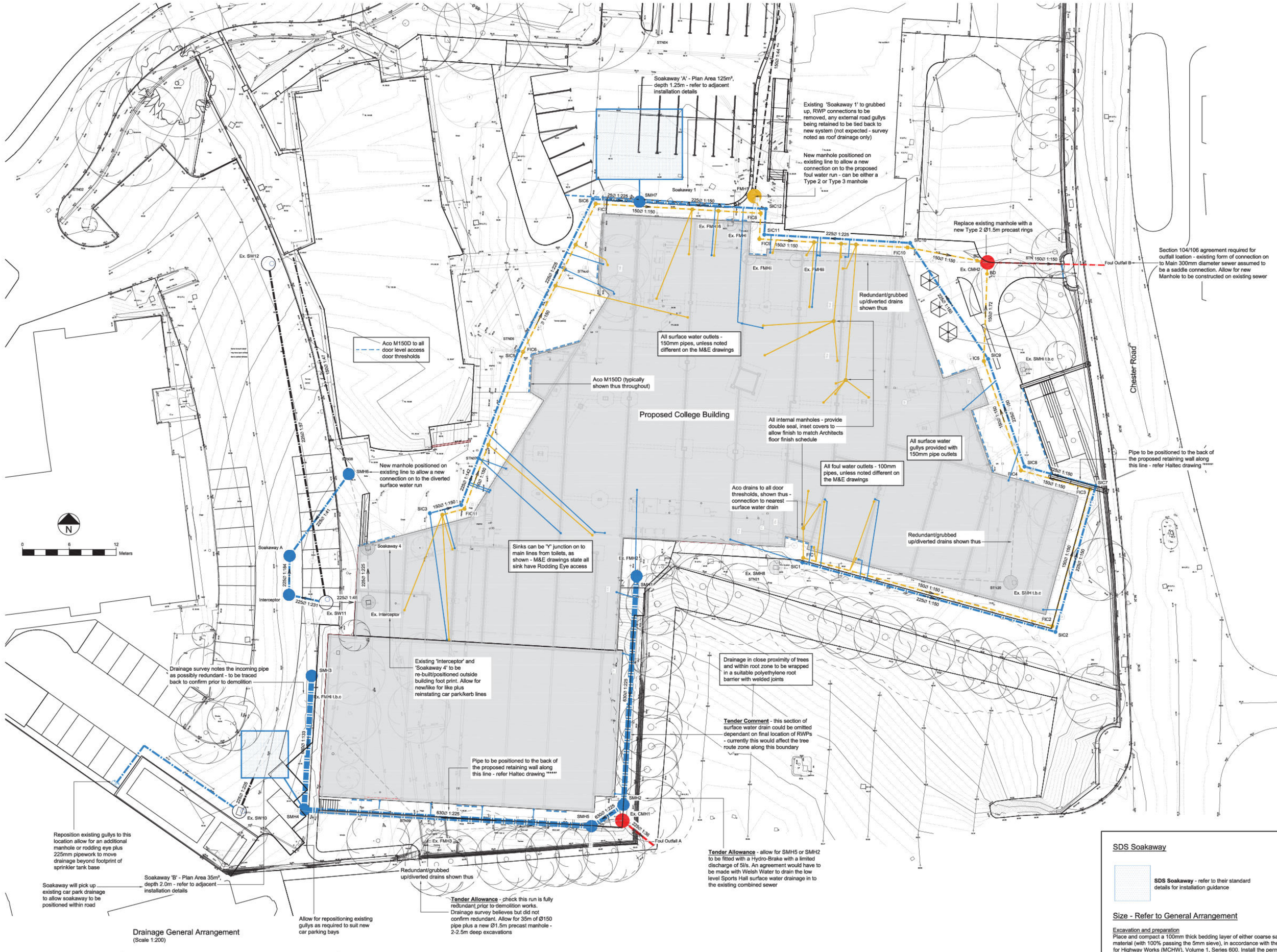
Refer to Haltec drawings 5007 for drainage long sections

Refer to Haltec drawings 3001-3002 for drainage standard details



Drainage General Arrangement
(Scale 1:200)

Tender Allowance (as noted on the general arrangement drawing above)

- Inspection Chambers - 25 No. with maximum inlet/outlets of Ø300mm
- Drainage Diversion - 35m Ø150mm pipe plus Ø1.5m precast concrete manhole - 2.5m excavations
- Hydro-brake with a limited discharge of 5l/s

Drainage Notes:

- This drawing is to be read in conjunction with all relevant Architect's, Engineer's and other specialists' drawings
- The contractor is responsible for checking dimensions and levels and for confirming the given level of outfall into public sewer, watercourse or other detail
- Refer to architect for all setting out
- Work to figured dimension only. Do not scale
- All works to be in accordance with BS EN752: British Standard for drain and sewer systems outside buildings and the Building Regulations and Sewers for Adoption 7th Addition
- All clay pipework and fittings to be plain and vitrified clay with flexible polypropylene couplings as Hepworth supersleeve or Naylor densleeve. All concrete pipework to be to BS5911
- All gravity PVCU pipework to be to BS4660 or BS5481 where relevant unless noted otherwise
- Trenches for pipework under roads and accessways to be backfilled with granular material in accordance with the requirements of the local authority
- All pipes under roads, car parking and access ways with depth less than 1200mm to have 150mm concrete bed & surround
- All pipes to be laid on Class S granular bed and surround
- Polypropylene access chambers to be min. 225 dia for depths up to 600mm and a min. 450 dia. for depths up to 1000mm. 600 dia. IC's for 300mm pipe
- All chamber and manhole covers and frames in roads, foot paths and access ways to be to BS EN 124 class D400. In gardens, landscaped areas to be to class B125
- Minimum pipe diameter under roads and access ways to be 150mm uno
- Foul water - all pipes beneath buildings and from SVP's, gullies and WC connections to access chambers to be 100mm at a minimum gradient of 1:40 unless noted otherwise. Min. gradient of 100mm pipe between access chambers outside building to be 1:80 uno
- Surface water - Min. gradient of 100mm pipe between access chambers/rodding eyes outside buildings to be 1:100 uno
- Foul Water : minimum pipe gradients to achieve 0.75m/s at one third design flow. Surface Water : minimum pipe gradients to achieve 1.00m/s at pipe full flow
- Connection to existing public sewer manhole to be agreed with Welsh Water
- All materials are to fully comply with the requirements of clause "E" in sewers for adoption 7th edition, of which the contractor must fully acquaint himself with to ensure compliance.
- Subject to a section 104 Adoption Agreement being complete, a Section 106 application to connect must be made to DCWW, the developer shall give 21 days' notice prior to connection. The works may only be undertaken by an SSIP health & safety approved contractor.
- The developer must self-vet and certify that the design criteria, material standards and workmanship specifications for the proposed adoptable sewers are in accordance with those set out in "Sewers For Adoption 7th Edition, The Welsh Ministers Standards and the requirements of DCWW as the Statutory Sewerage Undertaker.

Important Note: Ensure all notes on the plan are referred to, as some additional lengths of pipework/manholes/ inspection chamber are noted but not picked up within the schedule due to information not received before the Tender drawing was produced

Manhole Schedule - Cover Type : D400 - Manhole Type : 2 u.n.o

Reference	Diameter (m)	Cover Level	Pipe Invert Incoming (m)	Pipe Invert Outgoing (m)	Pipe Dia. Incoming (m)	Pipe Dia. Outgoing (m)
FMH1	1.500	84.889	83.991	83.934 83.818	0.150	0.150 0.150

Inspection Chamber Schedule - Cover Type : D400 - Inspection Chamber Type : 3

Reference	Cover Level	Pipe Invert Incoming (m)	Pipe Invert Outgoing (m)	Pipe Dia. Incoming (m)	Pipe Dia. Outgoing (m)
FIC1	84.814		83.758		0.150
FIC2	84.800	83.538	83.538	0.150	0.150
FIC3	84.810	83.417	83.417	0.150	0.150
FIC4	84.835	83.356	83.356	0.150	0.150
FIC5	84.845	83.267	83.267	0.150	0.150
FIC6	85.028	83.645	83.645	0.150	0.150
FIC7	84.859	83.504	83.441	0.150	0.150
FIC8	84.886	83.300 83.300	83.300	0.150 0.150	0.150
FIC9	84.860	83.276	83.276	0.150	0.150
FIC10	84.817	83.151	83.151	0.150	0.150
FIC11	84.843	83.766	83.766	0.150	0.150
FIC12	84.843		83.766		0.150
FIC13	84.795	83.729	83.729	0.150	0.150
FIC14	84.900	83.582	83.582	0.150	0.150
FIC15	84.818	83.543	83.543	0.150	0.150
FIC16	84.821	83.358	83.358	0.150	0.150
FIC17	84.821	83.336	83.336	0.150	0.150
FIC18	85.000	1.0.c Internal	1.0.c Internal	1.0.c Internal	1.0.c Internal
FIC19	85.000	1.0.c Internal	1.0.c Internal	1.0.c Internal	1.0.c Internal
FIC20	85.000	1.0.c Internal	1.0.c Internal	1.0.c Internal	1.0.c Internal
FIC21	84.816	83.195	83.195	0.150	0.150
FIC22	84.827	83.208	83.208	0.150	0.150
FIC23	84.835	83.231	83.231	0.150	0.150

Manhole Schedule - Cover Type : D400 - Manhole Type : 2 u.n.o

Reference	Diameter (m)	Cover Level	Pipe Invert Incoming (m)	Pipe Invert Outgoing (m)	Pipe Dia. Incoming (m)	Pipe Dia. Outgoing (m)
Interceptor	1.800	84.966	83.146	83.146	0.225	0.225
SMH1	1.500	84.129		81.789		0.630
SMH2	1.500	82.950	81.837	81.837	0.630	0.630
SMH3	1.500	84.478		82.852		0.630
SMH4	1.800	84.952	82.523 81.452		0.630 0.630	
SMH5	1.800	82.957	81.815	81.815	0.630	0.630
SMH6	1.800	84.711	82.958	82.958 83.388	0.150	0.150 0.225
SMH7	1.800	84.807	83.436 82.898		0.225 0.225	
Soakaway A	1.800	84.570	83.118 83.094		0.225 0.225	

Inspection Chamber Schedule - Cover Type : D400 - Inspection Chamber Type : 3

Reference	Cover Level	Pipe Invert Incoming (m)	Pipe Invert Outgoing (m)	Pipe Dia. Incoming (m)	Pipe Dia. Outgoing (m)
SIC1	84.782		83.737		0.225
SIC2	84.818	83.513	83.513	0.225	0.225
SIC3	84.839		83.754		0.150
SIC4	84.839	83.757	83.707	0.150	0.225
SIC5	85.042	83.559	83.559	0.225	0.225
SIC6	84.800	83.493	83.493	0.225	0.225
SIC7	84.971	83.384	83.384	0.225	0.225
SIC8	84.825	83.321	83.321	0.225	0.225
SIC9	84.845	83.224	83.224	0.225	0.225
SIC10	84.799	83.126	83.087	0.225	0.225
SIC11	84.862	82.984	82.984	0.225	0.225
SIC12	84.905	82.989	83.007	0.225	0.225
SIC13	84.795	83.662	83.662	0.225	0.225

Manhole Schedule - Cover Type : D400 - Manhole Type : 2 u.n.o

Reference	Diameter (m)	Cover Level	Pipe Invert Incoming (m)	Pipe Invert Outgoing (m)	Pipe Dia. Incoming (m)	Pipe Dia. Outgoing (m)
Ex. CMH1	1.500	83.073	81.440 81.440	81.440	0.225 0.150	0.225
Ex. CMH2	1.500	84.763	83.082 83.082	82.333	0.150 0.150	0.150

SDS Soakaway

SDS Soakaway - refer to their standard details for installation guidance

Size - Refer to General Arrangement

Excavation and preparation
Place and compact a 100mm thick bedding layer of either coarse sand or Class 6H selected granular material (with 100% passing the 5mm sieve), in accordance with the Manual of Contract Documents for Highway Works (MCHW), Volume 1, Series 600. Install the permeable geotextiles, forming joints in accordance with the manufacturer's recommendations, making an allowance for the connecting pipework or adapters.

Geotextile layer (Permeable)
The type of geosynthetic material used to encapsulate the SDScells will determine the installation requirements. Please note the following information is generic and advice from the geosynthetic manufacturer should be sought to ensure that the appropriate protective measures are taken to comply with any proprietary requirements.

Physical Properties
Material Typically Polypropylene/Polyethylene
Mass Min 125g/m2 EN 965

Mechanical Properties
CBR puncture resistance Min 1500 N EN ISO 12236
Peak tensile strength Min 8kN/m2 EN ISO 10319
Hydraulic properties
Water flow rate normal to plane Min 100 l/m2 .s (@ 50mm Head EN ISO 11058
Pore size O90 Typically 100 µm EN ISO 12956
pH Resistance to all naturally occurring soil acids and alkalis
Chemical/biological resistance
Resistance to all substances found to naturally occur in soils and rainwater.
Detailed information would need to be provided to geosynthetic manufacturer in instances of contaminated land.

All joints should be sealed, using proprietary methods recommended by the manufacturer. Please refer to CIRIA SP 124 – Barriers, liners and cover systems for containment and control of land contamination, for advice on seam testing procedures.
Before the cells are installed the geotextile should be laid over the subgrade level. The sheet of geotextile should be large enough such that it can overlap over the edge of the modules by 200mm.
SDScell installation
Place the SDScells on the geotextile in accordance with the construction drawings and Polypipe connection details. Ensure cells are arranged so that they are in the correct alignment with the adjoining pipework.

Drainage Key

- SMH?? — Surface Water Manhole
- SIC?? — Surface Water Inspection Chamber
- Surface Water Drain
- Aco Drain - MultiDrain M150D (185mm Invert)
- G G — SVP, RWP, Road and Aco Drain Gully
- FMH?? — Foul Water Manhole
- FIC?? — Foul Water Inspection Chamber
- Foul Water Drain
- Surface and Foul Water Flow Direction
- CMH?? — Existing Combined Manhole
- Combined Water Drain

Site Investigation Report required to finalise design of Surface Water (Percolation Rates Required)

rev	date	dm	chk	details
P2	20.09.18	DRB	JDH	Tender Drawing Issue - Pop Ups Added

client
Wynne Construction

project
Yale Campus Redevelopment

drawing title
Drainage General Arrangement

HALTEC
Consulting Civil and Structural Engineers
Tel: 01244 853883 Fax: 01244 853892
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drawn	scale	date	checked
DRB	As Shown @ A0	July '18	JDH

purpose of issue	status
Tender	D2

dwg no.	revision
YCR-HAL-XX-XX-DR-C-5006	P2