	2.002	13	35.7	1.058	0.884	0.1102	
15 minute winter	13	2.003	14	35.6	1.396	0.862	0.0280	
15 minute winter	14	Orifice	Tank 1	35.6				
180 minute winter	16	1.010	17	-8.0	0.356	-0.072	0.7104	
180 minute winter	17	1.011	18	-8.4	0.361	-0.075	0.7048	
180 minute winter	18	1.012	19	-8.0	0.427	-0.072	2.4093	
120 minute winter	19	1.013	Hydrobrake	-7.5	0.353	-0.036	1.7368	
15 minute winter	20	3.000	21	11.7	0.519	0.293	0.9830	
15 minute winter	21	3.001	22	24.8	0.816	0.622	0.1692	
15 minute winter	22	3.002	23	24.3	0.857	0.611	0.4528	
15 minute winter	23	3.003	Hydrobrake	36.1	1.018	0.717	1.1109	
180 minute winter	Hydrobrake	1.004	24_OUT	4.3	0.983	0.176	0.0268	142.3

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.28%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	15.633	0.083	9.3	0.0132	0.0000	OK
15 minute winter	2	10	15.537	0.104	9.3	0.0165	0.0000	OK
120 minute winter	3	120	15.520	0.110	2.8	0.0175	0.0000	OK
120 minute winter	4	120	15.519	0.290	6.8	0.0462	0.0000	SURCHARGED
120 minute winter	5	120	15.525	0.394	11.8	0.0626	0.0000	SURCHARGED
120 minute winter	Tank 2	118	15.516	0.397	26.0	33.1467	0.0000	SURCHARGED
120 minute winter	7	118	15.519	0.442	23.0	0.0703	0.0000	SURCHARGED
120 minute winter	8	118	15.520	0.639	16.4	0.1016	0.0000	SURCHARGED
120 minute winter	9	120	15.520	0.687	76.0	0.1092	0.0000	SURCHARGED
120 minute winter	Tank 1	114	15.519	0.688	110.2	84.0037	0.0000	SURCHARGED
15 minute winter	10	10	15.625	0.150	17.3	0.0238	0.0000	OK
15 minute winter	11	10	15.598	0.312	43.6	0.0496	0.0000	SURCHARGED
120 minute winter	12	120	15.517	0.280	13.4	0.0446	0.0000	SURCHARGED
120 minute winter	13	120	15.516	0.299	13.4	0.0476	0.0000	SURCHARGED
120 minute winter	14	120	15.517	0.307	42.4	0.0488	0.0000	SURCHARGED
120 minute winter	16	120	15.517	0.684	17.5	0.7741	0.0000	SURCHARGED
180 minute winter	17	176	15.520	0.707	12.0	0.7998	0.0000	SURCHARGED
180 minute winter	18	176	15.522	0.729	12.6	0.8247	0.0000	SURCHARGED
180 minute winter	19	176	15.518	0.793	11.5	0.8969	0.0000	SURCHARGED
15 minute winter	20	10	15.568	0.093	14.6	0.0148	0.0000	OK
15 minute winter	21	11	15.553	0.333	31.9	0.0530	0.0000	SURCHARGED
120 minute winter	22	116	15.515	0.328	9.5	0.0521	0.0000	SURCHARGED
120 minute winter	23	114	15.514	0.410	14.7	0.0651	0.0000	SURCHARGED
120 minute winter	Hydrobrake	114	15.516	0.966	14.6	1.0930	0.0000	SURCHARGED
180 minute winter	24_OUT	176	14.481	0.046	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	9.3	0.816	0.527	0.1355	
15 minute winter	2	1.001	3	9.3	0.838	0.520	0.0252	
120 minute winter	3	1.002	4	2.8	0.450	0.156	0.2870	
120 minute winter	4	1.003	5	6.7	0.857	0.372	0.0391	
120 minute winter	5	Orifice	Tank 2	22.0				
120 minute winter	Tank 2	1.005	7	23.0	1.736	0.226	0.0433	
120 minute winter	7	1.006	8	16.2	1.303	0.158	0.2043	
120 minute winter	8	1.007	9	25.3	0.918	0.248	0.0503	
120 minute winter	9	Orifice	Tank 1	62.7				
120 minute winter	Tank 1	1.009	16	-16.9	0.392	-0.125	0.1201	
15 minute winter	10	2.000	11	16.9	0.473	0.425	1.0824	
15 minute winter	11	2.001	12	42.7	1.075	1.066	0.3258	
120 minute winter	12	2.002	13	13.4	0.849	0.332	0.1308	
120 minute winter	13	2.003	14	13.4	1.175	0.324	0.0437	
120 minute winter	14	Orifice	Tank 1	32.5				
120 minute winter	16	1.010	17	-17.5	0.358	-0.157	0.7104	
180 minute winter	17	1.011	18	-12.0	0.367	-0.108	0.7048	
180 minute winter	18	1.012	19	-11.2	0.433	-0.101	2.4093	
180 minute winter	19	1.013	Hydrobrake	6.7	0.191	0.032	1.7368	
15 minute winter	20	3.000	21	14.6	0.535	0.366	1.1963	
15 minute winter	21	3.001	22	28.2	0.843	0.707	0.2217	
120 minute winter	22	3.002	23	9.5	0.728	0.239	0.5598	
120 minute winter	23	3.003	Hydrobrake	14.6	0.739	0.291	1.1765	
120 minute winter	Hydrobrake	1.004	24_OUT	5.0	1.024	0.206	0.0302	164.5

Appendix H Preliminary Drainage Layout



Surface Water Strategy:

1. Surface Water Discharge

Attenuated surface water flows to discharge, via a new connection, to existing surface water sewer beneath Tonybee Road. To be agreed with Southern Water. Possible alternative connection to Southern Water surface water system beneath Romsey Close to east.

2. Flow Control

Proposed surface water control chamber to restrict flows up to 100yr return period and limit discharge to discharge rate to the range 3.8-5.1 l/s.

3. Geocellular Attenuation Tank

Geocellular Attenuation Tank to receive flows from the proposed development. Tank to attenuate generated runoff up to and including the 100yr storm period, 45% allowance for climate change. Tank to discharge further downstream via a hydrabrace control chamber. Chambers immediately upstream of tanks to include silt traps.

4. Maintenance

Geocellular Attenuation Tank to be fitted with access arrangements for maintenance of feature. Minimum 1no. cover to be vented in accordance with manufacturer recommendations.

5. Exceedance Flows

Site levels to account for exceedance flows such that beyond the capacity of the proposed surface water network and attenuation, exceedance flows would be directed away from the proposed building and towards areas of landscaping, and/or car parking, wherever possible. Beyond the capacity of the site, levels to allow flows to leave the site onto Tonybee road and/or Romsey Close. Landscaping and levels along the southern boundary to retain flows on site and direct east and west.

Area Summary Schedule

Total Site Area	0.412ha
Impermeable Catchment	0.291ha

Pre-Development (Greenfield) Runoff

The greenfield runoff rates have been assessed for the 'net developable area' using the FEH Method. The calculation excludes large areas of open space which will remain undeveloped.

Existing Greenfield Runoff Rates

Return Period	Greenfield Rate (l/s)
2yr	1.4
30yr	3.8
100yr	5.1

Attenuation Summary

Cellular Storage Tank

Ownership	Private
Catchment	0.291 ha
Hydraulic Control	Hydrabrace @IL 14.550
Porosity	95%
Tank 1 Dimension	22.0m X 10.0m X 0.4m
Tank 2 Dimension	19.5m X 4.5m X 0.4m

Total Volume Required:	116.9 m ³
Total 100yr+45% Peak Discharge	5.1l/s

Notes

- The proposed development has been assessed in line with the National Planning Policy Framework, to allow the planning application to be progressed and to show that the development can be undertaken in an acceptable manner from a flood risk perspective.
- The proposed development is located within Flood Zone 1 and is not known to be susceptible to flooding from pluvial, groundwater, infrastructure or artificial sources.
- To ensure the development is safe throughout its lifetime, the surface water strategy accounts for runoff in up to the 1 in 100 year return period.
- The strategy also safeguards against climate change (45%), providing betterment over existing conditions, where the rate and volume of runoff would continue to increase due to climate change.
- The existing ground conditions are not suitable for the implementation of infiltration drainage, and the site is not near a watercourse. Instead, surface water runoff will be attenuated on-site and discharged to the adopted surface water sewer in Tonybee Road, at a peak rate ranging from 3.8-5.1 l/s. This provides up to 90% betterment compared to the existing site runoff rates.
- Runoff from the site will be intercepted by a new private network and will drain to a new cellular attenuation tank. Flows from the tank will pass through a flow control chamber prior to discharging to the proposed point of connection on the adopted surface water sewer.
- Beyond the 100-year critical storm, exceedance runoff will be directed away from the building and towards any residual areas of open space or parking, where aboveground storage can be utilised. Beyond the capacity of the site exceedance flows would discharge from the site as per existing conditions, albeit at a reduced frequency and extent.
- Foul flows generated by the proposed development will be served by a new private gravity network, with connectivity to the SW foul sewer network inside the eastern boundary of the site.
- The existing adopted foul sewer which enters the site from the rear of No.1 Romsey Close will be diverted inside the southern boundary of the site. All redundant adopted drainage within the site will be abandoned.
- With the exception of the foul sewer diversion, all proposed on-site drainage will remain private and will be designed in accordance with Building Regulations Part H and CIRIA C753 and will become the responsibility of the appointed management company.
- As the development will be safe from flooding throughout its lifetime and will actively reduce the flood risk to properties within the downstream catchment, it is recommended that the Local Planning Authority confirm they have no objections to the proposed development.

Foul Water Strategy

Foul flows generated by the proposed site to be connected via Southern Waters onsite adopted foul sewer. Southern Waters adopted foul sewer extending into the site, to be abandoned and diverted via adoptable onsite connection to Southern Waters foul sewer.

Key

Site Boundary	Adopted Foul Water Manhole	VM Virgin Media Cable
Easement	Adopted Surface Water Manhole	LV Underground Electric LV
Existing Drainage	Foul Water Inspection Chamber	Low Pressure Gas
Adopted Surface Water Sewer	British Telecom cable	Building Catchment
Adopted Foul Water Sewer	Water Main	Impermeable Catchment
Private Foul Water Sewer		
Sewer To Be Abandoned		

Private Surface Water Sewer	Private Flow Control Chamber
Private Foul Water Sewer	Adoptable Foul Water Manhole
Adoptable Foul Water Sewer	Landscaping
Private Cellular Attenuation Tank	Overland Flood Flow Route
Private Surface Water Inspection Chamber	
Private Foul Water Inspection Chamber	
Adoptable Foul Water Inspection Chamber	

C	27.04.2023	UPDATED TO SUIT NEW LAYOUT	BJG	CPY	CPY
B	16.12.2022	UPDATED TO SUIT NEW LAYOUT	TMR	JB	CPY
A	02.12.2022	INITIAL ISSUE	BJG	JB	CPY
REV	DATE	DESCRIPTION	BY	CHK	APD
CLIENT: PLANNING ISSUES LTD					
DRAWING STATUS: PLANNING APPLICATION					

PROJECT:	TOYNBEE ROAD, EASTLEIGH		
TITLE:	PRELIMINARY DRAINAGE LAYOUT		
PROJECT No:	1373	DRAWING No:	01-PDL-1001
SCALE @ A1:	0	1:200	10 metres

DESIGN BY:	awcockward partnership		
Awcock Ward Partnership, Ada House, Pynes Hill, Exeter, EX2 5TU Tel: 01392 409007 Web: www.gwpxenter.com			