70023367-DSR-001

### OLD HALL STREET, LIVERPOOL - T1 DRAINAGE STRATEGY

10 NOVEMBER 2016



### OLD HALL STREET, LIVERPOOL -T1 DRAINAGE STRATEGY

Project no: 70023367 Date: 10 November 2016

WSP | Parsons Brinckerhoff

Three White Rose Office Park Millshaw Park Lane Leeds, LS11 0DL Tel: +44(0) 113 395 6200 Fax: +44(0) 113 395 6201 www.wspgroup.com www.pbworld.com



## QUALITY MANAGEMENT

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### PRODUCTION TEAM

#### WSP | PARSONS BRINCKERHOFF

Graduate Engineer	Laura Barlow

Principal Engineer Deepika Valla

Associate Director

Chris Cozens

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# 1 EXECUTIVE SUMMARY

- 1.1.1 WSP | Parsons Brinckerhoff was appointed by Indigo Planning on behalf of 122 Old Hall Street Limited to undertake a Drainage Strategy for a proposed residential multi-storey tower known as T1. The site is located at the junction of Leeds Street and Old Hall Street in Liverpool.
- 1.1.2 This report provides information and presents proposals relating to:
  - → Constraints imposed by the regulatory bodies;
  - → Proposed foul and surface water flows and discharge points; and
  - → Proposed surface water storage volumes.
- 1.1.3 A 300mm diameter public combined water sewer is shown to cross the site on the United Utilities sewer record plans. Based on the United Utilities consultation response this sewer is 2.0 3.5 m deep and is protected by a 6 m easement (3 m either side). The proposed T1 does not encroach on this easement.

#### 1.2 FOUL WATER

- 1.2.1 A new foul water network will be required to serve the development.
- 1.2.2 In line with the United Utilities consultation response, foul water flows will discharge into the public combined water sewer which crosses the site.
- 1.2.3 There is no restriction imposed by United Utilities on this rate but it is expected that the site will generate approximately 3.94 l/s.
- 1.2.4 The foul water discharge will be pumped from the basement level in order to connect into the public sewer system at a combined water manhole on the sewer running through the site.

#### 1.3 SURFACE WATER

- 1.3.1 A new surface water network will be required for the site.
- 1.3.2 Following the hierarchy for surface water disposal, since discharge by infiltration or to a watercourse are not feasible the surface water will discharge to the public combined water sewer which runs through the site.
- 1.3.3 The proposed discharge rate from the site will be restricted to 10 l/s in accordance with the United Utilities consultation response.
- 1.3.4 Attenuation storage will accommodate flows for up to the 1 in 100 year storm including a 40 % allowance for climate change.
- 1.3.5 Owing to the limited external space which is highly congested with underground services, the attenuation storage is currently proposed in the basement of the building. Surface water will be pumped from this storage tank in order to connect to the combined water sewer running through the site. However, the routing of the surface water network and location and arrangement of the attenuation storage will be confirmed following internal and external coordination at the detailed design stage.

## 2 INTRODUCTION

#### 2.1 APPOINTMENT AND BRIEF

- 2.1.1 WSP | Parsons Brinckerhoff was appointed by Indigo Planning on behalf of 122 Old Hall Street Limited to undertake a Drainage Strategy for a proposed residential development site at the junction of Leeds Street and Back Leeds Street in Liverpool.
- 2.1.2 The development will consist of two multi-storey towers. This report has been prepared to support the detailed planning application for the first of these towers, known as T1.

#### 2.2 OBJECTIVE OF THE STUDY

- 2.2.1 The objective of this study is to provide information and present proposals relating to the following:
  - → Proposed surface water and foul water discharge points
  - → Proposed surface water and foul water flows
  - → Proposed surface water storage volumes
- 2.2.2 A separate Flood Risk Statement has been produced by WSP | Parsons Brinckerhoff (2016) to accompany this Drainage Strategy.

#### 2.3 PROPOSED DEVELOPMENT

- 2.3.1 The proposed development will consists of two multi-storey towers. This report considers the drainage strategy for the first tower (T1).
- 2.3.2 T1 will have 26 floors of residential development with a total of 168 apartments. There will also be a ground floor which will accommodate circulation and post room space and a transfer level for bike storage. The Ground Floor Plan (Drawing No. 000) is included in Appendix A.
- 2.3.3 Two floors of basement development are proposed which occupy the majority of the planning boundary. Basement level plans (Drawing Nos. B01 and B02) are included in Appendix A.

#### 2.4 LIMITATIONS

- 2.4.1 The Environment Agency, Liverpool City Council and United Utilities were contacted as part of these works.
- 2.4.2 This report is based on the interpretation and assessment of data provided by third parties. WSP | Parsons Brinckerhoff cannot be held responsible for the accuracy of the third party data and the conclusions and findings of this report may change if the data is amended or updated after the date of consultation.
- 2.4.3 The recommendations made within this report may change upon receipt of further consultation responses.

## **3** EXISTING SITE

#### 3.1 SITE LOCATION

- 3.1.1 The site is located at the junction of Leeds Street and Back Leeds Street in Liverpool city centre, Merseyside. Moorfields Merseyrail Station lies 0.5 km to the southeast of the site.
- 3.1.2 An approximate postcode is L3 9PY and approximate OS coordinates are 333950, 391030.
- 3.1.3 A site location plan can be found in Appendix B of this report.

#### 3.2 SITE DESCRIPTION

3.2.1 Table 3-1 describes the general site characteristics.

#### Table 3-1 - Characteristics of the Site

Area		The site area is approximately 0.16 ha.		
Existing Use		The site is currently occupied by a surface level car park which is covered in hardstanding.		
General Topography		The topographical survey (Appendix C) indicates that the site generally slopes down from west (~ 16.4 m AOD) to east (~ 15.94 m AOD). There is limited coverage on the survey but it appears that there is a raised kerb and wall at the northern boundary. Additionally, behind the vegetation in the south and east of the site there is a retaining wall for the neighbouring car park.		
	North	Landscaping and Leeds Street/ A5053.		
	South	Surface car park and vegetation.		
Boundaries	East	Trees and multi-storey car park.		
	West	Back Leeds Street, a future development plot (currently occupied by a data centre) and office building.		
Access		Access to the site is via Back Leeds Street.		

#### 3.3 EXISTING PRIVATE DRAINAGE

3.3.1 Private site drainage records were not available. The site is currently occupied by a surfaced car park and so is expected to be formally drained.

#### 3.4 EXISTING PUBLIC SEWERS

- 3.4.1 An extract of United Utilities public sewer records dated 15 August 2016 (Appendix D) indicates one public sewer in the immediate site vicinity. A combined water sewer runs through the site to the west of T1. In addition, some lines of abandoned sewer run under Leeds Street and in close proximity to the northwest of the site.
- 3.4.2 The sewer is labelled on United Utilities Sewer Plans as 300 mm diameter and 225 mm diameter along its length in the vicinity of the site. The sewer runs to the northwest under Back Leeds Street before turning westwards under King Edward Street. The depth of the sewer within the site is not available on the United Utilities sewer record plans however at manhole 9007, shortly downstream of the site, it is indicated to be 2.21 m deep.

- 3.4.3 The United Utilities consultation response received on 18 October 2016 indicated that the sewer was 300 mm in diameter and laid at a depth of approximately 2.0 to 3.5m.
- 3.4.4 The consultation response from United Utilities also stated that the sewer should not be located within 3 m of any existing or proposed building. This width is marked on the Indicative Drainage Strategy Layout in Appendix E which demonstrates that the proposed basement for T1 does not encroach on the easement.

## 4 FOUL WATER DRAINAGE STRATEGY

- 4.1.1 A new separate foul water drainage system will be required on the site.
- 4.1.2 Whilst the exact configuration of the foul water drainage network and associated connection points will be determined at the detailed design stage, an indicative foul water drainage layout is illustrated in the Indicative Drainage Strategy Layout included in Appendix E.

#### 4.2 CONNECTION TO THE PUBLIC SEWER

- 4.2.1 The United Utilities consultation response received on 18 October 2016 indicated that foul water drainage would be permitted to discharge to the public sewer network via the 300 mm public combined water sewer which runs through the site.
- 4.2.2 The Indicative Drainage Layout Plan in Appendix E shows a route to a proposed connection point at manhole 9005 on the 300 mm public combined water sewer.
- 4.2.3 A foul water pumping station is indicated in the basement of the building. At the detailed design stage there will be internal and external coordination which will confirm the final proposals for the foul water drainage but based on the congestion of underground services surrounding the building and the extents of the basement, the length of the proposed foul water network outside of the building has been minimised.

#### 4.3 PROPOSED DISCHARGE RATE

- 4.3.1 The United Utilities consultation response received on 18 October 2016 indicated that foul water flows could drain at an unrestricted rate into the public combined water sewerage system crossing the site.
- 4.3.2 The foul flow rates were estimated using the accommodation schedule. Based on a population of 284 and an allowance of 200 litres/person/day with a peak factor of 6, the resulting flow from the development is calculated as 3.94 l/s.

#### 4.4 MAINTENANCE

4.4.1 It is expected that the foul water network will be privately maintained up to and including the rising main discharge chamber. The lateral connection from this point to the public combined water sewer will be offered for adoption to United Utilities.

## 5 SURFACE WATER DRAINAGE STRATEGY

- 5.1.1 A new separate surface water drainage system will be required to manage water on site and discharge off site to the United Utilities sewerage system.
- 5.1.2 An indicative surface water drainage layout is illustrated in the Indicative Drainage Strategy Layout Plan included in Appendix E. The exact configuration of the surface water drainage network including attenuation storage should be confirmed at the detailed design stage.

#### 5.2 DISCHARGE POINT

- 5.2.1 Requirement H3 of the Building Regulations (2000) requires the following hierarchy for surface water disposal:
  - → Disposal of surface water by infiltration methods
  - → Discharge to a suitable watercourse
  - $\rightarrow$  Discharge to public sewer

#### **DISCHARGE BY INFILTRATION METHODS**

- 5.2.2 The Environment Agency Groundwater Map on the website indicates that the superficial deposits are shown to be Secondary Aquifers indicating variable levels of permeability. Groundwater monitoring information was provided by the Environment Agency on 01 November 2016 but the monitoring stations were not in close enough proximity to provide an indication of groundwater levels under the site.
- 5.2.3 The LandIS Soilscapes Viewer indicates that the soil under the site is slowly permeable and seasonally wet.
- 5.2.4 Based on this information it is not anticipated that the site has sufficient permeability. In addition, the site area in a city centre context does not have sufficient space for any meaningful infiltration solutions and therefore this method of discharge has been discounted for the site.

DISCHARGE TO WATERCOURSE

- 5.2.5 The River Mersey runs south to north approximately 0.4 km to the west of the site. The Liverpool City Council consultation response received on 14 October 2016 indicated that they had no record of watercourses (including culverted watercourses) in the immediate site vicinity.
- 5.2.6 The minimum length of sewer to be requisitioned to the watercourse would therefore be 0.4 km although it is likely to be longer given the requirement to route through adopted highways which is not considered to be practicable and this method of disposal has therefore also been discounted.

#### DISCHARGE TO PUBLIC SEWER

5.2.7 Since other preferable options are not available, surface water from the site is proposed to discharge into the public sewer. United Utilities sewer plans indicate that there are only combined water sewers in the site vicinity and so the proposed connection point will be to a combined water sewer instead of the preferable surface water sewer option.

5.2.8 The United Utilities consultation response received on 18 October 2016 indicated that surface water from the new development may flow into the combined water sewer crossing under the site.

#### 5.3 ALLOWABLE DISCHARGE RATE

- 5.3.1 The area enclosed within the planning application boundary is 0.16 ha, of which the majority is surfaced with only a small section of permeable area. The red line boundary includes areas which will be developed as part of phase 2 of the Old Hall Street development and have therefore been excluded. In order to determine the allowable discharge rate for T1, the area to be developed, i.e. Back Leeds Street and the plot to the east (0.11 ha) will be used in calculations.
- 5.3.2 The proposed layout also has some landscaping proposed but in order to make calculations robust, it has been assumed that the entire proposed area is impermeable. This should guard against an underestimation of the storage requirement in the event that the proposed landscaping was reduced at the detailed design stage.
- 5.3.3 The discharge rate from the site was proposed based on the following information:
  - → The United Utilities consultation response received on 24 October 2016 indicated that surface water from the site may discharge at a maximum rate of 10 l/s.
  - → The LCC consultation response received on 14 October 2016 indicated that the site will be classed as brownfield for drainage matters and it is assumed that the site drainage is still operational without the need for any further investigation work to prove connectivity.
  - → The LCC Greenfield / Brownfield Sites Surface Water Management Guidance provided within the LCC consultation response states that a 30 % reduction in flows should be applied for brownfield sites.
- 5.3.4 The existing and proposed discharge rates (if unrestricted) are shown in Table 5-1 based on a brownfield runoff allowance of 140 l/s/ha.

DEVELOPMENT STAGE	IMPERMEABLE AREA (HA)	CALCULATED BROWNFIELD RUNOFF RATE (I/s)
Existing	0.105	14.7
Proposed	0.110	15.7

#### Table 5-1 Existing and Proposed Runoff Rates

5.3.5 The proposed discharge rate via a pump from the basement is 10 l/s. Discharging surface water flows at this rate will provide an approximately 30% reduction in surface water flows from the existing site.

#### 5.4 ATTENUATION STORAGE

- 5.4.1 In order to attenuate surface water runoff to 10 l/s storage will be provided. In accordance with the Liverpool City Council Draft Local Liverpool Plan (September 2016) Policy R3 the implementation of SuDS on the site was considered.
- 5.4.2 The site area is 0.16 ha with limited external space in a city centre context for 'traditional' SuDS such as swales, basins or ponds with the required volume. SuDS principles have been applied in that surface water flows will be attenuated but the current proposal is for this storage to be in the form of an underground tank.

5.4.3 The Source Control Module of MicroDrainage was used to calculate the required volume of storage to facilitate a restriction of flows to 10 l/s in a 1 in 100 year event. In line with the new Environment Agency climate change allowances the volumes for both 20 and 40% increases in rainfall due to climate change were assessed. The requirements for these events are summarised in Table 5-2.

#### **Table 5-2 Attenuation Storage Requirements**

INCREASE IN PEAK RAINFALL DUE TO CLIMATE CHANGE	STORAGE VOLUME REQUIREMENT (m <sup>3</sup> )
20%	20
40%	25

5.4.4 The larger of the two volumes has been accommodated in the layout and an indicative location is shown on the Indicative Drainage Layout Plan in Appendix E. Designing for a 40% increase in peak rainfall meets the 30% climate change allowance to be considered according to the Liverpool Greenfield / Brownfield Sites Surface Water Management Guidance.

#### 5.5 REQUIREMENT FOR PUMPING

- 5.5.1 There is very limited space available within the site boundary for providing a gravity draining system with a below ground attenuation storage tank. The proposed development basement covers a large portion of the site and the highway boundary and congestion of the underground services surrounding the proposed building are further constraints.
- 5.5.2 Because of these restrictions, attenuation storage is proposed within the building basement in a tank installed with a pump. A rising main will discharge surface water from the tank to a discharge chamber upstream of the proposed connection point on the public combined water sewer which runs through the site.
- 5.5.3 An indicative location of the tank is shown on the Indicative Drainage Layout Plan in Appendix E which demonstrates that the volume can be accommodated on site. However, the exact location and arrangement may change following coordination at the detailed design stage.

#### 5.6 EXTREME EVENTS

5.6.1 In flows exceeding the 1 in 100 year storm plus a 40% allowance for climate change the site surface water drainage network will be exceeded. A suitable method for discharging overflow safely away from the building will need to be considered at a later design stage but it is expected that exceedance flow at the surface will be routed to the adjacent highways without posing risk to people or property. As is standard practice, allowance will be made in the pumped system for system failure.

#### 5.7 MAINTENANCE

5.7.1 It is expected that the surface water drainage network will be privately maintained up to and including the rising main discharge chamber. The lateral connection from this point to the public combined water sewer will be offered for adoption to United Utilities.

# 6 CONCLUSIONS

6.1.1 A 300mm diameter public combined water sewer is shown to cross the site on the United Utilities sewer record plans. Based on the United Utilities consultation response this sewer is 2.0 – 3.5 m deep and is protected by a 6 m easement (3 m either side). The proposed T1 does not encroach on this easement.

#### 6.2 FOUL WATER

- 6.2.1 A new foul water network will be required for the site.
- 6.2.2 In line with the United Utilities consultation response, foul water flows will discharge into the public combined water sewer which crosses the site.
- 6.2.3 There is no restriction imposed by United Utilities on this rate but it is expected that the site will generate approximately 3.94 l/s.
- 6.2.4 The foul water discharge will be pumped from the basement level in order to connect into the public sewer system at a combined water manhole on the sewer running through the site.

#### 6.3 SURFACE WATER

- 6.3.1 A new surface water network will be required for the site.
- 6.3.2 Following the hierarchy for surface water disposal, since discharge by infiltration or to a watercourse are not feasible the surface water will discharge to the public combined water sewer which runs through the site.
- 6.3.3 The proposed discharge rate from the site will be restricted to 10 l/s in accordance with the United Utilities consultation response.
- 6.3.4 Attenuation storage will accommodate flows for up to the 1 in 100 year storm including a 40 % allowance for climate change.
- 6.3.5 Owing to the limited external space which is highly congested with underground services, the attenuation storage is currently proposed in the basement of the building. Surface water will be pumped from this storage tank in order to connect to the combined water sewer running through the site.
- 6.3.6 The routing of the surface water network and location and arrangement of the attenuation storage will be confirmed following internal and external coordination at the detailed design stage. However, the current location demonstrates that the volume and associated pipework can be accommodated within the basement if necessary.

# Appendix A

GROUND FLOOR PLAN (DRAWING NO. 000) AND BASEMENT LEVELS PLANS (DRAWING NOS. B01 REV A AND B02 REV B)



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title:	drawing number.			
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status:	job number	revision:		
PLANNING	0593			



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# Appendix B

SITE LOCATION PLAN



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# Appendix C

**TOPOGRAPHICAL SURVEY (DRAWING NO. 16G059/001)** 





# Appendix D

#### UNITED UTILITIES PUBLIC SEWER RECORDS



WSP Civils 3 White Rose Office Park Millshaw Park Lane Leeds

LS11 0DL

#### **United Utilites Water Limited**

Property Searches Ground Floor Grasmere House Lingley Mere Business Park Great Sankey Warrington WA5 3LP DX 715568 Warrington Telephone 0370 751 0101

#### Property.searches@uuplc.co.uk

 Your Ref:
 70023367-403

 Our Ref:
 16/ 1240015

 Date:
 13/10/2016

FAO: Laura Barlow

**Dear Sirs** 

Location: Old Hall Street

I acknowledge with thanks your request dated 11/10/16 for information on the location of our services.

Please find enclosed plans showing the approximate position of our apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read our access statement before you start work to check how it will affect our network. http://www.unitedutilities.com/work-near-asset.aspx.

I trust the above meets with you requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please telephone us on 0370 7510101.

Yours Faithfully,

immonds.

Amanda Simmonds Property Searches Manager



#### **TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS**

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self-construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

#### **TERMS AND CONDITIONS:**

- 1. This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
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- 4. The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- 5. The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- 6. This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- 7. No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- 8. If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- 9. This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



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## OS Sheet No: SJ3390NE

Scale: 1:1250 Date: 13/10/2016

Refno	Cover Func	Invert	Size.x	Size.y	Shape	Matl	Length	Grad
6901 6902 7701 7703	6.73 CO 8.35 CO 8.23 CO 7.88 CO	3.87 4.38 4.99	580 900 450	930 1850	EG EG CI	BR VC VC	5.1 131.93 11.18	240
7801	7.13 CO	3.83	900	1850	EG	VC	30.76	220
7802	7.12 CO 7.44 CO	4.59 5.32	300	280	CI	VC	8.83	28
7804 7901	7.5 CO CO	5.59 0	150		CI	VC	8.06	64
7903 7904	8.38 CO 8.8 CO	5.93	300		CI	VC	37.12	112
7905 8501	7.78 CO 8.38 CO	6.39	150		CI	VC	29.3	37
8502 8503	7.76 SW 8.22 SW	4.51 5.05	1524 914		CI CI		20.2 80.26	149
8505 8601	FO 9.46 CO							
8602 8603	9.37 SW	0	450		CI	VC	12 65	
8604 8605	9.85 CO	7.16	600	870	EG	BR	11.66	
B606	10.13 SW	4.90	150		ci	VC	32.33	
B607 B612	10.49 FO	5.94	225		CI	VC	7.62	6
8701 8702	11.66 CO 13.2 CO	6.78 10.77	100 500	830	EG	VC BR	39.05 27.2	7
8703 8704	11.52 FO 11.52 FO	0 8.24	225 225		CI CI	VC VC	31.14 77.06	34
8705 8706	11.63 FO FO	8.26	225 225		CI	VC	10 14 42	
8708 8801	cõ	Ū	225		či	vč	11.29	
8803	15.84 CO	12.97	825		CI	VC	10.82	
8901 8902	14.69 CO 15.62 CO	9.51	375		CI	VC	34.06	64
8903 8904	17.83 CO 16.83 CO	15.01 10.38	550 375	900	EG Cl	BR VC	33.54 44.72	235
9501 9502	7.81 CO 8.27 CO	0	600		CI	со	31.44	
9503 9504	10.61 CO 10.94 CO	6.52	600	1130	EG	BR	8.25	
9505	12.89 CO	8.63	600	1130	EG	BR	72.62	34
9601	14.42 CO	10.24	570	1050	EG	BR	28.32	32
9602 9604	15.55 CO		225		CI	VC	42.08	
9605 9606	15.22 CO 15.65 CO	11.16	580	1100	EG	BR	7.81	781
9607 9608	16.05 CO 15.96 CO	11.84	600		CI	со	36.12	75
9609 9701	16.4 CO 18.31 CO	13.09	225		CI	VC	24.08	65
9801	18.07 CO	14.36 15 93	450 570	825 1000	EG FG	BR BR	44.41 28.43	
9806	19.26 CO	15.66	560	940	EG	BR	2.83	
9808	18.26 CO	0	550	900	EG	BR	37.22	
9809 9901	19.07 CO 18.41 CO							
9902 9903	18.63 CO 18.16 CO	13.66	300		CI	VC	55.01	
6904 6905	CO CO							
7705 7805	FO CO	3.69	900	1550	EG	VC	35.37	253
7806	CO	5.86	225	300	EG	VC	7.32	
B613	čõ	0	914	1524	EG	čŏ	49.65	
B709	co	0.09	400			vC	40.05	
9509	co	0	825		CI	BK	8.06	
9516 9603	CO CO	10.66	570	1050	EG	BR	22.63	57
9610 9611	CO CO	11.15 12.02	580 940	1010	EG CI	BR BR	8.49 35.47	849 209
9817 9818	CO CO	0	750 280	1200 390	EG EG	CO BR	39.02 12.04	
9819	CO	16 12	570	1000	FG	BR	19 21	107
9821	cõ	0	1050	1000	CI	CO	8	107
9905	co	0	1050			00	0	
9909 9910	co	0	225		CI	VC	8.2 21.46	
0909 6903	CO							
7702 7807	CO FO							
8608 8609	CO CO	0	914	1524	EG	СО	14.32	
8611 8802	FO	0	450	825	FG	BR	42 44	
9507	cõ	Ū	100	020	20	BIX		
9510	co	0	1524		CI	co	1.24	
9702	co	0	1500			00	23.23	
9813 9904	CO	0	225		CI	vC	11.4	
9906 9500	CO CO							
9511 9513								
9703 9803	CO							
9804	19.33 CO							
9810	co							
9816 9900	CO							

#### WASTE WATER SYMBOLOGY

Foul	Surface	Combined	Overflow
•	•	•	
<b>T</b>	<b>T</b>	<b>†</b>	<b>T</b>
— <b>-</b> -	— <b>-</b> -		
<b></b>	<b>_</b>		
	<b>b</b>		

Manhole Manhole, Side Entry MainSewer, Public MainSewer, Private MainSewer, S104 Rising Main, Public Rising Main, Private Rising Main, S104 Highway Drain, Private

			Sheet	1	of 1		
			11	2 No	odes		
		S	Scale: 1:1250	Da	te: 13/	10/20	16
			)S Sheet N	<u>n S</u>	13300		
any loss	e with t or dar yright a	he best ir nage caus ind databa	formation currently av sed by the actual positi ase rights [ 2016] Ordn	ailable. on being ance Su	United Utilit different fr rvey 10002	ties Wate om those 2432.	r will not accept liabili shown.
GRP	Glass F on of th	Reinforced ne undera	Plastic round apparatus show	U n on th	Unspecified is plan is a	l Ipproxima	te only and is given
GRC	Glass F	Reinforced	Concrete	MAR	Masonry, C	andom	
CC PSC	Concre	te Box Cul	verted	PF MAC	Pitch Fibre	oursed	
CSU	Concre	te Segmen	t Unbolted	PP	Polypropyle	ene	
CO CSB	Concre Concre	te te Segmen	t Bolted	ST VC	Steel Vitrified Cla	iy	
RP	Reinfo	rced Plastic	c Matrix	SI	Spun Iron		
PE	Polyeth	nylene		CI	Cast Iron		
AC BR	Asbest Brick	os Cement	I	DI PVC	Polyvinyl C	hloride	
SEWER					Dustile		
SQ S	Square		·				
FI F RE F	<ul> <li>at Top</li> <li>Rectang</li> </ul>	ular	HorseShoe				
OV (	Dval		BA Barrel				
EG E	Egg		AR Arch				
SEWEF	<b>R SHAP</b> Circular	E	TR Trapezoidal				
OV 0	Overflov	N					
SW S	Surface	Water					
MANH FO I	<b>OLE FL</b> Foul	INCTION					
			LEGEN	D			
●" ( →( →	• •	●"  • ←( →	Discharge Point Outfall			•	Unspecified
			Screen Chamber			CK	Control Kiosk
O Foul Su	O rface Co	O Imbined Ove	вила Manhole enlow				
	0		Penstock Chamber				
٢	0	0	Vortex Chamber				
•	•	•	Orifice Plate				
T T	T T		Network Storage Tapk				
ST		51	Septic Tank Vent Column				
			WW Treatment Work	(5			
	.DS		DropShaft				
WO	WO	wo	Washout Chamber				
(vc)	vc	ve	Valve Chamber				
VA	VA	VA	summit Valve				
SM	SM	SM	Soakaway Summit				
e RE	e RE	RE •	RoddingEye				
<b>A</b>			Pump				
PE	PE	PE	PenStock				
•	•	-	OilInterceptor				
LH LH	ш	ш _н	T Junction/Saddle				
<i></i>		→ <b>İ</b> →-	Sewer Overflow				
à	-		Sludge Pumping Stat	ion			
	•		WW Pumping Station	e water 1			
©A)	A	(CA)	Catchpit				
$\oplus$	$\oplus$	$\oplus$	Bifurcation				
IC	IC	IC	Inspection Chamber				
IN	N	IN	Hydrobrake / Vortex				
HS	HY	HY	Head of System				
HA	HA •	HA	Hatch Box		<u> </u>	Sludge N	Aain
GU	GU	GU	Gulley		→	Highway	/ Drain
FM	FM	FM	Flow Meter		→	MainSev Rising M	wer Iain
ES	ES	ES	Non Return Valve		ABANDO	ONED PI	PE
e CA	CA •	CA NEW	Cascade				
	•	•	Air Valve		- 222	Sludg	e Main, Private Main S104

SEWER RECORDS

Refno Cover Func Invert Size.xSize.yShapeMatl Length Grad



OS Sheet No: SJ3391SE

Printed By: Property Searches

Refno 001	Cover Func 7 CO	Invert 3 08	Size.x 950	Size.y	Shape FG	Matl	Length 78 69	Grad
002 003	6.94 CO 7.63 CO	0	150	1000	CI	VC	8.23	
009 101	FO 6.6 CO							
102 103 104	CO 6.67 CO 6.71 CO	3.43	510	890	EG	BR	7.13	2
200 201	6.95 CO	5.55	500	550	LO	DIX	5	2
202 203	6.76 CO 6.95 CO							
301 302	CO CO							
401 405	7.03 CO FO	0	2440		CI	CO	251.64	
001	8.66 CO 9.51 CO	4.35 5.22	450 550	950	EG	BR	13.04 12.21	93 28
003	9.08 CO CO	5.11	300		CI	VC	21.4	35
102 103	10.84 CO 11.22 CO							
104 105	11.26 CO 10.65 CO							
106 108	8.49 CO CO							
120 201 202	7.02 CO							
202 203 204	11.57 CO 6 79 CO							
205 206	8.44 CO 11.76 CO	5.7	225		CI	VC	32.02	11
301 001	8.86 CO 15.42 CO							
002 004	17.11 CO CO	12.72 0	600 225		SQ CI	VC VC	39.05 18.03	15
005 008	13.84 CO 16.71 CO	13.8	300		CI	VC	15.81	144
009 010 101	16.46 CO	13.94 14.05	300		CI	VC	9.9 12.21	122
101 102 103	13.68 CO 14.6 SW	10.03	600	900	EG	VC	39.02	16
104 105	13.5 CO 14.57 CO	9.33	600	900	EG		45	8
108 201	13.78 CO 12.93 CO	9.84	920			BR	53.78	9
202 203	CO 14.13 CO		300		CI	VC	17.26	
205 210	13.79 CO CO	9.56 0	970 762	1150 1219	EG EG	BR CO	41.22	-
302 304	13.99 CO 13.99 CO	11.35	300 950	960	EG	BR	33.54	224
304 306 401	13.95 CO	9.85	940 940 750	980 980 1130	EG	BR	3.16 22.2	22
402 403	CO	0.0	1090	1100	CI	со	32.06	~~~
005 007	16.1 CO 16.39 CO	14.18	300		CI	VC	12.08	93
008 009	CO 15.96 SW	0 11.6	300 450		CI CI	VC VC	11.18 57.22	
101 102 103	15.2 SW 15.02 SW	11.89	300		CI	VC	24.74	2
103 104 105	15.66 SW 16.13 SW	12.21	450 450		CI	VC	73.35 33.96	3 159 309
401 402	16.15 CO 14.38 CO	12.74	550	940	EG	BR	56.6	000
403 404	CO CO	0	940		CI	CO	23.09	
401 800	16.14 CO CO	0	1050		CI	VC	35.71	
110	CO	0	1500	700	CI	VC	3	
305 400	co	0	450	790	CI	CO	34 54	
403 404	CO CO	1.43	930	1480	EG	čõ	27.59	276
000 006	CO CO	0 4.21	300 450		CI CI	VC VC	8.65 13.57	97
007 008	CO CO	4.78 0	560 300	1000	EG CI	BR VC	12.21 21.56	28
107	CO	0	560 600	910 900	EG EG	BK	13.04 36.17	
122	co	5 28	560	960	FG	BR	19.03	23
124 125	ČŎ CŎ	0	530 580	920 940	EG EG	BR BR	6 9	20
207 208	CO CO							
000 006	CO CO	0 0	1150 300		CI CI	CO VC	8.29 17.43	
107 109	CO							
204 209								
212 300	CO CO	0	600	700	EG	со	33.05	
405 010	CO CO							
200 408	CO CO	0	1200		CI	CO	11.9	
411 412	CO	0	620	1090	EG	BR	31.02	
004	CO	U	100	1130	EG	ВК	JJ.25	
007 008	CO							
105 107	CO							
109 204	CO							
205	CO FO							
402 011	CO							
109	co							

CC CO CO CO CO CO CO CO

#### WASTE WATER SYMBOLOGY

Foul	Surface	Combined	Overflow
•	•	•	
<b>T</b>	<b>T</b>	<b>—</b>	<b>•</b>
			-
— <b>—</b> —	— <b>—</b> —	— <b>—</b> —	
<b></b>		<b>_</b>	

Manhole Manhole,Side Entry MainSewer, Public MainSewer, Private MainSewer, S104 Rising Main, Public Rising Main, Private Rising Main, S104 Highway Drain, Private

Foul	Surface	Combine	d					
O AV	O AV	O AV	WW	/ Site Termination		_	Sludge Main, Public	
•	e e	•	Air	√alve			Sludge Main, Private Sludge Main, S104	
• NEV	• NEV	NRV	Casi	cade				
e ES	• =	e	Nor	Return Valve		ABANDO	ONED PIPE	
FM	EM	EM	Exte	ent of Survey		→	MainSewer	
GU	GU	GU	FION	w Meter		<u> </u>	Rising Main	
	на	+A	Gull	ey		<b>—</b> ———	Highway Drain	
HS	• HS	HS	Hati	ch Box		<u> </u>	Sludge Main	
HY	н	ну	Hea	d of System				
N	• IN	IN	Hyd	robrake / Vortex				
	•	C	Inle	t				
-			Insp	ection Chamber				
U O	U O	U O	Bitu	ircation				
(CA)	(A)	9	Cate	mpit				
	•		Con	taminated Surface	e water			
		•	Shu	r Pumping Station Hoe Pumping Statio	מר			
233		<u>م</u> ظّم	Sev	ver Overflow	511			
凸	西	 	Th	nction/Saddle				
LH	LH	ЦН	l am	nHole				
0	a	-	Oill	ntercentor				
PE	PE	PE	Per	Stock				
			Pun	10 ar				
RE	RE	RE	Rod	ldingEve				
-	so	so	Sna	kawav				
SM	SM	SM	Sun	nmit				
VA	VA	<b>VA</b>	Val	ve.				
(vc)	(vc)	(vc)	Val	ve Chamber				
wo	wo	wo	Wa:	shout Chamber				
DS	DS	DS	Dro	pShaft				
WVTW			WW	/ Treatment Works	;			
ST		ST	Sep	tic Tank				
-	-	<b>.</b>	Ven	t Column				
T			Net	work Storage Tank				
• <sup>OP</sup>	OP	•°P	Orif	ice Plate				
٢	O	ø	Vort	ex Chamber				
			Pen	stock Chamber				
0	O Surface C	O ombined Ove	Blin	d Manhole				
Foul (		UTITIET OVE						
Foul ! ===			l s	creen Chamber			CK Control Kiosk	
Foul S		•	≣ si ₿ Di	creen Chamber scharge Point			CK Control Kiosk	
Foul s		■ ■ • • • • •	II si P Di ✓ O	creen Chamber scharge Point utfall			CK Control Kiosk • Unspecified	
Foul S		■ ■ ● ● ● +-( →	II s IP Di → O	creen Chamber scharge Point utfall <b>LEGENI</b>	D		CK Control Kiosk  Unspecified	
Foul S	IHOLE FU		II si ĭ° di ≺ o	creen Chamber scharge Point utfall LEGENI	D		CK Control Kiosk  Unspecified	
Foul S MAN FO SW	IHOLE FU Foul Surface		II si r Di -≺ O	creen Chamber scharge Point utfall <b>LEGENI</b>	D		CK Control Kiosk  Unspecified	
Foul S MAN FO SW CO OV	IHOLE FU Foul Surface Combin		II si ĭ° Di ≺ O	creen Chamber scharge Point utfall <b>LEGENI</b>	D		CK Control Kiosk  Unspecified	
Foul S MAN FO SW CO OV SEW	IHOLE FU Foul Surface Combin Overflor ER SHAF	JNCTION Water ed w PE	II si ₽ Di - <b>(</b> O	creen Chamber scharge Point utfall <b>LEGENI</b>	D		Control Kiosk ◆ Unspecified	
Foul S MAN FO SW CO OV SEW CI	IHOLE FU Foul Surface Combin Overflor ER SHAF	JNCTION Water ed w PE	TR	creen Chamber scharge Point utfall LEGENI	D		<ul><li>Control Kiosk</li><li>◆ Unspecified</li></ul>	
Foul S MAN FO SW CO OV SEW CI EG OV	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg	JNCTION Water led w PE	TR AR	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch	D		Control Kiosk ◆ Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top	JNCTION Water Hed WE	TR AR HO	creen Chamber scharge Point utfall <b>LEGENI</b> Trapezoidal Arch Barrel HorseShoe	D		Control Kiosk  Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang	JNCTION Water Hed WE	TR AR HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	D		○ Control Kiosk ◆ Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square	JNCTION Water Hed W PE	TR AR HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	D		○ Control Kiosk ◆ Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE	JNCTION Water ed w PE	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	D		Control Kiosk  Unspecified	
Foul S MAN FO SW CO SW CO OV SEW CI EG OV FT RE SQ SEW AC	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest	JNCTION Water led w PE ullar RIAL tos Cement	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	DI	Ductile Iron	Control Kiosk	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PF	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polvet	JNCTION Water Hed W PE JULAR SEINCE SEI	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	D DI PVC CI	Ductile Iron Polyvinyl C Cast Iron	Control Kiosk  Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo	JNCTION Water ed w PE ular ERIAL tos Cement hylene rced Plastic	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	D DI PVC CI SI	Ductile Iron Polyvinyl C Cast Iron Spun Iron	Control Kiosk  • Unspecified  thoride	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Brick Polyett Reinfo Concre	JNCTION Water led W PE JULAR SRIAL tos Cement hylene rced Plastic ete	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	DI PVC CI SI ST	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel	Control Kiosk  • Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre	JNCTION Water Hed W PE Hular FIAL tos Cement hylene rced Plastic ete te Segment	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	DI PVC CI SI ST VC	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla	Control Kiosk ★ Unspecified	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre Concre	JNCTION Water Hed Water Hed W PE Hular FRIAL tos Cement hylene rced Plastic te te Segment te Segment te Segment	TR AR BA HO UN	creen Chamber scharge Point utfall LEGENI Arch Barrel HorseShoe Unspecified	DI PVC CI SI VC PP	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyle	Control Kiosk • Unspecified hloride	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Brick Polyett Reinfo Concre Concre Concre	JNCTION Water led w PE gular ERIAL tos Cement hylene rced Plastic ete te Segment te Segment te Segment	TR AR BA HO UN t Bolted t Unbo verted	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified	DI PVC CI SI ST VC PP PF	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyla Pitch Fibre	Control Kiosk • Unspecified chloride	
Foul S MAN FO SW CO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC PSC GRC	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Brick Polyett Reinfo Concre Concre Concre Concre Concre	JNCTION Water Hed Water Hed W PE Hular FRIAL tos Cement hylene rced Plastic ete te Segment te Segment te Segment te Segment Reinforced	TR AR BA HO UN t Bolted t Unbo verted posite Concre	creen Chamber scharge Point utfall LEGENI Trapezoidal Arch Barrel HorseShoe Unspecified Unspecified	DI PVC CI SI ST VC PP PF MAC MAR	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyle Pitch Fibre Masonry, C Masonry R	Control Kiosk • Unspecified hloride av ene coursed andom	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC PSC GRC GRP	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre Concre Concre Concre Plastic Glass I Glass I	JNCTION Water Hed Water Hed W PE Hular FRIAL tos Cement hylene rced Plastic Ate Segment te Segment te Segment te Segment Reinforced Reinforced	TR AR BA HO UN t Bolted t Unbo verted posite Concre Plastic	treen Chamber scharge Point utfall LEGENI Arch Barrel HorseShoe Unspecified Unspecified	DI PVC CI SI VC PF MAC MAR U	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyla Pitch Fibre Masonry, C Masonry, R Unspecified	Control Kiosk • Unspecified whoride	
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC PSC GRC GRP The positi accordant for any loc	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre Conc Concre Concre Concre Concre Conc Conc Concre Conc Concre Conco	JNCTION Water Hed Water Hed W PE Hular FRIAL tos Cement hylene rced Plastic Ate Segment Ate Segm	TR AR BA HO UN t Bolted t Unbo verted posite Concre Plastic round aforma sed by ase rig	treen Chamber scharge Point utfall LEGENI Arch Barrel HorseShoe Unspecified Unspecified	DI PVC CI SI VC PF MAC MAR U non th ilable. on being nce Su	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyle Pitch Fibre Masonry, C Masonry, R Unspecified United Utili g different fi Irvey 10002	Control Kiosk Unspecified hloride Ay ene coursed andom functions and is given ties Water will not accept liab rom those shown. 2432.	n in ility
Foul S MAN FO SW CO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC PSC GRC GRP The posit accordant for any loc	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre	JNCTION Water and databa	TR AR BA HO UN t Bolted t Unbo verted posite Concre Plastic round ase rig	treen Chamber scharge Point utfall LEGENI Arch Barrel HorseShoe Unspecified Unspecified	DI PVC CI SI VC PF MAC MAR U n on th ilable. on being nce Su	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyla Pitch Fibre Masonry, C Masonry, R Unspecified United Utili g different fi Irvey 10002	Control Kiosk  Unspecified  Av ene  Coursed andom  pproximate only and is giver ties Water will not accept liab rom those shown. 2432.	n in ility
Foul S MAN FO SW CO OV SEW CI EG OV FT RE SQ SEW AC BR PE RP CO CSB CSU CC PSC GRC GRP The positi accordant for any loc	IHOLE FU Foul Surface Combin Overflor ER SHAF Circular Egg Oval Flat Top Rectang Square ER MATE Asbest Brick Polyett Reinfo Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre Concre	JNCTION Water and databa	TR AR BA HO UN t Bolted t Unbo verted posite Concre Plastic round ase rig	Trapezoidal Arch Barrel HorseShoe Unspecified d ted apparatus showr to n currently ava the actual position hts [ 2016] Ordna	DI PVC CI SI VC PF MAC MAR U non the ilable. on being nce Su	Ductile Iron Polyvinyl C Cast Iron Spun Iron Steel Vitrified Cla Polypropyle Pitch Fibre Masonry, R Unspecified United Utili g different fi Irvey 10002	Control Kiosk Unspecified whoride whoride we ene coursed andom more shown. 2432.	n in ility
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SEWER RECORDS

Refno Cover Func Invert Size.xSize.yShapeMatl Length Grad



#### WASTE WATER SYMBOLOGY

Foul	Su	urface	Combined	Overflow				Overflow	N	Foul	Surface	Combined			
	+ +				Manhole Manhole, Side MainSewer, Pr MainSewer, SJ Rising Main, P Rising Main, P Rising Main, SJ	Entr ublic rivato 104 ublic rivat 104	e e	Abando	Sludge Main, Public Sludge Main, Private Sludge Main, S104 ned Pipe MainSewer Rising Main Highway Drain		• • •		Septic Tank Vent Colum Network St Orifice Plat Vortex Cha Penstock Cl Blind Manh	n orage Ta e mber namber ole	ank
					Highway Drain	n, Pri	vate	Combine	- Sludge Main	Foul	Surface	Combined	Overflow		
Foul s	o av av	Combii	ned WW Sit Air Valv Cascado	te Termina ve e	tion 🔏	Sul Sul Sul	Surface		a Sludge Pumping Station Sewer Overflow T Junction/Saddle	₽001 ■ →	≣ ● → –<			Screen Discha Outfall	Chamber rge Point
NRV	NRV	NRV	Non Re	turn Valve		CH.	LH	LH	LampHole						
• <sup>E3</sup>	• 55		Extent	of Survey		0	•		OilInterceptor				CK	Contro	l Kiosk
•***		•	Flow M	leter		PE		-FE	PenStock	Lege	nd			Unspe	cified
GU	eu	eu	Gulley						Pump	MANH FO F	OLE FUNCTIO	N SEWE	ER SHAPE Circular	TR	Trapezoidal
HA HS	HA HS	HS	Hatch E	Box		RE	•	RE	RoddingEye	SW S CO C OV C	Surface Water Combined Overflow	EG I OV 0 FT I RE 1	Egg Oval Flat Top Rectangular	AR BA HO UN	Arch Barrel HorseShoe Unspecified
HY		HY	Head o	r System	•~~	53.4		- <sup>50</sup>	Soakaway	SEWE	R MATERIAL	50	Square		
N	N	N	Inlat	rake / vor	lex •	1/A	•	•	Summit	AC A	sbestos Cem Brick	ent DI I	Ductile Iron		
_0		10	Iner	ion Chamb	•		•	•	Valve	CO C	concrete	PP I	Polypropylene Pitched Fibre		
			inspect	tion Chamb	er (	9	(vo	6	Valve Chamber	CSU C	Concrete Segr	nent MA I Culverted MA	Masonry, Cours Masonry, Rando	ed m	
() ()	() ()	0	Bifurca	tion		NO	•	•	Washout Chamber	PSC P	lastic / Steel	RP I	Reinforced Plast Cast Iron	ic	
(CA)	(CA)	0	Catchpi	it		DS	OS	•	DropShaft	GRP C	lass Reinford	ed SI 1 ride ST 1	Spun Iron Steel		
	<b>A</b>		WW Pu	imping Sta	tion 📋	Ĥ		Ê	WW Treatment Works	PEF	olyethylene	Ū i	Unspecified		

#### CLEAN WATER SYMBOLOGY

#### PIPE WORK

Live	Proposed	
		Trunk Main - PressurisedMain
		Raw Water Aqueduct - PressurisedMain
		Raw Water Aqueduct - GravityMain
		LDTM Raw Water Distribution - PressurisedMain
		LDTM Raw Water Distribution - GravityMain
		LDTM Treated Water Distribution - PressurisedMain
		LDTM Treated Water Distribution - GravityMain
		Private Pipe - LateralLine
		Distribution Main - PressurisedMain
-		Comms Pipe - LateralLine
		Concessionary Service - LateralLine

#### ABANDONED PIPE

 Trunk Main
 Raw Water Aqueduct
 LDTM Raw Water Distribution
 LDTM Treated Water Distribution
 Private Pipe
 Distribution Main
 Comms Pipe
 Concessionary Service

#### PROPERTY TYPES

Live	Proposed	
¢	**	Condition Report
1	<u> </u>	Pipe Bridges
11		Tunnels (non carrier)
$\triangle$	$\triangle$	Pumping Station
Ħ		Water Treatment Works
-6	E E	Private Treatment Works

#### NODES/FURNITURES

Live	Proposed		Live	Proposed	
E	E	End Cap	PEH		Private Fire Hydrant
-	-	CC Valve	-0-	-0-	Pump
		AC valve	•	0	Site Termination
•		Air Valve	•	0	Service Start
X	I	Sluice Valve	•	0	Service End
	-	Non Return Valve	PM	PM	Process Meter
•	<b>By</b>	Pressure Management Valve	*		Stop Tap
$\nabla$	$\bigtriangledown$	Change of Characterstic	-	-	Monitor Location
<u>_</u>	17	Anode	SP	SP	Strainer Point
-	•	Chlorination Point	AP	AP	Access Point
•		Bore Hole	HB-	-	Hatch Box
iniet O	Donest O	Inlet Point		-	IP Point
$\oplus$	Ð	Bulk Supply Point	RM		Route Marker
FH	***	Fire Hydrant	SPT	SPT	Sampling Station
-		Hydrant	LB	1.8	Logger Box

#### Live Proposed



Valve House Water Tower Service Reservoir Supply Reservoir Abstraction Point Domestic meter Commercial meter Telemetry Outstation

MAT	ERIAL TYPES	LINI	NG TYPES
AC	ASBESTOS CEMENT	CL	CEMENT LINING
CI	CAST IRON	TB	TAR OR BITUMEN
CU	COPPER	ERL	EPOXY RESIN
co	CONCRETE		
DI	DUCTILE IRON	INSE	ERTION TYPES
GI	GALVANISED IRON		
GR	GREY IRON	DD	DIE DRAWN
OT	OTHERS	DR	DIRECTIONAL DRILLING
PB	LEAD	MO	MOLING
PV	uPVC	PI	PIPELINE
51	SPUN IRON	SL	SLIP LINED
ST	STEEL		
UN	UNKONWN		
PE	POLYETHYLENE		

# Appendix E

#### INDICATIVE DRAINAGE LAYOUT PLAN (70023367-D-001)



				DO NOT SCALE						
,	<u>KEY</u>	<u>,</u>								
/	; ;	»	site e Highw Existii Existii	SITE BOUNDARY HIGHWAY BOUNDARY EXISTING UNITED UTILITIES COMBINED WATER SEWER						
	EXISTING UNITED UTILITIES SEWER EASEMENT									
_	PROPOSED SURFACE WATER RISING MAIN (INDICATIVE ROUTE)									
 	PROPOSED FOUL WATER RISING MAIN (INDICATIVE ROUTE) PROPOSED COMBINED WATER SEWER GRAVITY CONNECTION									
	PROPOSED SURFACE WATER ATTENUATION TANK									
	INDICATIVE EXTENT OF BASEMENT									
	P02	10 11 2016	IB	SECOND ISSUE		рV				
	P02	27.10.2016	LB	FIRST ISSUE		DV	сс СС			
	rev	DATE	BY	DESCRIPTION		СНК	APD			
	DRAWI	NG STATUS:	PL	ANNING APPLICATIO	N					
	Т	hree White R Tel: +	Rose O 44 (0) www.	ffice Park, Millshaw Park Lar 113 395 6200 Fax: +44 (0)11 wspgroup.com www.pbworld	e, Leeds LS 3 395 6201 I.com	<b>IOF</b>	T			
/	CLIENT:		122 (	OLD HALL STREET LIM	TED					
	ARCHITE	CT:		HODDER + PARTNERS						
	PROJECT: OLD HALL STREET, LIVERPOOL									
	INDICATIVE DRAINAGE STRATEGY LAYOUT									
			DRA	INDICATIVE	OUT					
	SCALE @	) A3: 1:250	DRA	INDICATIVE INAGE STRATEGY LAY CHECKED: DV	OUT APPROVED: C	с				
	SCALE @ CAD FILE 7	₽ A3: 1:250 Ξ: 0023367-D-001	DRA P02	INDICATIVE INAGE STRATEGY LAY CHECKED: DV DESIGN-DRAWN: LB	OUT APPROVED: C DATE: Novemb	C er 2016				
	SCALE @ CAD FILE 71 PROJEC	аз: 1:250 ≘ 0023367-D-001 тм: 7002336	DRA 1 P02	INDICATIVE INAGE STRATEGY LAY CHECKED: DV DESIGN-DRAWN: LB DRAWING NO: 70023367-D-00	OUT APPROVED: C DATE: Novemb 1 P02	C er 2016 REV: PO	2			

