GRID– Related to Local Coordinate Grid

LEVEL– Related to TBM Survey station S2 Value 100.000m.

Hydrobrake Optimum
SHE–0077–2700–1110–2700
Design flow 2.70 lts/sec
Design head 1.11m
Flow control fitted with emergency drain down

PRIVATE DRAINAGE

All drainage to comply with BS8301
100mm drains to be laid at minimum gradient 1 : 80. 150mm drains to be laid at minimum gradient 1 : 150.
All drainage to be 100mm diameter, unless otherwise stated. All final connections to main sewer to be 150mm diameter. All connections joints to remain flexible.
Drains passing under buildings to be retained flexible with a bed and surround of pea gravel. All drains to be bridged over with concrete lintels when passing through walls.
All foundations to be taken below invert level of localized drains where within 1.00m of foundations.
All sink wastes not connected to an inspection chamber or manhole to be connected via a roddable gully.
225mm dia inspection chambers to be laid at a maximum depth of 600mm below finished ground level.
450mm dia inspection chambers to be laid at a maximum depth of 1200mm below finished ground level.
1200 x 1000mm pc concrete sections to BS 5911 to be laid at a maximum depth of 3.00m below finished ground level.

Rodding eye

Aco channel or similar

PRIVATE DRAINAGE
We understand from the clients Geotechnical Engineers (Rogers Geotechnical Services Ltd) that due to the nature of the filled ground soakaways were not recommended due to settlement. In view of this and my clients access to the combined sewer to the east we intend to construct a separate system on site, combining before a single connection to the existing sewer.
In view of planning conditions and Yorkshire Water policy we intend to attenuate the surface water using a 75mm flow control (minimum manufacturers recommended size.
The surface water will be stored in sealed cellular boxes with a 100year discharge of 2.7 l/s for the 100year storm
A 40% allowance has been incorporated within the design for climate change and urban creep.
A section 106 connection application will be submitted to Yorkshire Water once the existing manhole has been exposed and surveyed.

PRELIMINARY ONLY

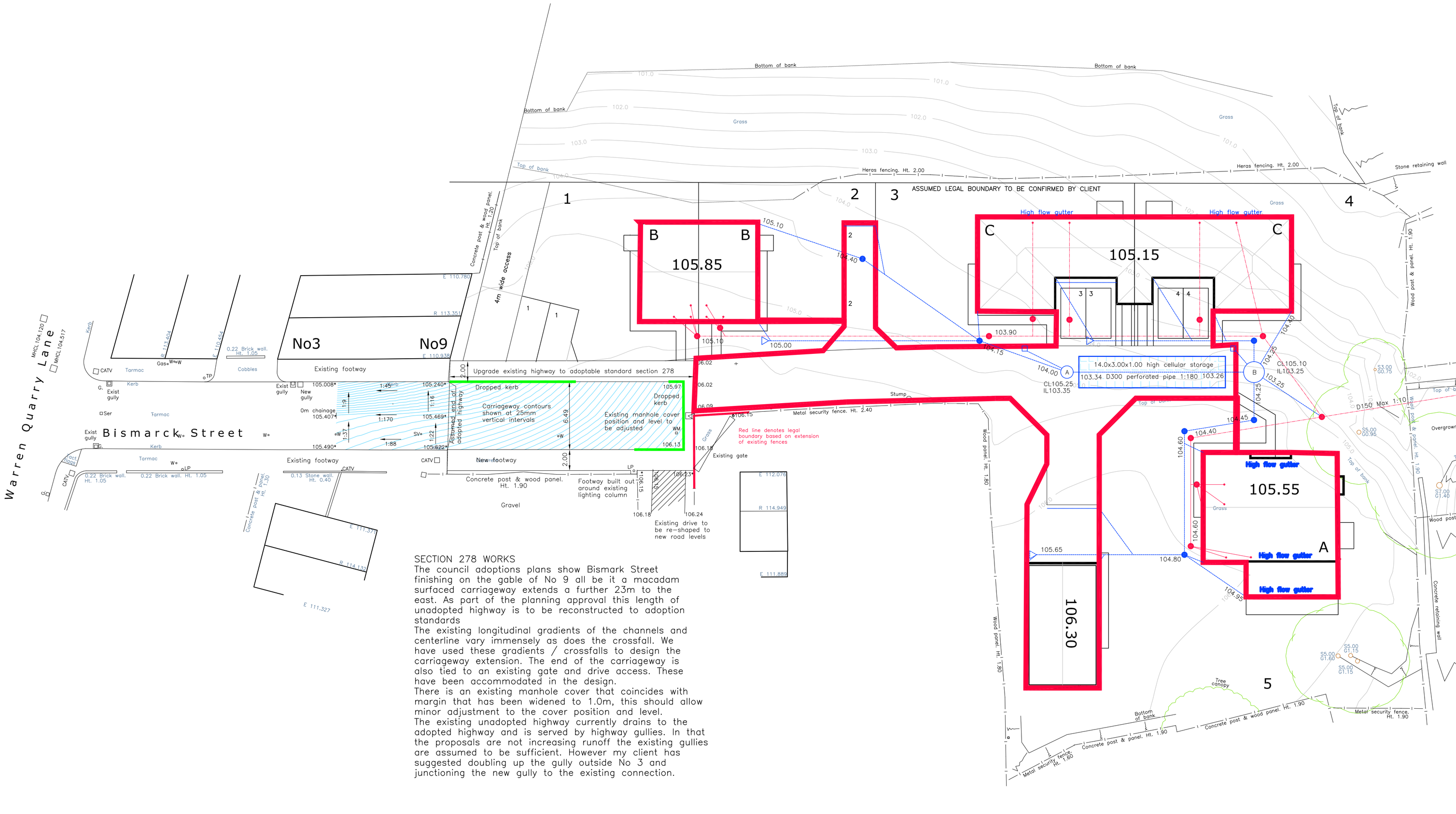
R.A.B. ENGINEERING DESIGN LTD
12 BERRY HOLME CLOSE
SHEFFIELD S35 1AB
TEL.(0114)2464871

Mr M Miller (GGG)

Bismark Street, Wosborough
Engineering layout
Impermeable area

DRAWN BY rab
SCALE 1:200 (A1) DATE Oct 19
DRAWING No 1124-1-IMP REV

Imp area 1080sqm



SECTION 278 WORKS
The council adoptions plans show Bismark Street finishing on the gable of No 9 all be it a macadam surfaced carriageway extends a further 23m to the east. As part of the planning approval this length of unadopted highway is to be reconstructed to adoption standards
The existing longitudinal gradients of the channels and centerline vary immensely as does the crossfall. We have used these gradients / crossfalls to design the carriageway extension. The end of the carriageway is also tied to an existing gate and drive access. These have been accommodated in the design.
There is an existing manhole cover that coincides with margin that has been widened to 1.0m, this should allow minor adjustment to the cover position and level.
The existing unadopted highway currently drains to the adopted highway and is served by highway gullies. In that the proposals are not increasing runoff the existing gullies are assumed to be sufficient. However my client has suggested doubling up the gully outside No 3 and junctioning the new gully to the existing connection.

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	14.000	0.110	127.3	0.108	4.00	0.0	0.600	[]	-14	Pipe/Conduit	
1.001	20.000	0.500	40.0	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)
1.000	50.00	4.06	103.360	0.108	0.0	0.0	5.8	3.80	11403.5	20.5
1.001	50.00	4.27	103.250	0.108	0.0	0.0	5.8	1.60	28.2	20.5

Conduit Sections for Storm

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 (m²)
-14	[]	3000	1000	90.0		1.500	3.000

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	40.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
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	Profile Type	Winter
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	15
Ratio R	0.356		

©1982-2019 Innovyze

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 2, DS/PN: 1.001, Volume (m³): 46.1

Unit Reference	MD-SHE-0077-2700-1110-2700
Design Head (m)	1.110
Design Flow (l/s)	2.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	77
Invert Level (m)	103.250
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.110	2.7
Flush-Flo™	0.335	2.7
Kick-Flo®	0.682	2.2
Mean Flow over Head Range	-	2.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	1.200	2.8	3.000	4.3	7.000	6.4
0.200	2.6	1.400	3.0	3.500	4.6	7.500	6.6
0.300	2.7	1.600	3.2	4.000	4.9	8.000	6.8
0.400	2.7	1.800	3.4	4.500	5.2	8.500	7.0
0.500	2.6	2.000	3.5	5.000	5.4	9.000	7.2
0.600	2.4	2.200	3.7	5.500	5.7	9.500	7.3
0.800	2.3	2.400	3.8	6.000	5.9		
1.000	2.6	2.600	4.0	6.500	6.1		

©1982-2019 Innovyze

Summary of Results for 15 minute 1 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.495	-0.865	0.000	0.00		17.2	OK
1.001	2	103.495	0.095	0.000	0.09		2.4	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 30 minute 1 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.523	-0.837	0.000	0.00		13.2	OK
1.001	2	103.523	0.123	0.000	0.09		2.4	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 60 minute 1 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.534	-0.826	0.000	0.00		9.1	OK
1.001	2	103.534	0.134	0.000	0.09		2.4	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 120 minute 1 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.521	-0.839	0.000	0.00		6.0	OK
1.001	2	103.522	0.122	0.000	0.09		2.4	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 180 minute 1 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.498	-0.862	0.000	0.00		4.7	OK
1.001	2	103.498	0.098	0.000	0.09		2.4	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 15 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.760	-0.600	0.000	0.01		43.0	OK
1.001	2	103.760	0.360	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 30 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.873	-0.487	0.000	0.01		32.9	OK
1.001	2	103.873	0.473	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 60 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.965	-0.395	0.000	0.00		21.9	OK
1.001	2	103.965	0.565	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 120 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.996	-0.364	0.000	0.00		13.8	OK
1.001	2	103.996	0.596	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 180 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.973	-0.387	0.000	0.00		10.5	OK
1.001	2	103.973	0.573	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 15 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	103.895	-0.465	0.000	0.01		55.5	OK
1.001	2	103.895	0.495	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	104.061	-0.299	0.000	0.01		42.8	OK
1.001	2	104.061	0.661	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	104.202	-0.158	0.000	0.01		28.7	OK
1.001	2	104.202	0.802	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	104.287	-0.073	0.000	0.00		17.9	OK
1.001	2	104.287	0.887	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze

Summary of Results for 180 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	104.267	-0.093	0.000	0.00		13.6	OK
1.001	2	104.267	0.867	0.000	0.10		2.6	SURCHARGED

©1982-2019 Innovyze