

SURFACE WATER MANHOLE SCHEDULE											
Manhole No.	Cover Level (m)	Invert Level (m)	Depth to Invert (m)	Main Channel (mm)	Branches	Manhole Type	Chamber Size (mm)	Cover Size (mm)	Cover Loading	Comment	Co-ordinates (mm) EastingNorthing
BSW01	27.240	25.890	1.350	1500	1500 @ IL 25.965 In 1500 @ IL 25.965 In 1500 @ IL 25.890 Out	PCC	1200Ø	750x675	D400	-	383703071,397248468
BSW02	27.240	25.780	1.460	1500	1500 @ IL 25.780 In 1500 @ IL 25.855 In 1500 @ IL 25.855 In 1500 @ IL 25.780 Out	PCC	1200Ø	750x675	D400	-	383715809,397250876
BSW03	27.240	25.570	1.670	1500	1500 @ IL 25.570 In 1500 @ IL 25.645 In 1500 @ IL 25.570 Out	PCC	1200Ø	600x600	D400	-	383738328,397262653
BSW04	27.240	25.015	2.225	1500	1500 @ IL 25.465 In 1500 @ IL 25.540 In 1500 @ IL 25.465 Out	PCC	1200Ø	600x600	D400	Catchpit	383732381,397274023
BSW05	27.240	25.890	1.350	1500	1500 @ IL 25.965 In 1500 @ IL 25.890 Out	PCC	1200Ø	750x675	D400	-	383702789,397267667
BSW06	27.240	25.715	1.525	1500	1500 @ IL 25.715 In 1500 @ IL 25.790 In 1500 @ IL 25.790 In 1500 @ IL 25.715 Out	PCC	1200Ø	750x675	D400	-	383721069,397277227
BSW07	27.240	25.315	1.925	1500	1500 @ IL 25.315 In 1500 @ IL 25.315 In 1500 @ IL 25.315 In	PCC	1200Ø	600x600	D400	-	383728636,397281185
BSW08-PS	27.240	REFER TO PUMP STATION SCHEDULE FOR DETAILS						600x600	D400		383726658,397284967
SW01	32.750	31.325	1.425	2250	1500 @ IL 31.400 In 1500 @ IL 31.400 In 2250 @ IL 31.325 Out	PCC	1200Ø	750x675	D400	Recessed, Single Sealed & Lockable	383702732,397230623
SW02	33.120	31.770	1.350	1500	1500 @ IL 31.845 In 1500 @ IL 31.770 Out	PCC	1200Ø	600x600	D400	Recessed, Single Sealed & Lockable	383773976,397229968
SW03	31.950	29.075	2.875	2250	2250 @ IL 30.525 In 1500 @ IL 29.525 In 2250 @ IL 30.525 Out	PCC	1200Ø	600x600	D400	Catchpit, Recessed, Single Sealed & Lockable	383758406,397259740
SW04	31.670	29.100	2.570	1500	2250 @ IL 29.550 In 1500 @ IL 29.625 In 1500 @ IL 29.550 Out	PCC	1200Ø	600x600	D400	Flow Control, Recessed, Single Sealed & Lockable	383749764,397266743
SW05	31.230	28.970	2.260	1500	1500 @ IL 29.420 In 1500 @ IL 29.495 In 1500 @ IL 29.420 Out	PCC	1200Ø	600x600	D400	Catchpt, Recessed, Single Sealed & Lockable	383742711,397280229
SW06	31.650	30.650	1.000	1500	1500 @ IL 30.650 Out	PPIC	450Ø	450x450	D400	Recessed, Single Sealed & Lockable	383755502,397267069
SW07	30.890	29.890	1.000	1500	1500 @ IL 29.890 In 1500 @ IL 29.890 Out	PPIC	450Ø	450x450	D400	Recessed, Single Sealed & Lockable	383742671,397291602
SW08	30.850	28.970	1.880	1500	1500 @ IL 29.420 In 1500 @ IL 29.495 In 1500 @ IL 29.420 Out	PCC	1200Ø	600x600	D400	Catchpit, Recessed, Single Sealed & Lockable	383741188,397294439
SW09	30.930	28.900	2.030	2250	R.M. @ IL T.B.C. In 1500 @ IL 28.900 In 2250 @ IL 28.900 Out	PCC	1200Ø	600x600	D400	Recessed, Single Sealed & Lockable	383730008,397291816
SW10	30.860	29.050	1.810	1500	1500 @ IL 29.575 In 1500 @ IL 29.575 In 1500 @ IL 29.575 In 1500 @ IL 29.575 In 1500 @ IL 29.500 Out	PCC	1200Ø	600x600	D400	Catchpit, Recessed, Single Sealed & Lockable	383727285,397293623
SW11	30.900	28.340	2.560	1500	2250 @ IL 28.370 In 1500 @ IL 28.370 Out	PCC	1200Ø	600x600	D400	Flow Control, Recessed, Single Sealed & Lockable Outlet from chamber to be fitted with non-return valve	383739224,397299867

ATTENUATION TANK SCHEDULE							
REF.	MANUFACTURER & TYPE	MIN. STORAGE VOLUME (m³)	PLAN AREA (m²)	HEIGHT (m)	INVERT LEVEL (m)	PIPE IN INVERT (m)	PIPE OUT INVERT (m)
ATTEN-1	ACO STORMBRIXx HD (95% VOID RATIO)	56	48	1.220	29.550	2250 @ 30.475	2250 @ 29.600
ATTEN-2	ACO STORMBRIXx HD (95% VOID RATIO)	106	91.5	1.220	28.370	1500 @ 29.370 1500 @ 29.370 1500 @ 29.370 2250 @ 28.850	2250 @ 28.420
1. TANK TO BE WRAPPED AND TAPED IN IMPERMEABLE GEOMEMBRANE AND GEOTEXTILE PROTECTION FLEECE. WELDED JOINTS REQUIRED DUE TO GROUND WATER LEVELS AND DEPTHS OF TANKS. 2. 100mm VENT PIPE FROM SOFFIT LEVEL OF TANK INTO DOWNSTREAM MANHOLE TO BE PROVIDED. 3. BEDDING AND SURROUND TO BE 150mm OF 6H SHARP SAND ON UNDISTURBED GROUND WITH 5% CBR AND FULL PERIMETER TO PROTECT GEOTEXTILE AND GEOMEMBRANE.							

OIL SEPARATOR SCHEDULE										
REF.	MANUFACTURER & TYPE	DESIGNATION	COVER LEVEL	OIL CAPACITY	OVERALL LENGTH (mm)	OVERALL DIAMETER (mm)	INLET INVERT/ DIA (m/ mm)	OUTLET INVERT/ DIA (m/ mm)	COVER SIZE (mm)	COVER LOADING
OS-1	SPEL STORMCEPTOR CLASS 1	NSB3	27.240	45 LITRES	1550mm	1300mm Ø	25.415 / 150	25.365 / 150	450 dia	D400
1. BESPOKE SQUARE COVER AND CONCRETE SUPPORT AROUND CIRCULAR ACCESS SHAFTS 2. OIL SEPARATOR TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. TO BE INSTALLED ON 500mm FND2 CONCRETE BASE WITH 500mm CONCRETE SURROUND. 3. OIL ALARM LINKED TO BMS REQUIRED. DN100 VENT PIPE TO ABOVE GROUND TO BE INSTALLED AND TERMINATED IN A LOCATION AGREED BY THE ARCHITECT										

PUMPING STATION SCHEDULE									
REF.	MANUFACTURER & TYPE	CONFIGURATION	CHAMBER SIZE (m)	PUMP DUTY (l/s)	PUMPING MAIN	GEODETIC HEAD (m)	PIPE IN INVERT (m)	MAIN OUT LEVEL (m)	SUMP LEVEL (m)
BSW08-PS	XYLEM SUBMERSIBLE PUMP	DUTY / STANDBY	1.800m Ø (TBC WITH PUMP SPECIALIST)	DUTY @ 1.0 L/S STANDBY @ 1.0 L/S	1no. DN65 MPDE SDR11 RISING MAIN APPROX. 12m LENGTH TBC BY PUMP SPECIALIST	TBC BY SPECIALIST TO SUIT FINAL WET-WELL DESIGN OUTLET DISCHARGE LEVEL @ 12.470mAOD	1500 @ 25.265m AOD	25.265m AOD TBC BY SPECIALIST TO SUIT WET WELL DESIGN	TBC BY SPECIALIST TO SUIT WET WELL AND LEVEL CONTROLS ALLOWANCE FOR SUMP IL = -0.505m
1. REFER TO M&E ENGINEERS DRAWINGS FOR CONTROL PANEL LOCATIONS, BMS LINKAGE AND POWER SUPPLY 2. DN100 VENT PIPE TO ABOVE GROUND TO BE INSTALLED AND TERMINATED IN A LOCATION AGREED BY THE ARCHITECT. APPROXIMATE LOCATIONS INDICATED ON GENERAL ARRANGEMENT. 3. ANCILLARY REQUIREMENTS TO BE CONFIRMED BY SPECIALIST PUMP MANUFACTURER. 4. ALL INFORMATION PROVIDED IN THIS SCHEDULE IS SUBJECT TO DETAILED DESIGN BY M&E CONTRACTOR AND PUMP SPECIALIST/MANUFACTURER 5. RISING MAIN & WET WELL ARE TO BE SIZED TO EMPTY DURING EACH CYCLE 6. STORAGE REQUIREMENT BEING SATISFIED WITHIN BELOW GROUND DRAINAGE SYSTEM IS TO BE SIGNED OFF BY BUILDING CONTROL PRIOR TO ANY CONSTRUCTION WORKS									

FOUL WATER MANHOLE SCHEDULE											
Manhole No.	Cover Level (m)	Invert Level (m)	Depth to Invert (m)	Main Channel (mm)	Branches	Manhole Type	Chamber Size (mm)	Cover Size (mm)	Cover Loading	Comment	Co-ordinates (mm) EastingNorthing
FW01	31.670	29.465	2.205	1500	1500 @ IL 29.540 In 1500 @ IL 29.465 Out	PCC	1200Ø	750x675	D400	Recessed, Double Sealed & Lockable	383748214,397265932
FW02	31.250	29.365	1.885	1500	1500 @ IL 29.440 In 1500 @ IL 29.365 In 1500 @ IL 29.365 Out	PCC	1200Ø	750x675	D400	Recessed, Double Sealed & Lockable	383742822,397276243
FW03	30.850	29.140	1.710	1500	1500 @ IL 29.140 In 1500 @ IL 29.140 Out	PCC	1200Ø	750x675	D400	Recessed, Double Sealed & Lockable	383730809,397299213

COMBINED WATER MANHOLE SCHEDULE											
Manhole No.	Cover Level (m)	Invert Level (m)	Depth to Invert (m)	Main Channel (mm)	Branches	Manhole Type	Chamber Size (mm)	Cover Size (mm)	Cover Loading	Comment	Co-ordinates (mm) EastingNorthing
CW01	30.850	28.320	2.530	1500 1500	1500 @ IL 28.320 In 1500 @ IL 28.320 Out 1500 @ IL 28.320 Out	PCC	1200Ø	600x600	D400	Recessed, Double Sealed & Lockable Outlets from chamber to be fitted with non-return valves	383737686,397302809

CHANNEL DRAIN SCHEDULE										
REF.	MANUFACTURER & TYPE		DESIGNATION	COVER LOADING AND MINIMUM TYPE		NUMBER OF OUTLETS		OUTLET DIA (mm)	LENGTH (m)	DRAINED AREA (m ²)
SD-1	ACO MULTIDRAIN		M100D 30.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	39.2	336
SD-2	ACO MULTIDRAIN		M150D 20.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		2		150	58	537
SD-2a	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1			1.5	35
SD-3	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	14.6	55
SD-4	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	4.2	88
SD-5	ACO MULTIDRAIN		M100D 20.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	12.4	242
SD-6	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	4	48
SD-7	ACO MULTIDRAIN		M100D 10.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	4	216
SD-8	ACO MULTIDRAIN		M100D 20.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	6	256
SD-9	ACO MULTIDRAIN		M100D 10.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		2		150	17.8	168
SD-10	ACO MULTIDRAIN		M150D 20.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	45.8	500
SD-11	ACO MULTIDRAIN		M100D 10.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	40	132
SD-12	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	5.3	117
SD-13	ACO MULTIDRAIN		M100D 0.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	3.4	60
SD-14	ACO MULTIDRAIN		M100D 30.0	D400 BRICKSLOT SINGLE SLOT OFFSET GALVANISED STEEL		1		150	23	368
DC-1	ACO MULTIDRAIN		M100D 30.0	D400 HEELGAURD DUCTILE IRON		1		150	4.5	370
KD-1a	ACO ROADRAIN		PD100 F 30.1	F900 ROADRAIN PD100 F 30.1 CHANNEL		CONNECTION INTO KD-1b			20	250
KD-1b	ACO KERBRAIN		KD HB480	D400 KERBRAIN HB480 CHANNEL		1		225	42	350
ALL CHANNELS HAVE BEEN DESIGNED FOR A DESIGN RAINFALL INTENSITY OF 110mm/hr (1in5yr EVENT +40% CLIMATE CHANGE, WITH A RISK CATEGORY 3)										
ALL OUTLETS TO BE DN150 WITH SUMPS AND RODDABLE TRAPS										

VORTEX FLOW CONTROL SCHEDULE					
MANUFACTURER & UNIT: ACO Q BRAKE MANHOLE REF: SW04 DESIGN FLOW: 4 l/s DESIGN HEAD: 1.2m					
HEADLOSS (m)	FLOW RATE (l/s)	HEADLOSS (m)	FLOW RATE (l/s)	HEADLOSS (m)	FLOW RATE (l/s)
0.1	2.6	0.4	3.8	0.8	3.3
0.2	3.7	0.5	3.2	1.0	3.7
0.3	4.0	0.6	2.9	1.2	4.0
MANUFACTURER & UNIT: ACO Q BRAKE MANHOLE REF: SW11 DESIGN FLOW: 2 l/s DESIGN HEAD: 1.2m					
HEADLOSS (m)	FLOW RATE (l/s)	HEADLOSS (m)	FLOW RATE (l/s)	HEADLOSS (m)	FLOW RATE (l/s)
0.1	2.6	0.4	3.8	0.8	3.3
0.2	3.7	0.5	3.2	1.0	3.7
0.3	4.0	0.6	2.9	1.2	4.0
ALL FLOW CONTROL DEVICES HAVE BEEN SIZED TO REDUCE UPSTREAM STORAGE VOLUMES. THE BELOW GROUND DRAINAGE SYSTEM HAS BEEN SIZED BASED ON THE HEAD/DISCHARGE RELATIONSHIP FOR THE ACO Q BRAKE AS SPECIFIED ABOVE. SHOULD ANOTHER TYPE/MANUFACTURER OF THE FLOW CONTROL DEVICE BE SPECIFIED THEN THE VOLUME OF THE BELOW GROUND ATTENUATION TANK AND ASSOCIATED PIPE SIZES WILL BE INCORRECT AND MAY REQUIRE RE-DESIGNING					

NON RETURN VALVE SCHEDULE			
MANHOLE REF.	DRAINAGE SYSTEM	MANUFACTURER & TYPE	TYPE
SW09	SURFACE WATER	ALTHON WASTOP	WASTOP SS225mm GRADE 304
SW11	SURFACE WATER	ALTHON WASTOP	WASTOP SS150mm GRADE 304
CW01 (BOTH OUTLETS)	COMBINED	ALTHON WASTOP	WASTOP SS150mm GRADE 304
	COMBINED	ALTHON WASTOP	WASTOP SS150mm GRADE 304
ALL NON RETURN VALVES TO BE INSTALLED AS PER MANUFACTURER'S REQUIREMENTS ALL NON RETURN VALVES TO BE FITTED ON DOWNSTREAM PIPE U.N.O (I.E. MANHOLE OUTLET)			

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
NOTES BELOW ARE ADDITIONAL TO HAZARDS/RISKS NORMALLY ASSOCIATED WITH THIS TYPE OF WORK. FOR DETAILS REFER TO: RAM-XX-XX-RA-D-00001	
CONSTRUCTION (INCLUDING DEMOLITION AND REMOVAL OF EXISTING STRUCTURAL COMPONENTS)	
A1	  SERVICES (IDENTIFIED AND UNIDENTIFIED) ARE PRESENT WITHIN AND ADJACENT TO THE REDLINE BOUNDARY.
A2	  LIVE GAS MAIN IDENTIFIED WITHIN THE SITE BOUNDARY.
B1	  DEEP EXCAVATIONS WILL BE REQUIRED FOR THE CONSTRUCTION OF THE EXTERNAL DRAINAGE ATTENUATION.
B2	 COMBINED WATER CONNECTION TO EXISTING DRAINAGE. DEEP EXCAVATIONS REQUIRED FOR CONNECTION.
B3	  GROUND WATER LIKELY TO BE ENCOUNTERED ON SITE DURING CONSTRUCTION OF ATTENUATION.
B4	 ALL BELOW GROUND DRAINAGE LOCATED WITHIN BASEMENT IS APPROXIMATELY 4m BELOW GROUND FLOOR LEVEL. POSSIBLE UNKNOWN CONNECTIONS.
OPERATIONS, MAINTENANCE	
D1	 MANHOLES LOCATED WITHIN INTERNAL SPACES AT BASEMENT LEVEL.
D2	 ACCESS TO ATTENUATION REQUIRED FOR MAINTENANCE.
D3	 ACCESS TO OIL SEPARATOR REQUIRED FOR MAINTENANCE.
D4	 ACCESS TO PUMP STATIONS REQUIRED FOR MAINTENANCE.
DISMANTLING / DEMOLITION (FUTURE)	
NO SIGNIFICANT RESIDUAL RISK IDENTIFIED	
REFER TO GENERAL NOTES AND THE PRINCIPAL CONTRACTOR FOR MORE INFORMATION ABOUT THE RISKS ASSOCIATED WITH THIS WORK.	

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- Notes
- DO NOT SCALE FROM THIS DRAWING
 - ALL DIMENSIONS ARE MILLIMETRES U.N.O.
 - ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS
 - REFER TO PROPOSED DRAINAGE NOTES DRAWING RAM-XX-ZZ-DR-D-10001 FOR FURTHER DETAILS.
 - REFER TO THE BELOW FOR ABBREVIATIONS USED ON THIS DRAWING:
PCC = PRECAST CONCRETE MANHOLE
PPIC = POLYPROPYLENE INSPECTION CHAMBER
RM = RISING MAIN
 - BRANCH CONNECTIONS OF DN150 OR LESS TO DISCHARGE INTO MAIN CHANNEL AT HALF PIPE LEVEL.
 - BRANCH CONNECTIONS GREATER THAN DN150 TO BE SET LEVEL WITH SOFFIT OF MAIN DRAIN.

THESE NOTES ARE BASED ON THE USE OF EXPERIENCED AND COMPETENT CONTRACTORS CARRYING OUT THE WORK USING AN APPROVED SAFE METHOD OF WORKING

KEY TO HEALTH AND SAFETY SYMBOLS

-  INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION
-