

Technical Note

Project: Doles Crescent, Royston, Barnsley

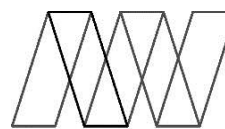
Client: NPS Group

Date: 01.12.2017

Reference: 40234_TEN03

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1. Introduction

A residential development comprising the construction of a single property on a brownfield site has been proposed off Doles Crescent, Royston, Yorkshire. Alan Wood & Partners have been commissioned to provide a drainage statement by way of a technical note to consider the drainage elements for the proposals.

2. Sources of Information

The information collected to assess the existing and proposed drainage is derived from a number of sources, which are summarised below:

- General mapping of the site and wider vicinity, from free issue sources
- Topographic survey
- Yorkshire Water Services (YWS) PPE Response (ref: T017873)
- Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment (ref: 23-24-18-1-6007/DSR1)
- NPS Group proposed development details

3. Existing Site Assessment

The proposed development is situated to the west of Doles Crescent to the west of Royston. The total site is approximately 414m² in area. The existing site is shown to have a relatively smooth surface, with a shallow fall from west to east. At the high point to the north, ground levels are up to 68.75m AOD with the low point towards the south east at a level of 67.97m AOD.

The site is an existing garaged area with a large portion of the site asphalted for access. Figure 1 below identifies the site and location. There is no evidence that the existing structures on the site have positive drainage.



Figure 1 Former Site Layout

3.1 Site Geology

A review of the British Geological Survey (BGS) information shows no recorded superficial deposits with a boundary between Sandstone (Mexborough Rock) and Mudstone (Pennine Middle Coal Measures) sat on bedrock as shown in Figure 2 below.



Figure 2 British Geological Survey Geology Map

Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment Report (Ref: 23-24-18-1-6007/DSR1) identified the site to contain firm or stiff clays derived from weathering of the mudstone bedrock with Coal Measures bedrock at Shallow depth.

3.2 Soakaway Testing

There has been no soakaway testing undertaken as part of the initial development. This testing will be required to confirm to Yorkshire Water that this is not a viable option.

Given the known ground conditions it is unlikely that soakaways will prove to be a viable option.

3.3 Existing Site Run Off

The development site is shown to be brownfield development land with garages and asphalt hardstanding area; therefore the greenfield run off rate for the site will be relatively low.

The development proposes to reduce the overall impermeable area within the site from an existing area of 263m², down to a proposed area of 101m².

The runoff rate can be estimated by using BS EN 752 Part 4: 1998 '11.3.2 Methods of Calculating Runoff from Small Development Schemes', which is an applicable method for sites up to 200ha in area and is based on the following formula:

$$Q = \Psi i A$$

where:

Q = Peak Runoff Rate (l/s)

Ψ = Permeability factor (1 being wholly impermeable)

i = Rainfall Intensity (l/s.ha) = 140l/s.ha for 1 in 30 year storm,
210l/s.ha for a 1 in 100 year storm

A = Area (ha)

Based on the known impermeable area, the existing run off from site has been calculated and summarised in Table 1 below.

Site Impermeable Area (m ²)	M30 Runoff Rate (l/s)	M100 Runoff Rate (l/s)
263	3.68	5.52
30% Betterment Rate	2.58	3.86

Table 1 Existing Site Run-off Rates

Given the low brownfield discharge rate, it is assumed that a discharge is restricted to 3l/s as per the lowest recommended rate. The final agreed rate is subject to further discussion with Yorkshire Water.

3.4 Existing Site Drainage

Yorkshire Water sewer records indicate the presence of an existing 225mm diameter surface water sewer crossing the entrance to the Doles Crescent site. A 150mm diameter foul sewer is shown to be located within Doles Crescent outside of the site before heading further east within Royston. It is not anticipated that any diversionary works will be required for this development.

At this stage, no further surveys have been undertaken on the existing network to confirm its condition, it is recommended that a CCTV be undertaken prior to commencing any works. The exact location and depth of the existing drainage runs is approximated from the Yorkshire Water information received, but will be subject to further survey to confirm.

3.4.1 Existing Surface Water Drainage

The existing development comprises private garages and asphalted area, there is not anticipated to be any surface water drainage located within the site.

The proposed connection into the Yorkshire Water networks is assumed to be in an acceptable condition given the information available.

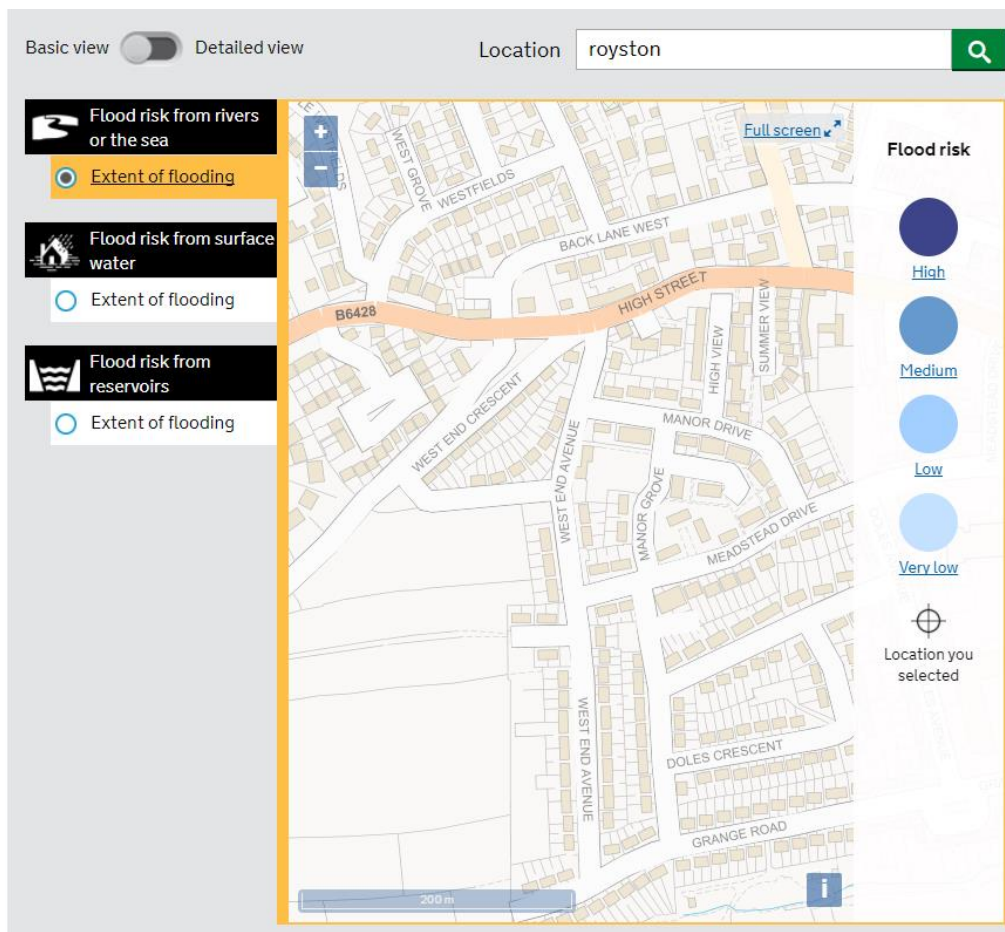


Figure 3 Environment Agency Long Term Flood Risk from Rivers and the Sea Map (August 2017)

3.4.2 Existing Foul Water Drainage

As mentioned in section 3.3 above, and existing adoptable surface water sewer is located crossing the entrance to the site to the east. As the current development comprises garaged units, it is not anticipated that any foul water drainage will be encountered within the site.

It is anticipated that the private foul drainage can be connected into the existing Yorkshire Water pipe within Doles Crescent.

3.5 Flood Risk

The area of proposed development is situated in in Flood Zone 1, indicating low risk of fluvial (river) flooding as indicated in Figure 3 above. Long term surface water flood risk maps produced by the Environment Agency indicate that there is a low risk of flooding crossing the site due to surface water flooding in the area surrounding the proposed development as indicated in Figure 4 below.

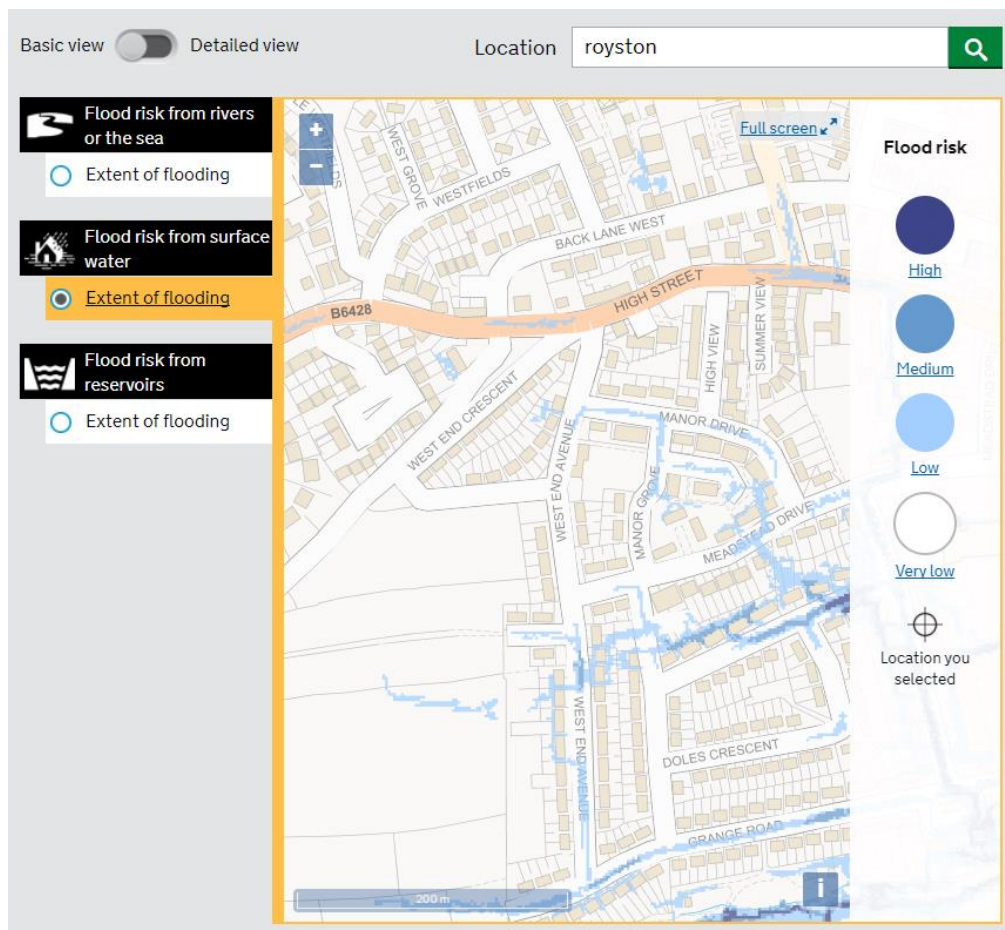


Figure 4 Environment Agency Long Term Surface Water Flood Risk Map (August 2017)

4. Proposed Development

The proposed development comprises the construction of a single property with off street parking and associated infrastructure. A new separate surface water and foul water drainage system is proposed in order to suitably drain the development. An indicative drainage layout is enclosed in Appendix A.

Information provided within the Yorkshire Water Pre-Planning Enquiry (ref:T017874) has identified that that an unrestricted foul water connection is acceptable.

The Pre-Planning Enquiry also highlights that the public surface water sewer network will accept discharge that matches the existing site discharge less a 30% reduction. A copy of the PPE response can be found in Appendix C.

4.1 Foul Drainage

A new foul water drainage system is required to serve the proposed property. Yorkshire Water have confirmed that foul water flows can discharge into the existing YWS foul water sewer network. It is proposed that foul water drainage waste should discharge to the 150mm diameter public combined sewer through a connection to the main within Doles Crescent to the east of the site.

Based on Sewers for Adoption 7 guidance of 4000 litres/dwelling/day, average foul water flows from the site will be **0.05 l/s**, assuming a peak factor of 6, the resultant peak flow from the site would be **0.27 l/s**.

4.2 Surface Water

In accordance with UK Building Regulations H3 SUDS guidance, the method of discharge of surface water from the site has been considered in the order of preference:

- Discharge to the Ground
- Discharge to a Watercourse
- Discharge to a Public Sewer

Hamson Barron Smith Preliminary Land Contamination and Geotechnical Risk Assessment (Ref: 23-24-18-1-6007/DSR1) shows the site to grey mudstone, siltstone, pale grey sandstone overlaying bedrock. At this stage no soakaway testing has been completed but this will be required to confirm viability to Yorkshire Water.

Infiltration testing has been completed within the site and indicates that soakaways are not a viable option for the site.

No watercourses are shown to bound the proposed site with the closest being approximately 300m to the south of the site with the only access being crossing / beneath adoptable roads and through private gardens. On this basis, discharge to a watercourse is a largely unviable option.

Therefore the development will require connection into the Yorkshire Water network which, pending receipt of confirmation above, is anticipated to be accepted.

For either of the above options, flow restriction from the site will be required by means of a flow control manhole (Hydrobrake or similar approved). The volume of storage required will be dictated by Land Drainage Authority / Internal Drainage Boards / Yorkshire Water.

Further liaison is required with Yorkshire Water to confirm the final discharge from the site. Due to the nature of this development and sites elsewhere in Royston (refer to: Meadstead Avenue – 40234 – TEN01, Manor Grove – 40234 – TEN02 and West End – 40234 – TEN 04). Further liaison is required to confirm an overall discharge philosophy within Royston in order to achieve an amicable solution for all the developments.

5. Conclusion and Recommendations

Existing Environment Agency flood maps indicate that the proposed development site lies within Flood Zone 1. Long term surface water flood risk maps indicate that the development is at a low risk of surface water flooding from outside the development site. Based on the above information, the risk of flooding to the development is believed to be low and acceptable.

Based on the drainage assessment undertaken, it is assumed that there is a current foul water drainage system the other side of Doles Crescent from the development which can be utilised for a connection.

The surface water drainage is anticipated to connect into the drainage run across the entrance to the site.

Confirmation of the infiltration rate is to be provided and discharge to a watercourse, due to the distance is a largely non-viable solution.

Appendix Summary:

Appendix A

Indicative Drainage Layout

Appendix B

WinDES Storage Calculations

Appendix C

Yorkshire Water PPE Response

Appendix D

Robson Liddle Ground investigation Extract

Appendix E

CCTV Survey Drawing