



ALAN BAXTER PARTNERSHIP_{LLP}

CONSULTING STRUCTURAL ENGINEERS



Joseph Wilson Industrial Estate Expansion
Milstrood Road
CT5 3PS

Drainage Statement

W1114
July 2021

Document Status and Signatures

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Signed on behalf of ABP	
Originator:	 James Bragg
Checker:	 Anthony Saunter

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1.0 Introduction

Alan Baxter Partnership LLP (ABP) has been engaged by George Wilson Developments Ltd to prepare a surface water drainage strategy and design for the new Joseph Wilson Industrial Estate Expansion, Milstrood Road, CT5 3PS.

This reports' focus is on the surface water drainage strategy for the new development.

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2.0 Overview

This report summarises the proposed drainage strategy for the Joseph Wilson Industrial Estate Expansion, Milstrood Road, CT5 3PS (Planning ref: CA/18/02408) and relates specifically to Planning Condition 4.

The existing development site is approximately 2.20ha, with a further 0.89ha designated for an attenuation pond. The site is currently approximately 95% greenfield.

There is an existing foul Southern Water sewer to the east of the site in South Street Road, and there is an existing surface water Southern Water sewer to the north of the site within the industrial estate (see **Appendix A**).

The existing 'brownfield' area of the development consists of a single industrial building (Plot 44) and its associated hardstanding areas. This building is currently drained by a private gravity network which ultimately connect into the existing surface water Southern Water sewer to the north (see **Appendix B**).

The original surface water drainage strategy (by others), submitted with the original planning application, proposed a system of standard gravity pipes and a single attenuation pond on the south-east part of the development. It proposed the final outflow from the attenuation pond would be vis a pumped discharge (restricted to 14.7l/s) identified as 'adequate to cater for a 1in100 year return period with a 40% allowance for climate change'. The outline layout can be seen below:

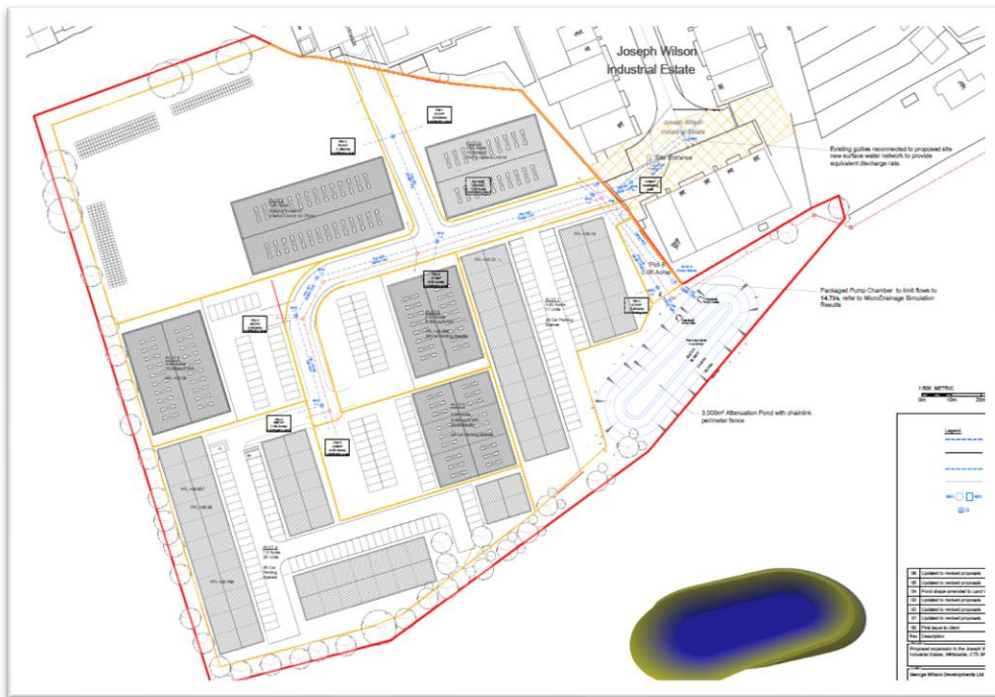


Figure 1 – Extract from Planning Drainage Strategy

However, the sole use of a pond for attenuation was flawed due to a discrepancy between the proposed levels at the southern tie-in to the existing estate and the cover levels of the proposed manholes at this location. The proposed cover level (27.500m) is indicated as being nearly 3m above the existing road level (24.700m) which is simply not practical. In reality these chambers will need to have a cover level close to the existing road level of 24.700m.

This has a considerable knock-on effect when it comes to the useable volume of storage within the attenuation pond. The top of the pond level is set to the at 26.00m A.O.D. to tie into the existing level at the pond's location, meaning that it would be impossible to utilise the full capacity of the attenuation pond. This is because as soon as the water level within the pond goes any higher than 24.700m, the manholes at the tie-in will begin to backup and begin to flood. This effectively makes the upper 1.3m of the pond redundant.

On this basis, it has been concluded that the original drainage strategy agreed at planning was not viable in its current form. Therefore, whilst we have adhered to the agreed strategy as much as possible, there has been the need to undertake variations in order to provide a viable solution.

3.0 Development Surface Water Drainage Strategy

This drainage strategy proposes a combination of permeable sub-base storage, geo-cellular storage tanks tanks and an attenuation pond to attenuate surface water runoff volumes.

The majority of the proposed roads, paths and hardstanding areas will be drained by standard gullies, with parking bays being comprised of permeable paving with an impermeable lining, for connection into the main gravity system running through the site. The permeable pavement areas will provide sub-base storage attenuation, as well as pollution treatment in the location considered most at risk i.e vehicles dropping for example oil when parked.

Building roofs will drain via rainwater pipes and standard inspection / catchpit chambers, and then into the main gravity system running through the site which discharges to the attenuation pond.

The final discharge point will be the same as the point to the private network that the drainage for Plot 44 currently discharges to. Formal approval will be required by Southern Water for the ultimate (indirect) connection to the public sewer.

The final discharge rate will be controlled by the pump chamber (as per the original strategy), with a flow rate of no greater than the existing 'brownfield rate' for the development site - i.e., the impermeable roof and hard paved areas associated with Plot 44 which is to be demolished as part of the development works.

The existing 2-year storm brownfield runoff rate for the site has been calculated to be 18.8 l/s (see **Appendix C**).

The surface drainage network design was designed using FEH data (which is considered to be more accurate and preferred by the LLFA). However, the smallest storm it is possible to model in MicroDrainage with FEH data is a 2-year storm. Therefore, the 2-year storm simulation data has been provided in the calculations (see **Appendix D**).

Brownfield Runoff Rates (l/s)	Drainage Design Simulation Results Final Discharge Rates (l/s)
1 in 100 year + 40% = 55.4	1 in 100 year + 40% = 18.0
1 in 30 year = 42.6	1 in 30 year = 18.0
1 in 2 year = 18.8	1 in 2 year = 12.5

As can be seen above and by the network calculations, the final discharge rates for the proposed development are less than the calculated 2-year brownfield runoff rate for all storm durations. This will ensure that there is no increased risk of offsite flooding and provides betterment for all durations.

MicroDrainage modelling shows there is no flooding up to the 30-year storm, and minimal flooding for the 100-year + 40% storm. These flood volumes are not considered to be significant (with flood levels no more than a few millimetres above the associated cover levels) and are retained within the boundary of the site. The maximum water levels do not exceed the proposed finished floor levels of the buildings and are contained within the boundary of the development – see **Figure 4** below.

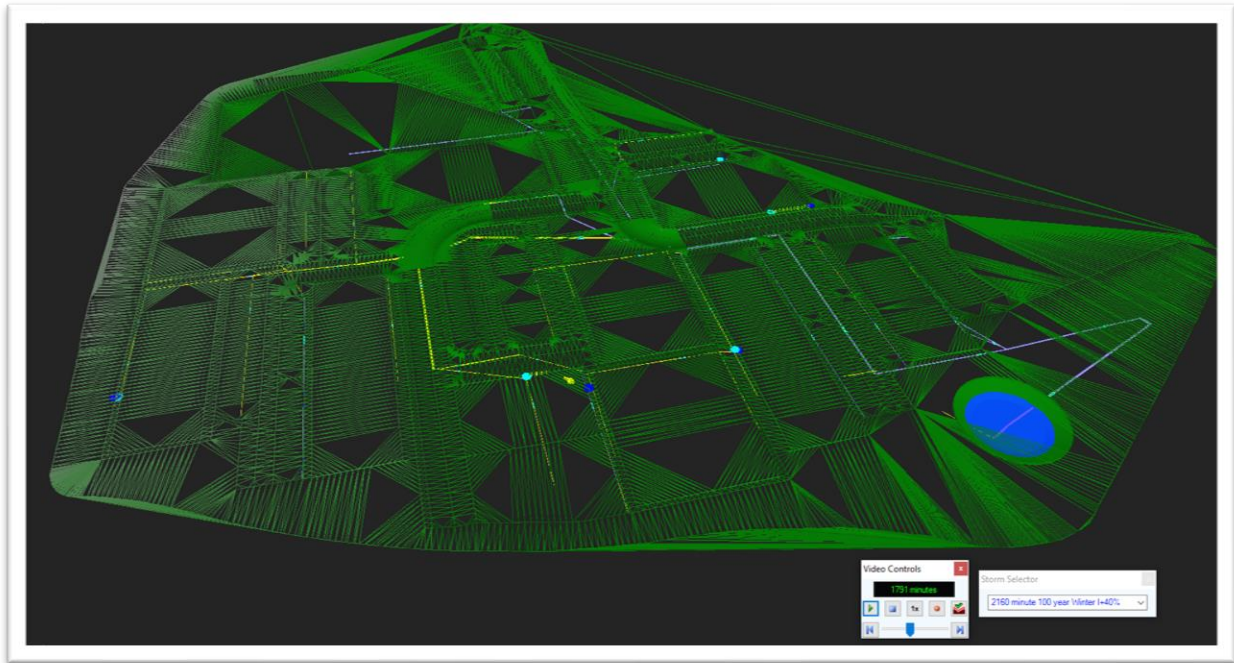


Figure 4 – MicroDrainage 3D Network Simulation - 2160 minute 100 year + 40%

The surface water drainage design is shown in the drainage design drawings (see **Appendix E**).

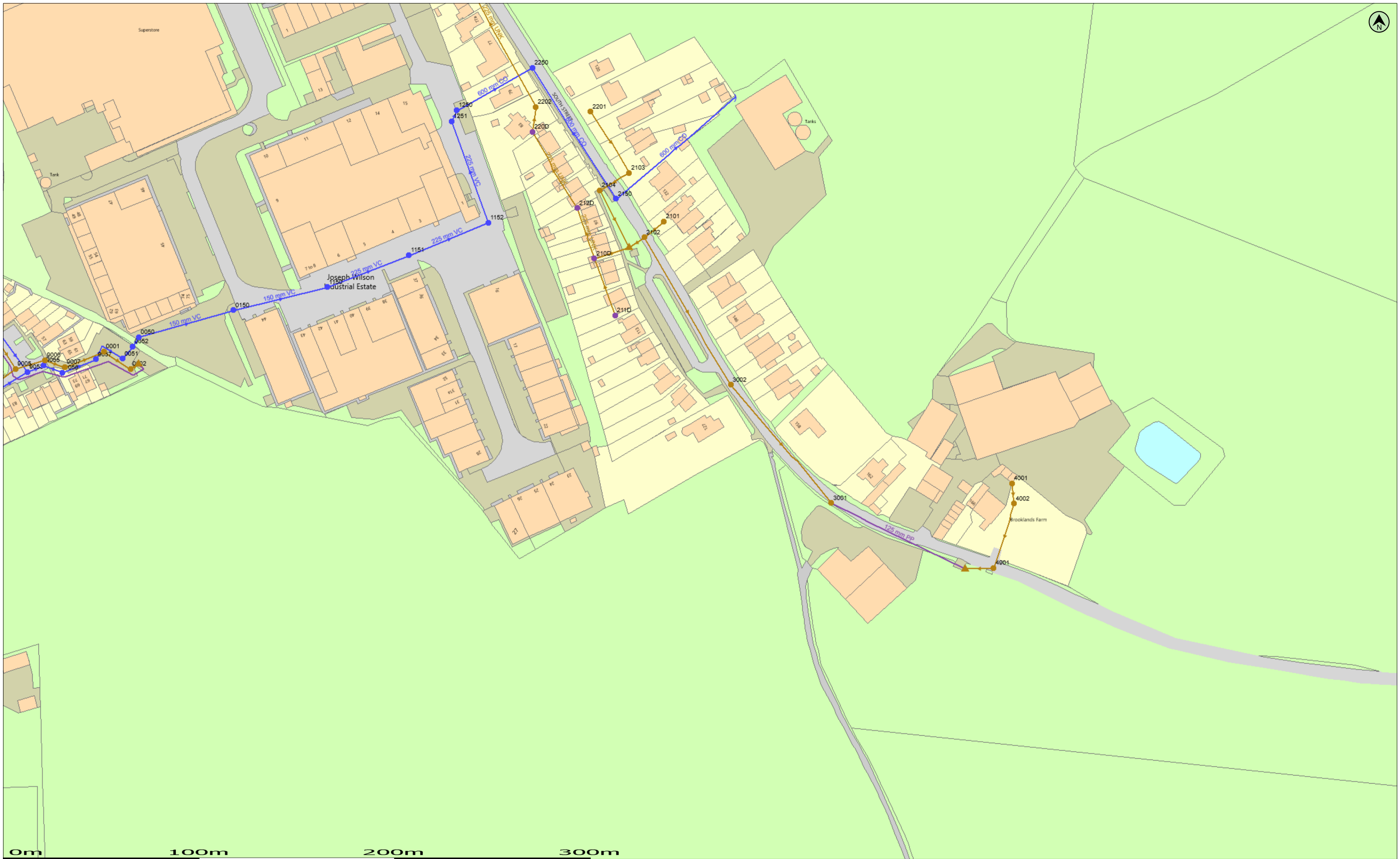
In conclusion, this drainage strategy proposed the use of numerous SUDs features which will provide a combination of attenuation, flow control and pollution control. The final discharge rates for all storm events are lower than the existing runoff rates for the site, and the principals of the original drainage strategy have been adhered to as far as possible.

Therefore, this drainage strategy is providing significant betterment compared to the existing situation for all storm events.

4.0 Development Foul Water Drainage Strategy

The foul drainage for this development will be collected by internal SVPs and conveyed under gravity by standard pipes and manholes to the existing foul Southern Water sewer within South Street to the east of the site. Formal approval will be required by Southern Water for the ultimate final connection.

The foul drainage design is shown in the drainage design drawings provided in the appendices.

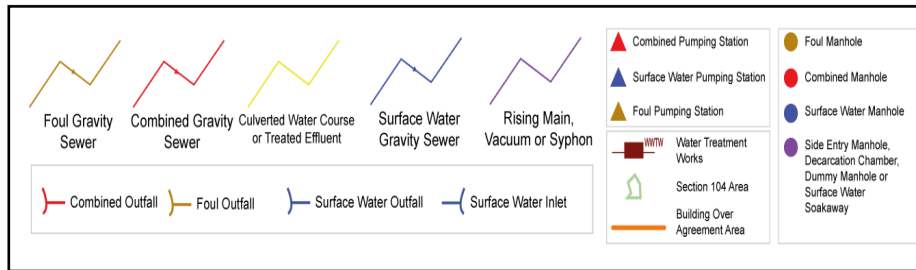


(c) Crown copyright and database rights 2020 Ordnance Survey 100031673 Date: 01/07/20 Scale: 1:1250 Map Centre: 612306,165048 Data updated: 15/06/20 Our Ref: 411108 - 1 Wastewater Plan A2

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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



anthony.saunter@abpengineers.co.uk

W1114 - Joseph Wils.





*Sewer Inspection,
Cleaning and Repair*

Project ref:TV201020

13th October 2020

CCTV Survey Report

CLIENT : GEORGE WILSON GROUP

SITE: Joseph Wilson Industrial Estate

Whitstable

Kent

CT5 3PS

www.insewer.co.uk

Tel : 01634 861 768



Project Information

Project Name
TV201020

Project Number

Project Date
14/10/2020

Client

Company: George Wilson Group
Description: c/o Alan Baxter Partnership LLP
Contact: Anthony Saunter
Department: The Clock Building, Pympes Court
Street: Busbridge Road
Town or City: Loose, Maidstone
County: Kent
Post Code: ME15 0HZ

Site

Contact: Chris Hall
Department: Lakeside Int. Business Park
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Town or City: Hersden
Post Code: CT3 4JH
Mobile: 07748 113 352

Contractor

Company: InSewer Surveys
Contact: Liam Sellar
Street: 16A Revenge Road
Town or City: Chatham
County: Kent
Post Code: ME5 8UD
Phone: 01634 861 768
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Mobile: 07802 660 752
Email: liam@insewer.co.uk



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Cleaning and Repair*

Site Photos

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IC1



LOCATION OF IC1



IC2



LOCATION OF IC2



IC3



LOCATION OF IC3



IC4



LOCATION OF IC4

IC5 NO CHAMBER PHOTO



LOCATION OF IC5 UNABLE TO LIFT AUDIO TESTED TO IC2



IC6



LOCATION OF IC6

IC7 NO CHAMBER PHOTO



LOCATION OF IC7 UNABLE TO LIFT BURIED/OBSTRUCTED



IC8



LOCATION OF IC8



IC9



LOCATION OF IC9

IC10 NO CHAMBER PHOTO



LOCATION OF IC10 OBSTRUCTED UNABLE TO LIFT UNDER CAR



IC11



LOCATION OF IC11



IC12



LOCATION OF IC12



IC13



LOCATION OF IC13



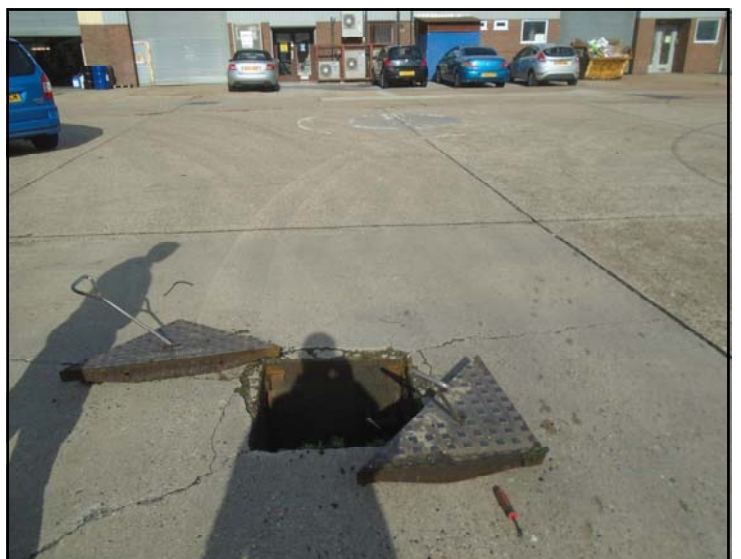
IC14 90% WATER LEVEL



LOCATION OF IC14



IC15 ASSUMED SURFACE WATER NO FOUL PRESENT AND SMELLS OILY



LOCATION OF IC15



RWP1



GULLY 1 SILTED

0050 NO CHAMBER PHOTO



LOCATION OF 0050 UNABLE TO LOCATE



0150 1.58M



LOCATION OF 0150



1150 1.52M



LOCATION OF 1150



1151 1.90M



LOCATION OF 1151



1152 1.45M



LOCATION OF 1152



1250 2.33M



LOCATION OF 1250



1251 1.98M



LOCATION OF 1251



IC16 UNABLE TO LIFT ASSUMED TO BE ON SURFACE WATER SYSTEM



LOCATION OF IC16



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Site Plan

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General Notes

-  foul water manhole with flow direction
-  soil pipe
-  foul gully
-  surface water manhole with flow direction
-  rwp
-  rainwater gully
- svp soil & vent pipe
- sp soil pipe
- wc toilet
- fg foul gully
- rg rainwater gully
- rwp rainwater pipe
- re rodding eye
- ed electronic depth
-  Points traced electronically

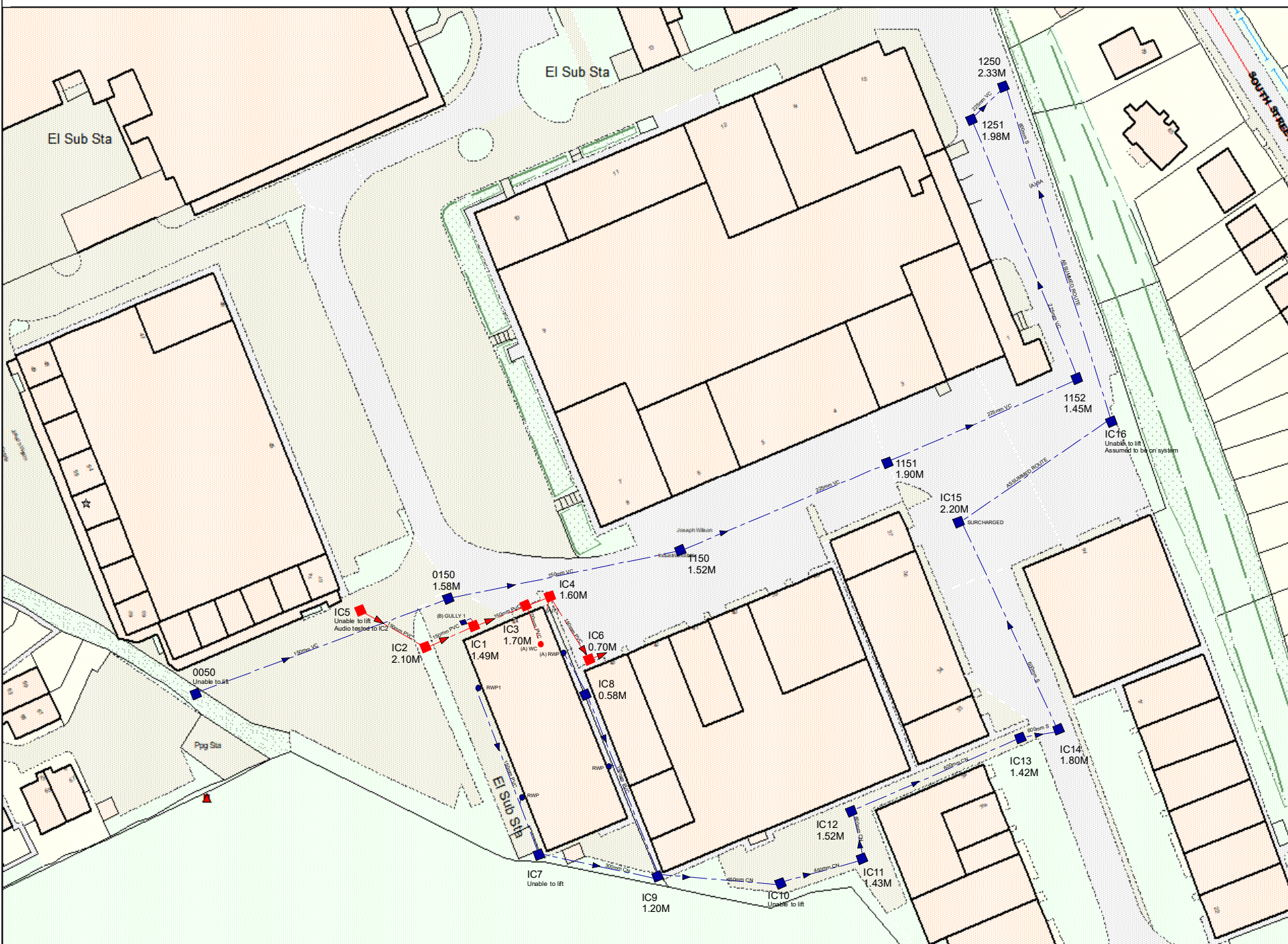
InSewer Surveys
16a Revenge Road
Chatham
Kent

ME5 8UD
 Tel: 01634 861 768
 Tel: 01634 201 376
 www.insewer.co.uk



Project Name and Address
Joseph Wilson
Industrial Estate
Whitstable
Kent
CT5 3PS
Drainage Survey

Project **TV201020**
 Date **14 OCT 2020**
 Scale **Not to scale**



Disclaimer

Detail shown on this plan is for reference only.
 The positions of the pipes have been traced electronically and their route and location are believed to be correct.
 InSewer Surveys accept no responsibility in the event of inaccuracy.
 Before mechanical plant is used the actual position and route of the drainage system should be verified on site.





*Sewer Inspection,
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Report

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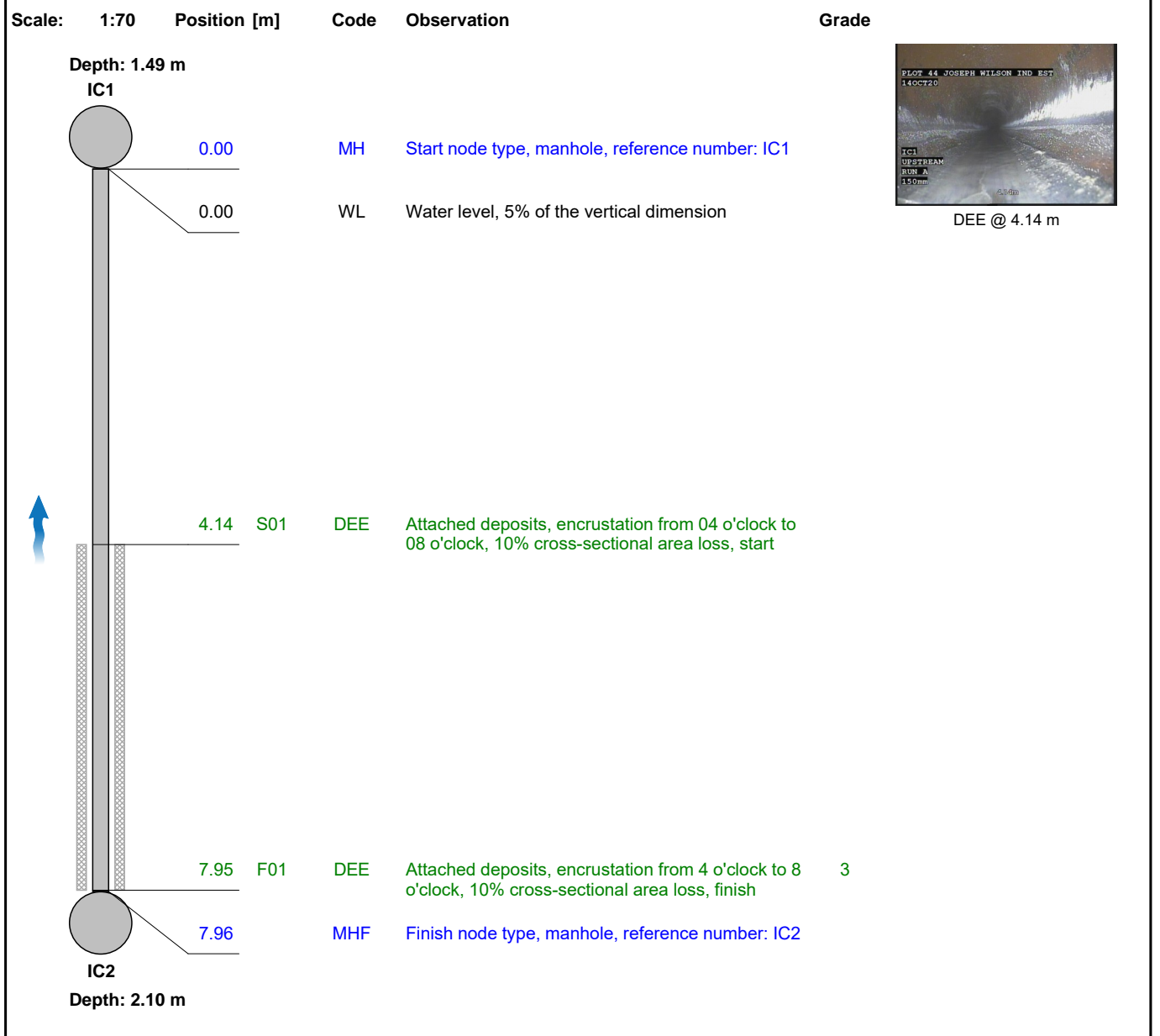




Section 1	Inspection 1	Date 14/10/20	Time 8:56	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC2X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	IC2
Road:	Joseph Wilson Ind Est	Inspected Length:	7.96 m	Upstream Pipe Depth:	2.100 m
Location:	Property with buildings	Total Length:	7.96 m	Downstream Node:	IC1
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.490 m
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	150 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
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Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
1	Upstream	IC2X	TV201020	



001.jpg, 00:00:36, 4.14 m

Attached deposits, encrustation from 04 o'clock to 08 o'clock,
10% cross-sectional area loss, start



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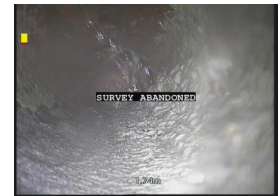
16A Revenge Road, Chatham
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Section 2	Inspection 2	Date 14/10/20	Time 9:04	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC5X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	IC5
Road:	Joseph Wilson Ind Est	Inspected Length:	1.74 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	1.74 m	Downstream Node:	IC2
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	2.100 m
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	150 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments: IC5 Unable to lift parked car - audio tested positive
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	Grade
		0.00	MH	Start node type, manhole, reference number: IC2	
		0.00	WL	Water level, 5% of the vertical dimension	
		0.99	LU	Line deviates up	
		1.74	SA	Survey abandoned: At backdrop no top eye for access	

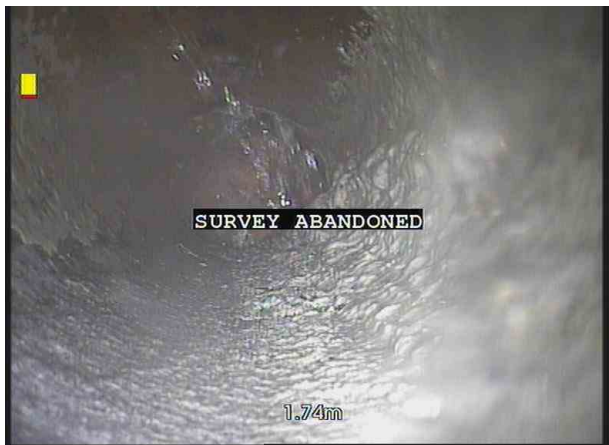


SA @ 1.74 m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
2	Upstream	IC5X	TV201020	



002.jpg, 00:00:41, 1.74 m
Survey abandoned, At backdrop no top eye for access



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Section 3	Inspection 3	Date 14/10/20	Time 9:06	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR RUN BX
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	RUN B
Road:	Joseph Wilson Ind Est	Inspected Length:	1.00 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	1.00 m	Downstream Node:	IC1
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.490 m
Use:	Surface water	Pipe Shape:	Circular	Year Constructed:	
Type of Pipe:	-	Dia/Height:	100 mm	Flow Control:	-
Year Constructed:		Pipe Material:	Polyvinyl chloride	Inspection Purpose:	Condition and location
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	Grade
		0.00	MH	Start node type, manhole, reference number: IC1	
		0.00	WL	Water level, 5% of the vertical dimension	
		0.59	LU	Line deviates up	
		1.00	SA	Survey abandoned: Unable to continue round bends - assumed to blocked road gully	



SA @ 1.00 m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
3	Upstream	RUN BX	TV201020	



003.jpg, 00:01:09, 1.00 m
Survey abandoned, Unable to continue round bends - assumm
to blocked road gully



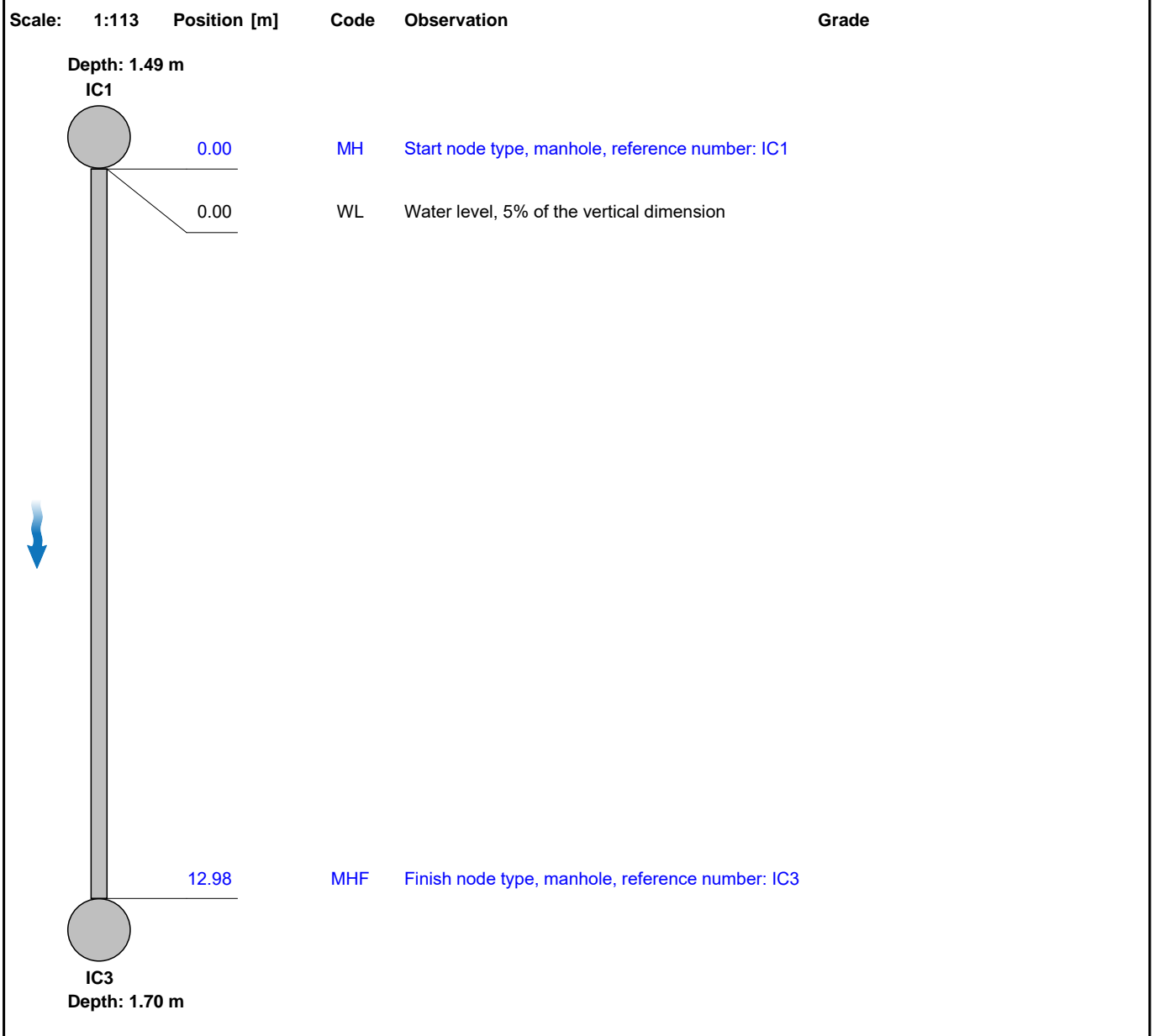
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Section 4	Inspection 4	Date 14/10/20	Time 9:14	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC1X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC1
Road:	Joseph Wilson Ind Est	Inspected Length:	12.98 m	Upstream Pipe Depth:	1.490 m
Location:	Property with buildings	Total Length:	12.98 m	Downstream Node:	IC3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.700 m
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	-	Dia/Height:	150 mm		
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



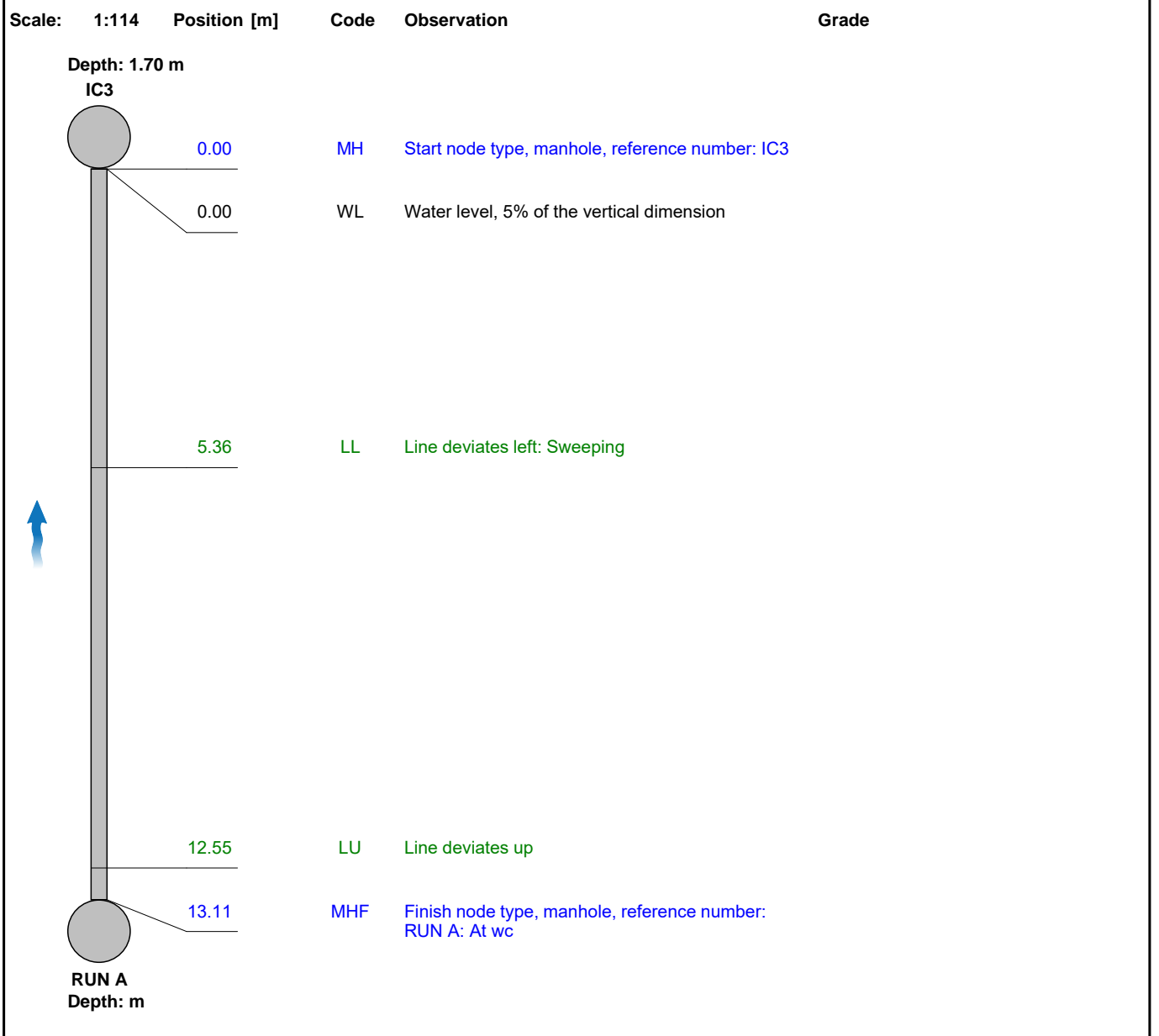
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Section 5	Inspection 5	Date 14/10/20	Time 9:20	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR RUN AX
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	RUN A
Road:	Joseph Wilson Ind Est	Inspected Length:	13.11 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	13.11 m	Downstream Node:	IC3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.700 m
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	100 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



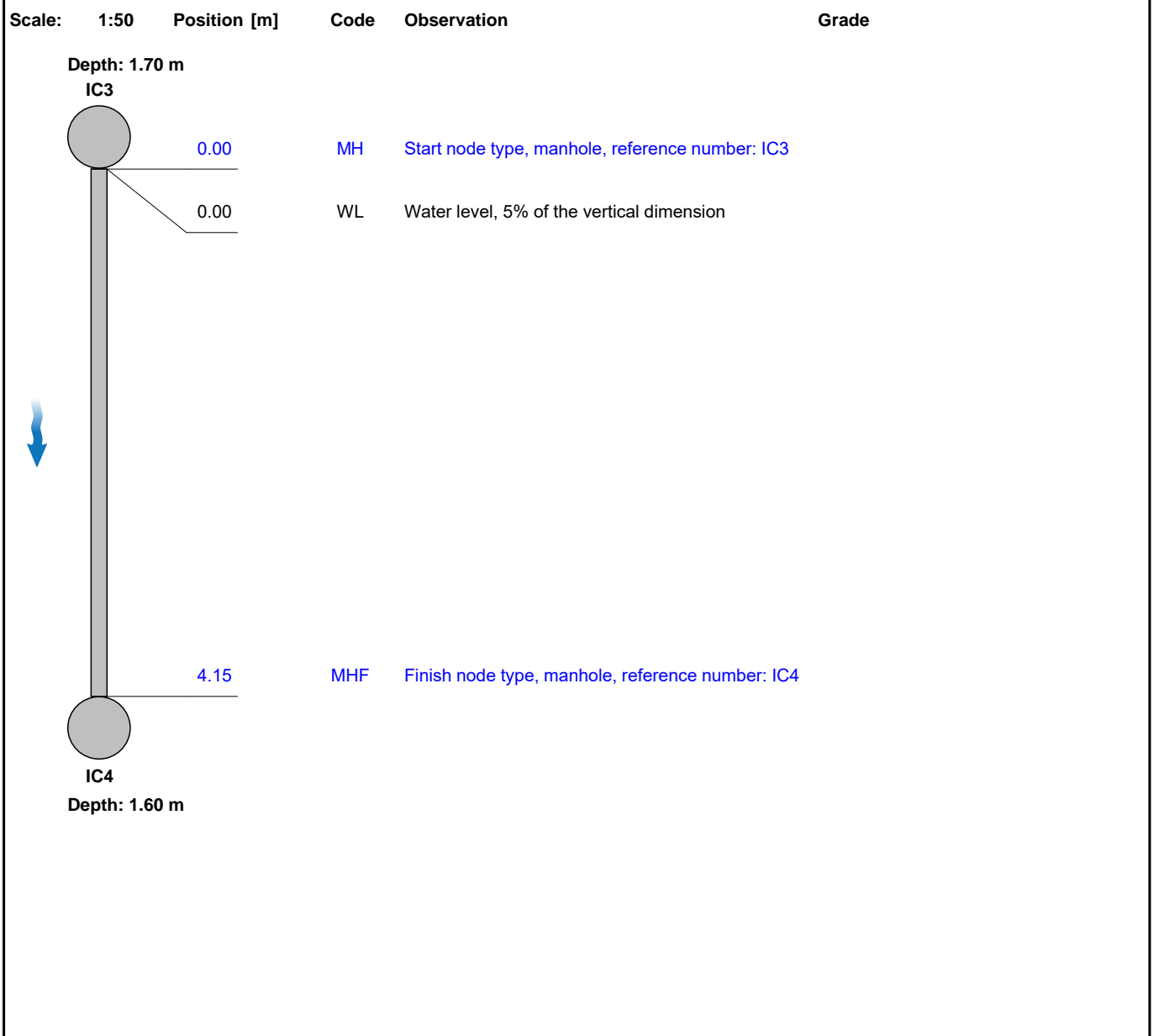
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liam@insewer.co.uk

Section 6	Inspection 6	Date 14/10/20	Time 9:23	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC3X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC3
Road:	Joseph Wilson Ind Est	Inspected Length:	4.15 m	Upstream Pipe Depth:	1.700 m
Location:	Property with buildings	Total Length:	4.15 m	Downstream Node:	IC4
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.600 m
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	150 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



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Section 7	Inspection 7	Date 14/10/20	Time 9:24	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR RUN AX
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	RUN A
Road:	Joseph Wilson Ind Est	Inspected Length:	0.67 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	0.67 m	Downstream Node:	IC4
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.600 m
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	100 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:

Scale:	1:50	Position [m]	Code	Observation	Grade
		0.00	MH	Start node type, manhole, reference number: IC4	
		0.00	WL	Water level, 5% of the vertical dimension	
		0.33	LU	Line deviates up	
		0.67	SA	Survey abandoned: Loss of vision	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



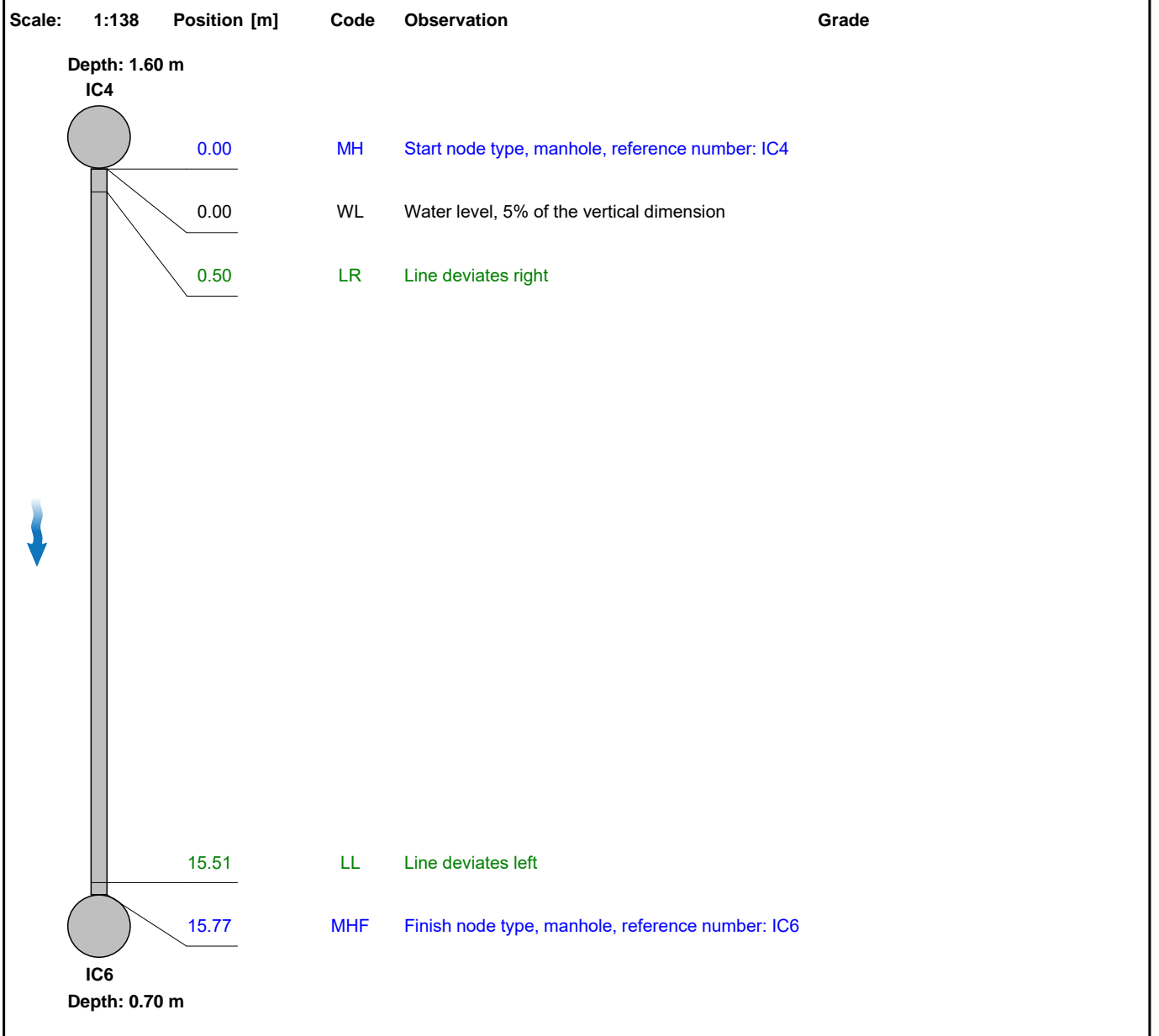
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Section 8	Inspection 8	Date 14/10/20	Time 9:25	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC4X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC4
Road:	Joseph Wilson Ind Est	Inspected Length:	15.77 m	Upstream Pipe Depth:	1.600 m
Location:	Property with buildings	Total Length:	15.77 m	Downstream Node:	IC6
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	0.700 m
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	-	Dia/Height:	150 mm		
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



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Section 9	Inspection 9	Date 14/10/20	Time 9:48	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR RWP1X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	RWP1
Road:	Joseph Wilson Ind Est	Inspected Length:	37.31 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	37.31 m	Downstream Node:	IC7
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	150 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:

Scale:	1:325	Position [m]	Code	Observation	Grade
	0.00	MH	Start node type, manhole, reference number: RWP1		
	0.00	WL	Water level, 5% of the vertical dimension		
	2.13	S01	CUW	Loss of vision, camera under water, start	
	5.00	WL	Water level, 10% of the vertical dimension		
	24.66	F01	CUW	Loss of vision, camera under water, finish	
	24.67	WL	Water level, 5% of the vertical dimension		
	28.39	JN	JN	Junction at 10 o'clock, diameter: 150mm: From rwp	
	33.80	LR	LR	Line deviates right	
	33.91	LD	LD	Line deviates down	
	35.54	LD	LD	Line deviates down	
	36.25	LU	LU	Line deviates up: Line levels out	
	36.25	LL	LL	Line deviates left	
	37.31	MHF	MHF	Finish node type, manhole, reference number: IC7: Buried/obstructed unable to lift	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



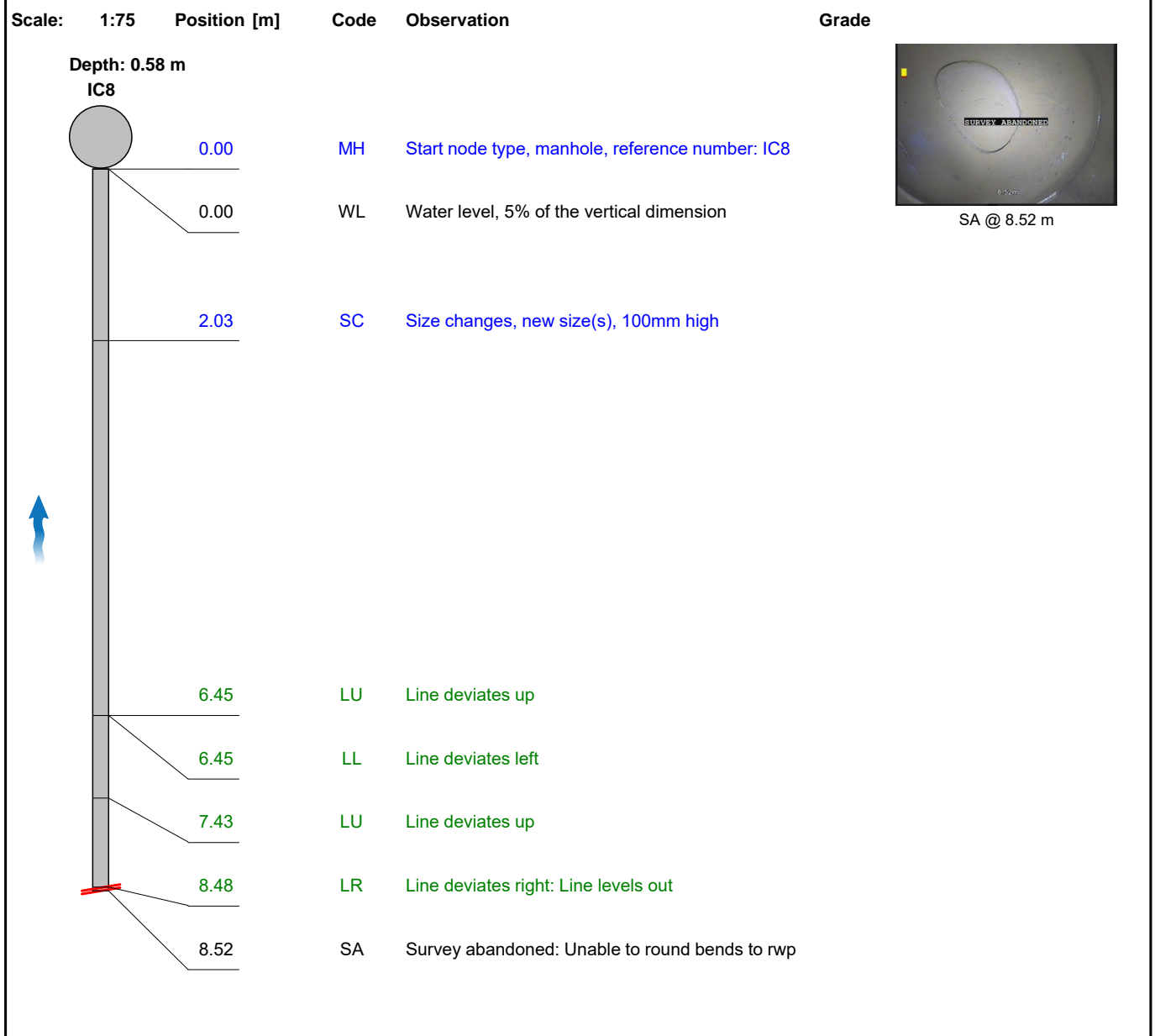
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Section 10	Inspection 10	Date 14/10/20	Time 10:10	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR RUN AX
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	RUN A
Road:	Joseph Wilson Ind Est	Inspected Length:	8.52 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	8.52 m	Downstream Node:	IC8
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	0.580 m
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	150 mm
Type of Pipe:	-	Pipe Material:	Polyvinyl chloride	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:



SA @ 8.52 m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section 10	Inspection Direction Upstream	PLR RUN AX	Client's Job Ref TV201020	Contractor's Job Ref
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004.jpg, 00:01:48, 8.52 m
Survey abandoned, Unable to round bends to rwp



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Section 11	Inspection 11	Date 14/10/20	Time 10:11	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC8X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC8
Road:	Joseph Wilson Ind Est	Inspected Length:	42.78 m	Upstream Pipe Depth:	0.580 m
Location:	Property with buildings	Total Length:	42.78 m	Downstream Node:	IC9
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.200 m
Use:	Surface water	Pipe Shape:	Circular	Year Constructed:	-
Type of Pipe:	-	Dia/Height:	150 mm	Flow Control:	-
Year Constructed:	-	Pipe Material:	Polyvinyl chloride	Inspection Purpose:	Condition and location
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:372	Position [m]	Code	Observation	Grade
	0.00	MH	Start node type, manhole, reference number: IC8		
	0.00	WL	Water level, 5% of the vertical dimension		
	6.26	JN	Junction at 09 o'clock, diameter: 150mm		
	13.85	JN	Junction at 09 o'clock, diameter: 150mm		
	21.00	WL	Water level, 10% of the vertical dimension		
	21.25	JN	Junction at 09 o'clock, diameter: 150mm		
	28.00	WL	Water level, 5% of the vertical dimension		
	28.33	JN	Junction at 09 o'clock, diameter: 150mm		
	28.76	JN	Junction at 2 o'clock, diameter: 150mm: From rwp from plot 44		
	28.78	LD	Line deviates down		
	31.25	JN	Junction at 03 o'clock, diameter: 150mm		
	31.85	SC	Size changes, new size(s), 225mm high		
	34.38	JN	Junction at 10 o'clock, diameter: 150mm		
	40.92	JN	Junction at 10 o'clock, diameter: 150mm		
	42.78	MHF	Finish node type, manhole, reference number: IC9		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



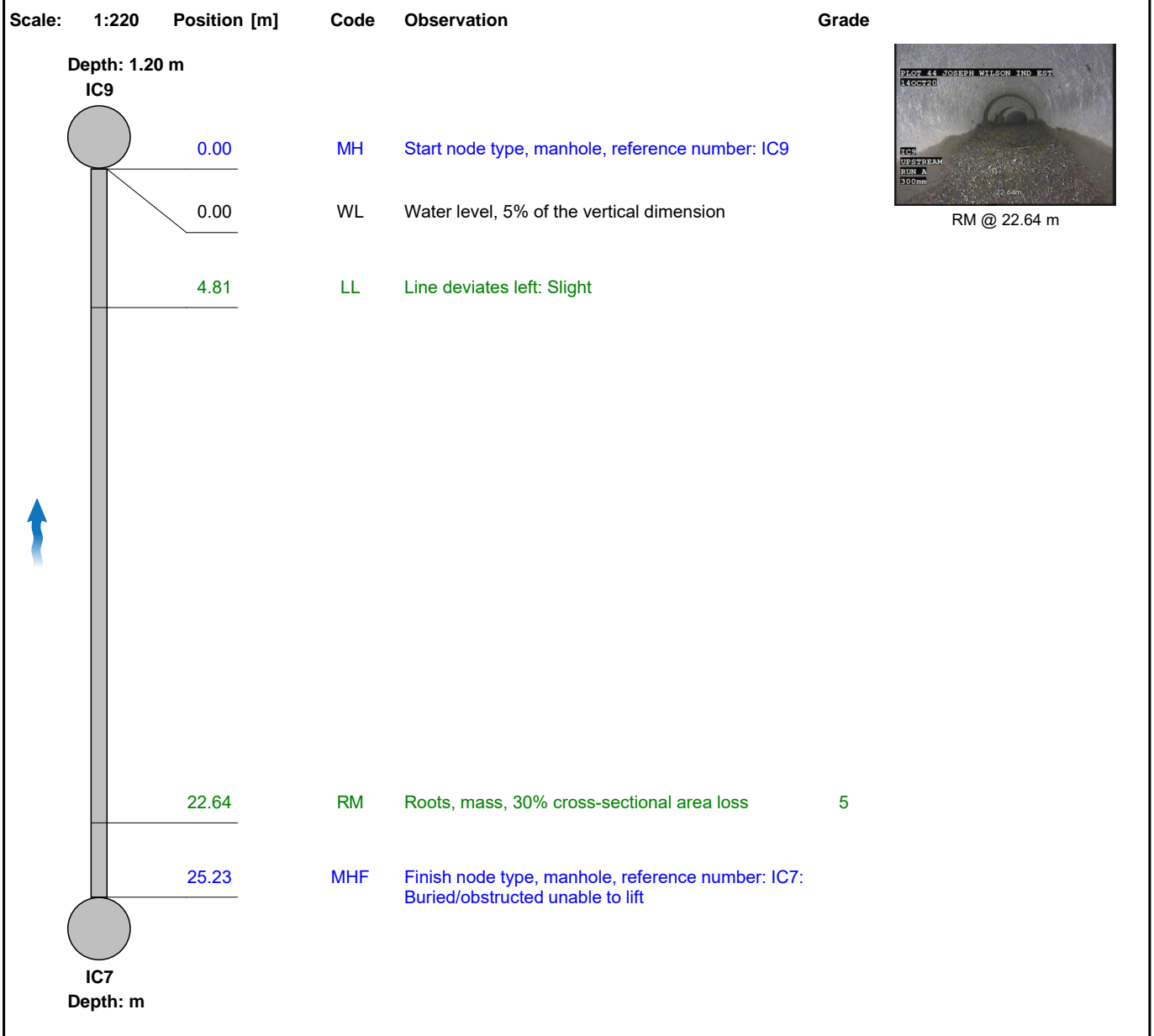
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Section 12	Inspection 12	Date 14/10/20	Time 10:34	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC7X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	IC7
Road:	Joseph Wilson Ind Est	Inspected Length:	25.23 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	25.23 m	Downstream Node:	IC9
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.200 m
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	-	Dia/Height:	300 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	1	10.0	0.4	10.0	5.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
12	Upstream	IC7X	TV201020	



005.jpg, 00:02:08, 22.64 m
Roots, mass, 30% cross-sectional area loss



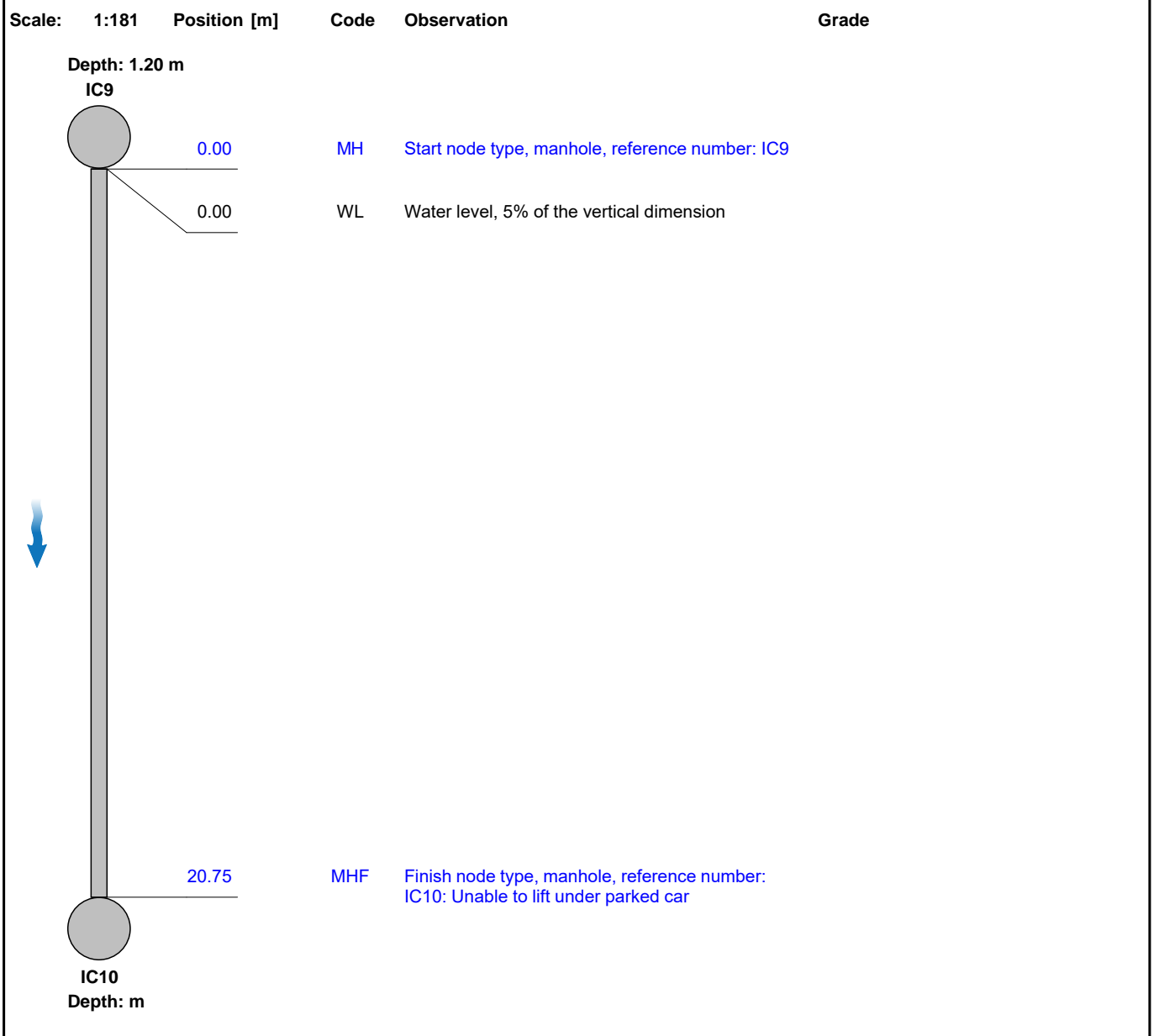
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Section 13	Inspection 13	Date 14/10/20	Time 10:40	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC9X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC9
Road:	Joseph Wilson Ind Est	Inspected Length:	20.75 m	Upstream Pipe Depth:	1.200 m
Location:	Property with buildings	Total Length:	20.75 m	Downstream Node:	IC10
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Year Constructed:	
Type of Pipe:	-	Dia/Height:	450 mm	Flow Control:	-
Year Constructed:		Pipe Material:	Concrete	Inspection Purpose:	Condition and location
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



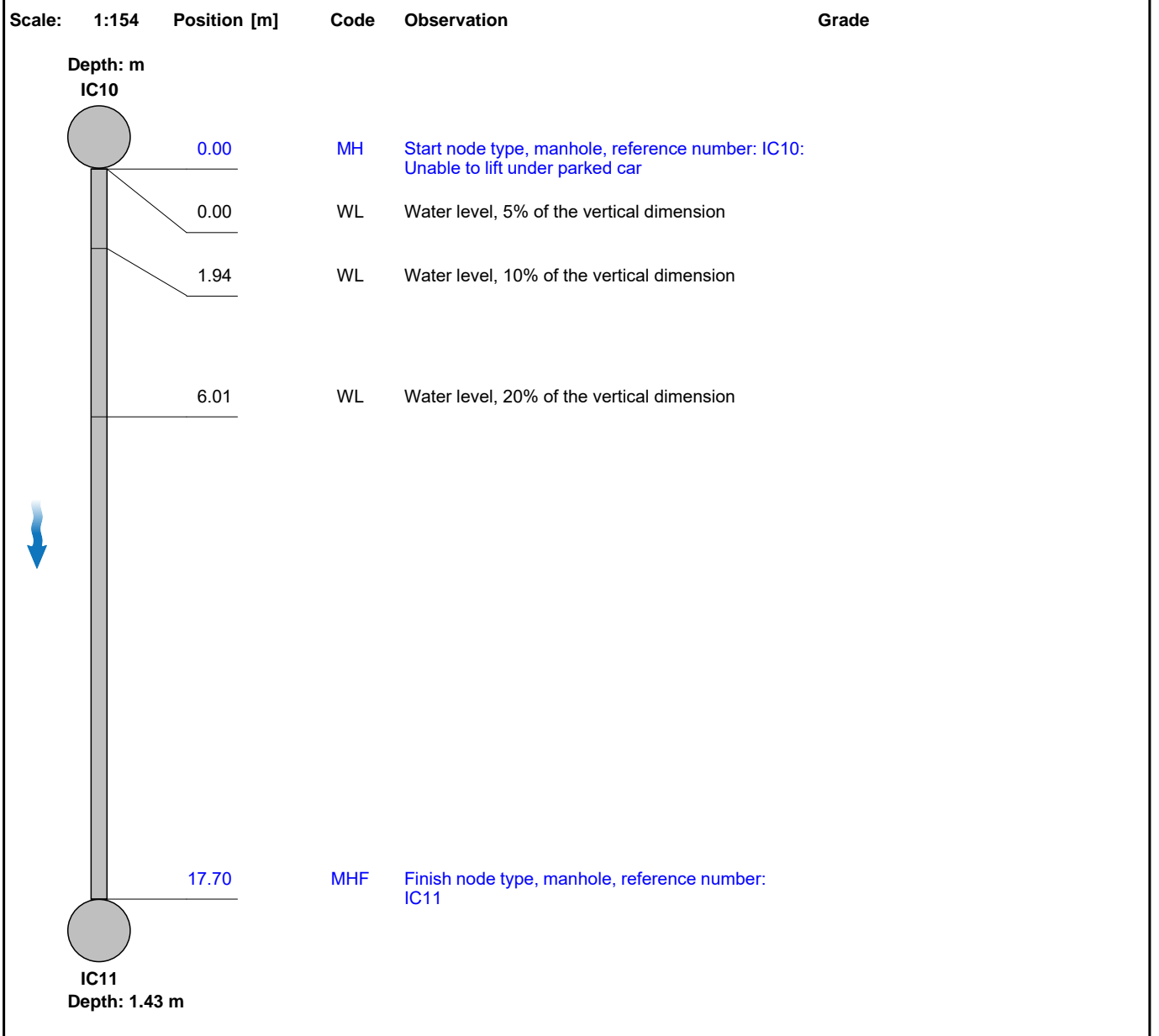
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Section 14	Inspection 14	Date 14/10/20	Time 10:45	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC10X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC10
Road:	Joseph Wilson Ind Est	Inspected Length:	17.70 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	17.70 m	Downstream Node:	IC11
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.430 m
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	-	Dia/Height:	450 mm		
Year Constructed:		Pipe Material:	Concrete		
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



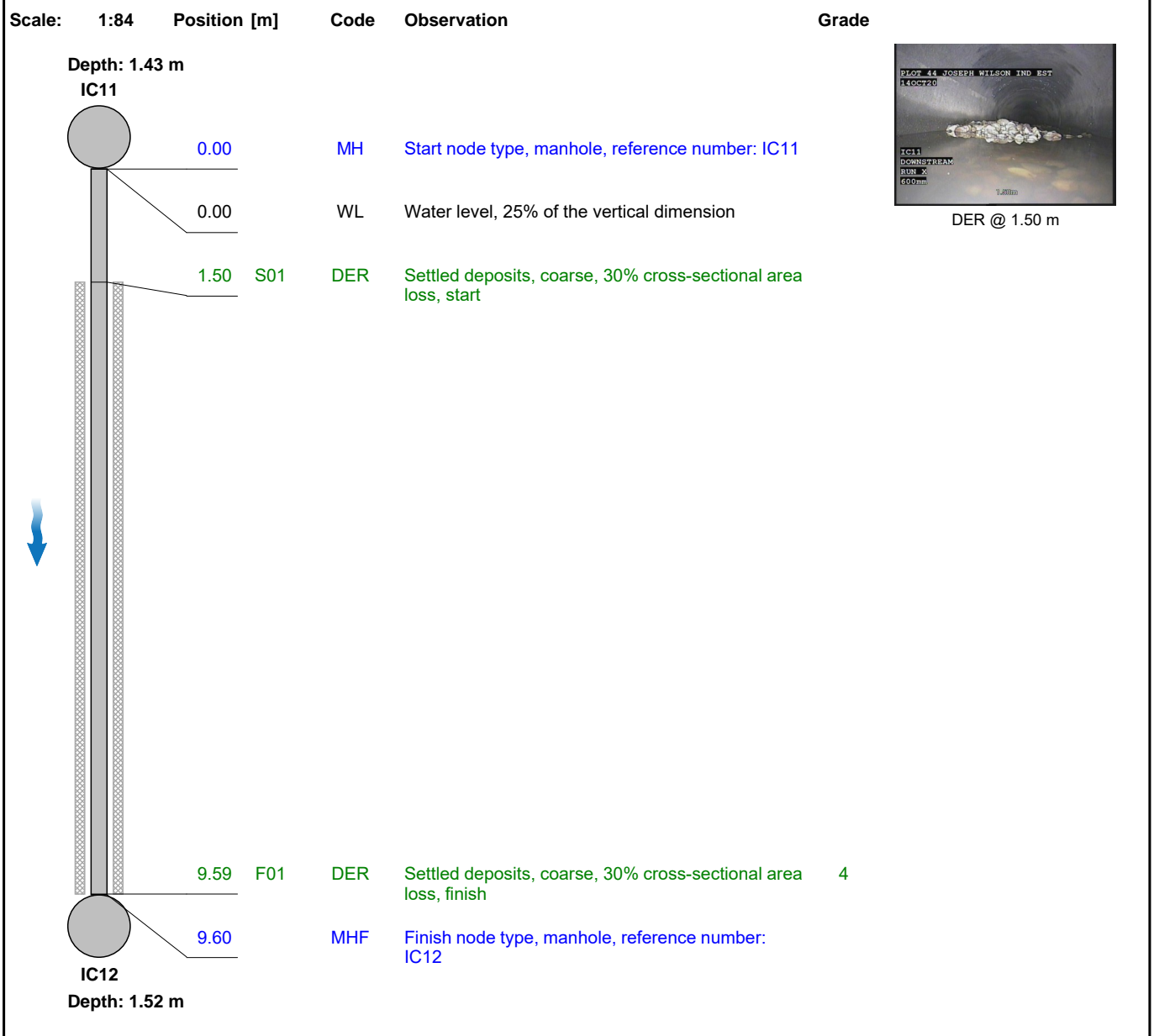
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Section 15	Inspection 15	Date 14/10/20	Time 10:52	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC11X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC11
Road:	Joseph Wilson Ind Est	Inspected Length:	9.60 m	Upstream Pipe Depth:	1.430 m
Location:	Property with buildings	Total Length:	9.60 m	Downstream Node:	IC12
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.520 m
Use:	Surface water	Pipe Shape:	Circular	Type of Pipe:	-
Type of Pipe:	-	Dia/Height:	600 mm	Year Constructed:	
Flow Control:	-	Pipe Material:	Concrete	Inspection Purpose:	Condition and location
Inspection Purpose:	Condition and location	Lining Type:	No Lining	Lining Material:	No Lining

Comments:
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	1	5.0	4.7	45.0	4.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
15	Downstream	IC11X	TV201020	



006.jpg, 00:00:14, 1.50 m
Settled deposits, coarse, 30% cross-sectional area loss, start



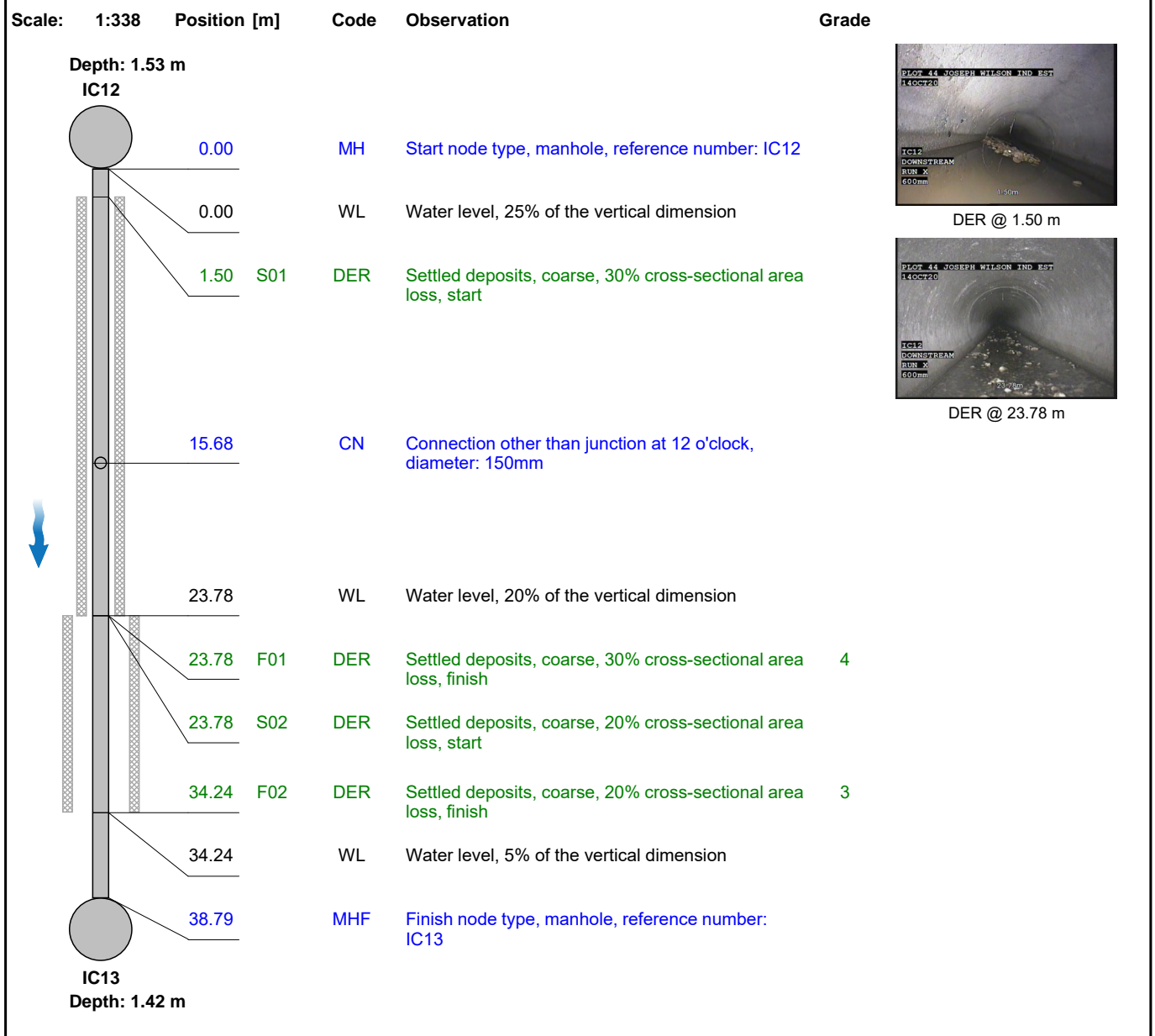
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Section 16	Inspection 16	Date 14/10/20	Time 10:52	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC12X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC12
Road:	Joseph Wilson Ind Est	Inspected Length:	38.79 m	Upstream Pipe Depth:	1.530 m
Location:	Property with buildings	Total Length:	38.79 m	Downstream Node:	IC13
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.420 m
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	600 mm
Type of Pipe:	-	Pipe Material:	Concrete	Lining Type:	No Lining
Year Constructed:		Lining Material:	No Lining		
Flow Control:	-				
Inspection Purpose:	Condition and location				

Comments:
Recommendations:



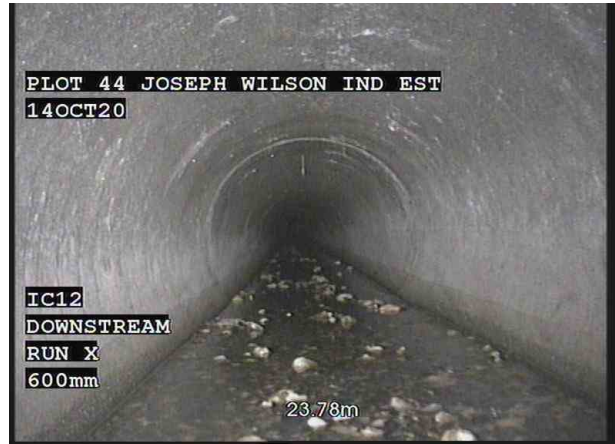
Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	2	7.0	3.5	137.0	4.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
16	Downstream	IC12X	TV201020	



007.jpg, 00:00:13, 1.50 m
Settled deposits, coarse, 30% cross-sectional area loss, start



008.jpg, 00:02:24, 23.78 m
Settled deposits, coarse, 20% cross-sectional area loss, start

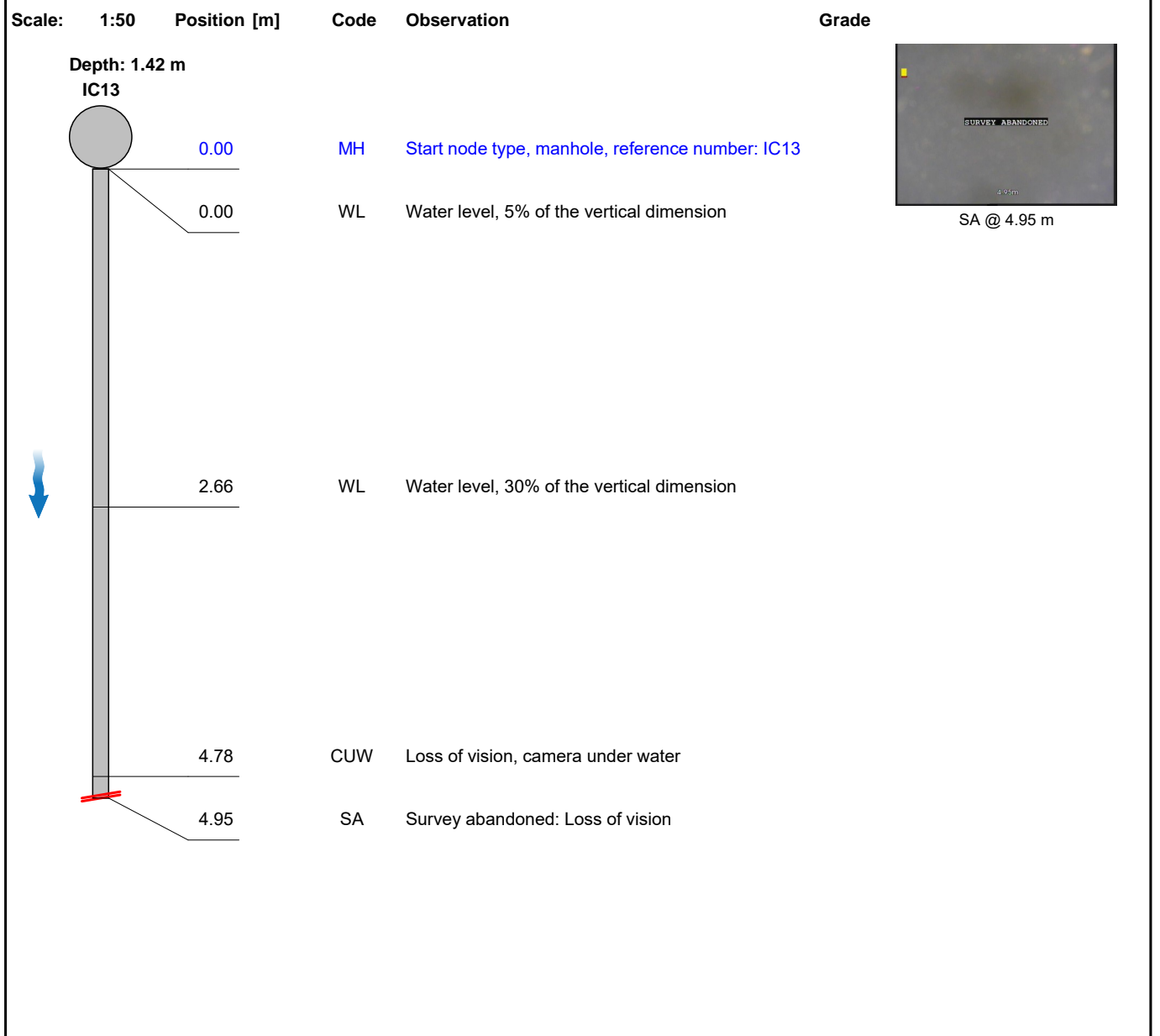


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Section 17	Inspection 17	Date 14/10/20	Time 11:13	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC13X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Downstream	Upstream Node:	IC13
Road:	Joseph Wilson Ind Est	Inspected Length:	4.95 m	Upstream Pipe Depth:	1.420 m
Location:	Property with buildings	Total Length:	4.95 m	Downstream Node:	IC14
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	1.800 m
Use:	Surface water	Pipe Shape:	Circular	Year Constructed:	
Type of Pipe:	-	Dia/Height:	600 mm	Flow Control:	-
Year Constructed:		Pipe Material:	Other (state in comments)	Inspection Purpose:	Condition and location
Flow Control:	-	Lining Type:	No Lining	Comments:	Corrigated steel pipe
Inspection Purpose:	Condition and location	Lining Material:	No Lining	Recommendations:	



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
17	Downstream	IC13X	TV201020	



009.jpg, 00:02:13, 4.95 m
Survey abandoned, Loss of vision



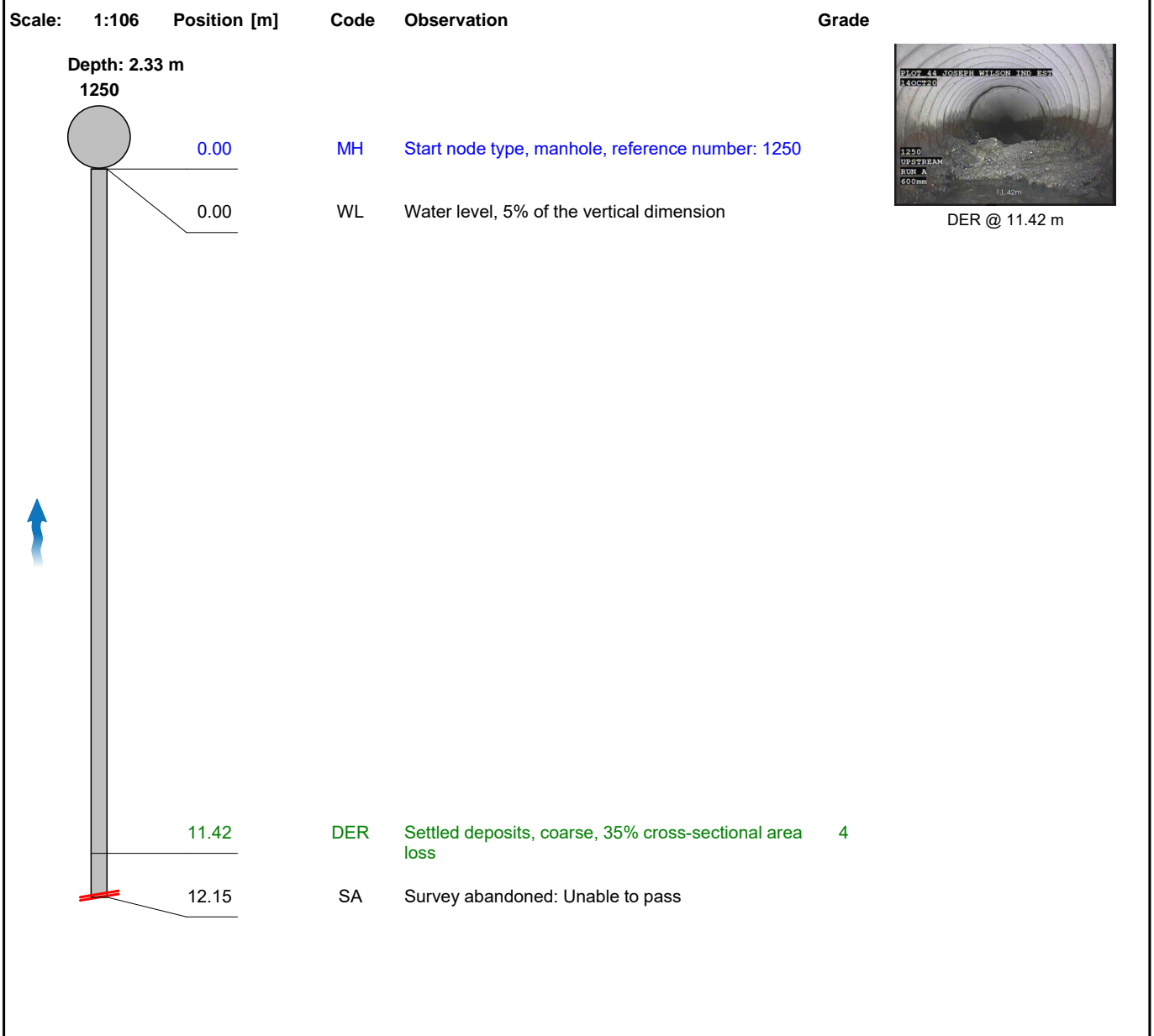
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Section 18	Inspection 18	Date 14/10/20	Time 12:21	Client's Job Ref TV201020	Weather No Rain Or Snow	Pre Cleaned No	PLR IC16X
Operator InSewer DW		Vehicle Not Specified		Camera Not Specified	Preset Length 0.00 m	Legal Status -	Alternative ID -

Town or Village:	Whitstable	Inspection Direction:	Upstream	Upstream Node:	IC16
Road:	Joseph Wilson Ind Est	Inspected Length:	12.15 m	Upstream Pipe Depth:	
Location:	Property with buildings	Total Length:	12.15 m	Downstream Node:	1250
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	2.330 m
Use:	Surface water	Pipe Shape:	Circular		
Type of Pipe:	-	Dia/Height:	600 mm		
Year Constructed:		Pipe Material:	Steel pipe		
Flow Control:	-	Lining Type:	No Lining		
Inspection Purpose:	Condition and location	Lining Material:	No Lining		

Comments: IC16 Assumed on run unable to lift
Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
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	0.0	0.0	1.0	1	5.0	0.4	5.0	4.0



Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
18	Upstream	IC16X	TV201020	



010.jpg, 00:01:35, 11.42 m
Settled deposits, coarse, 35% cross-sectional area loss



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Appendix C
Brownfield Runoff Rates

1:100 year

Summary of Results for 30 minute 100 year Summer

Pipe Number	US/MH Name	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)	Status
1.000	1	24.720	23.659	-0.311	0.000	55.4	OK
1.001	2	24.610	23.420	-0.310	0.000	55.5	OK

1:30 year

Summary of Results for 30 minute 30 year Summer


Pipe Number	US/MH Name	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)	Status
1.000	1	24.720	23.640	-0.330	0.000	42.6	OK
1.001	2	24.610	23.400	-0.330	0.000	42.6	OK

1:2 year

Summary of Results for 30 minute 2 year Summer

Pipe Number	US/MH Name	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)	Status
1.000	1	24.720	23.599	-0.371	0.000	18.8	OK
1.001	2	24.610	23.359	-0.371	0.000	18.8	OK

Appendix D
MicroDrainage Calculations

Alan Baxter Partnership LLP		Page 1
The Clock Building Loose ME15 0HZ	Joseph Wilson Ind. Est. Expans	
Date 20/07/2021 File W1114-Surface Water Dra...	Designed by JB Checked by ARWS	
XP Solutions	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model





Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 612700 164800 TR 12700 64800	
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	40
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	0.450
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm


- Indicates pipe length does not match coordinates

« - Indicates pipe capacity < flow














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
11.000	1.200#	0.000	10000.0	0.368	5.00	0.0	0.600	o	300	Pipe/Conduit	
12.000	29.234	0.292	100.1	0.011	5.00	0.0	0.600	o	225	Pipe/Conduit	
13.000	41.920	0.004	10000.0	0.070	5.00	0.0	0.600	o	100	Pipe/Conduit	
13.001	9.232	0.041	227.8	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)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
11.000	50.00	5.14	25.612	0.368	0.0	0.0	19.9	0.15	10.5«	69.8
12.000	50.00	5.37	25.296	0.011	0.0	0.0	0.6	1.31	52.0	2.1
13.000	50.00	15.11	24.620	0.070	0.0	0.0	3.8	0.07	0.5«	13.3
13.001	50.00	15.29	24.617	0.070	0.0	0.0	3.8	0.86	34.3	13.3


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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
12.001	17.293	0.083	207.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.001	8.941	0.100	89.4	0.054	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.002	2.000#	0.000	10000.0	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
14.000	29.402	0.029	1013.9	0.024	5.00	0.0	0.600	o	100	Pipe/Conduit	
14.001	7.261	0.227	32.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
15.000	29.406	0.029	1014.0	0.030	5.00	0.0	0.600	o	100	Pipe/Conduit	
15.001	8.077	0.263	30.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
14.002	1.600#	0.537	3.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.003	21.517	0.054	398.5	0.100	0.00	0.0	0.600	o	225	Pipe/Conduit	
16.000	43.225	0.043	1005.2	0.034	5.00	0.0	0.600	o	100	Pipe/Conduit	
16.001	7.409	0.127	58.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
17.000	49.409	0.049	1008.3	0.063	5.00	0.0	0.600	o	100	Pipe/Conduit	
17.001	11.276	0.480	23.5	0.000	0.00	0.0	0.600	o	100	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)
12.001	50.00	15.61	25.004	0.081	0.0	0.0	4.4	0.90	35.9	15.4
11.001	50.00	15.72	24.920	0.503	0.0	0.0	27.2	1.38	55.0«	95.4
11.002	50.00	15.99	24.821	0.524	0.0	0.0	28.4	0.12	4.8«	99.3
14.000	50.00	7.09	25.855	0.024	0.0	0.0	1.3	0.23	1.8«	4.5
14.001	50.00	7.16	25.826	0.024	0.0	0.0	1.3	1.79	31.6	4.5
15.000	50.00	7.10	25.816	0.030	0.0	0.0	1.6	0.23	1.8«	5.7
15.001	50.00	7.15	25.787	0.030	0.0	0.0	1.6	2.37	94.2	5.7
14.002	50.00	7.17	25.524	0.054	0.0	0.0	2.9	7.64	303.6	10.2
11.003	50.00	16.54	24.634	0.678	0.0	0.0	36.7	0.65	25.8«	128.5
16.000	50.00	8.07	30.259	0.034	0.0	0.0	1.8	0.23	1.8«	6.4
16.001	50.00	8.19	30.216	0.034	0.0	0.0	1.8	1.01	7.9	6.4
17.000	50.00	8.51	29.769	0.063	0.0	0.0	3.4	0.23	1.8«	11.9
17.001	50.00	8.63	29.720	0.063	0.0	0.0	3.4	1.60	12.6	11.9


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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
18.000	13.322	0.228	58.4	0.021	5.00	0.0	0.600	o	100	Pipe/Conduit	
18.001	13.093	0.224	58.5	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
18.002	7.021	0.120	58.5	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
18.003	30.005	0.513	58.5	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
19.000	7.730	0.132	58.6	0.036	5.00	0.0	0.600	o	100	Pipe/Conduit	
19.001	28.322	0.484	58.5	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
20.000	7.748	0.132	58.7	0.036	5.00	0.0	0.600	o	100	Pipe/Conduit	
19.002	3.001	0.181	16.6	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
21.000	34.464	0.034	1013.6	0.027	5.00	0.0	0.600	o	100	Pipe/Conduit	
21.001	6.511	0.111	58.7	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
16.002	15.106	0.814	18.6	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
22.000	34.464	0.034	1013.6	0.039	5.00	0.0	0.600	o	100	Pipe/Conduit	
22.001	5.137	1.300	4.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
16.003	13.689	0.046	297.6	0.000	0.00	0.0	0.600	o	375	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)
18.000	50.00	5.22	30.450	0.021	0.0	0.0	1.1	1.01	7.9	4.0
18.001	50.00	5.39	30.172	0.042	0.0	0.0	2.3	1.32	23.3	8.0
18.002	50.00	5.47	29.948	0.063	0.0	0.0	3.4	1.32	23.3	11.9
18.003	50.00	5.85	29.828	0.072	0.0	0.0	3.9	1.32	23.3	13.6
19.000	50.00	5.13	30.162	0.036	0.0	0.0	1.9	1.01	7.9	6.8
19.001	50.00	5.49	29.980	0.048	0.0	0.0	2.6	1.32	23.3	9.1
20.000	50.00	5.13	30.180	0.036	0.0	0.0	1.9	1.01	7.9	6.8
19.002	50.00	5.51	29.496	0.096	0.0	0.0	5.2	2.48	43.9	18.2
21.000	50.00	7.45	30.258	0.027	0.0	0.0	1.5	0.23	1.8<<	5.1
21.001	50.00	7.56	30.224	0.027	0.0	0.0	1.5	1.01	7.9	5.1
16.002	50.00	8.71	29.240	0.305	0.0	0.0	16.5	3.05	121.3	57.8
22.000	50.00	7.45	29.736	0.039	0.0	0.0	2.1	0.23	1.8<<	7.4
22.001	50.00	7.48	29.702	0.039	0.0	0.0	2.1	3.92	30.8	7.4
16.003	50.00	8.93	28.276	0.344	0.0	0.0	18.6	1.05	115.4	65.2


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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
23.000	7.617	0.050	152.3	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit	
23.001	13.383	0.134	99.9	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
23.002	12.093	0.125	96.7	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
23.003	10.703	1.700	6.3	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
24.000	34.605	0.032	1081.4	0.045	5.00	0.0	0.600	o	100	Pipe/Conduit	
24.001	13.393	0.081	165.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
24.002	17.664	0.085	207.8	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
25.000	26.702	0.027	989.0	0.076	5.00	0.0	0.600	o	100	Pipe/Conduit	
25.001	19.174	0.192	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
24.003	36.999	0.151	245.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.004	14.325	0.064	223.8	0.047	0.00	0.0	0.600	o	450	Pipe/Conduit	
16.005	1.000#	1.350	0.7	0.022	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.000	19.945	0.343	58.1	0.045	5.00	0.0	0.600	o	300	Pipe/Conduit	
26.001	9.828	0.099	99.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
26.002	1.500#	0.168	8.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
16.006	5.956	0.015	401.4	0.000	0.00	0.0	0.600	o	450	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)
23.000	50.00	5.20	29.450	0.020	0.0	0.0	1.1	0.62	4.9	3.8
23.001	50.00	5.43	29.399	0.040	0.0	0.0	2.2	1.01	17.8	7.6
23.002	50.00	5.62	29.265	0.060	0.0	0.0	3.2	1.02	18.1	11.4
23.003	50.00	5.67	29.140	0.080	0.0	0.0	4.3	4.04	71.4	15.2
24.000	50.00	7.55	27.714	0.045	0.0	0.0	2.4	0.23	1.8<<	8.5
24.001	50.00	7.92	27.682	0.045	0.0	0.0	2.4	0.60	4.7<<	8.5
24.002	50.00	8.25	27.601	0.118	0.0	0.0	6.4	0.90	35.9	22.4
25.000	50.00	6.88	28.217	0.076	0.0	0.0	4.1	0.24	1.9<<	14.4
25.001	50.00	7.20	28.190	0.076	0.0	0.0	4.1	1.01	17.8	14.4
24.003	50.00	8.73	27.441	0.194	0.0	0.0	10.5	1.29	205.8	36.8
16.004	50.00	9.10	27.140	0.665	0.0	0.0	36.0	1.35	215.5	126.1
16.005	50.00	9.11	27.076	0.687	0.0	0.0	37.2	23.76	3779.1	130.2
26.000	50.00	5.16	25.585	0.045	0.0	0.0	2.4	2.07	146.0	8.5
26.001	50.00	5.26	25.242	0.045	0.0	0.0	2.4	1.58	111.4	8.5
26.002	50.00	5.27	25.143	0.045	0.0	0.0	2.4	5.29	374.1	8.5
16.006	50.00	9.20	24.675	0.732	0.0	0.0	39.6	1.01	160.4	138.8


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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
11.004	9.237	0.031	298.0	0.041	0.00	0.0	0.600	o	450	Pipe/Conduit	
27.000	12.719	0.127	100.0	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit	
28.000	11.039	0.189	58.4	0.014	5.00	0.0	0.600	o	100	Pipe/Conduit	
28.001	10.824	0.185	58.5	0.015	0.00	0.0	0.600	o	100	Pipe/Conduit	
28.002	28.103	0.481	58.4	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit	
29.000	10.645	0.189	56.3	0.014	5.00	0.0	0.600	o	100	Pipe/Conduit	
29.001	11.049	0.185	59.7	0.015	0.00	0.0	0.600	o	100	Pipe/Conduit	
28.003	3.737	0.907	4.1	0.015	0.00	0.0	0.600	o	150	Pipe/Conduit	
27.001	19.718	0.340	58.0	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
27.002	14.218	0.212	67.1	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
30.000	11.549	0.197	58.6	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit	
31.000	23.325	0.229	102.0	0.067	5.00	0.0	0.600	o	100	Pipe/Conduit	
31.001	7.240	0.073	99.2	0.000	0.00	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)
11.004	50.00	16.67	24.580	1.451	0.0	0.0	78.6	1.17	186.5<<	275.1
27.000	50.00	5.21	25.687	0.032	0.0	0.0	1.7	1.00	17.8	6.1
28.000	50.00	5.18	27.551	0.014	0.0	0.0	0.8	1.01	7.9	2.7
28.001	50.00	5.36	27.362	0.029	0.0	0.0	1.6	1.01	7.9	5.5
28.002	50.00	5.72	27.127	0.044	0.0	0.0	2.4	1.32	23.3	8.3
29.000	50.00	5.17	27.436	0.014	0.0	0.0	0.8	1.03	8.1	2.7
29.001	50.00	5.36	27.247	0.029	0.0	0.0	1.6	1.00	7.8	5.5
28.003	50.00	5.73	26.646	0.088	0.0	0.0	4.8	5.00	88.4	16.7
27.001	50.00	5.92	25.664	0.141	0.0	0.0	7.6	1.72	68.4	26.7
27.002	50.00	6.07	25.324	0.162	0.0	0.0	8.8	1.60	63.6	30.7
30.000	50.00	5.15	27.490	0.031	0.0	0.0	1.7	1.32	23.3	5.9
31.000	50.00	5.51	27.769	0.067	0.0	0.0	3.6	0.76	6.0<<	12.7
31.001	50.00	5.63	27.490	0.067	0.0	0.0	3.6	1.01	17.8	12.7


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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
30.001	25.175	0.431	58.4	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
32.000	11.586	0.200	57.9	0.031	5.00	0.0	0.600	o	100	Pipe/Conduit	
30.002	3.816	0.909	4.2	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
27.003	3.033	0.030	101.1	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
33.000	10.229	0.175	58.5	0.024	5.00	0.0	0.600	o	150	Pipe/Conduit	
33.001	14.253	0.244	58.5	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
33.002	26.473	0.453	58.5	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
34.000	8.848	0.151	58.5	0.024	5.00	0.0	0.600	o	100	Pipe/Conduit	
34.001	9.695	0.166	58.5	0.012	0.00	0.0	0.600	o	100	Pipe/Conduit	
34.002	9.551	0.163	58.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
33.003	7.064	0.121	58.5	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.005	26.518	0.088	301.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.006	4.500#	0.162	27.8	0.044	0.00	0.0	0.600	o	450	Pipe/Conduit	
35.000	43.445	0.043	1010.3	0.000	5.00	0.0	0.600	o	100	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)
30.001	50.00	5.95	27.293	0.106	0.0	0.0	5.7	1.32	23.3	20.1
32.000	50.00	5.19	27.062	0.031	0.0	0.0	1.7	1.01	8.0	5.9
30.002	50.00	5.96	26.862	0.145	0.0	0.0	7.9	4.95	87.5	27.5
27.003	50.00	6.11	25.112	0.328	0.0	0.0	17.8	1.30	51.7<<	62.2
33.000	50.00	5.13	24.914	0.024	0.0	0.0	1.3	1.32	23.3	4.5
33.001	50.00	5.31	24.739	0.036	0.0	0.0	1.9	1.32	23.3	6.8
33.002	50.00	5.64	24.495	0.048	0.0	0.0	2.6	1.32	23.3	9.1
34.000	50.00	5.15	25.627	0.024	0.0	0.0	1.3	1.01	7.9	4.5
34.001	50.00	5.31	25.476	0.036	0.0	0.0	1.9	1.01	7.9	6.8
34.002	50.00	5.46	25.310	0.036	0.0	0.0	1.9	1.01	7.9	6.8
33.003	50.00	5.73	24.043	0.096	0.0	0.0	5.2	1.32	23.3	18.2
11.005	50.00	17.05	24.549	1.875	0.0	0.0	101.6	1.17	185.4<<	355.5
11.006	50.00	17.07	24.461	1.919	0.0	0.0	103.9	3.87	615.4	363.8
35.000	50.00	8.09	25.619	0.000	0.0	0.0	0.0	0.23	1.8	0.0


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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
36.000	11.199	0.043	259.2	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
35.001	4.700#	0.085	55.3	0.051	0.00	0.0	0.600	o	150	Pipe/Conduit	
11.007	4.300#	0.022	195.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
37.000	43.436	0.043	1010.1	0.046	5.00	0.0	0.600	o	100	Pipe/Conduit	
11.008	24.249	0.145	167.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
38.000	9.949	0.097	102.6	0.016	5.00	0.0	0.600	o	100	Pipe/Conduit	
38.001	13.020	0.123	105.9	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	
38.002	8.876	0.097	91.5	0.030	0.00	0.0	0.600	o	150	Pipe/Conduit	
39.000	4.966	0.017	300.0	0.046	5.00	0.0	0.600	o	225	Pipe/Conduit	
39.001	31.807	0.004	7951.8	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
39.002	10.631	0.106	100.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.009	34.703	0.073	476.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.010	2.308	0.007	310.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.011	2.083	0.007	300.0	0.000	0.00	0.0	0.600	o	450	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)
36.000	50.00	5.39	25.619	0.000	0.0	0.0	0.0	0.47	3.7	0.0
35.001	50.00	8.15	25.526	0.051	0.0	0.0	2.8	1.36	24.0	9.7
11.007	50.00	17.15	24.299	1.970	0.0	0.0	106.7	0.93	37.0<<	373.5
37.000	50.00	8.09	25.415	0.046	0.0	0.0	2.5	0.23	1.8<<	8.7
11.008	50.00	17.55	24.277	2.016	0.0	0.0	109.2	1.01	40.1<<	382.2
38.000	50.00	5.22	24.707	0.016	0.0	0.0	0.9	0.76	6.0	3.0
38.001	50.00	5.44	24.560	0.032	0.0	0.0	1.7	0.98	17.3	6.1
38.002	50.00	5.58	24.437	0.062	0.0	0.0	3.4	1.05	18.6	11.8
39.000	50.00	5.11	24.280	0.046	0.0	0.0	2.5	0.75	29.8	8.7
39.001	50.00	8.96	24.234	0.062	0.0	0.0	3.4	0.14	5.5<<	11.8
39.002	50.00	9.09	24.238	0.062	0.0	0.0	3.4	1.31	51.9	11.8
11.009	50.00	18.36	24.132	2.140	0.0	0.0	115.9	0.71	50.4<<	405.7
11.010	50.00	18.39	24.059	2.140	0.0	0.0	115.9	1.15	182.5<<	405.7
11.011	50.00	18.42	24.052	2.140	0.0	0.0	115.9	1.17	185.8<<	405.7


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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
11.012	0.500#	0.045	11.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.013	5.223	0.014	385.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
11.014	10.438	0.014	769.4	0.000	0.00	0.0	0.600	o	100	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)
11.012	50.00	18.42	24.045	2.140	0.0	0.0	115.9	6.13	974.2	405.7
11.013	50.00	18.51	24.000	2.140	0.0	0.0	115.9	1.03	163.8<<	405.7
11.014	50.00	19.15	23.986	2.140	0.0	0.0	115.9	0.27	2.1<<	405.7

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
11.000	-	-	100	0.368	0.368	0.368
12.000	-	-	100	0.011	0.011	0.011
13.000	-	-	100	0.070	0.070	0.070
13.001	-	-	100	0.000	0.000	0.000
12.001	-	-	100	0.000	0.000	0.000
11.001	-	-	100	0.054	0.054	0.054
11.002	-	-	100	0.021	0.021	0.021
14.000	-	-	100	0.024	0.024	0.024
14.001	-	-	100	0.000	0.000	0.000
15.000	-	-	100	0.030	0.030	0.030
15.001	-	-	100	0.000	0.000	0.000
14.002	-	-	100	0.000	0.000	0.000
11.003	-	-	100	0.100	0.100	0.100
16.000	-	-	100	0.034	0.034	0.034
16.001	-	-	100	0.000	0.000	0.000
17.000	-	-	100	0.063	0.063	0.063
17.001	-	-	100	0.000	0.000	0.000
18.000	-	-	100	0.021	0.021	0.021
18.001	-	-	100	0.021	0.021	0.021
18.002	-	-	100	0.021	0.021	0.021
18.003	-	-	100	0.009	0.009	0.009
19.000	-	-	100	0.036	0.036	0.036
19.001	-	-	100	0.012	0.012	0.012
20.000	-	-	100	0.036	0.036	0.036
19.002	-	-	100	0.012	0.012	0.012
21.000	-	-	100	0.027	0.027	0.027
21.001	-	-	100	0.000	0.000	0.000
16.002	-	-	100	0.013	0.013	0.013
22.000	-	-	100	0.039	0.039	0.039
22.001	-	-	100	0.000	0.000	0.000
16.003	-	-	100	0.000	0.000	0.000
23.000	-	-	100	0.020	0.020	0.020
23.001	-	-	100	0.020	0.020	0.020
23.002	-	-	100	0.020	0.020	0.020
23.003	-	-	100	0.020	0.020	0.020
24.000	-	-	100	0.045	0.045	0.045
24.001	-	-	100	0.000	0.000	0.000
24.002	-	-	100	0.073	0.073	0.073
25.000	-	-	100	0.076	0.076	0.076
25.001	-	-	100	0.000	0.000	0.000
24.003	-	-	100	0.000	0.000	0.000
16.004	-	-	100	0.047	0.047	0.047
16.005	-	-	100	0.022	0.022	0.022
26.000	-	-	100	0.045	0.045	0.045
26.001	-	-	100	0.000	0.000	0.000
26.002	-	-	100	0.000	0.000	0.000
16.006	-	-	100	0.000	0.000	0.000
11.004	-	-	100	0.041	0.041	0.041
27.000	-	-	100	0.032	0.032	0.032
28.000	-	-	100	0.014	0.014	0.014
28.001	-	-	100	0.015	0.015	0.015


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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
28.002	-	-	100	0.015	0.015	0.015
29.000	-	-	100	0.014	0.014	0.014
29.001	-	-	100	0.015	0.015	0.015
28.003	-	-	100	0.015	0.015	0.015
27.001	-	-	100	0.021	0.021	0.021
27.002	-	-	100	0.021	0.021	0.021
30.000	-	-	100	0.031	0.031	0.031
31.000	-	-	100	0.067	0.067	0.067
31.001	-	-	100	0.000	0.000	0.000
30.001	-	-	100	0.008	0.008	0.008
32.000	-	-	100	0.031	0.031	0.031
30.002	-	-	100	0.008	0.008	0.008
27.003	-	-	100	0.021	0.021	0.021
33.000	-	-	100	0.024	0.024	0.024
33.001	-	-	100	0.012	0.012	0.012
33.002	-	-	100	0.012	0.012	0.012
34.000	-	-	100	0.024	0.024	0.024
34.001	-	-	100	0.012	0.012	0.012
34.002	-	-	100	0.000	0.000	0.000
33.003	-	-	100	0.012	0.012	0.012
11.005	-	-	100	0.000	0.000	0.000
11.006	-	-	100	0.044	0.044	0.044
35.000	-	-	100	0.000	0.000	0.000
36.000	-	-	100	0.000	0.000	0.000
35.001	-	-	100	0.051	0.051	0.051
11.007	-	-	100	0.000	0.000	0.000
37.000	-	-	100	0.046	0.046	0.046
11.008	-	-	100	0.000	0.000	0.000
38.000	-	-	100	0.016	0.016	0.016
38.001	-	-	100	0.016	0.016	0.016
38.002	-	-	100	0.030	0.030	0.030
39.000	-	-	100	0.046	0.046	0.046
39.001	-	-	100	0.016	0.016	0.016
39.002	-	-	100	0.000	0.000	0.000
11.009	-	-	100	0.000	0.000	0.000
11.010	-	-	100	0.000	0.000	0.000
11.011	-	-	100	0.000	0.000	0.000
11.012	-	-	100	0.000	0.000	0.000
11.013	-	-	100	0.000	0.000	0.000
11.014	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.140	2.140	2.140

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
11.014	Outfall	26.051	23.973	0.000	0	0


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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 Storage Structures	18
Number of Online Controls	19	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 612700 164800 TR 12700 64800
Data Type	Catchment
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Orifice Manhole: IC 20.02, DS/PN: 13.001, Volume (m³): 0.5

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 24.617

Non Return Valve Manhole: IC 19.02, DS/PN: 12.001, Volume (m³): 1.7

Orifice Manhole: IC 18.03, DS/PN: 11.001, Volume (m³): 0.9

Diameter (m) 0.060 Discharge Coefficient 0.600 Invert Level (m) 24.921

Orifice Manhole: IC 21.02, DS/PN: 14.001, Volume (m³): 0.3

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 25.826

Orifice Manhole: IC 30.02, DS/PN: 15.001, Volume (m³): 0.3

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 25.787

Orifice Manhole: CP 1.09, DS/PN: 11.003, Volume (m³): 2.3

Diameter (m) 0.060 Discharge Coefficient 0.600 Invert Level (m) 24.634

Orifice Manhole: IC 4.02, DS/PN: 16.001, Volume (m³): 0.4

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 30.216

Orifice Manhole: IC 5.02, DS/PN: 17.001, Volume (m³): 0.5

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 29.720

Orifice Manhole: IC 6.02, DS/PN: 21.001, Volume (m³): 0.4


Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 30.224

Orifice Manhole: IC 7.02, DS/PN: 22.001, Volume (m³): 0.4

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 29.702

Orifice Manhole: IC 9.02, DS/PN: 24.001, Volume (m³): 0.4

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 27.682

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Orifice Manhole: IC 10.02, DS/PN: 25.001, Volume (m³): 0.3

Diameter (m) 0.090 Discharge Coefficient 0.600 Invert Level (m) 28.190

Non Return Valve Manhole: CP 17.03, DS/PN: 26.002, Volume (m³): 2.8

Orifice Manhole: FC 1.09, DS/PN: 16.006, Volume (m³): 2.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 24.825

Orifice Manhole: IC 11.02, DS/PN: 31.001, Volume (m³): 0.3

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 27.490

Orifice Manhole: IC 26.02, DS/PN: 35.001, Volume (m³): 0.5

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 25.576

Orifice Manhole: CP 1.15, DS/PN: 11.008, Volume (m³): 2.4

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 24.277


Orifice Manhole: IC 28.04, DS/PN: 39.002, Volume (m³): 1.6

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 24.238

Pump Manhole: PC 1.21, DS/PN: 11.014, Volume (m³): 6.8

Invert Level (m) 23.986

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	18.0000	1.800	18.0000	3.400	0.0000	5.000	0.0000
0.400	18.0000	2.000	18.0000	3.600	0.0000	5.200	0.0000
0.600	18.0000	2.200	18.0000	3.800	0.0000	5.400	0.0000
0.800	18.0000	2.400	0.0000	4.000	0.0000	5.600	0.0000
1.000	18.0000	2.600	0.0000	4.200	0.0000	5.800	0.0000
1.200	18.0000	2.800	0.0000	4.400	0.0000	6.000	0.0000
1.400	18.0000	3.000	0.0000	4.600	0.0000		
1.600	18.0000	3.200	0.0000	4.800	0.0000		

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Storage Structures for Storm

Porous Car Park Manhole: IC 20.02, DS/PN: 13.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.0
Max Percolation (l/s)	59.7	Slope (1:X)	4000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	24.620	Membrane Depth (mm)	90

Cellular Storage Manhole: IC 18.03, DS/PN: 11.001

Invert Level (m)	24.921	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	384.0	0.0	1.201	0.0	0.0
1.200	384.0	0.0			

Porous Car Park Manhole: IC 21.02, DS/PN: 14.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	30.0
Max Percolation (l/s)	41.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	25.855	Membrane Depth (mm)	90


Porous Car Park Manhole: IC 30.02, DS/PN: 15.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	30.0
Max Percolation (l/s)	41.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	25.816	Membrane Depth (mm)	90

Cellular Storage Manhole: CP 1.09, DS/PN: 11.003

Invert Level (m)	24.634	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	279.0	0.0	1.201	0.0	0.0
1.200	279.0	0.0			

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Porous Car Park Manhole: IC 4.02, DS/PN: 16.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.0
Max Percolation (l/s)	59.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	30.259	Membrane Depth (mm)	90

Porous Car Park Manhole: IC 5.02, DS/PN: 17.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	48.0
Max Percolation (l/s)	66.7	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	29.769	Membrane Depth (mm)	90

Porous Car Park Manhole: IC 6.02, DS/PN: 21.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	47.2	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	30.258	Membrane Depth (mm)	90

Porous Car Park Manhole: IC 7.02, DS/PN: 22.001


Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	34.0
Max Percolation (l/s)	47.2	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	29.736	Membrane Depth (mm)	90

Porous Car Park Manhole: IC 9.02, DS/PN: 24.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	35.0
Max Percolation (l/s)	48.6	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	27.714	Membrane Depth (mm)	90

Porous Car Park Manhole: IC 10.02, DS/PN: 25.001

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	28.217
Membrane Percolation (mm/hr)	1000	Width (m)	10.0
Max Percolation (l/s)	75.0	Length (m)	27.0
Safety Factor	2.0	Slope (1:X)	1000.0
Porosity	0.30	Depression Storage (mm)	5

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Porous Car Park Manhole: IC 10.02, DS/PN: 25.001

Evaporation (mm/day) 3 Membrane Depth (mm) 901

Cellular Storage Manhole: FC 1.09, DS/PN: 16.006

Invert Level (m) 24.675 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	378.0	0.0	1.201	0.0	0.0
1.200	378.0	0.0			

Porous Car Park Manhole: IC 11.02, DS/PN: 31.001

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 9.0
 Membrane Percolation (mm/hr) 1000 Length (m) 35.0
 Max Percolation (l/s) 87.5 Slope (1:X) 1000.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 27.490 Membrane Depth (mm) 90

Porous Car Park Manhole: IC 26.02, DS/PN: 35.001

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 5.0
 Membrane Percolation (mm/hr) 1000 Length (m) 55.0
 Max Percolation (l/s) 76.4 Slope (1:X) 1000.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 25.619 Membrane Depth (mm) 90


Cellular Storage Manhole: CP 1.14, DS/PN: 11.007

Invert Level (m) 24.299 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	180.0	0.0	1.201	0.0	0.0
1.200	180.0	0.0			

Porous Car Park Manhole: CP 1.15, DS/PN: 11.008

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 5.0
 Membrane Percolation (mm/hr) 1000 Length (m) 42.0
 Max Percolation (l/s) 58.3 Slope (1:X) 1000.0
 Safety Factor 2.0 Depression Storage (mm) 5
 Porosity 0.30 Evaporation (mm/day) 3
 Invert Level (m) 25.415 Membrane Depth (mm) 90

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Porous Car Park Manhole: IC 28.04, DS/PN: 39.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	32.0
Max Percolation (l/s)	44.4	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	24.263	Membrane Depth (mm)	90

Tank or Pond Manhole: HW 1.20, DS/PN: 11.013

Invert Level (m) 24.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	283.0	1.830	741.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 18
Number of Online Controls 19 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 612700 164800 TR 12700 64800
Data Type Catchment
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status ON


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440, 2160, 2880, 4320, 5760,
7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
11.000	IC 18.01	15 minute 2 year Winter I+0%	27.159	25.854	-0.058	0.000	55.6
12.000	IC 19.01	15 minute 2 year Winter I+0%	25.936	25.323	-0.198	0.000	1.7
13.000	BC 20.01	15 minute 2 year Summer I+0%	25.984	24.720	0.000	0.000	6.7
13.001	IC 20.02	10080 minute 2 year Winter I+0%	25.875	25.045	0.203	0.000	0.5
12.001	IC 19.02	15 minute 2 year Winter I+0%	26.105	25.020	-0.209	0.000	0.4
11.001	IC 18.03	480 minute 2 year Winter I+0%	26.275	25.106	-0.039	0.000	3.0
11.002	IC 18.04	960 minute 2 year Winter I+0%	26.083	24.912	-0.134	0.000	2.9
14.000	BC 21.01	15 minute 2 year Summer I+0%	26.405	25.955	0.000	0.000	3.1
14.001	IC 21.02	120 minute 2 year Winter I+0%	26.365	25.904	-0.072	0.000	0.5
15.000	BC 30.01	15 minute 2 year Summer I+0%	26.366	25.916	0.000	0.000	3.7
15.001	IC 30.02	120 minute 2 year Winter I+0%	26.395	25.878	-0.134	0.000	0.5
14.002	CP 30.03	120 minute 2 year Winter I+0%	26.547	25.534	-0.215	0.000	1.0
11.003	CP 1.09	960 minute 2 year Winter I+0%	26.658	24.911	0.052	0.000	3.5
16.000	BC 4.01	15 minute 2 year Summer I+0%	30.809	30.359	0.000	0.000	3.7

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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US/MH		
PN	Name	Status
11.000	IC 18.01	OK
12.000	IC 19.01	OK
13.000	BC 20.01	SURCHARGED*
13.001	IC 20.02	SURCHARGED
12.001	IC 19.02	OK
11.001	IC 18.03	OK
11.002	IC 18.04	OK
14.000	BC 21.01	SURCHARGED*
14.001	IC 21.02	OK
15.000	BC 30.01	SURCHARGED*
15.001	IC 30.02	OK
14.002	CP 30.03	OK
11.003	CP 1.09	SURCHARGED
16.000	BC 4.01	SURCHARGED*

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
16.001	IC 4.02	120 minute 2 year Winter I+0%	30.871	30.317	0.001	0.000	0.6
17.000	BC 5.01	15 minute 2 year Summer I+0%	30.314	29.869	0.000	0.000	5.1
17.001	IC 5.02	180 minute 2 year Winter I+0%	30.323	29.874	0.054	0.000	0.7
18.000	IC 1.01	15 minute 2 year Winter I+0%	31.000	30.496	-0.054	0.000	3.2
18.001	IC 1.02	15 minute 2 year Winter I+0%	31.000	30.226	-0.096	0.000	5.9
18.002	IC 1.03	15 minute 2 year Winter I+0%	31.000	30.018	-0.080	0.000	8.6
18.003	IC 1.04	15 minute 2 year Winter I+0%	31.000	29.898	-0.080	0.000	9.9
19.000	IC 2.01	15 minute 2 year Winter I+0%	31.061	30.228	-0.034	0.000	5.5
19.001	IC 2.02	15 minute 2 year Winter I+0%	31.021	30.038	-0.092	0.000	7.0
20.000	IC 3.01	15 minute 2 year Winter I+0%	31.083	30.246	-0.034	0.000	5.5
19.002	IC 2.03	15 minute 2 year Winter I+0%	31.047	29.574	-0.072	0.000	14.0
21.000	BC 6.01	15 minute 2 year Summer I+0%	30.808	30.358	0.000	0.000	3.3
21.001	IC 6.02	120 minute 2 year Winter I+0%	30.764	30.309	-0.015	0.000	0.5
16.002	CP 1.05	15 minute 2 year Winter I+0%	30.702	29.317	-0.148	0.000	26.9
22.000	BC 7.01	15 minute 2 year Summer I+0%	30.286	29.836	0.000	0.000	4.3
22.001	IC 7.02	180 minute 2 year Winter I+0%	30.240	29.812	0.010	0.000	0.6
16.003	CP 1.06	15 minute 2 year Winter I+0%	29.982	28.416	-0.235	0.000	27.3
23.000	IC 8.01	15 minute 2 year Winter I+0%	30.066	29.512	-0.038	0.000	3.0
23.001	IC 8.02	15 minute 2 year Winter I+0%	30.021	29.461	-0.088	0.000	5.6
23.002	IC 8.03	15 minute 2 year Winter I+0%	29.943	29.341	-0.074	0.000	8.3
23.003	IC 8.04	15 minute 2 year Winter I+0%	29.820	29.181	-0.109	0.000	10.8
24.000	BC 9.01	15 minute 2 year Summer I+0%	28.262	27.814	0.000	0.000	4.7
24.001	IC 9.02	180 minute 2 year Winter I+0%	28.275	27.803	0.021	0.000	0.6
24.002	CP 9.03	15 minute 2 year Winter I+0%	28.675	27.685	-0.141	0.000	9.5
25.000	BC 10.01	15 minute 2 year Summer I+0%	28.767	28.317	0.000	0.000	6.2
25.001	IC 10.02	15 minute 2 year Winter I+0%	28.767	28.385	0.045	0.000	6.5
24.003	CP 9.04	15 minute 2 year Winter I+0%	29.423	27.528	-0.363	0.000	15.2
16.004	CP 1.07	15 minute 2 year Winter I+0%	29.208	27.327	-0.263	0.000	58.5
16.005	CP 1.08	15 minute 2 year Winter I+0%	28.079	27.169	-0.357	0.000	61.0
26.000	IC 17.01	15 minute 2 year Winter I+0%	26.500	25.630	-0.255	0.000	6.9
26.001	IC 17.02	15 minute 2 year Winter I+0%	26.500	25.302	-0.240	0.000	6.8
26.002	CP 17.03	15 minute 2 year Winter I+0%	27.041	25.194	-0.249	0.000	6.9
16.006	FC 1.09	600 minute 2 year Winter I+0%	26.763	24.987	-0.138	0.000	7.0
11.004	CP 1.10	15 minute 2 year Winter I+0%	26.643	24.734	-0.296	0.000	5.8
27.000	IC 16.01	15 minute 2 year Winter I+0%	26.443	25.771	-0.066	0.000	4.8
28.000	IC 12.01	15 minute 2 year Winter I+0%	28.286	27.588	-0.063	0.000	2.1
28.001	IC 12.02	15 minute 2 year Winter I+0%	28.286	27.416	-0.046	0.000	4.1
28.002	IC 12.03	15 minute 2 year Winter I+0%	28.286	27.180	-0.097	0.000	6.0
29.000	IC 13.01	15 minute 2 year Winter I+0%	28.199	27.472	-0.064	0.000	2.1
29.001	IC 13.02	15 minute 2 year Winter I+0%	28.115	27.301	-0.046	0.000	4.1
28.003	IC 12.04	15 minute 2 year Winter I+0%	27.906	26.692	-0.104	0.000	12.0
27.001	IC 16.02	15 minute 2 year Winter I+0%	26.382	25.751	-0.138	0.000	19.6
27.002	IC 16.03	15 minute 2 year Winter I+0%	26.384	25.423	-0.125	0.000	22.4
30.000	IC 14.01	15 minute 2 year Winter I+0%	28.040	27.538	-0.102	0.000	4.7
31.000	BC 11.01	15 minute 2 year Summer I+0%	28.331	27.869	0.000	0.000	7.4
31.001	IC 11.02	360 minute 2 year Winter I+0%	28.263	27.603	-0.037	0.000	0.6
30.001	IC 14.02	15 minute 2 year Winter I+0%	28.050	27.346	-0.097	0.000	6.0
32.000	IC 15.01	15 minute 2 year Winter I+0%	27.866	27.120	-0.042	0.000	4.7

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Status
16.001	IC 4.02	SURCHARGED
17.000	BC 5.01	SURCHARGED*
17.001	IC 5.02	SURCHARGED
18.000	IC 1.01	OK
18.001	IC 1.02	OK
18.002	IC 1.03	OK
18.003	IC 1.04	OK
19.000	IC 2.01	OK
19.001	IC 2.02	OK
20.000	IC 3.01	OK
19.002	IC 2.03	OK
21.000	BC 6.01	SURCHARGED*
21.001	IC 6.02	OK
16.002	CP 1.05	OK
22.000	BC 7.01	SURCHARGED*
22.001	IC 7.02	SURCHARGED
16.003	CP 1.06	OK
23.000	IC 8.01	OK
23.001	IC 8.02	OK
23.002	IC 8.03	OK
23.003	IC 8.04	OK
24.000	BC 9.01	SURCHARGED*
24.001	IC 9.02	SURCHARGED
24.002	CP 9.03	OK
25.000	BC 10.01	SURCHARGED*
25.001	IC 10.02	SURCHARGED
24.003	CP 9.04	OK
16.004	CP 1.07	OK
16.005	CP 1.08	OK
26.000	IC 17.01	OK
26.001	IC 17.02	OK
26.002	CP 17.03	OK
16.006	FC 1.09	OK
11.004	CP 1.10	OK
27.000	IC 16.01	OK
28.000	IC 12.01	OK
28.001	IC 12.02	OK
28.002	IC 12.03	OK
29.000	IC 13.01	OK
29.001	IC 13.02	OK
28.003	IC 12.04	OK
27.001	IC 16.02	OK
27.002	IC 16.03	OK
30.000	IC 14.01	OK
31.000	BC 11.01	SURCHARGED*
31.001	IC 11.02	OK
30.001	IC 14.02	OK

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Status
32.000	IC 15.01	OK

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm


PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
30.002	IC 14.03	15 minute 2 year Winter I+0%	27.862	26.907	-0.105	0.000	11.7
27.003	IC 16.04	15 minute 2 year Winter I+0%	26.503	25.367	0.030	0.000	37.0
33.000	IC 23.01	15 minute 2 year Winter I+0%	26.375	24.957	-0.107	0.000	3.7
33.001	IC 23.02	15 minute 2 year Winter I+0%	26.375	24.845	-0.044	0.000	5.0
33.002	IC 23.03	15 minute 2 year Winter I+0%	26.385	24.824	0.179	0.000	6.4
34.000	IC 24.01	15 minute 2 year Winter I+0%	26.399	25.678	-0.049	0.000	3.7
34.001	IC 24.02	15 minute 2 year Winter I+0%	26.427	25.539	-0.037	0.000	5.2
34.002	IC 24.03	15 minute 2 year Winter I+0%	26.459	25.374	-0.037	0.000	5.2
33.003	IC 23.04	15 minute 2 year Winter I+0%	26.554	24.785	0.592	0.000	13.1
11.005	CP 1.11	15 minute 2 year Winter I+0%	26.573	24.733	-0.266	0.000	54.5
11.006	CP 1.12	720 minute 2 year Winter I+0%	26.523	24.667	-0.244	0.000	13.8
35.000	BC 26.01	240 minute 2 year Winter I+0%	26.169	25.695	-0.024	0.000	0.0
36.000	BC 25.01	240 minute 2 year Winter I+0%	26.169	25.695	-0.024	0.000	0.0
35.001	IC 26.02	240 minute 2 year Winter I+0%	26.157	25.695	0.019	0.000	0.6
11.007	CP 1.14	720 minute 2 year Winter I+0%	26.041	24.665	0.141	0.000	11.7
37.000	BC 27.01	15 minute 2 year Summer I+0%	25.965	25.515	0.000	0.000	4.6
11.008	CP 1.15	600 minute 2 year Winter I+0%	26.003	24.653	0.151	0.000	11.9
38.000	IC 29.01	15 minute 2 year Winter I+0%	25.397	24.754	-0.053	0.000	2.4
38.001	IC 29.02	15 minute 2 year Winter I+0%	25.506	24.615	-0.095	0.000	4.5
38.002	IC 29.03	15 minute 2 year Winter I+0%	25.628	24.514	-0.073	0.000	8.4
39.000	IC 28.01	240 minute 2 year Winter I+0%	24.830	24.395	-0.110	0.000	1.6
39.001	BC 28.03	240 minute 2 year Winter I+0%	24.791	24.395	-0.064	0.000	2.1
39.002	IC 28.04	240 minute 2 year Winter I+0%	26.279	24.393	-0.070	0.000	0.7
11.009	CP 1.16	600 minute 2 year Winter I+0%	25.964	24.239	-0.193	0.000	12.8
11.010	CP 1.17	600 minute 2 year Winter I+0%	25.563	24.154	-0.355	0.000	12.8
11.011	CP 1.18	600 minute 2 year Winter I+0%	25.581	24.147	-0.355	0.000	12.8
11.012	HW 1.19	720 minute 2 year Winter I+0%	25.637	24.133	-0.362	0.000	12.8
11.013	HW 1.20	720 minute 2 year Winter I+0%	26.384	24.131	-0.319	0.000	12.5
11.014	PC 1.21	720 minute 2 year Winter I+0%	26.418	24.125	0.039	0.000	12.5

PN	US/MH Name	Status
30.002	IC 14.03	OK
27.003	IC 16.04	SURCHARGED
33.000	IC 23.01	OK
33.001	IC 23.02	OK
33.002	IC 23.03	SURCHARGED
34.000	IC 24.01	OK
34.001	IC 24.02	OK
34.002	IC 24.03	OK
33.003	IC 23.04	SURCHARGED
11.005	CP 1.11	OK
11.006	CP 1.12	OK
35.000	BC 26.01	OK*
36.000	BC 25.01	OK*

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Status
35.001	IC 26.02	SURCHARGED
11.007	CP 1.14	SURCHARGED
37.000	BC 27.01	SURCHARGED*
11.008	CP 1.15	SURCHARGED
38.000	IC 29.01	OK
38.001	IC 29.02	OK
38.002	IC 29.03	OK
39.000	IC 28.01	OK
39.001	BC 28.03	OK*
39.002	IC 28.04	OK
11.009	CP 1.16	OK
11.010	CP 1.17	OK
11.011	CP 1.18	OK
11.012	HW 1.19	OK*
11.013	HW 1.20	OK
11.014	PC 1.21	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 18
Number of Online Controls 19 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 612700 164800 TR 12700 64800
Data Type Catchment
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status ON


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440, 2160, 2880, 4320, 5760,
7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
11.000	IC 18.01	15 minute 30 year Winter I+0%	27.159	26.161	0.249	0.000	125.0
12.000	IC 19.01	15 minute 30 year Winter I+0%	25.936	25.338	-0.183	0.000	3.7
13.000	BC 20.01	15 minute 30 year Summer I+0%	25.984	24.720	0.000	0.000	12.0
13.001	IC 20.02	1440 minute 30 year Winter I+0%	25.875	25.348	0.506	0.000	0.7
12.001	IC 19.02	960 minute 30 year Winter I+0%	26.105	25.313	0.084	0.000	0.4
11.001	IC 18.03	960 minute 30 year Winter I+0%	26.275	25.321	0.176	0.000	3.7
11.002	IC 18.04	960 minute 30 year Winter I+0%	26.083	25.183	0.137	0.000	4.2
14.000	BC 21.01	15 minute 30 year Summer I+0%	26.405	25.955	0.000	0.000	6.2
14.001	IC 21.02	120 minute 30 year Winter I+0%	26.365	25.964	-0.012	0.000	0.7
15.000	BC 30.01	15 minute 30 year Summer I+0%	26.366	25.916	0.000	0.000	7.2
15.001	IC 30.02	120 minute 30 year Winter I+0%	26.395	25.957	-0.055	0.000	0.7
14.002	CP 30.03	120 minute 30 year Winter I+0%	26.547	25.538	-0.211	0.000	1.4
11.003	CP 1.09	960 minute 30 year Winter I+0%	26.658	25.182	0.323	0.000	4.4
16.000	BC 4.01	15 minute 30 year Summer I+0%	30.809	30.359	0.000	0.000	6.9

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Status
11.000	IC 18.01	SURCHARGED
12.000	IC 19.01	OK
13.000	BC 20.01	SURCHARGED*
13.001	IC 20.02	SURCHARGED
12.001	IC 19.02	SURCHARGED
11.001	IC 18.03	SURCHARGED
11.002	IC 18.04	SURCHARGED
14.000	BC 21.01	SURCHARGED*
14.001	IC 21.02	OK
15.000	BC 30.01	SURCHARGED*
15.001	IC 30.02	OK
14.002	CP 30.03	OK
11.003	CP 1.09	SURCHARGED
16.000	BC 4.01	SURCHARGED*

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
16.001	IC 4.02	120 minute 30 year Winter I+0%	30.871	30.383	0.067	0.000	0.7
17.000	BC 5.01	15 minute 30 year Summer I+0%	30.314	29.869	0.000	0.000	8.7
17.001	IC 5.02	240 minute 30 year Winter I+0%	30.323	29.997	0.177	0.000	1.0
18.000	IC 1.01	15 minute 30 year Winter I+0%	31.000	30.529	-0.021	0.000	7.2
18.001	IC 1.02	15 minute 30 year Winter I+0%	31.000	30.279	-0.043	0.000	14.7
18.002	IC 1.03	15 minute 30 year Winter I+0%	31.000	30.181	0.083	0.000	21.0
18.003	IC 1.04	15 minute 30 year Winter I+0%	31.000	30.047	0.069	0.000	23.8
19.000	IC 2.01	15 minute 30 year Winter I+0%	31.061	30.489	0.227	0.000	11.9
19.001	IC 2.02	15 minute 30 year Winter I+0%	31.021	30.075	-0.055	0.000	15.8
20.000	IC 3.01	15 minute 30 year Winter I+0%	31.083	30.508	0.228	0.000	11.9
19.002	IC 2.03	15 minute 30 year Winter I+0%	31.047	29.714	0.068	0.000	31.5
21.000	BC 6.01	15 minute 30 year Summer I+0%	30.808	30.358	0.000	0.000	6.5
21.001	IC 6.02	120 minute 30 year Winter I+0%	30.764	30.371	0.047	0.000	0.7
16.002	CP 1.05	15 minute 30 year Winter I+0%	30.702	29.362	-0.103	0.000	60.6
22.000	BC 7.01	15 minute 30 year Summer I+0%	30.286	29.836	0.000	0.000	8.0
22.001	IC 7.02	180 minute 30 year Winter I+0%	30.240	29.908	0.106	0.000	0.8
16.003	CP 1.06	15 minute 30 year Winter I+0%	29.982	28.503	-0.148	0.000	60.7
23.000	IC 8.01	15 minute 30 year Winter I+0%	30.066	29.671	0.121	0.000	6.7
23.001	IC 8.02	15 minute 30 year Winter I+0%	30.021	29.565	0.016	0.000	13.2
23.002	IC 8.03	15 minute 30 year Winter I+0%	29.943	29.474	0.059	0.000	19.9
23.003	IC 8.04	15 minute 30 year Winter I+0%	29.820	29.208	-0.082	0.000	26.4
24.000	BC 9.01	15 minute 30 year Summer I+0%	28.262	27.814	0.000	0.000	8.6
24.001	IC 9.02	180 minute 30 year Winter I+0%	28.275	27.913	0.131	0.000	0.9
24.002	CP 9.03	15 minute 30 year Winter I+0%	28.675	27.759	-0.067	0.000	26.8
25.000	BC 10.01	15 minute 30 year Summer I+0%	28.767	28.317	0.000	0.000	10.5
25.001	IC 10.02	15 minute 30 year Winter I+0%	28.767	28.666	0.326	0.000	11.1
24.003	CP 9.04	15 minute 30 year Winter I+0%	29.423	27.575	-0.316	0.000	34.5
16.004	CP 1.07	15 minute 30 year Winter I+0%	29.208	27.456	-0.134	0.000	135.4
16.005	CP 1.08	15 minute 30 year Winter I+0%	28.079	27.218	-0.308	0.000	141.7
26.000	IC 17.01	15 minute 30 year Winter I+0%	26.500	25.655	-0.230	0.000	15.5
26.001	IC 17.02	15 minute 30 year Winter I+0%	26.500	25.332	-0.210	0.000	15.3
26.002	CP 17.03	720 minute 30 year Winter I+0%	27.041	25.261	-0.182	0.000	1.5
16.006	FC 1.09	720 minute 30 year Winter I+0%	26.763	25.261	0.136	0.000	10.4
11.004	CP 1.10	960 minute 30 year Winter I+0%	26.643	25.037	0.007	0.000	14.7
27.000	IC 16.01	15 minute 30 year Winter I+0%	26.443	26.098	0.261	0.000	11.2
28.000	IC 12.01	15 minute 30 year Winter I+0%	28.286	27.670	0.019	0.000	4.7
28.001	IC 12.02	15 minute 30 year Winter I+0%	28.286	27.596	0.134	0.000	9.7
28.002	IC 12.03	15 minute 30 year Winter I+0%	28.286	27.218	-0.059	0.000	14.7
29.000	IC 13.01	15 minute 30 year Winter I+0%	28.199	27.557	0.021	0.000	4.7
29.001	IC 13.02	15 minute 30 year Winter I+0%	28.115	27.485	0.138	0.000	9.7
28.003	IC 12.04	15 minute 30 year Winter I+0%	27.906	26.722	-0.074	0.000	29.3
27.001	IC 16.02	15 minute 30 year Winter I+0%	26.382	26.042	0.153	0.000	45.6
27.002	IC 16.03	15 minute 30 year Winter I+0%	26.384	25.852	0.303	0.000	52.1
30.000	IC 14.01	15 minute 30 year Winter I+0%	28.040	27.566	-0.074	0.000	10.6
31.000	BC 11.01	15 minute 30 year Summer I+0%	28.331	27.869	0.000	0.000	12.5
31.001	IC 11.02	360 minute 30 year Winter I+0%	28.263	27.714	0.074	0.000	0.9
30.001	IC 14.02	15 minute 30 year Winter I+0%	28.050	27.380	-0.063	0.000	13.6
32.000	IC 15.01	15 minute 30 year Winter I+0%	27.866	27.329	0.167	0.000	10.2

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Status
16.001	IC 4.02	SURCHARGED
17.000	BC 5.01	SURCHARGED*
17.001	IC 5.02	SURCHARGED
18.000	IC 1.01	OK
18.001	IC 1.02	OK
18.002	IC 1.03	SURCHARGED
18.003	IC 1.04	SURCHARGED
19.000	IC 2.01	SURCHARGED
19.001	IC 2.02	OK
20.000	IC 3.01	SURCHARGED
19.002	IC 2.03	SURCHARGED
21.000	BC 6.01	SURCHARGED*
21.001	IC 6.02	SURCHARGED
16.002	CP 1.05	OK
22.000	BC 7.01	SURCHARGED*
22.001	IC 7.02	SURCHARGED
16.003	CP 1.06	OK
23.000	IC 8.01	SURCHARGED
23.001	IC 8.02	SURCHARGED
23.002	IC 8.03	SURCHARGED
23.003	IC 8.04	OK
24.000	BC 9.01	SURCHARGED*
24.001	IC 9.02	SURCHARGED
24.002	CP 9.03	OK
25.000	BC 10.01	SURCHARGED*
25.001	IC 10.02	FLOOD RISK
24.003	CP 9.04	OK
16.004	CP 1.07	OK
16.005	CP 1.08	OK
26.000	IC 17.01	OK
26.001	IC 17.02	OK
26.002	CP 17.03	OK
16.006	FC 1.09	SURCHARGED
11.004	CP 1.10	SURCHARGED
27.000	IC 16.01	SURCHARGED
28.000	IC 12.01	SURCHARGED
28.001	IC 12.02	SURCHARGED
28.002	IC 12.03	OK
29.000	IC 13.01	SURCHARGED
29.001	IC 13.02	SURCHARGED
28.003	IC 12.04	OK
27.001	IC 16.02	SURCHARGED
27.002	IC 16.03	SURCHARGED
30.000	IC 14.01	OK
31.000	BC 11.01	SURCHARGED*
31.001	IC 11.02	SURCHARGED
30.001	IC 14.02	OK

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Status
32.000	IC 15.01	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm


PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
30.002	IC 14.03	15 minute 30 year Winter I+0%	27.862	26.933	-0.079	0.000	26.4
27.003	IC 16.04	15 minute 30 year Winter I+0%	26.503	25.660	0.323	0.000	84.7
33.000	IC 23.01	15 minute 30 year Winter I+0%	26.375	25.431	0.367	0.000	7.8
33.001	IC 23.02	15 minute 30 year Winter I+0%	26.375	25.403	0.514	0.000	11.5
33.002	IC 23.03	15 minute 30 year Winter I+0%	26.385	25.333	0.688	0.000	15.1
34.000	IC 24.01	15 minute 30 year Winter I+0%	26.399	26.064	0.336	0.000	7.2
34.001	IC 24.02	15 minute 30 year Winter I+0%	26.427	25.917	0.342	0.000	10.4
34.002	IC 24.03	15 minute 30 year Winter I+0%	26.459	25.572	0.162	0.000	10.4
33.003	IC 23.04	15 minute 30 year Winter I+0%	26.554	25.120	0.927	0.000	28.8
11.005	CP 1.11	960 minute 30 year Winter I+0%	26.573	25.034	0.035	0.000	21.5
11.006	CP 1.12	960 minute 30 year Winter I+0%	26.523	25.027	0.116	0.000	22.0
35.000	BC 26.01	960 minute 30 year Winter I+0%	26.169	25.719	0.000	0.000	0.0
36.000	BC 25.01	960 minute 30 year Winter I+0%	26.169	25.719	0.000	0.000	0.0
35.001	IC 26.02	240 minute 30 year Winter I+0%	26.157	25.778	0.102	0.000	0.8
11.007	CP 1.14	960 minute 30 year Winter I+0%	26.041	25.025	0.501	0.000	17.5
37.000	BC 27.01	15 minute 30 year Summer I+0%	25.965	25.515	0.000	0.000	8.2
11.008	CP 1.15	960 minute 30 year Winter I+0%	26.003	25.031	0.529	0.000	17.2
38.000	IC 29.01	15 minute 30 year Winter I+0%	25.397	24.814	0.007	0.000	5.5
38.001	IC 29.02	15 minute 30 year Winter I+0%	25.506	24.722	0.012	0.000	11.2
38.002	IC 29.03	15 minute 30 year Winter I+0%	25.628	24.659	0.072	0.000	21.3
39.000	IC 28.01	240 minute 30 year Winter I+0%	24.830	24.569	0.064	0.000	3.1
39.001	BC 28.03	15 minute 30 year Summer I+0%	24.791	24.488	0.029	0.000	20.0
39.002	IC 28.04	240 minute 30 year Winter I+0%	26.279	24.566	0.103	0.000	0.9
11.009	CP 1.16	30 minute 30 year Winter I+0%	25.964	24.290	-0.142	0.000	24.7
11.010	CP 1.17	960 minute 30 year Winter I+0%	25.563	24.205	-0.304	0.000	18.7
11.011	CP 1.18	960 minute 30 year Winter I+0%	25.581	24.202	-0.300	0.000	18.7
11.012	HW 1.19	960 minute 30 year Winter I+0%	25.637	24.199	-0.296	0.000	18.7
11.013	HW 1.20	960 minute 30 year Winter I+0%	26.384	24.199	-0.251	0.000	18.4
11.014	PC 1.21	960 minute 30 year Winter I+0%	26.418	24.200	0.113	0.000	18.0

PN	US/MH Name	Status
30.002	IC 14.03	OK
27.003	IC 16.04	SURCHARGED
33.000	IC 23.01	SURCHARGED
33.001	IC 23.02	SURCHARGED
33.002	IC 23.03	SURCHARGED
34.000	IC 24.01	SURCHARGED
34.001	IC 24.02	SURCHARGED
34.002	IC 24.03	SURCHARGED
33.003	IC 23.04	SURCHARGED
11.005	CP 1.11	SURCHARGED
11.006	CP 1.12	SURCHARGED
35.000	BC 26.01	SURCHARGED*
36.000	BC 25.01	SURCHARGED*

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Status
35.001	IC 26.02	SURCHARGED
11.007	CP 1.14	SURCHARGED
37.000	BC 27.01	SURCHARGED*
11.008	CP 1.15	SURCHARGED
38.000	IC 29.01	SURCHARGED
38.001	IC 29.02	SURCHARGED
38.002	IC 29.03	SURCHARGED
39.000	IC 28.01	FLOOD RISK
39.001	BC 28.03	SURCHARGED*
39.002	IC 28.04	SURCHARGED
11.009	CP 1.16	OK
11.010	CP 1.17	OK
11.011	CP 1.18	OK
11.012	HW 1.19	OK*
11.013	HW 1.20	OK
11.014	PC 1.21	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 18
Number of Online Controls 19 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 612700 164800 TR 12700 64800
Data Type Catchment
Cv (Summer) 0.750
Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status ON


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440, 2160, 2880, 4320, 5760,
7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
11.000	IC 18.01	15 minute 100 year Winter I+40%	27.159	26.722	0.810	0.000	224.0
12.000	IC 19.01	1440 minute 100 year Winter I+40%	25.936	25.924	0.403	0.000	0.4
13.000	BC 20.01	15 minute 100 year Summer I+40%	25.984	24.720	0.000	0.000	17.7
13.001	IC 20.02	2160 minute 100 year Winter I+40%	25.875	25.908	1.066	32.700	1.1
12.001	IC 19.02	1440 minute 100 year Winter I+40%	26.105	25.924	0.695	0.000	1.0
11.001	IC 18.03	1440 minute 100 year Winter I+40%	26.275	26.049	0.904	0.000	3.7
11.002	IC 18.04	1440 minute 100 year Winter I+40%	26.083	25.975	0.929	0.000	4.3
14.000	BC 21.01	15 minute 100 year Summer I+40%	26.405	25.955	0.000	0.000	9.8
14.001	IC 21.02	240 minute 100 year Winter I+40%	26.365	26.076	0.100	0.000	0.9
15.000	BC 30.01	15 minute 100 year Summer I+40%	26.366	25.916	0.000	0.000	11.1
15.001	IC 30.02	360 minute 100 year Winter I+40%	26.395	26.106	0.094	0.000	1.0
14.002	CP 30.03	1440 minute 100 year Winter I+40%	26.547	25.975	0.226	0.000	1.6
11.003	CP 1.09	1440 minute 100 year Winter I+40%	26.658	25.975	1.116	0.000	6.0
16.000	BC 4.01	15 minute 100 year Summer I+40%	30.809	30.359	0.000	0.000	10.4

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status
11.000	IC 18.01	SURCHARGED
12.000	IC 19.01	FLOOD RISK
13.000	BC 20.01	SURCHARGED*
13.001	IC 20.02	FLOOD
12.001	IC 19.02	FLOOD RISK
11.001	IC 18.03	FLOOD RISK
11.002	IC 18.04	FLOOD RISK
14.000	BC 21.01	SURCHARGED*
14.001	IC 21.02	FLOOD RISK
15.000	BC 30.01	SURCHARGED*
15.001	IC 30.02	FLOOD RISK
14.002	CP 30.03	SURCHARGED
11.003	CP 1.09	SURCHARGED
16.000	BC 4.01	SURCHARGED*

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow (l/s)
16.001	IC 4.02	360 minute 100 year Winter I+40%	30.871	30.515	0.199	0.000	1.0
17.000	BC 5.01	15 minute 100 year Summer I+40%	30.314	29.869	0.000	0.000	12.6
17.001	IC 5.02	600 minute 100 year Winter I+40%	30.323	30.324	0.504	0.806	1.4
18.000	IC 1.01	15 minute 100 year Winter I+40%	31.000	31.001	0.451	1.485	12.9
18.001	IC 1.02	15 minute 100 year Winter I+40%	31.000	30.992	0.670	0.000	17.5
18.002	IC 1.03	15 minute 100 year Winter I+40%	31.000	30.904	0.806	0.000	28.1
18.003	IC 1.04	15 minute 100 year Winter I+40%	31.000	30.656	0.678	0.000	33.6
19.000	IC 2.01	15 minute 100 year Winter I+40%	31.061	31.060	0.798	0.000	17.5
19.001	IC 2.02	15 minute 100 year Winter I+40%	31.021	30.544	0.414	0.000	21.9
20.000	IC 3.01	15 minute 100 year Winter I+40%	31.083	31.080	0.800	0.000	19.3
19.002	IC 2.03	15 minute 100 year Winter I+40%	31.047	30.067	0.421	0.000	48.3
21.000	BC 6.01	15 minute 100 year Summer I+40%	30.808	30.358	0.000	0.000	10.0
21.001	IC 6.02	240 minute 100 year Winter I+40%	30.764	30.489	0.165	0.000	0.9
16.002	CP 1.05	15 minute 100 year Winter I+40%	30.702	29.401	-0.064	0.000	90.9
22.000	BC 7.01	15 minute 100 year Summer I+40%	30.286	29.836	0.000	0.000	12.0
22.001	IC 7.02	480 minute 100 year Winter I+40%	30.240	30.100	0.298	0.000	1.2
16.003	CP 1.06	15 minute 100 year Winter I+40%	29.982	28.599	-0.052	0.000	90.4
23.000	IC 8.01	15 minute 100 year Winter I+40%	30.066	30.062	0.512	0.000	12.4
23.001	IC 8.02	15 minute 100 year Winter I+40%	30.021	29.972	0.423	0.000	19.3
23.002	IC 8.03	15 minute 100 year Winter I+40%	29.943	29.783	0.368	0.000	31.8
23.003	IC 8.04	15 minute 100 year Winter I+40%	29.820	29.234	-0.056	0.000	44.2
24.000	BC 9.01	15 minute 100 year Summer I+40%	28.262	27.814	0.000	0.000	12.8
24.001	IC 9.02	480 minute 100 year Winter I+40%	28.275	28.142	0.360	0.000	1.3
24.002	CP 9.03	15 minute 100 year Winter I+40%	28.675	27.917	0.091	0.000	47.3
25.000	BC 10.01	15 minute 100 year Summer I+40%	28.767	28.317	0.000	0.000	15.9
25.001	IC 10.02	30 minute 100 year Winter I+40%	28.767	28.771	0.431	3.374	12.4
24.003	CP 9.04	15 minute 100 year Winter I+40%	29.423	27.690	-0.201	0.000	56.7
16.004	CP 1.07	15 minute 100 year Winter I+40%	29.208	27.662	0.072	0.000	217.8
16.005	CP 1.08	15 minute 100 year Winter I+40%	28.079	27.261	-0.265	0.000	227.0
26.000	IC 17.01	960 minute 100 year Winter I+40%	26.500	26.502	0.617	1.560	5.2
26.001	IC 17.02	960 minute 100 year Winter I+40%	26.500	26.501	0.959	0.806	4.8
26.002	CP 17.03	720 minute 100 year Winter I+40%	27.041	26.508	1.065	0.000	3.8
16.006	FC 1.09	720 minute 100 year Winter I+40%	26.763	26.764	1.639	1.300	20.7
11.004	CP 1.10	960 minute 100 year Winter I+40%	26.643	26.040	1.010	0.000	18.3
27.000	IC 16.01	15 minute 100 year Winter I+40%	26.443	26.441	0.604	0.000	20.6
28.000	IC 12.01	15 minute 100 year Winter I+40%	28.286	28.281	0.630	0.000	9.0
28.001	IC 12.02	15 minute 100 year Winter I+40%	28.286	28.195	0.733	0.000	14.5
28.002	IC 12.03	15 minute 100 year Winter I+40%	28.286	27.474	0.197	0.000	23.0
29.000	IC 13.01	15 minute 100 year Winter I+40%	28.199	28.196	0.660	0.000	8.2
29.001	IC 13.02	15 minute 100 year Winter I+40%	28.115	28.033	0.686	0.000	15.8
28.003	IC 12.04	15 minute 100 year Winter I+40%	27.906	26.958	0.162	0.000	46.9
27.001	IC 16.02	15 minute 100 year Winter I+40%	26.382	26.387	0.498	4.925	66.2
27.002	IC 16.03	15 minute 100 year Winter I+40%	26.384	26.213	0.664	0.000	68.3
30.000	IC 14.01	15 minute 100 year Winter I+40%	28.040	27.641	0.001	0.000	18.5
31.000	BC 11.01	15 minute 100 year Summer I+40%	28.331	27.869	0.000	0.000	18.1
31.001	IC 11.02	720 minute 100 year Winter I+40%	28.263	27.968	0.328	0.000	1.3
30.001	IC 14.02	15 minute 100 year Winter I+40%	28.050	27.485	0.042	0.000	23.4
32.000	IC 15.01	15 minute 100 year Winter I+40%	27.866	27.862	0.700	0.000	15.9

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status
16.001	IC 4.02	SURCHARGED
17.000	BC 5.01	SURCHARGED*
17.001	IC 5.02	FLOOD
18.000	IC 1.01	FLOOD
18.001	IC 1.02	FLOOD RISK
18.002	IC 1.03	FLOOD RISK
18.003	IC 1.04	SURCHARGED
19.000	IC 2.01	FLOOD RISK
19.001	IC 2.02	SURCHARGED
20.000	IC 3.01	FLOOD RISK
19.002	IC 2.03	SURCHARGED
21.000	BC 6.01	SURCHARGED*
21.001	IC 6.02	FLOOD RISK
16.002	CP 1.05	OK
22.000	BC 7.01	SURCHARGED*
22.001	IC 7.02	FLOOD RISK
16.003	CP 1.06	OK
23.000	IC 8.01	FLOOD RISK
23.001	IC 8.02	FLOOD RISK
23.002	IC 8.03	FLOOD RISK
23.003	IC 8.04	OK
24.000	BC 9.01	SURCHARGED*
24.001	IC 9.02	FLOOD RISK
24.002	CP 9.03	SURCHARGED
25.000	BC 10.01	SURCHARGED*
25.001	IC 10.02	FLOOD
24.003	CP 9.04	OK
16.004	CP 1.07	SURCHARGED
16.005	CP 1.08	OK
26.000	IC 17.01	FLOOD
26.001	IC 17.02	FLOOD
26.002	CP 17.03	SURCHARGED
16.006	FC 1.09	FLOOD
11.004	CP 1.10	SURCHARGED
27.000	IC 16.01	FLOOD RISK
28.000	IC 12.01	FLOOD RISK
28.001	IC 12.02	FLOOD RISK
28.002	IC 12.03	SURCHARGED
29.000	IC 13.01	FLOOD RISK
29.001	IC 13.02	FLOOD RISK
28.003	IC 12.04	SURCHARGED
27.001	IC 16.02	FLOOD
27.002	IC 16.03	FLOOD RISK
30.000	IC 14.01	SURCHARGED
31.000	BC 11.01	SURCHARGED*
31.001	IC 11.02	FLOOD RISK
30.001	IC 14.02	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


PN	US/MH Name	Status
32.000	IC 15.01	FLOOD RISK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow (l/s)
30.002	IC 14.03	15 minute 100 year Winter I+40%	27.862	26.959	-0.053	0.000	43.8
27.003	IC 16.04	960 minute 100 year Winter I+40%	26.503	26.040	0.703	0.000	15.0
33.000	IC 23.01	15 minute 100 year Winter I+40%	26.375	26.376	1.312	0.297	14.3
33.001	IC 23.02	15 minute 100 year Winter I+40%	26.375	26.348	1.459	0.000	19.6
33.002	IC 23.03	15 minute 100 year Winter I+40%	26.385	26.198	1.553	0.000	25.0
34.000	IC 24.01	15 minute 100 year Winter I+40%	26.399	26.400	0.672	0.817	11.0
34.001	IC 24.02	15 minute 100 year Winter I+40%	26.427	26.379	0.803	0.000	12.2
34.002	IC 24.03	960 minute 100 year Winter I+40%	26.459	26.049	0.638	0.000	2.0
33.003	IC 23.04	960 minute 100 year Winter I+40%	26.554	26.042	1.849	0.000	5.1
11.005	CP 1.11	960 minute 100 year Winter I+40%	26.573	26.036	1.037	0.000	30.0
11.006	CP 1.12	960 minute 100 year Winter I+40%	26.523	26.026	1.115	0.000	31.2
35.000	BC 26.01	15 minute 100 year Summer I+40%	26.169	25.719	0.000	0.000	0.0
36.000	BC 25.01	15 minute 100 year Summer I+40%	26.169	25.719	0.000	0.000	0.0
35.001	IC 26.02	960 minute 100 year Winter I+40%	26.157	26.017	0.341	0.000	1.1
11.007	CP 1.14	960 minute 100 year Winter I+40%	26.041	26.023	1.499	0.000	31.7
37.000	BC 27.01	15 minute 100 year Summer I+40%	25.965	25.515	0.000	0.000	12.1
11.008	CP 1.15	960 minute 100 year Winter I+40%	26.003	26.003	1.501	0.114	25.1
38.000	IC 29.01	15 minute 100 year Winter I+40%	25.397	25.394	0.587	0.000	10.2
38.001	IC 29.02	15 minute 100 year Winter I+40%	25.506	25.178	0.468	0.000	18.5
38.002	IC 29.03	15 minute 100 year Winter I+40%	25.628	25.004	0.417	0.000	36.6
39.000	IC 28.01	720 minute 100 year Winter I+40%	24.830	24.837	0.332	7.272	2.9
39.001	BC 28.03	15 minute 100 year Summer I+40%	24.791	24.488	0.029	0.000	36.0
39.002	IC 28.04	720 minute 100 year Winter I+40%	26.279	24.833	0.370	0.000	1.3
11.009	CP 1.16	1440 minute 100 year Winter I+40%	25.964	24.769	0.337	0.000	25.8
11.010	CP 1.17	1440 minute 100 year Winter I+40%	25.563	24.745	0.236	0.000	25.8
11.011	CP 1.18	1440 minute 100 year Winter I+40%	25.581	24.744	0.242	0.000	25.8
11.012	HW 1.19	960 minute 100 year Winter I+40%	25.637	24.495	0.000	0.000	27.4
11.013	HW 1.20	1440 minute 100 year Winter I+40%	26.384	24.742	0.292	0.000	21.0
11.014	PC 1.21	1440 minute 100 year Winter I+40%	26.418	24.794	0.708	0.000	18.0

PN	US/MH Name	Status
30.002	IC 14.03	OK
27.003	IC 16.04	SURCHARGED
33.000	IC 23.01	FLOOD
33.001	IC 23.02	FLOOD RISK
33.002	IC 23.03	FLOOD RISK
34.000	IC 24.01	FLOOD
34.001	IC 24.02	FLOOD RISK
34.002	IC 24.03	SURCHARGED
33.003	IC 23.04	SURCHARGED
11.005	CP 1.11	SURCHARGED
11.006	CP 1.12	SURCHARGED
35.000	BC 26.01	SURCHARGED*
36.000	BC 25.01	SURCHARGED*

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Status
35.001	IC 26.02	FLOOD RISK
11.007	CP 1.14	FLOOD RISK
37.000	BC 27.01	SURCHARGED*
11.008	CP 1.15	FLOOD
38.000	IC 29.01	FLOOD RISK
38.001	IC 29.02	SURCHARGED
38.002	IC 29.03	SURCHARGED
39.000	IC 28.01	FLOOD
39.001	BC 28.03	SURCHARGED*
39.002	IC 28.04	SURCHARGED
11.009	CP 1.16	SURCHARGED
11.010	CP 1.17	SURCHARGED
11.011	CP 1.18	SURCHARGED
11.012	HW 1.19	SURCHARGED*
11.013	HW 1.20	SURCHARGED
11.014	PC 1.21	SURCHARGED

W1200-Quick Storage Estimate-Discharge Volumes-Existing Volumes

Discharge Volumes – Existing Volume - 1 in 2 year

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall

Return Period (years) 2

Version 2013 Catchment ...

Site GB 612700 164800 TR 12700 64800

Cv (Summer) 0.750

Cv (Winter) 0.840

Impemeable Area (ha) 0.144

Maximum Allowable Discharge (l/s) 18.8

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

Climate Change (%) 0

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 0.0 m³ and 4.8 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Area between 0.000 and 999.999

W1200-Quick Storage Estimate-Discharge Volumes-Existing Volumes

Discharge Volumes – Existing Volume - 1 in 30 year

The screenshot shows the 'Quick Storage Estimate' window with the 'Variables' tab selected. The interface includes a sidebar with navigation options: Variables, Results, Design, Overview 2D, Overview 3D, and Vt. The main area contains the following fields and values:

Parameter	Value
FEH Rainfall	FEH Rainfall
Return Period (years)	30
Version	2013
Catchment	...
Site	GB 612700 164800 TR 12700 64800
Cv (Summer)	0.750
Cv (Winter)	0.840
Impemeable Area (ha)	0.144
Maximum Allowable Discharge (l/s)	18.8
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	0

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer text: Enter Return Period between 2 and 1000

The screenshot shows the 'Quick Storage Estimate' window with the 'Results' tab selected. The main area displays the following text:

Global Variables require approximate storage of between 5.5 m³ and 20 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer text: Enter Return Period between 2 and 1000

W1200-Quick Storage Estimate-Discharge Volumes-Existing Volumes

Discharge Volumes – Existing Volume - 1 in 100 year

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The interface includes a sidebar with navigation options: Variables, Results, Design, Overview 2D, Overview 3D, and Vt. The main area contains the following fields:

Parameter	Value
FEH Rainfall	FEH Rainfall
Return Period (years)	100
Version	2013
Catchment	[...]
Site	GB 612700 164800 TR 12700 64800
Cv (Summer)	0.750
Cv (Winter)	0.840
Impemeable Area (ha)	0.144
Maximum Allowable Discharge (l/s)	18.8
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	0

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer text: Enter Return Period between 2 and 1000

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The sidebar navigation options are the same as in the previous screenshot. The main area displays the following results:

Global Variables require approximate storage of between 12 m³ and 30 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help.

Footer text: Enter Return Period between 2 and 1000

W1200-Quick Storage Estimate-Discharge Volumes-Existing Volumes

Discharge Volumes – Existing Volume - 1 in 100 year + 40%

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The interface includes a sidebar with navigation options: Variables, Results, Design, Overview 2D, Overview 3D, and Vt. The main area contains the following input fields:

Parameter	Value
FEH Rainfall	FEH Rainfall
Return Period (years)	100
Version	2013
Catchment	[...]
Site	GB 612700 164800 TR 12700 64800
Cv (Summer)	0.750
Cv (Winter)	0.840
Impemeable Area (ha)	0.144
Maximum Allowable Discharge (l/s)	18.8
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	40

Buttons at the bottom: Analyse, OK, Cancel, Help. A footer note reads: 'Enter Climate Change between -100 and 600'.

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The sidebar navigation options are the same as in the previous screenshot. The main area displays the following results:

Global Variables require approximate storage of between 24 m³ and 48 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help. A footer note reads: 'Enter Climate Change between -100 and 600'.

W1200-Quick Storage Estimate-Discharge Volumes-Proposed Volumes

Discharge Volumes – Proposed Volume - 1 in 2 year

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Variables' highlighted. The main area contains the following fields:

Parameter	Value
FEH Rainfall	FEH Rainfall
Return Period (years)	2
Version	2013
Catchment	...
Site	GB 612700 164800 TR 12700 64800
Cv (Summer)	0.750
Cv (Winter)	0.840
Impervious Area (ha)	2.140
Maximum Allowable Discharge (l/s)	18.8
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	0

Buttons at the bottom: Analyse, OK, Cancel, Help.

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Results' highlighted. The main area contains the following text:

Global Variables require approximate storage of between 216 m³ and 391 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help.

W1200-Quick Storage Estimate-Discharge Volumes-Proposed Volumes

Discharge Volumes – Proposed Volume - 1 in 30 year

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The window title is 'Quick Storage Estimate'. On the left, there is a sidebar with the 'Micro Drainage' logo and navigation buttons for 'Variables', 'Results', 'Design', 'Overview 2D', 'Overview 3D', and 'Vt'. The main area is titled 'Variables' and contains the following fields:

FEH Rainfall	Cv (Summer)	0.750
Return Period (years): 30	Cv (Winter)	0.840
Version: 2013	Impermeable Area (ha)	2.140
Catchment: ...	Maximum Allowable Discharge (l/s)	18.8
Site: GB 612700 164800 TR 12700 64800	Infiltration Coefficient (m/hr)	0.00000
	Safety Factor	2.0
	Climate Change (%)	0

At the bottom of the window, there are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'.

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The window title is 'Quick Storage Estimate'. On the left, there is a sidebar with the 'Micro Drainage' logo and navigation buttons for 'Variables', 'Results', 'Design', 'Overview 2D', 'Overview 3D', and 'Vt'. The main area is titled 'Results' and contains the following text:

Global Variables require approximate storage of between 596 m³ and 1007 m³.

These values are estimates only and should not be used for design purposes.

At the bottom of the window, there are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'.

W1200-Quick Storage Estimate-Discharge Volumes-Proposed Volumes

Discharge Volumes – Proposed Volume - 1 in 100 year

The screenshot shows the 'Quick Storage Estimate' software window with the 'Variables' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Variables' highlighted. The main area contains the following settings:

FEH Rainfall	Cv (Summer)	0.750
Return Period (years): 100	Cv (Winter)	0.840
Version: 2013	Impermeable Area (ha)	2.140
Catchment: [...]	Maximum Allowable Discharge (l/s)	18.8
Site: GB 612700 164800 TR 12700 64800	Infiltration Coefficient (m/hr)	0.00000
	Safety Factor	2.0
	Climate Change (%)	0

Buttons at the bottom: Analyse, OK, Cancel, Help. A footer note reads: 'Enter Climate Change between -100 and 600'.

The screenshot shows the 'Quick Storage Estimate' software window with the 'Results' tab selected. The window title is 'Quick Storage Estimate'. On the left is a navigation pane with 'Results' highlighted. The main area displays the following text:

Global Variables require approximate storage of between 974 m³ and 1651 m³.

These values are estimates only and should not be used for design purposes.

Buttons at the bottom: Analyse, OK, Cancel, Help. A footer note reads: 'Enter Climate Change between -100 and 600'.

W1200-Quick Storage Estimate-Discharge Volumes-Proposed Volumes

Discharge Volumes – Proposed Volume - 1 in 100 year + 40%

Quick Storage Estimate

Micro Drainage

Variables

FEH Rainfall

Return Period (years) 100

Version 2013 Catchment ...

Site GB 612700 164800 TR 12700 64800

Cv (Summer)	0.750
Cv (Winter)	0.840
Impemeable Area (ha)	2.140
Maximum Allowable Discharge (l/s)	18.8
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	40

Analyse OK Cancel Help

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 1629 m³ and 2559 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help