

PRELIMINARY DRAINAGE STRATEGY REPORT

UPON

PROPOSED NEW CLASSROOM BLOCK

UNIVERSITY ACADEMY HLBEACH,

HOLBEACH, LINCOLNSHIRE

PROJECT No: 33919

DOCUMENT REF: 33919-REP-01

For Lindum Peterborough
Lindum Business Park,
Newark Road
Peterborough
PE1 5TFT



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1. INTRODUCTION

The following drainage statement has been prepared to support the proposed general arrangement for the surface water drainage proposals to be submitted with the detailed planning application, at the instruction of Lindum Peterborough.

The object of this report is to clarify the design philosophy followed when preparing the proposed surface water drainage arrangement and to outline the proposed solution in sufficient detail for all relevant parties to be able to comment.

Comments on ground conditions are based on previous local experience and ground investigations undertaken for previous developments on other areas of the site.

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2. LOCATION & SITE DESCRIPTION

2.1 Site location

The development site is situated on the University Academy Holbeach campus, which is located to the West of Penny Hill Road and to the South of the A17 in Holbeach, Lincolnshire. appropriate National Grid reference TF359254. The existing site layout is shown on Lindum drawing 31468 425 26, which has been prepared and submitted alongside this statement for planning permission.

2.2 Site description

The development is proposed on a well-established campus with buildings to the North, East, South and West of the proposed development site.

The site is bound by Park Road and then the A17 to the North, "Old River" drain and Penny Hill Road to the East. To the South is the campus sports ground and to the West lies a residential Development.

2.2 Proposed Development

The proposed development is a two-storey science block with an approximate footprint of 28m x 23.5m. The proposed location is almost entirely within the footprint of the existing playground area. A proposed site location plan is contained within Appendix A.

The proposals for the project involve some areas of soft landscaping to the external of the new block, to replace the small area of green space lost to the development.

Other external proposals include ramp and stair access to the new block external doors, and reinstatement of the existing tarmac playground surface where it is required to remove to allow the development to be constructed.

3. FLOODING

A site specific Flood Risk Assessment has been prepared for the proposed development. Alan Wood & Partners report JAG/AD/JD/41979-Rp-001-REV A has been submitted to support the planning application and its findings and principles will be utilised in the preparation of this report and the detailed designs of the development.

A detailed drainage assessment for the proposed development has been undertaken within the Flood Risk Assessment report and the strategy outlined within this report and following detailed designs will be in accordance with its principles and recommendations.

4. SURFACE WATER

4.1 Existing System

The proposed development site is currently a playground area for the school. The majority of which is currently tarmac surfaced and positively drained with traditional linear drainage in the form of surface channel drains.

The playground areas discharge to the East of the site. On the Eastern boundary of the site is located a flow control device prior to the outfall running under Penny Hill Road into the South Holland Drainage Board system, the Old River drain.

The flow control device was installed into the system during the construction of a large new block approximately 8 years ago. This system was designed with the site wide impermeable areas fully considered and at the time offered a reduction in maximum flow rates of 30%. This system is detailed on the Buro Happold drawing contained within Appendix B.

4.2 SUDS Considerations

The proposed location and use of the development lead the SUDS considerations. The SDUS hierarchy has been given consideration, however the location of the Classroom block within an existing school playground environment does not lend itself to the use of open surface drainage features. School playgrounds are not considered appropriate as the size of the features and the open water within them would cause potential hazards in the setting.

Most Sustainable  Least Sustainable	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
	Living roofs	✓	✓	✓
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviers	✓	✓	
	Tanked systems - over-sized pipes/tanks - storms cells	✓		

Permeable surface landscaping features have been included within the proposed layout of the development, which has meant that the new development has only increased the impermeable area of the site by 49m². As illustrated by our drawing 33919/02 contained within Appendix D.

The ground conditions in the local area are known to have a high ground water table level, and as such, despite the soils being mainly granular in nature, a less than

favourable infiltration characteristic. Refer to draft borehole logs from Nicolls Colton ground investigation contained within Appendix E, illustrating a water table of approximately 1.5m BGL.

The existing system already discharges via. a SUDS system, albeit a less favoured type of system. As can be seen on the Buro Happold drain contained in Appendix B, the existing system has a flow control device restricting flows to 115 l/s and provides 140m³ of underground tanked storage.

It is therefore considered appropriate in accordance with SUDS guidance that the new classroom block roof water discharges directly into the existing system.

4.3 Surface Water Proposals

The existing nature of the development area as almost fully developed and positively drained, along with the nature of a school setting has dictated the design of the surface water drainage for the proposed new classroom block roof.

As discussed previously the proposed layout only increases the site impermeable area by 49m². As such it is proposed to discharge freely and directly to the existing on site surface water system.

The proposed increase in flow caused by the additional impermeable area is insignificantly small.

$$Q = 75 \text{ ml/hr/m}^2 \times 49\text{m}^2 / 3600 = 1.02 \text{ l/s.}$$

We have also undertaken a quick storage estimate using Windes Microdrainage software, using an input area of 49m² and a restricted flow of 5l/s to assess the volume of storage which may be required. The calculation can be seen in Appendix C and shows that a storage volume of less than 0.1m³ would be required.

The proposed drainage layout is illustrated on our drawings 33919/01, contained within Appendix D.

5. FOUL WATER

The proposed classroom block will generate small additional flow, which it is proposed to discharge directly into the existing on sit system under gravity flows.

Using British code of practice "Flows and Loads – 4" and a maximum number of occupants, the peak flow generated by the new development would be approximately 0.2 l/s. Even, allowing for factoring the peak flow rates, the maximum discharge achieved by the development is calculated at less than 1 l/s.

It is considered that such a low rate of discharge would not have any impact on the existing sewer network.

The proposed layout is illustrated on our drawing 33919/01 contained within Appendix D.

6. MAINTENANCE STRATEGY

The proposed systems contain the following assets which are all required to be in reasonable working order for the systems to function as a whole and operate as anticipated in design models.

Linear Drainage channels

Drainage channel sump outfalls

Gutters, downpipes and other building rainwater goods

SVP and AAV pipes.

Buried pipe networks

The entire new and existing system is maintained and owned by the site operator.

The scope/nature of inspection and maintenance is such that various facilities and structures are inspected and maintained at yearly intervals, as well as after or during use and/or heavy storms, in order that they continue to perform effectively.

The maintenance schedule for the foul water system, should as a minimum consist of annual inspections and 5 yearly rodding/jetting should no issue be encountered.

The maintenance schedule for the surface water system will comprise the following activities in accordance with the CIRIA publication C753 (The SuDS Manual)

Activity	Frequency	Typical Tasks
Routine/regular maintenance (including inspections and monitoring)	Monthly	- Litter/debris removal - Grass cutting (in season) - Inspection and clearance of gullies and drainage channels - Inspection of pumping station
Occasional maintenance	Annually	- Silt removal from catchpits/gullies - Pipe drainage every 3-5 years: suction sweeping (to Water Jetting Association standards) and CCTV where necessary
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	- Silt removal - Inlet/outlet repair - Erosion repairs - System rehabilitation following a pollution event - Pump failure

On completion of the above, ensure the drainage system is running freely and cleanly. If not, repeat maintenance activities. Written records should be kept of all maintenance work carried out.

Site operators should be trained in the correct response to incidents such as spillages.

A detailed plan of the buildings and grounds drainage should be available on site along with product data sheets and technical data for pumps.

Overland flow of water caused by blockages should be coned off and any blockages cleared.

Emergency call out such as Dalrod or similar should be available to site operators.

7. CONCLUSIONS

As illustrated by our design proposals on drawing 33919/01 & 02 and the information outlined within this report, it is demonstrable that a viable surface water and foul water drainage scheme can be provided for the proposed new classroom block. With the intention being that both systems will be maintained by the site owner.

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For and on behalf of **SIDEBOTTOM RICHARDSON CHENG LTD**

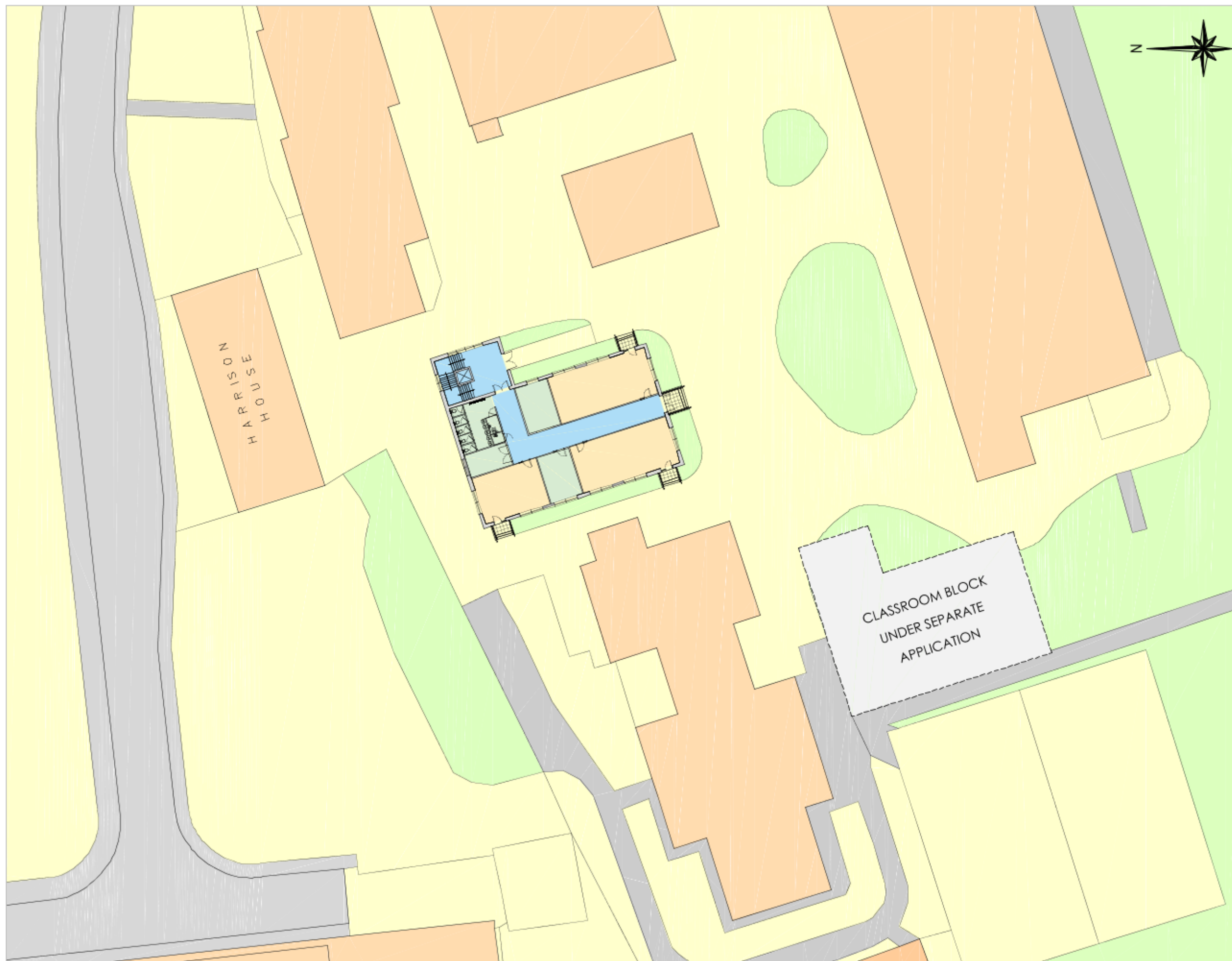
A. Wilson CEng MStructE

08th September 2019

APPENDIX A



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E	19.08.19	Planning Issue	SR
D	05.08.19	Position Revised	SR
C	25.07.19	Lift Moved to Plotwell	SR
B	04.07.19	Scheme Revised	SR
A	20.06.19	Scheme Revised	SR
Revision	Date	Details	Revised By

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Client
University Academy Holbeach

Project
New Classroom Block

Drawing
Proposed Site Plan

Date	June 2019	Scale	1:500
Drawn	SR	Checked	SR
Status	PLANNING		

Drawing No.	Revision
31468 425 23	E

Proposed Site Plan
University Academy Holbeach, New Classroom Block

APPENDIX B



Holbeach Technology Park

Ppg Sta

Tank

TEMPORARY PROTECTION REQUIRED TO FOUL WATER RISING MAIN IN THE LOCATION OF THE HAUL ROAD

EXISTING BUILDINGS SURFACE WATER DRAINAGE AND OUTFALL TO BE RETAINED

EXISTING BUILDINGS SURFACE WATER DRAINAGE AND OUTFALL TO BE RETAINED

FLOW CONTROL DEVICE LIMITING FLOW TO EXISTING DISCHARGE RATE REDUCED BY 20% Q=115 l/s

CLASS 1 NSRM BYPASS SEPARATOR WITH HIGH LEVEL ALARM AND INTEGRAL SILT SEPARATION

PACKAGED PUMP STATION (TWIN SUBMERSIBLE ALTERNATING DUTY/STANDBY PUMPS) WITH 500 m³ OF EMERGENCY STORAGE

1400 m³ OF ATTENUATION VOLUME SHOWN IS TO ADDRESS 1 IN 100 CRITICAL DURATION STORM EVENT +30% ALLOWANCE FOR CLIMATE CHANGE

TEMPORARY PROTECTION REQUIRED TO FOUL WATER RISING MAIN IN THE LOCATION OF THE HAUL ROAD

PIPES AND MANHOLES LOCATED IN AREAS WHERE CONSTRUCTION TRAFFIC IS USED REQUIRE TEMPORARY PROTECTION

LEGEND

- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED CAR PARK DRAINAGE
- PROPOSED CHANNEL DRAIN
- EXISTING FOUL WATER DRAINAGE TO BE RETAINED (SUBJECT TO CONDITION SURVEY)
- EXISTING SURFACE WATER DRAINAGE TO BE RETAINED (SUBJECT TO CONDITION SURVEY)
- EXISTING FOUL WATER DRAINAGE TO BE REMOVED
- EXISTING SURFACE WATER DRAINAGE TO BE REMOVED
- EXISTING FOUL WATER RISING MAIN TO BE REMOVED
- EXISTING PIPE CONDITION POOR
- EXISTING PIPE CONDITION BROKEN
- EXISTING PIPE CONDITION UNKNOWN

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HEALTH AND SAFETY INFORMATION

IN ADDITION TO THE HAZARD(S) NORMALLY ASSOCIATED WITH THE TYPE OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING CONSTRUCTION:

MAINTENANCE/OPERATIONAL

CONSTRUCTION INFORMATION

Notes

- THIS DRAWING HAS BEEN BASED ON THE FOLLOWING DRAWINGS:
 - TOPOGRAPHICAL SURVEY DRAWING NO. SL2406/1 BY SURVEYLINE, RECEIVED 04.11.2011
 - EXISTING DRAINAGE SURVEY DRAWING NO. SL2406/2 BY SURVEYLINE, RECEIVED 04.11.2011
 - LANDSCAPE MASTERPLAN DRAWING NO. L-953-GAP-01 REV 14
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH BH DRAINAGE SPECIFICATION
- ALL EXTERNAL GULLY CONNECTIONS TO BE 150mm# UNLESS OTHERWISE STATED.
- ALL RWP DRAINAGE TO BE 150mm# UNLESS OTHERWISE STATED.
- ALL UNDERSLAB BUILDING FOUL DRAINAGE TO BE 100mm# UNLESS OTHERWISE STATED.
- DRAINAGE TO FLOOR GULLIES TO BE 150mm#.
- ALL UNDERSLAB DRAINAGE TO BE LAID TO A MINIMUM GRADIENT OF 1:40 UNLESS OTHERWISE NOTED.
- RODDING POINTS MUST BE PROVIDED TO FOUL STACKS WHICH DO NOT CONNECT DIRECTLY TO MANHOLE.
- ACCESS PANELS REQUIRED TO ALL ABOVE GROUND RODDING POINTS.
- PIPES WITH LESS THAN 1.2m COVER UNDER ROADS AND HARDSTANDINGS AND LESS THAN 0.9m COVER ELSEWHERE TO BE SURROUNDED IN CONCRETE.

SUBJECT TO CHANGE
FOLLOWING RECEIPT OF COORDINATED RWP DESIGN

SUBJECT TO CHANGE
FOLLOWING RECEIPT OF COORDINATED ABOVE GROUND DRAINAGE DESIGN

FINAL CONSTRUCTION ISSUE
REVISION Z
27/09/2013

Please note "As Built" drawings are supplied by the relevant subcontractor

00 For Construction	28.06.12	MB	VB
Rev	Description	Date	Drn

CONSTRUCTION

Status of drawing

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Project: UNIVERSITY ACADEMY HOLBEACH
Drg Title: Civil Infrastructure
Proposed Drainage Strategy

Scale: A3 1:500	Job No: 029830
Drawn by: MB	Drawing No: C301
Checked by: SAB	Rev: 00
Date: 12/11	

APPENDIX C

Quick Storage Estimate

Micro Drainage

Variables

FSR Rainfall

Return Period (years)

Region

Map

Ratio R

Cv (Summer)

Cv (Winter)

Impermeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

Quick Storage Estimate

Micro Drainage

Results

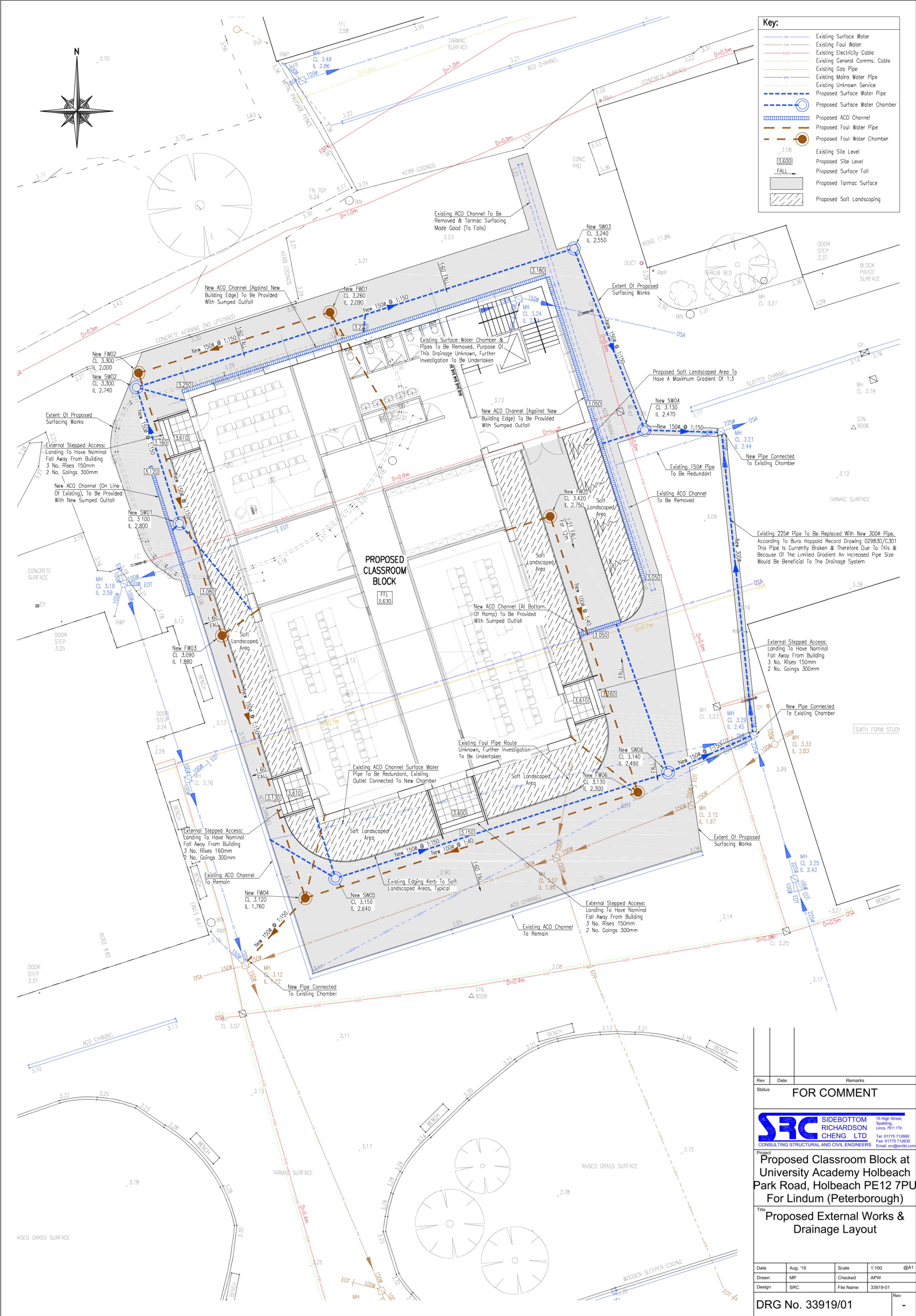
Global Variables require approximate storage of between 0.0 m³ and 0.1 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

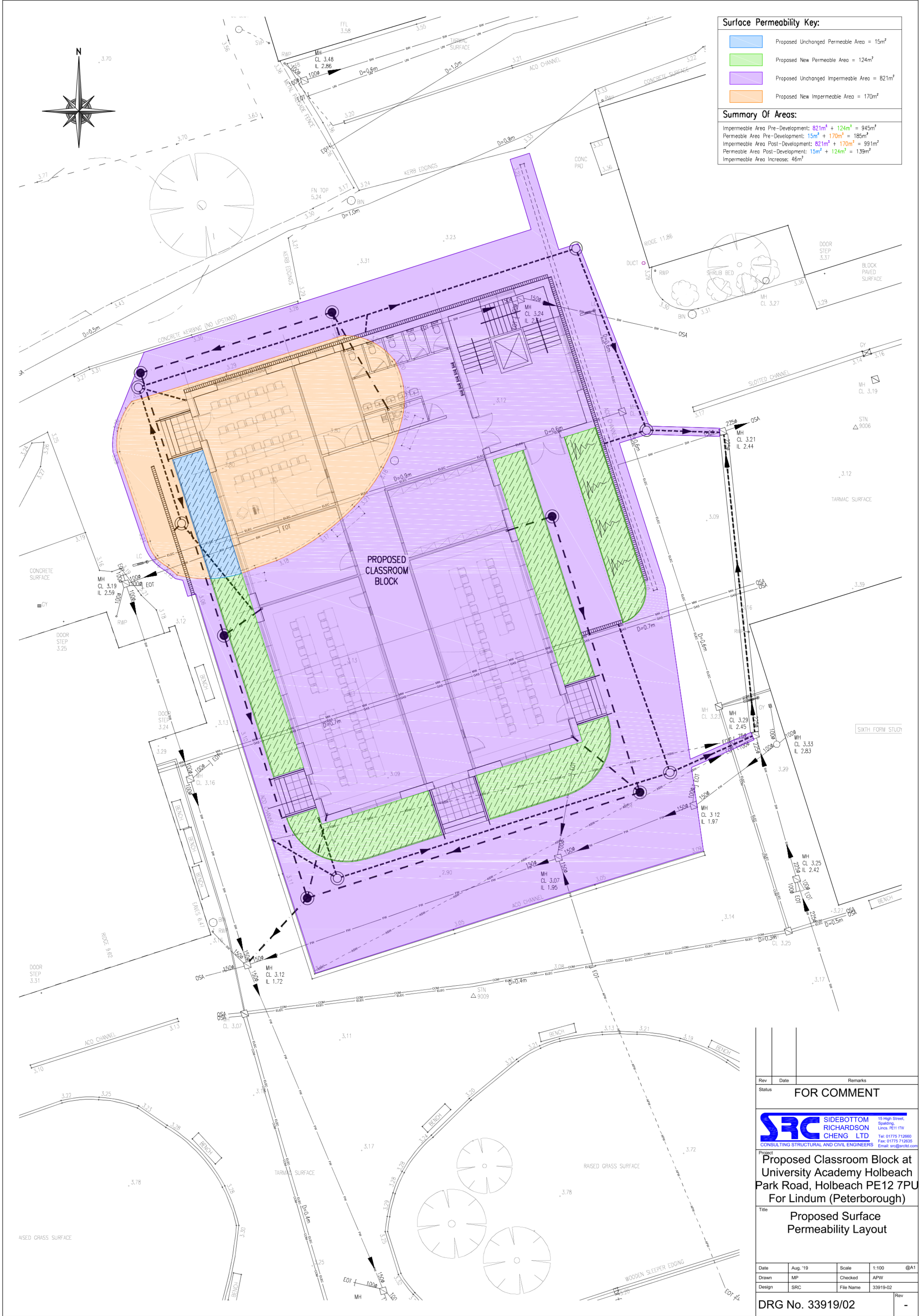
APPENDIX D



Key:

	Existing Surface Water
	Existing Foul Water
	Existing Electricity Cable
	Existing General Comms. Cable
	Existing Gas Pipe
	Existing Mains Water Pipe
	Existing Unknown Service
	Proposed Surface Water Pipe
	Proposed Surface Water Chamber
	Proposed ACO Channel
	Proposed Foul Water Pipe
	Proposed Foul Water Chamber
	Existing Site Level
	Proposed Surface Fall
	Proposed Tarmac Surface
	Proposed Soft Landscaping

Rev	Date	Remarks
FOR COMMENT		
SIDEBOTTOM RICHARDSON CHENG LTD CONSULTING STRUCTURAL AND CIVIL ENGINEERS 15 High Street, Spalding, Lincs PE11 1TW Tel: 01775 712660 Fax: 01775 712635 Email: src@srcld.com		
Project Proposed Classroom Block at University Academy Holbeach Park Road, Holbeach PE12 7PU For Lindum (Peterborough)		
Title Proposed External Works & Drainage Layout		
Date	Aug '19	Scale 1:100 @A1
Drawn	MP	Checked APW
Design	SRC	File Name 33919-01
DRG No. 33919/01		Rev -



APPENDIX E

BOREHOLE RECORD - CP1

Cable Percussion

Site:

University Academy, Holbeach

Client:
Lindum Group

Boring Diameter:
150mm to 13.00m

Casing Diameter:
120mm to 13.00m

Project No.:
G19125

Logged by: AC

Ground Level:

Date: 12/08/19

Location: -

Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1 B2 B3	0.20 0.30 0.50				0.10 0.40 0.60	MADE GROUND: BITUMINOUS MATERIALS MADE GROUND: Greyish brown, very gravelly, slightly cobbly fine to coarse SAND. Gravel is sub-angular type 1 limestone with occasional (2-20mm) fragments of plastic. Cobbles are yellow, sub-angular limestone. MADE GROUND: sandy COBBLES comprising yellow, sub-angular limestone with geotextile membrane at base of strata at 0.60m. Loose, brown, silty fine SAND.		
B4 E6 S D7	0.80 0.80 1.20 1.20 - 1.65	N=12	▼					
S D8	2.00 2.00 - 2.45	N=5	▽		1.80	Soft, brown, very sandy SILT		
B9 S D10	2.80 3.00 3.00 - 3.45	N=16			3.00	Loose, brown, very silty fine SAND.		
S D11	4.00 4.00 - 4.45	N=4				...Very loose below 4.00m.		
S D12	5.00 5.00 - 5.45	N=0						
S D13	6.00 6.00 - 6.45	N=0				...occasional black speckling below 6.00m.		
S D14	7.50 7.50 - 7.95	N=6				...Loose below 7.50m.		
S B16 D15	9.00 9.00 9.00 - 9.45	N=8				...slightly silty below 9.00m.		

Remarks and Water Observations

Sheet 1 of 2

- Hand dug pit excavated to 1.20m to check for underground services.
- Groundwater encountered at 2.00m which rose to 1.50m after 20 minutes.
- Borehole backfilled with arisings and bentonite upon completion.

NICHOLLS COLTON GROUP						BOREHOLE RECORD - CP1 Cable Percussion					
Client: Lindum Group						Site: University Academy, Holbeach					
Logged by: AC						Boring Diameter: 150mm to 13.00m		Casing Diameter: 120mm to 13.00m		Project No.: G19125	
Ground Level:						Date: 12/08/19		Location: -		Scale: 1:50	
Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill			
Ref:	Depth (m)	SPT N									
S D17	10.50 10.50 - 10.95	N=5				Loose, brown, very silty fine SAND. ...contains occasional (2-6.3mm) shells and shell fragments below 12.00m.					
S B19	12.00	N=8									
D18	12.00 - 12.45										
S D20	12.50 12.50 - 12.95	N=6									
B21	13.00				13.00						
Remarks and Water Observations									Sheet 2 of 2		
1. Hand dug pit excavated to 1.20m to check for underground services. 2. Groundwater encountered at 2.00m which rose to 1.50m after 20 minutes. 3. Borehole backfilled with arisings and bentonite upon completion.									AGS		

BOREHOLE RECORD - WS2

Window Sampler

Site:

University Academy, Holbeach

Client:

Lindum Group

Boring Diameter:

120mm to 2.00m

Casing Diameter:

Project No.:

G19125

Logged by:

AC

Ground Level:

Date:

13/08/19

Location: -

Scale:

1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.30	N=8			0.10	MADE GROUND: BITUMINOUS MATERIALS		
B2	0.70				0.45	MADE GROUND: Dark grey, slightly clayey, very gravelly fine to coarse SAND. Gravel is fine to medium, sub-angular type 1 limestone with geotextile membrane at base of strata at 0.45m. Loose, brown, silty, fine SAND		
S D3 B4	1.20 1.20 1.30 - 1.80					... Very silty below 1.10m.		
S D5	2.00 2.00	N=4			2.00			

Remarks and Water Observations

Sheet 1 of 1

1. Hand dug pit excavated to 1.20m to check for underground services.
2. Groundwater encountered at 2.10m.
3. Borehole backfilled with arisings and bentonite upon completion.

BOREHOLE RECORD - WS3

Window Sampler

Site:

University Academy, Holbeach

Client:
Lindum Group

Boring Diameter:
120mm to 2.90m

Casing Diameter:

Project No.:
G19125

Logged by: AC

Ground Level:

Date: 13/08/19

Location: -

Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.20				0.10	MADE GROUND: BITUMINOUS MATERIALS MADE GROUND: Dark brownish grey, very gravelly, fine to coarse SAND. Gravel is fine to medium, sub-angular type 1 limestone with occasional (2-6.3mm) fragments of brick. <i>...includes yellow sub-angular limestone cobbles with geotextile membrane at base of strata at 0.60m.</i> Loose, brown, slightly silty, fine SAND		
B2	0.40				0.60			
S	1.20	N=8			1.20			
D3	1.20				1.50			
B4	1.40 - 1.90				1.50	Soft, brown, sandy SILT		
						Loose brown, silty fine SAND.		
C	2.00	N=7				<i>...Continuous CPT's carried out below 2.00m.</i>		
C	2.45	N=8						
C	2.90	N=7			2.90			

Remarks and Water Observations

Sheet 1 of 1

- Hand dug pit excavated to 1.20m to check for underground services.
- Groundwater encountered at 2.10m.
- Gas and groundwater monitoring well (50mm ID HDPE pipe with bung and tap) installed to 2.00m (response zone from 1.00 to 2.00m) with bentonite seal and lockable flush cover at surface.

BOREHOLE RECORD - WS4

Window Sampler

Site:

University Academy, Holbeach

Client:
Lindum Group

Boring Diameter:
120mm to 2.90m

Casing Diameter:

Project No.:
G19125

Logged by: AC

Ground Level:

Date: 13/08/19

Location: -

Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.30				0.10	MADE GROUND: BITUMINOUS MATERIALS MADE GROUND: Dark grey occasionally mottled yellow brown, gravely, slightly cobbly fine to coarse SAND with geotextile membrane at base of strata at 0.50m. Gravel is fine to medium, sub-angular type 1 limestone with occasional (2-6.3mm) fragments of brick. Cobbles are yellow, sub-angular limestone. Loose, brown, very silty fine SAND. ...Very silty between 1.10 to 1.40m. ...Continuous CPT's carried out below 2.00m.		
					0.50			
D3	1.00							
E2	1.00							
S	1.20	N=7						
D4	1.20							
B5	1.50 - 2.00							
C	2.00	N=6	▼					
C	2.45	N=6						
C	2.90	N=6			2.90			

Remarks and Water Observations

Sheet 1 of 1

- Hand dug pit excavated to 1.20m to check for underground services.
- Groundwater encountered at 2.00m.
- Borehole backfilled with arisings and bentonite upon completion.