



**P4560**  
**Chatburn Road, Clitheroe**  
**Drainage Option Assessment**



**For**



**REPORT VERIFICATION**

<u>Report Title</u>	<u>Drainage Assessment - Chatburn Road, Clitheroe</u>			
<u>Project Number</u>	<u>P4560</u>			
<u>Revision</u>	<u>Issue</u>	<u>Date</u>	<u>Prepared</u>	<u>Approved</u>
<u>001</u>	<u>Draft</u>	<u>15.05.2013</u>	<u>KW</u>	<u>DTW</u>
<u>002</u>	<u>Client Amendments</u>	<u>17.10.2013</u>	<u>KW</u>	

## Table of Contents

1.0	Introduction .....	1
2.0	The Site .....	1
2.1	Site Location .....	1
2.2	Site Topography .....	1
3.0	Development Proposals.....	2
4.0	Foul Water Options.....	2
5.0	Surface Water Options .....	3
6.0	Additional Options. ....	4
7.0	Conclusion. ....	4

Appendix 1 – Windes Critical Storm Output.

## **1.0 Introduction**

Thomas Consulting have been appointed by Oakmere Homes to undertake a detailed assessment of drainage options associated with a potential development site located off Chatburn Road, Clitheroe.

## **2.0 The Site**

### **2.1 Site Location**

The site is located to the north of the A671 (Chatburn Road) approx. 1.3km to the north east of Clitheroe town centre.

The site area is approximately 2.62Ha (6.47Acres)

### **2.2 Site Topography**

A detailed topographic survey has been provided by the client. General site levels range from 93mAOD along Chatburn Road to approx. 81.5m AOD along the route of the existing watercourse.

The average site slope (from south to north) is approx. 1 in 10.  
The watercourse falls from a level of 84m AOD in the north eastern corner of the site to 81.5mAOD at the western end of the site.

The average bed slope of the existing watercourse running through the site is 1 in 100.

A site visit has not been undertaken by Thomas Consulting.

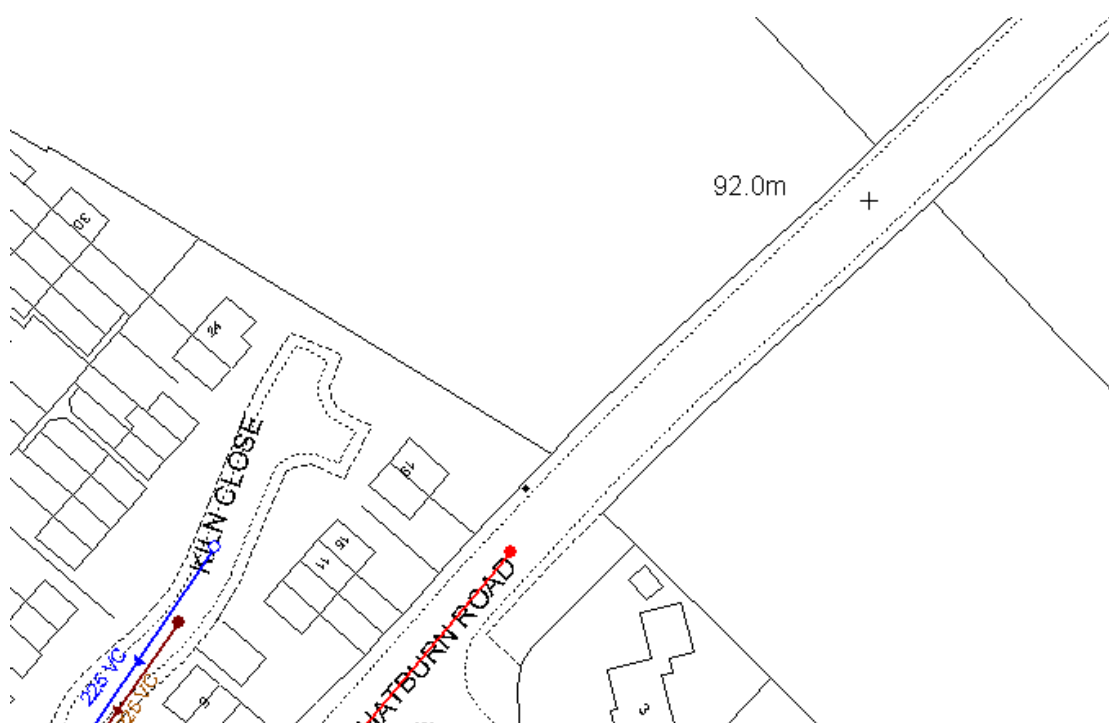
### 3.0 Development Proposals

Detailed development proposals have not been provided, however it is understood that the current proposal solely for residential development and associated infrastructure.

### 4.0 Foul Water Options

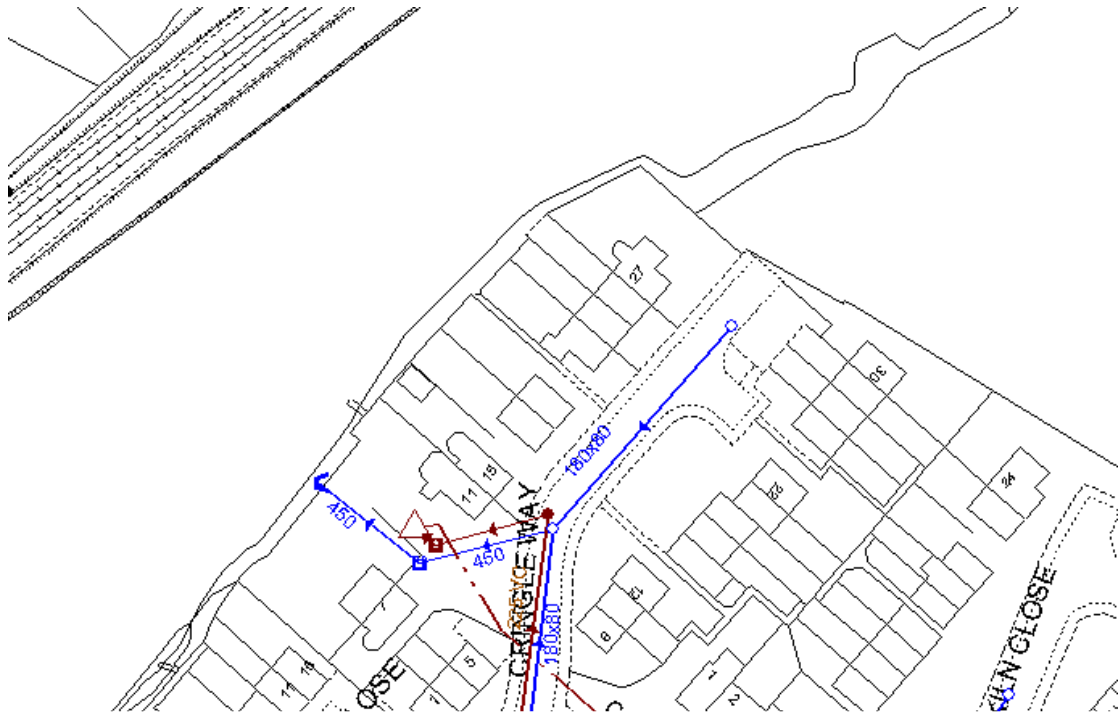
United Utilities sewer records indicate that there are adopted foul water sewers located within Chatburn Road to the south of the site and Cringle Way to the west.

A gravity connection from the site to the existing sewer within Chatburn Road would not be possible. As such, foul water flows from the site would need to be directed to a new adoptable foul water pumping station constructed on site and discharged via rising main to the sewer in Chatburn Road



Any proposal for a new foul water pumping station would need to comply with Sewers for adoption 6<sup>th</sup> edition at present, until such time as Sewers for Adoption 7<sup>th</sup> Ed (currently published but not implemented) is brought into operation.

Foul water flows from the adjacent residential development to the west drain via a gravity system to an adopted foul water pumping station located on Cringle Way. (see below)



Depending on land ownership / potential ransom strips between the adopted highway (cringle close) and the site boundary, it may be possible to direct foul water flows from the site towards the existing Foul water pumping station.

United Utilities may require upgrading works to the pumping station to cater for the increased flow rates, however, such a proposal may be more cost effective and preferable to the construction of a new on site foul water pumping station.

An enquiry has been issued to United Utilities regarding the above options and a response is currently awaited regarding the preferred option.

## 5.0 Surface Water Options

Thomas Consulting have carried out a Flood Risk Assessment for the above site and within that document identified that surface water discharges should be directed to the on site watercourse.

United utilities have confirmed verbally that until the implementation of the Flood and water Management Act 2010 they will still be prepared to adopt new surface water sewer networks.

They have also confirmed that the recommended restriction on flows to the calculated  $Q_{bar}$  value (in this case 17.5L/Sec) would be their preferred discharge limit.

On the basis of a site developable area of 2Ha and an assumed 40% impermeability, the total site impermeable area would be expected to be 0.8Ha.

Analysis using Windes design software has been undertaken and indicates that the likely attenuation volume required to comply with the required discharge rate and a 1 in 100 year storm event (plus 30%) climate change allowance would be 353Cu.m

A summary of the critical storm duration details is included below.

The design details included below are an estimate of required attenuation volume only and would be subject to verification by detailed design based upon a proposed site layout plan.

It should be noted that the attenuation volume indicated may differ substantially depending upon the actual developable site area and percentage of impermeable surfaces.

It is considered that the provision of on site attenuation and a restricted discharge would be the preferred drainage solution for the site, and would represent an acceptable solution for United Utilities (The adopting authority)

## **6.0 Additional Options.**

The site is unlikely to prove suitable for the incorporation of additional sustainable urban drainage solutions such as soakaways.

Alternative surface water management solutions that may be considered for the site are detailed below:-

### **6.1 Rainwater harvesting**

Rainwater harvesting may prove suitable for the site. however its use does not provide tangible benefits in the reduction of on site storage required. As such, rainwater harvesting would not be considered as beneficial for the site unless Code for sustainable homes compliance was required.

### **6.2 Permeable Paving**

Permeable paving solutions (e.g. private drive areas) can be utilised to attenuate surface water flows into the discharging sewer network. Subject to detailed design proposals, permeable paving (and associated sub grade storage) could be utilised on site to provide a direct reduction in the overall volume of online surface water attenuation required.

### **6.3 Ponds**

The incorporation of a pond structure would be seen as a viable alternative to the provision of underground attenuation on site. Surface water flows could be controlled by ensuring that sufficient attenuation volume is provided within the pond to cater for critical storm durations.

United utilities would not adopt surface water discharge systems leading from ponds to a watercourse, and the incorporation of a pond on site would have a detrimental effect on the developable site area.

As such whilst a viable alternative, the provision of a pond would be subject to the provision of detailed development proposals.

## **7.0 Conclusion.**

Foul and surface water drainage for the site are likely to comprise of connections to the existing foul sewer network and watercourse for the disposal of foul and surface water respectively.

Surface water attenuation will be required to limit peak flows and thereby reduce any potential flood risks downstream of the site.

Alternative solutions that may be of benefit to the site include permeable paving and the construction of an attenuation pond. Both of the above solutions would serve to reduce the physical volume of underground attenuation required, and would be subject to detailed layout proposals.

Subject to the recommendations above, Thomas Consulting would not consider that drainage solutions would prevent the site from being developed for residential end use.

It should be noted that this report should be read in conjunction with the separate Flood Risk Assessment for the site.

## **Appendix 1.**

### **Windes Surface Water design Output for Critical Storm Duration**



Church House  
New Church Road  
Wellington

Chatburn Road  
Clitheroe



Date May 2013  
File tmpFOA1.tmp

Designed By KW  
Checked By

Micro Drainage

Network W.12.4

Summary of Critical Results by Maximum Pipe Volume (Rank 1) for Storm

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 DVD Status ON  
 Inertia Status ON

Profile(s) Winter  
 Duration(s) (mins) 15, 30, 60, 120  
 Sensitivity flows(s) (%) 0, +30

PN	Storm	Sensitivity	Surcharge Sensitivity	Flood Sensitivity	Overflow Sensitivity	O/F Act.	Lvl Exc.
1.002	120 Winter	+30%	0/15	Winter			

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (1/s)	Pipe Flow (1/s)	Status
1.002	3	83.854	1.213	0.000	0.05	0.0	19.7	SURCHARGED

Church House  
New Church Road  
Wellington

Chatburn Road  
Clitheroe



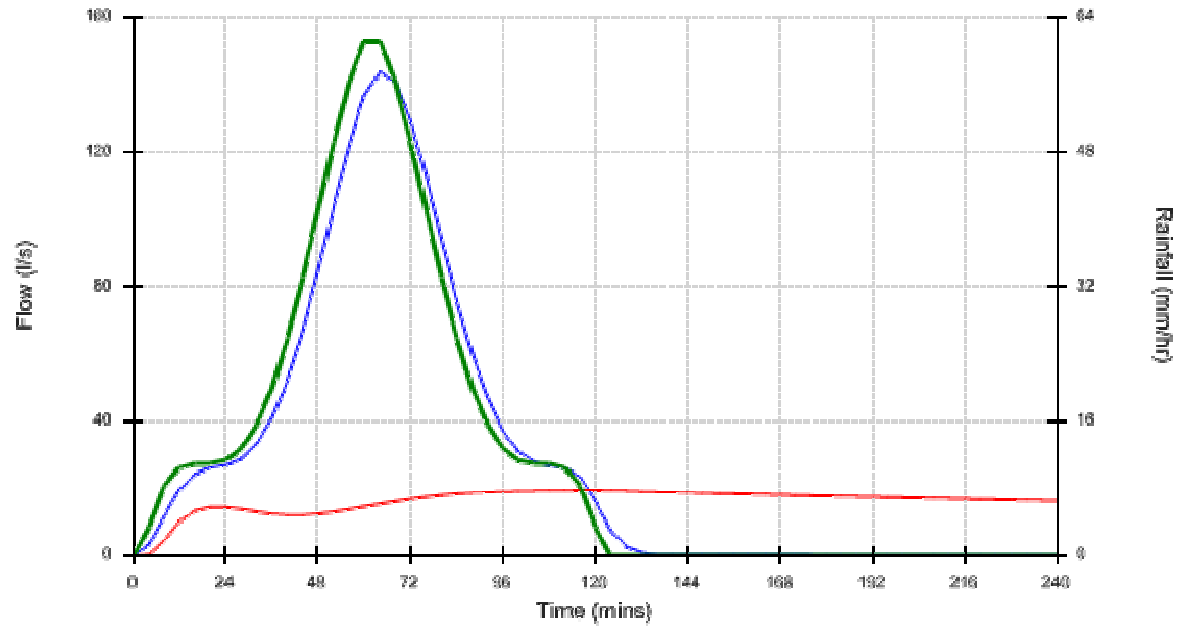
Date May 2013  
File tmpFOA1.tmp

Designed By KW  
Checked By

Micro Drainage

Network W.12.4

Graphs for Pipe 1.002 US/MH 3 (Storm)  
120 minute 100 year Winter Q+30%  
Status: SURCHARGED



Inflow      Outflow      Rainfall

