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LEGEND:

	RED LINE BOUNDARY
	PROPOSED 110mm WATERMAIN
	PROPOSED BOUNDARY BOX LINE
	EXISTING 150mm WATERMAIN
	PROPOSED SLUICE VALVE IN ACCORDANCE WITH STD-W-15
	PROPOSED ONLINE HYDRANT IN ACCORDANCE WITH STD-W-18
	PROPOSED ONLINE AIR VALVE IN ACCORDANCE WITH STD-W-22
	PROPOSED WATER METER IN ACCORDANCE WITH STD-W-26
	PROPOSED BOUNDARY BOX

WATERMAIN NOTES

1. **INTERNAL WATERMAINS** - MDPE PIPES SHALL BE OF A TYPE PE-80 AND HAVE AN SDR-11 RATING. THEY SHALL CONFORM TO IS EN 12201: PART 1 AND PART 2(PLASTIC SYSTEMS FOR WATER SUPPLY, DRAINAGE AND SEWERAGE UNDER PRESSURE - PART GENERAL, AND PART 2, PIPES) AND IS EN 12201-3(PLASTIC SYSTEMS FOR WATER SUPPLY, DRAINAGE AND SEWERAGE UNDER PRESSURE - PART 3: FITTINGS)

2. **SERVICE CONNECTIONS** - SERVICE CONNECTION PIPES SUITABLE FOR WORKS AND APPROVED BY IRISH WATER SHALL BE OF HDPE MATERIAL WITH TYPE PE100 SDR 17 RATING OR MDPE MATERIAL WITH PE80 AND AN SDR11 RATING. ALL PLASTIC WATER SERVICE CONNECTION PIPES SHALL BE BLUE IN COLOUR. AN ALTERNATIVE PIPE MATERIAL, TO IRISH WATER'S WRITTEN APPROVAL SHALL BE PROVIDED WHERE PRESSURE IN THE WORKS IS GREATER THAN THE PERFORMANCE RATING OF THESE MATERIALS. THE HDPE AND MDPE SERVICE PIPES SHALL COMPLY WITH IS EN 12201 PART 2 (PLASTIC SYSTEMS FOR WATER SUPPLY, DRAINAGE, AND SEWERAGE UNDER PRESSURE - PART 3: FITTINGS) AND WITH UK WIS 4-32-08(SPECIFICATION FOR THE FUSION JOINTING OF POLYETHYLENE PRESSURE PIPELINE SYSTEMS USING PE80 AND PE100 MATERIALS)

KEY PLAN
SCALE: NTS

1	05.08.26	ISSUED FOR INFORMATION	F.N.	I.B.
0	07.05.26	ISSUED FOR INFORMATION	F.N.	I.B.
REV	DATE	DESCRIPTION	BY	APP

PROJECT: KILLOWEN KENMARE LRD

TITLE: PROPOSED WATERMAIN LAYOUT SHEET 2

CLIENT:

ENGINEERING AND ENVIRONMENTAL CONSULTANTS
CORK | TRALEE | LONDON | LIMERICK
mwp.ie

DRAWN: F.N.	CHECKED: S.H.	APPROVED: I.B.
PROJECT NUMBER: 25631	DATE: MAY 2026	SCALE @ A1: 1:500
ACCEPTANCE CODE: S	PURPOSE OF ISSUE: ISSUED FOR INFORMATION	PURPOSE CODE: P1
DRAWING NUMBER: 25631-00-DTM-DR-MWP-CE-2106	REV: 1	

Appendix D

Storm Water Design Report

STORM SEWER DESIGN by the Modified Rational Method

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
s5.000	52.268	0.261	200.0	0.065	5.00	0.0	1.500	o	225	Pipe/Conduit		🔒
s4.002	7.914	0.040	200.0	0.000	0.00	0.0	1.500	o	300	Pipe/Conduit		🔓
s4.003	23.883	0.080	300.0	0.037	0.00	0.0	1.500	o	300	Pipe/Conduit		🔓
s6.000	35.207	0.587	60.0	0.000	5.00	0.0	1.500	o	150	Pipe/Conduit		🔓
s4.004	40.840	0.136	300.0	0.044	0.00	0.0	1.500	o	300	Pipe/Conduit		🔓

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.A. (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
s5.000	50.00	6.08	8.070	0.065	0.0	0.0	0.0	0.81	32.2	8.8
s4.002	50.00	6.21	7.213	0.117	0.0	0.0	0.0	0.98	69.2	15.8
s4.003	49.43	6.71	7.173	0.154	0.0	0.0	0.0	0.80	56.4	20.6
s6.000	50.00	5.52	8.034	0.000	0.0	0.0	0.0	1.13	20.0	0.0
s4.004	47.42	7.56	7.094	0.197	0.0	0.0	0.0	0.80	56.4	25.3

STORM SEWER DESIGN by the Modified Rational Method

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
s1.015	24.691	0.137	180.2	0.000	0.00	0.0	1.500	o	225	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)
s1.015	39.19	12.41	5.393	1.034	0.0	0.0	0.0	0.85	33.9«	123.7



Micro
Drainage

Designed by sean.harrington

Checked by

Network 2020.1.3

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
s34	6.770	1.052	Open Manhole	1200	s1.014	5.718	225	s1.013	5.718	225	
s35	6.058	0.665	Open Manhole	1200	s1.015	5.393	225	s1.014	5.393	225	
s	6.080	0.824	Open Manhole	0		OUTFALL		s1.015	5.256	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
s1	491483.306	571149.199	491483.306	571149.199	Required	
s2	491437.577	571122.511	491437.577	571122.511	Required	
s3	491426.524	571128.892	491426.524	571128.892	Required	
s4	491471.650	571180.172	491471.650	571180.172	Required	
s5	491456.621	571202.186	491456.621	571202.186	Required	



Micro
Drainage

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
s6	491447.996	571196.758	491447.996	571196.758	Required	
s7	491439.371	571191.329	491439.371	571191.329	Required	
s8	491437.663	571206.942	491437.663	571206.942	Required	
s9	491430.558	571192.782	491430.558	571192.782	Required	
s10	491399.383	571172.321	491399.383	571172.321	Required	
s11	491379.642	571189.829	491379.642	571189.829	Required	
s12	491406.316	571313.638	491406.316	571313.638	Required	
s13	491416.034	571277.404	491416.034	571277.404	Required	



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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
s31	491371.147	571258.365	491371.147	571258.365	Required	
s27	491343.394	571242.975	491343.394	571242.975	Required	
s32	491341.976	571230.274	491341.976	571230.274	Required	
s33	491341.976	571218.240	491341.976	571218.240	Required	
s34	491292.058	571221.046	491292.058	571221.046	Required	
s35	491253.314	571264.809	491253.314	571264.809	Required	
s	491232.298	571277.768			No Entry	

Network Classifications for Storm Main

Surcharged Outfall Details for Storm Main

s1.015	s	6.080	5.256	0.000	0	0
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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	0.000	180	0.000	300	0.000	420	0.000	540	0.000	660	6.300	780	6.300
120	0.000	240	0.000	360	0.000	480	0.000	600	6.300	720	6.300	840	6.300

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Park House, Mahon Technology Park Bessboro Road Blackrock, Cork		
Date 06/08/2026 18:21 File STORM WINDES - 2026-07-24.MDX	Designed by sean.harrington Checked by	
Innovyze	Network 2020.1.3	
<u>Simulation Criteria for Storm Main</u> Volumetric Runoff Coeff 0.750 Manhole Headloss Coeff (Global) 0.500 Inlet Coeffiecient 0.800 Areal Reduction Factor 1.000 Foul Sewage per hectare (l/s) 0.000 Flow per Person per Day (l/per/day) 0.000 Hot Start (mins) 0 Additional Flow - % of Total Flow 0.000 Run Time (mins) 60 Hot Start Level (mm) 0 MADD Factor * 10m³/ha Storage 2.000 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 <u>Synthetic Rainfall Details</u> Rainfall Model FSR M5-60 (mm) 15.800 Cv (Summer) 0.750 Return Period (years) 5 Ratio R 0.269 Cv (Winter) 0.840 Region Scotland and Ireland Profile Type Summer Storm Duration (mins) 30		
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s1.000	0.028	100	0.028	491478.386	571162.261
				491472.905	571170.765
				491471.852	571172.398
				491454.736	571161.804
				491461.961	571149.890
				491479.058	571160.910
				491478.246	571162.171
s1.000	0.021	100	0.021	491449.000	571142.144
				491441.531	571153.731
				491453.569	571161.491
				491454.413	571161.717
				491462.000	571149.957
				491449.000	571142.144
				s1.000	0.057
491486.074	571148.164				
491440.098	571121.629				
491437.638	571120.996				
491436.733	571126.417				
491439.352	571127.265				
491436.334	571132.433				
491449.288	571139.996				
491452.187	571135.031				
491454.346	571136.291				
491451.447	571141.257				
491464.289	571149.011				
491467.299	571143.855				
491469.641	571147.702				
491470.614	571150.342				

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<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s1.001	0.008	100	0.008	491469.940	571152.308
				491469.793	571152.559
				491479.889	571159.066
				491437.638	571120.996
				491436.733	571126.417
				491433.160	571126.520
				491429.129	571128.688
				491427.038	571131.152
				491421.993	571128.826
				491423.734	571125.969
				491428.468	571122.157
				491432.363	571121.074
				491437.638	571120.998
s1.002	0.030	100	0.030	491432.215	571132.344
				491443.886	571139.158
				491431.703	571158.244
				491420.271	571150.875
				491432.215	571132.344
s1.002	0.036	100	0.036	491421.994	571128.827
				491395.377	571170.115
				491399.383	571172.321
				491400.673	571173.167
				491403.794	571167.252
				491407.152	571161.999
				491409.674	571163.624
				491419.426	571148.495
				491416.904	571146.869
				491418.259	571144.768
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<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s1.002	0.021	100	0.021	491420.780	571146.393
				491427.282	571136.307
				491424.760	571134.682
				491427.038	571131.152
				491412.188	571134.806
				491401.210	571127.730
				491399.815	571128.972
				491392.333	571140.580
				491403.731	571147.926
				491412.188	571134.806
s1.002	0.022	100	0.022	491384.318	571153.015
				491394.333	571162.334
				491403.731	571147.926
				491392.333	571140.580
				491384.318	571153.015
s2.000	0.031	100	0.031	491456.350	571197.279
				491445.556	571190.322
				491457.896	571170.628
				491469.780	571178.199
				491456.350	571197.279
s2.003	0.021	100	0.021	491440.912	571187.329
				491448.258	571175.931
				491435.516	571167.718
				491428.170	571179.115
				491440.912	571187.329
s2.004	0.030	100	0.030	491417.061	571155.855
				491435.516	571167.718
				491428.170	571179.115
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<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s2.004	0.050	100	0.050	491409.729	571167.229
				491417.046	571155.846
				491403.146	571168.481
				491399.200	571177.081
				491401.157	571177.636
				491404.715	571179.755
				491401.600	571184.588
				491412.106	571191.360
				491415.221	571186.527
				491417.323	571187.882
				491414.207	571192.715
				491422.613	571198.133
				491425.725	571193.304
				491428.001	571196.026
				491428.493	571199.096
				491427.785	571201.467
				491438.051	571187.864
				491436.993	571187.182
				491433.269	571189.508
				491428.820	571188.749
				491431.820	571183.848
				491423.415	571178.430
				491420.300	571183.263
				491418.201	571181.905
				491421.312	571177.074
				491410.809	571170.302
				491407.692	571175.136
				491405.187	571173.476
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<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s1.003	0.020	100	0.020	491403.574	571171.328
				491403.330	571168.601
				491394.271	571162.404
				491385.290	571153.932
				491373.754	571163.859
s1.003	0.020	100	0.020	491381.816	571173.228
				491394.333	571162.334
				491373.754	571163.859
				491381.816	571173.228
				491370.548	571183.299
s1.003	0.022	100	0.022	491361.013	571174.914
				491373.754	571163.859
				491395.377	571170.115
				491400.955	571173.353
				491399.200	571177.081
				491397.357	571177.402
				491381.062	571191.232
				491376.671	571187.921
				491378.170	571186.259
				491374.572	571182.077
s1.003	0.019	100	0.019	491384.058	571173.937
				491387.645	571178.106
				491392.699	571173.721
				491393.344	571173.035
				491395.377	571170.115
				491395.961	571185.118
				491412.370	571194.503
				491407.610	571201.934
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s1.004	0.021	100	0.021	491396.568	571194.739
				491393.816	571198.963
				491388.989	571195.818
				491362.149	571195.701
				491351.249	571191.033
				491352.351	571188.122
				491361.013	571174.914
s1.004	0.025	100	0.025	491370.625	571183.209
				491362.149	571195.701
				491359.350	571211.577
				491349.629	571209.334
				491346.881	571209.418
				491351.249	571191.033
				491362.149	571195.701
s1.004	0.041	100	0.041	491361.638	571196.478
				491366.440	571199.641
				491359.350	571211.577
				491371.284	571185.469
				491375.978	571188.819
				491376.671	571187.921
				491381.195	571191.329
				491385.788	571194.354
				491380.287	571202.706
				491375.590	571199.612
				491374.321	571201.765
				491378.911	571204.795
				491373.205	571213.004
				491368.716	571210.048
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
				491366.510	571213.833
				491365.966	571216.695
				491365.416	571221.120
				491363.098	571224.747
				491357.307	571222.015
				491360.047	571216.047
				491361.600	571211.291
				491369.106	571199.003
				491364.421	571195.890
				491371.325	571185.499
				491375.764	571188.667
s1.004	0.037	100	0.037	491388.989	571195.818
				491396.791	571200.902
				491393.647	571205.728
				491390.671	571203.789
				491383.498	571214.790
				491397.221	571223.732
				491401.106	571218.426
				491405.332	571221.183
				491397.827	571233.353
				491393.001	571230.209
				491394.076	571228.559
				491387.537	571224.298
				491386.284	571226.221
				491374.458	571218.121
				491388.989	571195.818
s4.000	0.052	100	0.052	491399.821	571309.670
				491378.019	571303.139
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
				491380.245	571295.705
				491394.643	571300.018
				491398.257	571287.953
				491393.295	571286.466
				491398.087	571270.469
				491399.826	571264.663
				491402.872	571265.576
				491404.427	571260.384
				491409.945	571262.037
				491406.287	571274.278
				491408.195	571274.849
				491405.428	571284.088
				491406.194	571284.317
				491404.541	571289.835
				491403.775	571289.606
				491399.587	571303.587
				491401.474	571304.152
				491399.821	571309.670
s5.000	0.065	100	0.065	491417.988	571200.205
				491441.546	571214.965
				491426.889	571237.460
				491425.201	571236.360
				491415.710	571250.926
				491402.317	571241.093
				491402.800	571236.045
				491405.945	571231.219
				491407.794	571230.037
				491417.792	571236.629
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s4.003	0.019	100	0.019	491430.318	571217.954
				491418.010	571209.934
				491416.460	571212.314
				491412.012	571209.410
				491418.410	571199.590
				491374.685	571271.053
				491378.952	571256.808
				491384.469	571258.461
				491384.029	571259.932
				491392.823	571262.566
				491393.359	571260.777
				491398.876	571262.430
				491398.341	571264.218
				491399.649	571264.610
s4.003	0.018	100	0.018	491398.173	571270.181
				491382.376	571265.449
				491380.203	571272.705
				491374.685	571271.053
				491412.376	571259.297
				491415.726	571252.585
				491397.395	571241.070
				491396.396	571240.420
				491392.213	571246.801
				491405.818	571255.571
s4.004	0.044	100	0.044	491412.943	571259.570
				491415.382	571260.661
				491392.213	571246.801
				491391.338	571246.235
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
				491389.711	571248.758
				491379.625	571242.257
				491381.250	571239.735
				491377.383	571237.206
				491375.741	571239.753
				491365.655	571233.252
				491367.325	571230.713
				491365.208	571229.346
				491356.349	571223.979
				491359.416	571222.387
				491363.101	571224.742
				491365.006	571221.761
				491366.701	571223.527
				491370.275	571226.104
				491372.980	571221.909
				491397.273	571237.567
				491397.958	571238.009
				491396.393	571240.418
s1.005	0.055	100	0.055	491359.680	571216.848
				491356.344	571223.991
				491353.700	571223.100
				491350.116	571222.608
				491350.283	571228.330
				491337.800	571228.719
				491337.570	571222.949
				491329.222	571223.271
				491326.741	571224.561
				491325.183	571227.217
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
				491325.158	571232.505
				491330.904	571232.338
				491331.195	571242.333
				491314.204	571242.894
				491313.911	571232.832
				491319.661	571232.665
				491319.540	571228.184
				491320.096	571225.005
				491322.693	571220.900
				491326.411	571218.392
				491333.706	571218.064
				491337.454	571217.459
				491337.280	571211.709
				491349.777	571211.421
				491349.948	571217.074
				491356.593	571218.030
				491359.306	571217.662
s1.007	0.019	100	0.019	491299.094	571242.442
				491298.965	571227.430
				491311.742	571227.057
				491312.179	571242.061
				491299.092	571242.173
s7.000	0.019	100	0.019	491301.105	571302.850
				491312.017	571302.532
				491312.026	571302.835
				491313.714	571302.784
				491313.503	571287.520
				491300.572	571287.897
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Innovyze		Network 2020.1.3			
<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
s7.000	0.020	100	0.020	491301.105	571302.850
				491300.572	571287.897
				491313.503	571287.520
				491313.061	571272.367
				491300.108	571272.744
s7.000	0.020	100	0.020	491300.572	571287.897
				491300.108	571272.744
				491313.061	571272.367
				491312.620	571257.214
				491299.838	571257.586
s7.000	0.020	100	0.020	491300.108	571272.744
				491299.838	571257.586
				491312.620	571257.214
				491312.179	571242.061
				491299.094	571242.442
s7.000	0.093	100	0.093	491299.535	571257.595
				491311.886	571308.342
				491334.362	571307.662
				491334.195	571302.171
				491331.534	571302.017
				491328.907	571300.572
				491327.395	571298.292
				491326.886	571291.890
				491332.633	571291.723
				491332.339	571281.629
				491326.592	571281.796
				491326.647	571279.390
				491332.269	571279.226
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Areas for Storm Main <table><thead><tr><th>PN</th><th>C. Area (ha)</th><th>PIMP (%)</th><th>Imp. Area (ha)</th><th>X (m)</th><th>Y (m)</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td>491331.978</td><td>571269.230</td></tr><tr><td></td><td></td><td></td><td></td><td>491326.231</td><td>571269.397</td></tr><tr><td></td><td></td><td></td><td></td><td>491326.158</td><td>571266.898</td></tr><tr><td></td><td></td><td></td><td></td><td>491331.905</td><td>571266.731</td></tr><tr><td></td><td></td><td></td><td></td><td>491331.614</td><td>571256.735</td></tr><tr><td></td><td></td><td></td><td></td><td>491325.992</td><td>571256.899</td></tr><tr><td></td><td></td><td></td><td></td><td>491325.911</td><td>571254.125</td></tr><tr><td></td><td></td><td></td><td></td><td>491331.983</td><td>571253.948</td></tr><tr><td></td><td></td><td></td><td></td><td>491331.727</td><td>571245.152</td></tr><tr><td></td><td></td><td></td><td></td><td>491325.530</td><td>571245.333</td></tr><tr><td></td><td></td><td></td><td></td><td>491325.447</td><td>571242.501</td></tr><tr><td></td><td></td><td></td><td></td><td>491331.197</td><td>571242.392</td></tr><tr><td></td><td></td><td></td><td></td><td>491319.932</td><td>571242.661</td></tr><tr><td></td><td></td><td></td><td></td><td>491319.899</td><td>571245.229</td></tr><tr><td></td><td></td><td></td><td></td><td>491314.257</td><td>571245.328</td></tr><tr><td></td><td></td><td></td><td></td><td>491314.549</td><td>571255.323</td></tr><tr><td></td><td></td><td></td><td></td><td>491320.064</td><td>571255.163</td></tr><tr><td></td><td></td><td></td><td></td><td>491320.379</td><td>571257.398</td></tr><tr><td></td><td></td><td></td><td></td><td>491314.631</td><td>571257.565</td></tr><tr><td></td><td></td><td></td><td></td><td>491314.922</td><td>571267.561</td></tr><tr><td></td><td></td><td></td><td></td><td>491320.671</td><td>571267.415</td></tr><tr><td></td><td></td><td></td><td></td><td>491320.733</td><td>571269.557</td></tr><tr><td></td><td></td><td></td><td></td><td>491314.985</td><td>571269.725</td></tr><tr><td></td><td></td><td></td><td></td><td>491315.263</td><td>571279.713</td></tr><tr><td></td><td></td><td></td><td></td><td>491321.024</td><td>571279.556</td></tr><tr><td></td><td></td><td></td><td></td><td>491320.972</td><td>571282.058</td></tr><tr><td></td><td></td><td></td><td></td><td>491315.599</td><td>571282.215</td></tr><tr><td></td><td></td><td></td><td></td><td>491315.640</td><td>571292.218</td></tr></tbody></table>			PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)					491331.978	571269.230					491326.231	571269.397					491326.158	571266.898					491331.905	571266.731					491331.614	571256.735					491325.992	571256.899					491325.911	571254.125					491331.983	571253.948					491331.727	571245.152					491325.530	571245.333					491325.447	571242.501					491331.197	571242.392					491319.932	571242.661					491319.899	571245.229					491314.257	571245.328					491314.549	571255.323					491320.064	571255.163					491320.379	571257.398					491314.631	571257.565					491314.922	571267.561					491320.671	571267.415					491320.733	571269.557					491314.985	571269.725					491315.263	571279.713					491321.024	571279.556					491320.972	571282.058					491315.599	571282.215					491315.640	571292.218
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)																																																																																																																																																																											
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<u>Areas for Storm Main</u>					
PN	C. Area (ha)	PIMP (%)	Imp. Area (ha)	X (m)	Y (m)
				491321.263	571292.054
				491321.507	571297.192
				491319.896	571300.839
				491317.371	571302.436
				491311.729	571302.966
				491312.186	571308.332
s7.000	0.032	100	0.032	491337.773	571282.264
				491337.439	571269.428
				491335.469	571269.480
				491335.319	571263.721
				491349.624	571263.348
				491349.576	571261.495
				491355.330	571261.199
				491355.383	571263.198
				491362.625	571263.010
				491362.586	571261.143
				491368.344	571260.993
				491368.645	571272.554
				491362.887	571272.704
				491362.775	571268.768
				491343.197	571269.279
				491343.400	571277.080
				491345.400	571277.028
				491345.531	571282.062
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Innovyze		Network 2020.1.3																																							
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>																																									
<table><thead><tr><th></th><th></th><th>Half Drain</th><th>Pipe</th><th></th><th></th></tr><tr><th></th><th>US/MH</th><th>Time</th><th>Flow</th><th></th><th>Level</th></tr><tr><th>PN</th><th>Name</th><th>(mins)</th><th>(l/s)</th><th>Status</th><th>Exceeded</th></tr></thead><tbody><tr><td>s1.000</td><td>s1</td><td></td><td>12.9</td><td>OK</td><td></td></tr><tr><td>s1.001</td><td>s2</td><td></td><td>13.7</td><td>OK</td><td></td></tr><tr><td>s1.002</td><td>s3</td><td></td><td>24.7</td><td>OK</td><td></td></tr></tbody></table>								Half Drain	Pipe				US/MH	Time	Flow		Level	PN	Name	(mins)	(l/s)	Status	Exceeded	s1.000	s1		12.9	OK		s1.001	s2		13.7	OK		s1.002	s3		24.7	OK	
		Half Drain	Pipe																																						
	US/MH	Time	Flow		Level																																				
PN	Name	(mins)	(l/s)	Status	Exceeded																																				
s1.000	s1		12.9	OK																																					
s1.001	s2		13.7	OK																																					
s1.002	s3		24.7	OK																																					
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>					
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>																							
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		Half Drain	Pipe																				
PN	US/MH Name	Time (mins)	Flow (l/s)	Status	Level Exceeded																		
s8.002	s30		0.0	OK																			
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Innovyze		Network 2020.1.3			
<u>5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>					

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Innovyze		Network 2020.1.3			
<u>5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>					

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Date 06/08/2026 18:21 File STORM WINDES - 2026-07-24.MDX																													
Designed by sean.harrington Checked by		Innovyze																											
Network 2020.1.3																													
<u>5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>																													
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			Half Drain	Pipe																									
	US/MH	Time	Flow		Level																								
PN	Name	(mins)	(l/s)	Status	Exceeded																								
s8.002	s30		0.0	OK																									
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Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main

Half Drain		Pipe			
	US/MH	Time	Flow		Level
PN	Name	(mins)	(l/s)	Status	Exceeded
s1.000	s1		35.0	SURCHARGED	
s1.001	s2		37.6	SURCHARGED	
s1.002	s3		67.8	SURCHARGED	



Micro
Drainage

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main

		Half Drain	Pipe		
	US/MH	Overflow	Time	Flow	Level
PN	Name	(l/s)	(mins)	(l/s)	Status Exceeded
s2.000	s4			11.4	OK
s2.001	s5			11.5	OK
s2.002	s6			11.5	OK
s2.003	s7			18.1	OK
s3.000	s8			0.0	OK
s2.004	s9			46.6	OK
s1.003	s10			135.4	SURCHARGED
s1.004	s11			41.1	SURCHARGED
s4.000	s12			16.7	OK
s4.001	s13			16.7	SURCHARGED
s5.000	s14			24.0	OK
s4.002	s15			8.6	SURCHARGED
s4.003	s16			11.3	SURCHARGED
s6.000	s17			0.0	OK
s4.004	s18			14.5	SURCHARGED
s1.005	s19			71.0	SURCHARGED
s1.006	s20			59.6	SURCHARGED
s1.007	s21			72.6	SURCHARGED
s7.000	s22			14.9	SURCHARGED
s7.001	s23			14.9	SURCHARGED
s1.008	s24			90.3	SURCHARGED
s1.009	s25			90.3	SURCHARGED
s1.010	s26			90.2	SURCHARGED
s8.000	s28			0.9	SURCHARGED
s8.001	s29			2.9	SURCHARGED

Malachy Walsh & Partners			Page 56																							
Park House, Mahon Technology Park Bessboro Road Blackrock, Cork																										
Date 06/08/2026 18:21 File STORM WINDES - 2026-07-24.MDX		Designed by sean.harrington Checked by																								
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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Main</u>																										
<table><thead><tr><th></th><th></th><th></th><th>Half Drain</th><th>Pipe</th><th></th><th></th></tr><tr><th>PN</th><th>US/MH Name</th><th>Overflow (l/s)</th><th>Time (mins)</th><th>Flow (l/s)</th><th>Status</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>s8.002</td><td>s30</td><td></td><td></td><td>4.7</td><td>SURCHARGED</td><td></td></tr></tbody></table>									Half Drain	Pipe			PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	s8.002	s30			4.7	SURCHARGED	
			Half Drain	Pipe																						
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded																				
s8.002	s30			4.7	SURCHARGED																					
©1982-2020 Innovyze																										

Appendix E

Maintenance Plan and Schedule for Storm Drainage Infrastructure



Maintenance Plan and Schedule for Storm Drainage Infrastructure

**Large Residential Development at Kilowen, Kenmare,
Co.Kerry.**

On behalf of KPH Construction

September 2026

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- Appendix B - Product Data Sheets

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
25631	25631-ZZ-ZZZ-RP-MWP-CE-6002	0	07/09/2026	AH	DD	IB	Planning

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1. Introduction

MWP were commissioned by KPH Construction Ltd. to provide a maintenance plan and schedule in relation to the drainage design in connection with a planning application for a Residential Development at Kilowen, Kenmare, Co. Kerry.

1.1 Location and Proposed Development

The proposed LRD site is located within the townland of Killowen, Kenmare, Co. Kerry, approximately 500m northeast of the Kenmare town centre and is within the Kenmare development boundary in the Kenmare refer to Figure 1 for a site location map. The site itself has been subject to recent disturbance and vegetation clearance and is now largely characterised by bare and disturbed ground with limited semi-natural habitat remaining.

The eastern boundary of the site is defined by the local road, known as 'Pat Scarteen Road', which connects to the main Kenmare to Kilgarvan regional road (R569) to the southeast. To the north, the site adjoins the Aldi commercial premises, while Scarteen Park residential development lies to the northwest. The western and southwestern boundaries are bordered by woodland area.



Figure 1 Site Location

A review of the EPA map-viewer determined that there is a watercourse traversing north of the proposed development site, as shown in Figure 2.

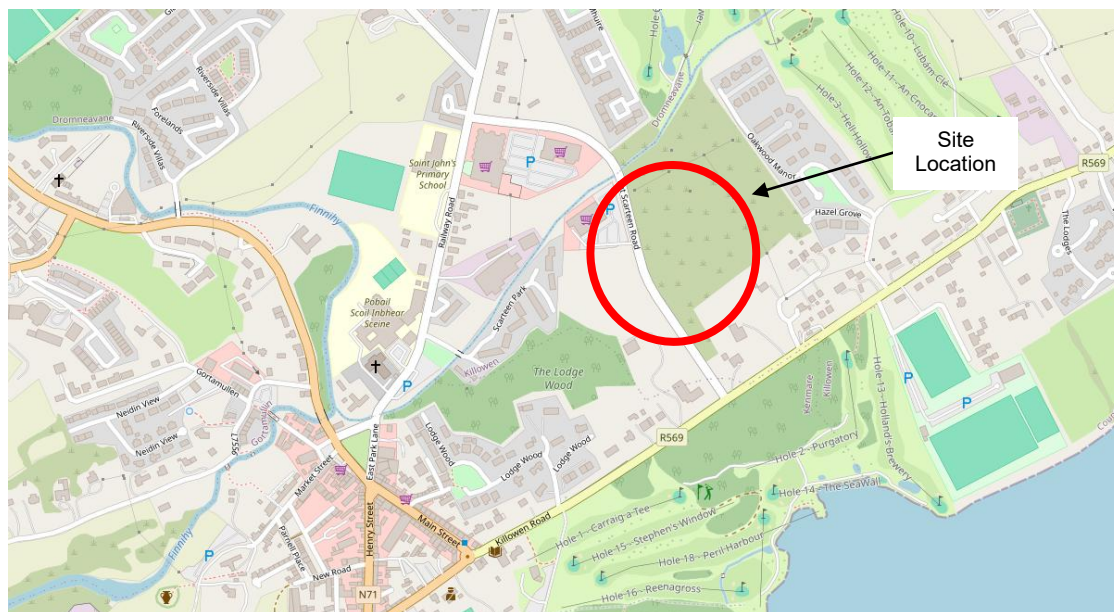


Figure 2 Water courses in vicinity of the site (EPA Maps)

KPH Construction Ltd intend to apply for planning permission for a Large-Scale Residential Development (LRD) at Kilowen (townland), Kenmare, Co. Kerry.

The proposed development will be on an area of approximately 2.7ha and consists of a LRD comprising 100 No. residential units, car parking, shared open spaces, landscaping, and all associated and ancillary site works to facilitate the proposed development.

The proposed development includes the following:

- The demolition of 2 no. existing single-storey sheds
- The construction of 100 No. residential houses comprising of:
 - 40 No. 3-Bed two storey house
 - 30 No. 1-Bed apartments
 - 30 No. 2-Bed apartments

with ancillary landscaping and associated site development works.

- The development makes provision for 40 no. two-storey houses, comprising 36 no. semi-detached 3 bed units and 4 no. 3 bed mid-terraced units and 60 no. own-door maisonette/apartment units over 2 no. storeys (30 no. 1 bed units, 30 no. 2 bed units).
- Vehicular access to the development will be via an upgraded and relocated entrance off the Pat Scarteen Road, with proposed upgrades including amendments to the existing shared pedestrian/cycle path and modifications to the signing and lining on the public road. The proposed development also provides for separate pedestrian/cycle entrances off Clash Road and includes dedicated pedestrian and cycling paths traversing the site.

- Ancillary infrastructure development works will include wastewater infrastructure, a pumping station, surface water attenuation, water utility services, public lighting, bin stores, bicycle stores, ESB substations, landscaping and all associated site development works.

2. Recommended Maintenance

All elements of the drainage system should be inspected following a major storm event. Maintenance should be carried out in tandem with the specification outlined by the manufacturer and be conducted to whichever is the most onerous. When carrying out maintenance, it is essential that a record of inspection and maintenance on all elements is kept and updated when required. A proposed template to record the maintenance and inspections conducted on the site can be found in Appendix A.

2.1 Storm Drains

It is recommended all storm drains are cleaned every 6 months. Further recommendation is shown below:

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt build-up should be removed	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

2.2 Kingspan Klargester Bypass Separators

Kingspan Klargester recommends checking the oil levels after the first 3 months. This will give an indication on when the separators should be maintained.

2.3 Operation & Maintenance requirements for attenuation storage tanks as per CIRIA C753 – SuDS Manual 2015 & Wavin Aquacell O&M Manual

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify areas that are not operating correctly. Take action where required	Monthly for 3 months. Yearly thereafter.
	Remove debris from catchment surface. (where it may cause risk to performance.)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures, isolation rows, and/ or internal forebays	Annually, or as required

Remedial Maintenance	Repair/rehabilitate inlets, outlet, overflows and vents	As required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually & following large storms
	Survey inside of system for sediment build-up and remove if necessary	Every 6 months or as required.

2.4 Operation & Maintenance requirements for silt traps as per CIRIA C753 – SuDS Manual 2015

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

2.5 Operation & Maintenance requirements for hydro brakes as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

2.6 External drainage system – Drainage adjacent to road

The drainage system should be inspected regularly to coincide with the aforementioned specification. A general guideline is shown below:

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

Appendix A

**Proposed Maintenance and Inspection Schedule Record
Sheet**

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Appendix B

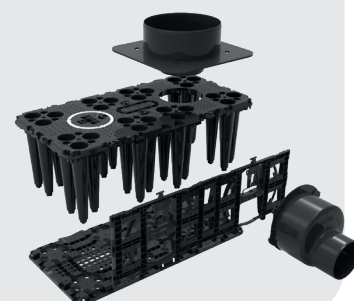
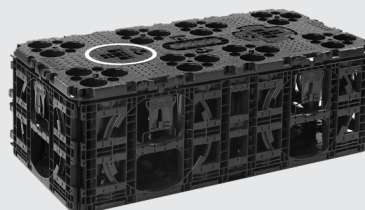
Product Data Sheets

AquaCell

Product Description

Geocellular units for detention and infiltration of rainwater.

The optimal solution for fast installation and total access for inspection and cleaning.



Technical information

Dimensions		
Length	48 in	1200 mm
Width	24 in	600 mm
Height	16 in	400 mm
Gross volume (without bottom)	10.25 cf	
Void ratio*		94-96%
Weight main unit	24 lb	11kg
Pipe connections	6-12 in	160-315 mm
Tank volume per truck	<11406 ft ³	<323 m ³

*Void ratio varies based on number of system layers & side panels

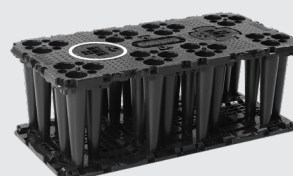
Accessibility		
Vertical access	10 in	250 mm
Width inspection channel (bottom)	8 in	200 mm
Accessible surface area	54%	

General	
Material	Recycled polypropylene
Color	Black
Connectors	Integrated
Standard	EN17152-1

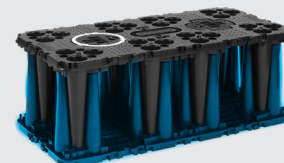
Window of Application*		
Type of Load	Regular	Extra strong
H-10 Traffic Loading	d=12in. / H= 14.4ft	d=12in. / H=26.2 ft
HS-20 Traffic Loading	d=24 in. / H=14.4ft	d=18 in. / H=26.2ft
HS-25 Traffic Loading	d=32in. / H=14.1 ft	d=22in. / H=26.1 ft

*General indication for installation above groundwater level, according to instructions for single layer tanks. For multi-layer tanks, the window of application may be limited. Wavin always recommends a minimum cover of 12 inches (0.3 meter). For specific projects, seek advice of Wavin.

Regular Configuration



Extra strong Configuration



@Montréal 9.2025

Orbia's Building and Infrastructure business Wavin is an innovative solutions provider for the global building and infrastructure industry. Backed by more than 60 years of product development experience, Wavin is advancing life around the world by building healthy, sustainable environments for global citizens. Whether it's to improve the distribution of clean drinking water, to make sanitation accessible for everyone, to create climate resilient cities, or to design comfortable living spaces, Wavin collaborates with municipal leaders, engineers, contractors, and installers to help future-proof communities, buildings and homes. Wavin has 12,000+ employees around 65 production sites worldwide, serving over 80 countries through a global sales and distribution network.

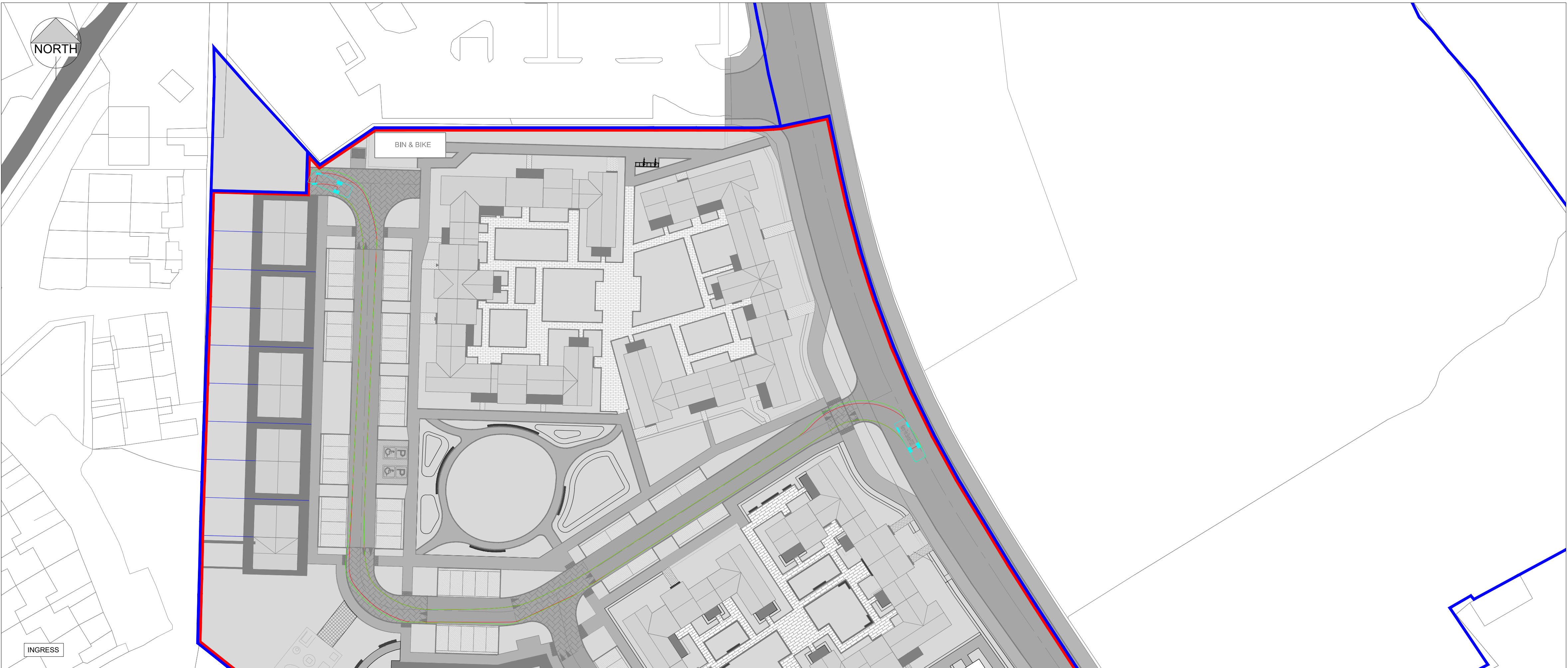
Wavin 950 Winter Street, South Entrance 1st Floor, Waltham, MA 02451, United States | Phone US 514-735-3632 / 1800-763-3632 | E-mail customer.service@orbia.com | wavin.us

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Appendix F

Swept Path Analysis

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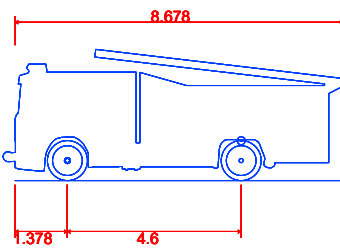
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6. AERIAL IMAGERY WHEN USED IS SOURCED FROM MICROSOFT BING MAPS THROUGH THE OPEN LICENSING AGREEMENT WITH AUTODESK.

LEGEND

- EXTENT OF BODY OUTLINE
- EXTENT OF WHEELBASE FOOTPRINT
- EXTENT OF LOAD OUTLINE
- EXTENT OF VEHICLE OUTLINE
- EXISTING ROAD
- PROPOSED ROAD

VEHICLE DETAILS:



Kerry Fire Service P320
Overall Length 8.678m
Overall Width 2.455m
Overall Body Height 3.467m
Min Body Ground Clearance 0.242m
Track Width 2.450m
Lock-to-lock time 5.00s
Curb to Curb Turning Radius 9.850m

1	05.08.26	ISSUED FOR INFORMATION	W.T.	I.B.
0	07.05.26	ISSUED FOR INFORMATION	W.T.	I.B.
REV	DATE	DESCRIPTION	BY	APP

PROJECT: KILLOWEN KENMARE LRD

TITLE: SWEPT PATH TRACKING
FIRE APPLIANCE-SHEET 1

CLIENT: KPH CONSTRUCTION

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PROJECT NUMBER: 25631	DATE: MAY 2026	SCALE @ A1: 1:500
ACCEPTANCE CODE: S	PURPOSE OF ISSUE: ISSUED FOR INFORMATION	PURPOSE CODE: P1

DRAWING NUMBER: 25631-00-DTM-DR-MWP-CE-0050
REV: 1