



FLOOD RISK ASSESSMENT

of

**Park Avenue
Royston
Barnsley
HD5 8EU**

for

**D Noble Limited
Noble House
Perseverance Street
Castleford
WF10 1LD**

June 2016

1. INTRODUCTION

- 1.1 This report is commissioned to investigate and report on the Flood Risk for this site in accordance NPPF 2012 and the proposals for drainage of this site when redeveloped as residential land. The report is based on information supplied by the client and from relevant authorities in both written and verbal format. Some of this information is in verbal form only. No liability can be accepted for information supplied by third parties which is subsequently found to be inaccurate or incorrect.

2. THE SITE

- 2.1 The site is located to the East of Park Avenue and South of Royston Park in Royston, Barnsley and is situated around 436609,411330 Ordnance Survey grid reference SE366113. A site location plan is shown on Figure 1 in Appendix A.
- 2.2 The site is square in nature, and located in a primarily residential area. The South edge abuts Plantation Avenue, To the West is Vicarage Lane, To the North is Royston Park and to the East is Park Avenue. The overall area of the site is approximately 0.88 acres.
- 2.3 The site itself is flat and undeveloped land.

3. EXISTING DRAINAGE

- 3.1 The nearest Public sewers are located in Park Avenue with a Culvert running just to the North of the site. Negotiations will begin into requisitioning a sewer connection through the site entrance to Park Avenue and to the North of the site to the Culvert.
- 3.2 Yorkshire Water are likely to report that there is no capacity for surface water discharges from the site in the existing public sewerage system which is usually the case. The lack of a suitable watercourse or the limited use of infiltration methods may however prompt a further negotiation with Yorkshire Water on this item. The current requirement from Land Drainage Authority in this area would be to limit the site discharges to agricultural levels if infiltration systems are not used.
- 3.3 They have not reported any capacity problems for foul water flows into the systems but records are far from accurate or complete. They may need to prepare a report into the capacity of the existing foul sewers running adjacent and through the site.
- 3.4 The ground investigation on the site has shown the site to be underlain by mudstones, siltstones and shales which can be expected to have weathered to silty clays. This is unsuitable for filtration methods therefore in accordance with Yorkshire Water requirements they would wish the developer to follow the hierarchy of the requirements of H3 of the Building Regulations 2010. The preferred hierarchy being soakaways, infiltration systems and watercourses or main sewers in that priority order. Before any limited discharge was allowed, they will require proof that infiltration systems are not suitable for the whole of this site. Whilst initial investigation suggest that soakaways will not be effective,

4. PROPOSED DEVELOPMENT

- 4.1 The proposed development is for residential development which does have a preliminary master plan. It is envisaged the whole development could be developed with approximately 12 detached, semi-detached and terraced townhouses with associated roads and car parking areas.

5. PROPOSED SURFACE WATER DRAINAGE

- 5.1 It is proposed that surface water discharge should be managed by the use of surface water storage systems. The site currently only has limited existing impermeable areas relating to roof or hard paved areas and so the site would have to be designed to achieve agricultural discharge rates. These would be around the 2.5 to 5 lit/sec/ha. Further discussions with Yorkshire Water, Barnsley MDC Land Drainage Department, and the Environment Agency will be necessary to agree discharge rates. The estimated discharges from the site would probably result in a maximum allowable discharge of approx. 14.12 lit for the whole site. This would be pro-rata to 5 lit/sec/ha.
- 5.2 The preferred hierarch for new developments is to provide a method of sustainable drainage where possible. Preliminary site investigations suggest that the site is underlain by clay deposits.
- 5.3 If the use of infiltration techniques in this area is not recommended. The flows from the site would therefore have to be attenuated to agricultural rates. The flows will be controlled by a hydraulic flow device such as a Hydrobrake or similar. This would mean that storm water storage would have to be provided on site. Prior to this however a point of discharge to a surface water sewer or foul/combined sewer or the adjacent open watercourse would have to be agreed with a right to discharge in perpetuity granted. This may entail making agreements with third parties and riparian owners. The EA may also need to approve any such discharge rate and water quality.
- 5.4 Due to the small nature of the site and the land uptake required it is proposed to provide storage in oversize pipes and or a storage facility under the public Highway. These will be designed to cater for storms up to and including the 100 year storm with due allowances for climate change. In accordance with NPPF this would mean an extra 30% based on the site usage and possible duration of development. Details design will be submitted to discharge conditions. The levels of the outfall discharge points to the surface water sewers.
- 5.5 The flows from the site would have to be controlled to achieve agricultural discharge rates and maintain the status quo of the current drainage systems. The drainage systems proposed would be sustainable but may have a significant land uptake. The risks to offsite systems downstream are not increased due to this attenuation system. The use of infiltration techniques where possible is also in keeping with current development criteria.
- 5.6 The size of the storm water storage facilities would need to be determined accurately in the final designs.
- 5.7 If on-site balancing is to be utilised then the risk to downstream properties would be negligible in relation to flood water flows in the downstream catchment.
- 5.8 If the measures outlined above are implemented we would consider that the site can be developed in accordance with current Water Authority and Land Drainage Authority requirements. The systems can also be adopted as part of the Public Sewer systems.

6. FLOOD RISK

- 6.1 The site currently falls within flood zone 1 as shown on the Environment Agency websites. The development is classified as more vulnerable in Table 2 of the Technical Guidance to the National Planning Policy Framework March 2012 and Table 3 of that document also states that the proposed residential development is appropriate.
- 6.2 There are a number of potential flooding mechanisms that NPPF now require are evaluated for each proposed development site. Each method of flooding requires an assessment to be made on its probability relative to the site development. The normal requirement of the document is for no flooding of properties for storms up to a 1% probability or a once in a 100 years storm. The Risk Assessment also includes for flooding both on site and off site, and the effects of the development on the downstream catchment or the flow regime of the watercourse. NPPF also requires that the effects of severe storms above the normal 1% probability are reviewed together with the effects of climate change relating to the design life of the development.
- 6.3 It also requires that the effects of climate change are taken into account together with the impacts of extreme events and flood defence failures. Prior to this the Sequential Test outlined in NPPF, must also be applied to each development site.
- 6.4 Based on the published Environment Agency Flood Risk Maps the site does not fall within the 0.1% Flood Risk. The site therefore falls within the low probability Zone 1. The proposed residential development falls within the More Vulnerable Classification in Table 02 Technical Guidance to NPPF. The Sequential Test is therefore considered passed and development is considered appropriate in accordance with Table 3 Technical Guidance to NPPF. NPPF requires that each flooding mechanism is addressed and levels of risk evaluated. We consider there are three main risks of flooding to the site the alternative mechanisms are not applicable to this site.
- 6.4.1 Inundation from floodwaters leaving watercourses or rivers entering the site. This can include the effects on culverted watercourses and where the risk of blockage can occur and from breach scenarios.
- 6.4.2 Rainwater falling on the site and not being able to leave the site at sufficient rate to prevent flooding on the site.
- 6.4.3 Overland flows from adjacent land sites due to surcharging of sewerage systems or other watercourse.
- 6.4.4 The impact of the developed site on the existing drainage systems and off-site surface water systems must also be assessed as part of this Flood Risk Assessment.

6.5 DISCUSSION OF FLOOD RISKS

- 6.5.1 Flood Rise from Watercourses, River and Tidal.
- 6.5.2 The site appears not to fall within the 1% probability Flood Risk Maps as published by the Environment Agency nor does it fall within the 0.1% Flood Risk Area. The site is therefore considered not at risk from fluvial flooding.
- 6.6.4 The site falls outside all recorded flood zones from fluvial sources. The risk of flooding from river or tidal water is therefore considered acceptable for the type of development.

6.7 RISK OF FLOODING FROM OVERLAND FLOWS FROM ADJACENT LAND

- 6.7.1 The site flat with open fields to the North and residential development on the East, West and south that is on the same level as the site.
- 6.7.2 The surrounding areas to the site is all served by adopted drainage systems and as such the level of risk of flooding from surcharged sewers is considered to be less than 1%.

6.8 RISK OF FLOODING FROM RAINWATER FALLING ON SITE

- 6.8.1 The risk of flooding from water falling on site and not being able to leave is considered to be low.
- 6.8.2 Storms in excess of this risk and allowances made for climatic change can be managed by the use of storm water storage systems. The design of these systems would be dependent on the permeability of the site and we cannot comment on these until that information is known. Suffice that the design can be detailed to cater for storm up to the 100 year return period with an allowance made for climatic change. This would currently suggest a 30% increase in flood water storage volume requirements. This proposal is covered earlier in the report. With this system in place the flows from the site are acceptable in relation to flood water flows in the downstream watercourse.
- 6.8.3 If the underlying ground is not suitable for percolation then the system should be made to connect to the existing combined/surface water system serving the adjacent developments. The discharge from this system would be limited to existing agricultural discharge rates. If the Discharge is limited to this level then it will be necessary to provide underground storm water attenuation tanks on site. The storage system should be designed to cater for a 30 or 100 year storm and additional storage to cater for climatic change could be catered for above ground in designated flood areas such as car parks or shallow swales or public open spaces.
- 6.8.4 The storage volumes can be provided by the use of oversized pipes or underground attenuation tank as discussed earlier in this report. The flows would have to be controlled by a 'Hydrobrake' or similar low maintenance flow control device. If these are provided the risk of onsite flooding from rainfall would be effectively controlled to acceptable levels.
- 6.8.5 The effects of the development on adjacent land should also be considered as part of this Risk Assessment.
- 6.8.6 We therefore consider the effects on flood risk to adjacent properties are not significantly affected by the proposed development.

7.0 CONCLUSIONS

- 7.1 In our opinion the site is not at risk of flooding from river or tidal water up to a 1% return period nor is it at risk for storms in excess of the 0.1% risk level.
- 7.2 The development of the site with the use of soakaways will not create problems on the downstream watercourses or drainage catchment.
- 7.3 The use of infiltration systems to serve the development is thought to be partially applicable based on knowledge of the ground conditions in this area. Further site investigations should be carried out to assess their suitability for this site. If soakaways are not feasible then attenuation of surface water flows to agreed rates will be required.

- 7.4 It would then be necessary to provide storm water attenuation tanks on site which may need ground raising or pumping stations to allow discharge from the site. Discharges would have to be limited to agricultural rates of discharge to ensure flood risks downstream are not increased.
- 7.5 If the measures outlined above are implemented we would consider that the requirements of NPPF can be satisfied.

See Appendices:

Appendix A	Location Plan & Aerial Views
Appendix B	Environment Agency Flood Risk Maps
Appendix C	Yorkshire Water Drainage Records

APPENDIX B

ENVIRONMENT AGENCY FLOOD RISK MAPS

[Go](#) Risk of Flooding from Rivers and Sea [View other Interactive Maps](#)

Risk of Flooding from Rivers and Sea

River flooding happens when a river cannot cope with the amount of water draining into it from the surrounding land. Sea flooding happens when there are high tides and stormy conditions.

The shading on the map shows the risk of flooding from rivers and the sea in this particular area.

Click on the map for a more detailed explanation.

Map of Royston, Barnsley at scale 1:15,000

[Data search](#)



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APPENDIX C

ENVIRONMENT AGENCY FLOOD RISK MAPS

Risk of Flooding from Surface Water

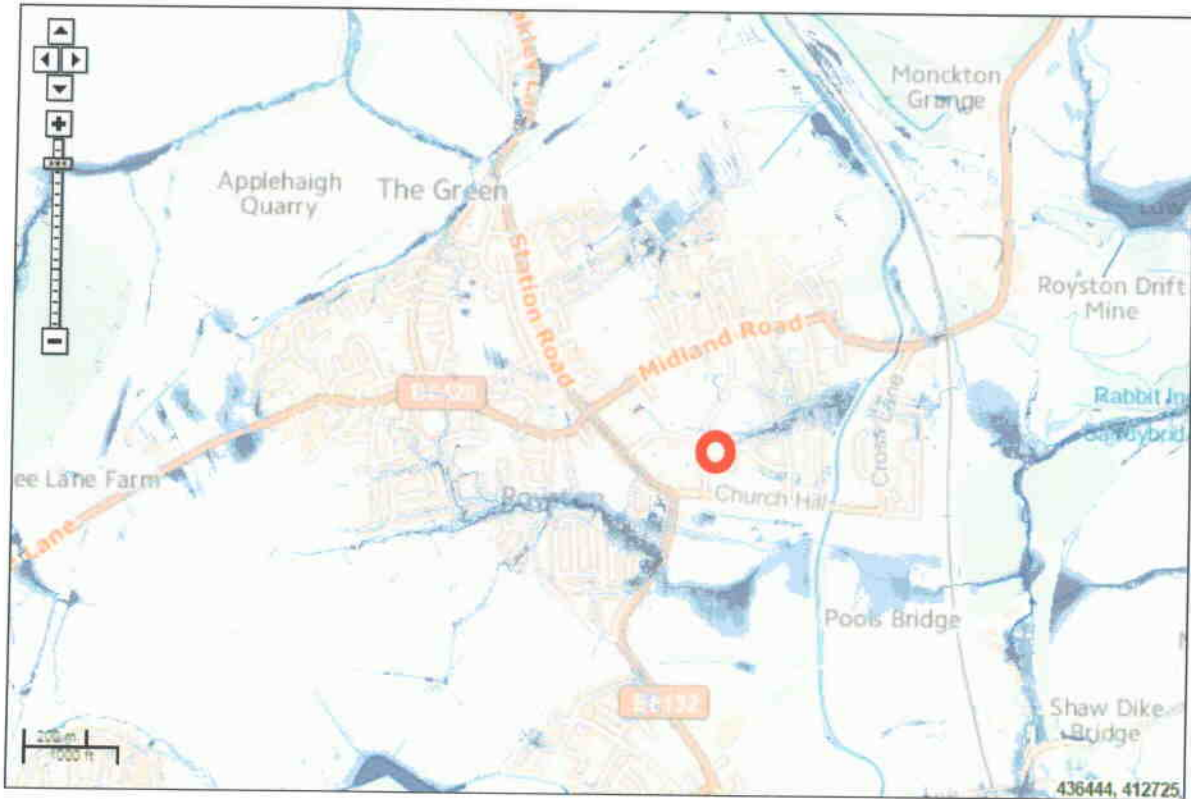
Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the risk of flooding from surface water in this particular area.

Click on the map for a more detailed explanation.

Map of X: 436,234; Y: 411,489 at scale 1:15,000

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APPENDIX B

ENVIRONMENT AGENCY FLOOD RISK MAPS

Risk of Flooding from Reservoirs

Reservoir flooding is extremely unlikely to happen.

The shading on the map shows the area that could be flooded if a large reservoir were to fail and release the water it holds. A large reservoir is one that holds over 25,000 cubic metres of water, equivalent to approximately 10 Olympic sized swimming pools. Since this is a worst case scenario, it's unlikely that any actual flood would be this large.

Click on the shading to see details of reservoirs that could cause flooding in this area.

Map of X: 436,234; Y: 411,489 at scale 1:15,000

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ENVIRONMENT AGENCY FLOOD RISK MAPS

Go Flood Map for Planning (Rivers and Sea)

X: 436,231;Y: 411,232 at scale 1:10,000

Other maps Data search Text only version



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APPENDIX C
YORKSHIRE WATER DRAINAGE RECORDS

