

H1600

MFG LEVENSHULME SERVICE STATION

HYDRAULIC MODEL

MARKS HEELEY LTD

OCTOBER 2022

The Stables, Cannons Mill Lane, Bishops Stortford, Herts CM23 2BN
Tel: 01279 465900 Fax: 01279 465999

MARKS HEELEY

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Junctions Phase: Phase	Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)
Manhole	Manhole	-61761.188	-121776.138	58.00	1.20
Manhole (1)	Manhole	-61768.12	-121765.321	58.00	1.07
Manhole (2)	Manhole	-61768.955	-121763.15	58.00	1.05
Manhole (3)	Manhole	-61770.96	-121755.34	58.00	0.65
Manhole (4)	Manhole	-61764.737	-121748.533	58.20	0.60
Manhole (5)	Manhole	-61774.134	-121743.396	58.00	0.40

Name	Invert Level (m)	Chamber Shape	Diameter (m)	Manhole Locked
Manhole	56.80	Circular	1.20	☒
Manhole (1)	56.93	Circular	1.20	☒
Manhole (2)	56.95	Circular	1.20	☒
Manhole (3)	57.35	Circular	1.20	☒
Manhole (4)	57.60	Circular	0.30	☒
Manhole (5)	57.60	Circular	0.30	☒

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Manhole	Inlet	Pipe (3)	(None)	No Restriction
Manhole (1)	Inlet (1)	Pipe (6)	(None)	No Restriction
	Inlet	Pipe (1)	(None)	No Restriction
Manhole (2)	Inlet (1)	Catchment Area (2)	(None)	No Restriction
		Pipe (5)		
	Inlet (2)	Catchment Area (3)	(None)	No Restriction
Manhole (3)	Inlet	Pipe	(None)	No Restriction
	Inlet (1)	Pipe (4)	(None)	No Restriction
Manhole (4)	Inlet	Catchment Area (1)	(None)	No Restriction
Manhole (5)	Inlet	Catchment Area	(None)	No Restriction

Project:	Date: 10/10/2022		
	Designed by: J.Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Phase: Phase	Company Address:		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole (1)	Outlet	Pipe (3)	Free Discharge
	Outlet	Pipe (2)	Free Discharge
	Outlet (1)	Pipe (6)	Hydro-Brake®
	Invert Level (m)	56.95	
	Design Depth (m)	0.50	
	Design Flow (L/s)	1.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0053-1000-0500-1000	
Manhole (2)			
Manhole (3)	Outlet	Pipe (1)	Free Discharge
Manhole (4)	Outlet	Pipe (4)	Free Discharge
Manhole (5)	Outlet	Pipe	Free Discharge

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Phase: Phase	Company Address:			



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedence Level (m)	58.00
Depth (m)	0.50
Base Level (m)	56.95
Number of Crates Long	15
Number of Crates Wide	8
Number of Crates High	1
Porosity (%)	98
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m³)	15.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (5)
Outlet Type	Free Discharge

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Connections Phase: Phase	Company Address:			

Name	From	To	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)
Pipe	Manhole (5)	Manhole (3)	12.36	Pipe	49.434		0.6	100
Pipe (1)	Manhole (3)	Manhole (2)	8.06	Pipe	20.157		0.6	100
Pipe (3)	Manhole (1)	Manhole	12.85	Pipe	98.825		0.6	100
Pipe (4)	Manhole (4)	Manhole (3)	9.22	Pipe	36.891		0.6	100
Pipe (5)	Cellular Storage	Manhole (2)	6.98	Pipe	0.000		0.6	100
Pipe (2)	Manhole (2)	Cellular Storage	3.59	Pipe	0.000		0.6	100
Pipe (6)	Manhole (2)	Manhole (1)	2.33	Pipe	116.335		0.6	100
Name	Upstream Cover Level (m)	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Flow Restriction (L/s)			
Pipe	58.00	57.60	58.00	57.35				
Pipe (1)	58.00	57.35	58.00	56.95				
Pipe (3)	58.00	56.93	58.00	56.80				
Pipe (4)	58.20	57.60	58.00	57.35				
Pipe (5)	58.00	56.95	58.00	56.95				
Pipe (2)	58.00	56.95	58.00	56.95				
Pipe (6)	58.00	56.95	58.00	56.93	1.09			

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details:	Company Address:			
Type: Area Summary Phase: Phase				

Inflow Label	Connected To	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Manhole (5)	Time of Concentration	0.002	100	0	100	0.002
Catchment Area (1)	Manhole (4)	Time of Concentration	0.002	100	0	100	0.002
Catchment Area (2)	Manhole (2)	Time of Concentration	0.017	100	0	100	0.017
Catchment Area (3)	Manhole (2)	Time of Concentration	0.010	100	0	100	0.010
TOTAL			0.031				0.031

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Network Design Criteria Phase: Phase	Company Address:			

Flow Options

Peak Flow Calculation (UK) Modified Rational Method
 Min. Time of Entry (mins) 5
 Max. Travel Time (mins) 30

FSR

Type: FSR

Return Period (years) 2.0
 Region England and Wales
 M5-60 (mm) 19.7
 Ratio R 0.396

Pipe Options

Lock Slope Options None
 Design Level Level Inverts
 Min. Cover Depth (m) 1.20
 Min. Slope (1:x) 500.00
 Max. Slope (1:x) 40.00
 Min. Velocity (m/s) 1.0
 Max. Velocity (m/s) 3.0
 Use Flow Restriction ☐
 Reduce Channel Depths ☐

Pipe Size Library

Default

Add. Increment (mm) 75

Diameter (mm)	Min. Slope (1:x)	Max. Slope (1:x)
100	0.00	0.00
150	0.00	0.00

Project:	Date: 10/10/2022		
	Designed by: J.Kusz	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Phase: Phase	Company Address:		



Manhole Options

Apply Offset	☐
Synchronise Manhole Invert Levels	☒

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.20	0.00
375	1.35	0.00
500	1.50	0.00
750	1.80	0.00

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.90
Width (m)	0.00

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.00	1.05	0.00
1.50	1.20	0.00

Access

Depth (m)	Ladder Protrusion (mm)
0.00	130
3.00	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Outfall Details Phase: Phase	Company Address:			

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Manhole	Free Discharge		

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Title:	Company Address:			
Analysis Criteria				

Runoff Type	Dynamic
Output Interval (mins)	1
Time Step	Default
Urban Creep (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Project:	Date: 10/10/2022			
	Designed by: J.Kusz	Checked by:	Approved By:	
Report Details: Type: Phase Management Phase: Phase	Company Address:			


Phase
 FSR: 100 years: Increase Rainfall (%): +40: 960 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Manhole				
TOTAL	1.2	27.412	1.0	27.288

Graphs



