

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Purbrook Park School
Proposed Re-Development
Surface Water Runoff Strategy
(Sustainable Urban Drainage Systems)

Caulmert Limited

Cattermole Building, Market Place, Codnor, Derbyshire, DE5 9QA

Tel: 01773 749132

Fax: 01773 746280

Web: www.caulmert.com

Document Reference: 1910.03.PPS.FAZ.PS.A0

November 2014

APPROVAL RECORD

Site: Purbrook Park School

Client: Purbrook Park School

Project Title: Proposed Re-Development

Document Title: Surface Water Runoff Drainage Strategy
(Sustainable Urban Drainage Systems)

Document Ref: 1910.03.PPS.FAZ.PS.A0

Report Status: **Final**

Project Director: Paul Savile

Project Manager: Faraj Arfa-Zangeneh

Caulmert Limited: Cattermole Buildings, Market Place, Codnor, Derbyshire, DE5 9QA

Telephone: 01773-749132

Author	Faraj Arfa-Zangeneh BSc, MSc, MICE, CEng, MCIWEM, C.WEM, CEnv	Date	November 2014
Reviewer	Paul Saville BEng(Hons) CEng MStructE	Date	November 2014
Approved	Faraj Arfa-Zangeneh BSc, MSc, MICE, CEng, MCIWEM, C.WEM, CEnv	Date	25 th November 2014

DISCLAIMER

This report has been prepared by Caulmert Limited with reasonable skill, care and diligence in accordance with the instruction of the above named client and within the terms and conditions of the Contract with the Client.

The report is for the sole use of the above named Client and Caulmert Limited shall not be held responsible for any use of the report or its content for any purpose other than that for which it was prepared and provided to the Client.

Caulmert Limited accepts no responsibility of whatever nature to any third parties who may have been made aware of or have acted in the knowledge of the report or its contents.

No part of this document may be copied or reproduced without the prior written approval of Caulmert Limited.

CONTENTS

1.0	INTRODUCTION	1
2.0	BLOCK (A) - SUDS STRATEGY.....	2
3.0	BLOCK (B) - SUDS STRATEGY	3
4.0	RECOMMENDATIONS.....	4
5.0	REFERENCES	5

APPENDICES

Appendix 1	Proposed Re-Development Drainage Layouts
Appendix 2	Section 106 Approval Letters

1.0 INTRODUCTION

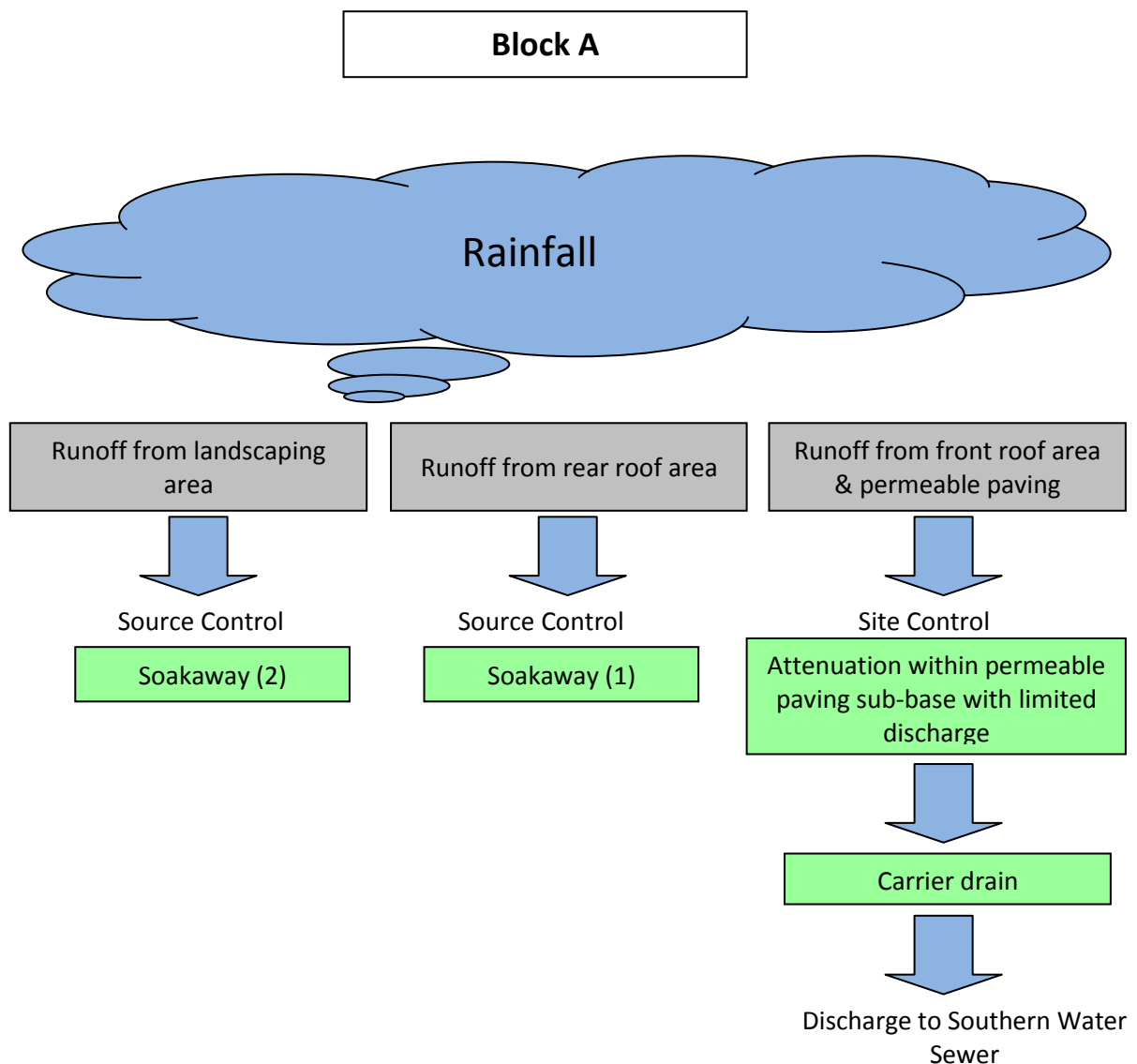
- 1.1.1 The purpose of the Surface Water Drainage Strategy report is to illustrate the proposed Sustainable Urban Drainage Systems (SUDS) for the proposed re-development at Purbrook Park School, demonstrating how the overall strategy would be applied. The aim is to assist relevant parties to understand the principles and approach to SUDS design.
- 1.1.2 The surface water drainage for the proposed re-development has been designed to comply with the requirements of SUDS and the Flood and Water Management Act 2010 (the Act). The principal objectives of SUDS for the proposed re-development based on the SUDS Manual^(Ref.1) are:
- Water Quantity: Control the effects of re-development surface water runoff on Southern Water Sewer hence mitigate against flood risk in their sewer system downstream of the site.
 - Water Quality: Protect downstream waters from contamination.
- 1.1.3 Drainage investigations at the site have confirmed that the existing surface water runoff is directed into a system of onsite soakaways.
- 1.1.4 Deep infiltration tests (greater than 2m depth) were carried out at two locations within the school boundary. One in the vicinity of the proposed Block (A), the other close to Block (B). The infiltration test results indicated medium coefficient of permeability at Block (A) area and poor coefficient of permeability at Block (B) area.
- 1.1.5 National Planning Policy Framework (NPPF)^(Ref.2) recommends that, in order to satisfactorily managing flood risk from new development, appropriate surface water runoff drainage arrangements i.e. SUDS are required to manage the runoff in a suitable manner to mimic the surface runoff flows arising from the site, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.
- 1.1.6 The Environment Agency (EA) recommends that, where feasible and appropriate, SUDS be incorporated into the site development, with preference being given first to infiltration drainage techniques such as soakaways. However, the underlay geological condition and urbanised site location restrict the choice of SUDS techniques to suit the development. Hence, not all SUDS options were appropriate for site.
- 1.1.7 Proposed re-development drainage layouts are included in Appendix (1). Section 106 approval letters are included in Appendix (2).

2.0 BLOCK (A) - SUDS STRATEGY

2.1.1 Chart below illustrates in general the SUDS strategy for Block (A) re-development surface water runoff.

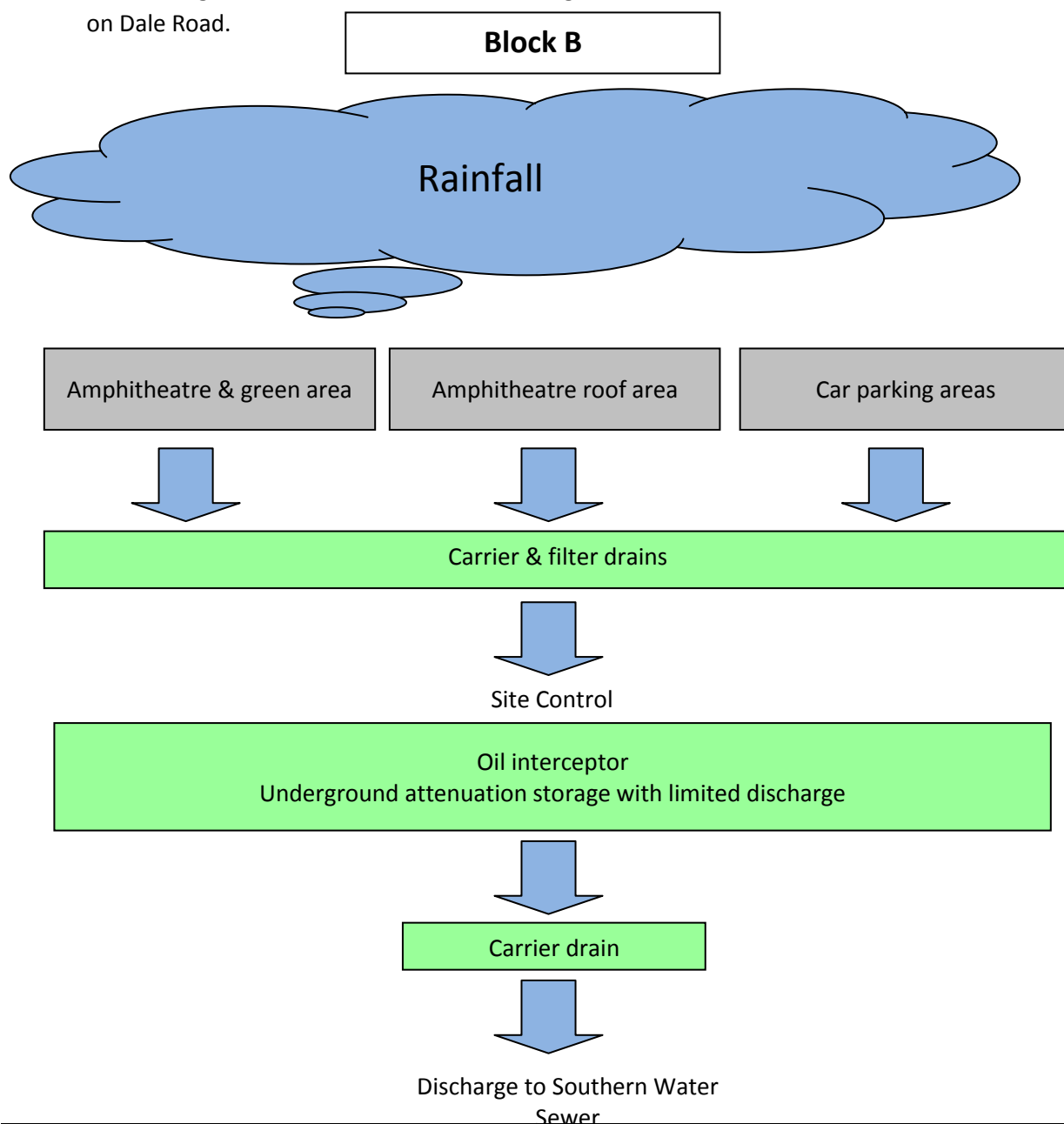
2.1.2 The runoff will be controlled at source. This will include permeable surface and soakaways. The runoff from front roof area would be piped directly into the free drainage sub-base below the permeable surface as well as rainfall falling on the permeable surface area itself. The runoff within the sub-base would be collected and directed by fin drains towards the outfall point. The surface water runoff will be attenuated at the limited discharge rate of 5 l/sec (as agreed with Southern Water) and stored within the sub-base. The outflow would be controlled using a Hydrobrake flow control structure. Downstream of the control structure, the flow will discharge into a carrier drain transferring the limited discharged runoff to the existing Southern Water manhole reference no. 5151 on Park Avenue.

2.1.3 The runoff from the rear roof area will be directed to a soakaway which is located behind the proposed Block (A). The runoff from the landscaping area and paved area in front of the main building will be directed to a second soakaway which is located within landscaping area.



3.0 BLOCK (B) - SUDS STRATEGY

- 3.1.1 Chart below illustrates in general the SUDS strategy for Block (B) re-development surface water runoff.
- 3.1.2 The runoff from amphitheatre area, green area and car parking areas would be directed by collected drains into filter or carrier drains transferring the runoff to the site control.
- 3.1.3 The surface water runoff will pass through a 'Class 1' oil interceptor and then attenuated to limited discharge rate of 5 l/sec (as agreed with Southern Water) and stored in below ground attenuation storage. The proposed below ground attenuation will be in the form of 'Stormcell'. These will be situated below the existing open green space areas within the school boundary. The outflow would be controlled using a Hydrobrake flow control structure. Downstream of the control structure, the flow will discharge into a carrier drain transferring the limited runoff into the existing Southern Water manhole reference no. 7050 on Dale Road.

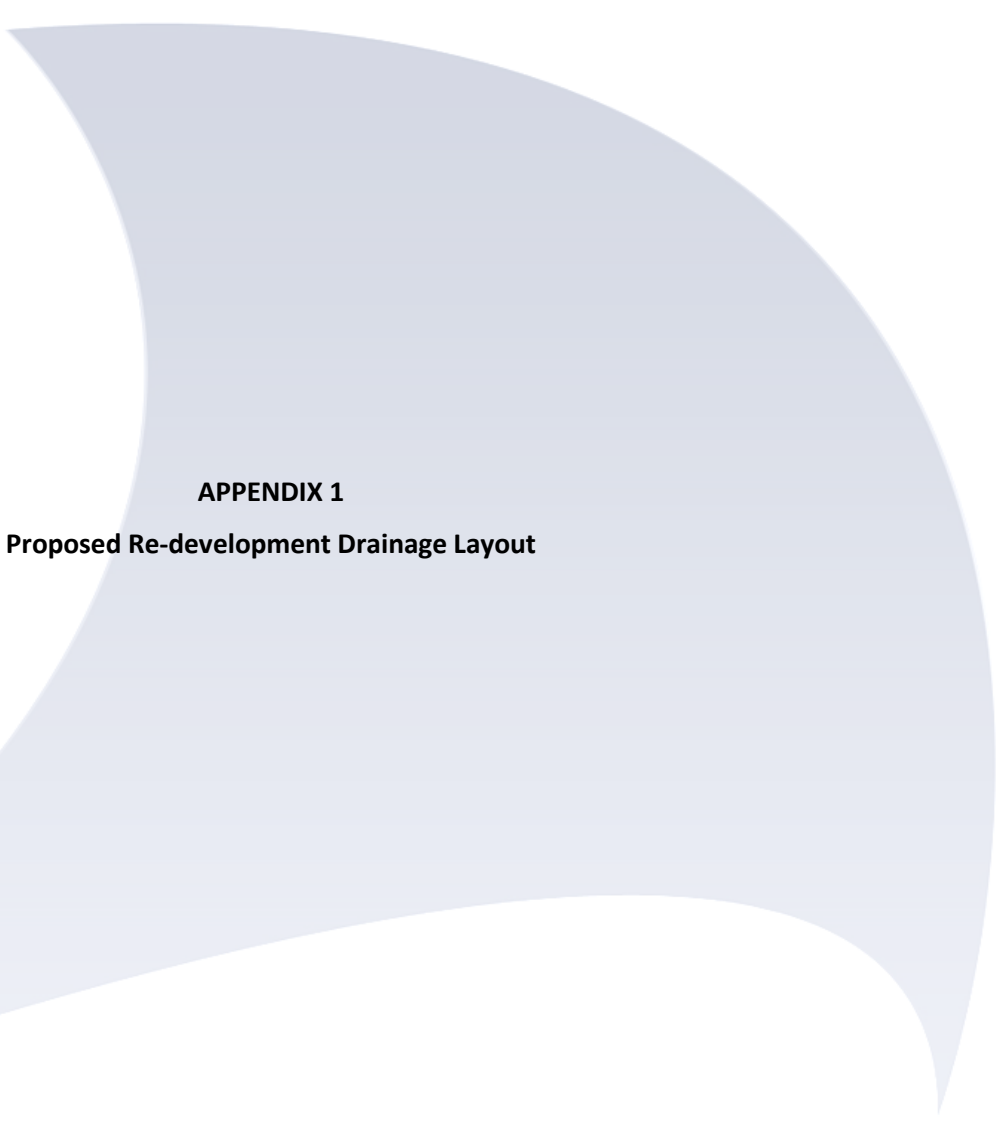


4.0 RECOMMENDATIONS

- 4.1.1 The proposed SUDS for re-development of the school provide attenuation of surface water runoff and limiting discharge to the existing Southern Water sewer system downstream of the site, and treatment of runoff for improved water quality. These measures were carefully evaluated and included at the detailed design stage to ensure that the design complies with the SUDS objectives.
- 4.1.2 It is essential that the school management are aware of the design permeable surfaces and their purpose. Good house keeping measures will help minimise the contaminants that may wash into the system and extend the life of the filter media. This would involve protecting the surface areas from oil spillage and similar material. Regular road sweeping would limit the quantity of silt and pollution on the permeable surface.

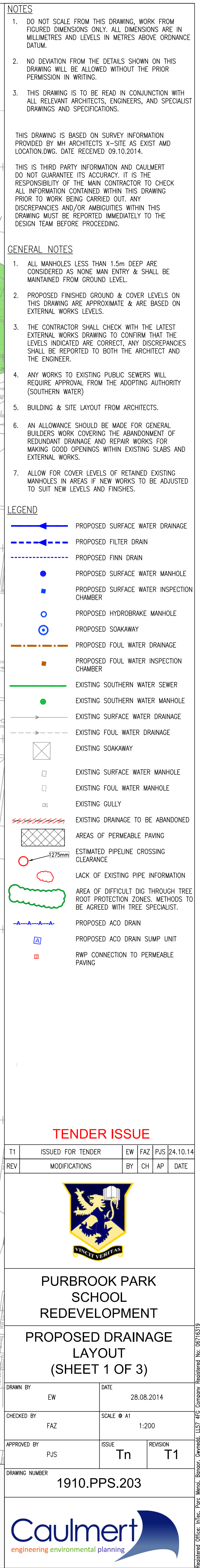
5.0 REFERENCES

1. CIRIA (Mar 2007), *The SUDS Manual, C697*
2. Communities and Local Government (March 2012), *National Planning Policy Framework*



APPENDIX 1

Proposed Re-development Drainage Layout





NOTES

- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM.
- NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING WILL BE ALLOWED WITHOUT THE PRIOR PERMISSION IN WRITING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

THIS DRAWING IS BASED ON SURVEY INFORMATION PROVIDED BY MH ARCHITECTS X-SITE AS EXIST AND LOCATION.DWG. DATE RECEIVED 09.10.2014.

THIS IS THIRD PARTY INFORMATION AND CAULMERT DO NOT GUARANTEE ITS ACCURACY. IT IS THE RESPONSIBILITY OF THE MAIN CONTRACTOR TO CHECK ALL INFORMATION CONTAINED WITHIN THIS DRAWING PRIOR TO WORK BEING CARRIED OUT. ANY DISCREPANCIES AND/OR AMBIGUITIES WITHIN THIS DRAWING MUST BE REPORTED IMMEDIATELY TO THE DESIGN TEAM BEFORE PROCEEDING.

GENERAL NOTES

- ALL MANHOLES LESS THAN 1.5m DEEP ARE CONSIDERED AS NONE MAN ENTRY & SHALL BE MAINTAINED FROM GROUND LEVEL.
- PROPOSED FINISHED GROUND & COVER LEVELS ON THIS DRAWING ARE APPROXIMATE & ARE BASED ON EXTERNAL WORKS LEVELS.
- THE CONTRACTOR SHALL CHECK WITH THE LATEST EXTERNAL WORKS DRAWING TO CONFIRM THAT THE LEVELS INDICATED ARE CORRECT, ANY DISCREPANCIES SHALL BE REPORTED TO BOTH THE ARCHITECT AND THE ENGINEER.
- ANY WORKS TO EXISTING PUBLIC SEWERS WILL REQUIRE APPROVAL FROM THE ADOPTING AUTHORITY (SOUTHERN WATER)
- BUILDING & SITE LAYOUT FROM ARCHITECTS.
- AN ALLOWANCE SHOULD BE MADE FOR GENERAL BUILDERS WORK COVERING THE ABANDONMENT OF REDUNDANT DRAINAGE AND REPAIR WORKS FOR MAKING GOOD OPENINGS WITHIN EXISTING SLABS AND EXTERNAL WORKS.
- ALLOW FOR COVER LEVELS OF RETAINED EXISTING MANHOLES IN AREAS IF NEW WORKS TO BE ADJUSTED TO SUIT NEW LEVELS AND FINISHES.

LEGEND

	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED FILTER DRAIN
	PROPOSED FINN DRAIN
	PROPOSED SURFACE WATER MANHOLE
	PROPOSED SURFACE WATER INSPECTION CHAMBER
	PROPOSED HYDROBRAKE MANHOLE
	PROPOSED SOAKAWAY
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED FOUL WATER INSPECTION CHAMBER
	EXISTING SOUTHERN WATER SEWER
	EXISTING SOUTHERN WATER MANHOLE
	EXISTING SURFACE WATER DRAINAGE
	EXISTING FOUL WATER DRAINAGE
	EXISTING SOAKAWAY
	EXISTING SURFACE WATER MANHOLE
	EXISTING FOUL WATER MANHOLE
	EXISTING GULLY
	EXISTING DRAINAGE TO BE ABANDONED
	AREAS OF PERMEABLE PAVING
	ESTIMATED PIPELINE CROSSING CLEARANCE
	LACK OF EXISTING PIPE INFORMATION
	AREA OF DIFFICULT DIG THROUGH TREE ROOT PROTECTION ZONES. METHODS TO BE AGREED WITH TREE SPECIALIST.
	PROPOSED ACO DRAIN
	PROPOSED ACO DRAIN SUMP UNIT
	PROPOSED HEXDRAIN
	PROPOSED HEXDRAIN SUMP UNIT

TENDER ISSUE

T1	ISSUED FOR TENDER	EW	FAZ	PJS	24.10.14
REV	MODIFICATIONS	BY	CH	AP	DATE

PURBROOK PARK SCHOOL REDEVELOPMENT

PROPOSED DRAINAGE LAYOUT (SHEET 2 OF 3)

DRAWN BY	EW	DATE	28.08.2014
CHECKED BY	FAZ	SCALE @ A1	1:200
APPROVED BY	PJS	ISSUE	Tn
		REVISION	T1

DRAWING NUMBER 1910.PPS.204

WORK IN PROGRESS (TENDER)

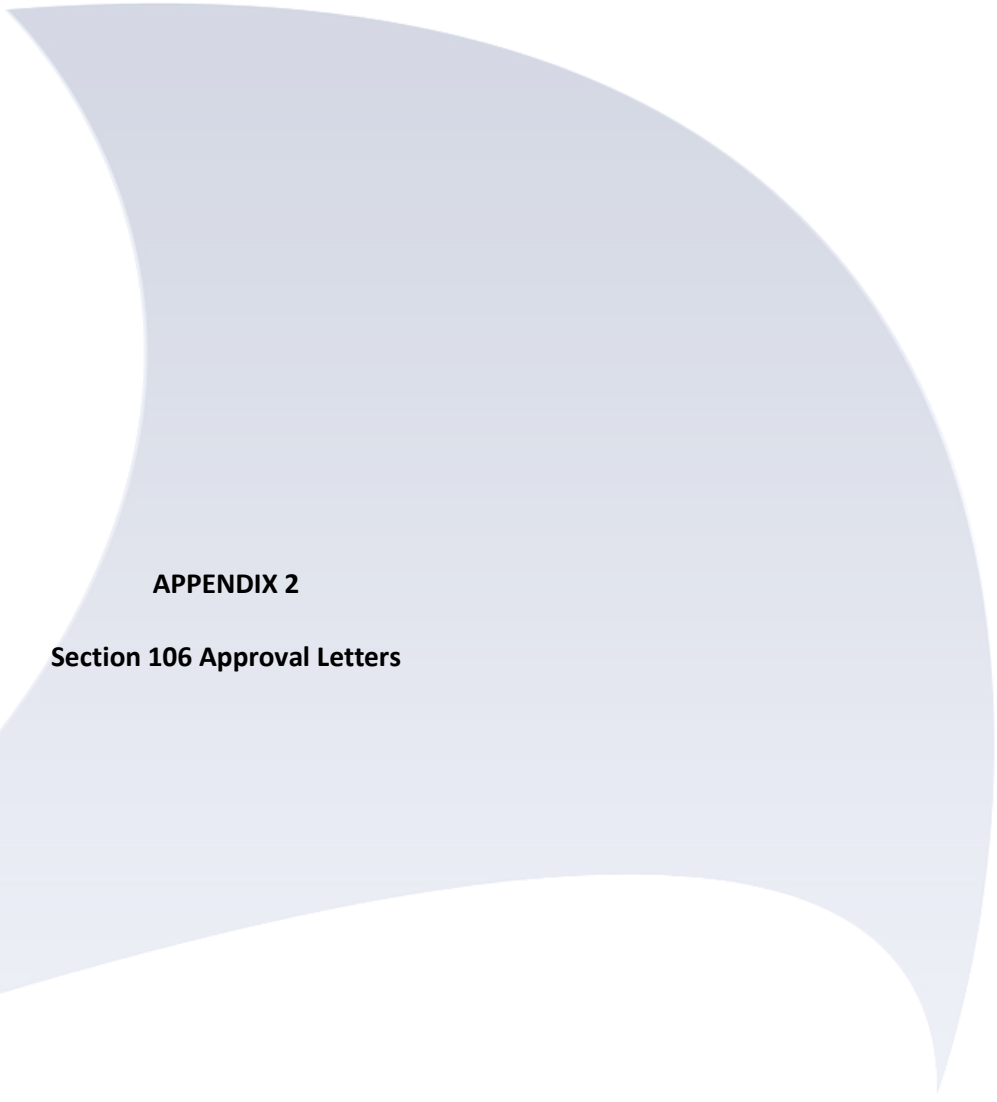
THIS DRAWING IS BASED UPON THE AVAILABLE CONSULTANT DESIGN TEAM INFORMATION AS OF 17/10/2014. AS SUCH THE INFORMATION PROVIDED MAY BE SUBJECT TO CHANGE BASED UPON EXTERNAL INFLUENCES THROUGH DESIGN DEVELOPMENT SUCH AS CLIENT BRIEF AND SCOPE CHANGES, M&E SERVICES DESIGN AND B.W.I.C., AND FOLLOWING THE RECEIPT OF DETAILED DESIGN INFORMATION FOR SUB-CONTRACTOR DESIGNED ELEMENTS.

IN RESPECT OF SUB-CONTRACTOR DESIGNED ELEMENTS, THE CLADDING/CURTAIN WALLING DESIGN, ROOFING DESIGN, M&E SERVICES DESIGN INCLUDING B.W.I.C., THE DESIGN OF PRECAST CONCRETE ELEMENTS AND OTHER PROPRIETARY FRAME COMPONENTS ALL HAVE AN INTERFACE WITH THE PRIMARY FRAME STRUCTURE. IF THIS DRAWING IS USED FOR CONSTRUCTION PURPOSES IN ADVANCE OF FINAL SUB-CONTRACTOR DETAILS FOR THESE ELEMENTS THEN THE MAIN CONTRACTOR ACKNOWLEDGES THE RISK OF VARIATIONS TO THE FRAME DETAILS IN RESPONSE TO SUCH DESIGN INFORMATION AND ACCEPTS THE RESPONSIBILITY FOR THE CONSEQUENCES THEREOF.

© COPYRIGHT CAULMERT LIMITED - NOT TO BE COPIED OR REPRODUCED IN ANY OR FORM WITHOUT PRIOR WRITTEN CONSENT FROM CAULMERT LIMITED

CAD FILE REF: M:\Cad Projects\1910 Purbrook Park School\Working Drawings\Preliminary Drawings\1910.PPS.203-205 Proposed Drainage Layout.dwg

Registered Office: Inile, Parc Mers, Bangor, Gwynedd, LL57 4PG Company Registered No: 06716319



APPENDIX 2

Section 106 Approval Letters



Faraj Arfa-Zangeneh
Caulmert Ltd
Cattermole Building
Market Place
Codnor
Derbyshire
DE5 9QA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: 0330 303 0119

Email: developerservices@southernwater.co.uk

10/10/2014

Our Ref: SWS-HANTS-S106-006334

Application to Connect to the Public Sewerage System - Section 106 Water Industry Act 1991

Location: Purbrook Park School, Park Avenue, Purbrook, Waterlooville, Hampshire, PO7 5DS.

Dear Mr. Zangeneh,

Further to your recent application to connect to the public sewerage system at the above location. I am pleased to inform you that your proposal to connect to the surface water sewers via an existing manhole has been approved subject to the following provision:-

Connections to existing manholes and arrangement of pipe junctions within the manhole should be in accordance with Sewers for Adoption 7th edition and Southern Water guidance documentation.

Please contact Mick Vince our Clerk of works for this area on 07803 259227 giving at least 2 full working days notice, in order that a mutually convenient date and time for the inspection of the works can be arranged.

If connection is to be made through the lands of another, the works may not proceed until the Landowners consent has been obtained.

In approving this application it is assumed that you have obtained any necessary Building Regulations Approval and /or Highway Authority Road Opening License.

Yours sincerely,

Developer Services



Faraj Arfa-Zangeneh
Caulmert Ltd
Cattermole Building
Market Place
Codnor
Derbyshire
DE5 9QA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: 0330 303 0119

Email: developerservices@southernwater.co.uk

10/10/2014

Our Ref: SWS-HANTS-S106-006326

Application to Connect to the Public Sewerage System - Section 106 Water Industry Act 1991

Location: Purbrook Park School, Park Avenue, Purbrook, Waterlooville, Hampshire, PO7 5DS.

Dear Mr. Zangeneh,

Further to your recent application to connect to the public sewerage system at the above location. I am pleased to inform you that your proposal to connect to the surface water sewers via an existing manhole has been approved subject to the following provision:-

Connections to existing manholes and arrangement of pipe junctions within the manhole should be in accordance with Sewers for Adoption 7th edition and Southern Water guidance documentation.

Please contact Mick Vince our Clerk of works for this area on 07803 259227 giving at least 2 full working days notice, in order that a mutually convenient date and time for the inspection of the works can be arranged.

If connection is to be made through the lands of another, the works may not proceed until the Landowners consent has been obtained.

In approving this application it is assumed that you have obtained any necessary Building Regulations Approval and /or Highway Authority Road Opening License.

Yours sincerely,

 Developer Services



Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG

Tel: 01248 672666

Fax: 01248 672601

Email: contact@caulmert.com

Web: www.caulmert.com