

PHILHARMONIC COURT, LIVERPOOL

SURFACE WATER AND FOUL WATER DESIGN STATEMENT

JULY 2012

REF: 95372



FAIRHURST

CONTROL SHEET

CLIENT: Marcus Worthington & Co Ltd

PROJECT TITLE: Student Accommodation, Philharmonic Court, Liverpool

REPORT TITLE: Surface Water and Foul Water Design Statement

PROJECT REFERENCE: 95372/Design Statement

Issue and Approval Schedule:

ISSUE 1	Name	Signature	Date
Prepared by	James Stockdale	J Stockdale	27/07/12
Reviewed by	Frazer Thompson	F Thompson	31/07/12
Approved by	Anthony Simmons	A Simmons	31/07/12

Revision Record:

Issue	Date	Status	Description	By	Chk	App
2	23/08/12	I	Revised to Planning Comments	JAS	FT	FT
3						
4						
5						
6						
7						
8						

This report has been prepared in accordance with procedure OP/P02 of Fairhurst's Quality Management System

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	APPENDIX B - WINDES OUTPUT	

DESIGN ASSESSMENT FORM

Project: Student Accommodation, Philharmonic Court, Liverpool	Job No. 95372
	By/Date: J Stockdale 27/07/12
	Approved/Date: 30/07/12
Fairhurst Scope of Works:	Civil design of proposed infrastructure required to serve new development on Caledonia St, Liverpool
Description:-	Works consist of design and construction of a new building and infrastructure to serve a new student accommodation building. Demolition of the existing buildings required.
Scope of Services	Civil design of the proposed foul and surface water drainage systems and assessment of existing drainage systems
Design Philosophy:	These calculations aim to determine the existing run off and determine the discharge rate for the proposed development.
Site Location	The site is in Liverpool city centre. Approximately 200m east of the River Mersey.
Site Restrictions	Site consists of existing student residences to be demolished. The area is fully developed; the site is bordered on all sides by existing buildings and highways. The disused Wapping Tunnel crosses the south east corner of the site beneath existing buildings. See Appendix A.
Drainage Issues	From records there are combined sewers in the highways surrounding the site, size requires confirmation via survey. There is an existing public sewer beneath the footprint of the proposed building which will require diverting. From the size shown on record a reduced easement will have to be agreed with UU.
Site Investigation	SI has been carried out by Fairhurst.

Project: Student Accommodation, Philharmonic Court, Liverpool	Job No. 95372
	By/Date J Stockdale 27/07/12
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Fairhurst Scope of Works Drainage Assessment and Future Strategy	
Design Philosophy This assessment aims to determine the existing run off from the site proposed for redevelopment to the public sewer. From this we will determine an acceptable rate of discharge for the proposed development. The development consists of a new student accommodation blocks	
Existing System The area of the site is approximately 8011 square metres, of which 4093 square metres are impermeable surfacing to be redeveloped. Assuming a peak 1 in 1 year run off of 50mm/hr using the rational method the existing discharge is:- <div style="text-align: center; margin-top: 20px;"> $0.4093 \times 50 \times 2.78 = 56.89\text{l/s}$ </div>	
Proposed system The vast majority of the site post development will be taken up with the proposed residential blocks. There are some areas of new landscaping. Approximately 5234 square metres has been redeveloped as impermeable surfacing It is assumed that the site requires protecting from flooding in rainfall events upto the 100 year return period with 20% climate change allowance. To present betterment to the public system the peak proposed discharge from the site will be limited to 70% peak of the existing 1 in 1 year for events upto the 1 in 100 year. This equates to 39.8l/s. To adhere to this discharge limit attenuation will be required. Using Microdrainage hydraulic modelling software this a quick storage estimate has been run, the output of which is included in Appendix B. 115 cubic metres of storage will be provided on site, the discharge from which will be limited by	

hydrobrake.

As the site is fully developed on all sides it is assumed that infiltration is not a valid method of surface water elimination. A formal surface water system is proposed, attenuated and discharged to the public network. The arrangements of which are shown on drawing sk7003 in Appendix A.

There are 354 beds within the proposed development, this gives a population of 354. If we assume a discharge of 200l/head/day (taken from British Water document Flows and Loads) this equates to a dry weather flow (DWF) of:-

$$\frac{354 \times 200}{(24 \times 60 \times 60)} = 0.82\text{l/s}$$

Peak foul discharge is taken as 3DWF, therefore the peak foul discharge to the public sewer from the development is 2.46l/s.

There is an existing public sewer crossing the site. It is currently unknown whether this is required post-development and can be abandoned. Currently it is proposed to divert this sewer around the proposed development, see Appendix A, drawing sk7003.

Conclusion

The proposal shown in Appendix A satisfies the requirements of not flooding in rainfall events upto the 1 in 100 year return period with 20% climate change allowance. Discharge rates, locations of drainage connections to the public sewer and the sewer diversion have to be agreed with United Utilities.

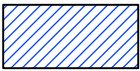
Project: Student Accommodation, Philharmonic Court, Liverpool		Job No. 95372
		By/Date J Stockdale 27/07/12
		Approved/Date 30/07/12
<p align="center">Checklist of potential operations and hazards</p>		
Potential Hazards	Present	Key Significant Hazards to be Addressed
Client operations		
Adjacent activities	X	
Restricted site		
Traffic		
Interface with public		
Near to highways		
Near to railways		
Near to waterways		
Tidal working		
Ground instability		
Contamination	X	Refer to Risk Register
Soil gas		
Ground water	X	
Inundation	X	
Sewage	X	
Fuel tanks		
Services	X	Refer to Risk Register
Overhead cables		
Demolition		
Unstable structures	X	
Explosives		
Asbestos	X	Refer to Risk Register
Bird droppings		
Dust		
Hazardous materials		
Radiation		

Hot working		
Confined spaces	X	
Working at height	X	Refer to Risk Register
Manual handling	X	
Lifting operations	X	
Vibration	X	
Noise	X	
Other (state)		
Underground Structures		

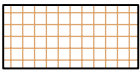
Project: Student Accommodation, Philharmonic Court, Liverpool		Job No. 95372
		By/Date J Stockdale 27/07/12
		Approved/Date 30/07/12
Stage		Sheet
Hazard	Action by Designer	Residual Hazard
Deep Excavations/ Working at Height	1. To eliminate hazard	
	2. To reduce hazard All manholes to be designed to minimum depths and gradients kept to a minimum where possible.	Deep Excavations
Live Services	1. To eliminate hazard	
	2. To reduce hazard Utility company records /CAT survey to be obtained prior to design commencement to ensure no clashes.	Live Services Crossing Site
Contamination	1. To eliminate hazard	
	2. To reduce hazard SI to be undertaken to establish type and location of contamination.	Contamination
Asbestos	1. To eliminate hazard	
	2. To reduce hazard Asbestos may be present in below ground fill. Testing is required prior to any construction works	Asbestos

APPENDIX A

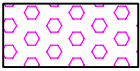
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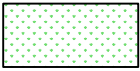
EXISTING ROOF AREAS 1599M²



EXISTING HARDSTANDING AREAS 2494M²



EXISTING BUILDINGS TO BE REFURBISHED 1213M²



EXISTING SOFT LANDSCAPED AREAS 2705M²

TOTAL SITE AREA 8011M²

CALEDONIA STREET

SUGN

Sc

N

Car Park

El Sub Sta

Philharmonic Court

CATHERINE STREET

FALKNER STREET

Wapping Tunnel
(disused)

--- DENOTES SITE BOUNDARY

Rev.	Date	Description	Drwn.	Chkd.	Appd.
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FAIRHURST

51a St. Pauls Street
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LS1 2TE

Tel: 0113 243 4671
Fax: 0844 381 4412

Project Title:
**STUDENT ACCOMMODATION
PHILHARMONIC COURT
LIVERPOOL**

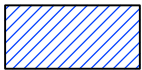
Drawing Title:
EXISTING AREA PLAN

Scale at A3: 1:500	Status: For Information	Approved:
Drawn: JS	Checked:	Date:
Date: 26/07/12	Date:	Date:
Drawing No.:	Revision:	

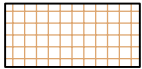
95372/sk7001

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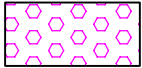
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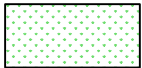
PROPOSED ROOF AREAS 2541m²



PROPOSED HARDSTANDING AREAS 2693m²



EXISTING BUILDINGS TO BE REFURBISHED 1213m²



PROPOSED SOFT LANDSCAPED AREAS 1564m²

TOTAL SITE AREA 8011m²

--- DENOTES SITE BOUNDARY

A 30/08/12 REVISED TO THE LATEST ARCHITECTS LAYOUT 20/08/12

JAS FT

Rev. Date Description

Drwn. Chkd. Appd.

FAIRHURST

51a St. Pauls Street
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Project Title:
**STUDENT ACCOMMODATION
PHILHARMONIC COURT
LIVERPOOL**

Drawing Title:
PROPOSED DRAINED AREAS

Scale at A3:

1:500

Drawn:

DS

Date:

27/07/12

Drawing No.:

Status:

For Information

Checked:

JAS

Date:

27/07/12

Approved:

FT

Date:

27/07/12

Revision:

95372/sk7002

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DIVERTED SEWER ROUTE, SIZE 900mm TBC. MAXIMUM POSSIBLE EASEMENT WIDTH WITHIN SITE BOUNDARY APPROX 4m IN TOTAL. REDUCED EASEMENT WIDTH AND POSITION OF DIVERSION TO BE AGREED WITH UNITED UTILITIES. SHEET PILING MAY BE REQUIRED DURING CONSTRUCTION.

PROPOSED COMBINED CONNECTION TO MANHOLE ON DIVERTED SEWER

EXISTING SEWER SHOWN WITH 4m WIDE EASEMENT EITHER SIDE OF SEWER

SURFACE WATER DISCHARGE LIMITED TO 39.8l/s VIA HYDROGRAB

115 CUBIC METRES OF ATTENUATION IN 1200mm PIPEWORK

EXISTING REFURBISHED BUILDINGS DRAIN THROUGH EXISTING CONNECTIONS TO THE PUBLIC SEWER



- Notes:
- PROPOSED SURFACE WATER DRAINAGE
 - PROPOSED FOUL WATER DRAINAGE
 - PROPOSED COMBINED DRAINAGE
 - EXISTING PUBLIC COMBINED DRAINAGE
 - DIVERTED PUBLIC COMBINED DRAINAGE

STUDENT ACCOMMODATION
PHILHARMONIC COURT
LIVERPOOL

PROPOSED ATTENUATION LOCATION
AND DISCHARGE POINT

FAIRHURST

51a St. Pauls Street,
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Tel: 0113 243 4671 Fax: 0844 381 4412

Scale at A1:
1:200

Status:
For Information

Drawn:
JS

Date:
30/07/12

Checked:
FT

Date:
30/07/12

Approved:
FT

Date:
30/07/12

Revision:
95372/sk7003

A

Rev.	Date	Description	Drawn	Checked	Approved
A	30/08/12	REVISED TO ARCHITECTS LATEST LAYOUT RECEIVED 20/08/12	JAS	FT	FT

APPENDIX B

Quick Storage Estimate

Micro Drainage

Variables

FSR Rainfall Cv (Summer)
Return Period (years) Cv (Winter)
Region Impermeable Area (ha)
Map M5-60 (mm) Maximum Allowable Discharge (l/s)
Ratio R 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 90 m³ and 161 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

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DEVELOPMENT • WATER SERVICES • CDM COORDINATOR SERVICES

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