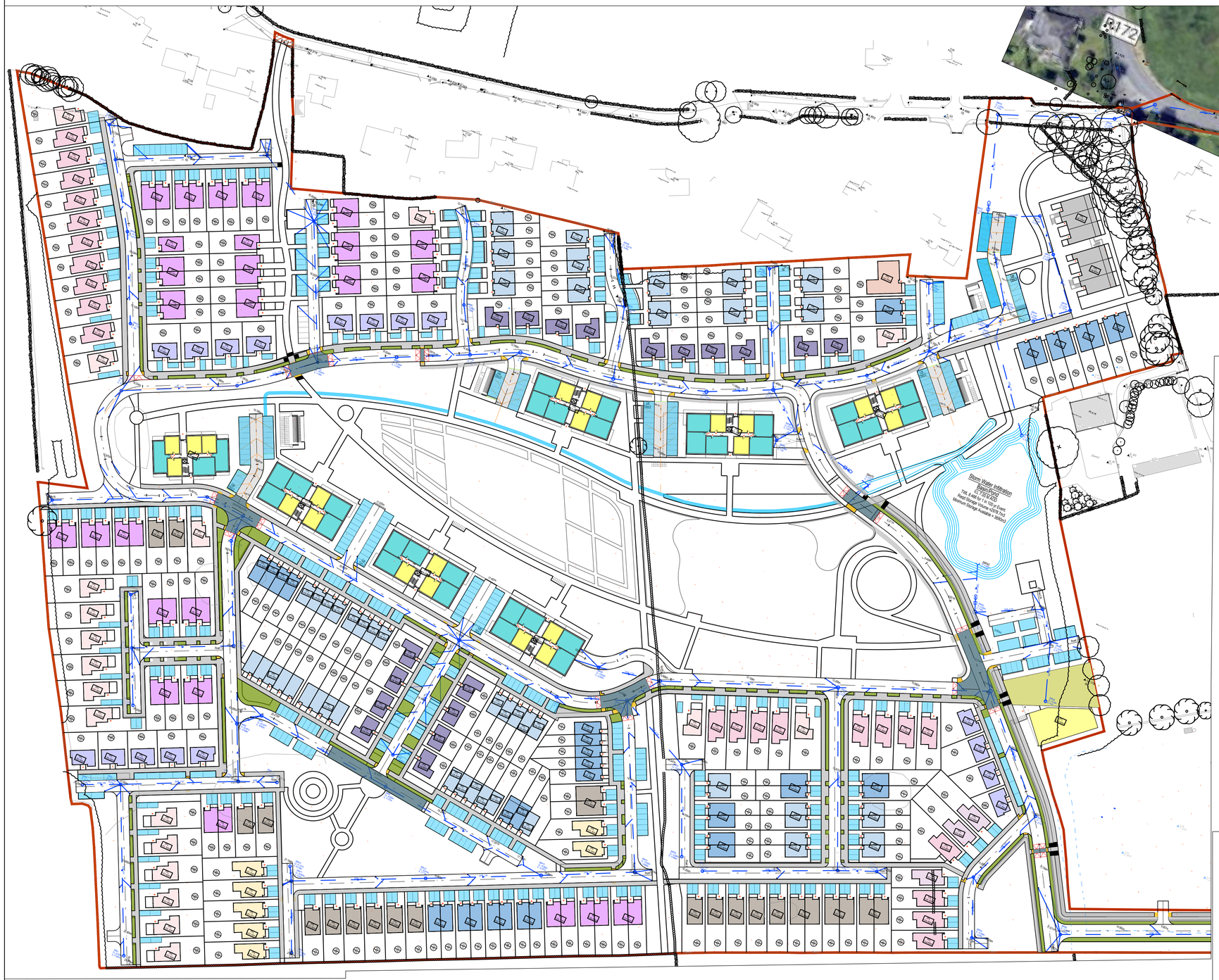

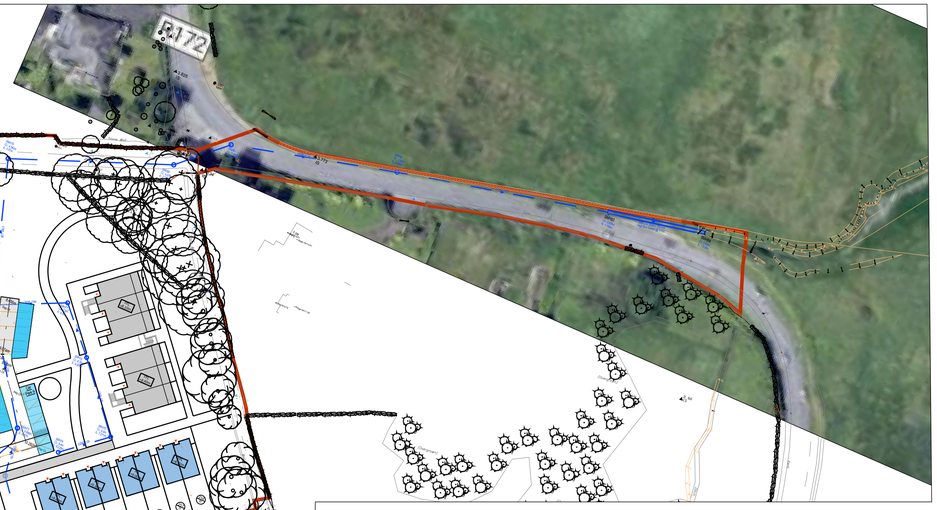

MH No.	MANHOLE DIAMETER (mm)	MANHOLE TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
SMH1	1200	Type E	23.029	21.645	1.159	706666.070	804050.880
SMH2	1200	Type D	21.234	20.25	0.759	706616.681	804115.875
SMH3	1200	Type E	20.997	19.615	0.777	706632.781	804123.054
SMH4	1200	Type E	21.272	19.916	1.131	706698.842	804152.954
SMH5	1350	Type E	21.015	19.276	0.993	706682.249	804146.200
SMH6	1350	Type E	20.591	19.098	1.193	706670.972	804170.431
SMH7	1350	Type E	20.327	18.803	1.224	706679.910	804178.413
SMH8	1350	Type E	18.982	17.373	1.309	706746.791	804171.407
SMH9	1200	Type E	21.630	20.227	1.178	706736.743	804083.299
SMH10	1200	Type E	21.141	19.728	1.188	706720.008	804119.810
SMH11	1200	Type B	20.993	19.20	0.840	706723.218	804113.770
SMH12	1200	Type E	18.814	17.13	1.459	706779.850	804139.881
SMH13	1350	Type B	16.992	14.781	1.422	706828.343	804162.585
SMH14	1240x975	Type C	15.500	13.696	1.278	706867.571	804181.411
SMH15	1200	Type E	19.069	17.706	1.138	706623.369	804158.959
SMH16	1200	Type E	17.682	16.226	1.231	706601.841	804205.560
SMH17	1200	Type B	18.351	15.976	0.608	706612.214	804183.067
SMH18	1350	Type A	20.192	15.736	4.156	706655.021	804202.867
SMH19	1350	Type A	19.641	15.467	3.874	706634.505	804247.049
SMH20	1200	Type E	18.291	16.819	1.247	706550.894	804231.079
SMH21	1200	Type A	19.637	16.218	3.194	706616.157	804261.167
SMH22	1350	Type A	19.580	15.27	3.242	706634.963	804259.799
SMH23	1200	Type E	18.804	17.398	1.181	706742.971	804186.247
SMH24	1350	Type B	17.422	14.677	1.722	706749.782	804247.200
SMH25	1350	Type B	15.525	13.461	1.402	706801.679	804241.268
SMH26	1200	Type D	14.996	13.884	0.887	706884.587	804196.704
SMH27	1200	Type D	13.812	12.689	0.898	706867.422	804235.814
SMH28	1240x1125	Type C	14.375	11.897	1.230	706832.332	804252.797
SMH29	1200	Type E	13.602	12.244	1.133	706814.117	804261.67
SMH30	1500	Type B	14.017	11.736	1.532	706842.618	804267.215
SMH31	1200	Type D	15.217	14.014	0.978	706896.002	804194.418
SMH32	1200	Type E	14.764	13.50	1.039	706970.096	804226.695
SMH33	1200	Type E	14.978	13.31	1.278	706953.339	804219.791
SMH34	1500	Type B	12.133	9.65	1.269	706919.532	804297.593
SMH35	1200	Type B	14.289	12.26	1.784	707022.858	804216.192
SMH36	1200	Type B	13.220	10.857	2.112	707012.218	804242.262
SMH37	1200	Type B	11.871	9.71	1.936	707027.356	804279.630
SMH38	1240x1200	Type C	10.266	8.13	1.386	706984.860	804324.343
SMH39	1200	Type E	10.45	9.20	1.025	707010.182	804330.336
SMH40	1200	Type D	9.239	8.10	0.909	707001.157	804356.414
SMH41	1200	Type D	8.916	7.87	0.741	706991.889	804368.871
SMH42	1240x1200	Type C	9.255	7.55	0.955	706963.558	804355.032
SMH43	---	HEADWALL	9.240	7.416	1.074	706955.868	804375.889
SMH44	1200	Type E	15.647	14.241	1.181	706505.314	804401.076

MH No.	MANHOLE DIAMETER (mm)	MANHOLE TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
SMH45	1200	Type E	15.825	14.133	1.392	706514.445	804387.425
SMH46	1200	Type E	13.731	12.291	1.140	706578.121	804417.444
SMH47	1200	Type A	15.613	12.091	3.222	706610.210	804398.175
SMH48	1200	Type E	16.185	14.617	1.268	706532.931	804359.074
SMH49	1200	Type E	17.278	16.00	1.053	706551.287	804320.565
SMH50	1200	Type A	18.318	13.85	4.168	706559.932	804290.404
SMH51	1200	Type A	17.397	13.52	3.577	706608.121	804314.037
SMH52	1350	Type A	16.567	11.65	3.006	706638.008	804338.883
SMH53	1350	Type A	15.450	11.355	3.595	706670.637	804355.776
SMH54	1200	Type E	12.879	11.425	1.154	706675.289	804426.858
SMH55	1200	Type B	13.906	11.035	2.571	706689.466	804390.534
SMH56	1350	Type A	14.415	10.80	2.837	706701.309	804370.479
SMH57	1500	Type B	13.602	10.574	2.503	706722.308	804380.853
SMH58	1200	Type E	10.871	9.45	1.121	706741.584	804443.289
SMH59	1200	Type B	11.464	9.16	2.001	706757.961	804419.729
SMH60	1500	Type A	12.059	8.80	1.280	706766.651	804386.973
SMH61	1500	Type B	11.273	8.50	2.239	706808.627	804398.791
SMH62	1200	Type E	9.948	8.603	1.120	706892.886	804446.089
SMH63	1200	Type E	10.282	8.902	1.125	706915.659	804478.861
SMH64	1200	Type B	10.181	8.25	1.327	706895.680	804457.474
SMH65	1200	Type B	10.109	8.04	1.766	706873.723	804435.516
SMH66	1200	Type E	9.905	8.494	1.186	706812.473	804462.709
SMH67	1500	Type B	10.474	7.65	1.656	706836.665	804411.999
SMH68	1200	Type D	8.326	7.50	0.601	706847.412	804391.186
SMH69	1240x975	Type C	9.910	7.437	1.677	706853.353	804398.792
SMH70	---	HEADWALL	8.672	7.267	0.880	706894.823	804389.246
SMH71	1350	Type B	8.782	6.80	1.607	706950.680	804438.790
SMH72	1350	Type A	9.880	6.48	3.027	706921.497	804475.500
SMH73	1350	Type A	9.996	6.37	3.248	706918.915	804491.368
SMH74	1200	Type D	9.40	8.225	0.95	706934.294	804489.451
SMH75	1200	Type E	8.50	7.271	0.698	706947.964	804500.919
SMH76	1200	Type E	8.35	6.907	1.215	706930.392	804521.501
SMH77	1200	Type D	7.80	6.50	1.00	706917.542	804535.385
SMH78	1350	Type B	8.337	5.00	2.013	706895.521	804424.968
SMH79	1240x900	Type C	4.680	3.07	1.155	706880.872	804570.721
SMH80	1240x900	Type C	4.195	2.709	1.035	706931.225	804590.547
SMH81	1350	Type D	3.952	2.614	0.887	706939.067	804602.330
SMH82	1350	Type D	-999.00	2.202	-1001.652	706998.940	804617.614
SMH83	1900	Type D	3.555	1.735	0.82	707066.905	804633.812
SMH84	---	HEADWALL	3.42	1.518	0.902	707098.900	804639.572
SMH85	1200	Type D	11.406	10.434	0.747	707059.836	804234.050
SMH86	1200	Type D	8.297	7.15	0.847	707138.987	804268.771
SMH87	1200	Type D	5.408	4.185	0.923	707199.322	804300.560
SMH88	1800	Type D	4.015	2.414	0.851	707230.916	804329.867
SMH89	1800	Type D	3.772	2.15	0.848	707253.314	804357.948
SMH90	---	HEADWALL	2.95	2.022	0.178	707248.320	804369.778

REV. NO.	DESCRIPTION	DATE	INITIALS
A	Issued for Planning	May 2019	T.Finn

NOTES:

THE GREENFIELD RUNOFF RATE OF (QBAR) 105.90LTS/SEC IS CALCULATED ON A SITE AREA OF 175500M2 OR 17.55HA. THE QBAR RATE USED FOR THE CALCULATION OF THE REQUIRED ON SITE STORAGE IS REDUCED TO 80.6LTS/SEC TO COMPENSATE FOR THE 25.3LTS/SEC OF RUNOFF THAT IS NOT ATTENUATED AND WHICH IS DERIVED FROM THE NORTHEAST CORNER OF THE DEVELOPMENT. THE ATTENUATION SYSTEM CONSISTS OF A SILT TRAPs, CLASS 1 BYPASS PETROLOIL INTERCEPTOR ON ALL NETWORKS AND AN ATTENUATION BASIN/POND HAVING A STORAGE VOLUME OF CIRCA 3784M3. THE CRITICAL STORM DURATION FOR A 1 in 30 YR STORM EVENT IS 360mins (WINTER) WHERE THE REQUIRED VOLUME IS 2243.70M3. THE CRITICAL STORM DURATION FOR A 1 in 100 YR STORM EVENT IS ALSO 360mins (WINTER) WHERE THE REQUIRED STORAGE VOLUME IS 2978.70M3 RESULTING IN AN OVERFLOW VOLUME OF 115.3M3.

ALL STORM DRAINAGE PIPE LINES HAVE BEEN DESIGNED FOR 1 IN 2YR RETURN PERIOD WITH A MAXIMUM RAINFALL OF 50MM/HR. MINIMUM SELF CLEANSING VELOCITY OF 0.8LT/SEC & MINIMUM TIME OF ENTRY 4 MINS. 10% ALLOWANCE HAS BEEN INCLUDED FOR GLOBAL CLIMATE CHANGE.

ALL COVER LEVELS ARE INDICATIVE AND THE FINAL COVER LEVELS TO MATCH FINISHED PATH/ROAD LEVELS.

ALL LEVELS FOR PIPES TO BE CHECKED AND VERIFIED PRIOR TO WORK COMMENCING ON SITE.

THE LAYOUT OF THE BRANCH DRAINS FROM THE INDIVIDUAL SITES ARE AS SHOWN ON THE DWELLINGS LAYOUT PLAN. ANY CHANGES ARE TO BE AGREED PRIOR TO CONSTRUCTION. THE DISTANCE FROM THE FINAL ACCESS JUNCTION ON EACH INDIVIDUAL SITE TO THE CONNECTION TO THE MAIN DRAIN TO BE A MAXIMUM OF 12m.

THE CONNECTION OF THE BRANCH DRAINS TO MAIN DRAINS SHOULD BE MADE AT A MANHOLE WHERE POSSIBLE OR BY USING AN OBLIQUE TYPE SADDLE. SADDLES SHOULD NOT BE USED ON PIPES OF 100mm DIAMETER, NOR TO CONNECT PIPES OF THE SAME DIAMETER.

ALL PIPES SHOULD HAVE FLEXIBLE JOINTS FORMED BY A METHOD RECOMMENDED BY THE PIPE MANUFACTURER. ELASTOMERIC SEALING RINGS, COMPLYING WITH THE REQUIREMENTS OF BS 2494, TYPE D, SHOULD BE USED.

MANHOLE COVERS AND FRAMES (TO COMPLY WITH THE REQUIREMENTS OF IS EN 124):

CLASS	LOCATION
D 400	ROADWAYS, HARDSHOULDERS, VEHICULAR ACCESSES
B 125	FOOTWAYS, GRASS VERGES
A 15	AREAS INACCESSIBLE TO MOTOR VEHICLES

ALL BRANCH CONNECTIONS FROM ACCESS JUNCTIONS (AJ'S) TO BE 100mmØ uPVC PIPES AT A GRADIENT OF 1 in 60.

GULLIES SHALL BE PRECAST CONCRETE COMPLYING WITH THE REQUIREMENTS OF BS 5911: PART 230, OR MAY CONSIST OF A CHAMBER CONSTRUCTED OF 100mm SOLID BLOCKWORK AND HAVING A 150mm IN SITU CONCRETE FLOOR, WITH INTERNAL DIMENSIONS OF 450mm x 300mm x 750mm. THE OUTLET FROM THE GULLY SHOULD BE 150mm DIAMETER, SET A MINIMUM OF 375mm ABOVE THE FLOOR OF THE CHAMBER.

GULLY GRATINGS IN ROADS SHOULD BE SET WITH THE DIRECTION OF THE OPENINGS AT RIGHT ANGLES TO THE DIRECTION OF TRAFFIC.

LOCATION AND INVERT LEVELS OF EXISTING (OR PROPOSED) MANHOLES OR OUTFALL POINTS TO BE VERIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION OF PROPOSED DRAINAGE NETWORK.

THE TYPE OF PIPE AND FITTINGS TO BE USED TO BE uPVC FOR PIPES UP TO 300mm IN DIAMETER (IN ACCORDANCE WITH THE REQUIREMENTS OF IS 424) .

TRENCH WIDTH AT THE LEVEL OF THE TOP OF THE PIPE SHOULD GENERALLY BE AS NARROW AS SAFE WORKING CONDITIONS WOULD ALLOW, WITH A MINIMUM WIDTH OF 300mm PLUS THE EXTERNAL DIAMETER OF THE PIPE BARREL.

DRAINS SHALL BE ACCESSIBLE FOR MAINTENANCE AND REPAIR AND SHALL BE CONSTRUCTED ON PUBLIC PROPERTY. ACCESS SHALL GENERALLY BE PROVIDED BY MEANS OF A MANHOLE BUT, SUBJECT TO APPROVAL, A PROPRIETARY ACCESS JUNCTION MAY BE USED IN LIEU OF A MANHOLE, ON A DRAIN WHERE THE DEPTH TO INVERT IS LESS THAN 600mm.

DRAINAGE PIPES SHOULD BE LAID WITH A MINIMUM COVER OF 1.2m IN ROADS AND DRIVEWAYS, 0.9m IN OPEN SPACES AND FOOTPATHS NOT ADJACENT TO RAODWAYS AND 0.6m IN GARDENS. WHERE IT IS NOT POSSIBLE TO ACHIEVE THESE MINIMUM COVERS, ADDITIONAL MEASURES SHOULD BE TAKEN IN ORDER TO PROTECT PIPEWORK. DETAILS SHOULD BE AGREED WITH THE ENGINEER PRIOR TO CONSTRUCTING THE PIPELINE.

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DRAWING. NO: 115
REV. NO: A

ENG

TITLE: Overall Storm Drainage Layout

PROJECT: Residential Development @ Haggardstown, Blackrock, Dundalk

CLIENT: Kingsbridge Consultancy Ltd
1st Floor Quayside Business Park
Mill Street, Dundalk, Co Louth.

SCALE: 1:1000 @ A1 DRAWN: P.Coyle

DATE: November 2018 CHECKED: -

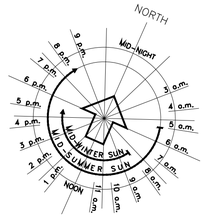
STATUS: Planning Permission

JOB NO: 1703

NOTES
1. Copyright Reserved 2003 ©
2. Work to figured dimensions only. Do not scale drawing.
3. The contractor is responsible for checking all levels and dimensions on site and shall refer all discrepancies to the Architect
4. Where appropriate, for details of r.c. structure, or mechanical and electrical details, see Engineers drawings
5. Proprietary items shall be fixed in strict accordance with manufacturers instructions.
6. Sizes of proprietary items shall be checked with manufacturer.
7. The contractor shall be responsible for the coordination of structure, finishes and services.

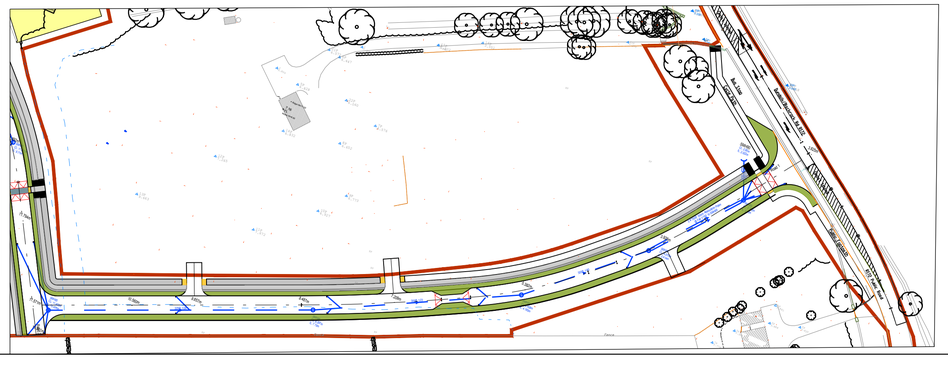
● CIVIL - STRUCTURAL ENGINEERING ● PROJECT MANAGEMENT

01 / 115 Overall Site Layout Plan - Storm Drainage
SCALE 1:1000



LEGEND:

ROAD EDGE (IN-SITU KERB)	1:40 / 6m ROAD GRADIENT
FOOTPATH EDGE	ROAD DIMENSION
ROAD CENTRELINE	PERMEABLE PAVING TO CAR PARKS 1-8
ROAD CHANNEL LINE	ROAD SURFACE
ROAD RAMP	FOOTPATH SURFACE
DROPPED KERB WITH TACTILE PAVING	RAISED TABLE
CORDUROY PAVING	SHARED SURFACE - VEHICULAR (HOMEZONE)
CAR DRIVEWAYS	PARKING
GFL 99.99 GROUND FLOOR LEVEL	GRASS/PLANTING
	TACTILE PAVING



02 / 115 Site Service Roadway - Storm Drainage
SCALE 1:1000