October 2009

Pin Brook – Hydraulic Modelling Exercise to define Flood Zones 1, 2, 3a and 3b between Monkerton Relief Road and M5

Introduction

This modelling exercise is for the Pin Brook that flows west to east through Monkerton to the east of Exeter between Pinhoe Road and the M5 motorway.

The Pin Brook is the major watercourse in the area. There is a further drainage ditch to the south of the Pin Brook which rises near Pilton Lane to the west before travelling east to join the Pin Brook at Pinn Lane via a 450mm diameter pipe. The ditch has been modelled as separate nodes connecting into the Pin Brook.

The Pin Brook is classified a “Main River” and managed by the EA. This status affords a 7m consultation buffer on either side of the watercourse, measured from top of the watercourse channel bank (bank full level). Within this buffer the EA must be consulted on any works and they have a power of refusal to allow development on flood risk and ecology grounds.

The Pin Brook has been modelled using the ISIS software package. The model is made up of a series of cross sections (Nodes) of ground levels that have been created using LIDAR data provided by the Environment Agency (EA) supplemented with fieldwork surveys to more accurately define the watercourse channel.

Four flow scenarios have been considered being the 25-year, 100-year, climate change, and 1000-year flood events.

The 25 year flow is deemed to be the equivalent of Flood Zone 3B with climate change influences added. The climate change event has been considered to be the 100-year event with an additional 20% added across the hydrograph. In addition to these flow scenarios, additional scenarios have been tested in the model to take into account of changes to the roughness of the channel (sensitivity test), blockage scenarios of structures and the removal of existing agricultural culverts, described later.

Hydrology

The design flow rates for use in the modelling have been provided by the EA. These flows were located to the east of Monkerton just upstream of where the brook passes underneath the M5 motorway. To compare peak flows at the catchment boundaries the FEH 2.0 CD has been used to derive catchment characteristics to the west of Monkerton village. This showed that the peak flows along the study length were very similar and therefore the flows provided by the EA have been used throughout the whole of the modelling. These flows have been derived as purely Greenfield flows, with no urban contribution.

Peak flows without including for urbanisation:

Return Period	EA Provided Flows	FEH Rainfall-Run-off	ReFH Method
25 year	4.51	4.03	2.95
100 year	6.29	5.73	3.98
1000 year	10.60	10.28	6.95

The catchment characteristics from FEH CD 2.0, shows the catchment size to be approximately 3.6km² with an urban contributing factor to be 16.8% of the entire catchment.

Peak Flows including urbanisation:

Return Period	FEH Method	ReFH Method	Pooled Catchments
25 year	6.48	2.39	1.87
100 year	9.94	2.54	2.55
1000 year	20.36	7.68	4.23

To determine the peak flow within the watercourse various methods have been applied. These are the FSR/FEH Rainfall-Runoff Methodology, the Revitalised Rainfall-Runoff methodology and by assessing similar catchments using the pooled methodology. As shown by the table above the FEH method provides the greatest peak flows within the Pin Brook, and these flows are considered to be the most appropriate for this catchment.

The hydrographs for the hydraulic models have been derived using the catchment characteristics from the FEH 2.0 CD by using the FEH method for the 25-year, 100-year and the 1000-year flow events.

The storm duration within this catchment is estimated to last for approximately 5 hours with the peak in flow after 2.3 hours from the start of the storm event. The table below shows the peak flows during each scenario that have been used in the modelling:

Return Period	Peak Flow (Cumecs)
25-year	6.48
100-year	9.94
100-year + 20% (Climate Change)	11.93
1000-year	20.36

Fig.1 shows the catchment area of the Pin Brook and is included in Appendix A.
The EA design flood flow data and the hydrographs used within the ISIS model are included in Appendix B.

ISIS Model Make-up

The model is made up using a series of nodes obtained from the LIDAR data, and physical on site survey of the watercourse channel. The ISIS model covers the Pin

Brook from the western boundary of the playing fields, immediately to the east of Pinhoe Road to approximately 100m downstream of the M5 motorway culvert. The model also includes a ditch that rises near Pilton Lane which drains a few houses and part of the local highway.

To take into account the roughness of the banks and bed of the watercourse Manning's values of 0.040 have been used in the Greenfield areas of the model and a value of 0.035 for the main channel through Monkerton village where the watercourse bed is partially concreted and masonry, gabions and other structures form the channel banks.

The Model takes into account the 1m diameter culverts that form the agricultural track between Nodes 2A and 2B, Pin Lane Bridge, Old Pin Lane Bridge, Grasslands Drive Bridge and the M5 motorway culvert. Online spill units have been included where the brook goes over weirs downstream of Sections 2B and Pin9. Side spills have also been included to take into account overland flows between Pin 1 and D1.

For all the scenarios apart from the 25-year flow event, floodwater is able to flow overland along Monkerton Drive, Pinn Land and Grasslands Drive. In these models additional sections have been inputted to replicate this overland flow path so as to determine the extents in this area. These sections have been attached to the existing model sections by spill levels, replicating floodwater over the right bank of the Pin Brook and the drainage channel.

A plan showing the LIDAR data and the location of the ISIS nodes is included in Appendix A as Fig. 2.

ISIS Model Results

The models show that the vast majority of the flows in the Pin Brook will remain within bank during a 25-year event.

Between nodes 2A and 2B there are two 1m diameter culverts that provide agricultural access between adjoining fields. The 100-year flow event and greater floodwater will be able to spill over the top of the track. Spill1 and Spill2 represent the flows that will spill over the track, during the 100-year scenario this will be 1.4 cumecs. During the 1000-year scenario the flows will have increase to 5.5 cumecs. These flows will merge back into the brook downstream of the culverts.

During the 100-year scenario a peak flow of 1.5 cumecs is shown to overtop the right bank of the Pin Brook upstream of these culverts. Additionally a further 0.065 cumecs is shown to overtop the right bank of the brook immediately upstream of the culvert. These right bank breakout flows travel in a south easterly direction and are intercepted by the drainage ditch. These flows increase to 4.9 cumecs and 3.4 cumecs respectively during the 1000-year scenario.

These overland flows towards the drainage ditch will cause large areas between the watercourse and the drainage ditch to convey floodwater. Under all scenarios floodwater remains within bank between Pin2 and Pin5. At Section D6 the topography of the ground levels change allowing for floodwater to flow towards the north east (away from the drainage ditch towards the Pin Brook).

At Broadleaf Close the ditch is culverted under the road in a 450mm diameter pipe. This restriction causes floodwater to backup within the channel and break out of bank. This is predicted in all scenarios apart from the 25-year flow event.

During the 100-year scenario floodwater will be able to spill over the right bank of the drainage ditch and flow down Monkerton Drive. This floodwater will be channelled by the kerbs along the road and be conveyed to Grasslands Drive via Pinn Lane. During the 1000-year scenario the floodwater will not be contained by the kerbs within the road and will flow overland to the east of Harts close to merge with the floodwater in Grasslands Drive. Also during this scenario floodwater from the Pin Brook around Pin8 and Pin9 will add to the overland floodwaters in this area.

At Grasslands Drive the floodwater is initially contained in a low spot. Once a level of 24.2m AOD has been reached the floodwater ponding in this area will be able to flow over the play area and re-enter into the Pin Brook just downstream of Grasslands Drive Bridge.

Downstream of Grasslands Drive the channel of the Pin Brook is large enough to convey the 100-year design flow. During the 1000-year event floodwater will brake out slightly over Pin12 and flood parts of the pathway, this floodwater will be channelled back into the brook downstream. Just downstream of Pin15 during the 1000-year event the floodwater will be able to break out of both banks. The motorway culvert provides a significant restriction to the flows to allow the floodwater to cover an area of approximately 1ha.

Downstream of the motorway culvert the land is much flatter, resulting floodwater extending further from the main channel of the watercourse and into the existing wetland features.

Sensitivity testing of models

A sensitivity test has been carried out on the watercourse for the climate change flood event. Generally within the watercourse the climate change flow will raise the flood levels by approximately 0.150m.

Blockage scenarios have been carried out on all the substantial bridges in the Pin Brook, The Pin Lane Bridge, The Old Pin Lane Bridge, Grasslands Drive Bridge, and the culvert underneath the motorway. Each of the openings have been reduced by 50%. The blockage scenarios for each bridge have been included in separate models with all using the climate change scenario as the input hydrograph.

None of the blockage scenarios show floodwater to backup to an extent where the floodwater will be able to break out of bank. Immediately upstream of Pinn Lane Bridge (Section Pinbridge1) floodwater is predicted to rise by approximately 560mm in the event of a 50% blockage. This will not increase the flood zone in the vicinity of the bridge.

The Old Pin Lane Bridge has been modelled as a bridge unit, whereas the other structures have been modelled as culverts. During a blockage scenario on the Old Pin

Bridge the floodwater is shown to increase by approximately 140mm. The floodwater is affected up to the weir at PB9.

A 50% blockage to the Grasslands Drive bridge is predicted to increase floodwater upstream by approximately 450mm. This will affect the floodwater levels up to the weir at PB9. Such a blockage during the climate change scenario will cause approximately 0.11m depth of floodwater over the bridge deck before rejoining the brook downstream.

A 50% blockage to the motorway culvert will cause the floodwater to rise by approximately 1.2m. This floodwater will be contained within the natural topography of the area and will reach approximately the same level as a 1000-year flood event. The flood extents will be affected to approximately Pin 14 compared with the 100-year flow event.

Historic Flooding in 1972 as recorded on the Environment Agency records show a much larger flood extent downstream of Monkerton. Since this flood extent the M5 was constructed. As part of the process it is assumed that the ground levels to the south of the Pin Brook have been modified, with the channel of the Pin Brook being made larger and hydraulically more efficient. Therefore the flood extents determined by this modelling exercise does not correspond to the flood extents downstream of Monkerton recorded in 1972.

The maximum results at all the ISIS nodes under all the scenarios considered along with an ISIS node plan are included in Appendix B.

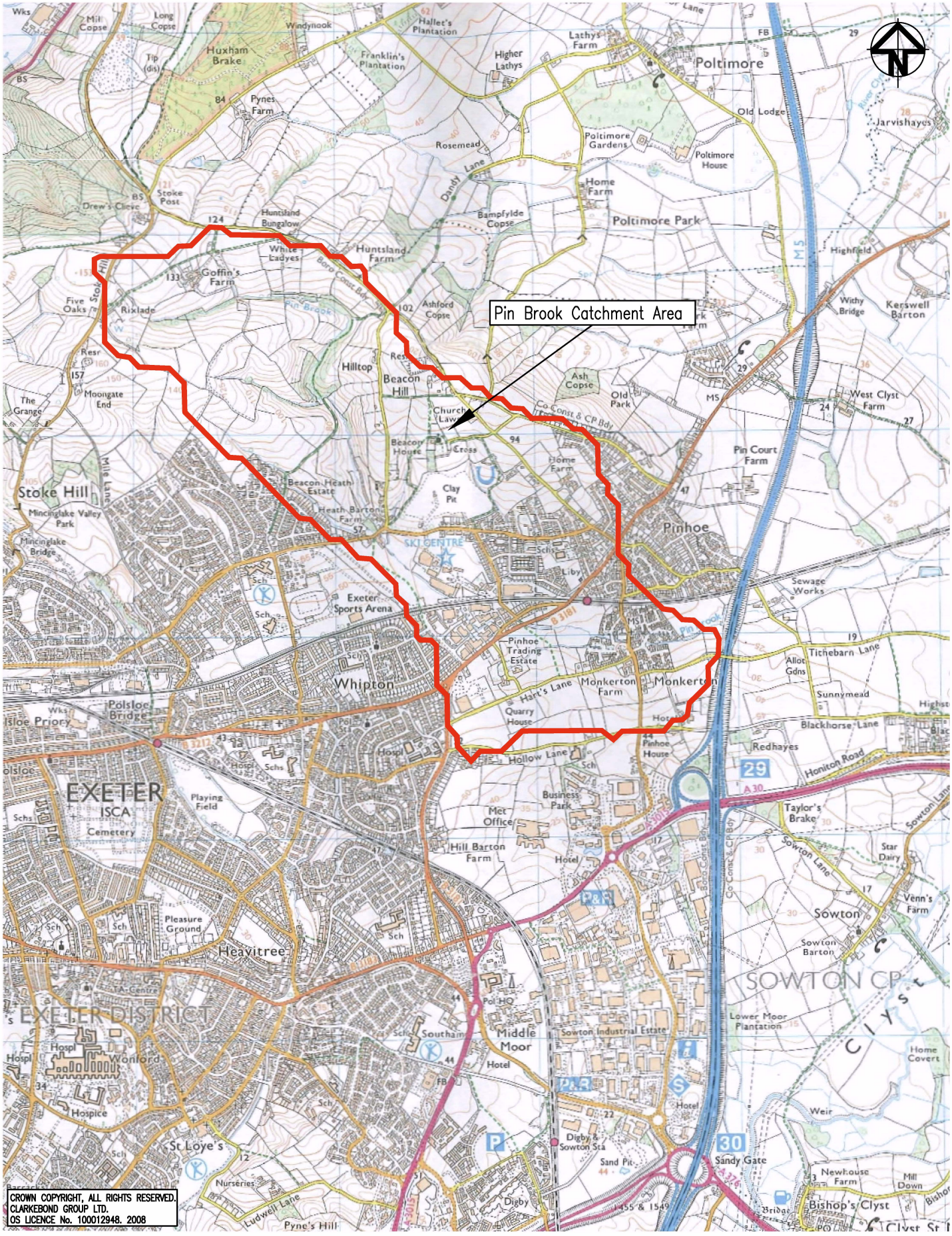
Conclusion

1. The majority of the land between the Pin Brook and the drainage ditch to the west of Monkerton is within Flood Zone 2 or three with a conveyance between the two watercourses.
2. Areas around Monkerton Drive, Pinn Lane and Grasslands Drive to the south of the Pin Brook are located within Flood Zone 2 and 3.
3. The remaining areas of undeveloped land between Monkerton and the M5 is mainly considered to be within Flood Zone 1 based on the modelling undertaken. The eastern parts of this land can be considered to be within Flood Zone 2, but a 50% blockage scenario to the culvert will cause a similar flood extent during a 100-year + 20% flow event.;
4. Main River buffer zones will need to be agreed with the EA.

Appendix A

Drawings

Fig. 1	Pin Brook Catchment Plan
Fig. 2	Pin Brook model – LIDAR topography and Node Locations
Fig. 3A	Flood Extents Plan – Upstream (West)
Fig. 3B	Flood Extents Plan – Downstream (East)



Rev.	Detail	By	Date
A	Original issue	NAS	21.08.08

Revisions

clarkebond
Engineering & Management Consultants
Malvern House, Matford Court
Yeoford Way, Exeter
EX2 8LB

Tel: +44 (0) 1392 823368
Fax: +44 (0) 1392 823369
e-mail exeter@clarkebond.co.uk
web www.clarkebond.co.uk

Birmingham Bristol Cardiff Exeter Harrogate
London Manchester Swansea Abu Dhabi

Client: Exeter City Council

Project: Exeter City Council SFRA
Pin Brook

Drawing Title: Pin Brook Catchment Plan

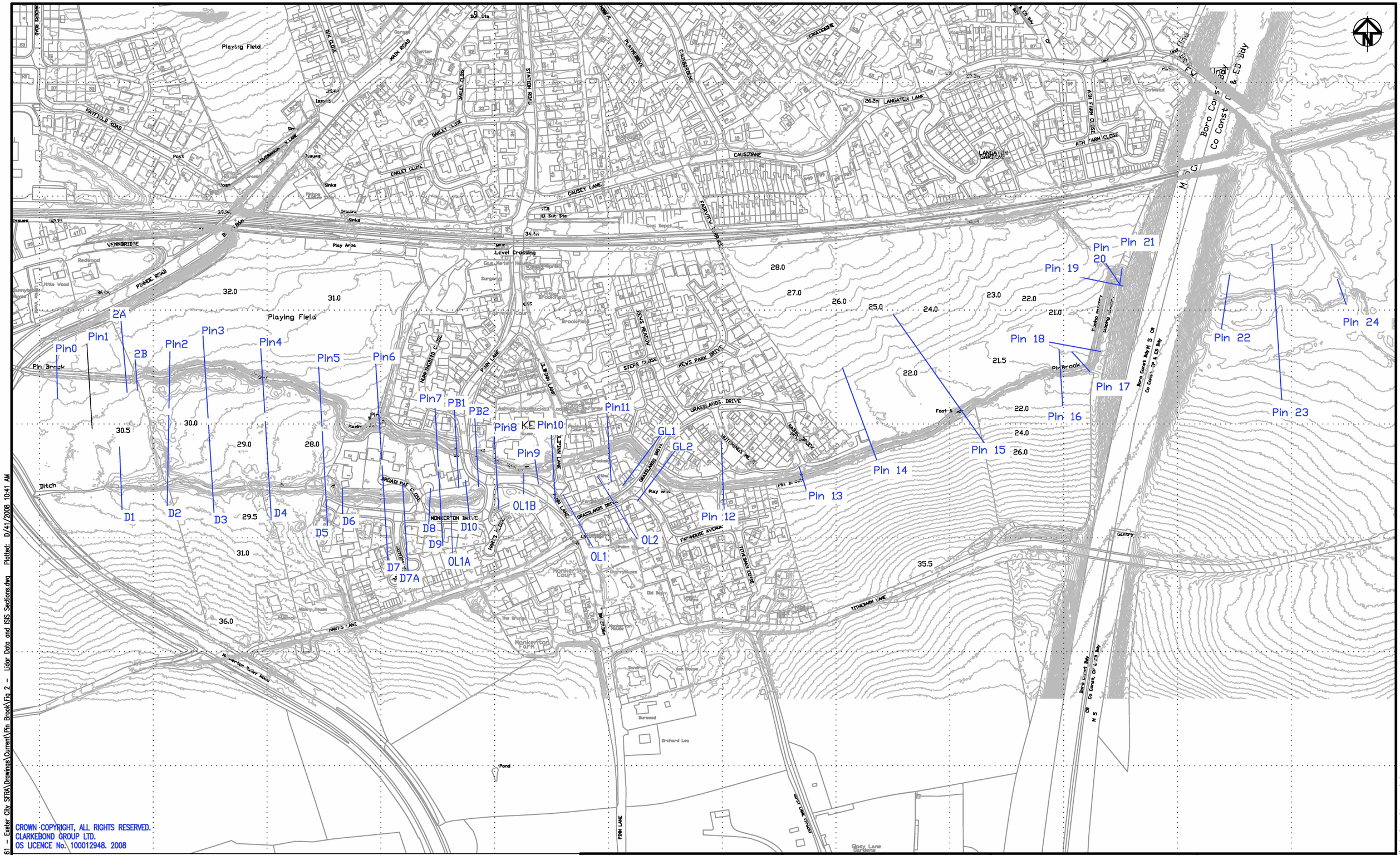
Reinforcement schedules nos.

PRELIMINARY ISSUE

Project No.	Drawing No.
WE00261	Pin/Fig.1

Scales	Date	Revision
1:25,000	31/07/08	–

Drawn	Checked	Sheet Size
AMR	SCS	A4



REV	DATE	BY	DESCRIPTION	CHK	APD
–	31/07/08	SCS	Original issue	NAS	MKR

clarkebond
Engineering & Management Consultants
Malvern House, Matford Court
Yeoford Way, Exeter
EX2 8LB

Tel: +44 (0) 1392 823368
Fax: +44 (0) 1392 823369
e-mail exeter@clarkebond.co.uk
web www.clarkebond.co.uk

Birmingham Bristol Cardiff Exeter Harrogate
London Manchester Swansea Abu Dhabi

CLIENT: Exeter City Council

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PROJECT: Exeter City Council SFRA

TITLE: Pin Brook Model LIDAR topography & Node Locations

DO NOT SCALE

SCALE:	CHECKED:	APPROVED:
1:1500 @ A3	SCS	NAS
CAD FILE:	DESIGN-DRAW:	DATE:
	AMR	29.07.08
PROJECT NO:	DRAWING NO:	REV:
WED0261	Pin/Fig.2	–

N:\CBsw Exeter Office\Projects\WED0261 – Exeter City SFRA\Drawings\Current\Pin Brook\Fig 2 – Lidar Data and ISIS Sections.dwg Plotted: D/41/2008 10:41 AM

Floodwaters back up behind the 2No. 1m diameter culverts, causing floodwater to break out over the right bank during the 100-year and 1000-year scenarios.

Floodwaters will follow ground contours

During the 1000-year event floodwater will flow overland and be intercepted by the drainage ditch

This Floodwater will backup behind the 450mm diameter pipe and break out over both banks.

Floodwaters over the left bank of the drainage ditch will flow overland to merge back into the Pin Brook. Additionally flows will travel eastwards towards Pin Lane.

Floodwaters over the right bank of the drainage ditch will flow down Monkerton Drive to a low point along Grasslands Drive.

Once the water depth along Grasslands Drive reaches 0.2m the floodwater will be able to spill over the play area into the Pin Brook downstream of Grasslands Drive Bridge.

Pin Brook

Ditch

Playing Field

Pin0 Pin1 2A 2B Pin2 Pin3 Pin4 Pin5 Pin6 Pin7 PB1 PB2 Pin8 RT Pin10 Pin9 Pin11 Pin 12

D1 D2 D3 D4 D5 D6 D7 D7A D8 D9 D10 OL1A OL1 OL2 GL1 GL2

Key:

- 25-year flood envelope (3b)
- 100-year flood envelope (3a)
- 1000-year flood envelope (2)

CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER

Rev.	Detail	By	Date	Chk
A	NEW FLOWS	AMR	14/09/09	SCS
-	ORIGINAL ISSUE	SCS	31/07/08	NAS

Revisions

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clarkebond
Engineering & Management Consultants
Malvern House, Matford Court
Yeoford Way, Exeter
EX2 8LB
Tel: +44 (0) 1392 823368
Fax: +44 (0) 1392 823369
e-mail exeter@clarkebond.co.uk
web www.clarkebond.co.uk
Birmingham Bristol Cardiff Exeter Harrogate
London Manchester Swansea Abu Dhabi

Client: Exeter City Council

Project: Exeter City Council SFRA Pin Brook

Drawing Title: Pin Brook Flood Extents Upstream (west)

PRELIMINARY
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Project No.	Drawing No.
WE00261	Pin/Fig.3A

Scales	Date	Revision
1:2000	14/09/09	A

Drawn	Checked	Approved	Sheet Size
AMR	SCS	MKR	A3

Plotted: 01/35/2009 4:35 PM

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Once floodwater overtop the banks, the topography of the surrounding area will direct the floodwaters back towards the brook.

Downstream of the motorway culvert the floodwaters will be able to break out of bank and flood both sides of the channel.

Pin 9
Pin10
Pin11
Pin 12
Pin 13
Pin 14
Pin 15
Pin 16
Pin 17
Pin 18
Pin 19
Pin 20
Pin 21
Pin 22
Pin 23
GL1
GL2
OL1
OL2

Key:
- 25–year flood envelope (3b)
- 100–year flood envelope (3a)
- 1000–year flood envelope (2)

Rev.	Detail	By	Date	Chk
A	NEW FLOWS	AMR	14/09/09	SCS
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Revisions

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clarkebond
Engineering & Management Consultants
Malvern House, Matford Court
Yeoford Way, Exeter
EX2 8LB
Tel: +44 (0) 1392 823368
Fax: +44 (0) 1392 823369
e-mail exeter@clarkebond.co.uk
web www.clarkebond.co.uk
Birmingham Bristol Cardiff Exeter Harrogate
London Manchester Swansea Abu Dhabi

Client: Exeter City Council

Project: Exeter City Council SFRA Pin Brook

Drawing Title: Pin Brook Flood Extents Downstream (East)

PRELIMINARY
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Project No.	Drawing No.
WE00261	Pin/Fig.3B

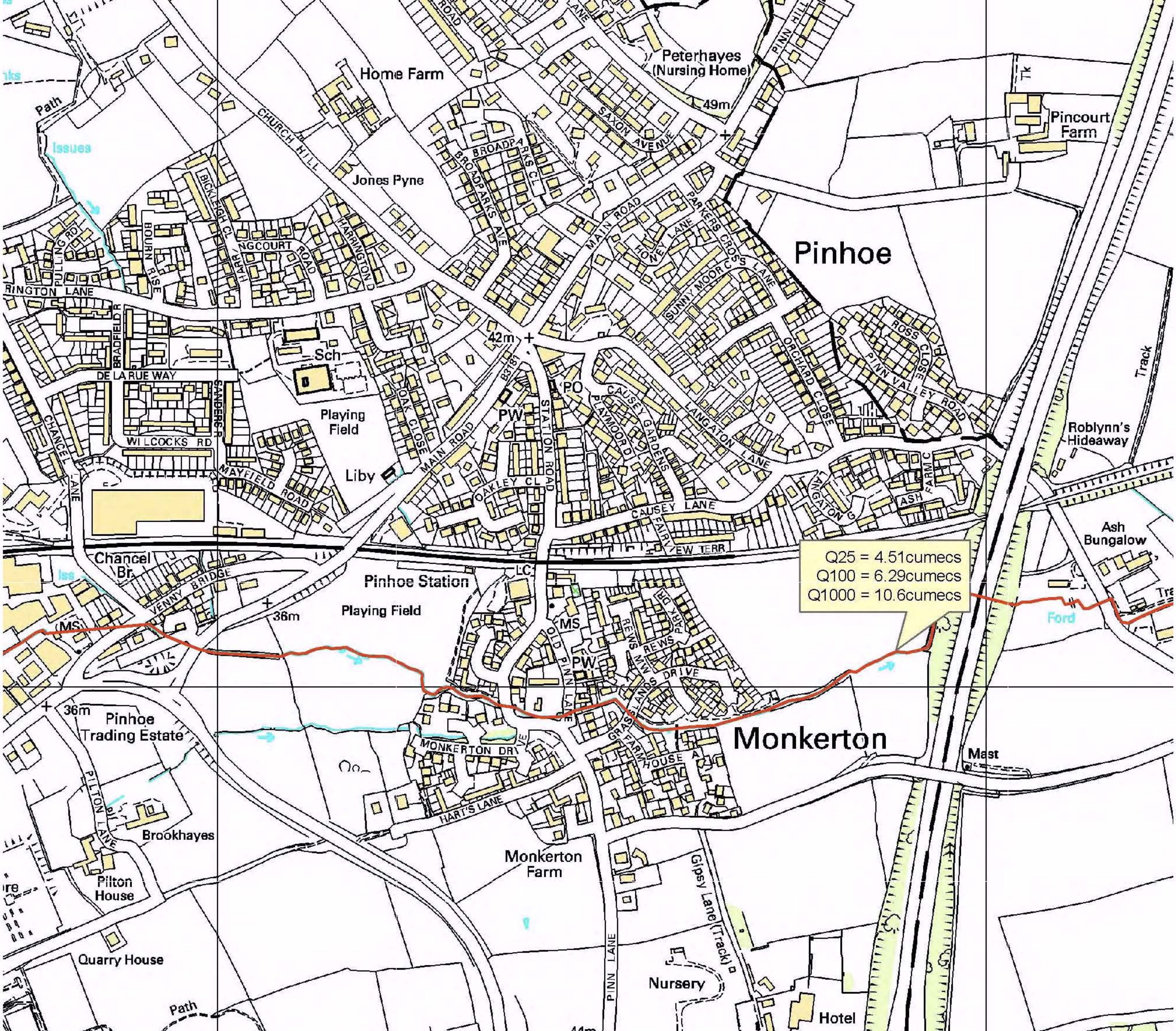
Scale	Date	Revision
1:2000 @ A3	14/09/09	A

Drawn	Checked	Approved	Sheet Size
AMR	SCS	MKR	A3

Appendix B

Hydrology & Modelling

EA Design flood flow data
Hydrographs used with the ISIS Models
ISIS Node Plan
Maximum Result Sheets

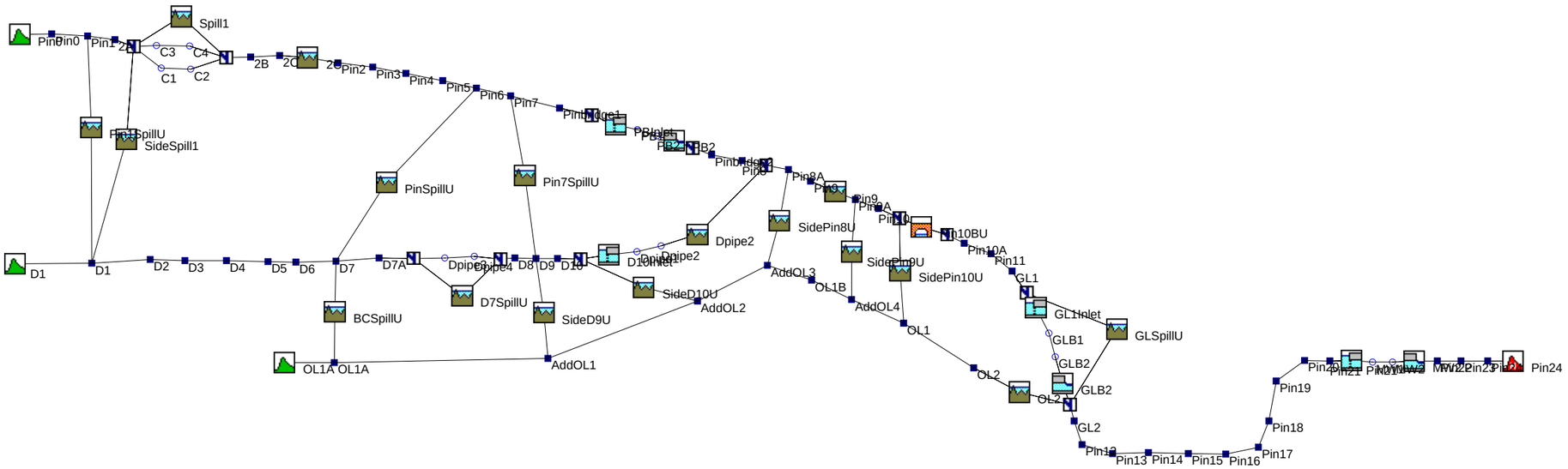


Q25 = 4.51cumecs
Q100 = 6.29cumecs
Q1000 = 10.6cumecs
Pinhoe
Monkerton
Home Farm
Peterhayes (Nursing Home)
Pincourt Farm
49m
Path
Issues
CHURCH HILL
Jones Pyne
SAXON AVENUE
BROADPARKS CL
BROADPARKS AVE
MAIN ROAD
HONEY LANE
PARKERS CROSS LANE
SUNNY MOOR CL
BICKLEIGH CL
HARRINGCOURT ROAD
HARRINGTON D
PULLING RD
BOURN RISE
RINGTON LANE
BRADFIELD R
DE LA RUE WAY
SANDERS R
WILCOCKS RD
CHANCEL LANE
MAYFIELD ROAD
Sch
Playing Field
Liby
42m
B3181
OAK CLOSE
PW
PO
STATION ROAD
OAKLEY CL
CAUSEY GARDENS
PLAYMOOR D
LANGATON LANE
ORCHARD CLOSE
ROSS CLOSE
PINN VALLEY ROAD
Track
Roblynn's Hideaway
ASH FARM C
LANGATON G
CAUSEY LANE
FAIRVIEW TERR
Ash Bungalow
Chancel Br
Iss
VENNY BRIDGE
36m
Pinhoe Station
LC
Playing Field
(MS)
MS
OLD PINN LANE
REWS MW
REWS PARK D
GRASSLANDS DRIVE
Ford
Mast
Pinhoe Trading Estate
MONKERTON DRIVE
FARM HOUSE A
HART'S LANE
PILTON LANE
Brookhayes
Pilton House
Monkerton Farm
Gipsy Lane (Track)
PINN LANE
Quarry House
Nursery
Hotel
Path

25-year		100-year		100-year + 20%		1000-year	
	flow		flow		flow		flow
time	hydrograph	time	hydrograh	time	hydrograh	time	hydrograph
(hours)	(m3/s)	(hours)	(m3/s)	(hours)	(m3/s)	(hours)	(m3/s)
0	0.078	0	0.078	0	0.094	0	0.078
0.225	0.131	0.225	0.160	0.225	0.192	0.225	0.246
0.45	0.263	0.45	0.363	0.45	0.436	0.45	0.665
0.675	0.537	0.675	0.785	0.675	0.942	0.675	1.532
0.9	1.103	0.9	1.657	0.9	1.988	0.9	3.324
1.125	2.073	1.125	3.151	1.125	3.781	1.125	6.398
1.35	3.274	1.35	5.001	1.35	6.001	1.35	10.203
1.575	4.499	1.575	6.888	1.575	8.266	1.575	14.083
1.8	5.600	1.8	8.584	1.8	10.301	1.8	17.571
2.025	6.346	2.025	9.734	2.025	11.681	2.025	19.936
2.25	**6.480**	**2.25**	**9.940**	**2.25**	**11.928**	**2.25**	**20.360**
2.475	6.073	2.475	9.312	2.475	11.174	2.475	19.069
2.7	5.354	2.7	8.205	2.7	9.846	2.7	16.792
2.925	4.472	2.925	6.846	2.925	8.215	2.925	13.997
3.15	3.510	3.15	5.365	3.15	6.438	3.15	10.951
3.375	2.567	3.375	3.912	3.375	4.694	3.375	7.964
3.6	1.702	3.6	2.580	3.6	3.096	3.6	5.223
3.825	0.992	3.825	1.486	3.825	1.783	3.825	2.973
4.05	0.520	4.05	0.759	4.05	0.911	4.05	1.478
4.275	0.268	4.275	0.370	4.275	0.444	4.275	0.678
4.5	0.146	4.5	0.182	4.5	0.218	4.5	0.292
4.725	0.091	4.725	0.098	4.725	0.118	4.725	0.120
4.95	0.078	4.95	0.078	4.95	0.094	4.95	0.078

Pin Brook

ISIS Model Plan



Conduit

River

Outlet

Inlet

Junction

Head Time Boundary

Flow Time boundary

Spill

Arch Bridge

Data file 100yr.DAT

	25-year							
Label	Max Flow	Time (hr)	Max Stage	Time (hr)	Max Fr	Time (hr)	Max Veloci	Time (hr)
Pin2	6.445	2.250	28.864	2.250	0.587	1.000	1.588	2.000
Pin3	6.441	2.250	28.092	2.250	0.810	2.250	2.397	2.250
Pin4	6.438	2.250	27.289	2.250	0.713	2.250	1.973	2.250
Pin5	6.435	2.250	26.445	2.250	0.763	2.250	2.092	2.250
Pin6	6.435	2.333	26.112	2.333	0.393	2.083	1.064	2.250
Pin7	6.440	2.333	25.861	2.333	0.537	1.583	1.428	2.250
Pinbridge1	6.442	2.333	25.784	2.333	0.590	1.167	1.152	2.333
PBInlet	6.442	2.333	25.784	2.333	1.014	2.333	1.045	1.000
PB1	6.442	2.333	25.733	2.333	0.406	2.333	1.412	2.333
PB2	6.443	2.333	25.659	2.333	0.394	2.333	1.383	2.333
Pinbridge2	6.443	2.333	25.561	2.333	1.237	1.250	2.128	2.333
Pin8	6.444	2.333	25.319	2.333	0.870	1.667	1.967	1.500
Pin9	6.577	2.333	24.716	2.333	0.564	2.333	1.837	2.333
Pin9A	6.577	2.333	23.565	2.333	0.497	1.000	1.233	1.750
Pin10	6.575	2.333	23.549	2.333	0.325	1.833	1.041	2.083
Pin10A	6.575	2.333	23.459	2.333	0.347	2.083	1.117	2.083
Pin11	6.568	2.333	23.248	2.333	0.645	1.167	1.481	1.750
D1	0.182	2.250	28.915	2.667	0.674	2.667	0.596	2.167
Pin1	6.477	2.250	31.192	2.500	0.670	3.750	1.269	1.333
2A	6.446	2.250	30.874	2.250	0.757	2.667	1.706	2.917
C1	3.223	2.250	30.874	2.250	0.869	1.250	3.722	2.250
C2	3.223	2.250	30.281	2.250	2.107	3.750	3.722	2.250
C3	3.223	2.250	30.874	2.250	0.869	1.250	3.722	2.250
Spill1	0.000	1.000	30.874	2.250	0.000	1.000	0.000	1.000
Spill2	0.000	1.000	30.281	2.250	0.000	1.000	0.000	1.000
SideSpill1	0.000	1.000	30.874	2.250	0.000	1.000	0.000	1.000
SideSpill2	0.000	1.000	-9999.99	1.000	0.000	1.000	0.000	1.000
C4	3.223	2.250	30.281	2.250	2.107	3.750	3.722	2.250
2B	6.446	2.250	30.281	2.250	0.856	3.750	2.254	2.333
2C	6.445	2.250	30.288	2.250	0.534	3.000	1.897	2.250
Pin0	6.480	2.250	31.328	2.000	0.516	1.333	1.209	2.250
Pin8A	6.575	2.333	25.319	2.333	0.891	3.000	2.019	1.500
Pin1SpillU	0.000	1.000	-9999.99	1.000	0.641	1.000	1.427	1.000
Pin1SpillD	0.000	1.000	-9999.99	1.000	0.641	1.000	1.427	1.000
PinSpillU	0.000	1.000	-9999.99	1.000	0.641	1.000	1.427	1.000
PinSpillD	0.000	1.000	-9999.99	1.000	0.641	1.000	1.427	1.000
Pin7SpillU	0.000	3.333	-9999.99	1.000	0.641	1.000	1.427	1.000
Pin7SpillD	0.000	3.333	-9999.99	1.000	0.641	1.000	1.427	1.000
GL1	6.558	2.333	23.235	2.417	0.269	1.333	0.673	1.333
GLSpillU	0.000	1.000	23.235	2.417	0.413	1.000	0.591	1.000
GLSpillD	0.000	1.000	23.086	2.417	0.413	1.000	0.591	1.000
GLB1	6.558	2.333	23.196	2.417	0.255	1.750	1.249	2.333
GLB2	6.558	2.333	23.133	2.417	0.247	1.750	1.249	2.333
GL2	6.558	2.333	23.086	2.417	0.257	1.500	0.799	2.167
GLB2Out	6.558	2.333	23.086	2.417	0.202	1.000	0.564	1.000
Pin12	6.545	2.333	23.035	2.417	0.226	1.333	0.766	2.333
Pin13	6.550	2.417	22.452	2.417	0.666	2.333	2.071	2.417
Pin14	6.553	2.417	21.884	2.333	0.653	2.417	1.837	2.417
Pin15	6.555	2.417	20.862	2.417	0.849	1.167	2.108	2.333
Pin16	6.551	2.417	20.121	2.417	0.340	2.333	1.226	2.333
Pin17	6.549	2.417	20.046	2.417	0.357	2.250	1.233	2.333
Pin18	6.547	2.417	19.959	2.500	0.384	2.333	1.374	2.333
Pin19	6.536	2.417	19.774	2.500	0.618	1.250	1.375	1.333
Pin20	6.535	2.417	19.809	2.500	0.252	1.250	0.637	2.250
Pin21	6.533	2.417	19.800	2.500	1.177	2.417	0.703	2.250
MW1	6.533	2.417	19.742	2.500	0.311	2.250	1.281	2.417
MW2	6.533	2.417	19.610	2.500	0.219	1.750	1.281	2.417
Pin22	6.533	2.417	19.529	2.500	0.249	1.500	0.451	1.417
Pin23	6.502	2.500	18.913	2.500	0.861	2.333	2.377	2.333
Pin24	6.492	2.500	17.994	2.667	0.644	2.417	1.562	2.333
D2	0.182	2.250	27.654	2.250	1.098	1.083	0.803	1.667
D3	0.183	2.250	27.044	1.250	0.424	3.500	0.421	2.250
D4	0.186	2.333	26.769	2.250	0.549	1.167	0.489	1.250
D5	0.191	2.333	26.089	1.000	0.776	3.500	0.615	2.250
D6	0.186	2.333	25.874	2.833	0.868	1.167	0.754	1.083
D7	0.176	3.250	25.866	2.833	0.163	1.167	0.231	1.167
D7A	0.186	3.750	25.866	2.833	0.063	1.083	0.142	1.083
D8	0.186	3.750	25.615	2.667	0.062	1.083	0.140	1.083
D9	0.192	3.750	25.616	2.667	0.070	1.083	0.132	1.083
D10	0.212	3.667	25.616	2.667	0.039	1.000	0.105	1.000
Dpipe2	0.212	3.667	25.321	2.333	0.000	1.000	1.335	3.667
Dpipe2a	0.212	3.667	25.319	2.333	0.209	1.000	0.463	1.000
PBOutlet	6.443	2.333	25.561	2.333	0.859	1.000	1.925	1.000
Pin10BU	6.575	2.333	23.549	2.333	0.253	1.000	0.606	1.000
Pin10BD	6.575	2.333	23.459	2.333	0.258	1.000	0.615	1.000
GL1Inlet	6.558	2.333	23.235	2.417	1.065	2.333	0.591	1.000
Dpipe3	0.186	3.750	25.866	2.833	0.000	1.000	1.170	3.750
D7SpillU	0.000	1.000	25.866	2.833	0.348	1.000	0.729	1.000
D7SpillD	0.000	1.000	25.615	2.667	0.348	1.000	0.729	1.000
Dpipe4	0.186	3.750	25.615	2.667	0.000	1.000	1.170	3.750
D10Inlet	0.212	3.667	25.616	2.667	0.477	3.667	0.100	1.000
Dpipe1	0.212	3.667	25.600	2.667	0.000	1.000	1.335	3.667

	100-year								100-year + 20% (Climate Change)							
Label	Max Flow	Time (hr)	Max Stage	Time (hr)	Max Fr	Time (hr)	Max Velocity	Time (hr)	**Label**	Max Flow	Time (hr)	Max Stage	Time (hr)	Max Fr	Time (hr)	Max Velocity	Time (hr)
Pin2	8.296	2.222	28.999	2.222	0.629	3.889	1.755	2.222	**Pin2**	8.987	2.222	29.072	2.222	0.630	3.972	1.762	1.806
Pin3	8.294	2.222	28.298	2.222	0.891	2.222	2.470	2.556	**Pin3**	8.985	2.222	28.367	2.222	0.893	1.806	2.469	1.722
Pin4	8.292	2.222	27.439	2.222	0.763	2.472	2.141	2.472	**Pin4**	8.984	2.222	27.477	2.056	0.780	2.222	2.213	2.222
Pin5	8.289	2.222	26.614	2.389	0.791	1.972	2.210	2.222	**Pin5**	8.980	2.222	26.700	2.306	0.793	1.972	2.232	1.972
Pin6	8.286	2.222	26.342	2.472	0.403	1.722	1.117	1.972	**Pin6**	8.975	2.306	26.490	2.306	0.440	1.972	1.124	1.889
Pin7	8.891	2.472	26.096	2.472	0.555	1.306	1.494	2.389	**Pin7**	10.597	2.306	26.250	2.306	0.557	1.222	1.517	2.056
Pinbridge1	8.885	2.472	26.037	2.472	0.628	0.972	1.215	2.472	**Pinbridge1**	10.599	2.306	26.196	2.306	0.589	3.889	1.244	2.139
PBInlet	8.885	2.472	26.037	2.472	1.257	2.472	1.045	0.889	**PBInlet**	10.599	2.306	26.196	2.306	1.413	2.306	1.045	0.889
PB1	8.885	2.472	25.968	2.472	0.431	2.472	1.635	2.472	**PB1**	10.599	2.306	26.116	2.306	0.445	2.306	1.772	2.306
PB2	8.882	2.472	25.877	2.472	0.427	2.472	1.626	2.472	**PB2**	10.601	2.306	26.012	2.306	0.447	2.306	1.778	2.306
Pinbridge2	8.882	2.472	25.742	2.472	1.358	1.056	2.275	2.472	**Pinbridge2**	10.601	2.306	25.851	2.306	1.242	3.806	2.352	2.306
Pin8	8.879	2.472	25.573	2.556	0.907	1.389	1.984	1.222	**Pin8**	10.599	2.306	25.720	2.306	0.898	1.222	1.975	1.139
Pin9	9.208	2.556	24.992	2.556	0.716	2.556	1.973	2.556	**Pin9**	11.571	2.306	25.174	2.306	0.722	2.056	1.982	2.306
Pin9A	9.208	2.556	24.119	2.556	0.525	3.972	1.252	1.472	**Pin9A**	11.571	2.306	24.643	2.306	0.524	3.972	1.258	1.306
Pin10	9.201	2.556	24.111	2.556	0.329	1.472	1.054	1.639	**Pin10**	11.548	2.306	24.634	2.306	0.328	1.389	1.055	1.472
Pin10A	9.201	2.556	23.841	2.556	0.356	1.639	1.156	2.472	**Pin10A**	11.552	2.306	24.143	2.306	0.355	1.556	1.225	2.139
Pin11	9.153	2.556	23.711	2.556	0.573	1.139	1.491	1.389	**Pin11**	11.652	2.389	24.043	2.306	0.557	1.139	1.492	1.306
D1	0.182	2.222	28.986	2.222	1.037	3.306	0.778	3.306	**D1**	0.219	2.222	29.086	2.222	1.197	3.639	0.897	3.639
Pin1	9.921	2.222	31.391	2.222	0.715	3.889	1.464	2.222	**Pin1**	11.907	2.222	31.455	2.222	0.718	3.972	1.630	2.222
2A	9.840	2.222	31.259	2.222	0.749	1.472	1.740	1.306	**2A**	11.436	2.222	31.328	2.222	0.768	3.306	1.738	1.222
C1	3.563	1.972	31.259	2.222	0.872	1.056	4.115	1.972	**C1**	3.567	1.722	31.328	2.222	0.871	0.972	4.119	1.722
C2	3.563	1.972	30.585	2.222	2.271	3.972	4.115	1.972	**C2**	3.567	1.722	30.678	2.222	1.992	3.972	4.119	1.722
C3	3.563	1.972	31.259	2.222	0.872	1.056	4.115	1.972	**C3**	3.567	1.722	31.328	2.222	0.871	0.972	4.119	1.722
Spill1	1.431	2.222	31.259	2.222	0.000	0.889	0.000	0.889	**Spill1**	2.241	2.222	31.328	2.222	0.000	0.889	0.000	0.889
Spill2	1.431	2.222	30.585	2.222	0.000	0.889	0.000	0.889	**Spill2**	2.241	2.222	30.678	2.222	0.000	0.889	0.000	0.889
SideSpill1	1.543	2.222	31.259	2.222	0.000	0.889	0.000	0.889	**SideSpill1**	2.448	2.222	31.328	2.222	0.000	0.889	0.000	0.889
SideSpill2	1.543	2.222	-9999.99	0.889	0.000	0.889	0.000	0.889	**SideSpill2**	2.448	2.222	-9999.99	0.889	0.000	0.889	0.000	0.889
C4	3.563	1.972	30.585	2.222	2.271	3.972	4.115	1.972	**C4**	3.567	1.722	30.678	2.222	1.992	3.972	4.119	1.722
2B	8.297	2.222	30.585	2.222	1.030	2.222	2.438	1.972	**2B**	8.988	2.222	30.678	2.222	1.078	2.639	2.443	1.722
2C	8.296	2.222	30.522	2.222	0.665	2.222	2.079	2.556	**2C**	8.987	2.222	30.592	2.222	0.928	2.222	2.071	2.806
Pin0	9.925	2.222	31.541	2.222	0.528	1.139	1.394	2.222	**Pin0**	11.910	2.222	31.634	2.222	0.529	1.056	1.499	2.222
Pin8A	9.135	2.472	25.573	2.556	0.920	1.389	2.035	1.222	**Pin8A**	10.840	2.306	25.720	2.306	0.915	1.222	2.030	1.139
Pin1SpillU	0.065	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889	**Pin1SpillU**	0.450	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin1SpillD	0.065	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889	**Pin1SpillD**	0.450	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889
PinSpillU	0.799	2.472	-9999.99	0.889	0.641	0.889	1.427	0.889	**PinSpillU**	1.618	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
PinSpillD	0.799	2.472	-9999.99	0.889	0.641	0.889	1.427	0.889	**PinSpillD**	1.618	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin7SpillU	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889	**Pin7SpillU**	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin7SpillD	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889	**Pin7SpillD**	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889
GL1	9.134	2.556	23.722	2.556	0.258	1.222	0.664	1.222	**GL1**	11.937	2.389	24.064	2.306	0.250	1.056	0.641	1.222
GLSpillU	0.000	0.889	23.722	2.556	0.413	0.889	0.591	0.889	**GLSpillU**	0.000	0.889	24.064	2.306	0.413	0.889	0.591	0.889
GLSpillD	0.000	0.889	23.404	2.639	0.413	0.889	0.591	0.889	**GLSpillD**	0.000	0.889	23.556	2.306	0.413	0.889	0.591	0.889
GLB1	9.134	2.556	23.645	2.556	0.251	1.389	1.740	2.556	**GLB1**	11.937	2.389	23.944	2.306	0.248	1.306	2.274	2.389
GLB2	9.134	2.556	23.522	2.556	0.239	1.389	1.740	2.556	**GLB2**	11.937	2.389	23.753	2.306	0.238	1.306	2.274	2.389
GL2	9.582	2.639	23.404	2.639	0.263	1.222	0.880	2.639	**GL2**	12.709	2.389	23.556	2.306	0.305	2.389	1.083	2.389
GLB2Out	9.134	2.556	23.404	2.639	0.202	0.889	0.564	0.889	**GLB2Out**	11.937	2.389	23.556	2.306	0.202	0.889	0.564	0.889
Pin12	9.688	2.556	23.349	2.639	0.245	2.556	0.887	2.556	**Pin12**	12.774	2.389	23.493	2.306	0.304	2.389	1.116	2.389
Pin13	9.539	2.556	22.702	2.639	0.768	2.556	2.394	2.556	**Pin13**	12.792	2.389	22.970	2.389	0.934	2.389	2.504	2.306
Pin14	9.505	2.639	22.083	2.639	0.710	2.722	2.148	2.639	**Pin14**	12.817	2.389	22.256	2.389	0.767	2.722	2.431	2.389
Pin15	9.534	2.639	21.123	2.639	0.875	1.139	2.248	2.639	**Pin15**	12.852	2.389	21.395	2.389	0.876	1.139	2.280	2.389
Pin16	9.546	2.639	20.491	2.639	0.374	2.556	1.365	2.556	**Pin16**	12.674	2.389	20.909	2.472	0.459	2.222	1.356	2.139
Pin17	9.539	2.639	20.413	2.639	0.383	1.722	1.352	2.556	**Pin17**	12.544	2.389	20.820	2.472	0.379	2.222	1.362	2.222
Pin18	9.535	2.639	20.313	2.639	0.431	2.556	1.513	2.556	**Pin18**	12.407	2.389	20.789	2.472	0.560	2.306	1.508	2.222
Pin19	9.514	2.639	20.153	2.639	0.559	1.222	1.389	1.222	**Pin19**	12.107	2.472	20.595	2.472	0.544	0.889	1.363	1.222
Pin20	9.512	2.639	20.186	2.639	0.237	1.222	0.676	1.806	**Pin20**	12.130	2.472	20.619	2.472	0.232	0.889	0.644	1.472
Pin21	9.509	2.639	20.176	2.639	1.512	2.639	0.751	1.806	**Pin21**	12.166	2.472	20.610	2.472	1.782	2.472	0.733	3.056
MW1	9.509	2.639	20.052	2.639	0.320	1.722	1.864	2.639	**MW1**	12.166	2.472	20.407	2.472	0.312	1.556	2.385	2.472
MW2	9.509	2.639	19.769	2.639	0.225	1.472	1.864	2.639	**MW2**	12.166	2.472	19.951	2.472	0.231	1.389	2.385	2.472
Pin22	9.509	2.639	19.617	1.972	0.282	1.056	0.492	1.222	**Pin22**	12.166	2.472	19.664	2.472	0.278	1.056	0.483	1.139
Pin23	9.487	2.639	19.194	2.722	1.246	1.806	2.522	1.639	**Pin23**	12.234	2.472	19.229	2.639	1.134	1.722	2.601	1.639
Pin24	9.578	2.722	18.787	2.722	0.365	1.722	0.760	1.722	**Pin24**	11.998	2.722	18.787	2.722	0.359	1.556	0.726	1.556
D2	1.786	2.222	27.924	2.222	1.924	3.056	1.437	2.222	**D2**	3.113	2.222	28.064	2.222	1.527	0.889	1.714	2.222
D3	1.767	2.222	27.422	2.472	0.520	2.139	0.930	2.139	**D3**	3.108	2.222	27.559	2.222	0.524	1.556	1.035	1.972
D4	1.676	2.139	27.373	2.472	0.743	1.889	1.098	1.972	**D4**	3.101	2.222	27.459	2.306	0.776	1.722	1.209	1.806
D5	1.470	2.472	27.366	2.472	0.827	1.639	0.858	1.806	**D5**	3.094	2.306	27.439	2.306	0.846	1.556	0.876	1.639
D6	1.465	2.472	27.365	2.472	1.183	0.889	0.897	0.889	**D6**	3.097	2.306	27.436	2.306	1.183	0.889	0.897	0.889
D7	1.455	2.472	27.365	2.472	0.162	1.056	0.225	1.056	**D7**	3.104	2.306	27.435	2.306	0.156	0.972	0.218	0.972
D7A	0.648	2.472	27.365	2.472	0.061	1.056	0.133	1.056	**D7A**	1.329	2.306	27.437	2.306	0.059	0.972	0.130	0.972
D8	0.648	2.472	26.461	2.472	0.054	1.056	0.123	1.056	**D8**	1.329	2.306	26.507	2.306	0.059	2.306	0.162	2.306
D9	0.645	2.472	26.461	2.472	0.059	0.972	0.112	0.972	**D9**	1.329	2.306	26.507	2.306	0.056	0.972	0.127	2.306
D10	0.637	2.556	26.461	2.472	0.036	0.972	0.098	0.972	**D10**	1.331	2.306	26.506	2.306	0.045	2.306	0.115	2.306
Dpipe2	0.343	3.889	25.578	2.556	0.000	0.889	2.155	3.889	**Dpipe2**	0.345	3.972	25.723	2.306	0.000	0.889	2.169	3.972
Dpipe2a	0.343	3.889	25.573	2.556	0.209	0.889	0.463	0.889	**Dpipe2a**	0.345	3.972	25.720	2.306	0.209	0.889	0.463	0.889
PBOutlet	8.882	2.472	25.742	2.472	0.859	0.889	1.925	0.889	**PBOutlet**	10.601	2.306	25.851	2.306	0.859	0.889	1.925	0.889
Pin10BU	9.201	2.556	24.111	2.556	0.253	0.889	0.606	0.889	**Pin10BU**	11.552	2.306	24.634	2.306	0.253	0.889	0.606	0.889
Pin10BD	9.201	2.556	23.841	2.556	0.258	0.889	0.615	0.889	**Pin10BD**	11.552	2.306	24.143	2.306	0.258	0.889	0.615	0.889
GL1Inlet	9.134	2.556	23.722	2.556	1.328	2.556	0.591	0.889	**GL1Inlet**	11.937	2.389	24.064	2.306	1.588	2.389	0.591	0.889
OL2	0.599	2.972	24.274	2.889	0.688	3.722	0.623	2.972	**OL2**	0.773	2.389	24.288	2.389	0.710	3.806	0.658	2.389
OL2D	0.599	2.972	23.404	2.639	0.432	0.889	0.386	0.889	**OL2D**	0.773	2.389	23.556	2.306	0.432	0.889	0.386	0.889
OL1A	0.200	0.889	27.250	2.472	0.777	1.056	0.592	1.056	**OL1A**	0.200	0.889	27.253	2.139	0.749	1.222	0.578	1.222
AddOL1	0.204	1.556	26.748	1.056	0.778	2.639	0.594	2.472	**AddOL1**	0.365	2.306	26.764	2.306	0.811	2.139	0.719	2.306
AddOL2	0.222	1.056	26.401	2.556	0.816	1.056	0.633	1.056	**AddOL2**	0.377	2.306	26.537	2.306	0.812	1.222	0.627	1.222
AddOL3	0.574	2.472	25.961	2.472	1.001	0.972	0.770	2.472	**AddOL3**	1.482	2.306	26.012	2.306	1.545	2.556	1.049	2.222
OL1B	0.468	2.472	25.636	2.556	0.742	1.889	0.548	1.889	**OL1B**	0.738	2.139	25.656	2.222	0.720	1.222	0.630	2.139
AddOL4	0.446	2.639	24.879	2.639	1.471	0.972	0.794	0.972	**AddOL4**	0.730	2.389	24.907	2.389	1.471	0.972	0.933	2.389
OL1	1.373	2.222	24.723	1.889	0.509	2.389	0.447	2.389	**OL1**	1.569	2.139	24.740	2.722	0.424	2.139	0.416	2.139
SideD9U	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SideD9U**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SideD9D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SideD9D**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SideD10U	0.381	2.556	26.461	2.472	0.000	0.889	0.000	0.889	**SideD10U**	1.090	2.306	26.506	2.306	0.000	0.889	0.000	0.889
SideD10D	0.381	2.556	-9999.99	0.889	0.000	0.889	0.000	0.889	**SideD10D**	1.090	2.306	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin8U	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SidePin8U**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin8D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SidePin8D**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin9U	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SidePin9U**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin9D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SidePin9D**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin10U	0.000	0.889	24.111	2.556	0.000	0.889	0.000	0.889	**SidePin10U**	0.000	0.889	24.634	2.306	0.000	0.889	0.000	0.889
SidePin10D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889	**SidePin10D**	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
BCSpillU	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889	**BCSpillU**	0.164	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
BCSpillD	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889	**BCSpillD**	0.164	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
Dpipe3	0.339	2.306	27.365	2.472	0.000	0.889	2.131	2.306	**Dpipe3**	0.346	1.972	27.437	2.306	0.000	0.889	2.174	1.972
D7SpillU	0.333	2.472	27.365	2.472	0.348	0.889	0.729	0.889	**D7SpillU**	1.009	2.306	27.437	2.306	0.348	0.889	0.729	0.889
D7SpillD	0.333	2.472	26.461	2.472	0.348	0.889	0.729	0.889	**D7SpillD**	1.009	2.306	26.507	2.306	0.348	0.889	0.729	0.889
Dpipe4	0.339	2.306	26.461	2.472	0.000	0.889	2.131	2.306	**Dpipe4**	0.346	1.972	26.507	2.306	0.000	0.889	2.174	1.972
D10Inlet	0.343	3.889	26.461	2.472	0.668	3.889	0.100	0.889	**D10Inlet**	0.345	3.972	26.506	2.306	0.672	3.972	0.100	0.889
Dpipe1	0.343	3.889	26.421	2.556	0.000	0.889	2.155	3.889	**Dpipe1**	0.345	3.972	26.471	2.306	0.000	0.889	2.169	3.972

	1000-year							
Label	Max Flow	Time (hr)	Max Stage	Time (hr)	Max Fr	Time (hr)	Max Veloci	Time (hr)
Pin2	12.004	2.222	29.263	2.222	0.633	1.972	1.864	2.222
Pin3	12.000	2.222	28.563	2.222	0.904	2.222	2.546	1.889
Pin4	11.997	2.222	27.655	2.222	0.815	2.222	2.395	2.222
Pin5	11.992	2.222	26.970	2.306	0.800	1.556	2.276	1.556
Pin6	11.980	2.222	26.854	2.306	0.440	1.472	1.128	1.472
Pin7	15.605	2.306	26.669	2.306	0.559	0.972	1.541	1.639
Pinbridge1	15.609	2.306	26.617	2.306	0.572	4.056	1.291	1.889
PBInlet	15.609	2.306	26.617	2.306	1.829	2.306	1.045	0.889
PB1	15.609	2.306	26.504	2.306	0.475	2.306	2.105	2.306
PB2	15.611	2.306	26.366	2.306	0.489	2.306	2.146	2.306
Pinbridge2	15.611	2.306	26.131	2.306	1.167	3.972	2.523	2.306
Pin8	15.622	2.306	26.115	2.306	0.917	1.056	2.003	0.972
Pin9	18.849	2.306	25.589	2.306	0.722	1.556	2.090	2.306
Pin9A	18.849	2.306	25.018	2.306	0.529	4.139	1.274	1.139
Pin10	18.591	2.306	25.013	2.306	0.340	2.139	1.067	1.222
Pin10A	12.783	1.722	24.390	2.389	0.360	1.222	1.270	1.722
Pin11	12.621	1.806	24.329	2.389	0.556	0.889	1.522	1.056
D1	0.182	2.222	29.474	2.222	0.982	3.806	0.735	3.806
Pin1	20.315	2.222	31.633	2.222	0.748	2.222	2.294	2.222
2A	16.892	2.222	31.478	2.222	0.671	1.139	1.722	0.972
C1	3.551	1.306	31.478	2.222	0.867	3.889	4.101	1.306
C2	3.551	1.306	30.875	2.222	2.033	4.139	4.101	1.306
C3	3.551	1.306	31.478	2.222	0.867	3.889	4.101	1.306
Spill1	5.505	2.222	31.478	2.222	0.000	0.889	0.000	0.889
Spill2	5.505	2.222	30.875	2.222	0.000	0.889	0.000	0.889
SideSpill1	4.886	2.222	31.478	2.222	0.000	0.889	0.000	0.889
SideSpill2	4.886	2.222	-9999.99	0.889	0.000	0.889	0.000	0.889
C4	3.551	1.306	30.875	2.222	2.033	4.139	4.101	1.306
2B	12.005	2.222	30.875	2.222	1.056	3.222	2.413	1.306
2C	12.004	2.222	30.779	2.222	0.969	1.472	2.079	1.306
Pin0	20.328	2.222	32.065	2.222	0.732	1.556	1.532	1.472
Pin8A	15.814	2.306	26.115	2.306	0.924	1.056	2.045	0.972
Pin1SpillU	3.402	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin1SpillD	3.402	2.222	-9999.99	0.889	0.641	0.889	1.427	0.889
PinSpillU	3.619	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
PinSpillD	3.619	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin7SpillU	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889
Pin7SpillD	0.000	0.889	-9999.99	0.889	0.641	0.889	1.427	0.889
GL1	12.174	2.972	24.350	2.389	0.242	1.056	0.648	1.056
GLSpillU	0.000	0.889	24.350	2.389	0.413	0.889	0.591	0.889
GLSpillD	0.000	0.889	23.813	2.306	0.413	0.889	0.591	0.889
GLB1	12.174	2.972	24.230	2.306	0.253	1.056	2.318	2.972
GLB2	12.174	2.972	24.042	2.306	0.237	1.056	2.318	2.972
GL2	20.888	2.306	23.813	2.306	0.459	2.306	1.418	2.306
GLB2Out	12.174	2.972	23.813	2.306	0.202	0.889	0.564	0.889
Pin12	20.609	2.306	23.706	2.389	0.545	2.306	1.215	2.306
Pin13	20.728	2.389	23.277	2.389	1.308	2.972	2.516	1.722
Pin14	20.616	2.389	22.640	2.472	2.401	2.139	2.671	2.056
Pin15	20.245	2.389	21.965	2.806	0.879	0.889	2.613	2.056
Pin16	19.360	2.472	21.876	2.806	0.481	1.889	1.335	1.639
Pin17	18.893	2.556	21.873	2.806	0.646	1.972	1.392	1.806
Pin18	18.644	2.556	21.873	2.806	0.513	1.806	1.511	1.722
Pin19	18.297	2.722	21.847	2.806	0.574	0.889	1.376	0.889
Pin20	18.291	2.722	21.849	2.806	0.238	0.889	0.690	1.306
Pin21	18.286	2.722	21.845	2.806	2.338	2.722	0.739	1.306
MW1	18.286	2.722	21.389	2.806	0.327	1.306	3.585	2.722
MW2	18.286	2.722	20.356	2.889	0.222	1.139	3.585	2.722
Pin22	18.286	2.722	19.737	3.222	0.245	1.056	0.488	0.972
Pin23	18.230	2.722	19.335	2.722	1.232	3.889	2.629	1.389
Pin24	18.578	2.806	18.984	2.722	0.442	1.806	0.794	1.556
D2	8.459	2.222	28.460	2.222	2.170	3.972	2.372	2.222
D3	8.451	2.222	27.879	2.222	0.558	2.222	1.517	2.222
D4	8.445	2.222	27.638	2.222	0.753	1.389	1.346	1.472
D5	8.436	2.306	27.585	2.306	0.691	1.222	0.780	1.306
D6	8.448	2.306	27.567	2.306	1.229	0.889	0.961	1.306
D7	8.458	2.306	27.566	2.306	0.169	0.889	0.334	2.306
D7A	3.175	2.306	27.573	2.306	0.056	0.889	0.119	0.889
D8	3.175	2.306	26.627	2.139	0.123	2.306	0.333	2.306
D9	3.170	2.306	26.627	2.139	0.097	2.306	0.263	2.306
D10	3.983	2.139	26.619	2.139	0.138	2.139	0.276	2.139
Dpipe2	0.347	4.139	26.117	2.306	0.000	0.889	2.179	4.139
Dpipe2a	0.347	4.139	26.115	2.306	0.209	0.889	0.463	0.889
PBOutlet	15.611	2.306	26.131	2.306	0.859	0.889	1.925	0.889
Pin10BU	12.783	1.722	25.013	2.306	0.253	0.889	0.606	0.889
Pin10BD	12.783	1.722	24.390	2.389	0.258	0.889	0.615	0.889
GL1Inlet	12.174	2.972	24.350	2.389	1.608	2.972	0.591	0.889
OL2	9.519	2.306	24.623	2.306	0.758	2.972	1.003	2.222
OL2D	9.519	2.306	23.813	2.306	0.432	0.889	0.386	0.889
OL1A	0.200	0.889	27.259	2.389	0.684	3.556	0.544	3.556
AddOL1	1.880	2.306	26.878	2.306	1.522	3.056	0.764	3.056
AddOL2	1.253	2.972	26.741	2.139	0.688	3.722	0.784	2.972
AddOL3	4.965	2.222	26.096	2.222	1.547	3.056	1.282	2.139
OL1B	1.855	2.222	25.724	2.306	0.968	2.972	1.000	1.972
AddOL4	1.825	2.306	25.028	2.222	1.319	0.972	1.300	1.806
OL1	2.826	1.806	24.981	2.222	0.531	1.056	0.449	1.056
SideD9U	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SideD9D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SideD10U	3.788	2.139	26.619	2.139	0.000	0.889	0.000	0.889
SideD10D	3.788	2.139	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin8U	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin8D	0.000	0.889	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin9U	0.269	2.306	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin9D	0.269	2.306	-9999.99	0.889	0.000	0.889	0.000	0.889
SidePin10U	7.144	2.306	25.013	2.306	0.000	0.889	0.000	0.889
SidePin10D	7.144	2.306	-9999.99	0.889	0.000	0.889	0.000	0.889
BCSpillU	1.673	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
BCSpillD	1.673	2.306	-9999.99	0.889	0.641	0.889	1.427	0.889
Dpipe3	0.362	1.556	27.573	2.306	0.000	0.889	2.277	1.556
D7SpillU	2.852	2.306	27.573	2.306	0.348	0.889	0.729	0.889
D7SpillD	2.852	2.306	26.627	2.139	0.348	0.889	0.729	0.889
Dpipe4	0.362	1.556	26.627	2.139	0.000	0.889	2.277	1.556
D10Inlet	0.347	4.139	26.619	2.139	0.674	4.139	0.100	0.889
Dpipe1	0.347	4.139	26.596	2.139	0.000	0.889	2.179	4.139