

Project Opera Limerick

Infrastructure Report

Limerick City & County Council

Project number: 60568520

8 March 2019

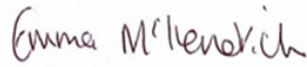
Quality information

Prepared by



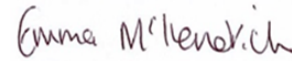
Aileen Prendergast
Senior Engineer

Checked by



Emma McKendrick
Associate Director

Approved by



Emma McKendrick
Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	08 March 2019	Planning Issue	EMcK	Emma McKendrick	Associate Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name
#16	Yes	Limerick City & County Council

Prepared by:

Aileen Prendergast
Senior Engineer

AECOM Ireland Limited
1st floor, Montrose House
Carrigaline Road
Douglas, Cork T12 P088
Ireland

T: +353 21 436 5006
F: +353 21 436 5156
aecom.com

© 2019 AECOM Ireland Limited. All Rights Reserved.

This document has been prepared by AECOM Ireland Limited (“AECOM”) for sole use of our client (the “Client”) in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Introduction	5
1.1	Proposed Development	5
1.2	Summary	5
1.3	Pre-Planning Consultation	5
1.4	Development Plan (2010 – 2016 - Extended).....	6
1.4.1	Policy WS.5 (Waste Water)	6
1.4.2	Policy WS.6/7 (Surface Water and Sustainable Urban Drainage System)	6
1.4.3	Policy WS.8 (Flood Protection and Risk).....	7
2.	Foul Water Drainage	8
2.1	Existing Foul Water System.....	8
2.2	Proposed Foul Water Drainage	8
2.3	Foul Water Design	8
3.	Storm Water Drainage	11
3.1	Existing Storm Water Network	11
3.2	Storm Water Drainage	11
3.3	Surface Water Sewer Design.....	11
4.	Surface Water Attenuation	13
4.1	Allowable Outflow	13
4.2	Proposed Rainwater Harvesting System	13
5.	Water Supply	14
5.1	Existing Water Supply Network.....	14
5.2	Proposed Water Supply Network.....	14
5.3	Proposed Water Supply Design.....	14
6.	Conclusion	15
	Appendix A – CCTV Report of Existing Combined Sewer	16
	Appendix B – Irish Water Response to Pre-connection Enquiry	17
	Appendix C – Foul Water Network Calculations.....	18
	Appendix D – Surface Water Network Calculations	19
	Appendix E - Record Drawings	20

Tables

Table 1 – Schedule Accommodation for Development	9
Table 2 – Schedule of Population Allowances and Loading	9
Table 3 – Calculation of Foul Water Generation for Each Land Parcel	9
Table 4 – Estimated DWF and 6DWF from Development	10
Table 5 – Rainwater Harvesting Tank Sizes	13

1. Introduction

1.1 Proposed Development

It is proposed to redevelop the 'Opera Site' (2.35 ha) that occupies the majority of a city block in Limerick City. The block is bounded to the west by Patrick Street and Rutland Street, to the north by Bank Place, to the east by Michael Street and to the south by Ellen Street.

The development site includes two Protected Structures, a range of existing terraced Georgian houses along Rutland Street, Patrick Street and Ellen Street, which are interspersed by Twentieth Century interventions on the corner of Patrick Street, Ellen Street and Rutland Street. The development site also includes various Twentieth Century Industrial/warehousing/workspace buildings, primarily located towards the centre of the site at Bogues Yard and Watch House Lane, and north fronting Bank Place. A surface carpark with c.100 spaces is located to the south-east corner of the site.

The main re-development relates to demolition of all the Twentieth Century buildings and later additions to the rear of existing heritage structures, which is accompanied by new-build elements and proposed renovation and adaptive re-use of the Protected Structures and the majority of other structures of heritage value within the site.

The development comprises a mixed-use scheme of primarily office uses, supported by a range of retail / non-retail services, café/restaurant, licenced premises, apart-hotel, civic/cultural uses (including the City Library), residential use, open spaces, access routes and ancillary areas. The development also includes environmental improvement works to the adjacent public streets.

For further details please refer to the EIAR which provides a full description of the proposed development. Please refer to the drawings accompanying this application for further details of the proposed development.

1.2 Summary

This report contains an outline of the design criteria for foul water drainage, surface water drainage and water supply for the proposed development.

Foul

It is proposed to drain the development by providing a new separate gravity foul sewer within the development and on Michael Street which will connect to the existing 600mm diameter Irish Water combined sewer located on Bank Place.

Please refer to AECOM Drawing No. PR289270-ACM-XX-B1-DR-CE-10-0501, 0502, 0503 and 0504 for more information on the proposed foul sewer network layout.

Surface Water

It is proposed to discharge attenuated and treated surface water flows from the development via a new separate surface water network which will discharge through a new outfall to the Abbey River.

Please refer to AECOM Drawing No. PR289270-ACM-XX-B1-DR-CE-10-0501, 0502, 0503 and 0504 for more information on the proposed surface water network layout.

Watermain

The water supply to the proposed development will be provided through individual connections from the existing 9" diameter cast iron and upgraded HDPE watermains in the streets surrounding the site

Please refer to AECOM Drawing No. PR289270-ACM-XX-B1-DR-CE-10-2701 and 2702 for more information on the proposed water supply network layout.

1.3 Pre-Planning Consultation

As part of the preliminary design, AECOM undertook consultation with Limerick City & County Council (LCCC) Planning Department on 22nd February 2017. The discussions provided AECOM with the opportunity to present the initial scheme proposals to LCCC, and to obtain relevant feedback for incorporation within the scheme.

Surface Water: At the meeting, LCCC Water Services Department requested an independent surface water network to avoid the need for discharging into the existing combined sewer. This surface water sewer would discharge to the Abbey River. LCCC did not express any preference for green roofs or rainwater harvesting.

Foul Water and Water Supply: No discussions took place regarding foul water discharge location or water supply connection as there was no representative from Irish Water present at the meeting.

A Pre-Connection Enquiry Form was submitted to Irish Water in relation to the feasibility of servicing the proposed development. Irish Water confirmed that the potable water and foul water connections are feasible but requested upgrades to the existing watermains on Ellen Street and Rutland Street.

Inland Fisheries Ireland (IFI) were consulted as part of the preliminary design. A meeting was held on 12th February 2019. The proposed surface water drainage network design, construction stage monitoring, and mitigation measures were presented to IFI to obtain feedback for incorporation within the scheme.

1.4 Development Plan (2010 – 2016 - Extended)

In preparing this Infrastructure Design Report, AECOM has taken cognisance of the Limerick City and County Council Development Plan (2010 – 2016_Extended). Of particular relevance to the production of this Infrastructure Design is Chapter 12 Part II Water Services.

1.4.1 Policy WS.5 (Waste Water)

Policy WS.5 of the Development Plan identifies a number of Statutory and Policy documents that the wastewater policy in Limerick City and County is influenced and informed by. These include the following key objectives and policies:

- Have regard to the policy, national standards and guidelines, of not allowing the discharge of contaminants and greases to the City Council sewers;
- Sewers required to be taken in charge by Limerick City and County Council in the future shall be laid in public open space.
- Access Junction boxes shall be located on the public footpath on each separate supply to individual residences or business units.
- Have regard for the specifications and details as defined in the DEHLG '**Recommendations for Site Development Works for Housing Areas**', National and Limerick City and County Council requirements in respect of discharges.

As presented in the Section 2 (Foul Water Drainage), these objectives have been taken into account.

1.4.2 Policy WS.6/7 (Surface Water and Sustainable Urban Drainage System)

Policy WS.6 of the Development Plan identifies a number of Statutory and Policy documents that the surface water management policy in Limerick City and County is influenced and informed by. These include the following key objectives and policies:

- To cater for the future developments through public and private driven initiatives where discharge capacity permits.
- Control all discharges from future developments to a maximum of 4 l/sec/ha in general areas around the City and in the areas which contribute to areas of restricted capacity, control all surface water discharges to 2 l/sec/ha through planning & development conditions.
- Monitor and control development areas of potential flooding, having regard to '**The Planning System and Flood Risk Management Guidelines for Planning Authorities, 2009**', Limerick City Council requirements, current best practice and relevant technical documents.
- Provide an adequate surface water system in order to minimise the risk of flooding.
- To work in conjunction with other public bodies towards a sustainable programme of improvement for riverbanks, back drains, etc.
- The parameters for a Hydraulic Analysis of the proposed storm water sewer network for any development as indicated:
 - Rain Fall intensity: 60mm/hr
 - Contributing areas: hard surfaces inclusive of roofs, roads, footpaths and any other hard standing area - 100% impermeable.

- Green areas or park land - 20% impermeable.
- Storm water drainage sewers shall be designed to cater for a storm return period of a 1:30 year storm without surcharge and to cater for a 1:100-year storm without flooding

The LCCC surface water objectives have been taken into account for the proposed development. As presented in Chapter 3 (Surface Water Drainage), the scheme has been designed in accordance with the above objectives and documents.

Policy WS.7 of the Development Plan recognises the importance of Sustainable Urban Drainage Systems (SuDS) and states that it is council policy that all development proposals incorporate SuDS.

As presented in Chapter 4 (Surface Water Attenuation) the LCCC sustainability drainage systems objectives have been taken into account for the proposed development.

1.4.3 Policy WS.8 (Flood Protection and Risk)

The Development Plan recognises the requirement to deliver designs that take flood risk and potential impacts into account. It is policy of LCCC that Applicants proposing development in an area where there is a flood risk shall:

- Provide a detailed study and modelling exercise of the catchments, Risk Assessment of whether the proposed development is likely to be affected by flooding (including for climate change), whether it will increase flood risk elsewhere and of the measures proposed to deal with these effects and risks in accordance with '**The Planning System and Flood Risk Management Guidelines for Planning Authorities**', 2009.
- Satisfy the planning authority that any flood risk arising from the proposal will be successfully managed with the minimum environmental effect to ensure that the site can be developed and occupied safely.
- Comply with Limerick City Council planning authority requirements on finished floor levels.

AECOM have carried out an assessment of the site with respect to flood risk. The details of this are included in a separate Flood Risk Assessment report submitted as part of this application.

2. Foul Water Drainage

2.1 Existing Foul Water System

The site is currently served by an existing 350mm diameter brickwork culvert combined sewer which runs diagonally through the site. This discharges to a 450mm diameter combined sewer in Patrick Street which in turn discharges to an 1800mm diameter interceptor sewer in the River Shannon. This ultimately flows to the wastewater treatment facility in Bunlicky.

A CCTV survey of the brickwork culvert was undertaken (See Appendix A) and the culvert was found to be in a poor state of repair. The invert levels of the upstream manhole are 2.71m OD Malin and downstream manhole is 1.26m OD Malin.

2.2 Proposed Foul Water Drainage

The existing brickwork culvert is at the same level as the basement proposed as part of the development. Therefore, it is proposed provide a new foul sewer in Michael Street to allow flow in the existing culvert to be diverted around the development (from Manhole EXF36). The existing culvert will then be decommissioned and removed as part of the proposed works.

Within the proposed development, a separate foul water drainage network will be provided to serve all new buildings. A gravity network will discharge foul flows to the diverted sewer in Michael Street and to the existing 600mm diameter combined sewer on Bank Place. As the basement is at a lower level than the proposed gravity system, a pumped system will be required to convey wastewater from the basement to the gravity network at street/ground floor level. It is proposed to provide duty and stand-by pumps in order to ensure the system stays operational in the event of a pump failure. In addition, the pump sump has been designed to provide 24-hour storage to allow for emergency works in the event of a failure.

Due to the particular risk of contamination by detergents, runoff from the basement car park will also be discharged to the basement foul water network.

All food production areas that may generate grease, fats, oils will discharge through a grease trap to prevent maintenance issues during the operation phase of the development.

Please see Appendix B for Pre-connection enquiry response.

Please refer to AECOM Drawing No. PR289270-ACM-XX-GF-DR-CE-10-0501, 0502, 0503 & 0504 for more information on the proposed foul water network layout.

2.3 Foul Water Design

The proposed foul sewers have been designed in accordance with the Building Regulations and specifically in accordance with the principles and methods set out in the Department of Environment, Heritage and Local Government 'Recommendations for Site Development Works.

The following criteria have been applied in the design of foul sewers:

- The foul loading rates are based on the Environmental Protection Agency (EPA) Waste Water Manual "Treatment Systems for Small Communities, Business, Leisure Centres and Hotels" within specific guidance taken from Table 3 "Recommended Wastewater Loading Rates from Commercial Premises".
- The occupancy loading factors are based on the guidelines set out in 'Table 1.1 – Occupancy Load Factor' in 'Part B' of 'The Building Regulations'.
- The proposed foul sewer system within the development has been designed to convey peak flows (6DWF).

The tables below provide details of the estimated flows generated by the proposed development.

Table 1 – Schedule Accommodation for Development

PARCEL	Retail Plan Area (m ²)	Office Plan Area (m ²)	Cultural Plan Area (m ²)	Restaurant/ Café/ Bar Plan Area (m ²)
1	766	9589	0	316
2A	862.5	0	0	0
2B	0	0	0	737.2
3A	0	0	1519	609.8
3B	377.6	0	0	0
4	0	2327	1968	0
5	0	6367	0	0
Total	1605	18283	3487	1663

Table 2 – Schedule of Population Allowances and Loading

Building Use	Staff Allowance (1 Person per X m ²)	Load/ person/ day
Retail	15	28
Office Space	12	60
Restaurant/ Café/ Bar	15	30
Cultural	30	5

Table 3 – Calculation of Foul Water Generation for Each Land Parcel

	Retail	Office	Cultural	Restaurant/ Café/ Bar
Parcel 1				
Estimated Users	51	799.08	0.00	21.07
Flow (l/day)	1430	47945	0	632.00
Dry Weather Flow (l/s)	0.02	0.55	0	0.01
Parcel 2 A				
Estimated Users	58	0	0	0
Flow (l/day)	1610	0	0	0
Dry Weather Flow (l/s)	0.02	0.00	0.00	0.00
Parcel 2 B				
Estimated Users	0	0.00	0.00	49.15
Flow (l/day)	0	0	0	1474.42
Dry Weather Flow (l/s)	0.00	0.00	0	0.02
Parcel 3 A				
Estimated Users	0	0.00	50.63	40.65
Flow (l/day)	0	0	253	1220
Dry Weather Flow (l/s)	0.000	0.000	0.003	0.014
Parcel 3 B				
Estimated Users	25	0.00	0.00	0.00
Flow (l/day)	705	0	0	0
Dry Weather Flow (l/s)	0.01	0.00	0.00	0.00
Parcel 4				
Estimated Users	0	193.92	65.60	0.00
Flow (l/day)	0	11635	328	0
Dry Weather Flow (l/s)	0.000	0.135	0.004	0.000
Parcel 5				
Estimated Users	0	530.58	0.00	0.00
Flow (l/day)	0	31835	0	0
Dry Weather Flow (l/s)	0.00	0.37	0.00	0.00
Basement Parking (Ex Bldg.)				
Estimated Users	0	0.00	0.00	0.00
Flow (l/day)	0	0	0	0
Dry Weather Flow (l/s)	0.00	0.00	0.00	0.00

Residential and ApartHotel				
Estimated Users	458			
Flow (l/day)	100760			
Dry Weather Flow (l/s)	1.17			

Table 4 – Estimated DWF and 6DWF from Development

Parcel	DWF (l/s)	6DWF (l/s)
1	0.58	3.47
2A	0.02	0.11
2B	0.02	0.10
3A	0.02	0.10
3B	0.01	0.05
4	0.14	0.83
5	0.37	2.21
Basement parking area (Ex BLD AREAS)	0.00	0.00
Residential and ApartHotel	1.17	7.00
Total	2.31	13.88

Please refer to Appendix C for details of the calculations for the proposed foul water network.

3. Storm Water Drainage

3.1 Existing Storm Water Network

LCCC records show that there is no separate storm water drainage network within or around the proposed development site. Surface water runoff generated within the site is currently collected by gullies and discharges to an existing 350mm diameter brickwork combined sewer that runs through the site. The existing road gullies on Michael Street, Ellen Street, Patrick Street, and Rutland Street are likely to discharge into the local combined sewer network. Existing gullies on Bank Place discharge directly to the Abbey River.

3.2 Storm Water Drainage

Within the site, a separate storm water drainage network will be provided to serve the proposed development. This network will collect, attenuate and treat runoff generated within the development. In addition to the proposed foul sewer in Michael Street, a new storm water sewer will be provided. Gullies which currently discharge to the existing combined sewer in Michael Street will be diverted to the proposed surface water sewer. Run-off collected by these gullies will flow through a proposed Class I By-Pass hydrocarbon interceptor, located in Michael Street. This will result in the removal of hydrocarbons and sediment suspended in run-off generated on Michael Street. Downstream of the interceptor run-off will discharge to the Abbey River through the proposed outfall.

Surface water runoff generated within proposed development will be collected by a combination of linear drains (ACO Brickslot or equivalent) and gullies. It is proposed to provide a sewer network within the development which will convey runoff to the attenuation tank proposed adjacent to the Granary Building. Prior to entering this attenuation tank, surface water will flow through a Class I By-Pass hydrocarbon interceptor (providing a concentration of 5 mg/l). This will provide treatment of run-off by removing hydrocarbons and allow for settlement of suspended sediment.

This attenuation tank will have a flow control device restricting the discharge to 4 l/s/ha, as set out in the development plan. Due to level constraints within and surrounding the proposed development, a pump will be required to convey flow from the manhole downstream of the Granary attenuation tank to a header manhole in Bank Place. From here, surface water will be discharged to the Abbey River via the proposed outfall.

Surface water run-off from the facade of the landmark building in Bank Place will discharge to an attenuation tank located in Bank Place prior to forward discharge to the Abbey River. This attenuation tank will have a flow control device restricting the forward flow to the limit set out in the development plan, 4 l/s/ha.

The existing gullies on Bank Place, which currently discharge directly to the Abbey River, will be diverted to the proposed surface water drainage system and will then discharge through the proposed outfall. Following consultation with Inland Fisheries Ireland (IFI) it is proposed to provide a recessed outfall with a rubber flap valve.

Limerick Twenty Thirty has given an undertaking to establish a maintenance company that will be responsible for the regular maintenance and monitoring of all infrastructure installed as part of the development. This includes the surface water drainage, gullies and petrol interceptor on Michael Street. Future third party Connection to the infrastructure in Michael Street will only be permitted if the same undertaking can be given with regards maintenance and monitoring. Limerick Twenty Thirty will be responsible for funding of the company and should units be sold (or resold) or leased (or subsequently lease), the sale shall incorporate a legal obligation on each unit owner to fund this management company on a pro rata basis.

It is proposed to provide a Rain Water Harvesting System (RWHS) within the development to facilitate re-use of roof run-off. The proposed surface water drainage network has been designed to allow for overflow from the areas served by the RWHS. The rainwater harvesting tanks capacity has been design in accordance with BS 8515: 2009 Rainwater harvesting systems: Code of practice. It proposed that tanks will be fitted with an overflow system that pumps overflow water to the adjacent surface water system.

Please refer to AECOM Drawing No. PR289270-ACM-XX-GF-DR-CE-10-0501, 0502, 0503 & 0504 for more information on the surface water network layout.

3.3 Surface Water Sewer Design

The proposed network has been designed in accordance with the Department of Environment, Heritage and Local Government 'Recommendations for Site Development Works' and Limerick City and County Development Plan.

The proposed surface water drainage network has been designed to convey run-off associated with a 1 in 5-year return period event without surcharge and a 1 in 100-year return period event without flooding. The following parameters were applied in the design:

- Rainfall Intensity = 60mm
- Hard Surfaces / Paved Areas / Roof Areas = 100% impermeability
- Return Period = 5 Year
- Time of entry = 4 mins
- Pipe Ks = 0.6mm
- Climate change allowance = 20% increase in flow rates.

Please refer to Appendix D for details of the calculations for the proposed surface water drainage network.

4. Surface Water Attenuation

4.1 Allowable Outflow

It is proposed that surface water runoff from the development will be attenuated in accordance with the requirements set out in the Limerick City & County Council Development Plan. The allowable outflow from the two attenuation tanks has been set based on the rate of 4 l/s/ha set out in the Development Plan. Flow restriction on the proposed surface water drainage network will be by means of a HydroBrake (or equal approved) flow control device within the manhole downstream of each attenuation tank.

Please refer to AECOM Drawing No. PR289270-ACM-XX-GF-DR-CE-10-0503 & 0504 for more information on the surface water attenuation system.

4.2 Proposed Rainwater Harvesting System

The rainwater harvesting tanks capacity has been design in accordance with BS 8515: 2009 *Rainwater harvesting systems: Code of practice*. This standard recommends that the rainwater harvesting tanks should have capacity for 18 days of average rainfall. Table 4.1 below outlines the initial capacities provided for each building parcel. It proposed that tanks will be fitted with an overflow system that pumps overflow water to the adjacent surface water system (located generally on the underside of basement roof slab).

Relatively small volumes of rainwater collected by the proposed rainwater harvesting tanks (134 m³ total capacities – See Table 5) will enter the public sewer network during typical low intensity storms thus decreasing the impact of the development on the receiving environment, reducing the peak flows generated.

Table 5 – Rainwater Harvesting Tank Sizes

PARCEL	Roof Area (m ²)	Capacity (m ³)
1	3001	46
2A	2031	31
3A	683	10
4	1716	26
5	1354	21
Total Capacity		134

There has been no provision for a green roof as it is proposed to utilise the roof space for plant and photovoltaic solar panels. Further details of this arrangement are outlined in the Energy Strategy Report prepared by our Mechanical & Electrical design team.

5. Water Supply

5.1 Existing Water Supply Network

There is an existing 9" diameter cast iron Irish Water watermain running in all streets surrounding the site. Following submission of the Pre-connection Enquiry Irish Water advised that to accommodate the proposed development, upgrade works are required to increase the capacity of the network in the area. The following upgrades are required:

1. Replacement of the existing watermain on Rutland Street from its junction with Francis Street to Bank Place and upgrade to 250 mm diameter HDPE watermain,
2. Replacement of the existing watermain in Ellen Street from its junction with Patrick Street to Michael Street and upgrade to 250 mm diameter HDPE watermain.

5.2 Proposed Water Supply Network

Sections of the existing 9" diameter cast iron mains in Ellen Street and Rutland Street will be upgraded to a 250mm diameter HDPE at the request of Irish Water. It is proposed that each building will be served by individual service connections from the existing 9" diameter water mains in Bank Place, Michael Street and Patrick Street. 2 no additional fire hydrants and a sluice valve will be provided within the Public Plaza. The new water supply connection serving the development will incorporate a bulk water meter and individual water meters will be installed upon the water supply to the individual buildings.

5.3 Proposed Water Supply Design

The water supply network is based on the Department of the Environment 'Recommendations for Site Development Works' and requirements of Limerick City & County Council/ Irish Water.

- Hydrants are positioned within 46m of the proposed buildings.
- A bulk water meter has been provided at the connection to the existing watermain at the southern boundary of the site.
- Individual water meters will be provided at the connection to the proposed watermain serving each proposed development.
- Sluice valves have been positioned to isolate the watermain and stopcocks have been provided to allow isolation of supply to each of the proposed individual units as described above.

Please refer to AECOM Drawing No. PR289270-ACM-XX-GF-DR-CE-10-2701 & 2702 for more information on the water supply network layout.

6. Conclusion

A rainwater harvesting system and surface water attenuation system are proposed to decrease the impact of the development on the receiving environment.

It is proposed to divert the existing combined sewer running through the site by providing a new separate foul sewer in Michael Street which will connect to the existing combined sewers in Bank Place. A new separate storm sewer will also be provided in Michael Street. Existing gullies will be connected to this new sewer and run-off will be discharged to the Abbey River.

It is proposed to provide separate foul and storm water drainage networks within the development site. The foul water network will discharge flows to the existing combined sewers and new foul water sewer in Michael Street. The storm water network will discharge run-off to the Abbey River through a new outfall.

The water supply to the proposed development will be provided from the existing 9" diameter uPVC Irish Water watermain/ upgraded 250mm diameter HDPE watermains located on the streets surrounding site.

It is considered that the methods and measures included in this infrastructure report are in accordance with the requirements of Irish Water and Limerick City & County Council.

The proposals for this development have been designed to be compliant with the OPW and EPA policy documents, Irish Water enabling polices/ Code of Practice and the requirements of Limerick City & County Council.

Appendix A – CCTV Report of Existing Combined Sewer

A1 Drain Repairs

Opera Centre, Limerick City

28 April 2017



GRADE 3,4 & 5 Summary

STRUCTURAL DEFECTS

Structural defects			
Section	PLR	Grade	Fault description
12	C 4 X	4	Broken pipe, from 6 to 9 o'clock
13	C 5 X	4	Hole in drain/sewer, at 12 o'clock
16	C 20 X	3	Cracks, multiple, from 1 to 4 o'clock
24	FMH 1 X	4	Broken pipe, from 9 to 3 o'clock
29	C 1 X	4	Broken pipe, from 10 to 2 o'clock
30	C 4 X	4	Broken pipe, from 10 to 2 o'clock
34	C 34 X	3	Cracks, multiple, from 5 to 12 o'clock

Grade 3: Best practice suggests consideration be given to repair in the medium term

Grade 4: Best practice suggests consideration be given to a repair to avoid potential collapse

Grade 5: Best practice suggests this pipe is at risk of collapse at any time; urgent consideration should be given to a repair to avoid collapse

SERVICE / OPERATIONAL DEFECTS

Service defects			
Section	PLR	Grade	Fault description
5	C37 X	3	Multiple defects at 0.1m
6	C38 X	5	Multiple defects at 0.0m
7	C33 X	4	Multiple defects at 19.1m
29	C 1 X	3	Multiple defects at 21.2m

Grade 3: Best practice suggests consideration be given to maintenance activities in the medium term

Grade 4: Best practice suggests consideration be given to maintenance activity to avoid potential blockage

Grade 5: Best practice suggests this pipe is at immediate risk of backing up / causing flooding

Abandoned Surveys

Camera no access		
Section	PLR	Fault description
6	C38 X	General remark
7	C33 X	Attached deposits, fouling, from 11 to 1 o'clock, 20% cross-section
11	C29 X	General remark
12	C 4 X	Other obstacles, other objects in invert at joint, from 5 to 7 o'clock
29	C 1 X	General remark
38	C 44 X	Line deviates right

Information

These summaries are based on the SRM grading from the WRC

Table of contents

Project Name: Opera Centre, Limerick City	Project number:	Date: 20/04/2017	Contact:	
--	-----------------	---------------------	----------	--

Profile Report	1
Inspection: 1	
Project Information	3
Legend of Classification	5
Section: 1, SMH 25 --- SMH 24	6
Section: 2, SMH 24 --- SMH 23	8
Section: 3, FMH 25 --- FMH 24	10
Section: 4, FMH 24 --- FMH 23	12
Section: 5, C37 --- C38	14
Section: 6, C38 --- C39	17
Section: 7, C33 --- C34	19
Section: 8, C22 --- C25	21
Section: 9, C30 --- C31	24
Section: 10, C25 --- C29	26
Section: 11, C29 --- C30	28
Section: 12, C 4 --- C 1	30
Section: 13, C 5 --- C 4	38
Section: 14, C 6 --- C 4	44
Section: 15, C 7 --- Mainline	47
Section: 16, C 20 --- C 21	49
Section: 17, C 21 --- C 22	54
Section: 18, C 21 --- C 22	57
Section: 19, FMH 4 --- C 1	60
Section: 20, FMH 5 --- FMH 4	62
Section: 21, SMH 3 --- FMH 4	64
Section: 22, SMH 4 --- FMH 4	66
Section: 23, SMH 5 --- SMH 4	68
Section: 24, FMH 1 --- FMH 2	70
Section: 25, FMH 2 --- FMH 3	73
Section: 26, FMH 3 --- FMH 4	75

Table of contents

Project Name: Opera Centre, Limerick City	Project number:	Date: 20/04/2017	Contact:	
--	-----------------	---------------------	----------	--

Section: 27, SMH 1 --- SMH 2	77
Section: 28, SMH 2 --- SMH 3	80
Section: 29, C 1 --- C 1A	82
Section: 30, C 4 --- C 1	86
Section: 31, C 2 --- C 1	89
Section: 32, C 3 --- C 2	93
Section: 33, C 26 --- C 25	95
Section: 34, C 34 --- C 37	97
Section: 35, C 40 --- C 41	100
Section: 36, C 39 --- C 40	104
Section: 37, C 43 --- C 40	106
Section: 38, C 44 --- C 45	113
Section: 39, C 45 --- Mainline	115
Section: 40, F 50 --- F 51	117
Section: 41, C 27 --- C 25	119
Section: 42, C 28 --- C 27	121
Section: 43, F 23 --- C 22	123
Section: 44, S 23 --- F 23	125

/ Main sections

Project name : Opera Centre, Limerick City	Project number :	Contact :	Date : 20/04/2017
--	------------------	-----------	-----------------------------

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
20	FMH 5	FMH 4	27/04/2017	Patrick St		Polyvinyl chloride	20.39	20.39
21	SMH 3	FMH 4	27/04/2017	Patrick St		Polyvinyl chloride	7.83	7.83
22	SMH 4	FMH 4	27/04/2017	Patrick St		Polyvinyl chloride	2.74	2.74
23	SMH 5	SMH 4	27/04/2017	Patrick St		Polyvinyl chloride	20.24	20.24
24	FMH 1	FMH 2	27/04/2017	Patrick St		Polyvinyl chloride	23.35	23.35
25	FMH 2	FMH 3	27/04/2017	Patrick St		Polyvinyl chloride	15.92	15.92
26	FMH 3	FMH 4	27/04/2017	Patrick St		Polyvinyl chloride	8.80	8.80
27	SMH 1	SMH 2	27/04/2017	Patrick St		Polyvinyl chloride	22.15	22.15
28	SMH 2	SMH 3	27/04/2017	Patrick St		Polyvinyl chloride	15.94	15.94
40	F 50	F 51	27/04/2017	Francis st		Polyvinyl chloride	22.84	22.84
41	C 27	C 25	27/04/2017	Michael st		Vitrified clay	5.47	5.47
42	C 28	C 27	27/04/2017	Michael st		Vitrified clay	2.14	2.14

Pipe size: CIRCULAR 150 = 167.81 m (167.81 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
3	FMH 25	FMH 24	20/04/2017	Michaels St		Polyvinyl chloride	12.70	12.70
4	FMH 24	FMH 23	20/04/2017	Michaels St		Polyvinyl chloride	19.70	19.70
8	C22	C25	21/04/2017	Michaels St		Vitrified clay	22.30	22.30
19	FMH 4	C 1	27/04/2017	Patrick St		Polyvinyl chloride	6.29	6.29
33	C 26	C 25	27/04/2017	Opera centre		Vitrified clay	0.88	0.88
34	C 34	C 37	27/04/2017	Michaels st		Vitrified clay	37.00	37.00
39	C 45	Mainline	27/04/2017	Francis st		Polyvinyl chloride	9.39	8.75

Pipe size: CIRCULAR 225 = 108.26 m (107.62 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
1	SMH 25	SMH 24	20/04/2017	Michaels St		Polyvinyl chloride	11.80	11.80
2	SMH 24	SMH 23	20/04/2017	Michaels St		Polyvinyl chloride	21.40	21.40
5	C37	C38	21/04/2017	Michaels St		Cast iron	31.20	31.20
13	C 5	C 4	27/04/2017	Opera Centre		Vitrified clay	13.83	13.83
14	C 6	C 4	27/04/2017	Opera Centre		Vitrified clay	28.79	28.79
16	C 20	C 21	27/04/2017	Opera centre		Vitrified clay	56.17	56.17
17	C 21	C 22	27/04/2017	Opera Centre		Vitrified clay	49.98	49.98
18	C 21	C 22	27/04/2017	Opera Centre		Vitrified clay	3.33	3.33
30	C 4	C 1	27/04/2017	Opera centre		Vitrified clay	4.86	4.86
31	C 2	C 1	27/04/2017	Opera centre		Vitrified clay	11.12	11.12
32	C 3	C 2	27/04/2017	Opera centre		Vitrified clay	6.92	6.92
43	F 23	C 22	27/04/2017	Michael st		Polyvinyl chloride	12.48	12.48
44	S 23	F 23	27/04/2017	Michael st		Polyvinyl chloride	1.00	1.00

Pipe size: CIRCULAR 300 = 252.88 m (252.88 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
15	C 7	Mainline	27/04/2017	Opera Centre		Vitrified clay	1.20	1.20
35	C 40	C 41	27/04/2017	Opera centre		Vitrified clay	53.29	53.29
36	C 39	C 40	27/04/2017	Opera centre		Vitrified clay	0.00	0.00
37	C 43	C 40	27/04/2017	Opera centre		Vitrified clay	44.38	44.38

Pipe size: CIRCULAR 400 = 98.87 m (98.87 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
9	C30	C31	21/04/2017	Charlottes Quay		Concrete	1.80	1.80
10	C25	C29	21/04/2017	Charlottes Quay		Concrete	6.80	6.80

Pipe size: CIRCULAR 450 = 8.6 m (8.6 m)

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

/ Main sections

Project name : Opera Centre, Limerick City	Project number :	Contact :	Date : 20/04/2017
--	------------------	-----------	-----------------------------

All sections = 636.42 m (635.78 m)

Project-information






















Project name : Opera Centre, Limerick City	Project Number :	Contact :	Date : 20/04/2017
--	------------------	-----------	-----------------------------

Client: **AECOM**
Contact Name: **Alex Racheru**
Department: **Senior Consultant**
Road: **Georges Street Upper**
Town: **Dun Laoghaire**
County: **Dublin**
Telephone: **01 2383194**
Fax:
Mobile:
E-mail: **alex.racheru@aecom.com**

Site: **Opera Centre**
Contact Name:
Department:
Road:
Town: **Limerick**
County: **Limerick**
Telephone:
Fax:
Mobile:
E-mail:

Contractor **A1 Drain Repairs**
Contact Name: **Adrian Barry**
Department:
Road: **Miltown, Kilasser**
Town: **Swinford**
County: **Mayo**
Telephone: **+353 (0) 94 9250480**
Fax:
Mobile: **087 6244097**
E-mail:

Legend of Drawing:

	WATER FLOW 1		Tree_Winter
	Tree_Summer		CESS PIT
	SOAKAWAY: FOUL WATER		GNDFLWC
	SURFACE WATER		SYPHON INTERCEPTOR
	PETROL INTERCEPTOR		PIPE RUN
	RAINWATER PIPE		ROAD GULLY
	RODDING EYE		SEPTIC TANK
	SOIL & VENT PIPE		COMBINED
	SOAKAWAY: SURFACE WATER		GULLY
	W.C.		PUMP CH
	FOUL WATER		

Defect Grade Description

Project Name : Opera Centre, Limerick City	Project number :	Contact :	Date : 20/04/2017
--	------------------	-----------	-----------------------------

1: Brick: No Structural Defects
 Pipe: No Structural Defects

Acceptable Structural Condition

2: Brick: Minor cracking, Surface mortar loss, Spalling slight, wear slight
 Pipe: Circumfrential crack, Moderate joint defects, Spalling slight, Wear slight

Minor collapse risk in short term but potential for further deterioration

3: Brick: Total mortarloss without other defects, single brick displaced, Deformation up to 5%,
 Spalling medium, Wear medium
 Pipe: Fractures with deformation up tp 5%, Longitudinal cracking or multitple cracking, Minor
 loss of level, More severe joint

! Collapse unlikely in near future but future deterioration likely !

4: Brick: Total mortarloss with deformation greater than 10%, Deformation up to 10% and
 fractured, Displaced/hanging brickwork, Small number of missing bricks
 Pipe: Broken, Deformation up to 10% and broken,, Fractured with deformation 5 - 10%,
 Multipl

!! Collapse likely in foreseeable future !!

5: Brick: Already Collapsed, Missing invert, Deformation over 10% and fractured,
 Displaced/hanging brickwork and deformation over 10%, Extensive missing bricks
 Pipe: Already collapsed, Deformation over 10% and broken, Extensive areas of fabric missin

!!! Collapsed or collapse imminent !!!

Inspection report

Date : 20/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 1	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road SMH 25 (D/S) SMH 24	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 11.80 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Polyvinyl chloride

Comment :

1:105	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : SMH 25	00:00:00	1_1_1_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:02						
	11.80	Water level, 5% of the vertical dimension	00:02:04	1_1_18_A.jpg					
	11.80	Finish node type, manhole reference number: SMH 24	00:02:04						
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Michaels St	Date : 20/04/2017	Section number : 1	PLR Suffix : X
---------------------------------	------------------------------	-----------------------------	------------------------------	--------------------------



Photo: 1_1_1_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : SMH 25



Photo: 1_1_18_A.jpg, 00:02:04
 11.8m, Water level, 5% of the vertical dimension

Inspection report

Date : 20/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 2	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road SMH 24 (D/S) SMH 23	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	SMH 24 SMH 23
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 21.40 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Polyvinyl chloride	

Comment :

1:180	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : SMH 24	00:00:00	3_3_3_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	5.70	Sealing ring intruding, from 9 to 2 o'clock	00:00:50	3_3_21_A.jpg
	18.20	Open joint, medium	00:02:32	3_3_22_A.jpg
	21.40	Water level, 5% of the vertical dimension	00:03:06	3_3_23_A.jpg
	21.40	Finish node type, manhole reference number: SMH 23	00:03:06	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	5	0.28	6	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
20/04/2017

Section number :
2

PLR Suffix :
X



Photo: 3_3_3_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : SMH 24



Photo: 3_3_21_A.jpg, 00:00:50
 5.7m, Sealing ring intruding, from 9 to 2 o'clock



Photo: 3_3_22_A.jpg, 00:02:32
 18.2m, Open joint, medium



Photo: 3_3_23_A.jpg, 00:03:06
 21.4m, Water level, 5% of the vertical dimension

Inspection report

Date : 20/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 3	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road FMH 25 (D/S) FMH 24	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	FMH 25 FMH 24
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 12.70 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Polyvinyl chloride	

Comment :

1:105	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : FMH 25	00:00:00	4_4_4_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	5.70	Open joint, medium	00:00:50	4_4_26_A.jpg
	12.60	Water level, 5% of the vertical dimension	00:01:25	4_4_27_A.jpg
	12.70	Finish node type, manhole reference number: FMH 24	00:01:35	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.08	1	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
20/04/2017

Section number :
3

PLR Suffix :
X



Photo: 4_4_4_A.jpg, 00:00:00
0m, Start node type, manhole, reference number : FMH 25



Photo: 4_4_26_A.jpg, 00:00:50
5.7m, Open joint, medium



Photo: 4_4_27_A.jpg, 00:01:25
12.6m, Water level, 5% of the vertical dimension

Inspection report

Date : 20/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 4	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road FMH 24 (D/S) FMH 23	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	FMH 24 FMH 23
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 19.70 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Polyvinyl chloride	

Comment :

1:165	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : FMH 24	00:00:00	5_5_5_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:02	
	18.20	Open joint, medium	00:02:12	5_5_30_A.jpg
	19.70	Water level, 5% of the vertical dimension	00:02:38	5_5_31_A.jpg
	19.70	Finish node type, manhole reference number: FMH 23	00:02:38	5_5_32_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.05	1	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Michaels St	Date : 20/04/2017	Section number : 4	PLR Suffix : X
---------------------------------	------------------------------	-----------------------------	------------------------------	--------------------------



Photo: 5_5_5_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : FMH 24



Photo: 5_5_30_A.jpg, 00:02:12
 18.2m, Open joint, medium



Photo: 5_5_31_A.jpg, 00:02:38
 19.7m, Water level, 5% of the vertical dimension



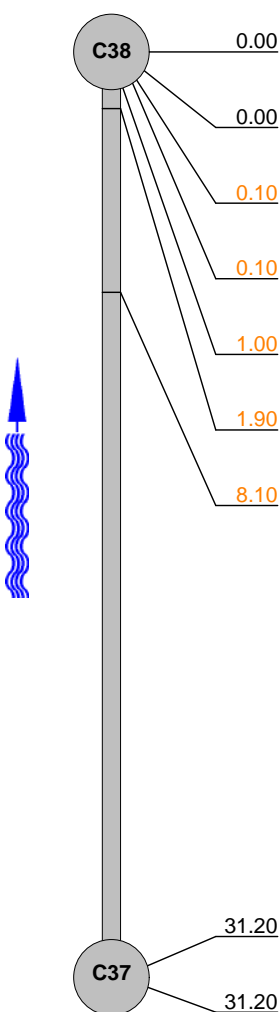
Photo: 5_5_32_A.jpg, 00:02:38
 19.7m, Finish node type, manhole reference number: FMH 23

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 5	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road C38 (U/S) C37	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C37 C38
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 31.20 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Cast iron Concrete	

Comment :

1:255	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : C38	00:00:00	8_8_8_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:01						
	0.10	Open joint, medium	00:00:10	8_8_34_A.jpg					
	0.10	Attached deposits, grease, from 10 to 2 o'clock, 10% cross-sectional area loss	00:00:17	8_8_35_A.jpg					
	1.00	Open joint, medium	00:00:27	8_8_36_A.jpg					
	1.90	Open joint, medium	00:00:46	8_8_37_A.jpg					
	8.10	Attached deposits, grease, from 10 to 2 o'clock, 10% cross-sectional area loss	00:01:44	8_8_38_A.jpg					
	31.20	Water level, 10% of the vertical dimension	00:04:35	8_8_39_A.jpg					
	31.20	Finish node type, manhole reference number: C37	00:04:35	8_8_40_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	1	0.1	3	1	2	2	0.13	4	3

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
21/04/2017

Section number :
5

PLR Suffix :
X



Photo: 8_8_8_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C38



Photo: 8_8_34_A.jpg, 00:00:10
 0.1m, Open joint, medium



Photo: 8_8_35_A.jpg, 00:00:17
 0.1m, Attached deposits, grease, from 10 to 2 o'clock, 10% cross-sectional area loss
 Remarks: Jet unable to remove,



Photo: 8_8_36_A.jpg, 00:00:27
 1m, Open joint, medium

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
21/04/2017

Section number :
5

PLR Suffix :
X



Photo: 8.8_37_A.jpg, 00:00:46
 1.9m, Open joint, medium



Photo: 8.8_38_A.jpg, 00:01:44
 8.1m, Attached deposits, grease, from 10 to 2 o'clock, 10% cross-sectional area loss
 Remarks: continuous



Photo: 8.8_39_A.jpg, 00:04:35
 31.2m, Water level, 10% of the vertical dimension



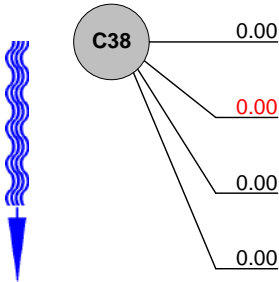
Photo: 8.8_40_A.jpg, 00:04:35
 31.2m, Finish node type, manhole reference number: C37

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 6	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road C38 (D/S) C39	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C38 C39
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 0.00 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 350 mm Concrete	

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C38	00:00:00	9_9_9_A.jpg
	0.00	Other obstacles, brick or masonry in invert, from 12 to 12 o'clock, 95% cross-sectional area loss	00:00:02	9_9_41_A.jpg
	0.00	General remark	00:00:02	
	0.00	Survey abandoned	00:00:02	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	10	0	10	5

Inspection pictures

Place : Limerick City	Road : Michaels St	Date : 21/04/2017	Section number : 6	PLR Suffix : X
---------------------------------	------------------------------	-----------------------------	------------------------------	--------------------------



Photo: 9_9_9_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C38



Photo: 9_9_41_A.jpg, 00:00:02
 0m, Other obstacles, brick or masonry in invert, from 12 to 12 o'clock, 95% cross-sectional area loss Remarks: pipe fully blocked. possibly collapsed, unable to determine

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 7	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road C34 (U/S) C33	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 19.10 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Concrete

Comment :

1:165	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C34	00:00:00	11_11_11_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	3.30	Attached deposits, fouling, from 12 to 2 o'clock, 5% cross-sectional area loss	00:00:21	11_11_45_A.jpg
	15.50	Attached deposits, fouling, at 12 o'clock, 5% cross-sectional area loss	00:01:19	11_11_46_A.jpg
	19.10	Attached deposits, fouling, from 11 to 1 o'clock, 20% cross-sectional area loss	00:01:43	
	19.10	Survey abandoned	00:01:43	11_11_48_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	3	5	0.47	9	4

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
21/04/2017

Section number :
7

PLR Suffix :
X



Photo: 11_11_11_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C34



Photo: 11_11_45_A.jpg, 00:00:21
 3.3m, Attached deposits, fouling, from 12 to 2 o'clock, 5% cross-sectional area loss



Photo: 11_11_46_A.jpg, 00:01:19
 15.5m, Attached deposits, fouling, at 12 o'clock, 5% cross-sectional area loss
 Remarks: continuous

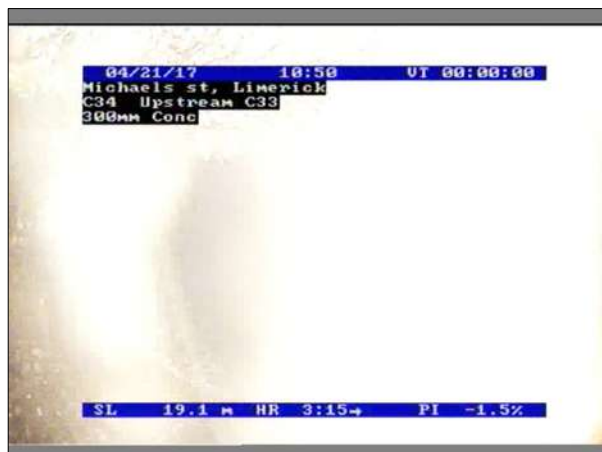


Photo: 11_11_48_A.jpg, 00:01:43
 19.1m, Survey abandoned
 Remarks: unable to travel beneath attached deposits

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 8	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels St Road C25 (U/S) C22	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C22 C25
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 22.30 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay 	

Comment :

1:180	Position	Observation	MPEG	Photo						
	0.00	Start node type, manhole, reference number : C25	00:00:00	12_12_12_A.jpg						
	0.00	Water level, 5% of the vertical dimension	00:00:02							
	15.50	Connection other than junction, at 12 o'clock, diameter 100mm	00:03:03	12_12_50_A.jpg						
	15.70	Crack, circumferential, from 11 to 2 o'clock	00:03:19	12_12_51_A.jpg						
	16.00	Connection other than junction, at 12 o'clock, diameter 100mm	00:03:38	12_12_52_A.jpg						
	21.80	Crack, circumferential, from 5 to 10 o'clock	00:05:18	12_12_53_A.jpg						
	22.30	Water level, 5% of the vertical dimension	00:05:50	12_12_54_A.jpg						
	22.30	Finish node type, manhole reference number: C22	00:05:53	12_12_55_A.jpg						
	STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
	2	10	0.9	20	2	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
21/04/2017

Section number :
8

PLR Suffix :
X



Photo: 12_12_12_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C25



Photo: 12_12_50_A.jpg, 00:03:03
 15.5m, Connection other than junction, at 12 o'clock, diameter 100mm



Photo: 12_12_51_A.jpg, 00:03:19
 15.7m, Crack, circumferential, from 11 to 2 o'clock



Photo: 12_12_52_A.jpg, 00:03:38
 16m, Connection other than junction, at 12 o'clock, diameter 100mm

Inspection pictures

Place :
Limerick City

Road :
Michaels St

Date :
21/04/2017

Section number :
8

PLR Suffix :
X



Photo: 12_12_53_A.jpg, 00:05:18
 21.8m, Crack, circumferential, from 5 to 10 o'clock



Photo: 12_12_54_A.jpg, 00:05:50
 22.3m, Water level, 5% of the vertical dimension



Photo: 12_12_55_A.jpg, 00:05:53
 22.3m, Finish node type, manhole reference number: C22

Inspection report

Date : 21/04/2017	Job number :	Weather :	Operator :	Section number : 9	PLR SUFFIX: X
Weather	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Charlottes Quay Road C30 (D/S) C31	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
---	---	---	--

Use: Combined	Pipe shape : Circular
Year laid :	Pipe size : 450 mm
Purpose : Sample survey to determine asset condition	Pipe material : Concrete
Total length : 1.80 m	Lining :

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C30	00:00:00	13_13_13_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	1.70	Connection other than junction, at 6 o'clock, diameter 450mm	00:00:44	13_13_314_A.jpg
	1.80	Finish node type, manhole reference number: C31	00:00:49	13_13_316_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Charlottes Quay	Date : 21/04/2017	Section number : 9	PLR Suffix : X
---------------------------------	----------------------------------	-----------------------------	------------------------------	--------------------------



Photo: 13_13_13_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C30



Photo: 13_13_314_A.jpg, 00:00:44
 1.7m, Connection other than junction, at 6 o'clock, diameter 450mm Remarks: backdrop



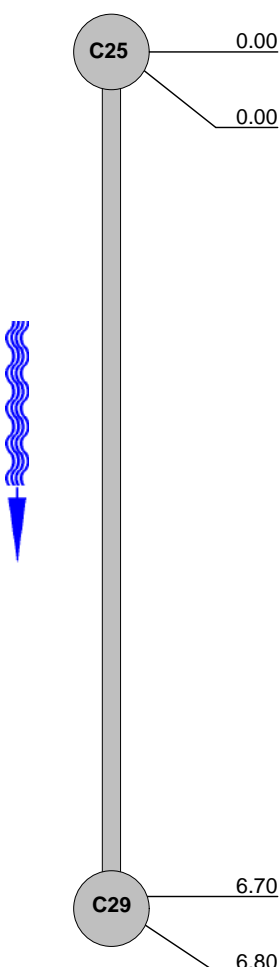
Photo: 13_13_316_A.jpg, 00:00:49
 1.8m, Finish node type, manhole reference number: C31

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 10	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick city Charlottes Quay Road C25 (D/S) C29	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C25 C29
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 6.80 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 450 mm Concrete 	

Comment :

1:60	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : C25	00:00:00	14_14_14_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:03						
	6.70	Water level, 5% of the vertical dimension	00:01:17	14_14_318_A.jpg					
	6.80	Finish node type, manhole reference number: C29	00:01:24						
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick city	Road : Charlottes Quay	Date : 21/04/2017	Section number : 10	PLR Suffix : X
---------------------------------	----------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 14_14_14_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C25



Photo: 14_14_318_A.jpg, 00:01:17
 6.7m, Water level, 5% of the vertical dimension

Inspection report

Date : 21/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 11	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick city Charlottes Quay Road C29 (D/S) C30	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C29 C30
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 9.01 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 450 mm Concrete	

Comment :

1:75	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C29	00:00:00	15_15_15_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:03	
	7.00	Connection other than junction, closed, at 2 o'clock, diameter 150mm	00:01:21	15_15_321_A.jpg
	9.00	General remark	00:01:37	
	9.00	Survey abandoned	00:01:37	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place :
Limerick city

Road :
Charlottes Quay

Date :
21/04/2017

Section number :
11

PLR Suffix :
X



Photo: 15_15_15_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C29



Photo: 15_15_321_A.jpg, 00:01:21
 7m, Connection other than junction, closed, at 2 o'clock,
 diameter 150mm



Photo: 2017-04-28-PHOTO-00000052.jpg
 9.01m, General photograph taken at this point Remarks:
 manhole C30 picture

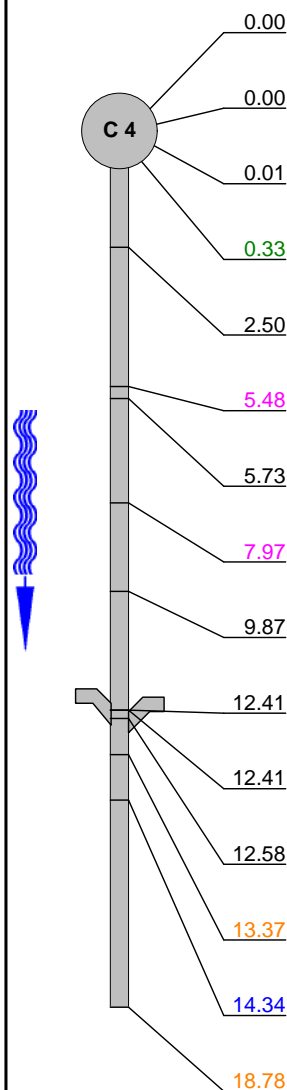
Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 12	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 4 (D/S) C 1	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 4 C 1
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 22.93 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

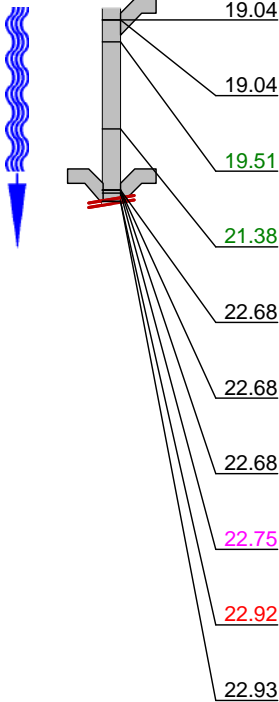
1:162	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 4	00:00:02	16_16_57_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:05	
	0.01	General remark		
	0.33	Joint displaced, medium	00:00:38	16_16_59_A.jpg
	2.50	General remark	00:02:28	16_16_60_A.jpg
	5.48	Broken pipe, from 6 to 9 o'clock	00:04:14	16_16_61_A.jpg
	5.73	General remark	00:04:39	16_16_62_A.jpg
	7.97	Broken pipe, at 1 o'clock	00:06:36	16_16_63_A.jpg
	9.87	General remark	00:07:10	16_16_65_A.jpg
	12.41	General remark	00:08:36	16_16_66_A.jpg
	12.41	Connection other than junction, at 3 o'clock, diameter 100mm	00:08:41	16_16_67_A.jpg
	12.58	Connection other than junction, at 10 o'clock, diameter 100mm	00:09:01	16_16_68_A.jpg
	13.37	Open joint, medium	00:09:31	16_16_69_A.jpg
	14.34	Open joint, medium	00:10:13	16_16_70_A.jpg
	18.78	Open joint, medium	00:11:36	16_16_71_A.jpg



Inspection Report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 12	PLR : X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Grade:

1:162	Position	Observation	MPEG	Photo
	19.04	General remark	00:12:07	16_16_72_A.jpg
	19.04	Connection other than junction, at 11 o'clock, diameter 150mm	00:12:07	16_16_73_A.jpg
	19.51	Joint displaced, medium	00:12:39	16_16_74_A.jpg
	21.38	Open joint, medium	00:13:35	16_16_75_A.jpg
	22.68	General remark	00:14:19	16_16_76_A.jpg
	22.68	Connection other than junction, at 3 o'clock, diameter 150mm	00:14:19	16_16_77_A.jpg
	22.68	Connection other than junction, at 10 o'clock, diameter 150mm	00:14:26	
	22.75	Joint displaced, large	00:14:42	16_16_79_A.jpg
	22.92	Other obstacles, other objects in invert at joint, from 5 to 7 o'clock, 10% cross-sectional area loss	00:16:43	16_16_80_A.jpg
	22.93	Survey abandoned	00:17:09	16_16_81_A.jpg



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
6	80	7.15	164	4	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
12

PLR Suffix :
X



Photo: 16_16_57_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : C 4



Photo: 16_16_59_A.jpg, 00:00:38
 0.33m, Joint displaced, medium



Photo: 16_16_60_A.jpg, 00:02:28
 2.5m, General remark Remarks: CHAMBER



Photo: 16_16_61_A.jpg, 00:04:14
 5.48m, Broken pipe, from 6 to 9 o'clock Remarks: IN CHAMBER

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 12	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 16_16_62_A.jpg, 00:04:39
 5.73m, General remark Remarks: CHAMBER



Photo: 16_16_63_A.jpg, 00:06:36
 7.97m, Broken pipe, at 1 o'clock



Photo: 16_16_65_A.jpg, 00:07:10
 9.87m, General remark Remarks: CHAMBER



Photo: 16_16_66_A.jpg, 00:08:36
 12.41m, General remark Remarks: CHAMBER

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
12

PLR Suffix :
X



Photo: 16_16_67_A.jpg, 00:08:41
 12.41m, Connection other than junction, at 3 o'clock, diameter 100mm



Photo: 16_16_68_A.jpg, 00:09:01
 12.58m, Connection other than junction, at 10 o'clock, diameter 100mm



Photo: 16_16_69_A.jpg, 00:09:31
 13.37m, Open joint, medium



Photo: 16_16_70_A.jpg, 00:10:13
 14.34m, Open joint, medium

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 12	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 16_16_71_A.jpg, 00:11:36
 18.78m, Open joint, medium



Photo: 16_16_72_A.jpg, 00:12:07
 19.04m, General remark Remarks: CHAMBER



Photo: 16_16_73_A.jpg, 00:12:07
 19.04m, Connection other than junction, at 11 o'clock, diameter 150mm



Photo: 16_16_74_A.jpg, 00:12:39
 19.51m, Joint displaced, medium

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
12

PLR Suffix :
X



Photo: 16_16_75_A.jpg, 00:13:35
 21.38m, Open joint, medium

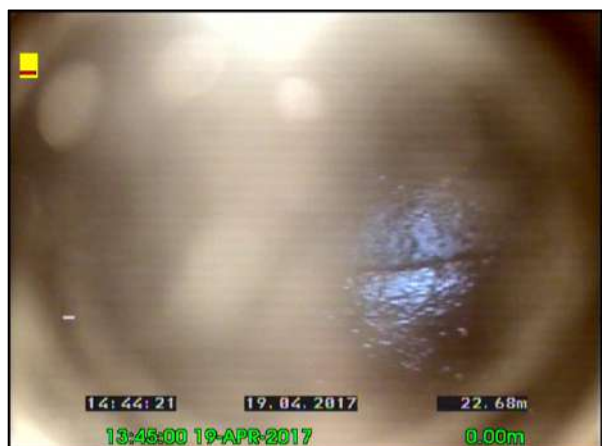


Photo: 16_16_76_A.jpg, 00:14:19
 22.68m, General remark Remarks: CHAMBER



Photo: 16_16_77_A.jpg, 00:14:19
 22.68m, Connection other than junction, at 3 o'clock, diameter 150mm



Photo: 16_16_79_A.jpg, 00:14:42
 22.75m, Joint displaced, large Remarks: LEAVING CHAMBER TO LINE

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 12	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 16_16_80_A.jpg, 00:16:43
 22.92m, Other obstacles, other objects in invert at joint, from 5 to 7 o'clock, 10% cross-sectional area loss Remarks: CAUGHT IN DISPLACED JOINT UNABLE TO REMOVE



Photo: 16_16_81_A.jpg, 00:17:09
 22.93m, Survey abandoned Remarks: UNABLE TO TRAVEL

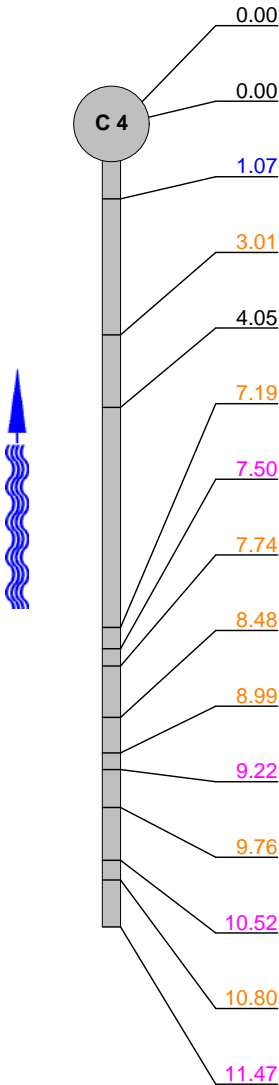
Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 13	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 4 (U/S) C 5	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 5 C 4
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 13.83 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

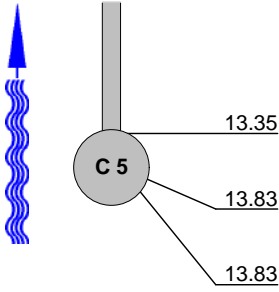
Comment :

1:108	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 4	00:00:01	17_17_82_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:06	
	1.07	Crack, longitudinal, at 6 o'clock	00:00:38	17_17_84_A.jpg
	3.01	Open joint, medium	00:02:12	17_17_85_A.jpg
	4.05	General remark	00:02:55	17_17_86_A.jpg
	7.19	Open joint, medium	00:03:50	17_17_87_A.jpg
	7.50	Hole in drain/sewer, at 12 o'clock	00:04:24	17_17_88_A.jpg
	7.74	Open joint, medium	00:04:49	17_17_89_A.jpg
	8.48	Open joint, medium	00:05:21	17_17_90_A.jpg
	8.99	Open joint, medium	00:05:50	17_17_91_A.jpg
	9.22	Hole in drain/sewer, at 12 o'clock	00:06:04	17_17_92_A.jpg
	9.76	Open joint, medium	00:06:29	17_17_93_A.jpg
	10.52	Hole in drain/sewer, at 12 o'clock	00:07:30	17_17_94_A.jpg
	10.80	Open joint, medium	00:07:46	17_17_95_A.jpg
	11.47	Broken pipe, at 10 o'clock	00:08:26	17_17_96_A.jpg



Inspection Report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 13	PLR : X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Grade:

1:108	Position	Observation	MPEG	Photo
		General remark	00:09:51	
	13.35			
	13.83	Water level, 5% of the vertical dimension	00:10:14	17_17_99_A.jpg
	13.83	Finish node type, manhole reference number: C 5	00:10:14	17_17_100_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
12	80	24.37	337	4	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
13

PLR Suffix :
X



Photo: 17_17_82_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 4



Photo: 17_17_84_A.jpg, 00:00:38
 1.07m, Crack, longitudinal, at 6 o'clock



Photo: 17_17_85_A.jpg, 00:02:12
 3.01m, Open joint, medium



Photo: 17_17_86_A.jpg, 00:02:55
 4.05m, General remark Remarks: CHAMBER

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 13	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 17_17_87_A.jpg, 00:03:50
 7.19m, Open joint, medium



Photo: 17_17_88_A.jpg, 00:04:24
 7.5m, Hole in drain/ sewer, at 12 o'clock



Photo: 17_17_89_A.jpg, 00:04:49
 7.74m, Open joint, medium



Photo: 17_17_90_A.jpg, 00:05:21
 8.48m, Open joint, medium

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 13	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 17_17_91_A.jpg, 00:05:50
 8.99m, Open joint, medium



Photo: 17_17_92_A.jpg, 00:06:04
 9.22m, Hole in drain/sewer, at 12 o'clock Remarks: COVERED



Photo: 17_17_93_A.jpg, 00:06:29
 9.76m, Open joint, medium



Photo: 17_17_94_A.jpg, 00:07:30
 10.52m, Hole in drain/sewer, at 12 o'clock Remarks: HOLE

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 13	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 17_17_95_A.jpg, 00:07:46
 10.8m, Open joint, medium



Photo: 17_17_96_A.jpg, 00:08:26
 11.47m, Broken pipe, at 10 o'clock



Photo: 17_17_99_A.jpg, 00:10:14
 13.83m, Water level, 5% of the vertical dimension



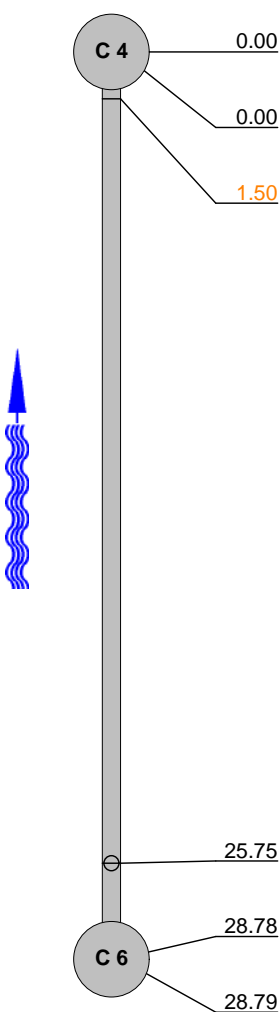
Photo: 17_17_100_A.jpg, 00:10:14
 13.83m, Finish node type, manhole reference number: C 5

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 14	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 4 (U/S) C 6	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 6 C 4
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 28.79 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:240	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : C 4	00:00:02	18_18_101_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:02	18_18_102_A.jpg					
	1.50	Open joint, medium	00:00:41	18_18_103_A.jpg					
	25.75	Connection other than junction, at 12 o'clock, diameter 150mm	00:03:52	18_18_104_A.jpg					
	28.78	Water level, 5% of the vertical dimension	00:05:12	18_18_106_A.jpg					
	28.79	Finish node type, manhole reference number: C 6	00:04:22	18_18_105_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.03	1	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
14

PLR Suffix :
X



Photo: 18_18_101_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : C 4



Photo: 18_18_102_A.jpg, 00:00:02
 0m, Water level, 5% of the vertical dimension

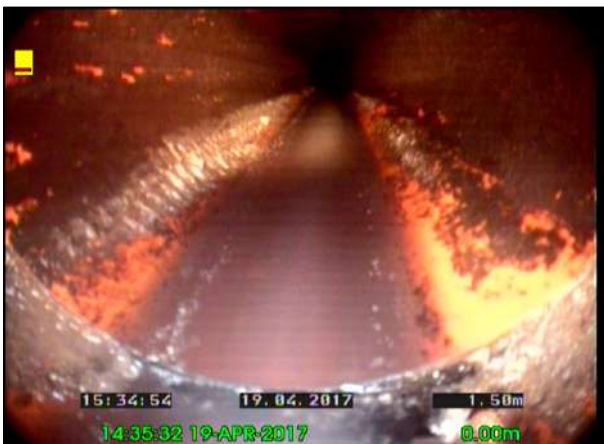


Photo: 18_18_103_A.jpg, 00:00:41
 1.5m, Open joint, medium



Photo: 18_18_104_A.jpg, 00:03:52
 25.75m, Connection other than junction, at 12 o'clock, diameter 150mm

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 14	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 18_18_106_A.jpg, 00:05:12
 28.78m, Water level, 5% of the vertical dimension



Photo: 18_18_105_A.jpg, 00:04:22
 28.79m, Finish node type, manhole reference number: C 6

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 15	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 7 Mainline
---	--	---	--	-----------------------------------

Use: Combined	Pipe shape : Circular
Year laid :	Pipe size : 400 mm
Purpose : Sample survey to determine asset condition	Pipe material : Vitrified clay
Total length : 1.20 m	Lining :

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C 7	00:00:01	19_19_107_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:02	
	1.20	Start node type, major connection without manhole, reference number : C 7	00:00:37	19_19_109_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 15	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------

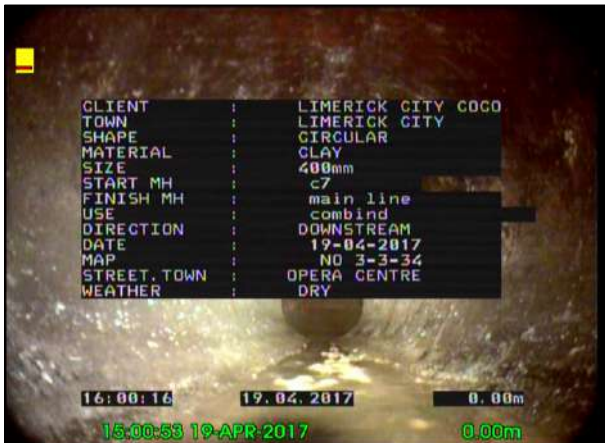


Photo: 19_19_107_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 7



Photo: 19_19_109_A.jpg, 00:00:37
 1.2m, Start node type, major connection without manhole,
 reference number : C 7 Remarks: connecting to mainline culvert

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 16	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 56.17 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay

Comment :

1:450	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 20	00:00:01	20_20_110_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	20_20_111_A.jpg
	0.33	Crack, circumferential, from 10 to 6 o'clock	00:00:21	20_20_112_A.jpg
	4.49	Cracks, multiple, from 1 to 4 o'clock	00:01:06	20_20_113_A.jpg
	6.32	Crack, longitudinal, at 12 o'clock	00:01:53	20_20_114_A.jpg
	8.73	Connection other than junction, at 10 o'clock, diameter 100mm	00:02:50	20_20_115_A.jpg
	11.01	Connection other than junction, at 2 o'clock, diameter 100mm	00:03:32	20_20_116_A.jpg
	20.79	Connection other than junction, at 12 o'clock, diameter 100mm	00:06:09	20_20_119_A.jpg
	21.87	Connection other than junction, at 2 o'clock, diameter 100mm	00:06:55	20_20_120_A.jpg
	28.74	Connection other than junction, at 2 o'clock, diameter 100mm	00:09:06	20_20_123_A.jpg
	34.77	Connection other than junction, at 2 o'clock, diameter 100mm	00:10:49	20_20_125_A.jpg
	56.16	Water level, 5% of the vertical dimension	00:14:15	20_20_126_A.jpg
	56.17	Finish node type, manhole reference number: C 21	00:14:19	20_20_127_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	40	1.07	60	3	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
16

PLR Suffix :
X



Photo: 20_20_110_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 20



Photo: 20_20_111_A.jpg, 00:00:01
 0m, Water level, 5% of the vertical dimension

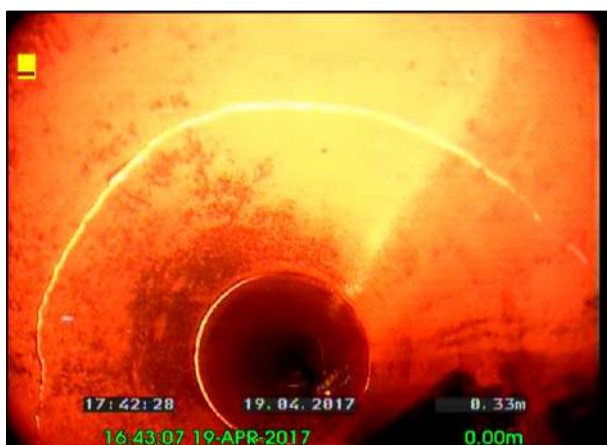


Photo: 20_20_112_A.jpg, 00:00:21
 0.33m, Crack, circumferential, from 10 to 6 o'clock

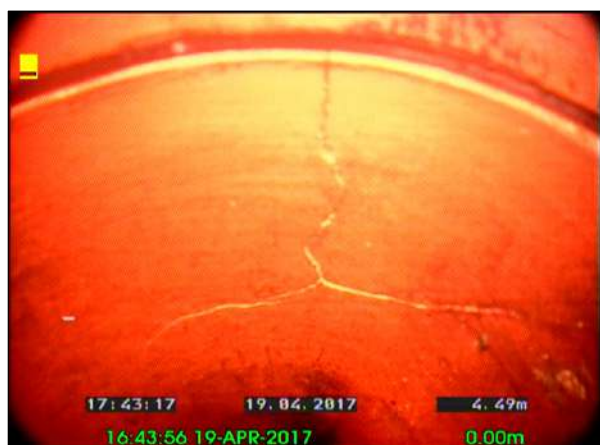


Photo: 20_20_113_A.jpg, 00:01:06
 4.49m, Cracks, multiple, from 1 to 4 o'clock

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
16

PLR Suffix :
X

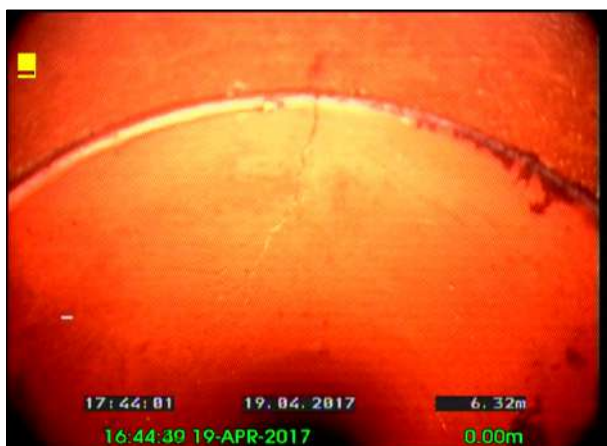


Photo: 20_20_114_A.jpg, 00:01:53
 6.32m, Crack, longitudinal, at 12 o'clock



Photo: 20_20_115_A.jpg, 00:02:50
 8.73m, Connection other than junction, at 10 o'clock, diameter 100mm



Photo: 20_20_116_A.jpg, 00:03:32
 11.01m, Connection other than junction, at 2 o'clock, diameter 100mm



Photo: 20_20_119_A.jpg, 00:06:09
 20.79m, Connection other than junction, at 12 o'clock, diameter 100mm

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 16	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------

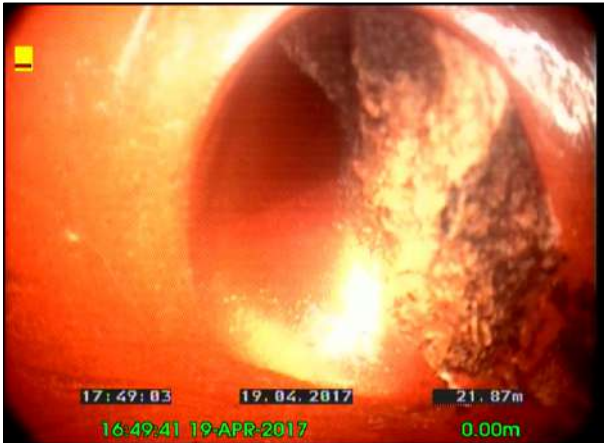


Photo: 20_20_120_A.jpg, 00:06:55
 21.87m, Connection other than junction, at 2 o'clock, diameter 100mm



Photo: 20_20_123_A.jpg, 00:09:06
 28.74m, Connection other than junction, at 2 o'clock, diameter 100mm



Photo: 20_20_125_A.jpg, 00:10:49
 34.77m, Connection other than junction, at 2 o'clock, diameter 100mm



Photo: 20_20_126_A.jpg, 00:14:15
 56.16m, Water level, 5% of the vertical dimension

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 16	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 20_20_127_A.jpg, 00:14:19
56.17m, Finish node type, manhole reference number: C 21

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 17	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 21 (D/S) C 22	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 21 C 22
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 49.98 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:405	Position	Observation	MPEG	Photo
	C 21	Start node type, manhole, reference number : C 21	00:00:02	21_21_128_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:02	
	11.83	Connection other than junction, at 2 o'clock, diameter 100mm	00:02:15	21_21_130_A.jpg
	28.67	Connection other than junction, at 2 o'clock, diameter 100mm	00:05:34	21_21_131_A.jpg
	29.15	Connection other than junction, at 10 o'clock, diameter 100mm	00:06:00	21_21_132_A.jpg
	49.96	Connection defective, connecting pipe is blocked, at 2 o'clock, diameter 100mm, intrusion 10%	00:09:15	21_21_133_A.jpg
	49.98	General photograph taken at this point	00:09:31	21_21_134_A.jpg
	49.98	General remark	00:09:31	
C 22				

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 17	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 21_21_128_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : C 21



Photo: 21_21_130_A.jpg, 00:02:15
 11.83m, Connection other than junction, at 2 o'clock, diameter 100mm



Photo: 21_21_131_A.jpg, 00:05:34
 28.67m, Connection other than junction, at 2 o'clock, diameter 100mm

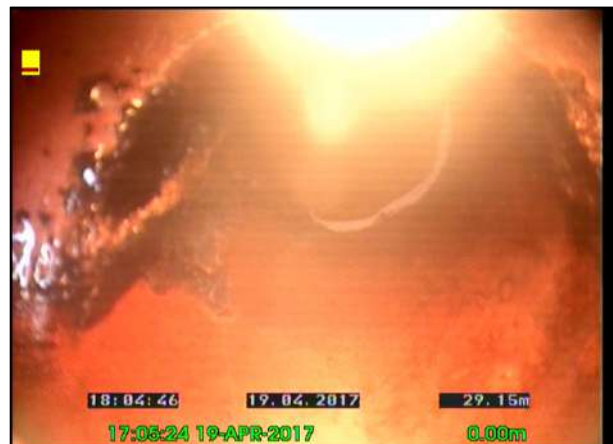


Photo: 21_21_132_A.jpg, 00:06:00
 29.15m, Connection other than junction, at 10 o'clock, diameter 100mm

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 17	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------

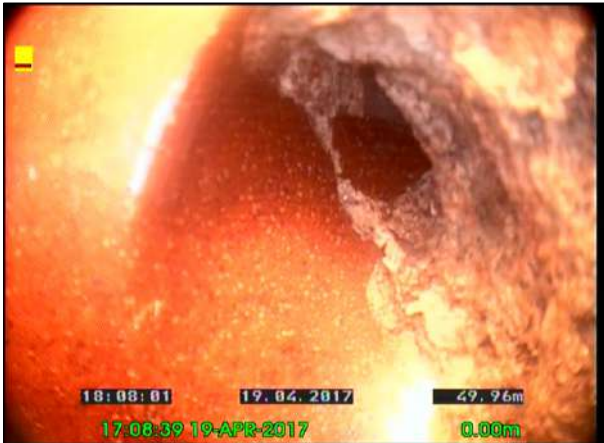


Photo: 21_21_133_A.jpg, 00:09:15
 49.96m, Connection defective, connecting pipe is blocked, at 2 o'clock, diameter 100mm, intrusion 10% Remarks: OBSTRUCTING CAMER A



Photo: 21_21_134_A.jpg, 00:09:31
 49.98m, General photograph taken at this point Remarks: OF CONNECTION

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 18	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 22 (U/S) C 21	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 21 C 22
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 3.33 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:50	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 22	00:00:01	22_22_136_A.jpg
	0.00	Water level, 20% of the vertical dimension	00:00:01	22_22_137_A.jpg
	1.88	Connection other than junction, at 10 o'clock, diameter 100mm	00:00:33	22_22_138_A.jpg
	3.31	Connection defective, connecting pipe is blocked, at 10 o'clock, diameter 100mm	00:01:05	22_22_139_A.jpg
	3.32	General photograph taken at this point	00:02:11	22_22_140_A.jpg
	3.33	General remark	00:02:11	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
18

PLR Suffix :
X



Photo: 22_22_136_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 22

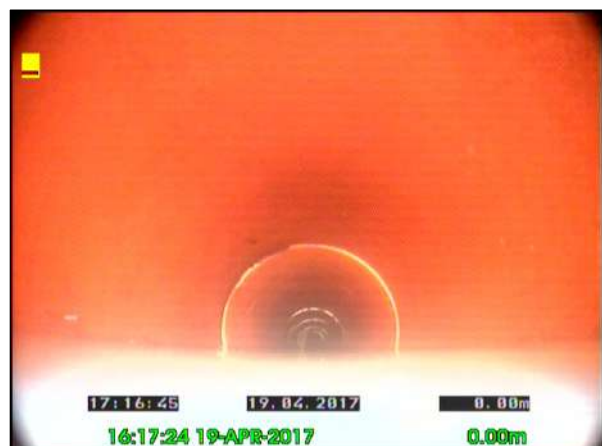


Photo: 22_22_137_A.jpg, 00:00:01
 0m, Water level, 20% of the vertical dimension

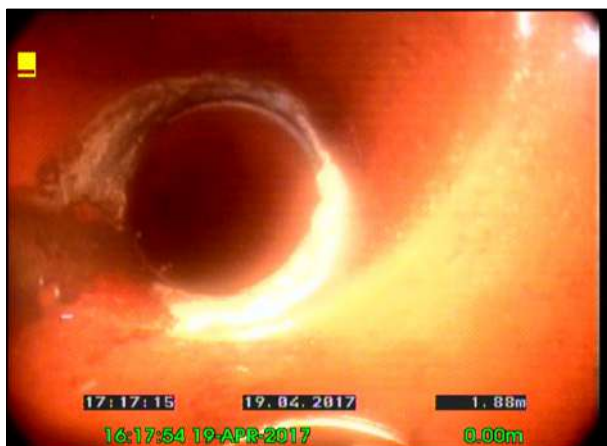


Photo: 22_22_138_A.jpg, 00:00:33
 1.88m, Connection other than junction, at 10 o'clock, diameter 100mm

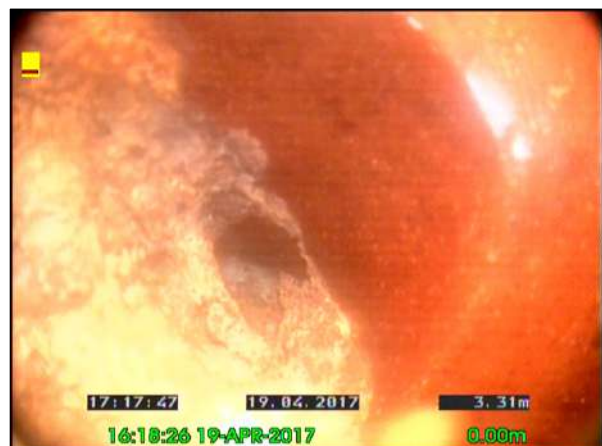


Photo: 22_22_139_A.jpg, 00:01:05
 3.31m, Connection defective, connecting pipe is blocked, at 10 o'clock, diameter 100mm

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 18	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 22_22_140_A.jpg, 00:02:11
3.32m, General photograph taken at this point Remarks: OF
OBSTRUCTING CONNECTION

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 19	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 4 (D/S) C 1	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 6.29 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Polyvinyl chloride

Comment :

1:60	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : FMH 4	00:00:01	23_23_142_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:03	23_23_143_A.jpg					
	6.29	Water level, 5% of the vertical dimension	00:01:00	23_23_144_A.jpg					
	6.29	Finish node type, manhole reference number: C 1	00:01:00						
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 19	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 23_23_142_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : FMH 4



Photo: 23_23_143_A.jpg, 00:00:03
 0m, Water level, 5% of the vertical dimension



Photo: 23_23_144_A.jpg, 00:01:00
 6.29m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 20	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 4 (U/S) FMH 5	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	FMH 5 FMH 4
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 20.39 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:165	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : FMH 4	00:00:00	24_24_146_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:00	
	20.39	Water level, 10% of the vertical dimension	00:03:55	24_24_148_A.jpg
	20.39	Finish node type, manhole reference number: FMH 5	00:03:55	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 20	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 24_24_146_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : FMH 4



Photo: 24_24_148_A.jpg, 00:03:55
 20.39m, Water level, 10% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 21	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 4 (U/S) SMH 3	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	SMH 3 FMH 4
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 7.83 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:75	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : FMH 4	00:00:04	25_25_151_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:04	
	7.83	Water level, 5% of the vertical dimension	00:02:17	25_25_153_A.jpg
	7.83	Finish node type, manhole reference number: SMH 3	00:02:17	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 21	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 25_25_151_A.jpg, 00:00:04
 0m, Start node type, manhole, reference number : FMH 4



Photo: 25_25_153_A.jpg, 00:02:17
 7.83m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 22	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 4 (U/S) SMH 4	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 2.74 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : FMH 4	00:00:01	26_26_155_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	2.74	Finish node type, manhole reference number: SMH 4	00:00:29	26_26_157_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 22	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 26_26_155_A.jpg, 00:00:01
0m, Start node type, manhole, reference number : FMH 4

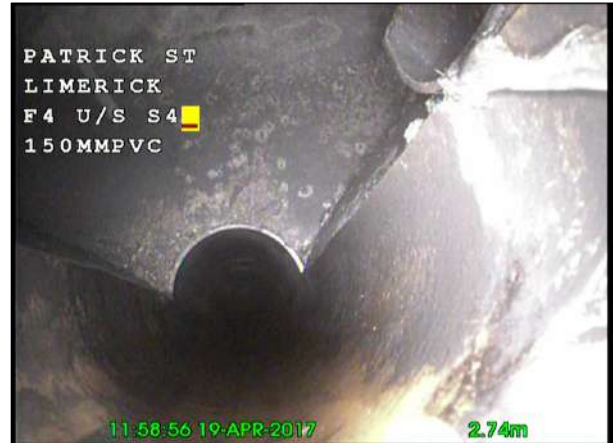


Photo: 26_26_157_A.jpg, 00:00:29
2.74m, Finish node type, manhole reference number: SMH 4

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 23	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road SMH 4 (U/S) SMH 5	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	SMH 5 SMH 4
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 20.24 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:165	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : SMH 4	00:00:02	27_27_158_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:02						
	20.24	Water level, 0% of the vertical dimension	00:05:12	27_27_160_A.jpg					
	20.24	Start node type, manhole, reference number : SMH 4	00:05:12	27_27_161_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 23	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 27_27_158_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : SMH 4



Photo: 27_27_160_A.jpg, 00:05:12
 20.24m, Water level, 0% of the vertical dimension



Photo: 27_27_161_A.jpg, 00:05:12
 20.24m, Start node type, manhole, reference number : SMH 4

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 24	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 1 (D/S) FMH 2	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 23.35 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride

Comment :

1:195	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : FMH 1	00:00:07	28_28_162_A.jpg
	0.00	Water level, 0% of the vertical dimension	00:00:07	
	0.10	Open joint, medium	00:00:07	28_28_164_A.jpg
	8.52	General photograph taken at this point	00:01:21	28_28_165_A.jpg
	22.43	Broken pipe, from 9 to 3 o'clock	00:03:26	28_28_166_A.jpg
	23.35	Water level, 5% of the vertical dimension	00:03:40	28_28_167_A.jpg
	23.35	Finish node type, manhole reference number: FMH 2	00:03:40	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	80	3.47	81	4	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 24	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 28_28_162_A.jpg, 00:00:07
 0m, Start node type, manhole, reference number : FMH 1



Photo: 28_28_164_A.jpg, 00:00:07
 0.1m, Open joint, medium



Photo: 28_28_165_A.jpg, 00:01:21
 8.52m, General photograph taken at this point



Photo: 28_28_166_A.jpg, 00:03:26
 22.43m, Broken pipe, from 9 to 3 o'clock Remarks: COMING INTO MANHOLE

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place :
Limerick City

Road :
Patrick St

Date :
27/04/2017

Section number :
24

PLR Suffix :
X



Photo: 28_28_167_A.jpg, 00:03:40
23.35m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 25	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 2 (D/S) FMH 3	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 15.92 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride

Comment :

1:135	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : FMH 2	00:00:02	29_29_169_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:02	
	0.10	Open joint, medium	00:00:04	29_29_171_A.jpg
	12.43	Open joint, medium	00:01:41	29_29_172_A.jpg
	15.92	Water level, 5% of the vertical dimension	00:02:11	29_29_173_A.jpg
	15.92	Start node type, manhole, reference number : FMH 2	00:02:11	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place :
Limerick City

Road :
Patrick St

Date :
27/04/2017

Section number :
25

PLR Suffix :
X



Photo: 29_29_169_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : FMH 2



Photo: 29_29_171_A.jpg, 00:00:04
 0.1m, Open joint, medium Remarks: SEALING RING INTRUDING AT BOTTOM OF PIPE



Photo: 29_29_172_A.jpg, 00:01:41
 12.43m, Open joint, medium



Photo: 29_29_173_A.jpg, 00:02:11
 15.92m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 26	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road FMH 3 (D/S) FMH 4	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 8.80 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride

Comment :

1:75	Position	Observation	MPEG	Photo					
		Start node type, manhole, reference number : FMH 3	00:00:00	30_30_175_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:00						
	8.80	Water level, 5% of the vertical dimension	00:01:03						
	8.80	Finish node type, manhole reference number: FMH 4	00:01:03	30_30_178_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 26	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 30_30_175_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : FMH 3



Photo: 30_30_178_A.jpg, 00:01:03
 8.8m, Finish node type, manhole reference number: FMH 4

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 27	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road SMH 1 (D/S) SMH 2	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	SMH 1 SMH 2
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 22.15 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:180	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : SMH 1	00:00:01	31_31_179_A.jpg
	0.00	Water level, 0% of the vertical dimension	00:00:01	
	3.83	Open joint, medium	00:00:39	31_31_181_A.jpg
	11.99	Water level, 10% of the vertical dimension	00:01:40	31_31_182_A.jpg
	15.32	Water level, 5% of the vertical dimension	00:02:27	31_31_183_A.jpg
	22.15	Water level, 5% of the vertical dimension	00:03:09	31_31_184_A.jpg
		Finish node type, manhole reference number: SMH 2	00:03:09	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.05	1	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 27	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 31_31_179_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : SMH 1



Photo: 31_31_181_A.jpg, 00:00:39
 3.83m, Open joint, medium



Photo: 31_31_182_A.jpg, 00:01:40
 11.99m, Water level, 10% of the vertical dimension Remarks:
 DIP IN LINE



Photo: 31_31_183_A.jpg, 00:02:27
 15.32m, Water level, 5% of the vertical dimension

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place :
Limerick City

Road :
Patrick St

Date :
27/04/2017

Section number :
27

PLR Suffix :
X



Photo: 31_31_184_A.jpg, 00:03:09
22.15m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 28	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Patrick St Road SMH 2 (D/S) SMH 3	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	SMH 2 SMH 3
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 15.94 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:135	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : SMH 2	00:00:01	32_32_186_A.jpg
		Water level, 5% of the vertical dimension	00:00:01	
		Open joint, medium	00:01:39	32_32_188_A.jpg
		Water level, 5% of the vertical dimension	00:02:11	32_32_189_A.jpg
		Finish node type, manhole reference number: SMH 3	00:02:11	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.06	1	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Patrick St	Date : 27/04/2017	Section number : 28	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 32_32_186_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : SMH 2



Photo: 32_32_188_A.jpg, 00:01:39
 11.1m, Open joint, medium



Photo: 32_32_189_A.jpg, 00:02:11
 15.94m, Water level, 5% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 29	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera Centre Road C 1 (D/S) C 1A	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 1 C 1A
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 23.48 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 400 mm Vitrified clay	

Comment :

1:195 Position	Observation	MPEG	Photo						
	<p>0.00 Start node type, manhole, reference number : C 1</p> <p>0.00 Water level, 10% of the vertical dimension</p> <p>0.01 General remark</p> <p>0.37 Water level, 40% of the vertical dimension</p> <p>0.42 Open joint, medium</p> <p>7.26 General photograph taken at this point</p> <p>10.68 Broken pipe, from 10 to 2 o'clock</p> <p>11.57 Water level, 15% of the vertical dimension</p> <p>14.64 General remark</p> <p>17.77 Broken pipe, from 10 to 2 o'clock</p> <p>17.95 Connection other than junction, at 10 o'clock, diameter 150mm</p> <p>19.34 Connection other than junction, at 2 o'clock, diameter 150mm</p> <p>21.21 Settled deposits, fine, 20% cross-sectional area loss</p> <p>21.21 General remark</p> <p>23.48 Survey abandoned</p>	<p>00:00:01</p> <p>00:00:03</p> <p>00:00:30</p> <p>00:00:38</p> <p>00:03:36</p> <p>00:04:50</p> <p>00:05:12</p> <p>00:05:45</p> <p>00:06:27</p> <p>00:06:54</p> <p>00:07:25</p> <p>00:08:48</p> <p>00:09:09</p> <p>00:11:12</p>	<p>33_33_191_A.jpg</p> <p>33_33_194_A.jpg</p> <p>33_33_193_A.jpg</p> <p>33_33_195_A.jpg</p> <p>33_33_196_A.jpg</p> <p>33_33_197_A.jpg</p> <p>33_33_199_A.jpg</p> <p>33_33_200_A.jpg</p> <p>33_33_201_A.jpg</p> <p>33_33_202_A.jpg</p> <p>33_33_203_A.jpg</p>						
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	80	6.86	161	4	1	2	0.09	2	3

Inspection pictures

Place :
Limerick City

Road :
Opera Centre

Date :
27/04/2017

Section number :
29

PLR Suffix :
X



Photo: 33_33_191_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 1



Photo: 33_33_194_A.jpg, 00:00:30
 0.37m, Water level, 40% of the vertical dimension



Photo: 33_33_193_A.jpg, 00:00:38
 0.42m, Open joint, medium



Photo: 33_33_195_A.jpg, 00:03:36
 7.26m, General photograph taken at this point

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 29	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 33_33_196_A.jpg, 00:04:50
 10.68m, Broken pipe, from 10 to 2 o'clock Remarks: PIPE
 BROKEN ON TOP AND CAPPED



Photo: 33_33_197_A.jpg, 00:05:12
 11.57m, Water level, 15% of the vertical dimension



Photo: 33_33_199_A.jpg, 00:06:27
 17.77m, Broken pipe, from 10 to 2 o'clock Remarks: PIPE
 ROOF BROKEN AND CAPPED



Photo: 33_33_200_A.jpg, 00:06:54
 17.95m, Connection other than junction, at 10 o'clock, diameter
 150mm

Inspection pictures

Place : Limerick City	Road : Opera Centre	Date : 27/04/2017	Section number : 29	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 33_33_201_A.jpg, 00:07:25
 19.34m, Connection other than junction, at 2 o'clock, diameter 150mm



Photo: 33_33_202_A.jpg, 00:08:48
 21.21m, Settled deposits, fine, 20% cross-sectional area loss



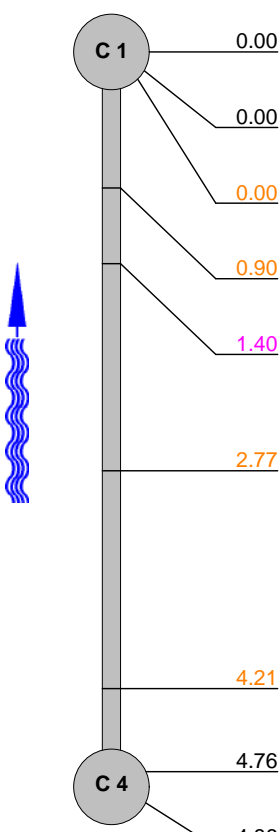
Photo: 33_33_203_A.jpg, 00:09:09
 21.21m, General remark Remarks: CHAMBER

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 30	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 1 (U/S) C 4	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 4 C 1
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 4.86 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:50	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 1	00:00:00	34_34_205_A.jpg
	0.00	Water level, 10% of the vertical dimension	00:00:00	
	0.00	Open joint, medium	00:00:09	34_34_207_A.jpg
	0.90	Open joint, medium	00:00:42	34_34_208_A.jpg
	1.40	Broken pipe, from 10 to 2 o'clock	00:00:55	34_34_209_A.jpg
	2.77	Open joint, medium	00:02:02	34_34_210_A.jpg
	4.21	Open joint, medium	00:02:37	34_34_211_A.jpg
	4.76	Water level, 5% of the vertical dimension	00:02:58	34_34_212_A.jpg
	4.86	Finish node type, manhole reference number: C 4	00:03:03	34_34_213_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
5	80	17.28	84	4	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 30	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 34_34_205_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C 1



Photo: 34_34_207_A.jpg, 00:00:09
 0m, Open joint, medium



Photo: 34_34_208_A.jpg, 00:00:42
 0.9m, Open joint, medium



Photo: 34_34_209_A.jpg, 00:00:55
 1.4m, Broken pipe, from 10 to 2 o'clock Remarks: TOP OF PIPE MISSING AND CAPPED OVER

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
30

PLR Suffix :
X



Photo: 34_34_210_A.jpg, 00:02:02
 2.77m, Open joint, medium



Photo: 34_34_211_A.jpg, 00:02:37
 4.21m, Open joint, medium



Photo: 34_34_212_A.jpg, 00:02:58
 4.76m, Water level, 5% of the vertical dimension



Photo: 34_34_213_A.jpg, 00:03:03
 4.86m, Finish node type, manhole reference number: C 4

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 31	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 2 (D/S) C 1	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 2 C 1
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 11.12 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:90	Position	Observation	MPEG	Photo					
	0.00	Start node type, manhole, reference number : C 2	00:00:04	35_35_214_A.jpg					
	0.00	Water level, 5% of the vertical dimension	00:00:04						
	0.33	Open joint, medium	00:00:36	35_35_216_A.jpg					
	0.77	Connection other than junction, at 12 o'clock, diameter 150mm	00:00:55	35_35_217_A.jpg					
	0.98	Open joint, medium	00:01:15	35_35_218_A.jpg					
	1.52	Connection other than junction, at 2 o'clock, diameter 150mm	00:01:49	35_35_219_A.jpg					
	2.32	Open joint, medium	00:02:25	35_35_220_A.jpg					
	6.93	Crack, longitudinal, at 7 o'clock	00:04:10	35_35_221_A.jpg					
	10.55	Line deviates left	00:04:42	35_35_222_A.jpg					
	11.12	Water level, 5% of the vertical dimension	00:05:26						
	11.12	Finish node type, manhole reference number: C 1	00:05:53	35_35_224_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
4	10	1.17	13	2	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 31	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 35_35_214_A.jpg, 00:00:04
 0m, Start node type, manhole, reference number : C 2



Photo: 35_35_216_A.jpg, 00:00:36
 0.33m, Open joint, medium



Photo: 35_35_217_A.jpg, 00:00:55
 0.77m, Connection other than junction, at 12 o'clock, diameter 150mm



Photo: 35_35_218_A.jpg, 00:01:15
 0.98m, Open joint, medium

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
31

PLR Suffix :
X



Photo: 35_35_219_A.jpg, 00:01:49
 1.52m, Connection other than junction, at 2 o'clock, diameter 150mm



Photo: 35_35_220_A.jpg, 00:02:25
 2.32m, Open joint, medium



Photo: 35_35_221_A.jpg, 00:04:10
 6.93m, Crack, longitudinal, at 7 o'clock



Photo: 35_35_222_A.jpg, 00:04:42
 10.55m, Line deviates left

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 31	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



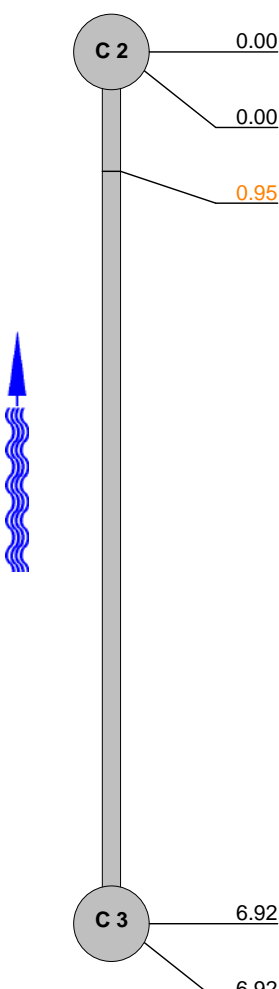
Photo: 35_35_224_A.jpg, 00:05:53
11.12m, Finish node type, manhole reference number: C 1

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 32	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 2 (U/S) C 3	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 3 C 2
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 6.92 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay	

Comment :

1:60	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C 2	00:00:02	36_36_225_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:03	
	0.95	Open joint, medium	00:00:29	36_36_227_A.jpg
	6.92	Water level, 5% of the vertical dimension	00:01:38	36_36_228_A.jpg
	6.92	Start node type, manhole, reference number : C 2	00:01:49	36_36_229_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 32	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------

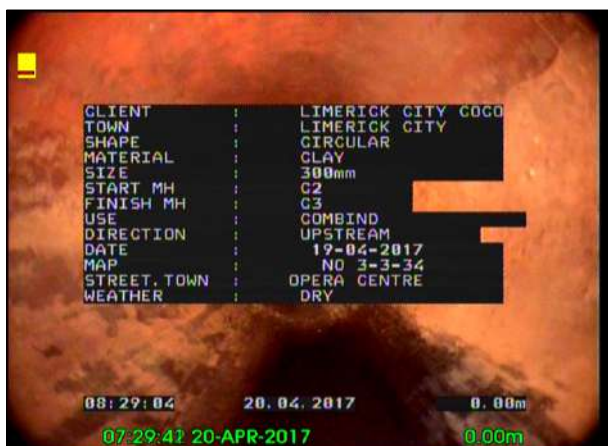


Photo: 36_36_225_A.jpg, 00:00:02
 0m, Start node type, manhole, reference number : C 2



Photo: 36_36_227_A.jpg, 00:00:29
 0.95m, Open joint, medium



Photo: 36_36_228_A.jpg, 00:01:38
 6.92m, Water level, 5% of the vertical dimension

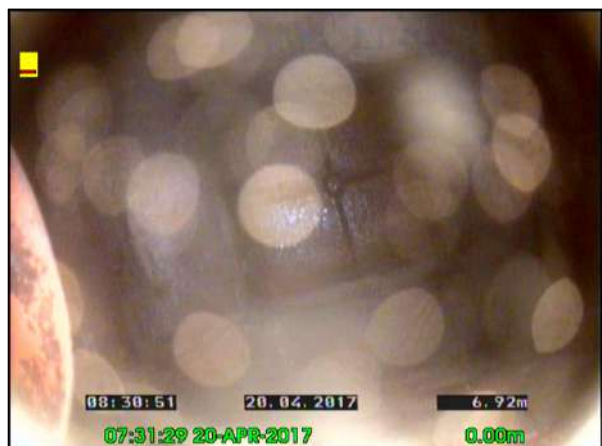


Photo: 36_36_229_A.jpg, 00:01:49
 6.92m, Start node type, manhole, reference number : C 2


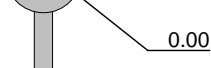
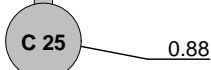
Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 33	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 26 (D/S) C 25	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 26 C 25
---	--	---	--	--------------------------------

Use: Combined	Pipe shape : Circular
Year laid :	Pipe size : 225 mm
Purpose : Sample survey to determine asset condition	Pipe material : Vitrified clay
Total length : 0.88 m	Lining :

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C 26	00:00:00	37_37_230_A.jpg
		Water level, 5% of the vertical dimension	00:00:00	37_37_231_A.jpg
		Finish node type, manhole reference number: C 25	00:00:59	37_37_233_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
33

PLR Suffix :
X



Photo: 37_37_230_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C 26



Photo: 37_37_231_A.jpg, 00:00:00
 0m, Water level, 5% of the vertical dimension



Photo: 37_37_233_A.jpg, 00:00:59
 0.88m, Finish node type, manhole reference number: C 25

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 34	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michaels st Road C 34 (D/S) C 37	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 34 C 37
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 37.00 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay	

Comment :

1:300	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 34	00:00:03	
	0.00	Water level, 5% of the vertical dimension	00:00:06	
	0.00	Line deviates right	00:00:06	
	0.95	Water level, 15% of the vertical dimension	00:00:22	38_38_237_A.jpg
	1.83	Cracks, multiple, from 5 to 12 o'clock	00:00:32	38_38_238_A.jpg
	3.35	Water level, 30% of the vertical dimension	00:01:21	38_38_239_A.jpg
	22.36	Connection other than junction, at 12 o'clock, diameter 150mm	00:03:09	38_38_240_A.jpg
	37.00	Water level, 15% of the vertical dimension	00:05:01	38_38_241_A.jpg
	37.00	Finish node type, manhole reference number: C 37	00:05:01	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	40	1.08	40	3	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Michaels st

Date :
27/04/2017

Section number :
34

PLR Suffix :
X



Photo: 38_38_237_A.jpg, 00:00:22
 0.95m, Water level, 15% of the vertical dimension



Photo: 38_38_238_A.jpg, 00:00:32
 1.83m, Cracks, multiple, from 5 to 12 o'clock



Photo: 38_38_239_A.jpg, 00:01:21
 3.35m, Water level, 30% of the vertical dimension



Photo: 38_38_240_A.jpg, 00:03:09
 22.36m, Connection other than junction, at 12 o'clock, diameter 150mm

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Michaels st	Date : 27/04/2017	Section number : 34	PLR Suffix : X
---------------------------------	------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 38_38_241_A.jpg, 00:05:01
37m, Water level, 15% of the vertical dimension

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 35	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 40 (D/S) C 41	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 53.29 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 400 mm Vitrified clay

Comment :

1:420	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 40	00:00:01	39_39_243_A.jpg
	0.01	General remark		
	0.07	Water level, 10% of the vertical dimension	00:00:04	39_39_244_A.jpg
	3.22	Open joint, medium	00:00:47	39_39_245_A.jpg
	4.01	General remark	00:01:18	39_39_246_A.jpg
	25.87	Connection other than junction, at 12 o'clock, diameter 225mm	00:05:24	39_39_249_A.jpg
	47.60	Connection other than junction, at 12 o'clock, diameter 150mm	00:08:27	39_39_250_A.jpg
	48.30	Connection other than junction, at 9 o'clock, diameter 150mm	00:08:52	39_39_251_A.jpg
	50.24	Connection other than junction, at 12 o'clock, diameter 150mm	00:09:29	39_39_252_A.jpg
	53.13	Open joint, medium	00:10:04	39_39_253_A.jpg
	53.27	Shape changes to circular, 300mm high	00:10:26	39_39_254_A.jpg
	53.28	General remark	00:10:35	
	53.29	General remark	00:00:58	

Inspection pictures

Place :

Limerick City

Road :

Opera centre

Date :

27/04/2017

Section number :

35

PLR Suffix :

X



Photo: 39_39_243_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 40



Photo: 39_39_244_A.jpg, 00:00:04
 0.07m, Water level, 10% of the vertical dimension



Photo: 39_39_245_A.jpg, 00:00:47
 3.22m, Open joint, medium



Photo: 39_39_246_A.jpg, 00:01:18
 4.01m, General remark Remarks: INTERMEDIATE BURIED
 MANHOLE ON LINE

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
35

PLR Suffix :
X



Photo: 39_39_249_A.jpg, 00:05:24
 25.87m, Connection other than junction, at 12 o'clock, diameter 225mm



Photo: 39_39_250_A.jpg, 00:08:27
 47.6m, Connection other than junction, at 12 o'clock, diameter 150mm



Photo: 39_39_251_A.jpg, 00:08:52
 48.3m, Connection other than junction, at 9 o'clock, diameter 150mm



Photo: 39_39_252_A.jpg, 00:09:29
 50.24m, Connection other than junction, at 12 o'clock, diameter 150mm

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 35	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 39_39_253_A.jpg, 00:10:04
 53.13m, Open joint, medium



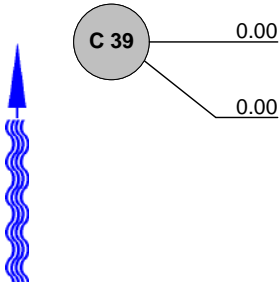
Photo: 39_39_254_A.jpg, 00:10:26
 53.27m, Shape changes to circular, 300mm high Remarks:
 ??????

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 36	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 40 (U/S) C 39	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 0.00 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 400 mm Vitrified clay

Comment :

1:50	Position	Observation	MPEG	Photo
	 C 39 0.00 0.00	Start node type, manhole, reference number : C 40	00:00:01	40_40_257_A.jpg
		Water level, 40% of the vertical dimension	00:00:01	40_40_258_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 36	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 40_40_257_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 40



Photo: 40_40_258_A.jpg, 00:00:01
 0m, Water level, 40% of the vertical dimension

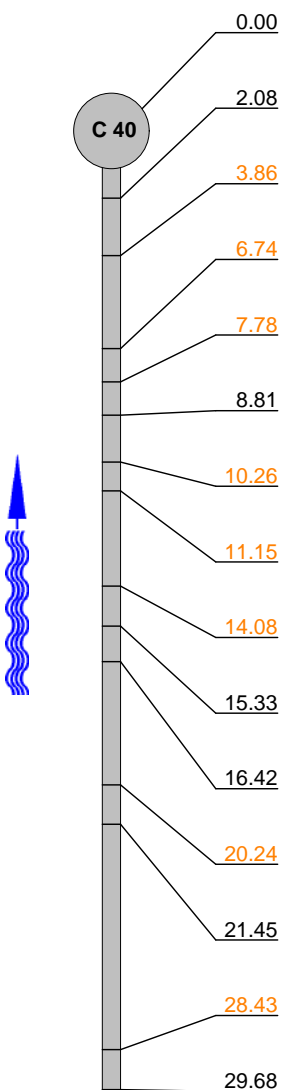
Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 37	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Opera centre Road C 40 (U/S) C 43	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 43 C 40
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 44.38 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 400 mm Vitrified clay	

Comment :

1:234	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 40	00:00:00	41_41_259_A.jpg
	2.08	Water level, 10% of the vertical dimension	00:00:52	41_41_260_A.jpg
	3.86	Open joint, medium	00:01:13	41_41_261_A.jpg
	6.74	Open joint, medium	00:02:00	41_41_262_A.jpg
	7.78	Open joint, medium	00:02:33	41_41_263_A.jpg
	8.81	General remark	00:03:01	41_41_264_A.jpg
	10.26	Open joint, medium	00:03:40	41_41_265_A.jpg
	11.15	Open joint, medium	00:04:09	41_41_266_A.jpg
	14.08	Open joint, medium	00:05:07	41_41_267_A.jpg
	15.33	General remark	00:05:36	41_41_268_A.jpg
	16.42	General photograph taken at this point	00:06:03	41_41_269_A.jpg
	20.24	Open joint, medium	00:06:50	41_41_270_A.jpg
	21.45	General remark	00:07:12	41_41_271_A.jpg
	28.43	Open joint, medium	00:08:44	41_41_272_A.jpg
	29.68	General remark	00:09:03	41_41_273_A.jpg



Inspection Report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 37	PLR : X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Grade:

1:234	Position	Observation	MPEG	Photo
	<u>32.77</u>	Open joint, medium	00:10:11	41_41_274_A.jpg
	<u>33.96</u>	General remark	00:10:40	41_41_276_A.jpg
	<u>39.13</u>	General remark	00:11:46	41_41_277_A.jpg
	<u>42.31</u>	Open joint, medium	00:12:46	41_41_278_A.jpg
	<u>44.38</u>	Finish node type, manhole reference number: C 43	00:13:24	41_41_280_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
10	1	0.24	10	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
37

PLR Suffix :
X



Photo: 41_41_259_A.jpg, 00:00:00
 0m, Start node type, manhole, reference number : C 40



Photo: 41_41_260_A.jpg, 00:00:52
 2.08m, Water level, 10% of the vertical dimension



Photo: 41_41_261_A.jpg, 00:01:13
 3.86m, Open joint, medium



Photo: 41_41_262_A.jpg, 00:02:00
 6.74m, Open joint, medium

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 37	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 41_41_263_A.jpg, 00:02:33
 7.78m, Open joint, medium



Photo: 41_41_264_A.jpg, 00:03:01
 8.81m, General remark Remarks: BURIED MANHOLE
 CHAMBER ON LINE



Photo: 41_41_265_A.jpg, 00:03:40
 10.26m, Open joint, medium



Photo: 41_41_266_A.jpg, 00:04:09
 11.15m, Open joint, medium

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 37	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 41_41_267_A.jpg, 00:05:07
 14.08m, Open joint, medium



Photo: 41_41_268_A.jpg, 00:05:36
 15.33m, General remark Remarks: BURIED MANHOLE CHAMBER ON LINE



Photo: 41_41_269_A.jpg, 00:06:03
 16.42m, General photograph taken at this point



Photo: 41_41_270_A.jpg, 00:06:50
 20.24m, Open joint, medium

Inspection pictures

Place : Limerick City	Road : Opera centre	Date : 27/04/2017	Section number : 37	PLR Suffix : X
---------------------------------	-------------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 41_41_271_A.jpg, 00:07:12
 21.45m, General remark Remarks: BURIED MANHOLE CHAMBER



Photo: 41_41_272_A.jpg, 00:08:44
 28.43m, Open joint, medium

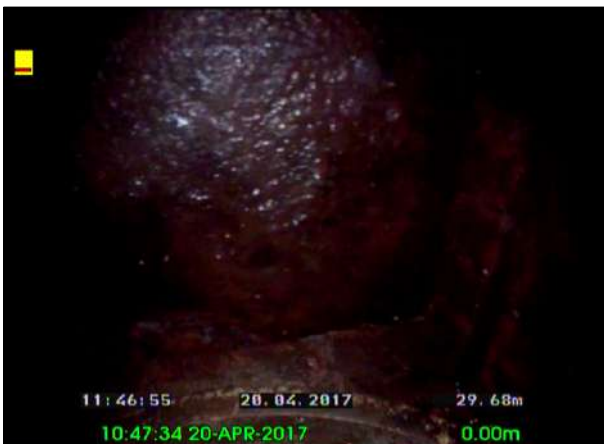


Photo: 41_41_273_A.jpg, 00:09:03
 29.68m, General remark Remarks: BURIED MANHOLE CHAMBER



Photo: 41_41_274_A.jpg, 00:10:11
 32.77m, Open joint, medium

Inspection pictures

Place :
Limerick City

Road :
Opera centre

Date :
27/04/2017

Section number :
37

PLR Suffix :
X

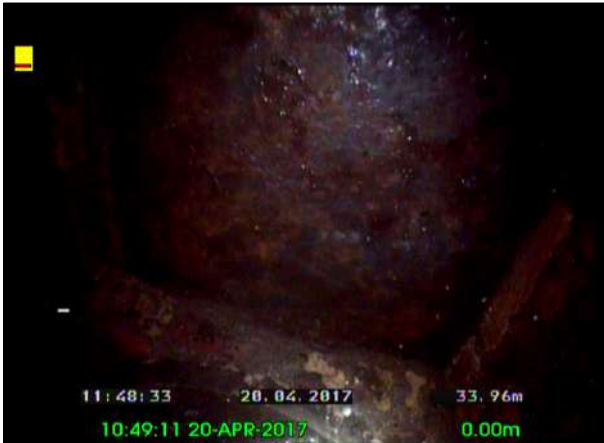


Photo: 41_41_276_A.jpg, 00:10:40
 33.96m, General remark Remarks: BURIED MANHOLE CHAMBER



Photo: 41_41_277_A.jpg, 00:11:46
 39.13m, General remark Remarks: BURIED MANHOLE CHAMBER



Photo: 41_41_278_A.jpg, 00:12:46
 42.31m, Open joint, medium



Photo: 41_41_280_A.jpg, 00:13:24
 44.38m, Finish node type, manhole reference number: C 43

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 38	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Francis st Road C 45 (U/S) C 44	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	C 44 C 45
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 4.43 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Polyvinyl chloride	

Comment :

1:50	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 45	00:00:01	42_42_281_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	4.01	Line deviates right	00:00:33	42_42_283_A.jpg
	4.43	Survey abandoned	00:01:28	42_42_284_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Francis st	Date : 27/04/2017	Section number : 38	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 42_42_281_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 45



Photo: 42_42_283_A.jpg, 00:00:33
 4.01m, Line deviates right



Photo: 42_42_284_A.jpg, 00:01:28
 4.43m, Survey abandoned Remarks: UNABLE TO TRAVEL
 BENDS

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 39	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Francis st Road	Location details: Catchment: Tape number : Pipe Length	U/S MH : C 45 U/S Depth : D/S MH : Mainline D/S Depth :
Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 9.39 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Polyvinyl chloride

Comment :

1:75	Position	Observation	MPEG	Photo
	C 45			
	0.64	Start node type, manhole, reference number : C 45	00:00:06	43_43_285_A.jpg
	2.50	Water level, 80% of the vertical dimension	00:00:15	43_43_286_A.jpg
	5.62	Water level, 10% of the vertical dimension	00:00:39	43_43_287_A.jpg
	9.39	Line deviates down	00:01:22	43_43_288_A.jpg
	9.39	Finish node type, manhole reference number: Mainline	00:01:22	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place :
Limerick City

Road :
Francis st

Date :
27/04/2017

Section number :
39

PLR Suffix :
X



Photo: 43_43_285_A.jpg, 00:00:06
 0.64m, Start node type, manhole, reference number : C 45



Photo: 43_43_286_A.jpg, 00:00:15
 2.5m, Water level, 80% of the vertical dimension



Photo: 43_43_287_A.jpg, 00:00:39
 5.62m, Water level, 10% of the vertical dimension



Photo: 43_43_288_A.jpg, 00:01:22
 9.39m, Line deviates down Remarks: DOWNWARDS INTO MAINLINE

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 40	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Francis st Road F 50 (D/S) F 51	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	F 50 F 51
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 22.84 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Polyvinyl chloride	

Comment :

1:180	Position	Observation	MPEG	Photo					
	0.00	Start node type, manhole, reference number : F 50	00:00:01	44_44_290_A.jpg					
	0.00	Water level, 0% of the vertical dimension	00:00:01						
	8.76	Water level, 5% of the vertical dimension	00:01:04	44_44_292_A.jpg					
	12.21	Connection other than junction, at 9 o'clock, diameter 100mm	00:01:36	44_44_293_A.jpg					
	22.84	Water level, 5% of the vertical dimension	00:02:51						
	22.84	Finish node type, manhole reference number: F 51	00:02:51	44_44_295_A.jpg					
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Francis st	Date : 27/04/2017	Section number : 40	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 44_44_290_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : F 50



Photo: 44_44_292_A.jpg, 00:01:04
 8.76m, Water level, 5% of the vertical dimension



Photo: 44_44_293_A.jpg, 00:01:36
 12.21m, Connection other than junction, at 9 o'clock, diameter 100mm



Photo: 44_44_295_A.jpg, 00:02:51
 22.84m, Finish node type, manhole reference number: F 51

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 41	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michael st Road C 27 (D/S) C 25	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
---	--	---	--

Use: Year laid : Purpose : Total length :	Combined Sample survey to determine asset condition 5.47 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 150 mm Vitrified clay
--	---	--	---

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : C 27	00:00:00	45_45_296_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:00	
	5.47	Water level, 5% of the vertical dimension	00:00:53	
	5.47	Start node type, manhole, reference number : C 27	00:00:53	45_45_299_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Michael st	Date : 27/04/2017	Section number : 41	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 45_45_296_A.jpg, 00:00:00
0m, Start node type, manhole, reference number : C 27



Photo: 45_45_299_A.jpg, 00:00:53
5.47m, Start node type, manhole, reference number : C 27

Inspection report

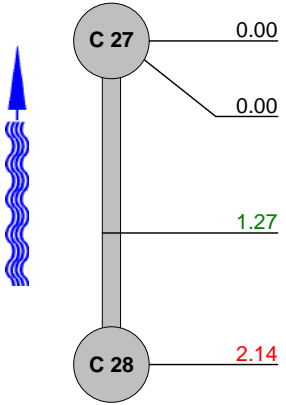
Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 42	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michael st Road C 27 (U/S) C 28	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
---	--	---	--

Use: Combined	Pipe shape : Circular
Year laid :	Pipe size : 150 mm
Purpose : Sample survey to determine asset condition	Pipe material : Vitrified clay
Total length : 2.14 m	Lining :

Comment : **Video should read C27 U/S C28**

1:50	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : C 27	00:00:01	46_46_300_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:01	
	1.27	Joint displaced, medium	00:00:27	46_46_302_A.jpg
	2.14	Other obstacles, other object in invert, from 12 to 12 o'clock, 95% cross-sectional area loss	00:00:43	46_46_303_A.jpg



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
------------	----------	----------	-----------	-----------	------------	----------	----------	-----------	-----------

Inspection pictures

Place : Limerick City	Road : Michael st	Date : 27/04/2017	Section number : 42	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 46_46_300_A.jpg, 00:00:01
 0m, Start node type, manhole, reference number : C 27



Photo: 46_46_302_A.jpg, 00:00:27
 1.27m, Joint displaced, medium



Photo: 46_46_303_A.jpg, 00:00:43
 2.14m, Other obstacles, other object in invert, from 12 to 12 o'clock, 95% cross-sectional area loss Remarks: UNABLE TO PASS

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 43	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michael st Road F 23 (D/S) C 22	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
---	--	---	--

Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 12.48 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Polyvinyl chloride
--	---	--	--

Comment : **F22 ON VIDEO SHOULD READ C 22**

1:105	Position	Observation	MPEG	Photo
	0.00	Start node type, manhole, reference number : F 23	00:00:04	47_47_304_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:04	
	5.72	Sealing ring intruding, from 6 to 12 o'clock	00:00:22	47_47_306_A.jpg
	12.48	Finish node type, manhole reference number: C 22	00:00:58	47_47_307_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	5	0.4	5	1	0	0	0	0	1

Inspection pictures

Place : Limerick City	Road : Michael st	Date : 27/04/2017	Section number : 43	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 47_47_304_A.jpg, 00:00:04
 0m, Start node type, manhole, reference number : F 23



Photo: 47_47_306_A.jpg, 00:00:22
 5.72m, Sealing ring intruding, from 6 to 12 o'clock



Photo: 47_47_307_A.jpg, 00:00:58
 12.46m, Finish node type, manhole reference number: C 22

Inspection report

Date : 27/04/2017	Job number :	Weather : no rain or snow	Operator :	Section number : 44	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : yes	Operator :

Place : Road : Location Inspection	Limerick City Michael st Road F 23 (U/S) S 23	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :
---	--	---	--

Use: Foul	Pipe shape : Circular
Year laid :	Pipe size : 300 mm
Purpose : Sample survey to determine asset condition	Pipe material : Polyvinyl chloride
Total length : 1.00 m	Lining :

Comment :

1:50	Position	Observation	MPEG	Photo
		Start node type, manhole, reference number : F 23	00:00:00	48_48_308_A.jpg
	0.00	Water level, 5% of the vertical dimension	00:00:00	
	1.00	Finish node type, manhole reference number: S 23	00:00:18	48_48_310_A.jpg

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Place :

A1 Drain Repairs
Miltown, Kilasser
Swinford
Tel: +353 (0) 94 9250480
Fax:
Email:

Inspection pictures

Place : Limerick City	Road : Michael st	Date : 27/04/2017	Section number : 44	PLR Suffix : X
---------------------------------	-----------------------------	-----------------------------	-------------------------------	--------------------------



Photo: 48_48_308_A.jpg, 00:00:00
0m, Start node type, manhole, reference number : F 23



Photo: 48_48_310_A.jpg, 00:00:18
1m, Finish node type, manhole reference number: S 23

Report Information

This page can be edited to contain any information you feel is necessary.

A disclaimer.

Any terms and conditions

Appendix B – Irish Water Response to Pre-connection Enquiry

Aecom C/o Riordan, Jamie
4th Floor Adelphi Plaza
Georges street upper
Dun Laoghaire
Dublin



Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

12 February 2019

Dear Sir/Madam,

**Re: Customer Reference No 1000851240 pre-connection enquiry - Subject to contract | Contract denied
Connection for Mixed Use Development**

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at St Michaels Street, Limerick City, Co. Limerick . Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

In the case of wastewater connections this assessment does not confirm that a gravity connection is achievable. Therefore a suitably sized pumping station may be required to be installed on your site. All infrastructure should be designed and installed in accordance with the Irish Water Code of Practice.

In order to accommodate the proposed connection at the Premises and also to ensure that existing connections are not affected by the proposed development, upgrade works are required to increase the capacity of the Irish Water network. Irish Water does not currently have any plans to carry out the works required to provide the necessary upgrade and capacity. Should you wish to have such upgrade works progressed, Irish Water may require you to provide a contribution of a relevant portion of the costs for the required upgrades, please contact Irish Water to discuss this further.

With respect to the watermain network, the following upgrades are required:

1. Replacement of the existing watermain on Ruthland Street from its junction with Francis Street to Bank Place and upgraded to 250mm D.I. Approximate length of 120m
2. Replacement of the existing watermain on Ellen Street from its junction with Patrick Street to Michael Street and upgraded to 250mm D.I. Approximate length of 120m

With respect to the wastewater network:

1. Please note that IW have no objection to your proposal in principle (see attached) which allows for the current brickwork culvert to be diverted and run along Michael Street, discharge to an existing manhole located on Bank Place and discharge to the 1800mm dia. interceptor sewer located in the Abbey River. It will be necessary to enter into a diversion agreement with IW in respect of proposed diversion works.
2. Confirmation shall be provided to IW that the proposed 450mm sewer has sufficient capacity to carry the diverted flows as well as the discharge from the proposed development.
3. The foul and storm discharge from the proposed Project Opera Development shall be separated with no storm water being discharged to the foul/combined network.
4. It is understood that there are existing stormwater discharges currently being discharged to the existing 225mm combined sewer along Michael Street, from both the eastern and western side of the street. Consideration shall be given to the separation of such and provision of a separate storm sewer in conjunction with the proposed foul sewer diversion.

This Connection Offer to connect to the Irish Water infrastructure also does not extend to your fire flow requirements. In order to determine the potential flow that could be delivered during normal operational conditions, an on site assessment of the existing network is required. Please note that Irish Water cannot guarantee a flow rate to meet fire flow requirements and in order to guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development.

IW have no objection to the discharge from an underground basement car-park to the combined network. This discharge must be limited to water dripping off vehicles using the basement rather than direct run-off from rainfall events.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

A connection agreement can be applied for by completing the connection application form available at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities.


If you have any further questions, please contact John Hennessy from the design team on 022-52256 or email <<jhennessy@water.ie>>. For further information, visit www.water.ie/connections

Yours sincerely,

Maria O'Dwyer
Connections and Developer Services

Stiúrthóirí / Directors: Mike Quinn (Chairman), Eamon Gallen, Cathal Marley, Brendan Murphy, Michael G. O'Sullivan
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

Appendix C – Foul Water Network Calculations

AECOM		Page 1
Midpoint Alencon Link Basingstoke		
Date 06/03/2019 14:45 File Foul ground floor.mdx	Designed by Aileen.Prendergast Checked by	
XP Solutions	Network 2018.1	

FOUL SEWERAGE DESIGN







Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Flow Per Person (l/per/day)	0.00	Maximum Backdrop Height (m)	1.500
Persons per House	0.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	17.410	0.058	300.2	0.000	0	3.1	1.500	o	375	Pipe/Conduit	
F1.001	90.039	0.299	301.1	0.000	0	0.0	1.500	o	375	Pipe/Conduit	
F1.002	36.694	0.123	298.3	0.000	0	0.0	1.500	o	375	Pipe/Conduit	
F2.000	52.868	1.133	46.7	0.000	0	4.4	1.500	o	150	Pipe/Conduit	
F1.003	28.730	0.066	435.3	0.000	0	0.0	1.500	o	450	Pipe/Conduit	
F1.004	20.715	0.042	493.2	0.000	0	0.0	1.500	o	450	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	3.248	0.000	3.1	0	0.0	45	0.41	0.92	102.0	3.1
F1.001	3.190	0.000	3.1	0	0.0	45	0.41	0.92	101.8	3.1
F1.002	2.891	0.000	3.1	0	0.0	45	0.42	0.93	102.3	3.1
F2.000	4.350	0.000	4.4	0	0.0	45	0.99	1.28	22.7	4.4
F1.003	2.693	0.000	7.5	0	0.0	71	0.46	0.86	137.1	7.5
F1.004	2.627	0.000	7.5	0	0.0	74	0.44	0.81	128.8	7.5


PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	o	375	F1-0	4.950	3.248	1.327	Open Manhole	1350
F1.001	o	375	F1-1	4.800	3.190	1.235	Open Manhole	1350
F1.002	o	375	F1-2	4.050	2.891	0.784	Open Manhole	1350
F2.000	o	150	F2-0	5.700	4.350	1.200	Open Manhole	1200
F1.003	o	450	F1-3	4.300	2.693	1.157	Open Manhole	1350
F1.004	o	450	F1-4	4.205	2.627	1.128	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	17.410	300.2	F1-1	4.800	3.190	1.235	Open Manhole	1350
F1.001	90.039	301.1	F1-2	4.050	2.891	0.784	Open Manhole	1350
F1.002	36.694	298.3	F1-3	4.300	2.768	1.157	Open Manhole	1350
F2.000	52.868	46.7	F1-3	4.300	3.217	0.933	Open Manhole	1350
F1.003	28.730	435.3	F1-4	4.205	2.627	1.128	Open Manhole	1350
F1.004	20.715	493.2		4.750	2.585	1.715	Open Manhole	0

AECOM		Page 1
Midpoint Alencon Link Basingstoke		
Date 08/03/2019 11:35	Designed by Aileen.Prendergast	
File jr foul drainage Under B...	Checked by	
XP Solutions	Network 2018.1	

FOUL SEWERAGE DESIGN









Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Flow Per Person (l/per/day)	0.00	Maximum Backdrop Height (m)	1.500
Persons per House	0.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F3.000	19.490	0.557	35.0	0.000	0	0.1	1.500	o	150	Pipe/Conduit	
F4.000	33.381	0.257	130.0	0.000	0	0.6	1.500	o	150	Pipe/Conduit	
F4.001	38.897	0.300	129.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.001	18.647	0.143	130.4	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.002	12.500	0.096	130.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.003	54.304	0.418	130.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.004	31.849	0.245	130.0	0.000	0	0.1	1.500	o	150	Pipe/Conduit	
F5.000	19.496	0.150	130.0	0.000	0	0.3	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F3.000	-0.050	0.000	0.1	0	0.0	7	0.33	1.48	26.2	0.1
F4.000	-0.050	0.000	0.6	0	0.0	22	0.38	0.77	13.6	0.6
F4.001	-0.307	0.000	0.6	0	0.0	22	0.38	0.77	13.6	0.6
F3.001	-0.607	0.000	0.7	0	0.0	23	0.40	0.77	13.5	0.7
F3.002	-0.750	0.000	0.7	0	0.0	23	0.40	0.77	13.6	0.7
F3.003	-0.846	0.000	0.7	0	0.0	23	0.40	0.77	13.6	0.7
F3.004	-1.264	0.000	0.8	0	0.0	25	0.41	0.77	13.6	0.8
F5.000	-0.050	0.000	0.3	0	0.0	16	0.30	0.77	13.6	0.3

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F3.000	o	150	F7	1.300	-0.050	1.200	Open Manhole	1200
F4.000	o	150	F8	1.300	-0.050	1.200	Open Manhole	1200
F4.001	o	150	F9	1.300	-0.307	1.457	Open Manhole	1200
F3.001	o	150	F10	1.300	-0.607	1.757	Open Manhole	1200
F3.002	o	150	F11	1.300	-0.750	1.900	Open Manhole	1200
F3.003	o	150	F12	1.300	-0.846	1.996	Open Manhole	1200
F3.004	o	150	F13	1.300	-1.264	2.414	Open Manhole	1200
F5.000	o	150	F14	1.300	-0.050	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F3.000	19.490	35.0	F10	1.300	-0.607	1.757	Open Manhole	1200
F4.000	33.381	130.0	F9	1.300	-0.307	1.457	Open Manhole	1200
F4.001	38.897	129.6	F10	1.300	-0.607	1.757	Open Manhole	1200
F3.001	18.647	130.4	F11	1.300	-0.750	1.900	Open Manhole	1200
F3.002	12.500	130.0	F12	1.300	-0.846	1.996	Open Manhole	1200
F3.003	54.304	130.0	F13	1.300	-1.264	2.414	Open Manhole	1200
F3.004	31.849	130.0	F8	0.000	-1.509		Open Manhole	1200
F5.000	19.496	130.0	F8	0.000	-0.200		Open Manhole	1200

Appendix D – Surface Water Network Calculations

AECOM		Page 1
Midpoint	Project Opera	
Alencon Link	Ground Floor SW Drainage	
Basingstoke	Catchment 1	
Date 13/03/2019 12:37	Designed by CD	
File Opera SW Network 2019.03.06.MDX	Checked by AS	
XP Solutions	Network 2018.1	



STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	19.762	0.198	100.0	0.161	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	17.141	0.114	150.0	0.117	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	19.676	0.131	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	39.251	0.262	150.0	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	15.866	0.106	150.0	0.279	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	16.741	0.112	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	6.303	0.042	150.1	0.275	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	3.121	0.021	148.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	11.671	0.078	149.6	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	17.210	0.115	149.7	0.023	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.007	16.196	0.108	150.0	0.035	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.008	5.396	0.036	150.0	0.026	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	11.124	0.074	150.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	9.596	0.064	150.0	0.084	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.011	7.516	0.050	150.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.012	20.737	0.138	150.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	4.862	0.032	151.9	0.096	4.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	62.35	4.25	4.500	0.161	0.0	0.0	0.0	1.31	52.0	27.3
S1.001	61.23	4.47	4.227	0.278	0.0	0.0	0.0	1.28	90.6	46.1
S2.000	61.60	4.40	4.555	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S3.000	59.68	4.80	4.500	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S1.002	58.75	5.01	4.000	0.557	0.0	0.0	0.0	1.28	90.6	88.6
S1.003	57.80	5.22	3.894	0.557	0.0	0.0	0.0	1.28	90.6	88.6
S1.004	57.49	5.29	3.600	0.831	0.0	0.0	0.0	1.48	163.1	129.5
S1.005	57.35	5.33	3.558	0.831	0.0	0.0	0.0	1.48	163.9	129.5
S4.000	62.43	4.24	4.032	0.000	0.0	0.0	0.0	0.82	14.5	0.0
S1.006	56.55	5.52	2.000	0.855	0.0	0.0	0.0	1.48	163.3	130.9
S1.007	55.82	5.71	1.800	0.890	0.0	0.0	0.0	1.48	163.2	134.5
S1.008	55.58	5.77	1.200	0.916	0.0	0.0	0.0	1.48	163.1	137.8
S1.009	55.10	5.89	1.000	0.916	0.0	0.0	0.0	1.48	163.1	137.8
S1.010	54.69	6.00	0.926	1.000	0.0	0.0	0.0	1.48	163.1	148.1
S1.011	54.38	6.09	0.862	1.000	0.0	0.0	0.0	1.48	163.0	148.1
S1.012	53.53	6.32	0.812	1.000	0.0	0.0	0.0	1.48	163.0	148.1
S5.000	63.27	4.08	0.900	0.096	0.0	0.0	0.0	1.06	42.1	16.4

Midpoint
Alencon Link
Basingstoke

Project Opera
Ground Floor SW Drainage
Catchment 1



Date 13/03/2019 12:37
File Opera SW Network 2019.03.06.MDX

Designed by CD
Checked by AS

XP Solutions

Network 2018.1

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S5.001	2.210	0.015	147.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.013	12.072	0.080	150.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.014	18.971	0.126	150.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	6.225	0.028	222.3	0.531	4.00	0.0	0.600	o	375	Pipe/Conduit	
S6.001	24.480	0.109	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.015	18.400	0.082	224.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.000	17.313	0.077	224.8	0.016	4.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	90.000	0.400	225.0	0.078	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.002	37.510	0.167	224.6	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.003	14.006	0.062	225.9	0.035	0.00	0.0	0.600	o	225	Pipe/Conduit	
S7.004	8.477	0.038	223.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.016	14.925	0.066	226.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.017	1.742	0.008	217.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S5.001	63.09	4.11	0.868	0.096	0.0	0.0	0.0	1.07	42.7	16.4
S1.013	62.68	4.19	0.691	0.000	9.4	0.0	0.0	1.06	42.2	9.4
S1.014	61.17	4.49	2.700	0.000	9.4	0.0	0.0	1.06	42.3	9.4
S6.000	63.22	4.09	3.000	0.531	0.0	0.0	0.0	1.21	133.8	90.9
S6.001	61.25	4.47	2.972	0.000	2.5	0.0	0.0	0.87	34.5	2.5
S1.015	59.50	4.84	2.574	0.000	11.9	0.0	0.0	0.87	34.5	11.9
S7.000	61.94	4.33	3.700	0.016	0.0	0.0	0.0	0.87	34.5	2.7
S7.001	54.47	6.06	3.623	0.094	0.0	0.0	0.0	0.87	34.5	13.9
S7.002	51.96	6.78	3.223	0.122	0.0	0.0	0.0	0.87	34.5	17.1
S7.003	51.09	7.05	3.056	0.157	0.0	0.0	0.0	0.87	34.4	21.7
S7.004	50.58	7.21	2.994	0.157	0.0	0.0	0.0	0.87	34.6	21.7
S1.016	49.72	7.50	2.492	0.157	11.9	0.0	0.0	0.87	34.4	33.0
S1.017	49.62	7.53	2.426	0.157	11.9	0.0	0.0	0.88	35.1	33.0

Midpoint
Alencon Link
Basingstoke

Project Opera
Ground Floor SW Drainage
Catchment 1

Date 13/03/2019 12:37

Designed by CD

File Opera SW Network 2019.03.06.MDX

Checked by AS



XP Solutions

Network 2018.1

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	LDU2	5.565	4.500	0.840	Open Manhole	1200
S1.001	o	300	LDU3	5.215	4.227	0.688	Open Manhole	1200
S2.000	o	150	LDU4	5.500	4.555	0.795	Open Manhole	1200
S3.000	o	150	LDU1	5.500	4.500	0.850	Open Manhole	1200
S1.002	o	300	LDU5	5.215	4.000	0.915	Open Manhole	1200
S1.003	o	300	LDU6	4.940	3.894	0.746	Open Manhole	1200
S1.004	o	375	LDU7	4.732	3.600	0.757	Open Manhole	1350
S1.005	o	375	S1-5	4.700	3.558	0.767	Open Manhole	1350
S4.000	o	150	LDU8	4.700	4.032	0.518	Open Manhole	1200
S1.006	o	375	S1-6	4.708	2.000	2.333	Open Manhole	1350
S1.007	o	375	S1-7	2.900	1.800	0.725	Open Manhole	1350
S1.008	o	375	S1-8	2.900	1.200	1.325	Open Manhole	1350
S1.009	o	375	S1-9	2.900	1.000	1.525	Open Manhole	1350
S1.010	o	375	S1-10	2.900	0.926	1.599	Open Manhole	1350
S1.011	o	375	S1-11	2.900	0.862	1.663	Open Manhole	1350
S1.012	o	375	S1-12	2.900	0.812	1.713	Open Manhole	1350
S5.000	o	225	S5-0	3.020	0.900	1.895	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	19.762	100.0	LDU3	5.215	4.302	0.688	Open Manhole	1200
S1.001	17.141	150.0	LDU5	5.215	4.113	0.802	Open Manhole	1200
S2.000	19.676	150.0	LDU5	5.215	4.424	0.641	Open Manhole	1200
S3.000	39.251	150.0	LDU5	5.215	4.238	0.827	Open Manhole	1200
S1.002	15.866	150.0	LDU6	4.940	3.894	0.746	Open Manhole	1200
S1.003	16.741	150.0	LDU7	4.732	3.783	0.649	Open Manhole	1350
S1.004	6.303	150.1	S1-5	4.700	3.558	0.767	Open Manhole	1350
S1.005	3.121	148.6	S1-6	4.708	3.537	0.796	Open Manhole	1350
S4.000	11.671	149.6	S1-6	4.708	3.954	0.604	Open Manhole	1350
S1.006	17.210	149.7	S1-7	2.900	1.885	0.640	Open Manhole	1350
S1.007	16.196	150.0	S1-8	2.900	1.692	0.833	Open Manhole	1350
S1.008	5.396	150.0	S1-9	2.900	1.164	1.361	Open Manhole	1350
S1.009	11.124	150.0	S1-10	2.900	0.926	1.599	Open Manhole	1350
S1.010	9.596	150.0	S1-11	2.900	0.862	1.663	Open Manhole	1350
S1.011	7.516	150.3	S1-12	2.900	0.812	1.713	Open Manhole	1350
S1.012	20.737	150.3	S1-13	2.850	0.674	1.801	Open Manhole	1350
S5.000	4.862	151.9	S5-1	2.900	0.868	1.807	Open Manhole	1200

Midpoint
Alencon Link
Basingstoke

Project Opera
Ground Floor SW Drainage
Catchment 1

Date 13/03/2019 12:37

Designed by CD

File Opera SW Network 2019.03.06.MDX

Checked by AS

XP Solutions

Network 2018.1



PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	o	225	S5-1	2.900	0.868	1.807	Open Manhole	1200
S1.013	o	225	S1-13	2.850	0.691	1.934	Open Manhole	1350
S1.014	o	225	S1-14	4.200	2.700	1.275	Open Manhole	1200
S6.000	o	375	S6-0	5.500	3.000	2.125	Open Manhole	1350
S6.001	o	225	S6-1	5.500	2.972	2.303	Open Manhole	1350
S1.015	o	225	S1-15	4.780	2.574	1.981	Open Manhole	1200
S7.000	o	225	S7-0	5.121	3.700	1.196	Open Manhole	1200
S7.001	o	225	S7-1	4.720	3.623	0.872	Open Manhole	1200
S7.002	o	225	S7-2	4.150	3.223	0.702	Open Manhole	1200
S7.003	o	225	S7-3	4.200	3.056	0.919	Open Manhole	1200
S7.004	o	225	S7-4	4.540	2.994	1.321	Open Manhole	1200
S1.016	o	225	S1-16	4.780	2.492	2.063	Open Manhole	1200
S1.017	o	225	S1-17	4.700	2.426	2.049	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	2.210	147.3	S1-13	2.850	0.853	1.772	Open Manhole	1350
S1.013	12.072	150.9	S1-14	4.200	0.611	3.364	Open Manhole	1200
S1.014	18.971	150.6	S1-15	4.780	2.574	1.981	Open Manhole	1200
S6.000	6.225	222.3	S6-1	5.500	2.972	2.153	Open Manhole	1350
S6.001	24.480	225.0	S1-15	4.780	2.863	1.692	Open Manhole	1200
S1.015	18.400	224.4	S1-16	4.780	2.492	2.063	Open Manhole	1200
S7.000	17.313	224.8	S7-1	4.720	3.623	0.872	Open Manhole	1200
S7.001	90.000	225.0	S7-2	4.150	3.223	0.702	Open Manhole	1200
S7.002	37.510	224.6	S7-3	4.200	3.056	0.919	Open Manhole	1200
S7.003	14.006	225.9	S7-4	4.540	2.994	1.321	Open Manhole	1200
S7.004	8.477	223.1	S1-16	4.780	2.956	1.599	Open Manhole	1200
S1.016	14.925	226.1	S1-17	4.700	2.426	2.049	Open Manhole	1200
S1.017	1.742	217.8	OUTFALL	4.800	2.418	2.157	Open Manhole	0

Midpoint
Alencon Link
Basingstoke

Project Opera
Ground Floor SW Drainage
Catchment 1

Date 13/03/2019 12:37

Designed by CD

File Opera SW Network 2019.03.06.MDX

Checked by AS

XP Solutions

Network 2018.1



Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	15.000	Storm Duration (mins)	30
Ratio R	0.300		

Midpoint
Alencon Link
Basingstoke

Project Opera
Ground Floor SW Drainage
Catchment 1

Date 13/03/2019 12:37

Designed by CD

File Opera SW Network 2019.03.06.MDX

Checked by AS



XP Solutions

Network 2018.1

Storage Structures for Storm

Tank or Pond Manhole: S1-13, DS/PN: S1.013


Invert Level (m) 0.691

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	200.0	1.800	200.0	1.801	0.0

Tank or Pond Manhole: S6-1, DS/PN: S6.001

Invert Level (m) 2.972

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	120.0	1.400	120.0	1.401	0.0

AECOM		Page 1
Midpoint Alencon Link Basingstoke		
Date 08/03/2019 11:37 File Basement drainage.MDX	Designed by Aileen.Prendergast Checked by	
XP Solutions	Network 2018.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	15.000	Add Flow / Climate Change (%)	20
Ratio R	0.300	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	200	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	200	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits



Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.172	4-8	0.058

Total Area Contributing (ha) = 0.230


Total Pipe Volume (m³) = 5.042

Network Design Table for Storm







PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S10.000	40.372	0.269	150.1	0.030	4.00	0.0	0.600	o	150	Pipe/Conduit	
S11.000	8.479	0.057	148.8	0.008	4.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S10.000	47.81	4.82	0.300	0.030	0.0	0.0	0.8	0.82	14.5	4.7
S11.000	50.38	4.17	0.300	0.008	0.0	0.0	0.2	0.82	14.5	1.3


AECOM		Page 2
Midpoint Alencon Link Basingstoke		
Date 08/03/2019 11:37	Designed by Aileen.Prendergast	
File Basement drainage.MDX	Checked by	
XP Solutions	Network 2018.1	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S10.001	18.670	0.124	150.6	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	16.100	0.107	150.5	0.013	4.00	0.0	0.600	o	150	Pipe/Conduit	
S10.002	30.720	0.154	199.5	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.003	21.708	0.109	199.2	0.053	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.000	30.268	0.151	200.5	0.088	4.00	0.0	0.600	o	225	Pipe/Conduit	
S10.004	6.951	0.035	198.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S10.001	46.44	5.20	0.031	0.046	0.0	0.0	1.2	0.82	14.4	6.9
S12.000	49.73	4.33	0.300	0.013	0.0	0.0	0.4	0.82	14.4	2.2
S10.002	44.62	5.76	-0.168	0.089	0.0	0.0	2.2	0.92	36.7	13.0
S10.003	43.43	6.15	-0.322	0.142	0.0	0.0	3.3	0.92	36.7	20.0
S13.000	48.85	4.55	0.300	0.088	0.0	0.0	2.3	0.92	36.6	14.0
S10.004	43.06	6.28	-0.431	0.230	0.0	0.0	5.4	0.92	36.7	32.2

AECOM		Page 3
Midpoint Alencon Link Basingstoke		
Date 08/03/2019 11:37	Designed by Aileen.Prendergast	
File Basement drainage.MDX	Checked by	
XP Solutions	Network 2018.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	o	150	SS10-0	1.300	0.300	0.850	Open Manhole	1200
S11.000	o	150	SS11-0	1.300	0.300	0.850	Open Manhole	1200
S10.001	o	150	SS10-1	1.300	0.031	1.119	Open Manhole	1200
S12.000	o	150	SS12-0	1.300	0.300	0.850	Open Manhole	1200
S10.002	o	225	SS10-2	1.300	-0.168	1.243	Open Manhole	1200
S10.003	o	225	SS10-3	1.300	-0.322	1.397	Open Manhole	1200
S13.000	o	225	SS13-0	1.300	0.300	0.775	Open Manhole	1200
S10.004	o	225	SS10-4	1.300	-0.431	1.506	Open Manhole	1200

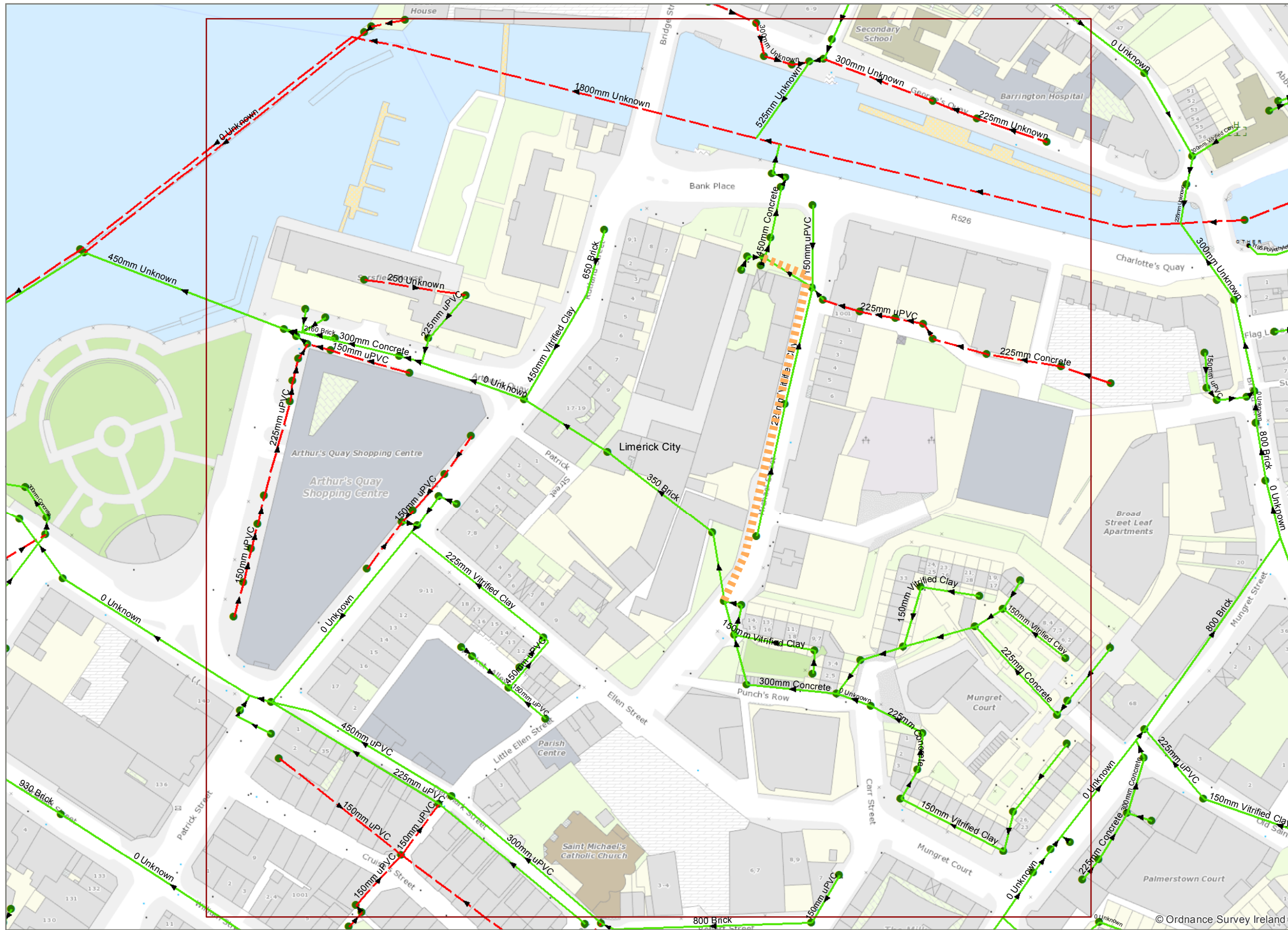
Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	40.372	150.1	SS10-1	1.300	0.031	1.119	Open Manhole	1200
S11.000	8.479	148.8	SS10-1	1.300	0.243	0.907	Open Manhole	1200
S10.001	18.670	150.6	SS10-2	1.300	-0.093	1.243	Open Manhole	1200
S12.000	16.100	150.5	SS10-2	1.300	0.193	0.957	Open Manhole	1200
S10.002	30.720	199.5	SS10-3	1.300	-0.322	1.397	Open Manhole	1200
S10.003	21.708	199.2	SS10-4	1.300	-0.431	1.506	Open Manhole	1200
S13.000	30.268	200.5	SS10-4	1.300	0.149	0.926	Open Manhole	1200
S10.004	6.951	198.6	S	1.300	-0.466	1.541	Open Manhole	0

Appendix E - Record Drawings

Legend

- Area Of Interest
- Sewer Gravity Mains (Irish Water owned)**
- Liquid Type**
- Combined
- Foul
- Sewer Manholes**
- Manhole Type**
- Hatchbox
- Standard
- Sewer Discharge Points**
- Discharge Type**
- T H E R Other, Unknown



Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3: 1:1,615
Drawing No.: IW-AGG-2017-496

Drawn By: CD
Checked By: KC
Approved By: <Add Name>

Drawn Date: 24/04/17
Checked Date: <dd/mm/yyyy>
Approved Date: <dd/mm/yyyy>

Waste Water Network

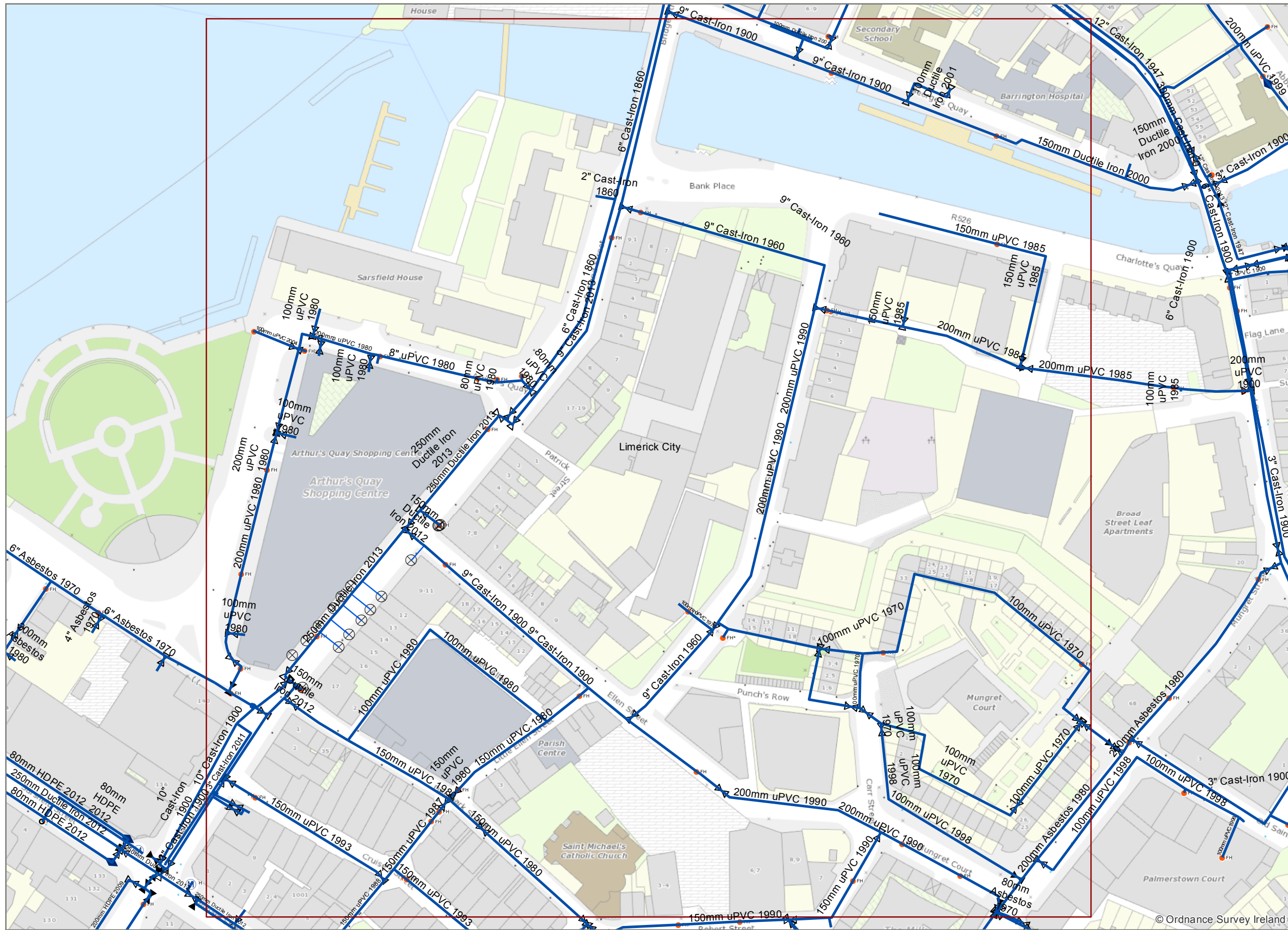
1. No part of this drawing may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Irish Water as copyright holder except as agreed for use on the project for which the document was originally issued.

2. Whilst every care has been taken in its compilation, Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

© Copyright Irish Water

Reproduced from the Ordnance Survey Of Ireland by Permission of the Government. License No. 3-3-24

Map Template Design: kcarroll@water.ie



- Legend**
- Area Of Interest
 - Water Mains (Irish Water Owned)**
 - Liquid Type**
 - Potable Water
 - Water Lateral Lines**
 - Owned By**
 - Irish Water
 - Flow Control Valves**
 - Valve Type**
 - Other
 - Non Boundary Valves**
 - Valve Normal Position**
 - ⊗ Open
 - ⊠ Closed
 - ◆ Air Control Valves
 - ⊗ Water Stop Valves
 - Non Boundary Meter**
 - Meter Function**
 - Ⓜ Meter
 - Water Hydrants**
 - Hydrant Function**
 - FH Fire Hydrant



Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A3: 1:1,615

Drawing No.: IW-AGG-2017-496

Drawn By: CD

Checked By: KC

Approved By: <Add Name>

Drawn Date: 24/04/17

Checked Date: <dd/mm/yyyy>

Approved Date: <dd/mm/yyyy>

Water Network

1. No part of this drawing may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Irish Water as copyright holder except as agreed for use on the project for which the document was originally issued.

2. Whilst every care has been taken in its compilation, Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

