

JNP Group	Page 1
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG	
Date 28/01/2022 15:28 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by
Micro Drainage	Network 2020.1



FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Flow Per Person (l/per/day)	222.00	Maximum Backdrop Height (m)	1.500
Persons per House	3.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	3.641	0.061	59.7	0.000	5	0.0	1.500	o	150	Pipe/Conduit	☺
F1.001	12.886	0.430	30.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.002	8.381	0.140	59.9	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.003	12.055	0.301	40.0	0.000	2	0.0	1.500	o	150	Pipe/Conduit	☺
F1.004	35.937	0.683	52.6	0.000	4	0.0	1.500	o	150	Pipe/Conduit	☺
F2.000	10.404	0.297	35.0	0.000	7	0.0	1.500	o	150	Pipe/Conduit	☺
F2.001	27.538	0.618	44.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.005	3.506	0.044	79.7	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.006	10.177	0.127	80.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.007	10.903	0.136	80.2	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.008	8.466	0.222	38.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.009	9.038	0.904	10.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.010	4.641	0.478	9.7	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.011	15.324	0.374	41.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.012	5.994	0.922	6.5	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F3.000	32.144	1.410	22.8	0.000	7	0.0	1.500	o	150	Pipe/Conduit	☺
F3.001	22.007	1.862	11.8	0.000	7	0.0	1.500	o	150	Pipe/Conduit	☺
F1.013	2.328	0.029	80.3	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.014	8.787	0.110	79.9	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺
F1.015	15.656	0.683	22.9	0.000	0	0.0	1.500	o	150	Pipe/Conduit	☺

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	47.400	0.000	0.0	5	0.0	12	0.36	1.14	20.1	0.2
F1.001	47.339	0.000	0.0	5	0.0	10	0.46	1.60	28.4	0.2
F1.002	46.909	0.000	0.0	5	0.0	12	0.36	1.13	20.0	0.2
F1.003	46.769	0.000	0.0	7	0.0	12	0.47	1.39	24.5	0.3
F1.004	46.468	0.000	0.0	11	0.0	16	0.49	1.21	21.4	0.5
F2.000	46.700	0.000	0.0	7	0.0	12	0.49	1.48	26.2	0.3
F2.001	46.403	0.000	0.0	7	0.0	13	0.45	1.31	23.2	0.3
F1.005	45.785	0.000	0.0	18	0.0	23	0.50	0.98	17.4	0.8
F1.006	45.741	0.000	0.0	18	0.0	23	0.50	0.98	17.3	0.8
F1.007	45.614	0.000	0.0	18	0.0	23	0.50	0.98	17.3	0.8
F1.008	45.478	0.000	0.0	18	0.0	19	0.64	1.42	25.1	0.8
F1.009	45.256	0.000	0.0	18	0.0	14	1.02	2.78	49.2	0.8
F1.010	44.352	0.000	0.0	18	0.0	14	1.03	2.82	49.9	0.8
F1.011	43.874	0.000	0.0	18	0.0	19	0.63	1.37	24.2	0.8
F1.012	43.500	0.000	0.0	18	0.0	13	1.17	3.45	61.0	0.8
F3.000	45.850	0.000	0.0	7	0.0	11	0.56	1.84	32.5	0.3
F3.001	44.440	0.000	0.0	14	0.0	13	0.89	2.56	45.2	0.6
F1.013	42.578	0.000	0.0	32	0.0	30	0.59	0.98	17.3	1.5
F1.014	42.549	0.000	0.0	32	0.0	30	0.59	0.98	17.3	1.5
F1.015	42.439	0.000	0.0	32	0.0	22	0.92	1.84	32.4	1.5

JNP Group		Page 2
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		
Date 28/01/2022 15:28	Designed by Ben.Douglas	
File M43794-JNP-92-XX-CL-C-1...	Checked by	
Micro Drainage		Network 2020.1

Manhole Schedules for Foul - Main

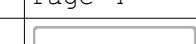
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
F1	49.086	1.686	Open Manhole	450	F1.000	47.400	150				
F2	48.780	1.441	Open Manhole	450	F1.001	47.339	150	F1.000	47.339	150	
F3	48.252	1.343	Open Manhole	450	F1.002	46.909	150	F1.001	46.909	150	
F4	48.190	1.421	Open Manhole	450	F1.003	46.769	150	F1.002	46.769	150	
F5	48.050	1.582	Open Manhole	450	F1.004	46.468	150	F1.003	46.468	150	
F6	48.230	1.530	Open Manhole	450	F2.000	46.700	150				
F7	48.000	1.597	Open Manhole	450	F2.001	46.403	150	F2.000	46.403	150	
F8	47.770	1.985	Open Manhole	450	F1.005	45.785	150	F1.004	45.785	150	
								F2.001	45.785	150	
F9	47.748	2.007	Open Manhole	450	F1.006	45.741	150	F1.005	45.741	150	
F10	47.521	1.907	Open Manhole	450	F1.007	45.614	150	F1.006	45.614	150	
F11	46.997	1.519	Open Manhole	450	F1.008	45.478	150	F1.007	45.478	150	
F12	46.626	1.370	Open Manhole	450	F1.009	45.256	150	F1.008	45.256	150	
F13	46.302	1.950	Open Manhole	450	F1.010	44.352	150	F1.009	44.352	150	
Fex	46.436	2.562	Open Manhole	450	F1.011	43.874	150	F1.010	43.874	150	
F14	45.972	2.472	Open Manhole	450	F1.012	43.500	150	F1.011	43.500	150	
F15	48.340	2.490	Open Manhole	450	F3.000	45.850	150				
F16	46.150	1.710	Open Manhole	450	F3.001	44.440	150	F3.000	44.440	150	
F17	45.972	3.394	Open Manhole	1200	F1.013	42.578	150	F1.012	42.578	150	
								F3.001	42.578	150	
F18	44.956	2.407	Open Manhole	1200	F1.014	42.549	150	F1.013	42.549	150	
F19	44.510	2.071	Open Manhole	450	F1.015	42.439	150	F1.014	42.439	150	
F	44.436	2.680	Open Manhole	0		OUTFALL		F1.015	41.756	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F1	470007.136	171987.721	470007.136	171987.721	Required	
F2	470008.056	171984.198	470008.056	171984.198	Required	
F3	470008.037	171971.312	470008.037	171971.312	Required	
F4	470008.025	171962.931	470008.025	171962.931	Required	
F5	470020.080	171963.023	470020.080	171963.023	Required	
F6	470053.875	172000.899	470053.875	172000.899	Required	
F7	470056.504	171990.832	470056.504	171990.832	Required	
F8	470056.017	171963.299	470056.017	171963.299	Required	
F9	470059.523	171963.326	470059.523	171963.326	Required	

JNP Group		Page 3
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		 Micro Drainage
Date 28/01/2022 15:28 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by	
Micro Drainage Network 2020.1		

Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F10	470067.571	171969.554	470067.571	171969.554	Required	
F11	470078.474	171969.554	470078.474	171969.554	Required	
F12	470086.208	171966.111	470086.208	171966.111	Required	
F13	470095.246	171966.111	470095.246	171966.111	Required	
Fex	470097.183	171961.894	470097.183	171961.894	Required	
F14	470112.506	171961.947	470112.506	171961.947	Required	
F15	470105.062	172013.213	470105.062	172013.213	Required	
F16	470112.978	171982.059	470112.978	171982.059	Required	
F17	470118.375	171960.724	470118.375	171960.724	Required	
F18	470120.631	171961.294	470120.631	171961.294	Required	
F19	470122.786	171952.775	470122.786	171952.775	Required	
F	470137.212	171946.693			No Entry	

JNP Group		Page 4
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG		 Micro Drainage
Date 28/01/2022 15:28 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by	
Micro Drainage	Network 2020.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
F1.000	o	150	F1	49.086	47.400	1.536	Open Manhole		450
F1.001	o	150	F2	48.780	47.339	1.291	Open Manhole		450
F1.002	o	150	F3	48.252	46.909	1.193	Open Manhole		450
F1.003	o	150	F4	48.190	46.769	1.271	Open Manhole		450
F1.004	o	150	F5	48.050	46.468	1.432	Open Manhole		450
F2.000	o	150	F6	48.230	46.700	1.380	Open Manhole		450
F2.001	o	150	F7	48.000	46.403	1.447	Open Manhole		450
F1.005	o	150	F8	47.770	45.785	1.835	Open Manhole		450
F1.006	o	150	F9	47.748	45.741	1.857	Open Manhole		450
F1.007	o	150	F10	47.521	45.614	1.757	Open Manhole		450
F1.008	o	150	F11	46.997	45.478	1.369	Open Manhole		450
F1.009	o	150	F12	46.626	45.256	1.220	Open Manhole		450
F1.010	o	150	F13	46.302	44.352	1.800	Open Manhole		450
F1.011	o	150	F14	46.436	43.874	2.412	Open Manhole		450
F1.012	o	150	F14	45.972	43.500	2.322	Open Manhole		450
F3.000	o	150	F15	48.340	45.850	2.340	Open Manhole		450
F3.001	o	150	F16	46.150	44.440	1.560	Open Manhole		450
F1.013	o	150	F17	45.972	42.578	3.244	Open Manhole		1200
F1.014	o	150	F18	44.956	42.549	2.257	Open Manhole		1200
F1.015	o	150	F19	44.510	42.439	1.921	Open Manhole		450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
F1.000	3.641	59.7	F2	48.780	47.339	1.291	Open Manhole		450
F1.001	12.886	30.0	F3	48.252	46.909	1.193	Open Manhole		450
F1.002	8.381	59.9	F4	48.190	46.769	1.271	Open Manhole		450
F1.003	12.055	40.0	F5	48.050	46.468	1.432	Open Manhole		450
F1.004	35.937	52.6	F8	47.770	45.785	1.835	Open Manhole		450
F2.000	10.404	35.0	F7	48.000	46.403	1.447	Open Manhole		450
F2.001	27.538	44.6	F8	47.770	45.785	1.835	Open Manhole		450
F1.005	3.506	79.7	F9	47.748	45.741	1.857	Open Manhole		450
F1.006	10.177	80.1	F10	47.521	45.614	1.757	Open Manhole		450
F1.007	10.903	80.2	F11	46.997	45.478	1.369	Open Manhole		450
F1.008	8.466	38.1	F12	46.626	45.256	1.220	Open Manhole		450
F1.009	9.038	10.0	F13	46.302	44.352	1.800	Open Manhole		450
F1.010	4.641	9.7	F14	46.436	43.874	2.412	Open Manhole		450
F1.011	15.324	41.0	F14	45.972	43.500	2.322	Open Manhole		450
F1.012	5.994	6.5	F17	45.972	42.578	3.244	Open Manhole		1200
F3.000	32.144	22.8	F16	46.150	44.440	1.560	Open Manhole		450
F3.001	22.007	11.8	F17	45.972	42.578	3.244	Open Manhole		1200
F1.013	2.328	80.3	F18	44.956	42.549	2.257	Open Manhole		1200
F1.014	8.787	79.9	F19	44.510	42.439	1.921	Open Manhole		450
F1.015	15.656	22.9	F	44.436	41.756	2.530	Open Manhole		0

JNP Group								Page 5	
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG									
Date 28/01/2022 15:28 File M43794-JNP-92-XX-CL-C-1...				Designed by Ben.Douglas Checked by					
Micro Drainage				Network 2020.1					
<u>Setting Out Information - True Coordinates (Foul - Main)</u>									
PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)	
F1.000	F1	450		470007.136	171987.721	470007.136	171987.721		
F1.001	F2	450		470008.056	171984.198	470008.056	171984.198		
F1.002	F3	450		470008.037	171971.312	470008.037	171971.312		
F1.003	F4	450		470008.025	171962.931	470008.025	171962.931		
F1.004	F5	450		470020.080	171963.023	470020.080	171963.023		
F2.000	F6	450		470053.875	172000.899	470053.875	172000.899		
F2.001	F7	450		470056.504	171990.832	470056.504	171990.832		
F1.005	F8	450		470056.017	171963.299	470056.017	171963.299		
F1.006	F9	450		470059.523	171963.326	470059.523	171963.326		
F1.007	F10	450		470067.571	171969.554	470067.571	171969.554		
F1.008	F11	450		470078.474	171969.554	470078.474	171969.554		
F1.009	F12	450		470086.208	171966.111	470086.208	171966.111		
F1.010	F13	450		470095.246	171966.111	470095.246	171966.111		
F1.011	Fex	450		470097.183	171961.894	470097.183	171961.894		
F1.012	F14	450		470112.506	171961.947	470112.506	171961.947		
F3.000	F15	450		470105.062	172013.213	470105.062	172013.213		
F3.001	F16	450		470112.978	171982.059	470112.978	171982.059		
F1.013	F17	1200		470118.375	171960.724	470118.375	171960.724		
F1.014	F18	1200		470120.631	171961.294	470120.631	171961.294		
©1982-2020 Innovyze									

JNP Group	Page 6
The Innovation Centre Queens Meadow Bus. Park Hartlepool TS25 5TG	
Date 28/01/2022 15:28 File M43794-JNP-92-XX-CL-C-1...	Designed by Ben.Douglas Checked by
Micro Drainage	Network 2020.1



Setting Out Information - True Coordinates (Foul - Main)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)
F1.015	F19	450		470122.786	171952.775	470122.786	171952.775	

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
F1.015	F	0		470137.212	171946.693	

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.015	F	44.436	41.756	0.000	0	0

Simulation Criteria for Foul - Main

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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 Online Controls	0	Number of Storage Structures	0
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	0	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	0.000	Storm Duration (mins)	30
Ratio R	0.000		