

High Street, Royston
Flood Risk Assessment
For
Aldi Stores Ltd

Report ref	Issue	Prepared by	Date	Reviewed by	Date
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1. Introduction

1.1. This report is commissioned by Aldi Stores Ltd to examine the flood risk associated with the re-development of land off High Street, Royston. This risk assessment is required by and in accordance with the National Planning Policy Framework (NPPF) which has now superseded Planning Policy Statement 25, Development and Flood Risk. This report is based upon information taken from the Environment Agencies indicative online flood map, the topographical survey and a site visit.

1.2. The development site is approximately 1.03ha and presently unoccupied following the demolition of a factory building with rough demolition rubble remaining and several concrete slabs. It is proposed for the site to be developed in two parts. The larger northern portion of the site will be redeveloped to provide an Aldi foodstore with associated car parking, servicing and access. The smaller southern portion of the site will be reserved for a future residential development.

1.3. Section 2.00 of this report describes the site location, and topography. Section 3.00 identifies the existing watercourses, drainage and flood risk to the site from all sources. Section 4.00 identifies the surface water run-off and Section 5.00 provides conclusions and recommendations.

2. Site Location, Proposed Development and Topography

2.1 The site location is shown in **Appendix A** with the proposed development layout shown in **Appendix B**. The topographical survey is shown in **Appendix C**. The site, centred on National Grid Reference 453890, 411370, is located immediately south of High Street, Royston approximately 300m west of the village centre.

2.2 The site is presently unoccupied following the demolition of a factory building with rough demolition rubble remaining and several concrete slabs. The north eastern part of the site is heavily overgrown with bushes. The site falls steeply from the northwest to the southeast.

2.2 It is proposed for the site to be developed in two parts. The larger northern portion of the site will be redeveloped to provide an Aldi foodstore with associated car parking, servicing and access. The smaller southern portion of the site will be reserved for a future residential development. Access to the development is proposed from an upgraded access onto High Street.

2.3 The topographical survey produced by Ellam Land Surveys shows the site to fall steeply from the highest point in the northwest at a level of 74.6m AOD to the lowest point in the southeast at a level of 65.3m AOD. This 9.3m level difference represents an average fall of approximately 1 in 16. Abutting the southern boundary is an existing modular concrete retaining structure running the full length of the boundary within the rear gardens of the housing bounding the site. A buttressed masonry wall approximately 2.0m high also retains the south western portion of the site.

2.4 All heights specified on the topographical survey relate to the OSGB 36 datum and have been computed using the OSTN(02) Geoid model.

3. Existing Watercourses, Drainage and Flood Risk

3.1 The nearest watercourse is located approximately 200m to the south of the site and flows in an easterly direction. The Environment Agency indicative flood map is shown in **Appendix D**. The site is shown to be located entirely within Flood Zone 1 'Low Probability'. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1% AEP). The site is therefore not considered to be at risk of flooding from the watercourse.

3.2 As also shown in **Appendix D** the proposed development is not located within an Environment Agency flood warning zone.

3.3 At present no details are available on the adopted sewer systems that may be present adjacent to the site. It is anticipated that both surface and foul (or combined) sewers are present within the adjacent highway (High Street) to the north. A drainage connectivity survey has not been undertaken on the site but a site visit, together with an inspection of the topographical survey, suggests that the existing drainage is likely to have been excavated and/or filled as part of the site demolition works. No existing connectivity to a public sewer within the highway is expected.

3.4 The site may be at risk of pluvial flooding from these existing drainage systems adjacent to the site. It is likely that these floodwaters will remain within the carriageway channels and will be conveyed along High Street and away from the proposed development. It is therefore considered that the site is not at significant risk of pluvial flooding.

3.5 A further source of flooding is as a result of excess run-off from the development. It is important that the proposed ground levels are configured such that any flooding on site is directed away from the proposed building and towards the surface water storage facilities. It should also ensure that any overland flows resulting from excess run-off are retained on site within the development area and not permitted to discharge off site.

3.6 Given the above, it is recommended that finished floor levels should be set 150mm above the average site level to ensure any floodwaters are directed away from the proposed buildings and towards the attenuation facilities.

4. Surface Water Run Off

4.1 The current Building Regulations now requires disposal of new development surface water run off to discharge by infiltration (to ground), to watercourse or to sewer in that order of priority. Sustainable Urban Drainage Systems (SUDS) should also be used wherever possible to mimic as far as practicable the natural run off.

4.2 The Phase 1 Geo-Environmental Assessment produced by 3e Consulting Engineers indicates that infiltration methods may be considered suitable only if weathered sandstone is encountered. If mudstones are encountered then the likelihood of soakaways functioning is considered to be very low. Furthermore, given the excessive falls across the site and adjacent ground levels, disposal of surface water by infiltration methods may increase the risk of flooding by groundwater to properties to the south of the site. Further site investigations will determine if soakaways should be considered.

4.3 Further site investigation will also be required to determine the extents of any contamination. Soakaways will only be permitted in areas where no significant contamination is present. These systems must also be positioned at least 5 metres from any existing or proposed building and from the site boundary.

4.4 There are no watercourses within or adjacent to the site to which the surface water could outfall.

4.5 Should the additional site investigations prohibit the use of soakaways, surface water should then be discharged into the nearest public sewer. No records are available at present but it is assumed that both surface and foul water sewers are present within High Street to the north.

4.6 Due to the demolition of the existing buildings on site and the lack of any positive drainage systems remaining, a greenfield run-off rate is likely to be imposed on any off site discharge. The greenfield run-off rate should be calculated based on 5.0 l/sec/ha and a total site area of 1.03ha. However, it is likely that the foodstore development will be progressed independently from the residential development in the southern portion of the site. Should this be the case then each development should be designed with a 5.0l/sec run-off rate. Whilst this may exceed the existing greenfield run-off rate, the minimum restricted rate of 5.0l/sec should be used to reduce the risk of blockage within the system.

4.7 Flows from the proposed development should be restricted to this maximum discharge rate using a suitable flow control device. Surface water attenuation should be provided below ground to accommodate these flow rates.

4.8 At this stage no information is available on the location or depth of the existing sewer network. However, given levels across the site relative to the adjacent highway, both surface and foul water pumping stations are likely to be required.

4.9 In accordance with PPS25, Sustainable Urban Drainage (SUDS) techniques should be employed to:

- a) Reduce the peak surface water run-off from the site and hence reduce the risk of flooding both on site and downstream of the site and
- b) Increase the quality of any surface water discharged from the site.

4.10 All proposed surface water systems should be designed to accommodate a 1 in 30 year storm event without flooding. Furthermore, the 1 in 100 year plus climate change storm event should be retained on site in an area that will not affect any proposed buildings. A climate change uplift in accordance with the National Planning Policy Framework Technical Guidance, Table 5, should be applied to all rainfall estimates.

5. Conclusions & Recommendations

5.1 The site is shown to be located entirely within Flood Zone 1 'Low Probability'. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1% AEP). The site is therefore not considered to be at risk of flooding from the watercourse.

5.2 The site may be at risk of pluvial flooding from the existing drainage systems adjacent to the site. A further source of flooding is as a result of excess run-off from the development. It is important that the proposed ground levels are configured such that any flooding on site is directed away from the proposed building and towards the surface water storage facilities.

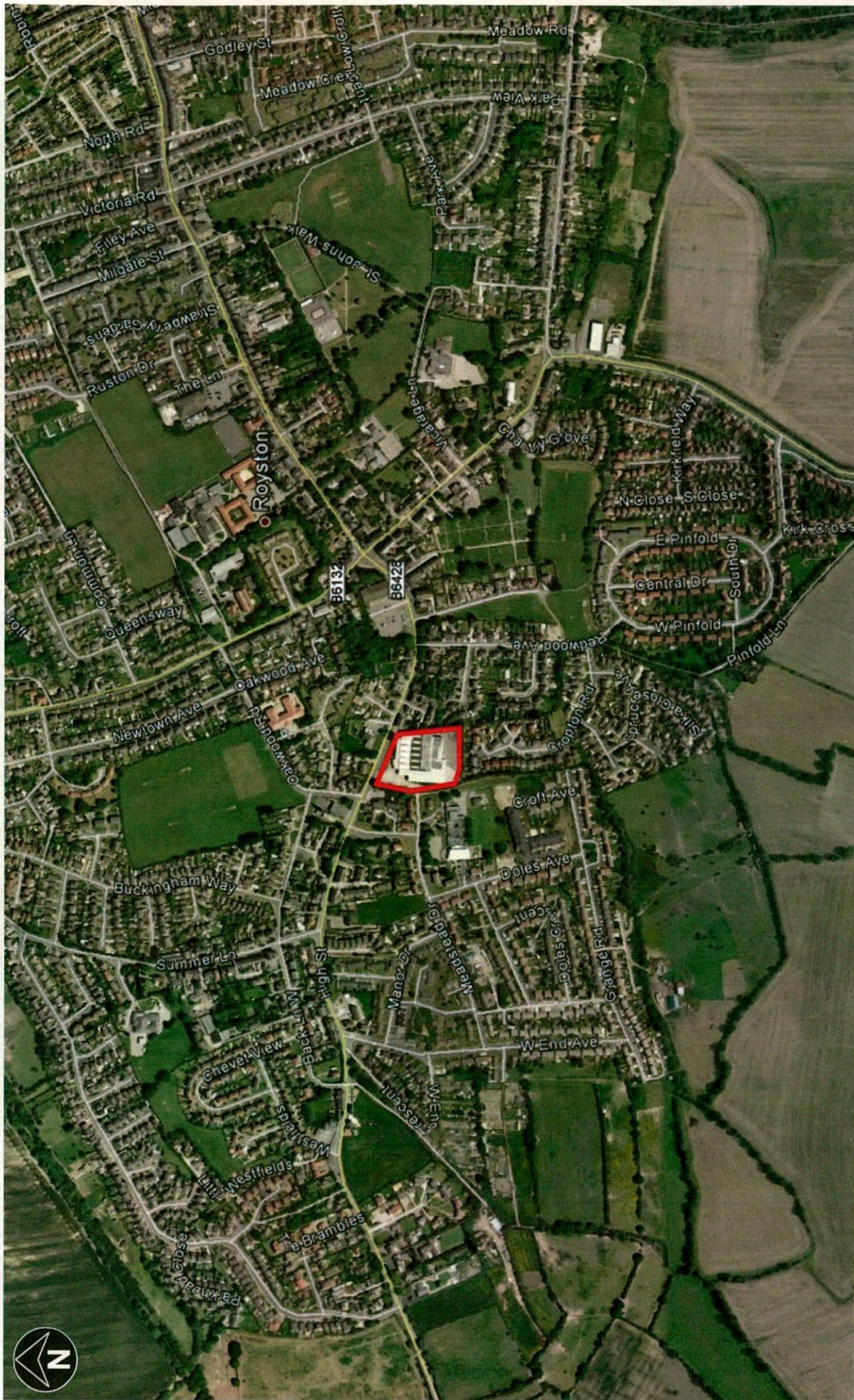
5.3 Given the above it is recommended that finished floor levels should be set 150mm above the average site level to ensure any floodwaters are directed away from the proposed buildings and towards the attenuation facilities.

5.4 The Phase 1 Geo-Environmental Assessment produced by 3e Consulting Engineers suggests that drainage via infiltration methods such as soakaways may be feasible. Further site investigations should be carried out to determine the type and depths of the existing strata across the site.

5.5 Should infiltration systems not be considered suitable, surface water flows should be directed to the existing Yorkshire Water sewer understood to be located within High Street. Due to the demolition of the existing buildings on site and the lack of any positive drainage systems remaining, a greenfield run-off rate is likely to be imposed. However, given the small nature of site, a minimum restricted rate of 5.0l/sec should be used to reduce the risk of blockage within the system.

5.6 Flows from the proposed development should be restricted to the agreed rate using a suitable flow control device. Surface water attenuation should be provided below ground to accommodate these flow rates.

5.7 At this stage no information is available on the location or depth of the existing sewer network. However, given levels across the site relative to the adjacent highway, both surface and foul water pumping stations are likely to be required.



Possible Development Site - High Street, Royston

Client: Aldi Stores Ltd
Date: 25/06/13
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Scale: NTS@ A4



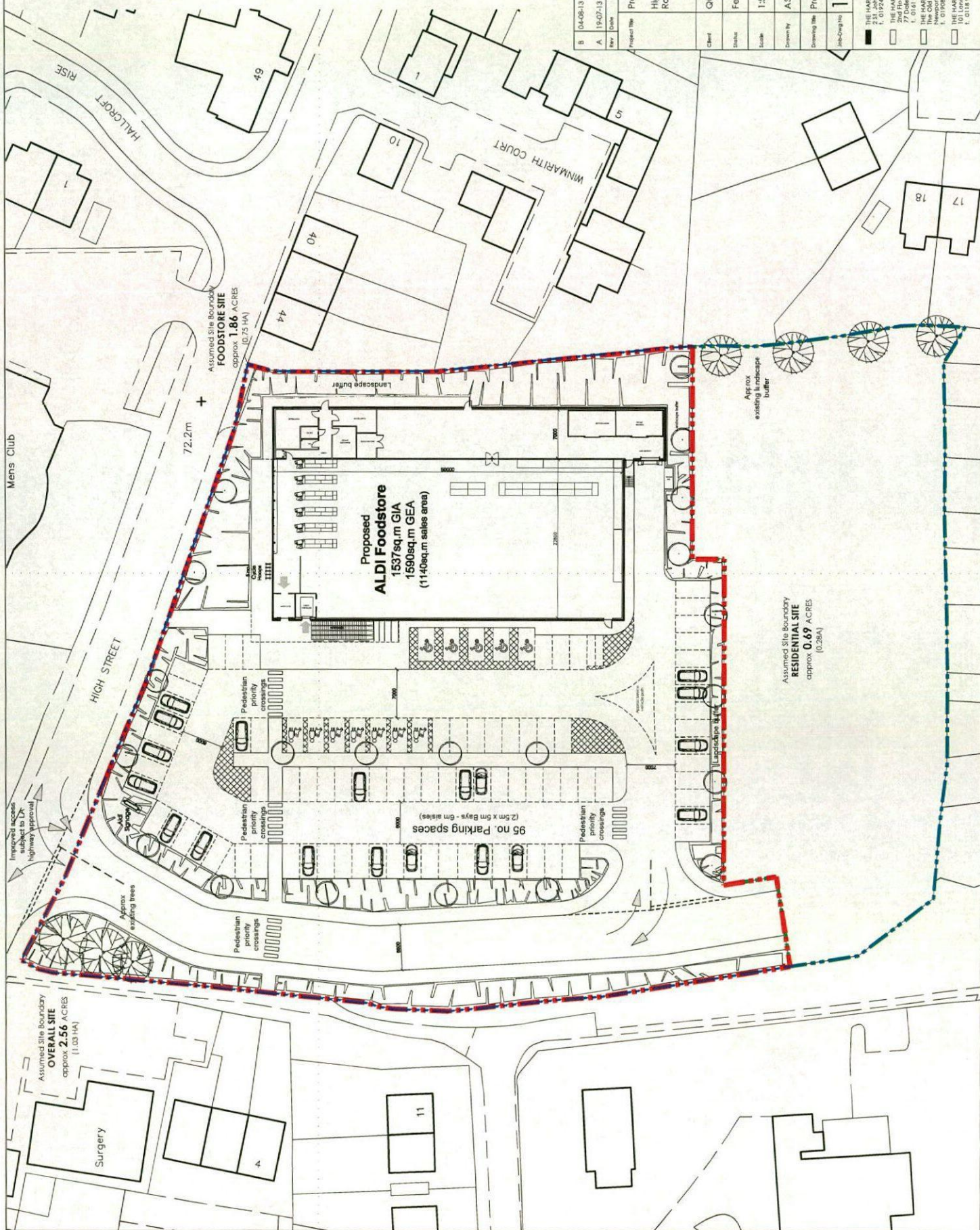
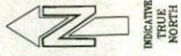


Possible Development Site - High Street, Royston

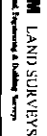
Client: Aldi Stores Ltd
Date: 25/06/13
Job/Dwg: 12791 - View Pack
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Site from Ordnance Survey and subject to full topographical survey/assumed site boundary.



Proposed Development			
High Street Royston			
B	04-08-13	Foodstore boundary amended to include access	NJC
A	14-02-13	Store sales area increased in size	NJC
Rev	Date	Description	Rev By
1	04-08-13	Final	CH-1
Proposed Site Plan			
12791-002			
B			
THE HARRIS PARTNERSHIP LIMITED 215, JAMES NORTH, WIMBORNE, DT9 3DA T: 01924 291 800 F: 01924 290 072			
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AND THE POLYMERIZATION WOULD PROCEED, POSSIBLY IN A CATALYTIC, SELF-ACCELERATING MANNER.

HIGH STREET, ROYSTON

MARK'S PARTNERSHIP

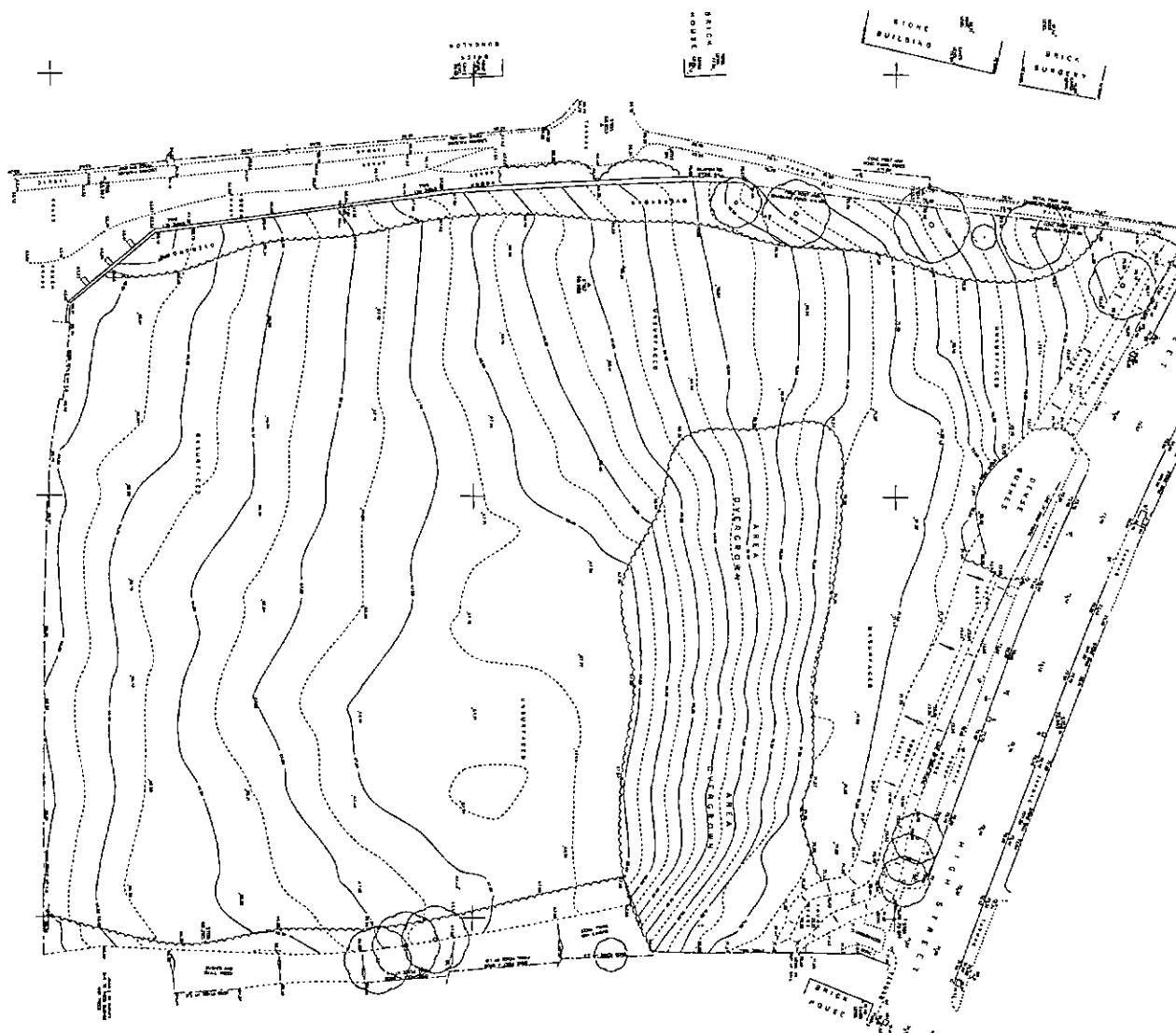
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ENVIRONMENT AGENCY INDICATIVE FLOOD MAP



ENVIRONMENT AGENCY FLOOD WARNING ZONES