

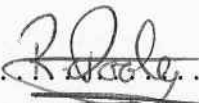


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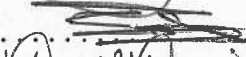
MEADOWLANDS SCHOOL RE-DEVELOPMENT SITE

DRAINAGE STRATEGY REPORT

Prepared by: Robin Dooley

Signed:  Date: 12/11/12

Checked by: Simon Fryer

Signed:  Date: 12/11/12

Approved by: David Devenish

Signed:  Date: 12/11/12

Rev	Date	Originator	Checked	Approved	Description
A	29/05/12	RD	SF	DD	Details of SUDS added
B	14/08/12	RD	SF	DD	References to PPG25 removed

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Certificate No. FS 21846



Stuart Jarvis, BSc DipTP FCIHT MRTPI, Director of Environment, The Castle, Winchester

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1. INTRODUCTION

The Meadowlands School site comprised an Infant school and Junior school with associated playing fields. Hampshire County Council has combined both the infant and junior schools to create a new primary school.

This work is now complete with the former junior school being refurbished to form the new primary school whilst the infant school has been demolished. Part of the infant school site has been retained by the primary school for use as additional playing fields with the surplus area sold off to a private developer for the construction of approximately 43 new housing units.

2. SURFACE WATER STRATEGY

Both the original schools discharged into the public surface water sewer in Woodcroft Lane via the private school sewer network.

The demolition of the infants school resulted in a significant reduction in impermeable area and hence a reduction in the surface water discharge entering the public surface water sewer.

The reduction in impermeable area resulting from the demolition of the infant school is approximately 3890 sq m. This equates to a net reduction of 50 l/s entering the surface water network.

Ground investigation reports have shown the site to be underlain by clay deposits over 4.0m deep. This has ruled out the use of infiltration drainage as an effective means of dealing with the surface water discharge.

Our proposal is therefore to use the 'spare' capacity from the demolished school to serve the new development and store and attenuate any flows in excess of the pre-existing discharge rate so that the potential for downstream flooding is not increased.

Drawing number 502728/001 (appendix A) shows the outline planning layout as having an impermeable area of 6616m² or 0.662ha. This would generate a peak surface water discharge of approximately 116 l/s in total for a 1 in 30 year storm event.

A capacity study was commissioned from Southern Water to establish the if there was sufficient spare capacity within the local public sewer network. The study concluded that if it could be proved that the existing school did connect to the public sewer in Woodcroft Lane then the discharge from any development should be limited to the pre-existing discharge rate of 50 l/s. It should be noted that the study is only valid for 12 months therefore this rate could be subject to change and cannot be reserved for this development alone. Any developer of the site needs to agree the discharge rate with Southern Water at detailed design stage.

It is therefore proposed to connect the surface water into the existing 225 dia. pipe in Woodcroft Lane. Flows would be attenuated on site in oversized pipes beneath the adopted highway and the pass forward flow would be limited to 50 l/s by a flow control device up to and including the 1 in 100 year storm events.

The currently proposed site layout has limited areas of public open space which could be utilised for the storage of the 1 in 100 year storm flood. Allowance must therefore be made within the underground storage to attenuate all surface water run off. Preliminary calculations indicate that approximately 166m of 1.05m dia concrete pipes will be

required. This will need to be confirmed at detailed design stage by the developer's consultant.

On this basis there should be no net increase in the amount of surface water entering the public sewer network and there should be no increase in the potential for downstream flooding.

3. SUDS

Opportunities for SUDS features on this site are limited. Ground conditions rule out the use of infiltration as a means of dealing with surface water run-off. However, water conservation should be encouraged and it is proposed that all properties are provided with a Water Butt for collecting rainwater. The collected water can be used where potable water quality is not required i.e. watering the garden or flushing the toilet.

4. FOUL WATER STRATEGY

Both of the existing schools discharged into a public foul sewer in Woodcroft Lane, via the private school sewer network.

The tables below summarise the reduction in the foul water discharge from the site as a result of the demolition of the infants school. Table 1 below is a summary of the reduction in the number of facilities, toilets, sinks etc, and table 2 shows this reduction converted to a discharge using the BS EN 752 method.

Table 1 - Foul Water facilities in the existing and proposed schools

Item	Existing Infants school	Existing Junior school	Proposed Primary	Change ±
W.C.	13	18	19	-13
Whb	18	26	26	-18
Sink	15	17	18	-15
Urinal	5	7	6	-5
Shower	1	1	1	-1
drinking water	6	4	6	-4

Table 2 – Calculation of Waste Water Flows

	Project	Meadowlands School			
	Project No	R.J502728.02			
	Date	27/01/11			
	Calculation of Waste Water Flows for Drain Systems				
	to BS EN 752-4:1997 Annex C				
	& BS EN 12056-2:2000				

	No of units			1	
	Frequency Factor		<i>Table C1</i>	0.7	<i>kDU</i>
	Table C1				
	Intermittent use, e.g. in dwelling, guesthouse, office			0.5	
	Frequent use, e.g. in hospital, school, restaurant, hotel			0.7	
	Congested use, e.g. in toilets and/or showers open to public			1	
	Special use, e.g. laboratory			1.2	
	<i>DU values based on BS EN 12056-2:2000 Table 2 - System 1</i>				
	Appliance	No of	<i>DU</i>	<i>DU</i>	
			<i>App</i>	Total	
	Wash basin, bidet	18	0.5	9	
	Shower without plug	1	0.6	0.6	
	Shower with plug		0.8	0	
	Single urinal with cistern		0.8	0	
	Urinal with flushing valve		0.5	0	
	Slab Urinal	5	0.2	1	<i>0.2 per person</i>
	Bath		0.8	0	
	Kitchen Sink	15	0.8	12	
	Dishwasher (Household)		0.8	0	
	Washing Machine up to 6kg		0.8	0	
	Washing Machine up to 12kg		1.5	0	
	Wc with 6.0 & 7.5 l cistern	13	2	26	
	WC with 9.0 l cistern		2.5	0	
	Floor Gully DN 50		0.8	0	
	Floor Gully DN 70		1.5	0	
	Floor Gully DN 100		2	0	
		Sub Total/per Unit		48.6	
		Total		48.6	
	Waste Water Design Flow =		Freq Factor x (Total)^{1/2}		
	Waste Water Design Flow =			4.88	l/s

The table above shows that the foul flow is reduced by 4.88 l/s due to the redevelopment of the school buildings.

Using the sewers for adoption discharge rate of 4000 l/d per property this produces a foul discharge of approximately 2.0 l/s for the proposed housing development.

From the above analysis it can be seen that foul flows to the public foul sewer in Woodcroft Lane will be significantly reduced following the redevelopment of the school and the construction of the proposed residential development.

It is proposed to make a new connection into the existing 150 dia. foul sewer in Woodcroft Lane which currently serves the school as indicated on drawing number 502728/001. It may be necessary to re-lay the sewer in order to make a connection into public sewer further downstream due to the shallow invert levels of the current school connection. This should be taken into account by any potential purchasers.

5. CONCLUSION

5.1. Surface Water

Ground conditions effectively rule out the use of infiltration as a method of disposal for surface water. Site investigations have proven the site to be underlain by clay upto and beyond 4.0m in depth.

There are no water courses or drainage ditches in the vicinity of the site which would could be used as a receptor for the surface water run off.

It is therefore proposed to discharge all surface water run-off to the public sewer network at a rate equal to the pre-existing development rate of 50 l/s. This has been agreed by the sewerage authority. Any flows over and above this are to be attenuated on site utilising underground storage features such as oversized pipes or geocellular tanks or a mixture of both.

The currently proposed development layout provides limited public open space to provide above ground storage features. Therefore the preliminary design is based on attenuating the 1 in 100yr +30% storm events in underground storage.

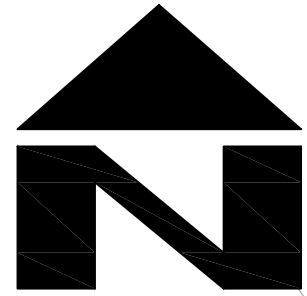
Preliminary Microdrainage calculations are included in Appendix D. These indicate that for the 1 in 100yr +30% 60min Winter storm event a storage volume of approx 151m³ needs to be provided. The preliminary design shows this as provided within oversized underground pipes although consideration should be given to providing some of this storage beneath driveways and public car parking areas. A quick assessment shows this could yield upto 133m³ based on a sub base depth of 400mm and a porosity value of 30%.

The capacity study produced by Southern Water confirmed that the surface water discharge from any subsequent re-development of this site should not exceed the pre-existing discharge rate of 50 l/s. It should be noted that their report is only valid for a period of 12 months after which the available capacity cannot be guaranteed. See Appendix E.

5.2. Foul Water

Preliminary calculations provided in section 3 above indicate that a net reduction of 2.48 l/s will be achieve due to the re-development of the school site. Southern Water has confirmed that this can be discharged to the public sewer network.

APPENDIX A:
DRAINAGE STRATEGY PLAN 001



LEGEND		
KEY	DESCRIPTION	AREA
	HIGHWAY	2990m²
	HOUSE ROOFS	2364m²
	DRIVEWAYS (POSSIBLE PERMEABLE PAVING)	1200m²
	TOTAL	6554m²
	SEWER EASEMENT	
	GEOCELLULAR UNDERGROUND STORAGE TANK	
	EXISTING ADOPTABLE SURFACE WATER SEWER	
	EXISTING ADOPTABLE FOUL SEWER	
	PROPOSED ADOPTABLE SURFACE WATER SEWER	
	PROPOSED ADOPTABLE FOUL SEWER	

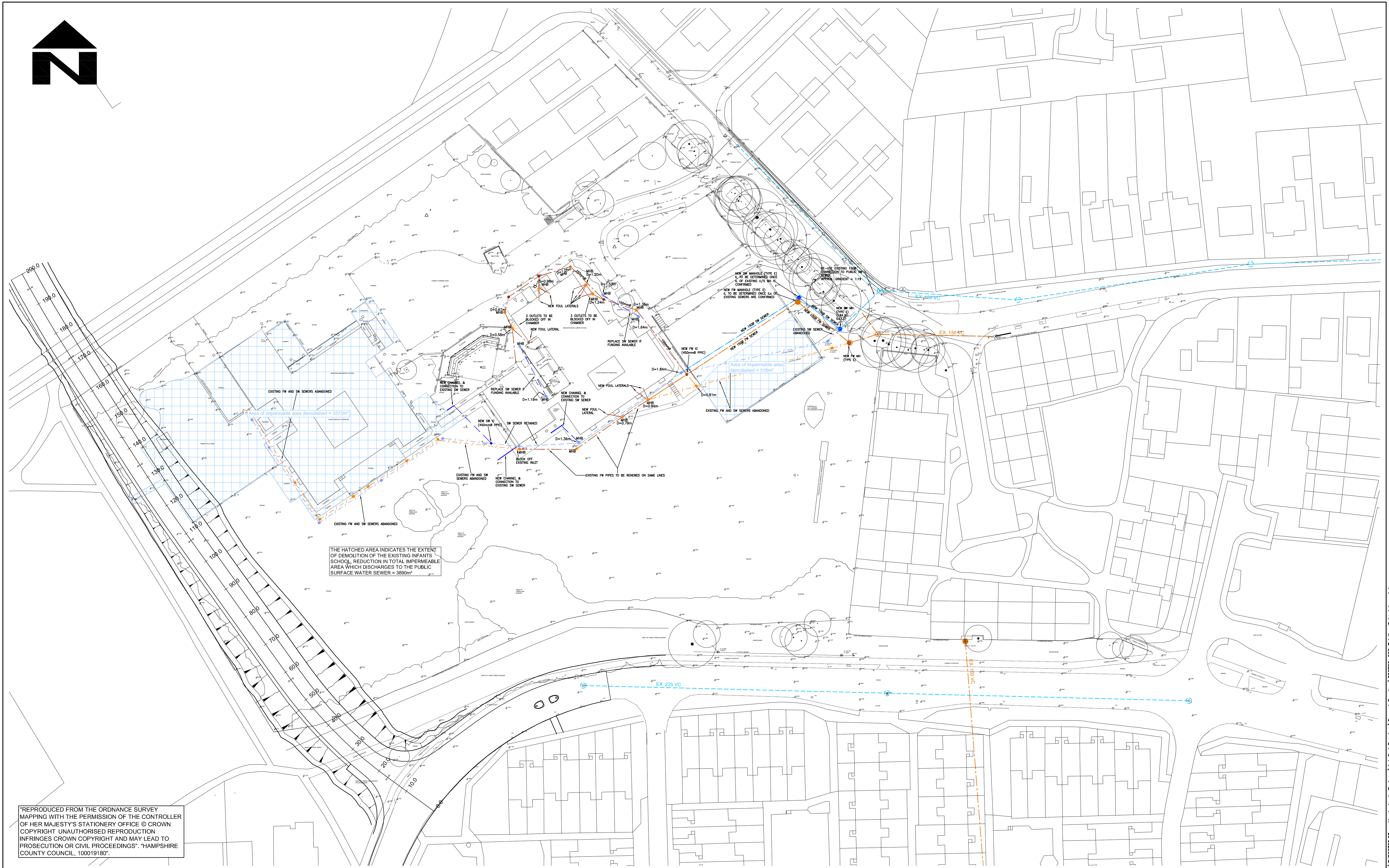
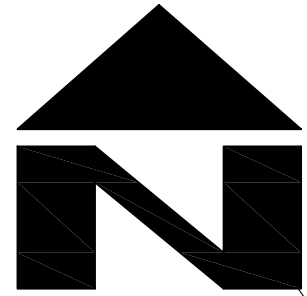
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PRELIMINARY

						CLIENT	HAMPSHIRE COUNTY COUNCIL PROPERTY, BUSINESS AND REGULATORY SERVICES ASSETS AND DEVELOPMENT										CONSULTANT	 Hampshire County Council   Certificate No. FS 21845			<table><tr><td>DRAWN</td><td>RD</td></tr><tr><td>CAD</td><td>RD</td></tr><tr><td>CHECKED</td><td>SF</td></tr><tr><td>APPROVED</td><td>DD</td></tr></table>	DRAWN	RD	CAD	RD	CHECKED	SF	APPROVED	DD	SCHEME MEADOWLANDS SCHOOL WOODCROFT LANE WATERLOOVILLE		DRAWING TITLE DRAINAGE STRATEGY	
DRAWN	RD																																
CAD	RD																																
CHECKED	SF																																
APPROVED	DD																																
D Drawing amended to suit revised layout						09/08/12 RD SF DD		STUART JARVIS BSc DipTP FCIT MRTP, DIRECTOR OF ENVIRONMENT, THE CASTLE, WINCHESTER.										JOB No. R.J502728.03	SCALE @ A1 1:500	DATE JAN 2011	SHEET No. 1	HCC 09/08/12 at 4:39pm	DRG No. 502728/001	REV D	SUFFIX P								
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APPENDIX B:
DRAINAGE STRATEGY PLAN 002



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CLIENT

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**Engineering**
CONSULTANCY



CERTIFICATE No. FS 21845

STUART JARVIS BSc DipTP FCITP MRTPI, DIRECTOR OF ENVIRONMENT, THE CASTLE, WINCHESTER.

DRAWN RD	CAD RD	CHECKED SF	APPROVED DD	SCHEME MEADOWLANDS SCHOOL WOODCROFT LANE WATERLOOVILLE	JOB No. R.J502728.03	SCALE A1 1:500	DATE JAN 2011	SHEET No. 1	DRAWING TITLE DRAINAGE STRATEGY IMPERMEABLE AREAS	HCC Date: 31 May 2012 at 8:49am	DRG No. 502728/002	REV	SUFFIX P
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