

AL/10040169

**Drainage Feasibility Study
Proposed Residential Development
At The Foundry, Wombwell**

**For
Ben Bailey Homes Limited
February 2004**

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1.0 Introduction

1.1 Terms of reference

Joynes Pike & Associates have been appointed by Ben Bailey Homes Ltd., to provide a drainage feasibility study for the proposed residential development of the derelict Foundry Site, Wombwell, Barnsley.

1.2 Scope

The aim of this report is to undertake the following

- i. Undertake an assessment of the existing and anticipated foul and surface water discharges from the proposed development.
- ii. Assess the proximity of existing drainage points to which the proposed development may connect.
- iii. Undertake liaison with the Environment Agency and Local Sewerage Undertaker to establish approvals in principle to the proposed drainage philosophy for the site.
- iv. Produce preliminary drainage layout proposals and provide guidance as to the nature of any pumping, attenuation or off site network improvements likely to facilitate the drainage philosophy of the site.

1.3 In assessing the drainage feasibility of the site, a consideration of existing conditions and constraints against its proposed redevelopment as a residential scheme is undertaken to aid in the identification of abnormal costs that could be associated with the proposed development, over and above a simple unrestricted gravity discharge to outfalls adjacent to the site boundary.

Although these costs are identified and expressed as "abnormal" it has become current practice, with the tightening of Development Control and the adoption of Sustainable Urban Drainage Systems, to expect some form of attenuation on development outfall rates.

The following drawings and documents have been referred to in the compilation of this report:

- Web Site: Floodplain Data Maps: Environment Agency: 2003
- Document: Sewers For Adoption 5th: WRC: 2001
- Document: C522/523: Sustainable Urban Drainage Systems: CIRIA: 2000
- Document: Part H: Building Regulations 2000: DETR: 2002

1.4 The Site

The site is located off Hough Lane to the North of Wombwell Town Centre, Nr Barnsley and is bounded by Hough Lane residential and commercial development to the north, the existing railway line to the southwest and open grounds. The site

area is approximately 5.0 Ha and is currently occupied by the derelict buildings and hardstanding areas associated with the sites former use.

1.5 Site Observations

The site slopes to the south east and varies in altitude from 72.5-82.0m approximately. A culverted watercourse outfall was observed at the south east boundary of the site. The outfall was submerged at the time of site visit.

A number of manholes were lifted on site and these appeared to demonstrate the surface water from the site draining toward the existing culverted watercourse, which passes through the site. An historic survey plan of the site drainage also confirms this view.

1.6 Off Site Observations

Downstream of the watercourse outfall was very boggy with evidence of contamination possibly from the site run off.

1.7 Sewer Records

The sewer records show there to be a number of combined sewers crossing the site.

The existing combined sewer is to be maintained through the site, however it will require diverting (under S185 of the Water Industry Act) through the site to achieve the desired planning layout. The foul drainage from the proposed site may discharge freely to the combined sewer.

The combined sewer is up to 6m deep in places on the site. It would be necessary to upsize and slacken the gradient of the diverted sewer to reduce the depth of excavation for the diverted route. Both the discharge and diversion of the combined sewer have been verbally agreed with Yorkshire Water.

1.8 Culverted watercourse

A culverted watercourse is known to cross the site, its exact location size and condition is yet to be confirmed. However as part of the development it will be necessary to divert this watercourse to achieve the desired planning layout. There will be a requirement to provide an easement to this culverted watercourse of approx 4m from each side of the culvert. This may be relaxed subject to agreement with the EA.

The submerged outfall may require replacing as part of the development. If the condition of the outfall is inadequate, or the issues that cause the outfall to become submerged cannot be addressed, there may be a need to construct new outfall structure at a higher level than existing.

2.0 Surface Water Drainage.

2.1 The site currently comprises of predominantly hardstanding and roofed areas, accounting for approx 75% of the total site area. The remainder of the site is a former landfill site, which has now been capped and landscaped. The nature of capping to landfill means that groundwater recharge is generally limited, and for the purposes of this report is assumed to act as 100% impermeable.

2.2 The effectiveness of the existing storm drainage was not known, however based on the on site observations and historic plans, the site appears to drain freely to the watercourse.

2.3 The proposed development will reduce the impermeable area provision to approx 50% with gardens etc offering an improvement over the existing situation.

2.4 Surface Water Drainage Options

2.4.1 Connection to public Sewers

The combined sewer passing along the north east boundary of the site is unlikely to have spare capacity for an unrestricted discharge from the site. Yorkshire Water state that no connection from the site will be accepted to this combined sewer.

2.4.2 Outfall to the River / watercourse

The site could connect to the existing culverted watercourse subject to approval from the Environment Agency and the Local Land Drainage Authority. If the condition of the existing outfall was inadequate, then a new outfall could be constructed in its place. The Environment Agency's development control office for this area stated that although attenuation would be preferred, the fact that we are significantly reducing the impermeable area draining to the watercourse, attenuation may not be required. Barnsley MBC confirmed this view, stating that provided that 25-50% reduction was made, then they would raise no objection.

An outfall to the existing culverted watercourse should be acceptable, subject to capacity, route and condition surveys of both the culvert and the outfall.

2.4.3 Soakaways and SUDS

In accordance with Environment Agency guidelines, the Building Regulations, and Severn Trent Water advice, the preferred means of surface water drainage for any new development is to a suitable soakaway or infiltration drainage system. If this proves unviable, then discharge to a watercourse. As a last option, the connection to a sewer is recommended if available.

Sustainable urban drainage systems can reduce the impact of urbanisation on watercourse flows, ensure the protection and enhancement of water quality, and encourage recharge of groundwater in a manner which mimics nature.

Due to the contaminated nature of the site substrata and the need for a 750mm capping layer to facilitate the development, it is not recommended that soakaways would be suitable at this site.

The use of porous pavings for driveways and areas of hardstanding should be considered, as these aid infiltration of run off to ground water in a manner which mimics nature. These can prove particularly effective in areas of low infiltration rates where soakaways would typically be uneconomical or require large areas of land if used in isolation.

2.5 Attenuation of flows

Based on the discussions with the EA and BMBC, attenuation would not be required at this site due to the reduction in impermeable areas provided due to the nature of the proposed development. This is subject to the condition and capacity of the culverted watercourse. If the capacity is insufficient for a free discharge to the watercourse there are two options:

1. Attenuate the discharge to the capacity of the outgoing culverted watercourse at the connection from the development site. The volume of required attenuation is not expected to be significant greater than the designed sewers shown on the Preliminary engineering Layout. or
2. Construct a new outfall to the watercourse of adequate size. This would require EA Land Drainage Consent.

3.0 Foul Water Drainage

3.1 The foul water emanating from the site may discharge freely to the combined sewer, and Yorkshire Water have confirmed this in writing.

The provision of adoptable sewers within the site should not present any constraints in terms of the housing layout, provided some thought into the road layout is made with a view to containing public sewers beneath the highway. Should this be unattainable, easements will have to be provided to accommodate the sewers.

3.3 Foul Drainage Options

3.3.1 Gravity Connection to Public Sewers.

The diverted combined sewer shall receive all foul connections from the proposed development.

3.3.2 Pumped Connection to Public Sewers

Pumping is not considered necessary for this site.

4.0 Conclusions and Recommendations.

4.1 Surface Water Drainage.

The surface water drainage from this development should drain to the existing culverted watercourse, without attenuation, subject to confirmation of the CCTV survey.

4.2 Foul Water Drainage.

The foul water drainage from this site should drain freely to the public combined sewer diverted through the site.

4.3 Disclaimer

The information in this report has been prepared following consultation with third party consultees, and receipt of third party information. In some instances, due to the time scales involved, this has only been verbal information.

The receipt of such information is based upon limited information supplied to those bodies by the client.

The developer is advised that such information and opinions received from third parties are likely to be subjective to the individuals concerned, and may not necessarily represent the opinions of the bodies themselves. As such, said opinions may be subject to variation, clarification or expansion upon submission of more detailed proposals from the developer.

All opinions expressed are based upon current design standards in force at the date of this report. These standards may be subject to change with the passage of time.

The opinions expressed herein are intended to provide general guidance as to how a problem related to a particular development might be resolved. Given the paucity of the original information, and the often indirect nature of information received, they should not be relied upon as absolute or definitive guidance as to any particular solution. Such conclusions can only sensibly be arrived at upon detailed design.

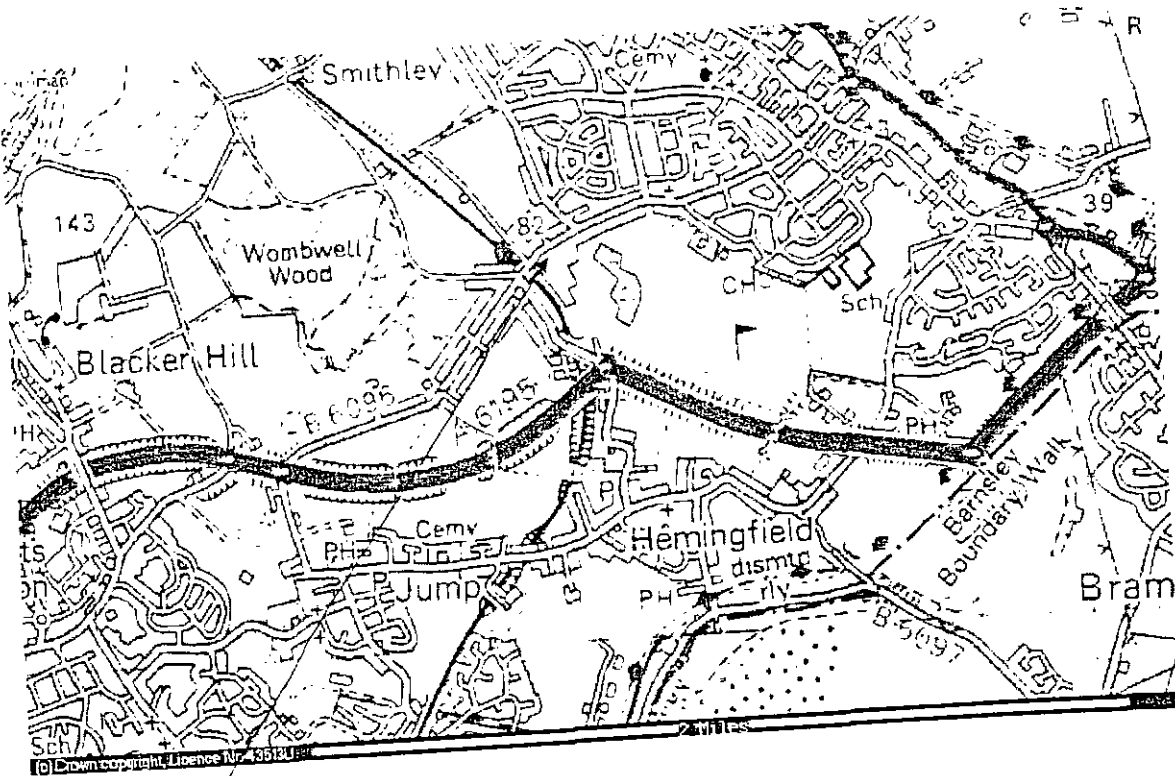
As a consequence of the above, Joynes Pike and Associates will not be held liable for any consequential losses, howsoever caused, as a consequence of inaccurate missing, incomplete, or erroneous data contained in this report, nor any data capable of being subject to variable interpretation by means of its generalised nature.

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Figure Site Location



Site Location