

APPENDIX B - DRAINAGE STRATEGY DRAWINGS

The following section has been prepared by Aecom

Project Management Initials: Designer: CP Checked: UG Approved: MW ISO A1 194mm x 84mm
 Last saved by: PURDY(2016-11-22) Last Plotted: 2016-11-22
 Filename: F:\SPECULATIVE PROJECTS\UOH SPORTS SCIENCES DOCUMENT CONTROL\1 OUTGOING INFORMATION\16-11-16 INFRASTRUCTURE TENDER ISSUE\UHS-ACM-00-00-DR-DR-0101.DWG
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Manhole Number	Approximate Cover Level (m)	Invert Level (m)	Depth (m)	Manhole Type	Min Internal Chamber Size (mm)	Access Cover Type	Access Cover Opening	Special Requirements
SW01	75.050	73.888	1.162	B (0-3m)	1200mm	B125	1200x750	
SW02	75.050	73.833	1.217	B (0-3m)	1200mm	B125	1200x750	
SW03	75.050	73.768	1.282	B (0-3m)	1200mm	B125	1200x750	
SW04	75.050	73.688	1.362	B (0-3m)	1200mm	B125	1200x750	
SW05	75.050	73.608	1.442	B (0-3m)	1200mm	B125	1200x750	
SW06	75.050	73.529	1.521	B (0-3m)	1200mm	B125	600x600	
SW07	75.200	73.750	1.450	B (0-3m)	1200mm	B125	1200x750	
SW08	75.200	73.689	1.511	B (0-3m)	1200mm	B125	600x600	
SW09	75.050	73.750	1.300	B (0-3m)	1200mm	C250	1200x750	
SW10	75.200	73.625	1.575	B (0-3m)	1200mm	C250	600x600	
SW11	75.400	73.449	1.951	B (0-3m)	1200mm	C250	Vented Cover 600x600	FLOW CONTROL
SW12	75.610	73.347	2.263	B (0-3m)	1200mm	C250	600x600	
FW01	74.600	73.514	1.086	Plastic Inspection Chamber	450mm	B125 Recessed Double Sealed	430x430 Bolted Down	
FW02	75.050	73.494	1.556	Plastic Inspection Chamber	450mm	A15 Recessed Double Sealed	350x350 Bolted Down	
FW03	75.050	73.482	1.568	Plastic Inspection Chamber	450mm	A15 Recessed Double Sealed	350x350 Bolted Down	
FW04	75.050	73.368	1.682	Plastic Inspection Chamber	450mm	B125 Recessed Double Sealed	350x350 Bolted Down	
FW05	75.050	73.466	1.584	Plastic Inspection Chamber	450mm	A15 Recessed Double Sealed	350x350 Bolted Down	
FW06	75.050	73.350	1.700	Grease Trap	1050mm	B125	600x600	
FW07	75.050	73.343	1.707	Plastic Inspection Chamber	450mm	B125	350x350	
FW08	75.050	73.296	1.754	Plastic Inspection Chamber	450mm	A15 Recessed Double Sealed	350x350 Bolted Down	
FW09	75.050	73.265	1.785	Plastic Inspection Chamber	450mm	B125	350x350	
FW10	75.050	73.190	1.860	Plastic Inspection Chamber	450mm	B125	350x350	
FW11	75.400	73.071	2.329	Plastic Inspection Chamber	450mm	C250	350x350	

GENERAL NOTES

SITE WIDE LEVEL STRATEGY TO BE CONFIRMED IN ORDER TO PROGRESS DRAINAGE DESIGN AND REQUIREMENT FOR SURFACE DRAINAGE LOCATIONS.

SECTION 106 APPLICATION TO BE COMPLETED AND APPROVED BY LOCAL WATER AUTHORITY PRIOR TO ANY CONNECTION MADE TO THE PUBLIC SEWER. PLEASE ENSURE THAT A WATER AUTHORITY INSPECTOR IS PRESENT DURING CONNECTION TO THE PUBLIC SEWER.

DRAINAGE STRATEGY SUBJECT TO LOCAL AUTHORITY AND ENVIRONMENT AGENCY APPROVAL.

THERE MAY BE A REQUIREMENT FOR DRAINAGE TO PASS THROUGH GROUND BEAMS AND FOUNDATIONS.

SURFACE WATER STACK LOCATIONS TO BE CONFIRMED IN ORDER TO FINALISE DRAINAGE DESIGN.



PROJECT
UOH SOCIAL SPACE

CLIENT
UNIVERSITY OF HERTFORDSHIRE

CONSULTANT
AECOM
AECOM House, 63-77 Victoria Street,
St Albans, Herts, AL1 3ER
+44 (0) 01727 535000 tel
+44 (0) 01727 535099 fax
www.aecom.com

- NOTES**
- Do not scale this drawing & only work only to figured dimensions.
 - Levels related to ordnance datum Newlyn.
 - All dimensions in millimetres unless shown otherwise.
 - Report any discrepancies to AECOM immediately and seek advice.
 - This drawing must be read in conjunction with all other party drawings, specifications and schedule.
 - The contractor shall check levels & condition of all existing drainage prior to construction of any new drainage, unless otherwise agreed, to ensure the proposed design may be achieved.
 - Before any works commence reference should be made to the latest utilities mapping records for the locations of all existing services. AECOM accept no liability for any omissions or errors in these drawings and the contractor is deemed to have satisfied himself of the location of any services.
 - Contractor to allow for jet washing all lengths of sewers to be retained.
 - Manhole cover levels and orientation are to be coordinated with the landscape architect drawings.
 - Adoptable drainage works to be in accordance with the water authorities association "Sewers for Adoption 7" edition".
 - All private drainage works to be in accordance with part H of the current building regulations, BS EN 752 and BS EN 12056.
 - The works described and specified on this drawing and associated drawings shall be undertaken in accordance with all current health and safety legislation. Reference shall also be made to the project health & safety plan prepared by the CDM coordinator for the project.
 - Where stacks are connected direct to drain, rodding access points are to be provided above finished floor level.
 - Stack gully connections, Rainwater Connections & Channel outlets to be 150mm diameter minimum unless noted otherwise.
 - Below slab foul drainage to be 100mm diameter minimum unless noted otherwise.
 - Construction of some sewers may involve deep excavations and working in hazardous confined space atmospheres.

LEGEND

	NEW BUILDING OUTLINE
	NEW FOUL WATER SEWER
	NEW SURFACE WATER SEWER
	NEW SURFACE WATER DRAINAGE CHANNEL
	EXISTING PRIVATE FOUL WATER SEWER
	EXISTING PRIVATE SURFACE WATER SEWER
	NEW SUMP UNIT
	NEW ROAD GULLY
	NEW YARD GULLY
	NEW SOIL VENT PIPES
	NEW WASTE PIPES
	NEW RAINWATER PIPES

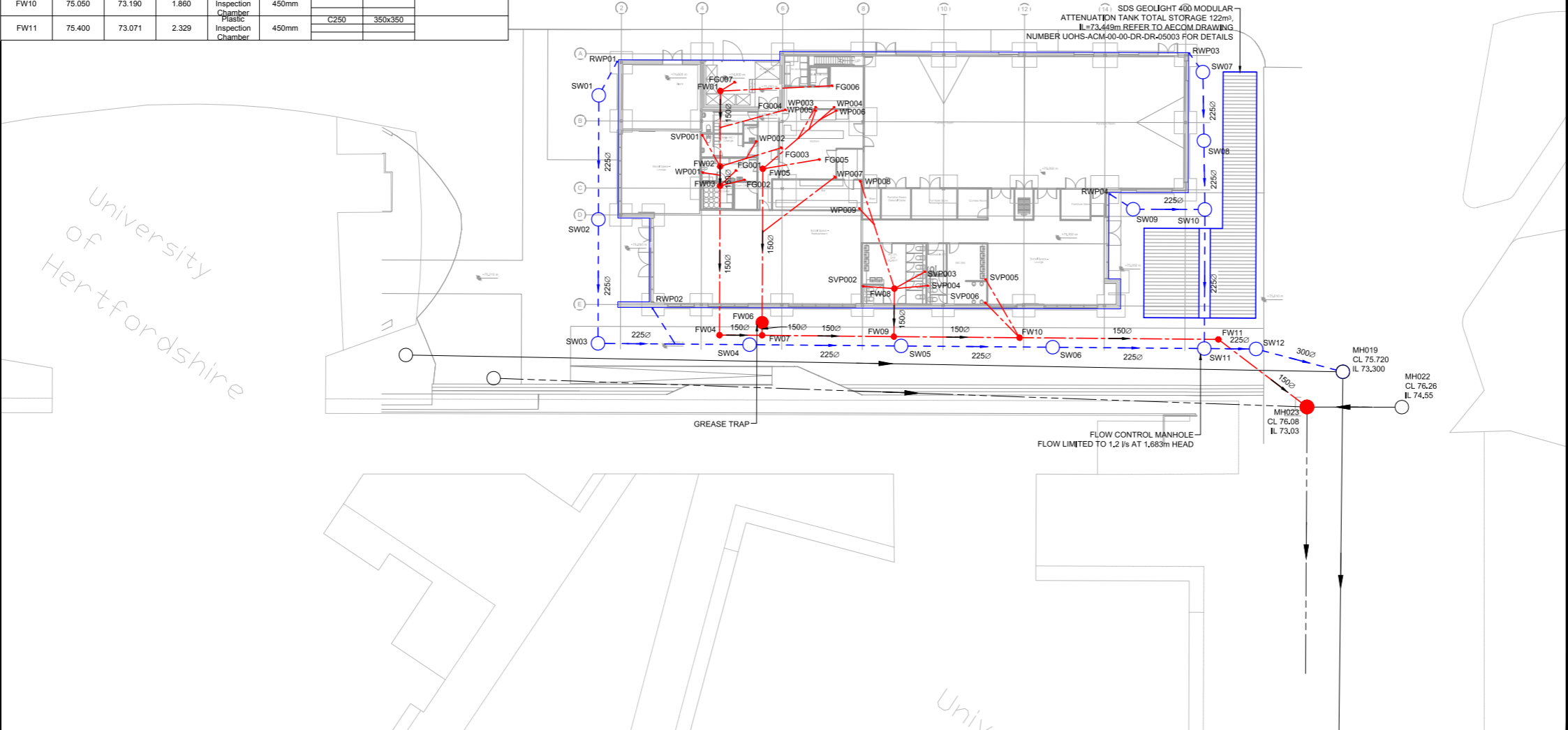
ISSUE/REVISION

NO	DATE	DESCRIPTION
T1	18 NOV 2016	Stage 3 Design

PROJECT NUMBER
60508686

SHEET TITLE
DRAINAGE LAYOUT

SHEET NUMBER
UHS-ACM-00-00-DR-DR-01001



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CLIENT
UNIVERSITY OF
HERTFORDSHIRE

CONSULTANT
AECOM
AECOM House, 63-77 Victoria Street,
St Albans, Herts, AL1 3ER
+44 (0) 01727 535000 tel
+44 (0) 01727 535099 fax
www.aecom.com

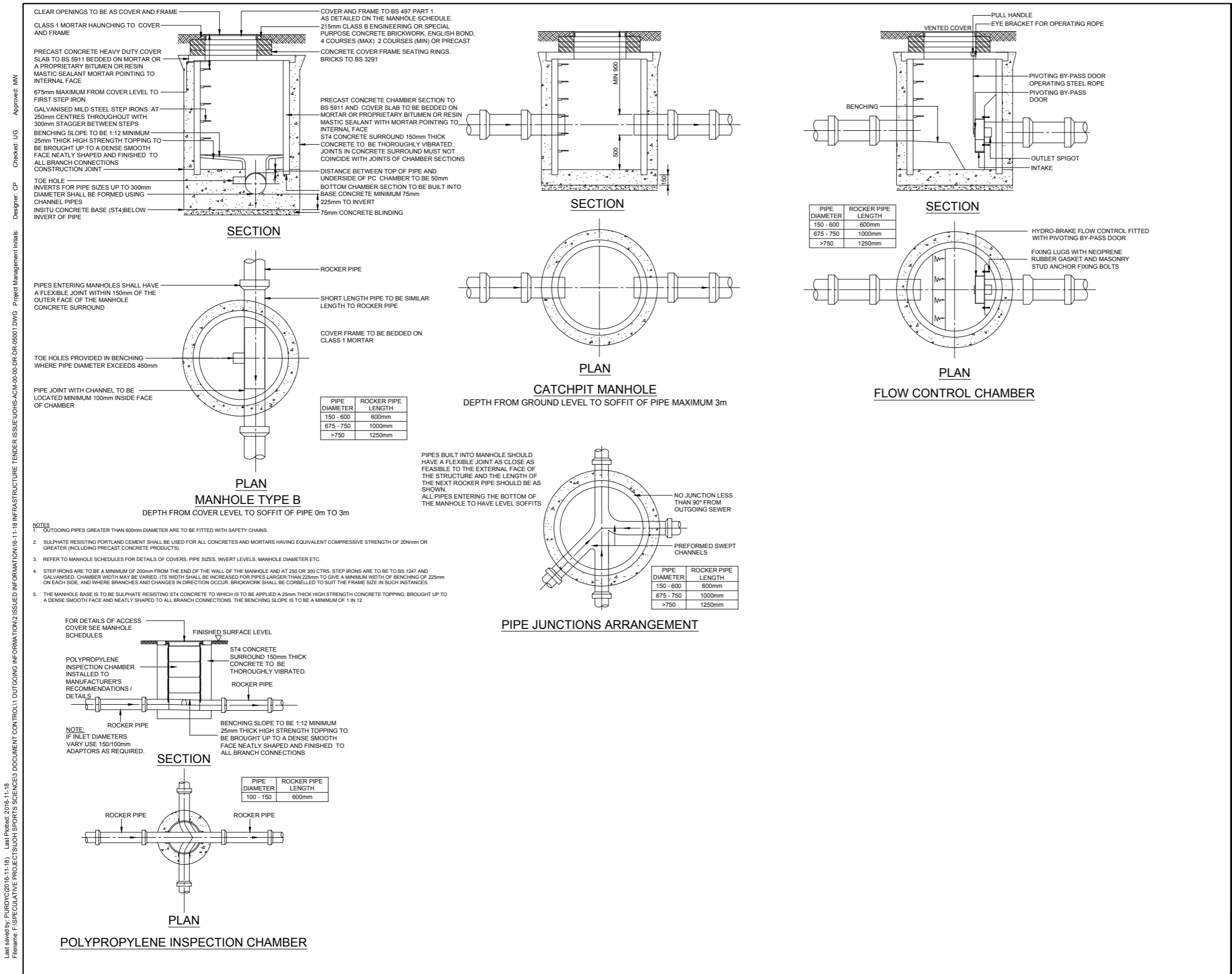
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ISSUE/REVISION		
T1	18 NOV 2016	Stage 3 Design
I/R	DATE	DESCRIPTION

PROJECT NUMBER
60508686

SHEET TITLE
DRAINAGE DETAILS
SHEET 1 OF 3

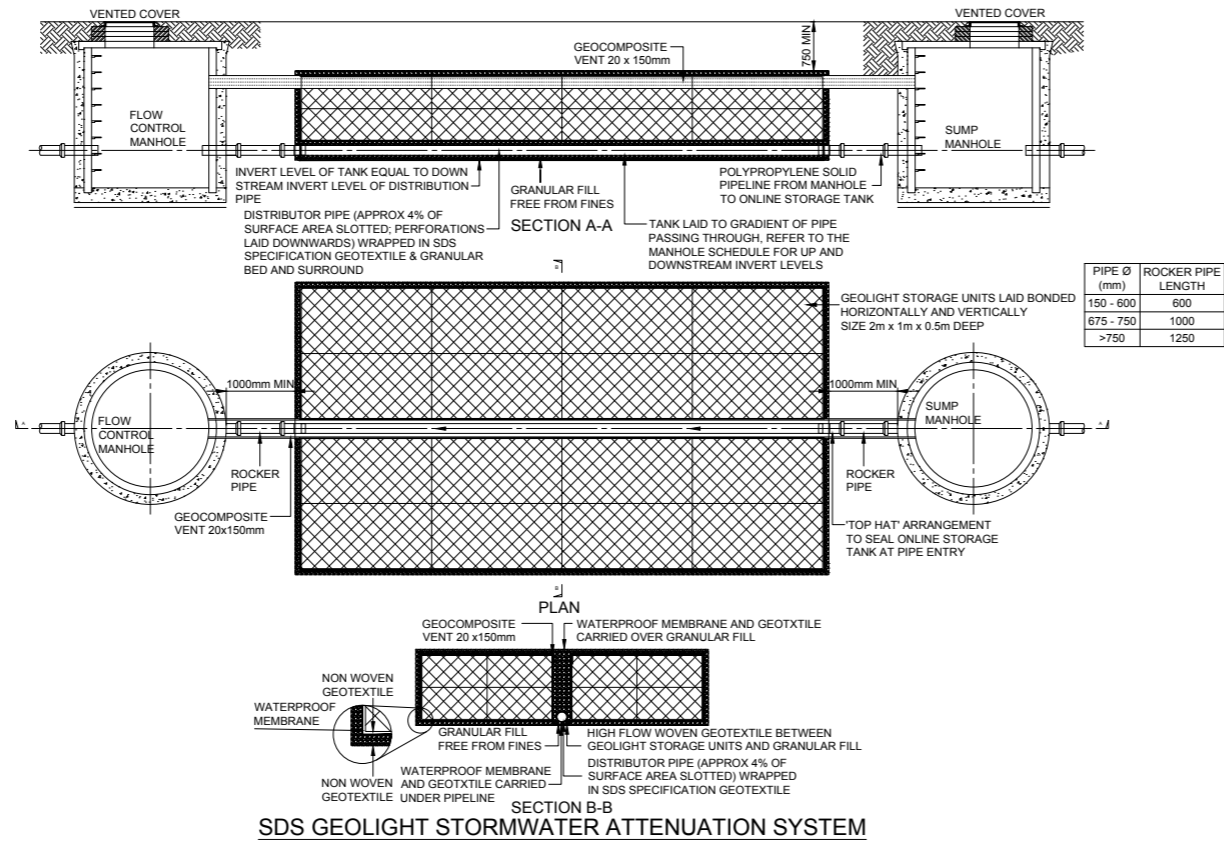
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UOH SOCIAL SPACE

CLIENT
UNIVERSITY OF HERTFORDSHIRE

CONSULTANT
AECOM
AECOM House, 63-77 Victoria Street,
St Albans, Herts, AL1 3ER
+44 (0) 01727 535000 tel
+44 (0) 01727 535099 fax
www.aecom.com

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T1	18 NOV 2016	Stage 3 Design
I/R	DATE	DESCRIPTION

PROJECT NUMBER
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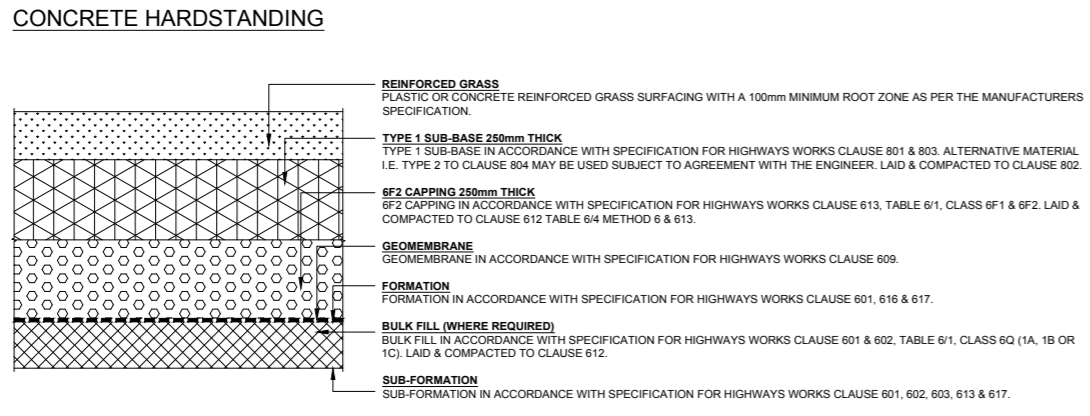
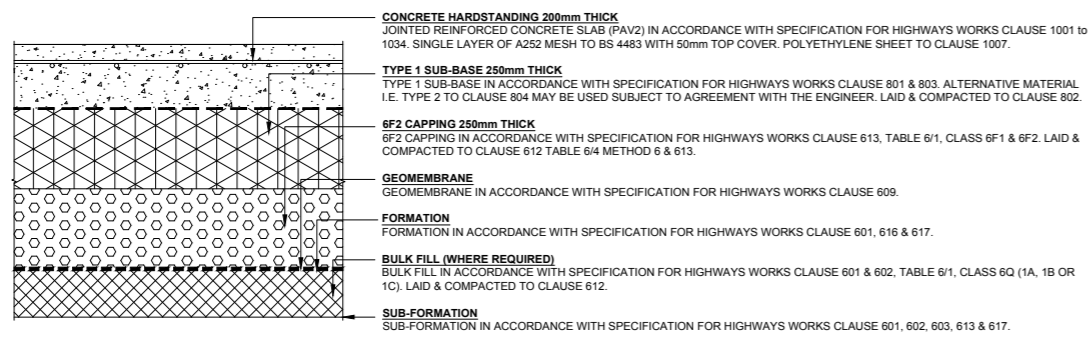
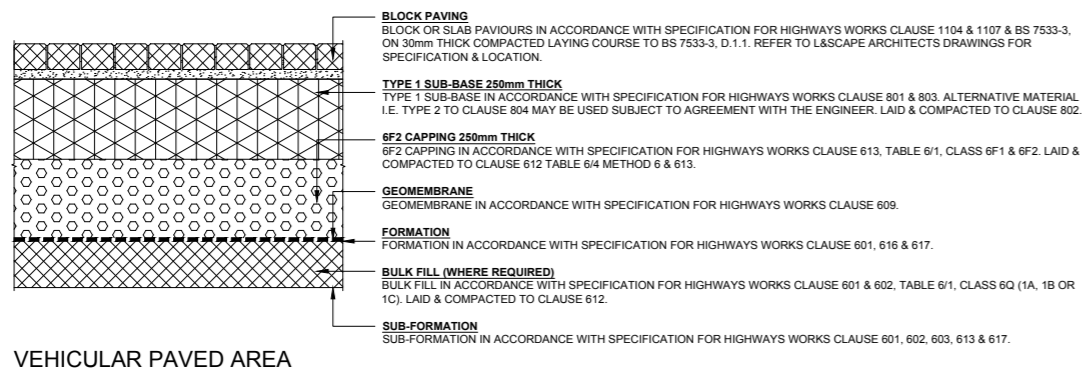
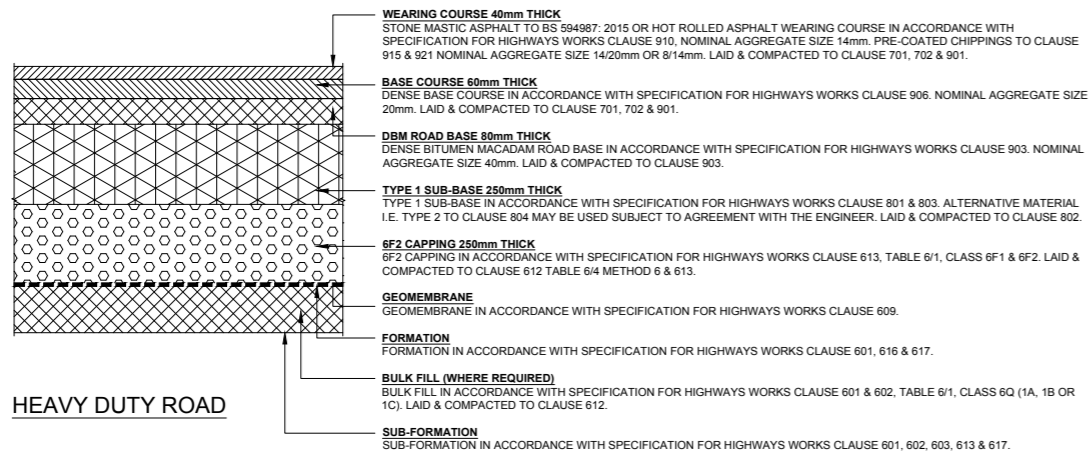
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DRAINAGE DETAILS
SHEET 3 OF 3

SHEET NUMBER
UHSS-ACM-00-00-DR-DR-05003

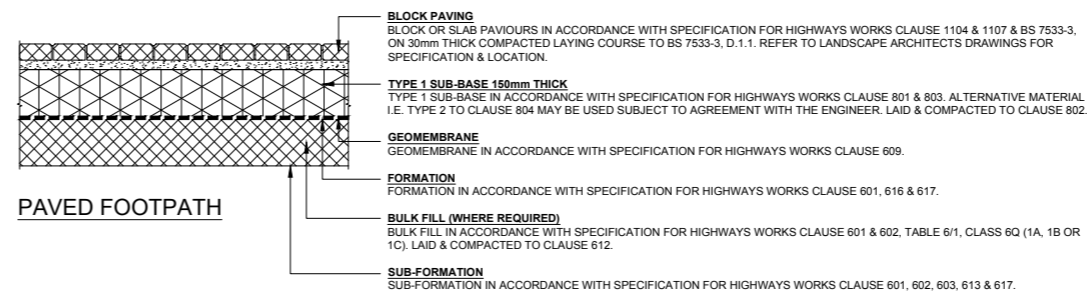
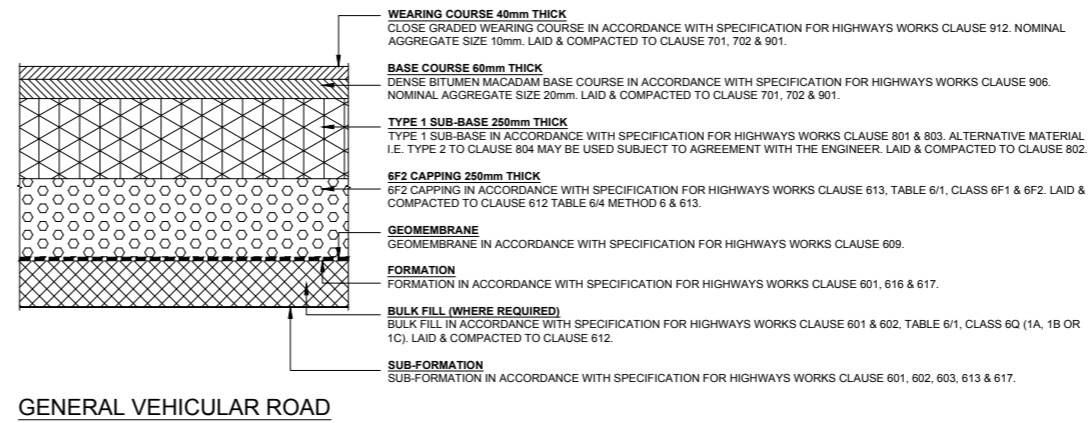
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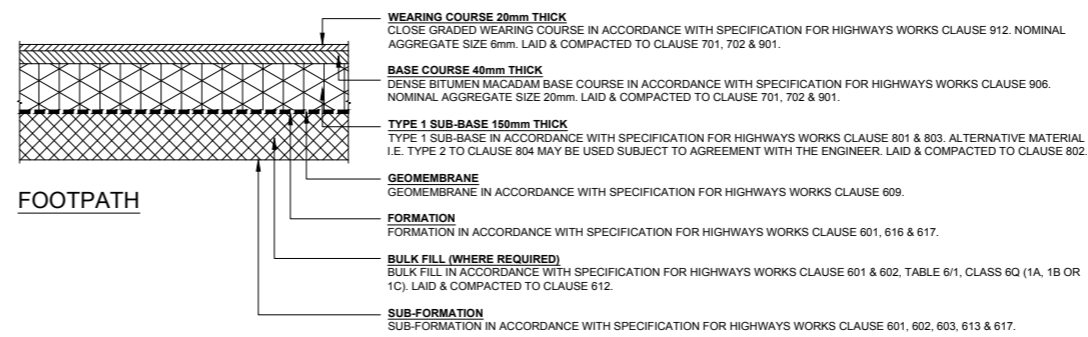
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REINFORCED GRASS



PAVED FOOTPATH



FOOTPATH



MACADAM FOOTPATH



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CLIENT
UNIVERSITY OF HERTFORDSHIRE

CONSULTANT
AECOM
AECOM House, 63-77 Victoria Street,
St Albans, Herts, AL1 3ER
+44 (0) 01727 535000 tel
+44 (0) 01727 535099 fax
www.aecom.com

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 - Clause references are to the Specification for Highway Works, unless otherwise stated.
 - Report any discrepancies to AECOM immediately and seek advice.
 - This drawing must be read in conjunction with all other engineers, architects and specialist drawings and specifications.
 - Pavement specifications are based on a frost susceptible sub grade with a minimum CBR as noted & a design life is 20 years.
 - The sub-base thicknesses shown are a minimum, any additional thicknesses to be in type 1A or 6F1 or 6F2.
 - Prior to commencing works the contractor shall review the geo-environmental site investigation reports.

CAPPING TO BE ADJUSTED TO SUIT CBR VALUES. SEE TABLE BELOW, IF IN ANY DOUBT CONSULT AECOM

USAGE	CONSTRUCTION	MINIMUM SUB-GRADE %		
		2.5%	5%	5%
HEAVY DUTY	H/W/MA WEARING COURSE	40	40	40
	DBM ROAD BASE	80	80	80
	TYPE 1 SUB-BASE	250	250	250
GENERAL VEHICLE	COMMON WEARING COURSE	40	40	40
	DBM ROAD BASE	80	80	80
	TYPE 1 SUB-BASE	250	250	250

FOR LOCATION AND EXTENT OF TYPES OF CONSTRUCTION, REFER TO ARCHITECTS DRAWINGS

DETAILS SHOWN ON THIS DRAWING ARE BASED ON A MINIMUM SUBGRADE CBR OF 2.5%

ISSUE/REVISION

NO	DATE	DESCRIPTION
T1	18 NOV 2016	Stage 3 Design

PROJECT NUMBER
60508686

SHEET TITLE
EXTERNAL WORKS DETAILS
2.5% CBR

SHEET NUMBER
UHSS-ACM-00-00-DR-DR-05004

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APPENDIX C - BRUKL OUTPUT DOCUMENT

The following section has been prepared by Couch Perry Wilkes

BRUKL Output Document

Compliance with England Building Regulations Part L 2013

Project name	UoH Social Building	As designed
Date: Mon Mar 06 15:45:51 2017		

Administrative information

Building Details	Owner Details
Address: UoH Social Building, ,	Name:
	Telephone number:
Certification tool	Address: , ,
Calculation engine: Apache	
Calculation engine version: 7.0.6	Certifier details
Interface to calculation engine: IES Virtual Environment	Name: Couch Perry Wilkes
Interface to calculation engine version: 7.0.6	Telephone number: 0121 709 6600
BRUKL compliance check version: v5.2.g.3	Address: Interface 100, Arleston way, Solihull, B90 4LH

Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	23.1
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	23.1
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	21.8
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.15	0.15	00000000:Surf[2]
Floor	0.25	0.18	0.18	00000000:Surf[0]
Roof	0.25	0.15	0.15	00000000:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.6	1.6	0000000F:Surf[2]
Personnel doors	2.2	2.2	2.2	00000000:Surf[3]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
U _a -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* There might be more than one surface where the maximum U-value occurs. ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. *** Display windows and similar glazing are excluded from the U-value check. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	5

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- DX Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.59	3.58	0	0	-
Standard value	2.5*	3.2	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

2- LTHW Radiator Heating with Mech Vent

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	0.3	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

3- LTHW Radiator Heating with Nat Vent

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	0.3	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

4- LTHW Radiator Heating with Central Dirty Ext

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	0.3	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

5- LTHW Radiator Heating with Mech Vent (Bar)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	0.3	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

6- LTHW Radiator Heating with Mech Vent (Kitchen)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.93	-	0.3	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system NO

* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.

7- VRF Cooling Heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.59	3.58	0	0	0.75
Standard value	2.5*	3.2	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

8- Central AHU Heating via Boiler and DX Cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.94	3.25	0	1.6	0.75
Standard value	2.5*	3.2	N/A	1.6^	0.65
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					
^ Allowed SFP may be increased by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

"No HWS in project, or hot water is provided by HVAC system"

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
00: WC(F) G40	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: ACC WC G50	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: WC(M) G49	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: BAR G39	-	-	-	1.8	-	-	-	-	-	-	-	N/A
00: DRY STORE G38	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: BULK COLD ROOM G37	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: KITCHEN G36	-	-	-	1.8	-	-	-	-	-	-	-	N/A
00: SOCIAL SPCAE LOUNGE G26	-	1.6	0	-	-	-	-	-	-	-	-	N/A
00: SOCIAL SPACE REFRESHMENT G53	G53	1.6	0	-	-	-	-	-	-	-	-	N/A
00: SOCIAL SPACE-LOUNGE G47	-	1.6	0	-	-	-	-	-	-	-	-	N/A
00: CLEANER G60	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: FEMALE WC/ CHANGE G29	-	-	0.5	-	-	-	-	-	-	-	-	N/A
00: MALE WC/CHANGE G18	-	-	0.5	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting

Zone name	Standard value	Luminous efficacy [lm/W]			General lighting [W]
		Luminaire	Lamp	Display lamp	
	60	60	22		
00: PLANT LG01	102	-	-	139	
00: CELLAR G58	85	-	-	13	
00: COLD CELLAR G57	91	-	-	9	
00: CASH OFFICE G43	94	-	-	51	
00: LOBBY	-	99	-	17	
00: WC(F) G40	-	81	-	145	
00: ACC WC G50	-	84	-	34	
00: FUNCTION ROOM GENERAL STORE G34	210	-	-	8	
00: FURNITURE STORE 1 G33	164	-	-	13	
00: COMMS ROOM G31	150	-	-	23	
00: ROOM	55	-	-	20	
00: FURNITURE STORE G32	210	-	-	8	
00: ROOM	55	-	-	13	
00: CIRCULATION	-	122	-	39	
00: WC(M) G49	-	85	-	112	
00: BAR G39	-	147	-	54	
00: DRY STORE G38	103	-	-	6	
00: STAIR	-	210	-	11	
00: BULK COLD ROOM G37	127	-	-	4	
00: KITCHEN G36	-	112	-	495	
00: SOCIAL SPCAE LOUNGE G26	-	78	-	215	
00: SOCIAL SPACE REFRESHMENT G53	-	70	-	691	
00: SOCIAL SPACE-LOUNGE G47	-	82	-	442	
00: CLEANER G60	168	-	-	2	
00: FEMALE WC/ CHANGE G29	-	107	-	43	
00: MALE WC/CHANGE G18	-	105	-	45	
00: FUNCTION ROOM 1 G01	125	-	-	618	
00: FUNCTION ROOM 2 G02	125	-	-	618	

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00: CELLAR G58	N/A	N/A
00: COLD CELLAR G57	N/A	N/A
00: CASH OFFICE G43	N/A	N/A
00: COMMS ROOM G31	N/A	N/A
00: BAR G39	N/A	N/A
00: SOCIAL SPCAE LOUNGE G26	NO (-61.6%)	NO
00: SOCIAL SPACE REFRESHMENT G53	NO (-41.7%)	NO
00: SOCIAL SPACE-LOUNGE G47	NO (-32.1%)	NO
00: FUNCTION ROOM 1 G01	NO (-53.7%)	NO
00: FUNCTION ROOM 2 G02	NO (-61.7%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Building Global Parameters

	Actual	Notional
Area [m ²]	967.2	967.2
Internal area [m ²]	2849.6	2849.6
Orientation	LON	LON
Transmittance [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	760.42	1014.9
Average U-value [W/m ² K]	0.27	0.36
Thermal bridge value* [%]	10.37	10

*Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
99	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
1	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	13.76	16.64
Cooling	3.83	4.59
Domestic hot water	19.98	10.91
Space heating	8.42	14.77
Hot water	9.64	4.55
Equipment*	43.09	43.09
TAL**	55.64	51.47

*Energy used by equipment does not count towards the total for calculating emissions.
**TAL is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	3.72	0
Wind turbines	0	0
CHP generators	0	0
Other thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	158.6	180.78
Primary energy* [kWh/m ²]	161.71	168.42
CO ₂ emissions [kg/m ²]	21.8	23.1

*Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	104	0	34.8	0	1.5	0.83	0	0.93	0
Notional	85.6	0	27.6	0	1.5	0.86	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	46.3	0	15.5	0	14	0.83	0	0.93	0
Notional	68.6	0	22.1	0	15.8	0.86	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	151	0	50.5	0	2.6	0.83	0	0.93	0
Notional	151.7	0	48.9	0	1.3	0.86	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	27.5	219.7	1.8	12.5	0	4.28	4.86	4.59	6.85
Notional	28	239.2	3	17.5	0	2.56	3.79	----	----
[ST] Constant volume system (variable fresh air rate), [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	62.9	39.8	7	6.2	37.2	2.49	1.78	2.94	3.25
Notional	79.8	47.4	8.7	3.5	21.6	2.56	3.79	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	269.3	0	90.1	0	17.1	0.83	0	0.93	0
Notional	107.6	0	34.7	0	8.6	0.86	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	0.1	0	0	0	11.3	0.83	0	0.93	0
Notional	0	0	0	0	5.6	0.86	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	218.7	69.9	14.2	4	12	4.28	4.86	4.59	6.85
Notional	214.6	118.2	23.3	8.7	4	2.56	3.79	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	0	----	----

Electricity

Key Features

The BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.15	00000000:Surf[2]
Floor	0.2	0.18	00000000:Surf[0]
Roof	0.15	0.15	00000000:Surf[1]
Windows, roof windows, and rooflights	1.5	1.6	0000000F:Surf[2]
Personnel doors	1.5	2.2	00000000:Surf[3]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building

U_{i-Typ} = Typical individual element U-values [W/(m²K)]
 U_{i-Min} = Minimum individual element U-values [W/(m²K)]
 * There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m ³ /(h.m ²) at 50 Pa	5	5

Key to terms

- Heat dem [MJ/m2] = Heating energy demand
- Cool dem [MJ/m2] = Cooling energy demand
- Heat con [kWh/m2] = Heating energy consumption
- Cool con [kWh/m2] = Cooling energy consumption
- Aux con [kWh/m2] = Auxiliary energy consumption
- Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
- Cool SSEER = Cooling system seasonal energy efficiency ratio
- Heat gen SSEFF = Heating generator seasonal efficiency
- Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
- ST = System type
- HS = Heat source
- HFT = Heating fuel type
- CFT = Cooling fuel type

SHEPPARD ROBSON

enquiries@sheppardrobson.com
www.sheppardrobson.com

77 Parkway
London NW1 7PU
T: +44 (0)20 7504 1700
F: +44 (0)20 7504 1701
london@sheppardrobson.com

City Tower
Piccadilly Plaza
Manchester M1 4BT
T: +44 (0)161 233 8900
F: +44 (0)161 233 8901
manchester@sheppardrobson.com

93 West George Street
Glasgow G2 1PB
T: +44 (0)141 285 3100
F: +44 (0)141 285 3101
glasgow@sheppardrobson.com

Incubator Building
Masdar City
Abu Dhabi
United Arab Emirates
abudhabi@sheppardrobson.com