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# Land off Clitheroe Road, Whalley

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## Drainage Design Statement for Attenuation Ponds

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6<sup>th</sup> January 2016

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Statement prepared by:

Ian McCann, Senior Projects Manager ~ Redrow Homes

Richard Nicholas, Director ~ Betts Hydro



## 1.0 Introduction

The following statement has been commissioned by Redrow Homes Ltd to catalogue the design process of the surface water drainage design and design evolution from initial requirements to current status.

## 2.0 Site Location

The site is located at Ordnance Survey National Grid Reference SD 737 365, as shown in **Figure 1**.



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**Figure 1. Site Location**

## 3.0 Development proposals and proposed phasing

The site is approximately 14.6 hectares (ha) in area. Proposals are for the development of up to 260 residential dwellings, a primary school and associated access and landscaping.

The phases of the proposed development are as follows:

- i) Residential Phase 1 comprising 54 dwellings (split into an east phase and a west phase)
- ii) Residential Phase 2 comprising up to 148 dwellings
- iii) Residential Phase 3 comprising up to 58 dwellings
- iv) The Primary School site

The approximate locations of the different development phases are shown in **Figure 2**.

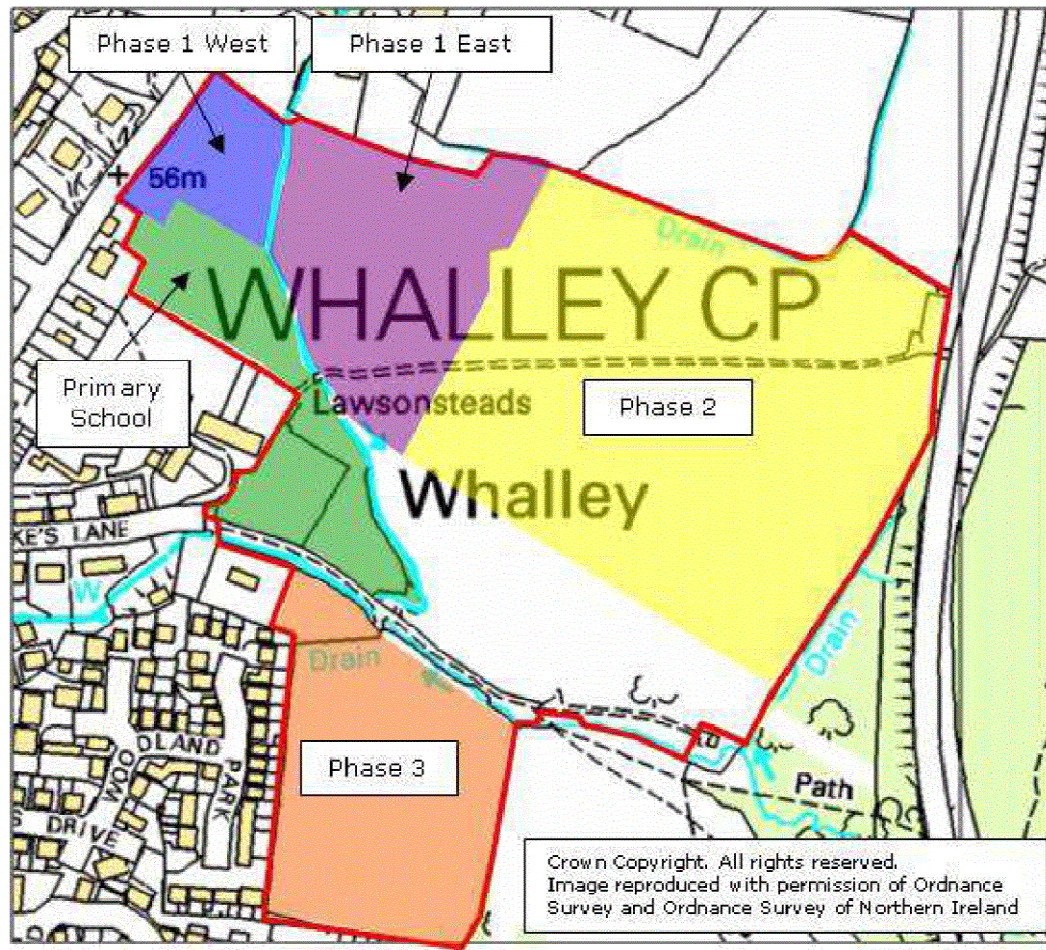


Figure 2. Development Phasing Plan

#### 4.0 Outline Planning Background

Ribble Valley BC granted outline planning permission for a residential-led mixed use development of the above site on 16 October 2013 (LPA ref: 3/2013/0137). The outline consent includes a number of conditions; including the following:

*Condition 15: Prior to the commencement of development, a strategy outlining the general system of drainage for foul and surface water flows arising from the entire site shall be submitted to and agreed in writing by the Local Planning Authority. The strategy shall include details of any necessary on site infrastructure. Thereafter detailed schemes for foul and surface water drainage for any phase of development (pursuant to conditions [17] and [18]) shall be prepared in accordance with the agreed strategy.*

*Condition 17: Prior to the commencement of each phase of development, a detailed surface water drainage scheme for that phase, based on sustainable drainage principles and evidence of an assessment of the hydrological and hydrogeological context of that phase, shall be submitted to and approved in writing by the Local Planning Authority. No surface water shall connect into the public sewerage system, directly or indirectly, without the consent of the Local Planning Authority pursuant to this condition. The scheme for each phase shall be implemented in accordance with the approved details prior to the occupation of any development within that phase and retained thereafter.*

## **5.0 Drainage Design Strategy**

As per the outline planning permission 3/2013/0137; conditions 15 and 17, the surface water proposals for the development site were designed with attenuated surface water within a single surface water attenuation pond. The pond was designed to attenuate flows for up to and including the 100 year + 30 % climate change storm event incorporating the following.

### **a. Post development surface water discharge rates**

The FRA, submitted with the outline application, recommended that runoff rates from the proposed impermeable areas at the site should be limited to the existing 1 in 2 year greenfield runoff rate. Based upon the anticipated extent of post development impermeable areas at that time, the peak runoff rate was calculated as 37.7 l/s.

The EA has, however, allowed a variation to the calculation of the allowable post development discharge rates. Redrow Homes suggested to the EA that the allowable discharge rate post development should be calculated by applying the greenfield runoff rate to the whole area of the development parcel rather than just to the post development impermeable areas within that development parcel. The EA accepted this approach and the allowable runoff from all phases of the development has been calculated on this basis.

### **b. Residential development Phase 1 (west)**

Redrow Homes has designed the layout for this phase of the development (Reference Figure 1.) and developed a Micro Drainage Simulation model for the proposed surface water drainage system. The rate of discharge will be controlled to 6 l/s by a Hydrobrake flow control device located upstream of the outfall pipe.

Surface water runoff from this phase will discharge to a surface water sewer in Clitheroe Road (at Redrow Homes manhole reference S4). The surface water sewer in Clitheroe Road is to be subsequently transferred to UU under a Section 104 agreement.

Planning conditions 15 and 17 have already been discharged for this phase of development, under application 3/2014/0228.

### **c. Residential Phase 1 (east) and Phase 2**

Surface water runoff from this phase of development will be discharged to a watercourse within the site. A maximum discharge rate of 57.7 l/s has been agreed with the EA.

The report to discharge condition 15 dated 7 May 2014 (Reference 1695/DC15\_v1.2), which was accepted by the EA and RVBC, included a single detention basin for the attenuation of surface water up to a 1 in 100 annual probability event including an allowance for climate change from residential phase 1 (east) and phase 2 prior to discharge to the watercourse.

### **d. Residential Phase 3**

The allowable discharge rate for this phase of the site is 13.8 l/s calculated in accordance with the principle of the agreement reached between Redrow and the EA. It is proposed that runoff would be directed to a detention basin located in the north of this area with an outfall into the watercourse. The total storage volume of the detention basin would be designed to accommodate the 1 in 100 year storm event plus 30% climate change. The volume of the detention basin will be determined at the reserved matters stage for this phase of the development.

#### **e. Primary School**

There are no detailed development proposals for this phase of the site. The allowable discharge rate for this phase of the site is 7.1 l/s calculated in accordance with the principle of the agreement reached between Redrow and the EA. It is proposed that runoff would be directed to a detention basin located in the south of the school site with an outfall into the watercourse. The total storage volume of the detention basin would be designed to accommodate the 1 in 100 year storm event plus 30% climate change. The volume of the detention basin will be determined at the reserved matters stage for this phase of the development.

#### **f. Maintenance of SUDS**

The surface water pipe networks in all phases of the development will be put forward for adoption by UU. The detention basins and outfalls to the watercourse will be maintained by a management company.

The drainage design has been submitted to Untied Utilities for submission under Section 104 of the Water Industries Act. Technical approval to the design of the sewers was received on 28/03/2015.

### **6.0 Reserved Matters Application & Discharge of Outline Conditions**

A report relating to the Discharge of Condition 15 for Land to the east of Clitheroe Road, Whalley was prepared by Weetwood (Reference 1695/DC15\_v1.2; dated 7 May 2014). The EA's consultation response to RVBC dated 23 May 2014 (Ref: NO/2014/106372/02-L01; **Appendix A**) stated "*We have previously reviewed a draft version of this report (Reference 1695/DC15\_V1.1; Dated 28 March 2014) and accepted the proposed surface water drainage strategy for the entire site. We have compared the draft report that we have previously reviewed and the final report as submitted to discharge Condition 15 and the only difference is the addition of Environment Agency correspondence confirming that we are satisfied with the strategy. On this basis, we have no objection to the discharge of Condition 15 and we will expect any subsequent phase of development to proceed in accordance with this drainage strategy*".

RVBC's decision dated 24 June 2014 in relation to application 3/2014/0228 (**Appendix B**) states "*Condition No. 15 is partially discharged insofar as the general Strategy for Foul & Surface Water strategy for the entire site approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details and relates to further phases of development*".

The report to discharge condition 15 dated 7 May 2014 (Reference 1695/DC15\_v1.2), which was accepted by the EA and RVBC, included a single detention basin for the attenuation of surface water from phase 1 (east) and phase 2.

### **7.0 Subsequent Investigations**

During the initial stages of the attenuation ponds being excavated for construction, geotechnical investigation and groundwater monitoring were undertaken during the Autumn/Winter of 2014/2015. These investigations were commissioned in order to determine the geotechnical / bearing properties of the ground beneath the proposed storage pond. The investigation results identified the ground conditions in the area of the pond to be generally topsoil over sand lenses over clay. The identification of sand lenses has highlighted a concern that the sands in saturated form have a potential to move and become unstable during excavation for the ponds.

The 4No. large diameter pipes of the Hayeswater Aqueduct are located immediately north of the proposed pond, it became clear, should excavation for the pond in this location be carried out, there would be a high risk of causing major implications/damages to the Aqueduct should movement occur close to or under the Aqueducts causing the Aqueducts to fracture or burst. It should be noted that the Aqueducts supply over 2 million people in Greater Manchester.

The investigations have also shown that the groundwaters in the vicinity of the pond are artesian and that groundwater was present at surface level during the period of groundwater monitoring. With ground water at high level a standard pond liner would be unsuitable. Considering the investigation results the geotechnical engineers have calculated that for every 1m head of groundwater a 500mm thick clay liner would be required. The location of the pond is within an area where there is 2m head of water therefore a 1m thick clay liner will be required.

## **8.0 Design Evolution**

Following the geotechnical investigations a redesign of the proposed attenuation ponds location and depth have been reconsidered to prevent major damages to the Aqueducts.

This revised design significantly reduces the area taken up by the original pond within the area affected by artesian groundwater and sand lenses.

In order to accommodate the sand lenses, proximity to the Aqueducts and a further United Utilities Water main, encountered during site investigations; the redesign of the attenuation system has been split into two ponds. The originally designed pond and new proposed ponds both cater for the same storage capacity; there is no increase or decrease in attenuation volume. Both ponds are sized to attenuate flows for the 100 year + 30 % climate change storm event. The outfall for the amended ponds will be restricted to the agreed discharge rate that has already been approved by the EA. The redesign will utilise one outfall structure in the same location, as per the original design, with two outfall pipes, one from each pond, rather than one; with the same collective peak rate of discharge as agreed for the single pond solution.

## **9.0 Summary**

In summary the two pond design for surface water attenuation provides;

- Surface water from Residential Phase 1 West will discharge into the surface water sewer in Clitheroe Road at a controlled rate of 6 l/s. This surface water sewer will be subsequently transferred to UU under a Section 104 agreement.
- Planning conditions 15 and 17 have already been discharged for this phase of development, under application 3/2014/0228.
- Surface Water from Residential Phase 1 East and Phase 2 will discharge into two detention basins. The basins will outfall to the watercourse at a controlled rate of 57.7 l/s.
- Surface Water from Residential Phase 3 will discharge into a detention basin and the basin will outfall to the watercourse at a controlled rate of 13.8 l/s.
- Surface Water from school site will discharge into a detention basin and the basin will outfall to the watercourse at a controlled rate of 7.1 l/s.
- The total peak surface water runoff rate post development is 84.6 l/s.

## **APPENDIX A**

Ribble Valley Borough Council  
Development Control  
Council Offices Church Walk  
Clitheroe  
Lancashire  
BB7 2RA

**Our ref:** NO/2014/106372/02-L01  
**Your ref:** 3/2014/0220  
**Date:** 23 May 2014

Dear Sir/Madam

**DISCHARGE OF CONDITIONS 6 (PHASING), 7 (ACCESS DETAILS), 9 (FRONTAGE), 15 (DRAINAGE), 16 (FOUL & SURFACE WATER), 17 (SURFACE WATER DRAINAGE), 18 (FOUL DRAINAGE PHASING), 20 (FLOOD DEFENCES WATERCOURSE A), 22 (WATERCOURSE SURVEY), 23 (WATERCOURSE BUFFER), 25 (ARCHEOLOGICAL INVESTIGATION), 26 (CONSTRUCTION MANAGEMENT PLAN), 28 (EXTERNAL LIGHTING) OF APPROVAL 3/2013/0137 LAND TO THE EAST OF CLITHEROE ROAD (LAWSONSTEADS), WHALLEY**

I refer to the above and my previous response dated 2 May 2014.

The applicant has subsequently submitted copies of the following documents to the Council and us in relation to the discharge of Conditions 15, 22 & 23:

- Final Report Relating to the Discharge of Planning Condition 15 for Land to the East of Clitheroe Road, Whalley prepared by Weetwood (Reference 1695/DC15\_V1.2; Dated 7 May 2014)
- Lawsonsteads, Whalley, Lancashire Water Vole Survey prepared by Baker Consultants (078.05 rep 001 ml.docx; dated 20 September 2013)

We have reviewed these documents and wish to offer the following comments:-

**Condition 15** We have previously reviewed a draft version of this report (Reference 1695/DC15\_V1.1; Dated 28 March 2014) and accepted the proposed surface water drainage strategy for the entire site. We have compared the draft report that we have previously reviewed and the final report as submitted to discharge Condition 15 and the only difference is the addition of Environment Agency correspondence confirming that we are satisfied with the strategy. On this basis, we have no objection to the discharge of Condition 15 and we will expect any subsequent phase of development to

Environment Agency  
PO Box 519, South Preston, Lancashire, PR5 8GD.  
Customer services line: 03708 506 506  
[www.gov.uk/environment-agency](http://www.gov.uk/environment-agency)  
Cont/d..

proceed in accordance with this drainage strategy.

**Condition 22** Based on the details as submitted, we have no objection to the discharge of Condition 22 in relation to Phase 1 of the proposed development as approved under application 3/2014/0043.

**Condition 23** Based on the details as submitted, we have no objection to the discharge of Condition 23 in relation to Phase 1 of the proposed development as approved under application 3/2014/0043.

Yours faithfully

**Philip Carter**  
**Planning Officer - Sustainable Places**

Direct dial 01772 714219  
Direct fax 01772 697032  
Direct e-mail [nwnorthplanning@environment-agency.gov.uk](mailto:nwnorthplanning@environment-agency.gov.uk)

cc Christopher Tweedle (Redrow)

End

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## **APPENDIX B**

## RIBBLE VALLEY BOROUGH COUNCIL

Department of Development

Council Offices, Church Walk, Clitheroe, Lancashire, BB7 2RA

Telephone: 01200 425111

Fax: 01200 414488

Planning Fax: 01200 414487

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Town and Country Planning Act 1990

### DISCHARGE OF CONDITION ATTACHED TO A PLANNING PERMISSION

**APPLICATION NO:** 3/2014/0228

**DECISION DATE:** 24 June 2014

**DATE RECEIVED:** 28 March 2014

**APPLICANT:**

Redrow Homes Ltd  
c/o Agent

**AGENT:**

Hourigan Connolly  
7 Swan Square  
15 Swan Street  
Greater Manchester  
M4 5JJ

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**DEVELOPMENT PROPOSED:** Discharge of conditions 6 (Phasing), 7 (Access Details), 9 (Frontage), 15 (Drainage), 16 (Foul & Surface Water), 17 (Surface Water Drainage), 18 (Foul Drainage Phasing), 20 (Flood Defences Watercourse A), 22 (Watercourse Survey), 23 Watercourse Buffer), 25 (Archaeological Investigation), 26 (Construction Management Plan), 28 (External Lighting) of planning consent 3/2013/0137

**AT:** Land to the east of Clitheroe Road (Lawsonsteads) Whalley

The following Condition(s) have been discharged from the above planning application.

Condition No. 06 is partially discharged insofar as the submission of details relating to Phase 01 of the development are approved by the Local Planning Authority. The condition cannot be fully discharged as it relates to further phases of development.

Condition No. 07 is partially discharged insofar as the submission of details relating to the proposed site access to/from Clitheroe Road including the provision of a pedestrian crossing are approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further information/details and relates to further phases of development.

Condition No. 09 is partially discharged insofar as the access details for dwelling that have frontage access to/from Clitheroe Road are approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the development of the phase to be carried out in accordance with the approved details.

Condition No. 15 is partially discharged insofar as the general Strategy for Foul & Surface Water strategy for the entire site approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details and relates to further phases of development.

Condition No. 16 is partially discharged insofar as the details relating to foul & surface water discharge for Phase 01 is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details and relates to further phases of development.

P.T.O.

Condition No. 17 is partially discharged insofar as the details relating to surface water drainage for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details and relates to further phases of development.

Condition No. 18 is partially discharged insofar as the details relating to foul drainage for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details and relates to further phases of development.

Condition No. 20 is partially discharged insofar as the details relating to the improvement and maintenance of flood defences to the west of the identified watercourse for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires the submission of further details, requires that the works be implemented in accordance with the submitted details and relates to further phases of development which may be located to the west of the identified watercourse.

Condition No. 22 is partially discharged insofar as the details relating to the water vole survey for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires that mitigation measures shall be implemented in accordance with the submitted details and requires further survey work relating to further phases of development which may affect the identified watercourse.

Condition No. 23 is partially discharged insofar as the details relating to the provision and management of a buffer zone adjoining the watercourse for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires that each phase of the development shall be carried out in accordance with the approved details and relates to further phases of development which may affect/be adjacent the identified watercourse.

Condition No. 25 is partially discharged insofar as the details relating to the written scheme of archaeological investigation for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires that a scheme of recording be undertaken, the investigation be carried out in accordance with the agreed/submitted details and relates to further phases of development.

Condition No. 26 is partially discharged insofar as the details relating to the construction management plan for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires that the approved statement be adhered to throughout the construction period and requires further information to be submitted relating to further phases of development.

Condition No. 28 is partially discharged insofar as the details relating the lighting strategy for Phase 01 of the development is approved by the Local Planning Authority. The condition cannot be fully discharged as it requires that the lighting scheme shall be implemented in accordance with the approved details and requires further information to be submitted relating to further phases of development.

**JOHN HEAP**  
**DIRECTOR OF COMMUNITY SERVICES**