



Completed section inspection

Item No. 9	Insp. No. 1	Date 15/06/23	Time 11:48	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH F6X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH F6
Road:	Sneakeat Road	Inspected Length:	15.00 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	15.00 m	Downstream Node:	MH F8
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	150 mm	Width:	150 mm
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:130 Position [m] Code Observation MPEG Photo Grade

Depth: m
MH F6



0.00

MH

Start node, manhole, reference: MH F6

00:00:09



15.00

MHF

Finish node, manhole, reference: MH F8: Backdrop

00:02:12

MH F8
Depth: m

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 10	Insp. No. 1	Date 15/06/23	Time 13:34	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH F8X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH F8
Road:	Sneakeat Road	Inspected Length:	20.20 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	20.20 m	Downstream Node:	MAIN LINE
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	150 mm Width: 150 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:

Recommendations:

Scale: 1:175 Position [m] Code Observation MPEG Photo Grade

Depth: m
MH F8



0.00

MH

Start node, manhole, reference: MH F8

00:00:10

20.20

MHF

Finish node, manhole, reference: Main Line: Buried Manhole

00:01:04

Main Line
Depth: m

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 11	Insp. No. 1	Date 15/06/23	Time 13:30	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR BRANCH BX
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Upstream	Upstream Node:	BRANCH B
Road:	Sneakeat Road	Inspected Length:	19.40 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	19.40 m	Downstream Node:	MH F8
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular	Dia/Height:	100 mm Width: 100 mm
Type of Pipe:	Gravity drain/sewer	Material:	Polyvinyl chloride	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:**Recommendations:**

Scale:	1:168	Position [m]	Code	Observation	MPEG	Photo	Grade		
<p>Depth: m MH F8</p>									
		0.00	MH	Start node, manhole, reference: MH F8	00:00:08				
		19.40	MHF	Finish node, manhole, reference: Branch B: Manhole Boundary Line Covered	00:01:46				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 12	Insp. No. 1	Date 15/06/23	Time 13:50	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH S4X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH S4
Road:	Sneakeat Road	Inspected Length:	24.50 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	24.50 m	Downstream Node:	MAIN LINE
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	375 mm Width: 375 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:**Recommendations:**

Scale:	1:213	Position [m]	Code	Observation	MPEG	Photo	Grade		
<p>Depth: m MH S4</p>									
	0.00	MH	Start node, manhole, reference: MH S4	00:00:10					
	24.50	MHF	Finish node, manhole, reference: Main Line: Buried Manhole Boundary Line Covered	00:01:54					
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 13	Insp. No. 1	Date 15/06/23	Time 14:00	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH S3X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH S3
Road:	Sneakeat Road	Inspected Length:	15.50 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	15.50 m	Downstream Node:	MH S4
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	375 mm Width: 375 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:

Recommendations:

Scale:	1:135	Position [m]	Code	Observation	MPEG	Photo	Grade		
<p>Depth: m MH S3</p>									
	0.00	MH	Start node, manhole, reference: MH S3	00:00:10					
	4.90	JN	Junction at 2 o'clock, 150mm dia	00:00:41					
	15.50	MHF	Finish node, manhole, reference: MH S4	00:02:23					
<p>MH S4 Depth: m</p>									
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 14	Insp. No. 1	Date 15/06/23	Time 14:08	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH S2X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Upstream	Upstream Node:	MH S2
Road:	Sneakeat Road	Inspected Length:	18.30 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	18.30 m	Downstream Node:	MH S3
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	300 mm Width: 300 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

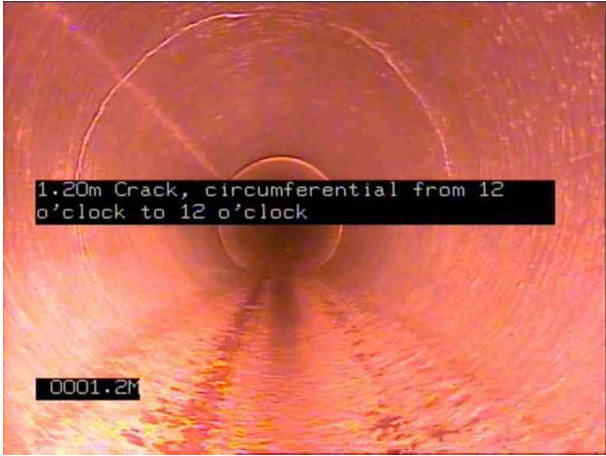
Comments:**Recommendations:**

Scale:	1:159	Position [m]	Code	Observation	MPEG	Photo	Grade																								
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Depth: m</p> <p>MH S3</p> </div> <table border="1"> <tr> <td>0.00</td> <td>MH</td> <td>Start node, manhole, reference: MH S3</td> <td>00:00:09</td> <td></td> <td></td> </tr> <tr> <td>1.20</td> <td>CC</td> <td>Crack, circumferential from 12 o'clock to 12 o'clock</td> <td>00:00:28</td> <td></td> <td>2 / 2</td> </tr> <tr> <td>11.60</td> <td>JN</td> <td>Junction at 10 o'clock, 100mm dia</td> <td>00:01:27</td> <td></td> <td></td> </tr> <tr> <td>18.30</td> <td>MHF</td> <td>Finish node, manhole, reference: MH S2: Buried</td> <td>00:02:01</td> <td></td> <td></td> </tr> </table> </div>								0.00	MH	Start node, manhole, reference: MH S3	00:00:09			1.20	CC	Crack, circumferential from 12 o'clock to 12 o'clock	00:00:28		2 / 2	11.60	JN	Junction at 10 o'clock, 100mm dia	00:01:27			18.30	MHF	Finish node, manhole, reference: MH S2: Buried	00:02:01		
0.00	MH	Start node, manhole, reference: MH S3	00:00:09																												
1.20	CC	Crack, circumferential from 12 o'clock to 12 o'clock	00:00:28		2 / 2																										
11.60	JN	Junction at 10 o'clock, 100mm dia	00:01:27																												
18.30	MHF	Finish node, manhole, reference: MH S2: Buried	00:02:01																												
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade																						
1	10.0	0.5	10.0	2.0	1	1.0	0.1	1.0	2.0																						



Section Pictures - 6/15/2023 - MH S2X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
14	Upstream	MH S2X		33884



MH

S2X_800260c4-c07f-4107-a4ec-0df9db68a9b2_20230615_19
1152_545.jpg, 00:00:28, 1.20 m



Completed section inspection

Item No. 15	Insp. No. 1	Date 15/06/23	Time 14:30	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH S1X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH S1
Road:	Sneakeat Road	Inspected Length:	44.30 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	44.30 m	Downstream Node:	MH S2
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	225 mm Width: 225 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:

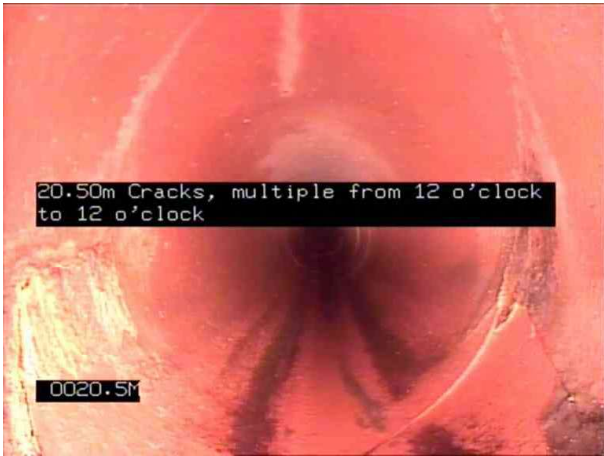
Recommendations:

Scale: 1:384	Position [m]	Code	Observation	MPEG	Photo	Grade			
<p>Depth: m MH S1</p>									
	0.00	MH	Start node, manhole, reference: MH S1	00:00:11					
	20.50	CM	Cracks, multiple from 12 o'clock to 12 o'clock	00:01:45		3 / 2			
	22.20	JN	Junction at 2 o'clock, 150mm dia	00:01:58					
	23.60	CM	Cracks, multiple from 12 o'clock to 12 o'clock	00:02:13		3 / 2			
	26.00	JN	Junction at 11 o'clock, 150mm dia	00:02:30					
	44.30	MHF	Finish node, manhole, reference: MH S2: Buried	00:04:01					
<p>MH S2 Depth: m</p>									
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	40.0	1.8	80.0	3.0	2	1.0	0.0	2.0	2.0



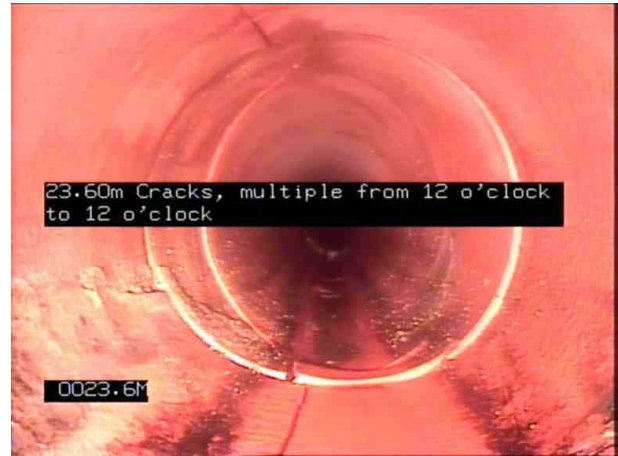
Section Pictures - 6/15/2023 - MH S1X

Item No.	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
15	Downstream	MH S1X		33884



MH

S1X_cf33a996-a7df-4a86-a3d3-1aa8c43f2ec7_20230615_191213_943.jpg, 00:01:45, 20.50 m



MH

S1X_263130bd-fda0-4778-9d8e-105c846b918c_20230615_191239_467.jpg, 00:02:13, 23.60 m



Completed section inspection

Item No. 16	Insp. No. 1	Date 15/06/23	Time 14:17	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MAIN LINEYX
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Upstream	Upstream Node:	MAIN LINEY
Road:	Sneakeat Road	Inspected Length:	42.90 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	42.90 m	Downstream Node:	MH S1
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Surface water	Pipe Shape:	Circular	Dia/Height:	225 mm Width: 225 mm
Type of Pipe:	Gravity drain/sewer	Material:	Vitrified clay	Lining Type:	No Lining
Flow Control:	No flow control	Lining Material:	No Lining		
Year Constructed:	Not Specified				
Inspection Purpose:	Sample condition survey				

Comments:

Recommendations:

Scale:	1:372	Position [m]	Code	Observation	MPEG	Photo	Grade		
<p>Depth: m MH S1</p>									
	0.00	MH	Start node, manhole, reference: MH S1	00:00:09					
	2.10	JN	Junction at 2 o'clock, 150mm dia	00:00:28					
	21.00	JN	Junction at 9 o'clock, 150mm dia	00:01:55					
	33.00	JN	Junction at 2 o'clock, 150mm dia	00:02:58					
	42.90	MHF	Finish node, manhole, reference: Main LineY: End of Line	00:03:53					
<p>Main LineY Depth: m</p>									
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Completed section inspection

Item No. 17	Insp. No. 1	Date 15/06/23	Time 14:43	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned Yes	PLR MH F4X
Operator L Hilton		Vehicle PK65 HFB		Camera P235 Flexi-Rod	Preset Length Not Specified	Legal Status Private Sewer	Alternative ID Not Specified

Town or Village:	Whitehaven	Inspection Direction:	Downstream	Upstream Node:	MH F4
Road:	Sneakeat Road	Inspected Length:	12.30 m	Upstream Pipe Depth:	
Location:	Footway	Total Length:	12.30 m	Downstream Node:	MH F5
Surface Type:		Joint Length:		Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	150 mm	Width:	150 mm
Flow Control:	No flow control	Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Sample condition survey	Lining Material:	No Lining		

Comments:
Recommendations:

Scale:	1:107	Position [m]	Code	Observation	MPEG	Photo	Grade		
<p>Depth: m MH F4</p>									
		0.00	MH	Start node, manhole, reference: MH F4	00:00:10				
		12.30	MHF	Finish node, manhole, reference: MH F5: Buried	00:01:00				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



WinCan

Drain-Alert Ltd
Cripplegate Lane, Houghton
Tel. 0800 616222



Manhole Record Card

Number	MHF1	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 400	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.RegCourses	<input type="text" value=""/>	Segments	<input type="checkbox"/>
		No.Land	<input type="text" value="0"/>	Step Irons	<input type="checkbox"/>
		Ladder	<input type="checkbox"/>		

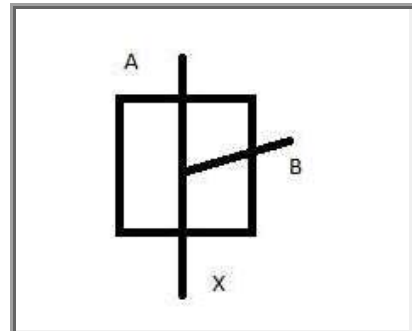
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-1.950	1.95	MH				C			150		VC	
B	-1.050	1.05	MH				C			100		VC	
X	-1.980	1.98				MHF2	C			150		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF2	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 400	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.RegCourses	<input type="text"/>	Segments	<input type="checkbox"/>
		No.Land	0	Step Irons	<input checked="" type="checkbox"/>
		Ladder	<input type="checkbox"/>		

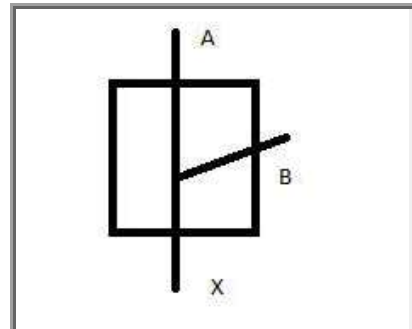
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-2.180	2.18	MHF1				C			150		VC	
B	-1.420	1.42	MH				C			100		VC	
X	-2.210	2.21			MHF3		C			150		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF3	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 400	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.RegCourses	<input type="text"/>	Segments	<input type="checkbox"/>
		No.Land	0	Step Irons	<input type="checkbox"/>
		Ladder	<input type="checkbox"/>		

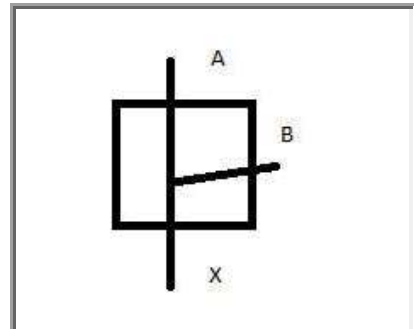
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-2.340	2.34	MHF2				C			150		VC	
B	-1.400	1.40					C			100		VC	
X	-2.450	2.45			MHF4		C			150		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	<input type="text" value="MHS1"/>	Date Of Survey	<input type="text" value="15/06/2023"/>
Status	<input type="text" value="PR"/>	Function	<input type="text" value="F"/>
		Type	<input type="text" value="M"/>

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	<input type="text" value="600"/> X <input type="text" value="400"/>	Chamber	<input type="text" value="0"/> X <input type="text" value="0"/>	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	<input type="text" value="0"/> X <input type="text" value="0"/>	ShaftDepth	<input type="text" value="0"/>	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	<input type="text" value="0"/>	Step Irons	<input checked="" type="checkbox"/>
		Segments	<input type="checkbox"/>	No.RegCourses	<input type="text"/>
		Ladder	<input type="checkbox"/>		

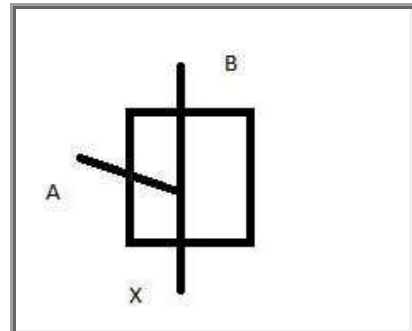
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	<input type="text" value="OK"/>	Shaft	<input type="text" value="OK"/>
Irons/Ladder	<input type="text" value="OK"/>	Chamber	<input type="text" value="OK"/>
Benching/Channel	<input type="text" value="OK"/>		

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	-1.880	1.88	GULLY		C		100	VC	
B	-2.000	2.00	main line y		C		225	VC	
X	-2.050	2.05		MHS2	C		225	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF4	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 400	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	0	Step Irons	<input type="checkbox"/>
		Segments	<input type="checkbox"/>	No.RegCourses	<input type="text"/>
		Ladder	<input type="checkbox"/>		

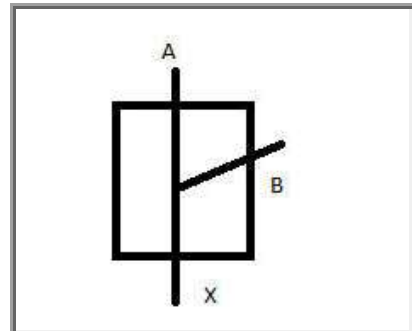
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	-2.550	2.55	MHF3		C		150	VC	
B	-1.120	1.12	MH		C		100	VC	
X	0.000	0.00		MHF2	C		150	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	<input type="text" value="MHS3"/>	Date Of Survey	<input type="text" value="15/06/2023"/>
Status	<input type="text" value="PR"/>	Function	<input type="text" value="S"/>
		Type	<input type="text" value="M"/>

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	<input type="text" value="600"/> X <input type="text" value="400"/>	Chamber	<input type="text" value="0"/> X <input type="text" value="0"/>	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	<input type="text" value="0"/> X <input type="text" value="0"/>	ShaftDepth	<input type="text" value="0"/>	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	<input type="text" value="0"/>	Step Irons	<input checked="" type="checkbox"/>
		Segments	<input type="checkbox"/>	No.RegCourses	<input type="text"/>
		Ladder	<input type="checkbox"/>		

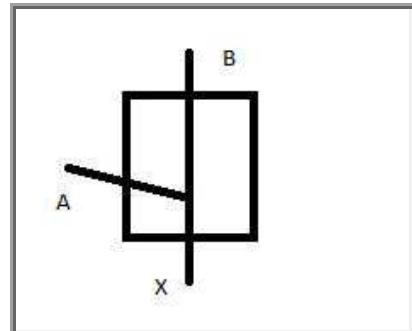
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	<input type="text" value="OK"/>	Shaft	<input type="text" value="OK"/>
Irons/Ladder	<input type="text" value="OK"/>	Chamber	<input type="text" value="OK"/>
Benching/Channel	<input type="text" value="OK"/>		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-2.500	2.50	redundant				C				100	VC	
B	-1.500	1.50	MHS2				C				300	VC	
X	-2.700	2.70				MHS4	C				375	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF6	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 400	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	0	Step Irons	<input checked="" type="checkbox"/>
		Segments	<input type="checkbox"/>	No.RegCourses	<input type="text"/>
		Ladder	<input type="checkbox"/>		

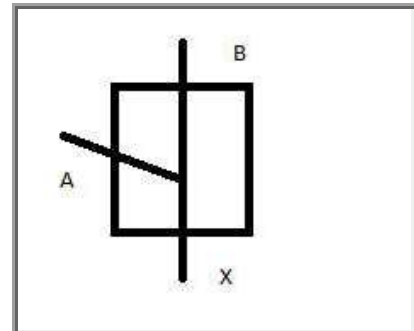
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRe	Downstream	Pipe Sh	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	-2.420	2.42	MHF7		C		150	VC	
B	-1.100	1.10	MHF5		C		150	VC	
X	-2.570	2.57		MHF8	C		150	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF7	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	600 X 600	Chamber	0 X 0	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	0	Step Irons	<input type="checkbox"/>
		Segments	<input type="checkbox"/>	No.RegCourses	<input type="text"/>
		Ladder	<input type="checkbox"/>		

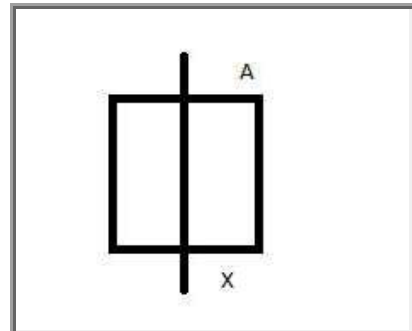
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-1.210	1.21	redundant				C			150		VC	
X	-1.230	1.23			MHF6		C			150		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	<input type="text" value="MHS4"/>	Date Of Survey	<input type="text" value="15/06/2023"/>
Status	<input type="text" value="PR"/>	Function	<input type="text" value="S"/>
		Type	<input type="text" value="M"/>

Cover Details:

Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable

CoverLevel Cover Load Class

Cover	<input type="text" value="600"/> X <input type="text" value="400"/>	Chamber	<input type="text" value="0"/> X <input type="text" value="0"/>	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	<input type="text" value="0"/> X <input type="text" value="0"/>	ShaftDepth	<input type="text" value="0"/>	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.RegCourses	<input type="text"/>	Segments	<input type="checkbox"/>
		No.Land	<input type="text" value="0"/>	Step Irons	<input checked="" type="checkbox"/>
		Ladder	<input type="checkbox"/>		

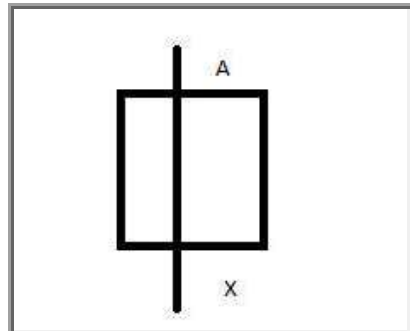
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	<input type="text" value="OK"/>	Shaft	<input type="text" value="OK"/>
Irons/Ladder	<input type="text" value="OK"/>	Chamber	<input type="text" value="OK"/>
Benching/Channel	<input type="text" value="OK"/>		

Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-1.510	1.51	MHS3				C			300			
X	-2.120	2.12			BMH		C			375		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.



Manhole Record Card

Number	MHF8	Date Of Survey	15/06/2023
Status	PR	Function	F
		Type	M

Cover Details:
 Square Recta Double Triang Single Triangl Circular Multiple Hinged Lockable
 CoverLevel Cover Load Class

Cover	<input type="text" value="600"/> X <input type="text" value="400"/>	Chamber	<input type="text" value="0"/> X <input type="text" value="0"/>	EvidenceOfSurcharge	<input type="checkbox"/>
Shaft	<input type="text" value="0"/> X <input type="text" value="0"/>	ShaftDepth	<input type="text" value="0"/>	ToxicAtmosphere	<input type="checkbox"/>
Brick	<input checked="" type="checkbox"/>	Precast Concrete	<input type="checkbox"/>	PVC	<input type="checkbox"/>
Reducing Slab	<input type="checkbox"/>	Taper	<input type="checkbox"/>	Side Entry	<input type="checkbox"/>
		No.Land	<input type="text" value="0"/>	Step Irons	<input checked="" type="checkbox"/>
				Ladder	<input type="checkbox"/>

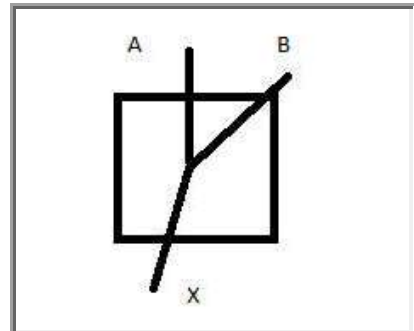
PlanPhoto



LocationPhoto



PlanofManhol



Chamber Conditions:

Cover	<input type="text" value="OK"/>	Shaft	<input type="text" value="OK"/>
Irons/Ladder	<input type="text" value="OK"/>	Chamber	<input type="text" value="OK"/>
Benching/Channel	<input type="text" value="OK"/>		

--	--	--	--	--	--	--	--	--	--	--

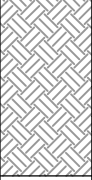





Pipe	Invert L	Depth	Fr	Upstream	Re	Downstream	Pipe Sh	Size	Height	Size	Width	Pipe Material	Lining Material
A	-1.210	1.21	MHF6				C			150		VC	
B	-1.710	1.71	MH				C			100		PVC	
X	-1.900	1.90				BMH	C			150		VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Appendix E: - Trial Hole Investigation Logs

TRIAL PIT LOG

LOCATION ID:	PROJECT No:	2020.221		
TPO 1 SITE 2	PROJECT TITLE	SNECKYEAT INDUSTRIAL ESTATE, WHITEHAVEN		
	CLIENT	NORTHERN TRUST		
	PLANT		START & END DATE	04.11.20
GROUND LEVEL (m AOD)				

STRATA					SAMPLES			IN-SITU TESTS			
GROUND WATER STRIKE	BACKFILL	LEVEL (m AOD)	DESCRIPTION	LEGEND	DEPTH (m BGL)	TYPE	FROM (m)	TO (m)	TYPE	DEPTH (m)	RESULT
			Grass over soft dark brown sandy slightly CLAY with abundant rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse. (Topsoil)		0.20						
			General Fill material comprising bricks/concrete and general builders waste (Hardcore)		0.60						
			Thin layer Soft to Firm dark orangish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Sand is fine and medium.		0.80						
			Graded Limestone MOT Material		0.90						
			Thin layer Soft to Firm dark orangish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Sand is fine and medium.		1.20						
			Hole Terminated at 1.20m BGL								

REMARKS

Reason for Termination:
Target depth reached.

Groundwater Notes:
No groundwater encountered.

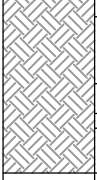

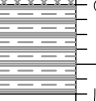

Other Remarks:

GRAHAM SCHOFIELD ASSOCIATES
Consulting Civil and Structural Engineers
 Suite 3 Balfour Court
 Off Hough Lane
 Leyland
 PR25 2TF
 tel: (01772) 459383
 email: reception@gsa72.co.uk

GSA

TRIAL PIT LOG

LOCATION ID:	PROJECT No:	2020.221		
TPO2 SITE 2	PROJECT TITLE	SNECKYEAT INDUSTRIAL ESTATE, WHITEHAVEN		
	CLIENT	NORTHERN TRUST		
	PLANT		START & END DATE	04.11.20
GROUND LEVEL (m AOD)				

STRATA					SAMPLES			IN-SITU TESTS			
GROUND WATER STRIKE	BACKFILL	LEVEL (m AOD)	DESCRIPTION	LEGEND	DEPTH (m BGL)	TYPE	FROM (m)	TO (m)	TYPE	DEPTH (m)	RESULT
			Grass over soft dark brown sandy slightly CLAY with abundant rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse. (Topsoil)		0.15						
			General Fill material comprising LIMESTONE bricks/concrete and general builders waste (Hardcore)		0.60						
			Thin layer Soft to Firm dark orangish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Sand is fine and medium.		1.20						
			Hole Terminated at 1.20m BGL								

REMARKS

Reason for Termination:
Target depth reached.

Groundwater Notes:
No groundwater encountered.

Other Remarks:

GRAHAM SCHOFIELD ASSOCIATES
Consulting Civil and Structural Engineers

Suite 3 Balfour Court
Off Hough Lane
Leyland
PR25 2TF
tel: (01772) 459383
email: reception@gsa72.co.uk

GSA

Appendix F: - HR Wallingford Greenfield Runoff Rate Estimation for Sites

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	1188	1188
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.31	3.31
1 in 1 year (l/s):	2.88	2.88
1 in 30 years (l/s):	5.62	5.62
1 in 100 year (l/s):	6.88	6.88
1 in 200 years (l/s):	7.84	7.84

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix G: - Proposed Drainage Strategy and Calculations

- NOTES**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS.
 - ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND ANY DISCREPANCIES IDENTIFIED PRIOR TO COMMENCEMENT OF WORK.
 - ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
 - ALL LEVELS IN METRES UNLESS NOTED OTHERWISE.

DRAINAGE LEGEND

	EXISTING PRIVATE SURFACE WATER
	EXISTING PRIVATE FOUL WATER
	PROPOSED PRIVATE SURFACE WATER
	PROPOSED PRIVATE FOUL WATER
	RAIN WATER PIPE
	RWP
	RWP
	SOIL AND VENT PIPE
	GULLY

REFERENCES

2022-262-C001 - BATHWORKS LAYOUT SHOWING BLOCKS 1 AND 2
 2022-262-C003 - BATHWORKS LAYOUT SHOWING BLOCK 3
 2022-262-C004 - SITE SECTIONS SHEET 2 OF 2
 2022-262-C005 - SITE 1 DRAINAGE STRATEGY
 2022-262-C006 - SITE 2 DRAINAGE STRATEGY

RESIDUAL RISKS

NO.	DESCRIPTION	STATUS

PLANNING

GRAMM SCHOFIELD ASSOCIATES
 Civil, Environmental and Structural Engineers
 5th Floor, 54 Colindale Avenue, London NW9 1QH
 Tel: 01753 650000
 Fax: 01753 650001
 www.grammschofield.co.uk

GSA

client: **NORTHERN TRUST**

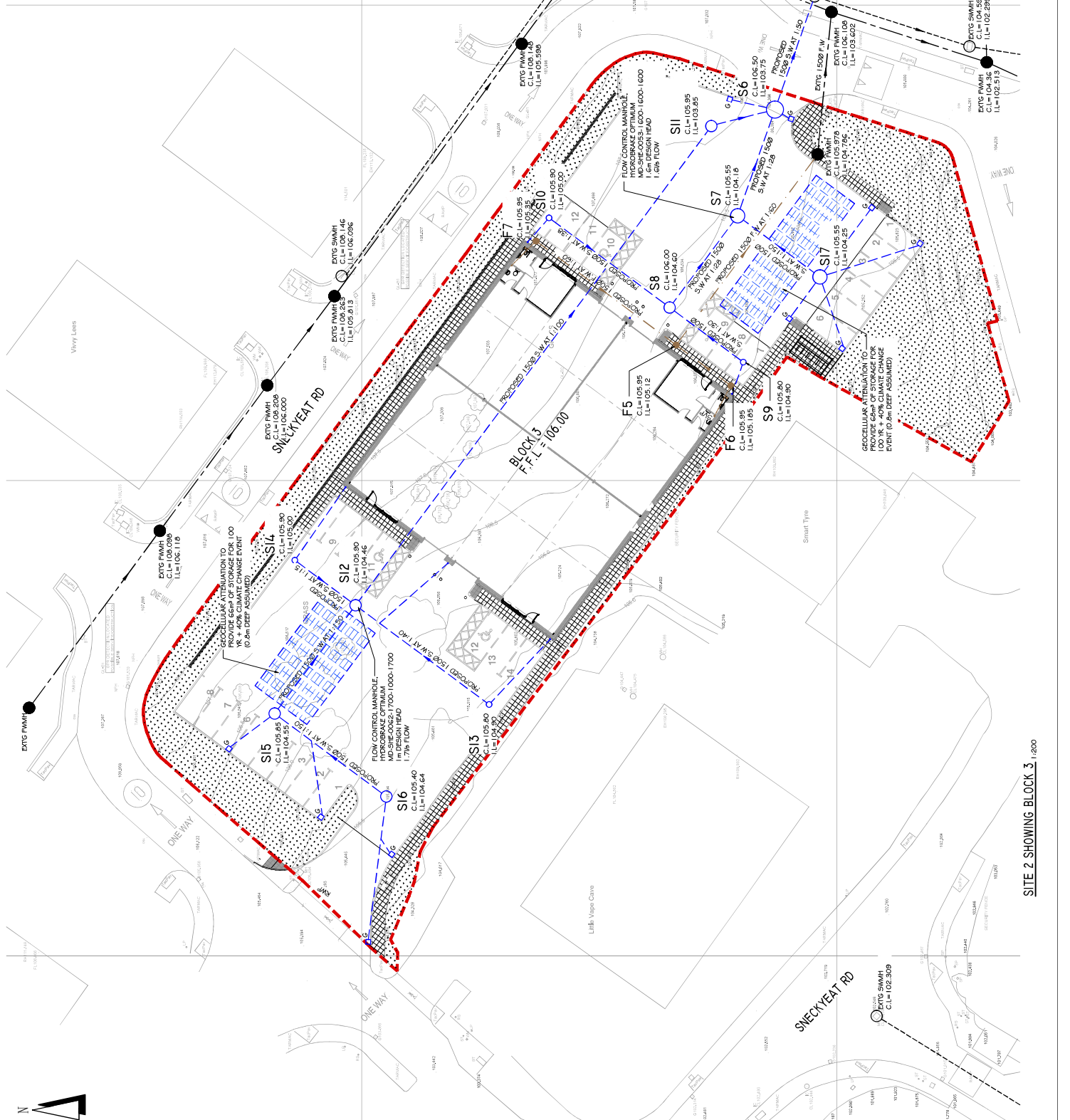
Project: **PROPOSED INDUSTRIAL UNITS
 SNECKYEAT INDUSTRIAL ESTATE
 WHITEHAVEN**

title: **SITE 2
 PROPOSED DRAINAGE STRATEGY**


Drawn By:	checked By:	drawing number:
date:	date:	2022-262-C006
		A.1.



KEY PLAN 1:2500



SITE 2 SHOWING BLOCK 3 1:200

Graham Schofield Associates		Page 1
72 Balcarres Road Leyland Lancashire PR25 3ED	Northern Trust Proposed Commercial Units Sneckyeat Industrial Estate	
Date 07/10/2020 File Proposed Drainage Networks	Designed by O. Clark Checked by G. Scofield	
XP Solutions	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Block 1 - West SW







Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.258	Minimum Backdrop Height (m)	0.600
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Block 1 - West SW

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
S11.000	22.000	0.376	58.5	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
S12.000	3.630	0.076	47.8	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
S11.001	16.769	1.209	13.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S13.000	14.216	0.095	150.0	0.060	5.00	0.0	0.600	o	150	Pipe/Conduit	
S11.002	11.920	0.397	30.0	0.009	0.00	0.0	0.600	o	150	Pipe/Conduit	
S11.003	8.836	0.275	32.1	0.012	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)
S11.000	43.97	5.28	105.785	0.033	0.0	0.0	0.0	1.32	23.3	3.9
S12.000	44.71	5.04	105.485	0.020	0.0	0.0	0.0	1.46	25.8	2.4
S11.001	43.66	5.38	105.409	0.053	0.0	0.0	0.0	2.72	48.1	6.3
S13.000	43.93	5.29	104.295	0.060	0.0	0.0	0.0	0.82	14.5	7.1
S11.002	43.34	5.49	104.200	0.122	0.0	0.0	0.0	1.84	32.6	14.3
S11.003	43.09	5.57	103.803	0.134	0.0	0.0	0.0	1.78	31.5	15.6

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneckyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

Manhole Schedules for Block 1 - West SW

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)	Backdrop (mm)
S11	106.685	0.900	Open Manhole	600	S11.000	105.785	150				
S12	106.685	1.200	Open Manhole	600	S12.000	105.485	150				
S13	106.685	1.276	Open Manhole	600	S11.001	105.409	150	S11.000	105.409	150	
								S12.000	105.409	150	
S14	106.310	2.015	Open Manhole	1200	S13.000	104.295	150				
S15	105.400	1.200	Open Manhole	1800	S11.002	104.200	150	S11.001	104.200	150	
								S13.000	104.200	150	
S16	105.300	1.497	Open Manhole	1800	S11.003	103.803	150	S11.002	103.803	150	
S17	104.700	1.172	Open Manhole	1200		OUTFALL		S11.003	103.528	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S11	299094.686	516302.580	299094.686	516302.580	Required	
S12	299079.318	516281.962	299079.318	516281.962	Required	
S13	299081.490	516284.876	299081.490	516284.876	Required	
S14	299076.533	516306.284	299076.533	516306.284	Required	
S15	299068.047	516294.879	299068.047	516294.879	Required	
S16	299057.113	516299.655	299057.113	516299.655	Required	
S17	299049.015	516303.190			No Entry	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

PIPELINE SCHEDULES for Block 1 - West SW

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)
S11.000	o	150	S11	106.685	105.785	0.750	Open Manhole	600
S12.000	o	150	S12	106.685	105.485	1.050	Open Manhole	600
S11.001	o	150	S13	106.685	105.409	1.126	Open Manhole	600
S13.000	o	150	S14	106.310	104.295	1.865	Open Manhole	1200
S11.002	o	150	S15	105.400	104.200	1.050	Open Manhole	1800
S11.003	o	150	S16	105.300	103.803	1.347	Open Manhole	1800

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)
S11.000	22.000	58.5	S13	106.685	105.409	1.126	Open Manhole	600
S12.000	3.630	47.8	S13	106.685	105.409	1.126	Open Manhole	600
S11.001	16.769	13.9	S15	105.400	104.200	1.050	Open Manhole	1800
S13.000	14.216	150.0	S15	105.400	104.200	1.050	Open Manhole	1800
S11.002	11.920	30.0	S16	105.300	103.803	1.347	Open Manhole	1800
S11.003	8.836	32.1	S17	104.700	103.528	1.022	Open Manhole	1200

Free Flowing Outfall Details for Block 1 - West SW

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	----------	--------

S11.003 S17 104.700 103.528 103.162 1200 0

Simulation Criteria for Block 1 - West SW

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	16.000	Storm Duration (mins)	30
Ratio R	0.260		

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneckyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

Online Controls for Block 1 - West SW

Hydro-Brake® Optimum Manhole: S16, DS/PN: S11.003, Volume (m³): 4.0

Unit Reference MD-SHE-0062-1700-1000-1700
 Design Head (m) 1.000
 Design Flow (l/s) 1.7
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 62
 Invert Level (m) 103.803
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.7	Kick-Flo®	0.549	1.3
Flush-Flo™	0.270	1.6	Mean Flow over Head Range	-	1.4

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)	Depth (m)	Flow (l/s)
0.100	1.4	0.800	1.5	2.000	2.3	4.000	3.2	7.000	4.2
0.200	1.6	1.000	1.7	2.200	2.4	4.500	3.4	7.500	4.3
0.300	1.6	1.200	1.8	2.400	2.5	5.000	3.6	8.000	4.4
0.400	1.5	1.400	2.0	2.600	2.6	5.500	3.7	8.500	4.6
0.500	1.4	1.600	2.1	3.000	2.8	6.000	3.9	9.000	4.7
0.600	1.3	1.800	2.2	3.500	3.0	6.500	4.0	9.500	4.8

72 Balcarres Road
Leyland
Lancashire PR25 3ED

Northern Trust
Proposed Commercial Units
Sneckyeat Industrial Estate



Date 07/10/2020

Designed by O. Clark

File Proposed Drainage Networks

Checked by G. Scofield

XP Solutions

Network 2020.1

Storage Structures for Block 1 - West SW

Cellular Storage Manhole: S15, DS/PN: S11.002

Invert Level (m) 104.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	82.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	82.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	82.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	82.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	82.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
0.801	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - West SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S11.000	S11	15 Winter	1	+0%					105.823	-0.112
S12.000	S12	15 Winter	1	+0%					105.518	-0.117
S11.001	S13	15 Winter	1	+0%					105.443	-0.116
S13.000	S14	15 Winter	1	+0%	30/15 Winter				104.365	-0.080
S11.002	S15	120 Winter	1	+0%	30/30 Summer				104.285	-0.065
S11.003	S16	120 Winter	1	+0%	1/15 Summer				104.280	0.327

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m ³)	Flow / Cap. (l/s)	Time (mins)	Flow (l/s)			
S11.000	S11	0.000	0.14			3.2	OK	
S12.000	S12	0.000	0.11			1.9	OK	
S11.001	S13	0.000	0.11			5.0	OK	
S13.000	S14	0.000	0.43			5.7	OK	
S11.002	S15	0.000	0.11			61 3.3	OK	
S11.003	S16	0.000	0.06			1.5	SURCHARGED	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - West SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S11.000	S11	15 Winter	2	+0%					105.829	-0.106
S12.000	S12	15 Winter	2	+0%					105.523	-0.112
S11.001	S13	15 Winter	2	+0%					105.447	-0.112
S13.000	S14	15 Winter	2	+0%	30/15 Winter				104.376	-0.069
S11.002	S15	180 Winter	2	+0%	30/30 Summer				104.325	-0.025
S11.003	S16	180 Winter	2	+0%	1/15 Summer				104.320	0.367

PN	US/MH Name	Flooded			Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)		
S11.000	S11	0.000	0.19			4.1	OK	
S12.000	S12	0.000	0.14			2.5	OK	
S11.001	S13	0.000	0.15			6.5	OK	
S13.000	S14	0.000	0.55			7.4	OK	
S11.002	S15	0.000	0.10		91	2.8	OK	
S11.003	S16	0.000	0.06			1.5	SURCHARGED	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - West SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S11.000	S11	15 Winter	30	+0%					105.846	-0.089
S12.000	S12	15 Winter	30	+0%					105.538	-0.097
S11.001	S13	15 Winter	30	+0%					105.463	-0.096
S13.000	S14	240 Winter	30	+0%	30/15 Winter				104.530	0.085
S11.002	S15	240 Winter	30	+0%	30/30 Summer				104.527	0.177
S11.003	S16	240 Winter	30	+0%	1/15 Summer				104.523	0.570

PN	US/MH Name	Flooded			Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)		
S11.000	S11	0.000	0.35			7.6	OK	
S12.000	S12	0.000	0.27			4.6	OK	
S11.001	S13	0.000	0.27			12.1	OK	
S13.000	S14	0.000	0.27			3.5	SURCHARGED	
S11.002	S15	0.000	0.09		204	2.5	SURCHARGED	
S11.003	S16	0.000	0.06			1.5	SURCHARGED	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/10/2020
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - West SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S11.000	S11	15 Winter	100	+40%					105.871	-0.064
S12.000	S12	15 Winter	100	+40%					105.559	-0.076
S11.001	S13	15 Winter	100	+40%					105.484	-0.075
S13.000	S14	360 Winter	100	+40%	30/15 Winter				104.958	0.513
S11.002	S15	360 Winter	100	+40%	30/30 Summer				104.955	0.605
S11.003	S16	360 Winter	100	+40%	1/15 Summer				104.949	0.996

PN	US/MH Name	Flooded			Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)		
S11.000	S11	0.000	0.62			13.6	OK	
S12.000	S12	0.000	0.48			8.3	OK	
S11.001	S13	0.000	0.49			21.7	OK	
S13.000	S14	0.000	0.37			4.9	SURCHARGED	
S11.002	S15	0.000	0.06		340	1.9	SURCHARGED	
S11.003	S16	0.000	0.07			1.8	SURCHARGED	

Technical Specification

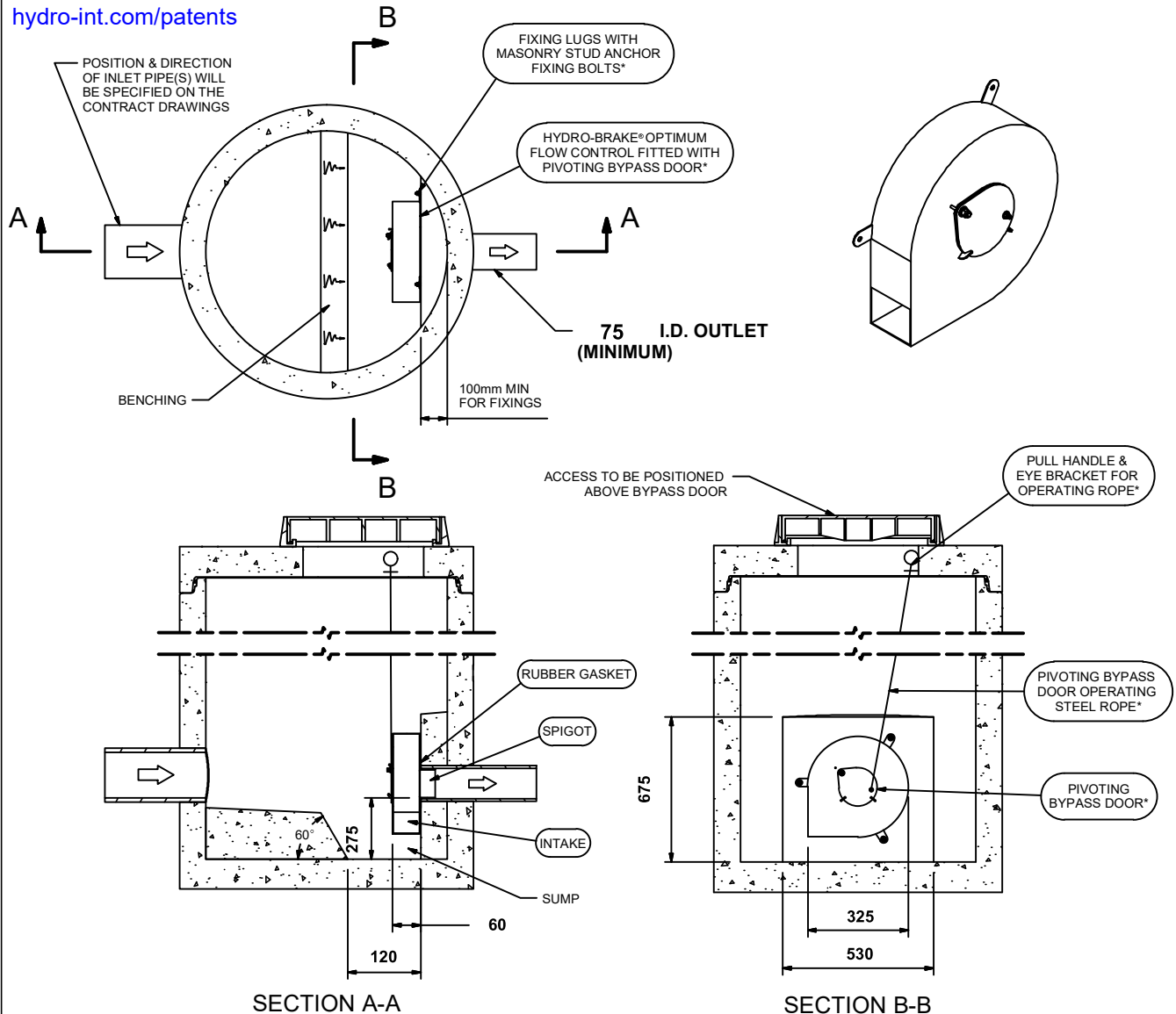
Control Point	Head (m)	Flow (l/s)
Primary Design	1.600	1.600
Flush-Flo™	0.234	1.130
Kick-Flo®	0.475	0.928
Mean Flow		1.202

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet



hydro-int.com/patents



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
 CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0053-1600-1600-1600 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**

DATE 10/7/2020 2:26 PM

SITE Sneckyeat Industrial Estate

DESIGNER Oliver Clark

REF 2020.221

SHE-0053-1600-1600-1600

Hydro-Brake® Optimum

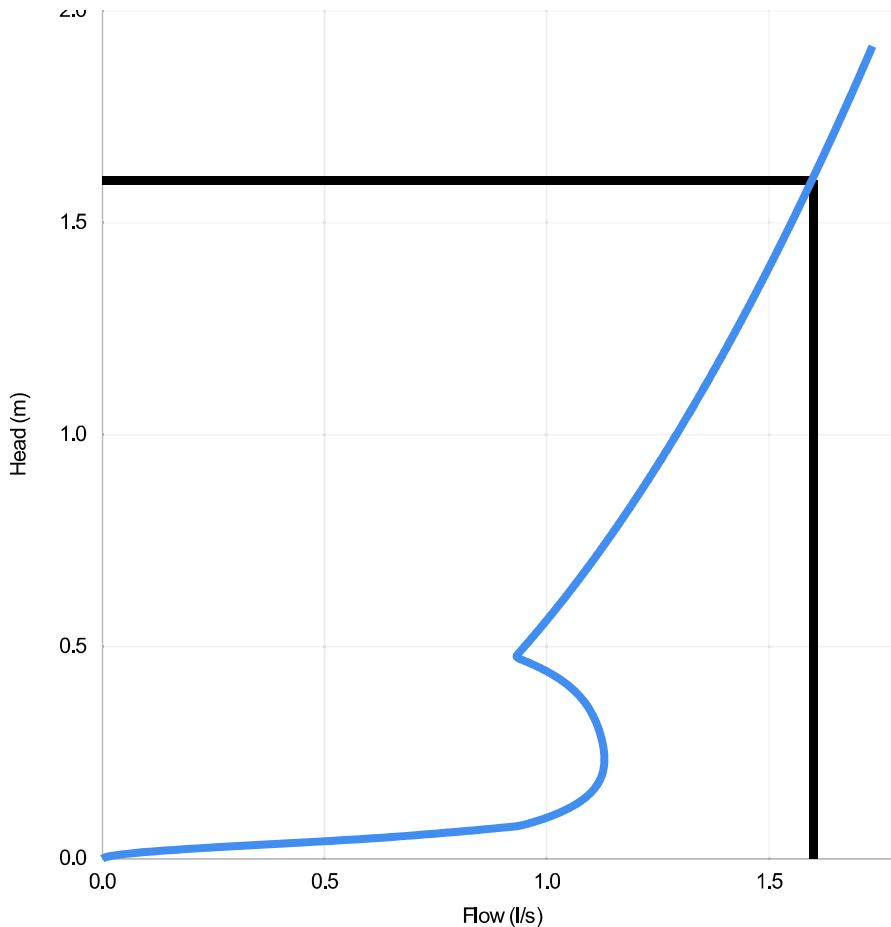
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.600	1.600
Flush-Flo	0.234	1.130
Kick-Flo®	0.475	0.928
Mean Flow		1.202



PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.055	0.700
0.110	1.032
0.166	1.107
0.221	1.129
0.276	1.125
0.331	1.107
0.386	1.072
0.441	1.001
0.497	0.946
0.552	0.991
0.607	1.034
0.662	1.075
0.717	1.113
0.772	1.151
0.828	1.187
0.883	1.221
0.938	1.255
0.993	1.287
1.048	1.319
1.103	1.350
1.159	1.380
1.214	1.409
1.269	1.437
1.324	1.465
1.379	1.493
1.434	1.519
1.490	1.545
1.545	1.571
1.600	1.596

DESIGN ADVICE




The head/flow characteristics of this SHE-0053-1600-1600-1600 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	07/10/2020 14:26
Site	Sneckyeat Industrial Estate
DESIGNER	Oliver Clark
Ref	2020.221

SHE-0053-1600-1600-1600
Hydro-Brake Optimum®

Graham Schofield Associates		Page 1
72 Balcarres Road Leyland Lancashire PR25 3ED	Northern Trust Proposed Commercial Units Sneckyeat Industrial Estate	
Date 07/01/2021 File Proposed Drainage Networks	Designed by O. Clark Checked by G. Scofield	
XP Solutions	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Block 1 - East SW







Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.260	Minimum Backdrop Height (m)	0.600
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	250

Designed with Level Soffits

Network Design Table for Block 1 - East SW

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	12.845	0.220	58.4	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	12.871	0.220	58.5	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	17.069	1.250	13.7	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	12.871	0.086	150.0	0.056	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	8.781	0.164	53.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	11.613	0.551	21.1	0.013	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)
S1.000	44.50	5.16	105.785	0.020	0.0	0.0	0.0	1.32	23.3	2.4
S2.000	44.50	5.16	105.785	0.021	0.0	0.0	0.0	1.32	23.3	2.5
S1.001	44.18	5.27	105.565	0.062	0.0	0.0	0.0	2.74	48.4	7.4
S3.000	44.19	5.26	104.401	0.056	0.0	0.0	0.0	0.82	14.5	6.7
S1.002	43.85	5.37	104.315	0.118	0.0	0.0	0.0	1.38	24.4	14.0
S1.003	43.59	5.46	104.151	0.131	0.0	0.0	0.0	2.20	38.9	15.5

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneckyeat Industrial Estate



Date 07/01/2021
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

Manhole Schedules for Block 1 - East SW

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)	Backdrop (mm)
S1	106.685	0.900	Open Manhole	600	S1.000	105.785	150				
S2	106.685	0.900	Open Manhole	600	S2.000	105.785	150				
S3	106.685	1.120	Open Manhole	1200	S1.001	105.565	150	S1.000	105.565	150	
								S2.000	105.565	150	
S4	105.735	1.334	Open Manhole	1200	S3.000	104.401	150				
S5	106.485	2.170	Open Manhole	1200	S1.002	104.315	150	S1.001	104.315	150	
								S3.000	104.315	150	
S6	106.150	1.999	Open Manhole	1800	S1.003	104.151	150	S1.002	104.151	150	
S7	105.600	2.000	Open Manhole	1200		OUTFALL		S1.003	103.600	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	299125.193	516279.923	299125.193	516279.923	Required	
S2	299109.897	516259.252	299109.897	516259.252	Required	
S3	299117.553	516269.598	299117.553	516269.598	Required	
S4	299123.591	516249.063	299123.591	516249.063	Required	
S5	299131.247	516259.409	299131.247	516259.409	Required	
S6	299138.292	516254.167	299138.292	516254.167	Required	
S7	299148.085	516247.925			No Entry	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/01/2021
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

PIPELINE SCHEDULES for Block 1 - East SW

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	150	S1	106.685	105.785	0.750	Open Manhole	600
S2.000	o	150	S2	106.685	105.785	0.750	Open Manhole	600
S1.001	o	150	S3	106.685	105.565	0.970	Open Manhole	1200
S3.000	o	150	S4	105.735	104.401	1.184	Open Manhole	1200
S1.002	o	150	S5	106.485	104.315	2.020	Open Manhole	1200
S1.003	o	150	S6	106.150	104.151	1.849	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	12.845	58.4	S3	106.685	105.565	0.970	Open Manhole	1200
S2.000	12.871	58.5	S3	106.685	105.565	0.970	Open Manhole	1200
S1.001	17.069	13.7	S5	106.485	104.315	2.020	Open Manhole	1200
S3.000	12.871	150.0	S5	106.485	104.315	2.020	Open Manhole	1200
S1.002	8.781	53.5	S6	106.150	104.151	1.849	Open Manhole	1800
S1.003	11.613	21.1	S7	105.600	103.600	1.850	Open Manhole	1200

Free Flowing Outfall Details for Block 1 - East SW

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

S1.003 S7 105.600 103.600 103.600 1200 0

Simulation Criteria for Block 1 - East SW

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	16.000	Storm Duration (mins)	30
Ratio R	0.260		

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneekyeat Industrial Estate



Date 07/01/2021
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

Online Controls for Block 1 - East SW

Hydro-Brake® Optimum Manhole: S6, DS/PN: S1.003, Volume (m³): 5.2

Unit Reference MD-SHE-0053-1600-1600-1600
 Design Head (m) 1.600
 Design Flow (l/s) 1.6
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 53
 Invert Level (m) 104.151
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	1.6	Kick-Flo®	0.475	0.9
Flush-Flo™	0.234	1.1	Mean Flow over Head Range	-	1.2

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)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.8	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	0.9	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.5
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.0	9.500	3.6

72 Balcarres Road
Leyland
Lancashire PR25 3ED

Northern Trust
Proposed Commercial Units
Sneckyeat Industrial Estate



Date 07/01/2021

Designed by O. Clark

File Proposed Drainage Networks

Checked by G. Scofield

XP Solutions

Network 2020.1

Storage Structures for Block 1 - East SW

Cellular Storage Manhole: S4, DS/PN: S3.000

Invert Level (m) 104.535 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	85.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	85.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	85.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	85.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	85.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
0.801	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

72 Balcarres Road
Leyland
Lancashire PR25 3ED

Northern Trust
Proposed Commercial Units
Sneckyeat Industrial Estate



Date 07/01/2021

Designed by O. Clark

File Proposed Drainage Networks

Checked by G. Scofield

XP Solutions

Network 2020.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - East SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
S1.000	S1	15 Winter	1	+0%					105.815	-0.120	0.000
S2.000	S2	15 Winter	1	+0%					105.816	-0.119	0.000
S1.001	S3	15 Winter	1	+0%					105.600	-0.115	0.000
S3.000	S4	180 Winter	1	+0%	1/15 Summer				104.615	0.064	0.000
S1.002	S5	180 Winter	1	+0%	1/15 Summer				104.614	0.149	0.000
S1.003	S6	180 Winter	1	+0%	1/15 Summer				104.611	0.310	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.09			1.9	OK	
S2.000	S2	0.10			2.0	OK	
S1.001	S3	0.12			5.6	OK	
S3.000	S4	0.08		89	1.0	SURCHARGED	
S1.002	S5	0.08			1.6	SURCHARGED	
S1.003	S6	0.03			1.1	SURCHARGED	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneckyeat Industrial Estate



Date 07/01/2021
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - East SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
S1.000	S1	15 Winter	2	+0%					105.819	-0.116	0.000
S2.000	S2	15 Winter	2	+0%					105.820	-0.115	0.000
S1.001	S3	15 Winter	2	+0%					105.606	-0.109	0.000
S3.000	S4	240 Winter	2	+0%	1/15 Summer				104.660	0.109	0.000
S1.002	S5	240 Winter	2	+0%	1/15 Summer				104.658	0.193	0.000
S1.003	S6	240 Winter	2	+0%	1/15 Summer				104.655	0.354	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.12			2.5	OK	
S2.000	S2	0.12			2.6	OK	
S1.001	S3	0.16			7.3	OK	
S3.000	S4	0.08		135	1.0	SURCHARGED	
S1.002	S5	0.07			1.6	SURCHARGED	
S1.003	S6	0.03			1.1	SURCHARGED	

72 Balcarres Road
Leyland
Lancashire PR25 3ED

Northern Trust
Proposed Commercial Units
Sneckyeat Industrial Estate



Date 07/01/2021
File Proposed Drainage Networks

Designed by O. Clark
Checked by G. Scofield

XP Solutions

Network 2020.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - East SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
S1.000	S1	15 Winter	30	+0%					105.833	-0.102	0.000
S2.000	S2	15 Winter	30	+0%					105.834	-0.101	0.000
S1.001	S3	15 Winter	30	+0%					105.624	-0.091	0.000
S3.000	S4	240 Winter	30	+0%	1/15 Summer				104.874	0.323	0.000
S1.002	S5	240 Winter	30	+0%	1/15 Summer				104.872	0.407	0.000
S1.003	S6	240 Winter	30	+0%	1/15 Summer				104.869	0.568	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.22			4.6	OK	
S2.000	S2	0.23			4.9	OK	
S1.001	S3	0.32			14.6	OK	
S3.000	S4	0.08		242	1.1	SURCHARGED	
S1.002	S5	0.07			1.4	SURCHARGED	
S1.003	S6	0.03			1.1	SURCHARGED	

72 Balcarres Road
 Leyland
 Lancashire PR25 3ED

Northern Trust
 Proposed Commercial Units
 Sneckyeat Industrial Estate



Date 07/01/2021
 File Proposed Drainage Networks

Designed by O. Clark
 Checked by G. Scofield

XP Solutions

Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Block 1 - East SW

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
 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 Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 16.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.259 Cv (Winter) 0.840

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

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, 2, 30, 100
 Climate Change (%) 0, 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
S1.000	S1	15 Winter	100	+40%					105.850	-0.085	0.000
S2.000	S2	15 Winter	100	+40%					105.852	-0.083	0.000
S1.001	S3	15 Winter	100	+40%					105.648	-0.067	0.000
S3.000	S4	480 Winter	100	+40%	1/15 Summer				105.330	0.779	0.000
S1.002	S5	480 Winter	100	+40%	1/15 Summer				105.328	0.863	0.000
S1.003	S6	480 Winter	100	+40%	1/15 Summer				105.324	1.023	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.39			8.3	OK	
S2.000	S2	0.41			8.7	OK	
S1.001	S3	0.58			26.2	OK	
S3.000	S4	0.10		470	1.3	SURCHARGED	
S1.002	S5	0.06			1.3	SURCHARGED	
S1.003	S6	0.04			1.4	SURCHARGED	

Technical Specification

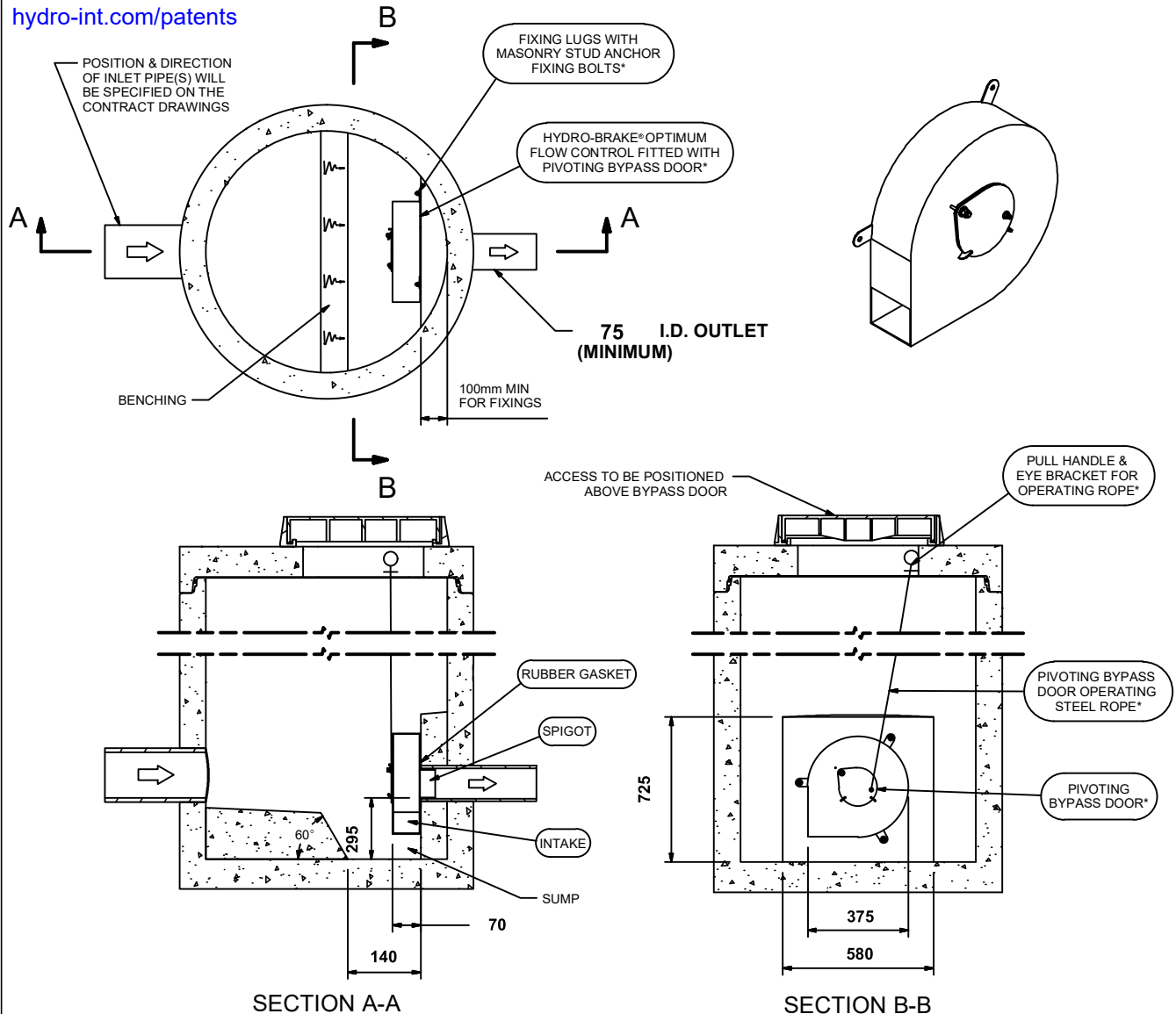
Control Point	Head (m)	Flow (l/s)
Primary Design	1.000	1.700
Flush-Flo™	0.270	1.591
Kick-Flo®	0.549	1.295
Mean Flow		1.433

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet



hydro-int.com/patents



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
 CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0062-1700-1000-1700 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International

DATE 10/7/2020 2:25 PM

SITE Sneckyeat Industrial Estate

DESIGNER Oliver Clark

REF 2020.221

SHE-0062-1700-1000-1700

Hydro-Brake® Optimum

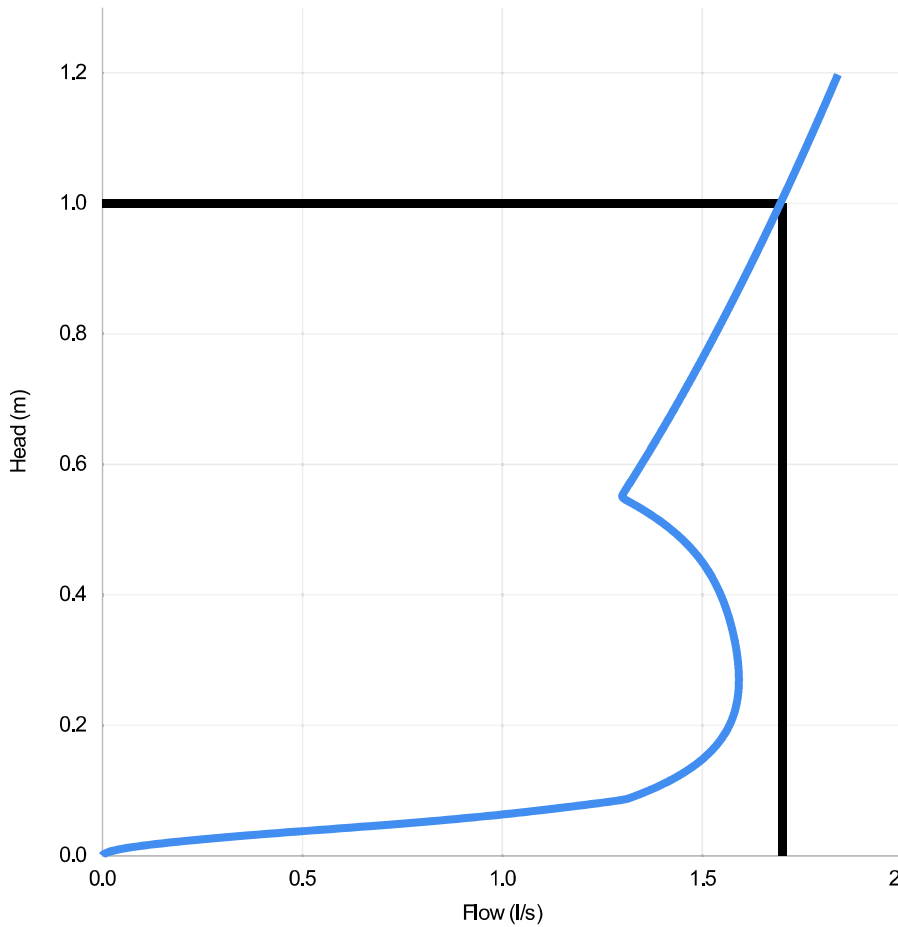
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.000	1.700
Flush-Flo	0.270	1.591
Kick-Flo®	0.549	1.295
Mean Flow		1.433



PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.034	0.431
0.069	1.084
0.103	1.379
0.138	1.479
0.172	1.539
0.207	1.573
0.241	1.588
0.276	1.591
0.310	1.586
0.345	1.575
0.379	1.559
0.414	1.536
0.448	1.502
0.483	1.454
0.517	1.385
0.552	1.299
0.586	1.334
0.621	1.368
0.655	1.402
0.690	1.434
0.724	1.466
0.759	1.497
0.793	1.527
0.828	1.556
0.862	1.585
0.897	1.613
0.931	1.641
0.966	1.668
1.000	1.695

DESIGN ADVICE

The head/flow characteristics of this SHE-0062-1700-1000-1700 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.



The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.



DATE	07/10/2020 14:25
Site	Sneckyeat Industrial Estate
DESIGNER	Oliver Clark
Ref	2020.221

SHE-0062-1700-1000-1700
Hydro-Brake Optimum®