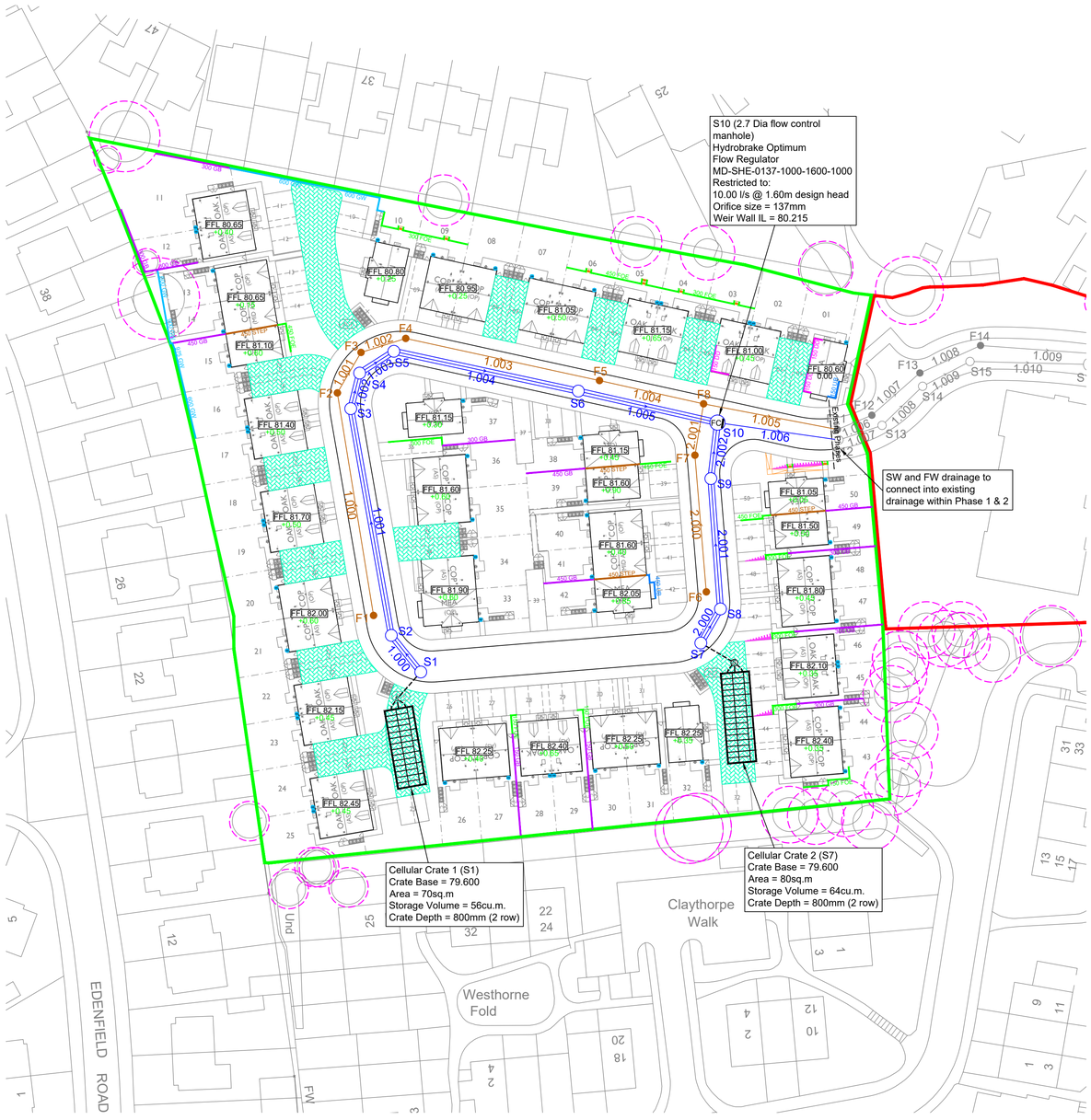
DO NOT SCALE

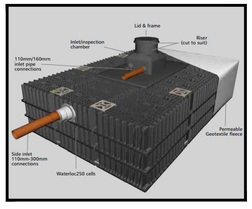


SUDS Methods

Method	Comment	Suitability for Development
Green Roofs	Can be used on suitable low -rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.	Not suitable: Architectural proposals for the development involve a pitched roof arrangement which are not suitable for green roofs.
Rainwater Harvesting	Rainwater harvesting reduces the total runoff volume from the developed site, and reduces treated water consumption.	Not suitable: Additional costs of installation would have severe effect on viability of the development. Running and maintenance costs would not be acceptable to our client. The ability to restrict peak flow rates and short -term peak volumes is non -existent where a critical storm event occurs. Water butts will be installed to rear RWP of residential houses for reuse in the garden.
Infiltration	Reduces total run off volume from the development	Not suitable due to clay strata
Permeable Surfacing (Infiltration)	Reduces total run off volume from the development. Can be used to enhance quality of run -off water.	Not suitable due to clay strata
Permeable Surfacing (Tanked)	Can be used to enhance quality of run -off water. Sub -base provides 'source' storage and reduces the volume of storage downstream. The storage can be created with selection of the stone fill or use of plastic box systems. Impermeable membrane at base of construction to prevent impact on pavement stability	**Suitable:** To be installed in shared drives and double driveways to provide at source surface water storage and improve water quality prior to discharge into piped system.
Swales, basins and ponds	Provide areas for above ground surface run off storage. Swales also allow filtering of particulate matter, improving water quality.	Not suitable: Space constraints on site do not permit large above ground areas for flood storage. No scope to reduce plot numbers due to site viability
Bio-Retention Areas	Collect and retain run -off to help improve water quality, prior to discharge in piped system or infiltration	Not suitable: Space constraints on site do not permit large above ground areas for flood storage. No scope to reduce plot numbers due to site viability.
Highway Tree Planters	Suitable as traffic calming features. Can be used as surface water run off storage and improve water quality prior to discharge in piped system or infiltration.	Not Suitable: Due to the site topography, driveway locations, junctions and steep highway gradients there are no suitable locations to introduce tree planters. Site geology not suitable for infiltration.
Geocellular storage	Suitable for sites with insufficient space for basins etc. Suitable for sites where topography prevents the use of open basins etc. Can be very effective infiltration devices subject to ground conditions.	**Suitable:** Subject to detailed design and drainage layout suitable for attenuation. Infiltration not suitable due to soil conditions, clay strata.
Large Pipes, conduits and tanks	Suitable for sites with insufficient space for basins etc. Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. Generally, be suitable for adoption by the statutory water company (e.g. United Utilities).	**Suitable:** Large diameter on-line pipes can be located within the highway corridor and will be adopted by United Utilities via S104 agreement



Water Butt
(All Plots)



Cellular Storage

Legend

- Site Boundary
- 600 GW — Geo Retaining Wall
- 450 FOE — Flag Retaining Wall
- 150 UB — Underbuild
- 150 GB — Gravel Board
- 150 STEP — Step In Slab
- 150 DD — Double Damp
- FFL 18.65 — Plot Slab Level
- S01 — Adoptable Surface Water Sewer
- F01 — Adoptable Foul Sewer
- +0.95 -0.95 — Depth of fill (Existing levels to proposed)
- S01 — Surface Water Sewer (Existing Phase)
- Cellular Attenuation Tank
- F01 — Foul Water Sewer (Existing Phase)
- WB — Water Butt
- FC — Flow Control Manhole
- Tanked Permeable Paving

STORM Network 1

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	1050	400	Circular	8.335	S1	78.82	81.73	S2	78.80	81.65
1.001	1050	400	Circular	40.844	S2	78.80	81.65	S3	78.70	81.15
1.002	1050	400	Circular	6.500	S3	78.70	81.15	S4	78.69	81.04
1.003	1050	400	Circular	7.195	S4	78.69	81.04	S5	78.67	80.92
1.004	1050	400	Circular	33.453	S5	78.67	80.92	S6	78.58	80.90
1.005	1050	400	Circular	25.307	S6	78.58	80.90	S10	78.52	80.99
1.006	300	239	Circular	21.762	S10	78.52	80.99	S12	78.43	80.16
1.007	300	22	Circular	8.051	S12	78.43	80.16	S13	78.07	79.78
1.008	300	32	Circular	9.986	S13	78.07	79.78	S14	77.76	79.30
1.009	300	5	Circular	9.490	S14	77.76	79.30	S15	76.01	78.80
1.010	300	21	Circular	21.320	S15	76.01	78.80	S16	74.98	77.73
2.000	1050	400	Circular	6.976	S7	78.62	81.82	S8	78.60	81.76
2.001	1050	400	Circular	23.170	S8	78.60	81.76	S9	78.55	81.28
2.002	1050	400	Circular	9.996	S9	78.55	81.28	S10	78.52	80.99
3.000	150	9	Circular	6.840	S17A	76.30	76.80	S17	75.50	76.36

FOUL Network 2

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	150	22	Circular	39.980	F1	80.25	81.60	F2	78.43	81.09
1.001	150	150	Circular	8.316	F2	78.43	81.09	F3	78.38	80.98
1.002	150	150	Circular	8.309	F3	78.38	80.98	F4	78.32	80.87
1.003	150	150	Circular	35.148	F4	78.32	80.87	F5	78.09	80.94
1.004	150	150	Circular	18.916	F5	78.09	80.94	F8	77.96	81.04
1.005	150	150	Circular	24.151	F8	77.96	81.04	F11	77.80	80.17
1.006	150	30	Circular	6.613	F11	77.80	80.17	F12	77.58	79.82
1.007	150	26	Circular	11.352	F12	77.58	79.82	F13	77.14	79.23
1.008	150	37	Circular	11.804	F13	77.14	79.23	F14	76.82	78.80
1.009	150	17	Circular	24.163	F14	76.82	78.80	F15	75.39	77.50
2.000	150	10	Circular	24.322	F6	80.38	81.74	F7	78.02	81.13
2.001	150	150	Circular	9.243	F7	78.02	81.13	F8	77.96	81.04

0 5 10 15 20 25 30 35 40 45 50
SCALEBAR (m)

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Notes

1. Setting out shall be undertaken using only the information given. Distances should not be scaled from this drawing.
2. All sewers shall be constructed in accordance with Design and Construction Guidance (DCG) Standards and United Utilities Details & Guidelines.
3. The minimum gravity pipe diameter under adoptable highways shall be 150mm
4. It is the responsibility of the Contractor to verify all information given with regards to existing services and drainage connections etc. prior to commencing the works. The rates shall include for hand dig around services where necessary. The Contractor shall adhere to the CDM Regulations at all times
5. The outsides of all sewers shall be a minimum of 1.0m from kerb lines and the outside of manholes shall be a minimum of 0.5m from kerb lines
6. Existing flows in watercourses, sewers and land drains shall be maintained at all times
7. Only trained personnel shall be permitted to enter confined spaces
8. All materials to bear the relevant B.S. Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement to withstand Class 3 condition (unless the site investigation report proves that sulphate attack from soils and groundwater will not occur).
9. All opening notices etc. as required under Highways Acts etc. are to be obtained prior to commencement of works. All works are to be inspected by L.A., NHBC or the Network Operator as applicable.
10. Where "Structured Wall" UPVC pipes (or similar approved) are used in adoptable drainage they shall be handled and laid in accordance with the manufacturers instructions and will be subject to post installation deformation testing prior to adoption. A Class S Bed and Surround must be used for "Structured Wall" pipes
11. Trench backfill in highways to within 1m of highway shall, as directed by the Highway Authority be a suitable granular material all in accordance with Design and Construction Guidance (DCG) Standards.
12. Slab levels shall not be varied without reference to the Engineer for guidance.
13. Pipes have not been designed to accommodate construction traffic loading. The contractor is responsible for providing adequate protection to the pipes during construction.

Design based on Layout:
Middleton Road, Crumpsall Site Layout
Rev: P5 (WH-001-NW-A-401 18.05.26)
Grid/Level datum based on Topo:
Middleton Road, Crumpsall. Topographical Survey - 2D
Rev: A

PLANNING

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Client
WAINHOMES NORTH WEST

Project
Middleton Road,
Crumpsall, Manchester

Title
Engineering Layout

DRAWING NUMBER
8755 / PL01

SCALE at A1	1:500	
DATE	27.05.26	REVISION
DRAWN	PW	-
CHECKED	AJ	