



Barry Biomass UK No2 Ltd
(Application 2015/00031/OUT)

Surface Water Drainage Review

October 2018



Pitman Associates Ltd.

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Document title	Surface Water Drainage Review
Status	Rev A - Discharge of Planning Condition
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Project name	Barry Biomass UK No2 Ltd
Project number	0322
Client	

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1. INTRODUCTION

- 1.1 This document has been prepared in response to the Vale of Glamorgan's correspondence dated 1 June 2018 regarding the discharge of condition 5 of planning permission 2015/00031/OUT. It should be noted that subsequent to the correspondence the agreed climate change allowance was reduced to 20%
- 1.2 It is understood that the Vale of Glamorgan's concerns arise from the fact that drainage channels were designed to accommodate runoff from the 30year return period event as opposed to the 100year +20%
- 1.3 The aim of this report is to review the performance of the proposed drainage system and in particular the scope for runoff to the adjacent highway from the 100yr +20% rainfall event.

2. METHODOLOGY

- 2.1 The following approach was adopted:
 1. The MicroDrainage model of the drainage system was extended to include all drainage channels as individual conduits. This was done using ACO's bespoke conduit file.
 2. A contributing area survey of the site was carried out by Draintech Ltd.
 3. The model was updated with the results of the survey.
 4. The 100yr+20% rainfall events for durations between 15minutes and 1 week were simulated.
- 2.2 Drawings of the model layout and contributing areas are included in Appendix A.

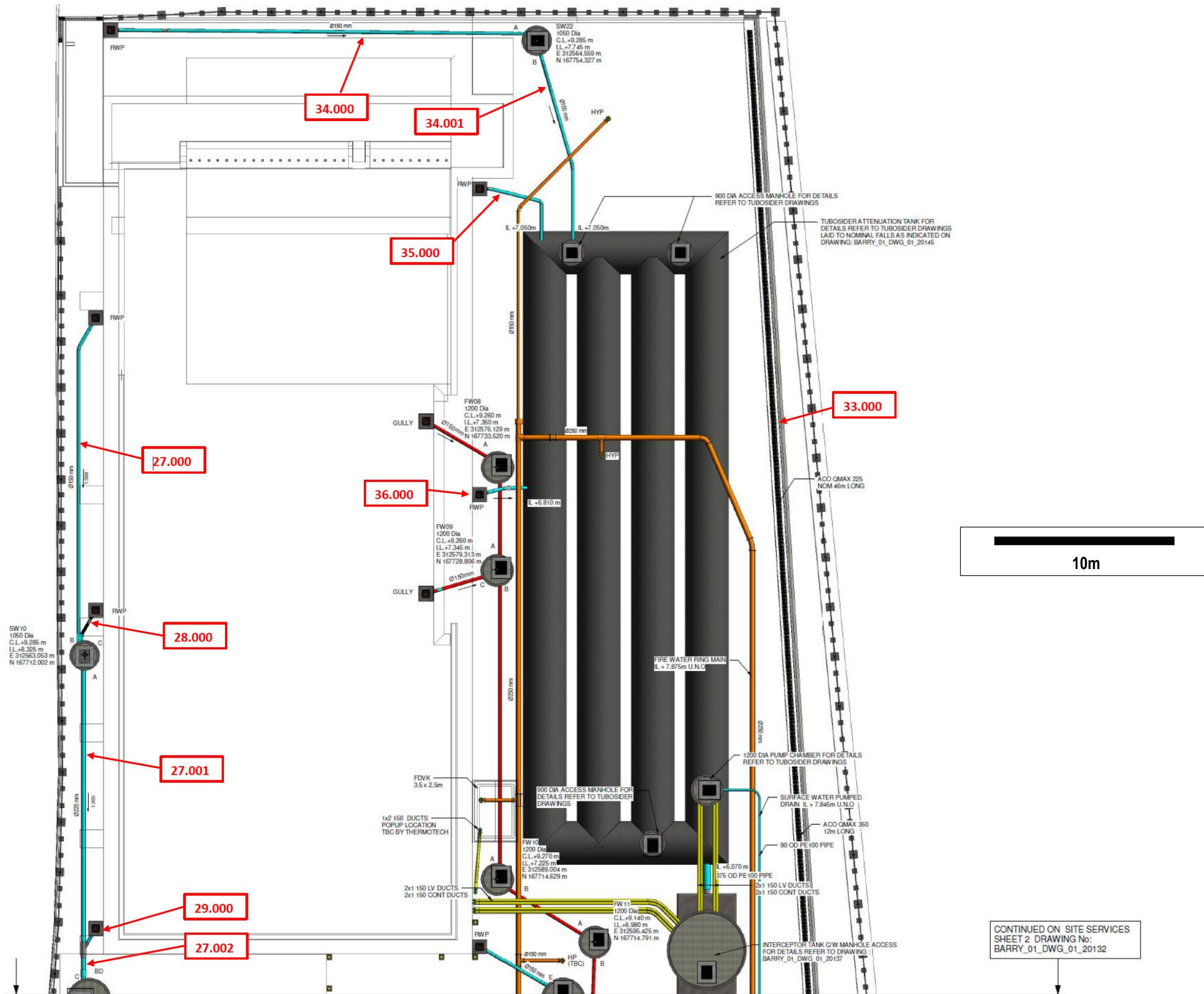
3. RESULTS AND CONCLUSION

- 3.1 A printout of the model and results of the simulations is included in Appendix B. The printout indicates that there is no predicted flooding from the drainage system for the 100yr+20% rainfall event.
- 3.2 It is concluded that there will be no runoff from the site to the highway for the design rainfall event.

**APPENDIX A
DRAWINGS**

- SK001 – MicroDrainage Model References – Sheet 1 of 4**
- SK002 – MicroDrainage Model References – Sheet 2 of 4**
- SK003 – MicroDrainage Model References – Sheet 3 of 4**
- SK004 – MicroDrainage Model References – Sheet 4 of 4**
- SK011 – Area Take-Off – Sheet 1 of 4**
- SK012 – Area Take-Off – Sheet 2 of 4**
- SK013 – Area Take-Off – Sheet 3 of 4**
- SK014 – Area Take-Off – Sheet 4 of 4**

(NB – the coloured shaded on drawings 011-014 is purely for ease of demarcation of areas)



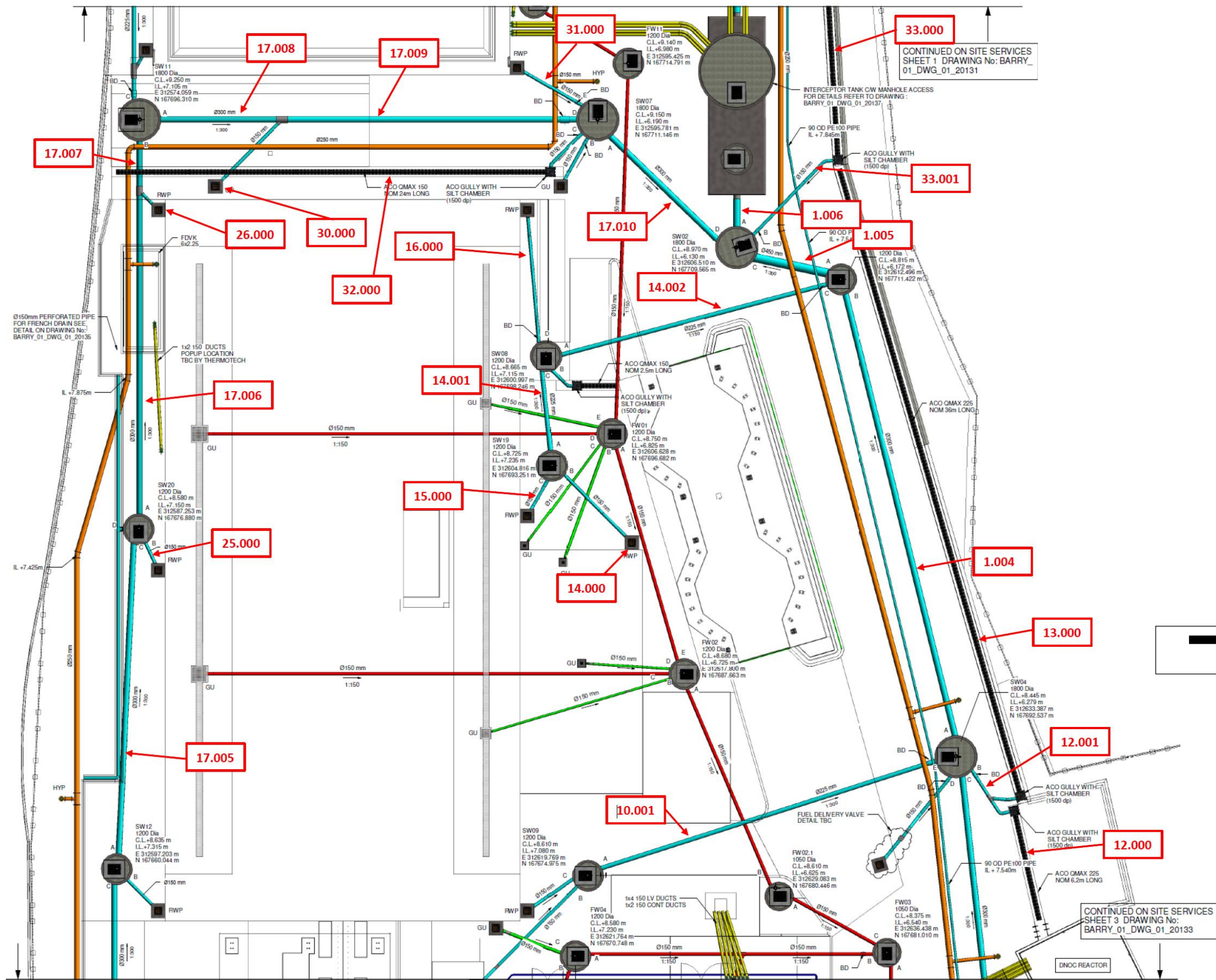
Revisions
A 11.10.2018 – Planning Issue

Project Nr 0322
Drg Nr/Rev SK001/A
Status Planning Condition Issue

CLIENT PROJECT
Barry Biomass UK No 2 Limited
DRG TITLE
MicroDrainage Model References – Sheet 1 of 4
SCALE
As Shown

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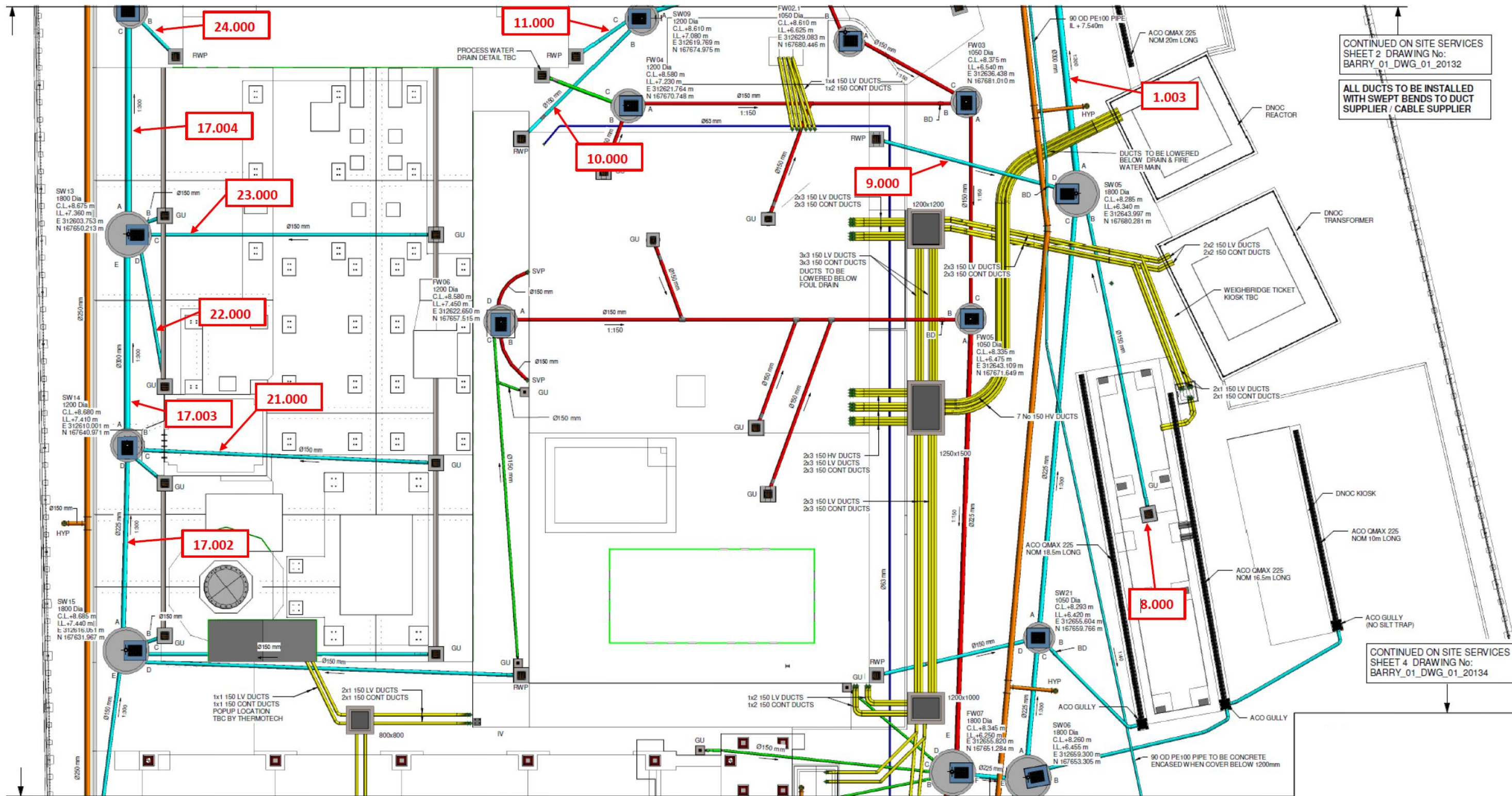
Revisions
A 11.10.2018 – Planning Issue

Project Nr 0322
Drg Nr/Rev SK002/A
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CLIENT PROJECT DRG TITLE SCALE
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MicroDrainage Model References –
Sheet 2 of 4
As Shown

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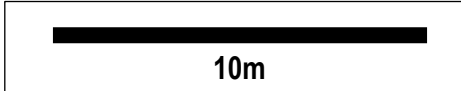




CONTINUED ON SITE SERVICES SHEET 2 DRAWING No: BARRY_01_DWG_01_20132

ALL DUCTS TO BE INSTALLED WITH SWEEP BENDS TO DUCT SUPPLIER / CABLE SUPPLIER

CONTINUED ON SITE SERVICES SHEET 4 DRAWING No: BARRY_01_DWG_01_20134



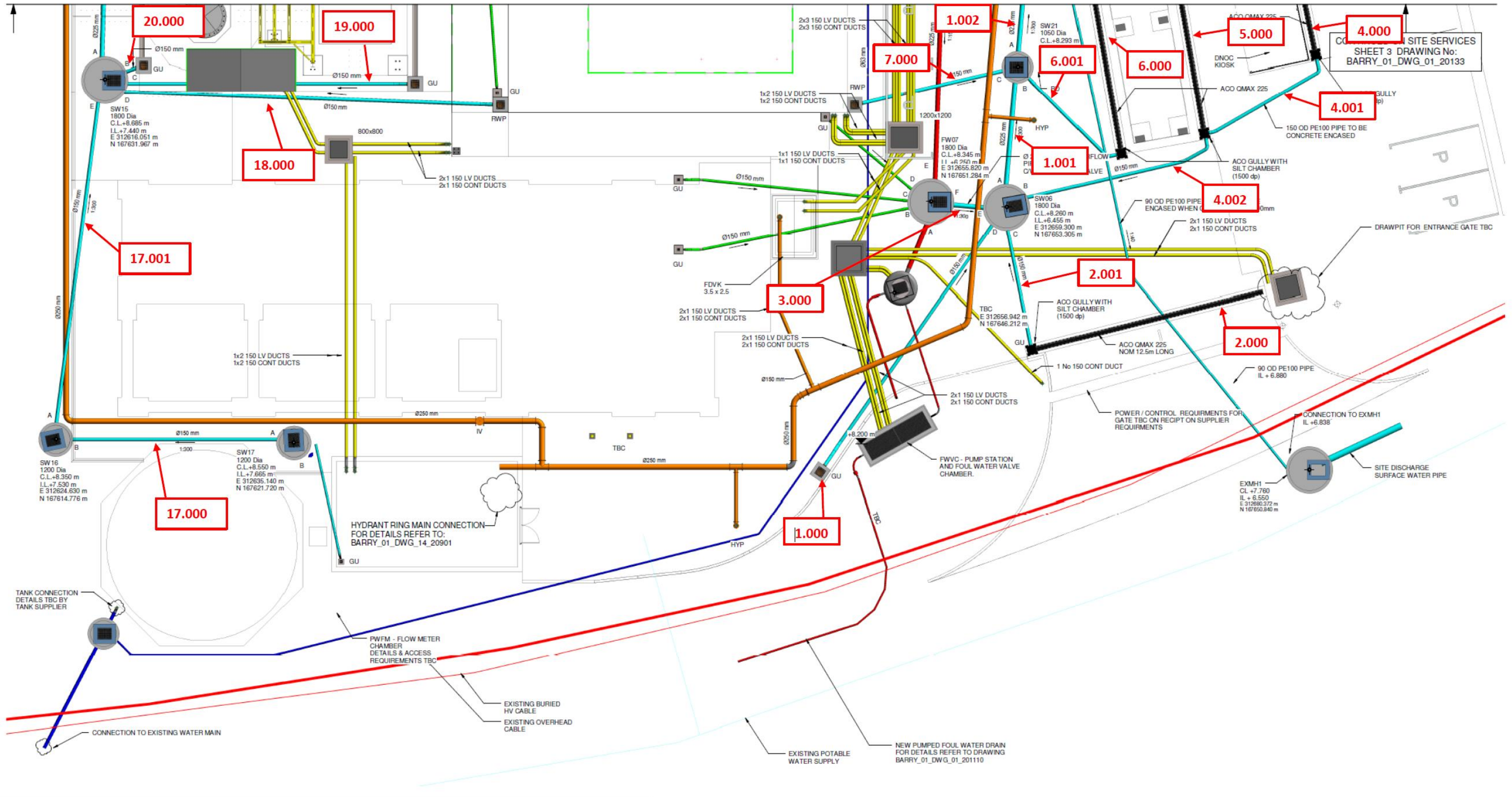
Revisions
A 11.10.2018 – Planning Issue

Project Nr 0322
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CLIENT PROJECT DRG TITLE SCALE
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MicroDrainage Model References –
Sheet 3 of 4
As Shown

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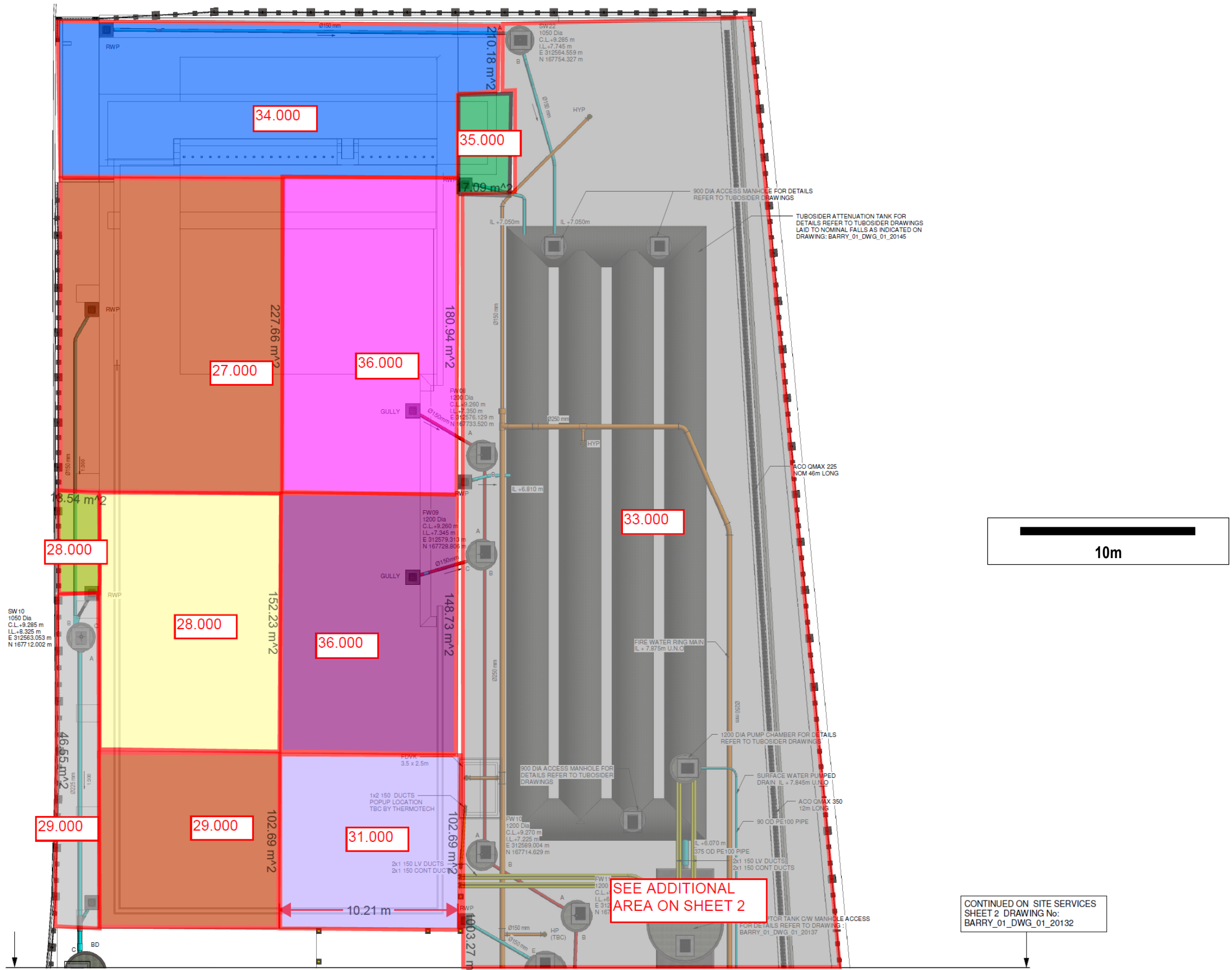
Revisions
A 11.10.2018 – Planning Issue

Project Nr 0322
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CLIENT PROJECT DRG TITLE SCALE
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MicroDrainage Model References –
Sheet 4 of 4
NTS

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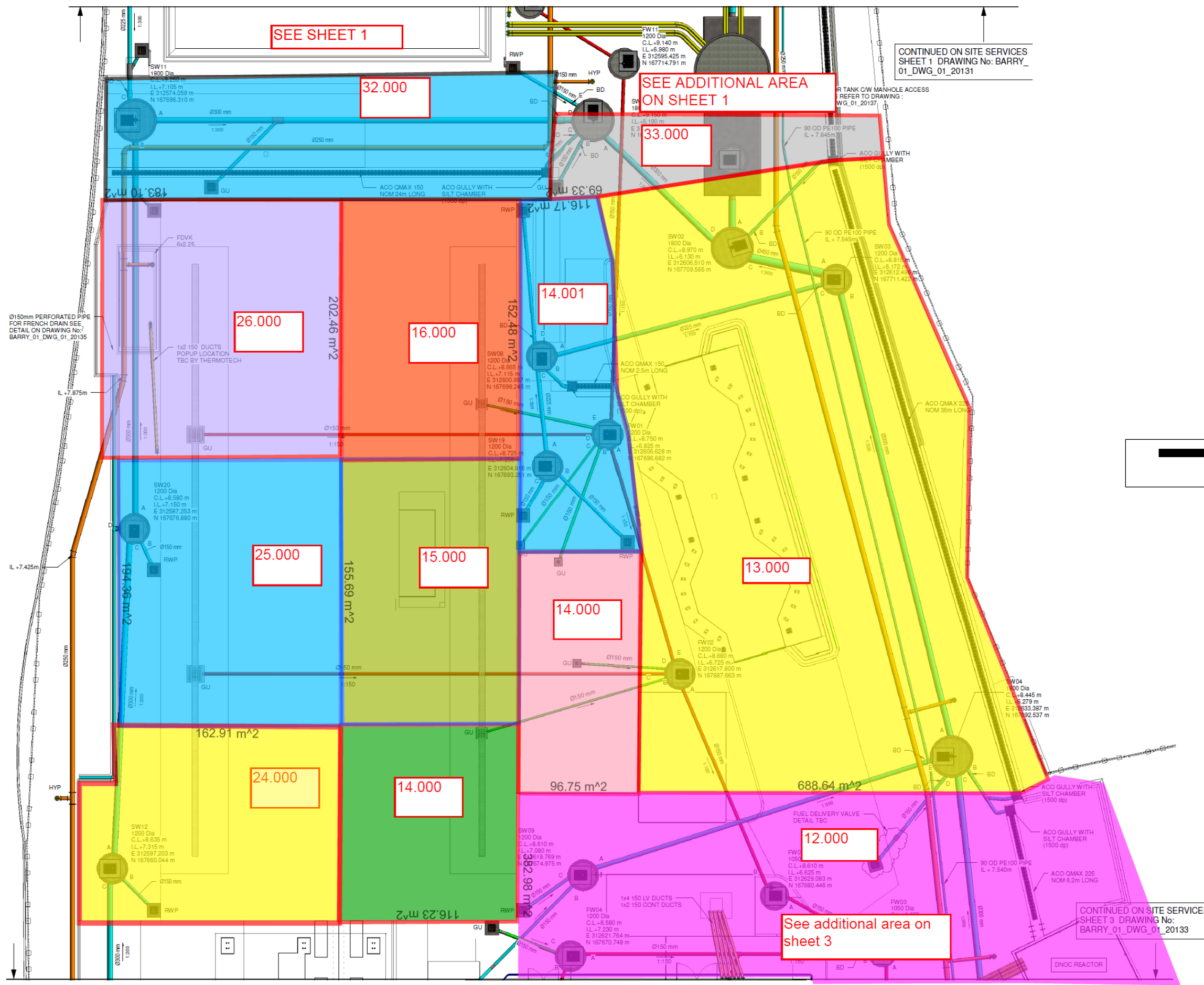
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A 11.10.2018 – Planning Issue

Project Nr 0322
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Status Planning Condition Issue

CLIENT PROJECT
Barry Biomass UK No 2 Limited
DRG TITLE Area Take-Off – Sheet 1 of 4
SCALE As Shown

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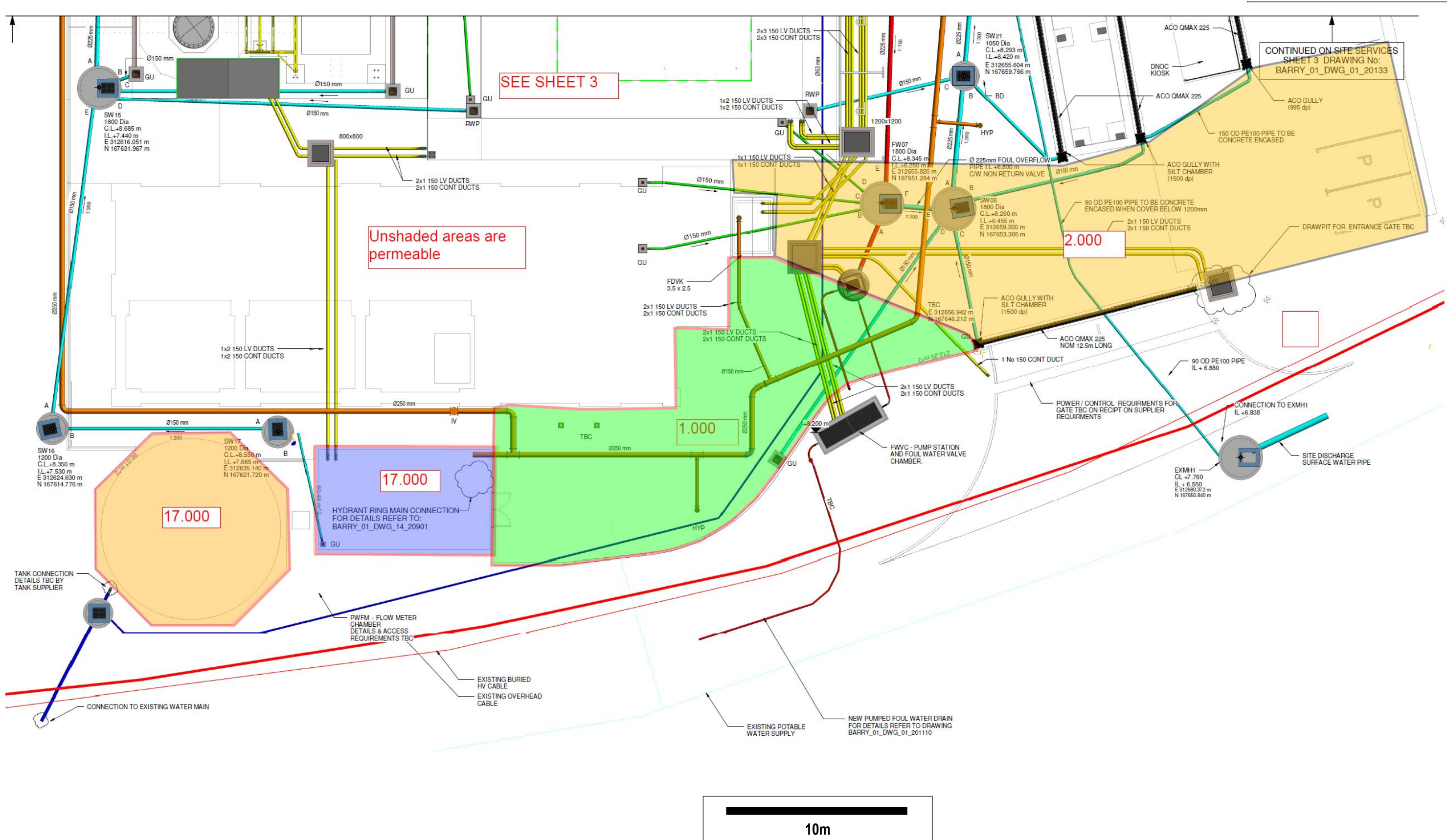
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A 11.10.2018 – Planning Issue

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CLIENT PROJECT Barry Biomass UK No 2 Limited
DRG TITLE Area Take-Off – Sheet 2 of 4
SCALE As Shown

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CLIENT PROJECT DRG TITLE
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Area Take-Off – Sheet 4 of 4
SCALE As Shown

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APPENDIX B
CALCULATIONS

Pitman Associates Ltd		Page 1
South Lodge Exminster Devon EX6 8AT	BARRY EFW SURFACE DRAINAGE	
Date 06/07/2017 File SW 3lps pump.MDX	Designed by HA Checked by	
XP Solutions	Network 2018.1	


Existing Network Details for MODEL HA1.SIM

- Indicates pipe length does not match coordinates

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
E1.000	15.700#	0.670	23.4	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit
E2.000	12.500#	0.025	500.0	0.034	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E2.001	6.300#	1.270	5.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E3.000	3.000#	-0.205	-14.6	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit
E4.000	10.000#	0.000	0.0	0.011	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E4.001	6.900#	0.010	690.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E5.000	16.500#	0.000	0.0	0.020	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E4.002	9.900#	1.335	7.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E1.001	6.000#	0.035	171.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E6.000	18.500#	0.000	0.0	0.008	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E6.001	6.000#	1.360	4.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E7.000	7.600#	1.305	5.8	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E1.000	7.200	0.021	0.0	2.09	36.9
E2.000	7.825	0.034	0.0	0.58	23.2
E2.001	7.800	0.034	0.0	4.56	80.5
E3.000	6.250	0.000	0.0	0.00	0.0
E4.000	7.875	0.011	0.0	0.00	0.0
E4.001	7.875	0.011	0.0	0.38	6.6
E5.000	7.865	0.020	0.0	0.00	0.0
E4.002	7.865	0.031	0.0	3.72	65.8
E1.001	6.455	0.086	0.0	1.00	39.6
E6.000	7.855	0.008	0.0	0.00	0.0
E6.001	7.855	0.008	0.0	4.83	85.4
E7.000	7.800	0.013	0.0	4.20	74.3


Pitman Associates Ltd		Page 2
South Lodge Exminster Devon EX6 8AT	BARRY EFW SURFACE DRAINAGE	
Date 06/07/2017 File SW 3lps pump.MDX	Designed by HA Checked by	
XP Solutions	Network 2018.1	

Existing Network Details for MODEL HA1.SIM

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
E1.002	21.500#	0.005	4300.0	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit
E8.000	15.800#	1.310	12.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
E9.000	9.300#	1.310	7.1	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit
E1.003	14.000#	0.061	229.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E10.000	7.600#	0.845	9.0	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit
E11.000	3.000#	0.845	3.6	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit
E10.001	20.000#	0.726	27.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E12.000	6.200#	0.000	0.0	0.046	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E13.000	36.000#	0.455	79.1	0.069	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E12.001	3.300#	1.591	2.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E1.004	26.100#	0.107	243.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E1.002	6.420	0.149	0.0	0.19	7.6
E8.000	7.800	0.000	0.0	2.92	51.6
E9.000	7.800	0.013	0.0	3.81	67.3
E1.003	6.340	0.162	0.0	1.03	73.1
E10.000	8.000	0.013	0.0	3.38	59.7
E11.000	8.000	0.012	0.0	5.39	95.2
E10.001	7.080	0.025	0.0	2.50	99.5
E12.000	8.020	0.046	0.0	0.00	0.0
E13.000	8.475	0.069	0.0	1.48	59.1
E12.001	8.020	0.115	0.0	7.05	124.6
E1.004	6.279	0.302	0.0	1.00	70.8


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South Lodge Exminster Devon EX6 8AT	BARRY EFW SURFACE DRAINAGE	
Date 06/07/2017 File SW 3lps pump.MDX	Designed by HA Checked by	
XP Solutions	Network 2018.1	

Existing Network Details for MODEL HA1.SIM

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
E14.000	4.800#	0.690	7.0	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit
E15.000	3.000#	0.690	4.3	0.012	5.00	0.0	0.600	o	150	Pipe/Conduit
E14.001	4.500#	0.120	37.5	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit
E16.000	7.000#	0.810	8.6	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit
E14.002	15.500#	0.760	20.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E1.005	4.000#	0.042	95.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
E17.000	10.700#	0.135	79.3	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.001	17.100#	0.015	1140.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E18.000	19.500#	0.485	40.2	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit
E19.000	14.600#	0.485	30.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
E20.000	3.000#	0.485	6.2	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E14.000	8.000	0.010	0.0	3.85	68.0
E15.000	8.000	0.012	0.0	4.87	86.0
E14.001	7.235	0.038	0.0	2.14	85.2
E16.000	8.000	0.016	0.0	3.45	60.9
E14.002	7.115	0.054	0.0	2.91	115.7
E1.005	6.172	0.356	0.0	2.08	331.4
E17.000	7.665	0.016	0.0	1.13	20.0
E17.001	7.530	0.016	0.0	0.29	5.1
E18.000	8.000	0.013	0.0	1.59	28.1
E19.000	8.000	0.000	0.0	1.84	32.5
E20.000	8.000	0.008	0.0	4.08	72.1


Pitman Associates Ltd		Page 4
South Lodge Exminster Devon EX6 8AT	BARRY EFW SURFACE DRAINAGE	
Date 06/07/2017 File SW 3lps pump.MDX	Designed by HA Checked by	
XP Solutions	Network 2018.1	

Existing Network Details for MODEL HA1.SIM

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
E17.002	8.800#	0.030	293.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E21.000	14.900#	0.440	33.9	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.003	8.800#	0.050	176.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E22.000	6.500#	0.590	11.0	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit
E23.000	14.500#	0.590	24.6	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.004	9.600#	0.045	213.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E24.000	3.000#	0.535	5.6	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.005	17.800#	0.165	107.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E25.000	3.000#	0.700	4.3	0.019	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.006	18.500#	0.040	462.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E26.000	3.000#	0.745	4.0	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E17.002	7.440	0.037	0.0	0.76	30.2
E21.000	8.000	0.029	0.0	1.74	30.7
E17.003	7.410	0.066	0.0	1.18	83.6
E22.000	8.000	0.009	0.0	3.05	53.9
E23.000	8.000	0.014	0.0	2.04	36.0
E17.004	7.360	0.089	0.0	1.07	75.8
E24.000	8.000	0.016	0.0	4.28	75.7
E17.005	7.315	0.105	0.0	1.51	107.0
E25.000	8.000	0.019	0.0	4.90	86.6
E17.006	7.150	0.124	0.0	0.72	51.2
E26.000	8.000	0.020	0.0	5.06	89.4

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South Lodge Exminster Devon EX6 8AT	BARRY EFW SURFACE DRAINAGE	
Date 06/07/2017 File SW 3lps pump.MDX	Designed by HA Checked by	
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Existing Network Details for MODEL HA1.SIM

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
E17.007	3.000#	0.005	600.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E27.000	17.200#	0.100	172.0	0.023	5.00	0.0	0.600	o	150	Pipe/Conduit
E28.000	3.000#	0.100	30.0	0.017	5.00	0.0	0.600	o	150	Pipe/Conduit
E27.001	17.200#	1.215	14.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E29.000	3.000#	1.390	2.2	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit
E27.002	3.000#	0.005	600.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
E17.008	7.000#	0.325	21.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E30.000	5.200#	0.500	10.4	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
E17.009	16.800#	0.590	28.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E31.000	3.800#	0.500	7.6	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit
E32.000	24.000#	0.000	0.0	0.018	5.00	0.0	0.600	Q22	-2	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E17.007	7.110	0.144	0.0	0.63	44.9
E27.000	8.500	0.023	0.0	0.76	13.5
E28.000	8.500	0.017	0.0	1.84	32.6
E27.001	8.325	0.040	0.0	3.50	139.0
E29.000	8.500	0.015	0.0	6.91	122.2
E27.002	7.110	0.055	0.0	0.53	20.9
E17.008	7.105	0.199	0.0	3.40	240.5
E30.000	8.500	0.000	0.0	3.14	55.5
E17.009	6.780	0.199	0.0	2.96	209.1
E31.000	8.500	0.010	0.0	3.68	65.0
E32.000	8.825	0.018	0.0	0.00	0.0

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BARRY EFW
SURFACE DRAINAGE



Date 06/07/2017
File SW 3lps pump.MDX

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Checked by

XP Solutions


Network 2018.1

Existing Network Details for MODEL HA1.SIM

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
E17.010	8.300#	0.060	138.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
E33.000	46.000#	0.135	340.7	0.107	5.00	0.0	0.600	Q22	-2	Pipe/Conduit
E33.001	6.200#	2.645	2.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
E1.006	13.400#	0.060	223.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
E34.000	22.000#	0.755	29.1	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit
E34.001	8.790#	0.695	12.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
E35.000	5.000	1.450	3.4	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit
E36.000	5.000	0.200	25.0	0.015	5.00	0.0	0.600	o	100	Pipe/Conduit
E1.007	140.000	0.050	2800.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
E1.008	5.000	0.300	16.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Vel (m/s)	Cap (l/s)
E17.010	6.190	0.227	0.0	1.33	94.4
E33.000	8.860	0.107	0.0	0.71	28.2
E33.001	8.775	0.107	0.0	6.63	117.2
E1.006	6.130	0.690	0.0	1.21	133.5
E34.000	8.500	0.021	0.0	1.87	33.1
E34.001	7.745	0.021	0.0	2.85	50.3
E35.000	8.500	0.020	0.0	5.47	96.6
E36.000	7.700	0.015	0.0	1.55	12.2
E1.007	5.400	0.746	0.0	0.33	36.8
E1.008	5.300	0.746	0.0	2.48	43.8

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Conduit Sections for MODEL HA1.SIM

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \ / open channel, oo dual pipe, ooo triple pipe, O egg.

Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Major Dimn. (mm)	Minor Dimn. (mm)	Side Slope (Deg)	Corner Splay (mm)	4*Hyd Radius (m)	XSect Area (m ²)
-2	Q22	225	225			0.226	0.040

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Devon EX6 8AT

BARRY EFW
SURFACE DRAINAGE



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Manhole Schedules for MODEL HA1.SIM

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Back (m)
EGU1	8.200	1.000	Open Manhole	300	E1.000	7.200	150				
E1qmax225	8.200	0.375	Open Manhole	300	E2.000	7.825	-2				
EGU2	8.200	0.400	Open Manhole	300	E2.001	7.800	150	E2.000	7.800		-2
EF	8.345	2.095	Open Manhole	1800	E3.000	6.250	225				
E2qmax225	8.300	0.425	Open Manhole	300	E4.000	7.875	-2				
EGU3	8.300	0.425	Open Manhole	300	E4.001	7.875	150	E4.000	7.875		-2
E3qmax225	8.290	0.425	Open Manhole	300	E5.000	7.865	-2				
EGU4	8.290	0.425	Open Manhole	300	E4.002	7.865	150	E4.001	7.865		150
								E5.000	7.865		-2
ESW06	8.260	1.805	Open Manhole	1800	E1.001	6.455	225	E1.000	6.530		150
								E2.001	6.530		150
								E3.000	6.455		225
								E4.002	6.530		150
E4qmax225	8.280	0.425	Open Manhole	300	E6.000	7.855	-2				
EGU5	8.280	0.425	Open Manhole	300	E6.001	7.855	150	E6.000	7.855		-2
ERWP1	8.340	0.540	Open Manhole	300	E7.000	7.800	150				
ESW21	8.293	1.873	Open Manhole	1050	E1.002	6.420	225	E1.001	6.420		225
								E6.001	6.495		150
								E7.000	6.495		150
EGU6	8.285	0.485	Open Manhole	300	E8.000	7.800	150				
ERWP2	8.380	0.580	Open Manhole	300	E9.000	7.800	150				
ESW05	8.285	1.945	Open Manhole	1800	E1.003	6.340	300	E1.002	6.415		225
								E8.000	6.490		150
								E9.000	6.490		150
EGU7	8.600	0.600	Open Manhole	300	E10.000	8.000	150				
ERWP3	8.600	0.600	Open Manhole	300	E11.000	8.000	150				
ESW09	8.610	1.530	Open Manhole	1200	E10.001	7.080	225	E10.000	7.155		150
								E11.000	7.155		150
E5qmax225	8.445	0.425	Open Manhole	300	E12.000	8.020	-2				
E6qmax225	8.900	0.425	Open Manhole	300	E13.000	8.475	-2				
EGU8	8.445	0.425	Open Manhole	300	E12.001	8.020	150	E12.000	8.020		-2
								E13.000	8.020		-2
ESW04	8.445	2.166	Open Manhole	1800	E1.004	6.279	300	E1.003	6.279		300
								E10.001	6.354		225
								E12.001	6.429		150
ERWP4	8.725	0.725	Open Manhole	300	E14.000	8.000	150				
E25	8.725	0.725	Open Manhole	300	E15.000	8.000	150				
ESW19	8.725	1.490	Open Manhole	1200	E14.001	7.235	225	E14.000	7.310		150

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Manhole Schedules for MODEL HA1.SIM

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., I*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Back
ERWP5	9.000	1.000	Open Manhole	300	E16.000	8.000	150	E15.000	7.310	150	
ESW08	8.665	1.550	Open Manhole	1200	E14.002	7.115	225	E14.001	7.115	225	
ESW03	8.815	2.643	Open Manhole	1200	E1.005	6.172	450	E16.000	7.190	150	
								E1.004	6.172	300	
ESW17	8.550	0.885	Open Manhole	1200	E17.000	7.665	150	E14.002	6.355	225	
								E17.001	7.530	150	E17.000
EGU9	8.600	0.600	Open Manhole	300	E18.000	8.000	150				
EGU10	8.600	0.600	Open Manhole	300	E19.000	8.000	150				
EGU11	8.680	0.680	Open Manhole	300	E20.000	8.000	150				
ESW15	8.685	1.245	Open Manhole	1200	E17.002	7.440	225	E17.001	7.515	150	
								E18.000	7.515	150	
								E19.000	7.515	150	
								E20.000	7.515	150	
EGU12	8.600	0.600	Open Manhole	300	E21.000	8.000	150				
ESW14	8.680	1.270	Open Manhole	1200	E17.003	7.410	300	E17.002	7.410	225	
								E21.000	7.560	150	
EGU13	8.680	0.680	Open Manhole	300	E22.000	8.000	150				
EGU14	8.600	0.600	Open Manhole	300	E23.000	8.000	150				
ESW13	8.640	1.280	Open Manhole	1800	E17.004	7.360	300	E17.003	7.360	300	
								E22.000	7.410	150	
								E23.000	7.410	150	
ERWP6	8.635	0.635	Open Manhole	300	E24.000	8.000	150				
ESW12	8.635	1.320	Open Manhole	1200	E17.005	7.315	300	E17.004	7.315	300	
								E24.000	7.465	150	
ERWP7	8.580	0.580	Open Manhole	300	E25.000	8.000	150				
ESW20	8.580	1.430	Open Manhole	1200	E17.006	7.150	300	E17.005	7.150	300	
								E25.000	7.300	150	
ERWP8	9.000	1.000	Open Manhole	300	E26.000	8.000	150				
EJunction	9.000	1.890	Open Manhole	300	E17.007	7.110	300	E17.006	7.110	300	
								E26.000	7.255	150	
ERWP9	9.260	0.760	Open Manhole	300	E27.000	8.500	150				
ERWP10	9.285	0.785	Open Manhole	300	E28.000	8.500	150				
ESW10	9.285	0.960	Open Manhole	1050	E27.001	8.325	225	E27.000	8.400	150	
								E28.000	8.400	150	
ERWP11	9.285	0.785	Open Manhole	300	E29.000	8.500	150				
EJunction2	9.255	2.145	Open Manhole	300	E27.002	7.110	225	E27.001	7.110	225	

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Manhole Schedules for MODEL HA1.SIM

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)
ESW11	9.250	2.145	Open Manhole	1800	E17.008	7.105	300	E29.000 E17.007 E27.002	7.110 7.105 7.105	150 300 225
EGU15	9.250	0.750	Open Manhole	300	E30.000	8.500	150			
EJunction3	8.900	2.120	Open Manhole	300	E17.009	6.780	300	E17.008 E30.000	6.780 8.000	300 150
ERWP12	9.150	0.650	Open Manhole	300	E31.000	8.500	150			
E7qmax225	9.250	0.425	Open Manhole	300	E32.000	8.825	-2			
ESW07	9.150	2.960	Open Manhole	1800	E17.010	6.190	300	E17.009 E31.000 E32.000	6.190 8.000 8.825	300 150 -
E7qmax225	9.285	0.425	Open Manhole	300	E33.000	8.860	-2			
EGU16	9.000	0.275	Open Manhole	300	E33.001	8.775	150	E33.000	8.725	-
ESW02	8.970	2.840	Open Manhole	1800	E1.006	6.130	375	E1.005 E17.010 E33.001	6.130 6.130 6.130	450 300 150
ERWP13	9.300	0.800	Open Manhole	300	E34.000	8.500	150			
ESW22	9.285	1.540	Open Manhole	1050	E34.001	7.745	150	E34.000	7.745	150
ERWP14	9.285	0.785	Open Manhole	300	E35.000	8.500	150			
ERWP15	9.260	1.560	Open Manhole	300	E36.000	7.700	100			
Etubosider tank	9.000	3.600	Open Manhole	1800	E1.007	5.400	375	E1.006 E34.001 E35.000 E36.000	6.070 7.050 7.050 7.500	375 150 150 100
E20	9.000	3.700	Open Manhole	1500	E1.008	5.300	150	E1.007	5.350	375
ERoad	9.300	4.300	Open Manhole	1200		OUTFALL		E1.008	5.000	150

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PIPELINE SCHEDULES for MODEL HA1.SIM


Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E1.000	o	150	EGU1	8.200	7.200	0.850	Open Manhole	300
E2.000	Q22	-2	E1qmax225	8.200	7.825	0.150	Open Manhole	300
E2.001	o	150	EGU2	8.200	7.800	0.250	Open Manhole	300
E3.000	o	225	EF	8.345	6.250	1.870	Open Manhole	1800
E4.000	Q22	-2	E2qmax225	8.300	7.875	0.200	Open Manhole	300
E4.001	o	150	EGU3	8.300	7.875	0.275	Open Manhole	300
E5.000	Q22	-2	E3qmax225	8.290	7.865	0.200	Open Manhole	300
E4.002	o	150	EGU4	8.290	7.865	0.275	Open Manhole	300
E1.001	o	225	ESW06	8.260	6.455	1.580	Open Manhole	1800
E6.000	Q22	-2	E4qmax225	8.280	7.855	0.200	Open Manhole	300
E6.001	o	150	EGU5	8.280	7.855	0.275	Open Manhole	300

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E1.000	15.700#	23.4	ESW06	8.260	6.530	1.580	Open Manhole	1800
E2.000	12.500#	500.0	EGU2	8.200	7.800	0.175	Open Manhole	300
E2.001	6.300#	5.0	ESW06	8.260	6.530	1.580	Open Manhole	1800
E3.000	3.000#	-14.6	ESW06	8.260	6.455	1.580	Open Manhole	1800
E4.000	10.000#	0.0	EGU3	8.300	7.875	0.200	Open Manhole	300
E4.001	6.900#	690.0	EGU4	8.290	7.865	0.275	Open Manhole	300
E5.000	16.500#	0.0	EGU4	8.290	7.865	0.200	Open Manhole	300
E4.002	9.900#	7.4	ESW06	8.260	6.530	1.580	Open Manhole	1800
E1.001	6.000#	171.4	ESW21	8.293	6.420	1.648	Open Manhole	1050
E6.000	18.500#	0.0	EGU5	8.280	7.855	0.200	Open Manhole	300
E6.001	6.000#	4.4	ESW21	8.293	6.495	1.648	Open Manhole	1050

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PIPELINE SCHEDULES for MODEL HA1.SIM

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E7.000	o	150	ERWP1	8.340	7.800	0.390	Open Manhole	300
E1.002	o	225	ESW21	8.293	6.420	1.648	Open Manhole	1050
E8.000	o	150	EGU6	8.285	7.800	0.335	Open Manhole	300
E9.000	o	150	ERWP2	8.380	7.800	0.430	Open Manhole	300
E1.003	o	300	ESW05	8.285	6.340	1.645	Open Manhole	1800
E10.000	o	150	EGU7	8.600	8.000	0.450	Open Manhole	300
E11.000	o	150	ERWP3	8.600	8.000	0.450	Open Manhole	300
E10.001	o	225	ESW09	8.610	7.080	1.305	Open Manhole	1200
E12.000	Q22	-2	E5qmax225	8.445	8.020	0.200	Open Manhole	300
E13.000	Q22	-2	E6qmax225	8.900	8.475	0.200	Open Manhole	300
E12.001	o	150	EGU8	8.445	8.020	0.275	Open Manhole	300

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E7.000	7.600#	5.8	ESW21	8.293	6.495	1.648	Open Manhole	1050
E1.002	21.500#	4300.0	ESW05	8.285	6.415	1.645	Open Manhole	1800
E8.000	15.800#	12.1	ESW05	8.285	6.490	1.645	Open Manhole	1800
E9.000	9.300#	7.1	ESW05	8.285	6.490	1.645	Open Manhole	1800
E1.003	14.000#	229.5	ESW04	8.445	6.279	1.866	Open Manhole	1800
E10.000	7.600#	9.0	ESW09	8.610	7.155	1.305	Open Manhole	1200
E11.000	3.000#	3.6	ESW09	8.610	7.155	1.305	Open Manhole	1200
E10.001	20.000#	27.5	ESW04	8.445	6.354	1.866	Open Manhole	1800
E12.000	6.200#	0.0	EGU8	8.445	8.020	0.200	Open Manhole	300
E13.000	36.000#	79.1	EGU8	8.445	8.020	0.200	Open Manhole	300
E12.001	3.300#	2.1	ESW04	8.445	6.429	1.866	Open Manhole	1800

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PIPELINE SCHEDULES for MODEL HA1.SIM

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E1.004	o	300	ESW04	8.445	6.279	1.866	Open Manhole	1800
E14.000	o	150	ERWP4	8.725	8.000	0.575	Open Manhole	300
E15.000	o	150	E25	8.725	8.000	0.575	Open Manhole	300
E14.001	o	225	ESW19	8.725	7.235	1.265	Open Manhole	1200
E16.000	o	150	ERWP5	9.000	8.000	0.850	Open Manhole	300
E14.002	o	225	ESW08	8.665	7.115	1.325	Open Manhole	1200
E1.005	o	450	ESW03	8.815	6.172	2.193	Open Manhole	1200
E17.000	o	150	ESW17	8.550	7.665	0.735	Open Manhole	1200
E17.001	o	150	ESW16	8.350	7.530	0.670	Open Manhole	1200
E18.000	o	150	EGU9	8.600	8.000	0.450	Open Manhole	300
E19.000	o	150	EGU10	8.600	8.000	0.450	Open Manhole	300

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E1.004	26.100#	243.9	ESW03	8.815	6.172	2.343	Open Manhole	1200
E14.000	4.800#	7.0	ESW19	8.725	7.310	1.265	Open Manhole	1200
E15.000	3.000#	4.3	ESW19	8.725	7.310	1.265	Open Manhole	1200
E14.001	4.500#	37.5	ESW08	8.665	7.115	1.325	Open Manhole	1200
E16.000	7.000#	8.6	ESW08	8.665	7.190	1.325	Open Manhole	1200
E14.002	15.500#	20.4	ESW03	8.815	6.355	2.235	Open Manhole	1200
E1.005	4.000#	95.2	ESW02	8.970	6.130	2.390	Open Manhole	1800
E17.000	10.700#	79.3	ESW16	8.350	7.530	0.670	Open Manhole	1200
E17.001	17.100#	1140.0	ESW15	8.685	7.515	1.020	Open Manhole	1200
E18.000	19.500#	40.2	ESW15	8.685	7.515	1.020	Open Manhole	1200
E19.000	14.600#	30.1	ESW15	8.685	7.515	1.020	Open Manhole	1200

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PIPELINE SCHEDULES for MODEL HA1.SIM

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E20.000	o	150	EGU11	8.680	8.000	0.530	Open Manhole	300
E17.002	o	225	ESW15	8.685	7.440	1.020	Open Manhole	1200
E21.000	o	150	EGU12	8.600	8.000	0.450	Open Manhole	300
E17.003	o	300	ESW14	8.680	7.410	0.970	Open Manhole	1200
E22.000	o	150	EGU13	8.680	8.000	0.530	Open Manhole	300
E23.000	o	150	EGU14	8.600	8.000	0.450	Open Manhole	300
E17.004	o	300	ESW13	8.640	7.360	0.980	Open Manhole	1800
E24.000	o	150	ERWP6	8.635	8.000	0.485	Open Manhole	300
E17.005	o	300	ESW12	8.635	7.315	1.020	Open Manhole	1200
E25.000	o	150	ERWP7	8.580	8.000	0.430	Open Manhole	300

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E20.000	3.000#	6.2	ESW15	8.685	7.515	1.020	Open Manhole	1200
E17.002	8.800#	293.3	ESW14	8.680	7.410	1.045	Open Manhole	1200
E21.000	14.900#	33.9	ESW14	8.680	7.560	0.970	Open Manhole	1200
E17.003	8.800#	176.0	ESW13	8.640	7.360	0.980	Open Manhole	1800
E22.000	6.500#	11.0	ESW13	8.640	7.410	1.080	Open Manhole	1800
E23.000	14.500#	24.6	ESW13	8.640	7.410	1.080	Open Manhole	1800
E17.004	9.600#	213.3	ESW12	8.635	7.315	1.020	Open Manhole	1200
E24.000	3.000#	5.6	ESW12	8.635	7.465	1.020	Open Manhole	1200
E17.005	17.800#	107.9	ESW20	8.580	7.150	1.130	Open Manhole	1200
E25.000	3.000#	4.3	ESW20	8.580	7.300	1.130	Open Manhole	1200

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PIPELINE SCHEDULES for MODEL HA1.SIM

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E17.006	o	300	ESW20	8.580	7.150	1.130	Open Manhole	1200
E26.000	o	150	ERWP8	9.000	8.000	0.850	Open Manhole	300
E17.007	o	300	EJunction	9.000	7.110	1.590	Open Manhole	300
E27.000	o	150	ERWP9	9.260	8.500	0.610	Open Manhole	300
E28.000	o	150	ERWP10	9.285	8.500	0.635	Open Manhole	300
E27.001	o	225	ESW10	9.285	8.325	0.735	Open Manhole	1050
E29.000	o	150	ERWP11	9.285	8.500	0.635	Open Manhole	300
E27.002	o	225	EJunction2	9.255	7.110	1.920	Open Manhole	300
E17.008	o	300	ESW11	9.250	7.105	1.845	Open Manhole	1800
E30.000	o	150	EGU15	9.250	8.500	0.600	Open Manhole	300
E17.009	o	300	EJunction3	8.900	6.780	1.820	Open Manhole	300

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E17.006	18.500#	462.5	EJunction	9.000	7.110	1.590	Open Manhole	300
E26.000	3.000#	4.0	EJunction	9.000	7.255	1.595	Open Manhole	300
E17.007	3.000#	600.0	ESW11	9.250	7.105	1.845	Open Manhole	1800
E27.000	17.200#	172.0	ESW10	9.285	8.400	0.735	Open Manhole	1050
E28.000	3.000#	30.0	ESW10	9.285	8.400	0.735	Open Manhole	1050
E27.001	17.200#	14.2	EJunction2	9.255	7.110	1.920	Open Manhole	300
E29.000	3.000#	2.2	EJunction2	9.255	7.110	1.995	Open Manhole	300
E27.002	3.000#	600.0	ESW11	9.250	7.105	1.920	Open Manhole	1800
E17.008	7.000#	21.5	EJunction3	8.900	6.780	1.820	Open Manhole	300
E30.000	5.200#	10.4	EJunction3	8.900	8.000	0.750	Open Manhole	300
E17.009	16.800#	28.5	ESW07	9.150	6.190	2.660	Open Manhole	1800

South Lodge
Exminster
Devon EX6 8AT

BARRY EFW
SURFACE DRAINAGE



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PIPELINE SCHEDULES for MODEL HA1.SIM

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E31.000	o	150	ERWP12	9.150	8.500	0.500	Open Manhole	300
E32.000	Q22	-2	E7qmax225	9.250	8.825	0.200	Open Manhole	300
E17.010	o	300	ESW07	9.150	6.190	2.660	Open Manhole	1800
E33.000	Q22	-2	E7qmax225	9.285	8.860	0.200	Open Manhole	300
E33.001	o	150	EGU16	9.000	8.775	0.075	Open Manhole	300
E1.006	o	375	ESW02	8.970	6.130	2.465	Open Manhole	1800
E34.000	o	150	ERWP13	9.300	8.500	0.650	Open Manhole	300
E34.001	o	150	ESW22	9.285	7.745	1.390	Open Manhole	1050
E35.000	o	150	ERWP14	9.285	8.500	0.635	Open Manhole	300
E36.000	o	100	ERWP15	9.260	7.700	1.460	Open Manhole	300
E1.007	o	375	Etubosider tank	9.000	5.400	3.225	Open Manhole	1800
E1.008	o	150	E20	9.000	5.300	3.550	Open Manhole	1500


Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
E31.000	3.800#	7.6	ESW07	9.150	8.000	1.000	Open Manhole	1800
E32.000	24.000#	0.0	ESW07	9.150	8.825	0.100	Open Manhole	1800
E17.010	8.300#	138.3	ESW02	8.970	6.130	2.540	Open Manhole	1800
E33.000	46.000#	340.7	EGU16	9.000	8.725	0.050	Open Manhole	300
E33.001	6.200#	2.3	ESW02	8.970	6.130	2.690	Open Manhole	1800
E1.006	13.400#	223.3	Etubosider tank	9.000	6.070	2.555	Open Manhole	1800
E34.000	22.000#	29.1	ESW22	9.285	7.745	1.390	Open Manhole	1050
E34.001	8.790#	12.6	Etubosider tank	9.000	7.050	1.800	Open Manhole	1800
E35.000	5.000	3.4	Etubosider tank	9.000	7.050	1.800	Open Manhole	1800
E36.000	5.000	25.0	Etubosider tank	9.000	7.500	1.400	Open Manhole	1800
E1.007	140.000	2800.0	E20	9.000	5.350	3.275	Open Manhole	1500
E1.008	5.000	16.7	ERoad	9.300	5.000	4.150	Open Manhole	1200

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Free Flowing Outfall Details for MODEL HA1.SIM

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
E1.008	ERoad	9.300	5.000	0.000	1200	0


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Online Controls for MODEL HA1.SIM

Pump Manhole: Etubosider tank, DS/PN: E1.007, Volume (m³): 10.7

Invert Level (m) 5.400

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	3.0000	1.000	3.0000	2.600	3.0000	4.200	3.0000
0.400	3.0000	1.400	3.0000	3.000	3.0000	4.600	3.0000
0.600	3.0000	1.800	3.0000	3.400	3.0000		
0.800	3.0000	2.200	3.0000	3.800	3.0000		


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Storage Structures for MODEL HA1.SIM

Tank or Pond Manhole: Etubosider tank, DS/PN: E1.007

Invert Level (m) 5.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	319.2	2.400	319.2	2.401	5.0

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Summary of Critical Results by Maximum Level (Rank 1) for MODEL HA1.SIM

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 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.289
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 18.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS 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) 1, 100
Climate Change (%) 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
E1.000	EGU1	30 Summer	100	+20%	100/15 Summer			
E2.000	E1qmax225	15 Summer	100	+20%				
E2.001	EGU2	15 Summer	100	+20%				
E3.000	EF	30 Summer	100	+20%	1/15 Summer			
E4.000	E2qmax225	15 Summer	100	+20%				
E4.001	EGU3	15 Summer	100	+20%				
E5.000	E3qmax225	15 Summer	100	+20%				
E4.002	EGU4	15 Summer	100	+20%				
E1.001	ESW06	30 Summer	100	+20%	1/15 Summer			
E6.000	E4qmax225	15 Summer	100	+20%				
E6.001	EGU5	15 Summer	100	+20%				
E7.000	ERWP1	15 Summer	100	+20%				
E1.002	ESW21	30 Summer	100	+20%	1/15 Summer			
E8.000	EGU6	2160 Winter	1	+0%				
E9.000	ERWP2	15 Summer	100	+20%				
E1.003	ESW05	30 Summer	100	+20%	100/15 Summer			
E10.000	EGU7	15 Summer	100	+20%				
E11.000	ERWP3	15 Summer	100	+20%				
E10.001	ESW09	15 Summer	100	+20%	100/15 Summer			
E12.000	E5qmax225	15 Summer	100	+20%				

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Summary of Critical Results by Maximum Level (Rank 1) for MODEL HA1.SIM

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
E1.000	EGU1	7.788	0.438	0.000	0.28		9.5	SURCHARGED	
E2.000	E1qmax225	8.004	-0.046	0.000	1.17		18.1	FLOOD RISK	
E2.001	EGU2	7.853	-0.097	0.000	0.27		18.1	OK	
E3.000	EF	7.751	1.276	0.000	0.32		8.6	SURCHARGED	
E4.000	E2qmax225	7.991	-0.109	0.000	0.39		5.9	OK	
E4.001	EGU3	7.976	-0.049	0.000	0.78		5.9	OK	
E5.000	E3qmax225	7.968	-0.122	0.000	1.01		10.6	OK	
E4.002	EGU4	7.920	-0.095	0.000	0.28		16.5	OK	
E1.001	ESW06	7.751	1.071	0.000	1.22		36.5	SURCHARGED	
E6.000	E4qmax225	7.922	-0.158	0.000	0.43		4.3	OK	
E6.001	EGU5	7.879	-0.126	0.000	0.06		4.3	OK	
E7.000	ERWP1	7.833	-0.117	0.000	0.11		7.0	OK	
E1.002	ESW21	7.692	1.047	0.000	5.47		54.2	SURCHARGED	
E8.000	EGU6	7.800	-0.150	0.000	0.00		0.0	OK	
E9.000	ERWP2	7.834	-0.116	0.000	0.12		7.0	OK	
E1.003	ESW05	7.391	0.751	0.000	1.03		62.1	SURCHARGED	
E10.000	EGU7	8.037	-0.113	0.000	0.14		7.0	OK	
E11.000	ERWP3	8.033	-0.117	0.000	0.11		6.5	OK	
E10.001	ESW09	7.357	0.052	0.000	0.15		13.2	SURCHARGED	
E12.000	E5qmax225	8.170	-0.075	0.000	1.11		24.6	FLOOD RISK	

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Summary of Critical Results by Maximum Level (Rank 1) for MODEL HA1.SIM

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
E13.000	E6qmax225	15 Summer	100	+20%			
E12.001	EGU8	15 Summer	100	+20%			
E1.004	ESW04	15 Summer	100	+20%	100/15	Summer	
E14.000	ERWP4	15 Summer	100	+20%			
E15.000	E25	15 Summer	100	+20%			
E14.001	ESW19	15 Summer	100	+20%			
E16.000	ERWP5	15 Summer	100	+20%			
E14.002	ESW08	1440 Winter	100	+20%			
E1.005	ESW03	1440 Winter	100	+20%	100/15	Summer	
E17.000	ESW17	15 Summer	100	+20%			
E17.001	ESW16	15 Summer	100	+20%	100/15	Summer	
E18.000	EGU9	15 Summer	100	+20%			
E19.000	EGU10	2160 Winter	1	+0%			
E20.000	EGU11	15 Summer	100	+20%			
E17.002	ESW15	15 Summer	100	+20%			
E21.000	EGU12	15 Summer	100	+20%			
E17.003	ESW14	15 Summer	100	+20%			
E22.000	EGU13	15 Summer	100	+20%			
E23.000	EGU14	15 Summer	100	+20%			
E17.004	ESW13	15 Summer	100	+20%			
E24.000	ERWP6	15 Summer	100	+20%			
E17.005	ESW12	15 Summer	100	+20%			
E25.000	ERWP7	15 Summer	100	+20%			
E17.006	ESW20	15 Summer	100	+20%	100/15	Summer	
E26.000	ERWP8	15 Summer	100	+20%			
E17.007	EJunction	15 Summer	100	+20%	100/15	Summer	
E27.000	ERWP9	15 Summer	100	+20%			
E28.000	ERWP10	15 Summer	100	+20%			
E27.001	ESW10	15 Summer	100	+20%			
E29.000	ERWP11	15 Summer	100	+20%			
E27.002	EJunction2	15 Summer	100	+20%	100/15	Summer	
E17.008	ESW11	15 Summer	100	+20%			
E30.000	EGU15	2160 Winter	1	+0%			
E17.009	EJunction3	1440 Winter	100	+20%	100/15	Summer	
E31.000	ERWP12	15 Summer	100	+20%			
E32.000	E7qmax225	15 Summer	100	+20%			
E17.010	ESW07	1440 Winter	100	+20%	100/15	Summer	
E33.000	E7qmax225	15 Summer	100	+20%	100/15	Summer	
E33.001	EGU16	30 Summer	100	+20%			
E1.006	ESW02	1440 Winter	100	+20%	100/15	Summer	
E34.000	ERWP13	15 Summer	100	+20%			
E34.001	ESW22	15 Summer	100	+20%			
E35.000	ERWP14	15 Summer	100	+20%			
E36.000	ERWP15	15 Summer	100	+20%			
E1.007	Etubosider tank	1440 Winter	100	+20%	1/360	Summer	
E1.008	E20	15 Summer	100	+20%			

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Summary of Critical Results by Maximum Level (Rank 1) for MODEL HA1.SIM

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
E13.000	E6qmax225		8.611	-0.089	0.000	0.66		36.6
E12.001	EGU8		8.132	-0.038	0.000	0.77		60.5
E1.004	ESW04		7.335	0.756	0.000	1.83		116.0
E14.000	ERWP4		8.032	-0.118	0.000	0.10		5.4
E15.000	E25		8.035	-0.115	0.000	0.12		6.5
E14.001	ESW19		7.340	-0.120	0.000	0.44		21.4
E16.000	ERWP5		8.041	-0.109	0.000	0.17		8.6
E14.002	ESW08		7.262	-0.078	0.000	0.02		1.8
E1.005	ESW03		7.262	0.640	0.000	0.07		11.1
E17.000	ESW17		7.739	-0.076	0.000	0.48		8.6
E17.001	ESW16		7.706	0.026	0.000	1.93		8.5
E18.000	EGU9		8.052	-0.098	0.000	0.27		7.0
E19.000	EGU10		8.000	-0.150	0.000	0.00		0.0
E20.000	EGU11		8.032	-0.118	0.000	0.10		4.3
E17.002	ESW15		7.649	-0.016	0.000	0.73		18.0
E21.000	EGU12		8.080	-0.070	0.000	0.55		15.6
E17.003	ESW14		7.627	-0.083	0.000	0.52		32.2
E22.000	EGU13		8.033	-0.117	0.000	0.11		4.9
E23.000	EGU14		8.048	-0.102	0.000	0.23		7.5
E17.004	ESW13		7.607	-0.053	0.000	0.72		42.2
E24.000	ERWP6		8.044	-0.106	0.000	0.19		8.6
E17.005	ESW12		7.580	-0.035	0.000	0.54		49.6
E25.000	ERWP7		8.045	-0.105	0.000	0.20		10.2
E17.006	ESW20		7.531	0.081	0.000	1.46		57.7
E26.000	ERWP8		8.045	-0.105	0.000	0.20		10.8
E17.007	EJunction		7.464	0.054	0.000	1.30		66.5
E27.000	ERWP9		8.619	-0.031	0.000	0.97		12.2
E28.000	ERWP10		8.572	-0.078	0.000	0.46		9.2
E27.001	ESW10		8.388	-0.162	0.000	0.17		21.3
E29.000	ERWP11		8.533	-0.117	0.000	0.11		8.1
E27.002	EJunction2		7.400	0.065	0.000	1.09		29.2
E17.008	ESW11		7.385	-0.020	0.000	0.63		89.6
E30.000	EGU15		8.500	-0.150	0.000	0.00		0.0
E17.009	EJunction3		7.263	0.183	0.000	0.04		6.6
E31.000	ERWP12		8.535	-0.115	0.000	0.12		5.4
E32.000	E7qmax225		8.913	-0.137	0.000	0.91		9.6
E17.010	ESW07		7.263	0.773	0.000	0.12		7.2
E33.000	E7qmax225		9.284	0.199	0.000	1.59		42.9
E33.001	EGU16		8.844	-0.081	0.000	0.44		43.0
E1.006	ESW02		7.262	0.757	0.000	0.20		21.4
E34.000	ERWP13		8.562	-0.088	0.000	0.36		11.3
E34.001	ESW22		7.797	-0.098	0.000	0.25		11.2
E35.000	ERWP14		8.538	-0.112	0.000	0.14		10.8
E36.000	ERWP15		7.766	-0.034	0.000	0.76		8.1
E1.007	Etubosider tank		7.260	1.485	0.000	0.05		3.0
E1.008	E20		5.330	-0.120	0.000	0.09		3.0

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Summary of Critical Results by Maximum Level (Rank 1) for MODEL HA1.SIM

PN	US/MH Name	Status	Level Exceeded
E13.000	E6qmax225	FLOOD RISK	
E12.001	EGU8	OK	
E1.004	ESW04	SURCHARGED	
E14.000	ERWP4	OK	
E15.000	E25	OK	
E14.001	ESW19	OK	
E16.000	ERWP5	OK	
E14.002	ESW08	OK	
E1.005	ESW03	SURCHARGED	
E17.000	ESW17	OK	
E17.001	ESW16	SURCHARGED	
E18.000	EGU9	OK	
E19.000	EGU10	OK	
E20.000	EGU11	OK	
E17.002	ESW15	OK	
E21.000	EGU12	OK	
E17.003	ESW14	OK	
E22.000	EGU13	OK	
E23.000	EGU14	OK	
E17.004	ESW13	OK	
E24.000	ERWP6	OK	
E17.005	ESW12	OK	
E25.000	ERWP7	OK	
E17.006	ESW20	SURCHARGED	
E26.000	ERWP8	OK	
E17.007	EJunction	SURCHARGED	
E27.000	ERWP9	OK	
E28.000	ERWP10	OK	
E27.001	ESW10	OK	
E29.000	ERWP11	OK	
E27.002	EJunction2	SURCHARGED	
E17.008	ESW11	OK	
E30.000	EGU15	OK	
E17.009	EJunction3	SURCHARGED	
E31.000	ERWP12	OK	
E32.000	E7qmax225	OK	
E17.010	ESW07	SURCHARGED	
E33.000	E7qmax225	FLOOD RISK	
E33.001	EGU16	FLOOD RISK	
E1.006	ESW02	SURCHARGED	
E34.000	ERWP13	OK	
E34.001	ESW22	OK	
E35.000	ERWP14	OK	
E36.000	ERWP15	OK	
E1.007	Etubosider tank	SURCHARGED	
E1.008	E20	OK	