Proposed Extension for ASOS Barnsley
Houghton Main
South Yorkshire

Flood Risk Assessment

For

Teal Houghton Main Sarl

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RPS HEALTH, SAFETY & ENVIRONMENT

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1. The following notes should be read in conjunction with the report:

2. This report contains only that available factual data for the site, which was obtained from the sources, described in the text. These data were related to the site on the basis of the location information made available to RPS by the client.

3. The assessment of the site is based on information supplied by the client. Relevant information was also obtained from other sources.

4. The report reflects both the information provided to RPS in documents made available for review and the results of observations and consultations by RPS staff.

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1 INTRODUCTION

2.1 RPS was commissioned by Teal Houghton Main Sarl to undertake a Flood Risk Assessment of a distribution centre in Barnsley in relation its proposed extension.

2.2 The aim of the Flood Risk Assessment is to outline the potential for the site to be impacted by flooding, the impacts of the proposed development on flooding in the vicinity of the site, and the proposed measures which could be incorporated into the development to mitigate the identified risk. The report has been produced in accordance with the guidance detailed in the National Planning Policy Framework (NPPF). Reference has also been made to the CIRIA SUDS manual (C697) and the Barnsley Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA).

2.3 This report has been produced in consultation with the Partnership and Strategic Overview Team at the Environment Agency. The site is located within The Dearne and Dove Internal Drainage Board (IDB) District.

2.4 This report is not intended to provide formal details of the final drainage design for the development. It provides information regarding the capabilities of the conceptual surface water drainage strategy to meet the requirements of the NPPF.

2.5 The desk study was undertaken by reference to information provided / published by the following bodies:

- Environment Agency
- Centre for Ecology and Hydrology
- British Geological Survey
- Ordnance Survey
- Yorkshire Water

2 PLANNING POLICY CONTEXT

Regional Planning Policy

2.1 The Yorkshire and Humber Plan - The Plan :Regional Spatial Strategy to 2026 (RSS) was adopted in May 2008. The RSS sets out the broad development strategy for the Region. It covers topics such as housing, economic development, transport, the environment and regeneration. The following policies relate to flood risk;

2.2 Policy ENV1:

Development and flood risk, states:

- *The Region will manage flood risk pro-actively by reducing the causes of flooding to existing and future development, especially in tidal areas, and avoid development in high flood risk areas where possible.*
- *Allocation of areas for development will follow a sequential approach and will be in the lowest risk sites appropriate for the development (identified by Strategic Flood Risk Assessments).*
- *Flood management will be required to:*
    1. *Facilitate development in the cities of Leeds, Bradford, Sheffield, Hull and York, coastal towns including Bridlington, Grimsby, Scarborough, and Whitby, inland urban areas including Doncaster, Goole, Halifax, Scunthorpe, Selby and Wakefield where there is little development land available outside high flood risk zones, and land on the south bank of the Humber, provided the sequential approach has been used to inform decisions regarding flood risk`.*
    2. *Protect parts of the strategic transport network, especially the Selby-Hull, Doncaster-York, and Doncaster- Immingham transport corridors.*
    3. *Provide flood storage, habitat creation and managed realignment in areas around the Humber, and other river corridors as required.*
    4. *Provide positive land management for flood alleviation, particularly in the upland areas of the Yorkshire Dales, the North York Moors, the Howardian Hills and the Pennines.*

2.3 Policy YH1:

Overall approach and key special priorities states:

- *Avoid increasing flood risk, and manage land and river catchments for flood mitigation, renewable energy generation, biodiversity enhancement and increase tree cover.*

2.4 Policy YH2:

Climate change and resource use states:

- *Plan for the successful adaptation to the predicted impacts of climate change by: Minimise threats from and impacts of coastal erosion, increased flood risk, increased storminess, habitat disturbance, increased pressure on water resources, supply and drainage systems.*

2.5 Policy YH8:

Green infrastructure states:

- *Identify the functional role of green infrastructure in supporting the provision of renewable energy, urban micro climate control, and flood risk management*

Local Planning Policy

2.6 The Barnsley Unitary Development Plan (UDP), originally prepared under the provisions of the Local Government Act 1985 and the Town and Country Planning Act 1990, and adopted in 2000 is currently in the process of being replaced by the Barnsley Local Development Framework (LDF). The following policies within the Barnsley Local Development Framework Core Strategy (adopted September 2011) relate to flood risk and drainage;

2.7 CSP 3 Sustainable Drainage Systems (SuDS)

All development will be expected to use Sustainable drainage systems (SuDS).

Only in exceptional circumstances, where it can be demonstrated that all types of SuDS are impractical, will other drainage management systems be permitted.

Planning applications must include an assessment to show that SuDS will work and be maintained. Measures should be taken to avoid water contamination and safeguard groundwater supply.

Developers will be required to contribute to the maintenance of SuDS.

2.8 CSP 4 Flood Risk

The extent and impact of flooding will be reduced by:

- *not permitting new development where it would be at an unacceptable risk of flooding or would give rise to flooding elsewhere*
- *requiring developers with proposals in Flood Zones 2 and 3 to provide evidence of the sequential test and exception test where appropriate*
- *requiring site-specific Flood Risk Assessments (FRAs) for proposals over 1 hectare in Flood Zone 1 and all proposals in Flood Zones 2 and 3*
- *expecting proposals over 1000 m2 floor space or 0.4 hectares in Flood Zone 1 to demonstrate how the proposal will make a positive contribution to reducing or managing flood risk*
- *expecting all development proposals on brownfield sites to reduce surface water run-off by at least 30% and development on greenfield sites to maintain or reduce existing run-off rates*
- *requiring development proposals to use Sustainable Drainage Systems (SuDS) in accordance with policy CSP 3*
- *not culverting or building over watercourses and encouraging the removal of existing culverts wherever practicable; and*
- *using flood resilient design in areas of high flood risk.*

2.9 The Barnsley Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA) identifies and maps flood risk from all sources at a borough-wide scale as well as providing guidance on producing site specific FRAs. Relevant information from the SFRA has been reproduced throughout this Flood Risk Assessment report.

3 CONSULTATION

3.1 This Flood Risk Assessment has been produced in consultation with the Partnership and Strategic Overview Team at the Environment Agency (Gary Cliffe, 16th August 2012). The Environment Agency have advised that the balancing pond on the site would need to be able to accommodate the additional volume of surface water generated from the newly impermeable surfaces up to the 1 in 100 year plus climate change storm event, maintaining the current maximum discharge rate to the adjacent watercourse of 218 l/s.

4 SITE DESCRIPTION

Site Description

4.1 The site is located approximately 7.5 km to the east of Barnsley in South Yorkshire at National Grid Reference SE 419 063. It is irregular in shape, occupying an area of approximately 15.34 hectares. A site location plan is provided in Figure 1.

4.2 The site is currently occupied by a distribution centre which includes an ancillary three-storey office block.

4.3 Vehicular and pedestrian access to the site is currently gained via an access road leading off the A6195 Park Spring Road which forms the western boundary of the site.

4.4 The majority of the site is currently laid to hardstanding, the combined hardstanding area including the distribution centre car / lorry parking and circulation road currently occupy approximately 94,275 m^2 or 65% of the total site area. Soft landscaping is confined to the peripheral areas of the site, covering a total area of approximately 49,136 m^2 or 35% of the site as a whole.

Surrounding Land Uses

4.5 The site is situated within a wider distribution park, with distribution centres located along Park Spring Road to the north and south. The site is bound on all sides by agricultural land.

4.6 The site is not situated within or in close proximity to either a Special Area of Conservation (SAC) or Special Protection Area (SPA).

Topography

4.7 A current topographic survey was not made available for review during the production of the flood risk assessment, however site levels are included within the drawings for the existing site (RPS, Proposed Finished Site Levels, Ref. 14833/A0/1601, 2006, included as Appendix A). The site generally slopes shallowly downwards in a southerly direction from approximately 34.5 m AOD in the north to approximately 32.3 m AOD at the balancing pond situated within the southern end of the site.

5 PROPOSED DEVELOPMENT

5.1 It is proposed to extend the distribution centre to the south and to the west with necessary amendments to the circulation roads and car parking to the northern end and the lorry parking to the eastern end of the site. The southern extension will comprise 8,103 m^2 of additional warehouse accommodation; the extension to the west of the building will result in an additional 7,272 m^2 of warehouse accommodation. Development plans are shown in Appendix B.

5.2 Vehicular and pedestrian access will remain via an access road leading off the A6195 Park Spring Road which forms the western boundary of the site.

5.3 As the proposed development is an extension to the existing distribution centre, floor levels will need to be maintained at 34.375 m AOD.

5.4 The proposed extension to the current distribution centre and expansion to the staff car parking towards the northern end of the site will result in an increase in the impermeable area on the site to approximately 102,984 m^2 which equates to approximately 71% of the total site area.

5.5 The proposed use of the site is classified as 'less vulnerable' within the NPPF.

5.6 The Proposed Drainage Strategy for the site is included as Appendix C. Where possible, the existing drainage for the existing distribution centre and car park will be retained and the site will continue to drain to the balancing pond and subsequently to the adjacent watercourse at the existing rate. Within the localised area of the proposed extension, existing foul and storm water drainage runs will be diverted in accordance with the Structural Engineer's design and specification (to be confirmed at detailed design stage). The new drainage for the roof water from the proposed extension will be connected to the existing drainage system.

5.7 The redevelopment will increase the impermeable area on the site by 8,709 m^2 from 94,275 m^2 to 102,984 m^2. In establishing the new additional volume required the net increase in impermeable area has been considered in the storage calculations. For the net additional area, a 1 in 100 year storm plus 10% increase to rainfall intensity due to climate change (building life of 30 years) has been considered, whilst the original concept of 1 in 100 year storage is maintained for the existing contributing area. The increase in impermeable area will require additional attenuation of up to 500m^3 subject to detailed design/rigorous network modelling and expansion of the existing attenuation volume via a combination of enlargement of the pond and raising of the existing bank level.

6 HYDROLOGICAL SETTING

Nearby Watercourses

6.1 Reference to Ordnance Survey Mapping indicates that the nearest surface water feature is the balancing pond located towards the southern end of the site.

6.2 A stream located to the eastern end of the site is identified as flowing in a southerly direction before meeting at a confluence with the River Dearne, approximately 300 meters to the south of the site. The River Dearne is situated approximately 75 m to the south west of the site beyond the A6195 Park Spring Road which forms the western boundary of the site; the river is identified as flowing in a southerly direction.

6.3 No artificial watercourses / features (e.g. canals, reservoirs) have been identified within 1km of the site.

Flood Risk Classification

6.4 The Environment Agency's indicative floodplain map indicates that the site is located wholly within Flood Zone 1 which is classified as being at a low risk of fluvial flooding (less than 1 in 1000 annual probability). The Environment Agency indicative floodplain map is included as Figure 2.

6.5 The Environment Agency's indicative floodplain map indicates that Flood Zone 2 extends up to approximately 20 m from the south western boundary of the site therefore RPS ordered site specific flood data from the Environment Agency which is included as Appendix D.

6.6 Modelled flood levels for a 1 in 200 year event have been provided for a reach of the River Dearne close to the site. The modelled 1 in 200 year event flood level for the nearest cross section to the site (DRN01_14806) is 28.34 m AOD. The topographical low of the site is approximately 32.30 m AOD therefore the site is approximately 4 m above the modelled 1 in 200 year event. Given the depth and steepness of the valley side separating the south western boundary of the site and the River Dearne, it is considered that flows and levels during an extreme flood event within the watercourse are unlikely to result in fluvial flooding to the site.

6.7 A small un-modelled watercourse flows adjacent to the site. The flood risk assessment produced as part of the planning application for the existing distribution centre assessed the potential fluvial flood risk associated with this watercourse in response to concerns raised by the Dearne and Dove Internal

Drainage Board (IDB). The FRA undertook an analysis of culvert capacities on the adjacent brook and determined that a single culvert (Culvert 1) was undersized. On site mitigation was recommended to avoid localised on site flooding.

7 HYDROGEOLOGICAL SETTING

7.1 Reference to the British Geological Survey online mapping (1:50,000 scale) indicates that the southern end of the site is underlain by superficial deposits of Alluvium deposited by the River Deane. The remainder of the site is indicated to be laid directly to the bedrock. The bedrock underlying the site is identified as Pennine Middle Coal Measures Formation generally described as 'Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base'.

7.2 The Ground Investigation Report, dated August 2005 conducted by RSA Geotechnics Ltd, indicated that before the current distribution centre had been constructed the site was underlain by opencast spoil backfill from adjacent coal workings resting on top of the natural bedrock consisting of the Pennine Middle Coal Measures Formation.

7.3 The borehole logs within RSA Geotechnics Ltd Ground Investigation Report, dated August 2005 indicate that the groundwater levels throughout the site are deep (at approximately 12 m AOD).

7.4 According to the Environment Agency's online Groundwater Vulnerability Mapping, the underlying bedrock consisting of the Pennine Middle Coal Measures Formation is classified as a Secondary A Aquifer. Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

7.5 Soilscapes online mapping describes the underlying soil on the site as 'Slowly permeable seasonally wet acid loamy and clayey soils'.

7.6 Reference to the Environment Agency's online groundwater Source Protection Zone maps indicates that the site is not located within a groundwater Source Protection Zone.

8 EXISTING DRAINAGE / WATER MAINS

8.1 Reference to the site specific drainage drawing, Surface and Foul Water Drainage Layout (Ref. 14833) indicates that surface water from the site is currently collected via private surface water drainage network and discharged to a balancing pond located towards the southern end of the site before being discharged at a controlled rate to the adjacent watercourse.

8.2 Reference to the foul water drainage drawing, Foul Drainage Connection to Existing Yorkshire Water Sewer Network (Ref. 14813/A1SK1300) indicates that the foul water drainage for the site is directed towards a foul water rising main situated towards the south western corner of the site before being discharged to a Yorkshire Water foul water sewer situated approximately 295 m to the south of the site.

9 FLOOD RISK AND MITIGATION

9.1 The key sources of flooding that could potentially impact the site are discussed below:

Fluvial / Tidal Flooding

9.2 The Environment Agency's indicative floodplain map indicates that the site is located wholly within Flood Zone 1 which is classified as being at a low risk of fluvial flooding (less than 1 in 1000 annual probability). The Environment Agency indicative floodplain map is included as Figure 2.

9.3 The Environment Agency's indicative floodplain map indicates that Flood Zone 2 extends up to approximately 20 m from the south western boundary of the site therefore RPS ordered site specific flood data from the Environment Agency which is included as Appendix D.

9.4 Modelled flood levels for a 1 in 200 year event have been provided for a reach of the River Dearne close to the site. The modelled 1 in 200 year event flood level for the nearest cross section to the site (DRN01_14806) is 28.34 m AOD. The topographical low of the site is approximately 32.30 m AOD therefore the site is approximately 4 m above the modelled 1 in 200 year event. Given the depth and steepness of the valley side separating the south western boundary of the site and the River Dearne, it is considered that flows and levels during an extreme flood event within the watercourse are unlikely to result in fluvial flooding to the site.

9.5 A small un-modelled watercourse flows adjacent to the site. The flood risk assessment produced as part of the planning application for the existing distribution centre assessed the potential fluvial flood risk associated with this watercourse in response to concerns raised by the Dearne and Dove Internal Drainage Board (IDB). The FRA undertook an analysis of culvert capacities on the adjacent brook and determined that a single culvert (Culvert 1) was undersized. On site mitigation was recommended to avoid localised on site flooding.

9.6 The SFRA indicates that the site is not situated within an area that has been affected by historical flooding events.

9.7 The Environment Agency's indicative floodplain map indicates that access to the site from the south may be restricted in a 1 in 100 year flood event but dry access is available to the north. The proposed extension of the existing building will not impact the emergency access/egress arrangements for the site, which will remain as existing.

9.8 The proposed extension to the existing building is located within Flood Zone 1 therefore there will be no increase in flood risk through loss of flood storage area and flood storage compensation is not required. There would be no impact on flood flow routes.

Proposed Mitigation

9.9 None required.

Flooding from sewers

9.10 Sewer flooding can occur during periods of heavy rainfall when a sewer becomes blocked or is of inadequate capacity. The site is currently served by a private surface water drainage network which directs water to a balancing pond situated at the southern end of the site before discharging to a watercourse which forms the southern boundary of the site. Foul water is discharged to a Yorkshire Water foul water sewer situated approximately 295 m beyond the southern boundary of the site.

9.11 The level 1 SFRA states that incidences of external sewer flooding in the Yorkshire Water managed and maintained sewer system are not widespread or particular frequent. The SFRA indicates that the site is not in an area more prone to external sewer flooding.

9.12 The proposed development comprises extending the existing building over part of the yard area. The overall existing drainage network for the site will be retained and the drainage for the new roof area will connect into the existing wider site drainage network. The proposed extension will lead to an increase of the impermeable area on the site and therefore the volume and rate of run-off entering the on-site balancing pond will increase, however the rate of discharge to the watercourse will remain the same. The proposed development will therefore not result in an increased risk of flooding from sewers to the site itself or elsewhere.

Proposed Mitigation

9.13 The finished floor level of the existing distribution centre and proposed extension will be above surrounding car park levels thereby preventing egress of water into the building. Any temporary localised ponding on the site would be restricted to car parking areas and would not affect the building.

Surface water flooding (overland flow)

9.14 This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems.

9.15 Reference to OS Mapping contours identifies that site is located within a wider area where levels are generally sloping downwards in a southerly direction. Ground to the north of the site is generally higher than the site and ground to the south of the site is generally lower. The area to the north of the site is indicated to consist of agricultural land which by its nature would limit overland flow, any surface water generated off site is likely to be intercepted by the open cannel drain which follows the boundary of the site.

9.16 The map, 'Pluvial flooding caused by 100 year rain storm' within the SFRA indicates that parts of the site may be prone to pluvial flooding. The potential pluvial flood risk zone is limited to the areas of the site associated with the old and existing attenuation ponds on the site.

9.17 Surface water flooding from on-site sources is considered in Section 10 of this report.

9.18 The proposed extension will not increase the risk of flooding from overland flow.

Proposed Mitigation

9.19 The finished floor level of the existing distribution centre and proposed extension will be above surrounding car park levels thereby preventing egress of water into the building. Any temporary localised ponding on the site would be restricted to car parking areas and would not affect the building.

Groundwater flooding

9.20 This can occur in low-lying areas when groundwater levels rise above surface levels, or within underground structures. BGS mapping and the Ground Investigation Report conducted by RSA Geotechnics Ltd indicates that the site is underlain by opencast spoil backfill on top of the natural bedrock consisting of the Pennine Middle Coal Measures Formation.

9.21 The borehole logs within RSA Geotechnics Ltd Ground Investigation Report, dated August 2005 indicate that the groundwater levels throughout the site are deep (at approximately 12 m AOD).

9.22 The site is not within close proximity of a recorded groundwater flooding incident as identified within the Level 1 SFRA.

9.23 The proposed extension to the existing distribution facility does not comprise basement levels. The floor level of the existing building and proposed extension are a minimum of 100 mm above surrounding ground levels. The risk of groundwater flooding to the proposed development is considered to be low.

Proposed Mitigation

9.24 None required.

Other Sources

9.25 There is a limited risk of flooding occurring as a result of a break in a water main. In the unlikely event of such an occurrence, water from the burst may migrate on to the site and flow across it following the topographic gradient towards the northern boundary of the site. The floor level of the existing building and proposed extension are a minimum of 100 mm above surrounding ground levels. The risk of floodwater entering the building as a result of a break in a water main is considered to be low.

9.26 The risk of flooding associated with reservoirs, canals and other artificial structures is considered to be low given the absence of any such structures in the site vicinity. The Environment Agency's indicative Reservoir Flooding map indicates that the site is not in an area at risk of inundation from reservoir flooding.

9.27 SFRA mapping identifies that the site is not within an area at risk from artificial sources.

Proposed Mitigation

9.28 None required.

Event Exceedence and Residual Risk

9.29 The mitigation measures proposed as part of the development scheme are considered appropriate to mitigate against any residual risks or event exceedence scenarios.

10 SURFACE WATER MANAGEMENT

10.1 The proposed development comprises the extension of the existing building and associated addition of the car parking. The proposed development will result in an increase in impermeable area of 8,709 m^2.

10.2 The existing drainage layout for the site is described in Section 8. Where possible, the existing drainage for the site will be retained and the site will continue to drain to the balancing pond and subsequently to the adjacent watercourse at the existing rate. Within the localised area of the proposed extension, existing foul and storm water drainage runs will be diverted in accordance with the Structural Engineer's design and specification (to be confirmed at detailed design stage).

10.3 The redevelopment will increase the impermeable area on the site to 102,984 m^2. The increase in impermeable area will require additional attenuation of up to 500m^3 subject to detailed design/rigorous network modelling and expansion of the existing attenuation volume via a combination of enlargement of the pond and raising of the existing bank level.

10.4 In establishing the new additional volume required the net increase in impermeable area has been considered in the storage calculations. For the net additional area, a 1 in 100 year storm plus 10% increase in rainfall intensity due to climate change (building life of 30 years) has been considered, whilst the original concept of 1 in 100 year storage is maintained for the existing contributing area. This assessment has accounted for the differing return period by multiplying the net increased area of 8,709 m^2 by 10% to 9,580 m^2 to directly account for the climate change of this new area. The total of this 'enhanced' net increase in area and the existing area equates to 103,855 m^2. This has then been simulated for all storm events up to the 1 in 100 year, which determined an increase in free volume for the pond of up to 500 m^3 (subject to detailed design/rigorous network modelling). The 'free storage volume' is volume above permanent wet level and below the freeboard level.

10.5 The additional volume within the balancing pond will allow the rate of discharge from the balancing pond to the adjacent watercourse to remain at the current rate of 218 l/s.

10.6 The Environment Agency have advised that the proposed approach of maintaining the existing wider site drainage network whilst increasing the capacity of the balancing pond to accommodate the additional volume of water generated by the increase in impermeable area of the site is appropriate as the scheme will ensure that the volume and rate of discharge of surface water to the watercourses and wider public sewer network will remain as existing.

11 SEQUENTIAL TEST AND EXCEPTION TEST

Sequential test

11.1 The NPPF requires the Local Authority to apply the Sequential Test in consideration of new development. The aim of the Test is to steer new development to areas at the lowest probability of flooding. The site is located within Flood Zone 1 and therefore meets the requirements of the Sequential Test.

The Exception Test

11.2 According to Table 3 of the NPPF, 'less vulnerable' developments are considered appropriate within Flood Zone 1 without the requirement to apply the Exception Test. Therefore, application of the Exception Test is not required for the proposed development.

12 SUMMARY AND CONCLUSIONS

12.1 The aim of the Flood Risk Assessment is to outline the potential for the site to be impacted by flooding, the potential impacts of the development on flooding both onsite and in the vicinity, and the proposed measures which can be incorporated into the development to mitigate the identified risks. The report has been produced in accordance with the guidance detailed in the NPPF. Reference has also been made to the CIRIA SUDS manual (C697), the Strategic Flood Risk Assessment and following consultation with the Environment Agency's Partnership and Strategic Overview Team.

12.2 The potential flood risks to the site, and the measures proposed to mitigate the identified risks, are summarised in the table below:

Source of flooding	Identified Risk			Mitigation proposed	Residual risk		
	L	M	H		L	M	H
Fluvial	✓				✓		
Tidal	✓				✓		
Surface Water		✓		Existing wider site drainage system will be retained. Existing rate of surface water run-off discharge from site maintained. The existing balancing pond will be enlarged to accommodate the 1 in 100 year plus climate change event run-off from the newly impermeable area.	✓		
Groundwater	✓				✓		
Other Sources (e.g. reservoirs, water mains)	✓				✓		

12.3 The redevelopment will increase the impermeable area on the site by 8,709 m^2 from 94,275 m^2 to 102,984 m^2. The increase in impermeable area will require additional attenuation of up to 500m^3 subject to detailed design/rigorous network

modelling and expansion of the existing attenuation volume via a combination of enlargement of the pond and raising of the existing bank level. The rate of rate of discharge from the balancing pond to the adjacent watercourse will remain at the current rate of 218 l/s.

12.4 The proposed development will not result in an increased risk of flooding to the site itself or elsewhere. It has been demonstrated that the development meets the Sequential and Exception Tests imposed under the NPPF.

12.5 Overall, it has been demonstrated that the development would be safe, without increasing flood risk elsewhere.

Appendix A

Current Site Levels

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notes :

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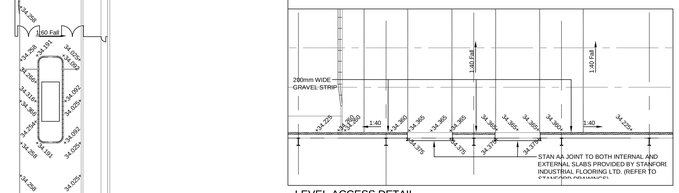
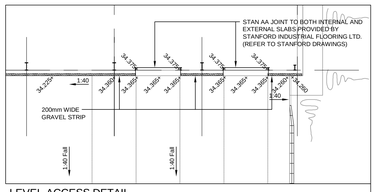
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE IT IS RECOMMENDED THAT INFORMATION IS NOT SCALED OFF THIS DRAWING
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS
4. FOR DETAILED LEVELS TO OFFICE ENTRANCE AND FOOTPATH AREAS, PLEASE REFER TO DRAWING 14833/A01/602



LEVEL ACCESS DETAIL
SCALE 1:200

FINISHED FLOOR LEVEL= 34.375



LEVEL ACCESS DETAIL
SCALE 1:200

10m SCALE 1:500

rev	amendments	by	date
F	Drawing revised to Final Issue status from red line drawings received from site.	RSL	17.11.200
E	Level access levels updated and details added. Gravel strip detail shown as confirmed by AJA 02.08.06. New RPS Burks Green title block added. Issued to ProLogis as "work in progress" drawing for information for potential tenant.	RSL	31.07.200
D	Road levels to North of Inbound Gatehouse revised.	RSL	19.07.200
C	Road level updated at bottom of ramp adjacent outgoing gatehouse.	WL	27.06.200
B	Site levels reduced 0.125m typically to suit dynamic compaction results at contractors request. Southern and western vehicle route and lorry parking gradients revised. Car park levels raised to balance cut/fill operation.	WL	05.05.200
A	Site layout updated (as agreed with AJA 31/03/2006). Additional levels added to site entrance area. Kerbline adjacent office moved to accommodate increased entrance lobby and footpath as required. Note 4 added. Car park exit lane decreased in width to suit. Status revised to construction.	WL	03.04.200

FINAL ISSUE

RPS Burks Green

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Client

ProLogis®
The Global Distribution Solution

Project
Houghton Main

Title
Proposed Finished Site Levels

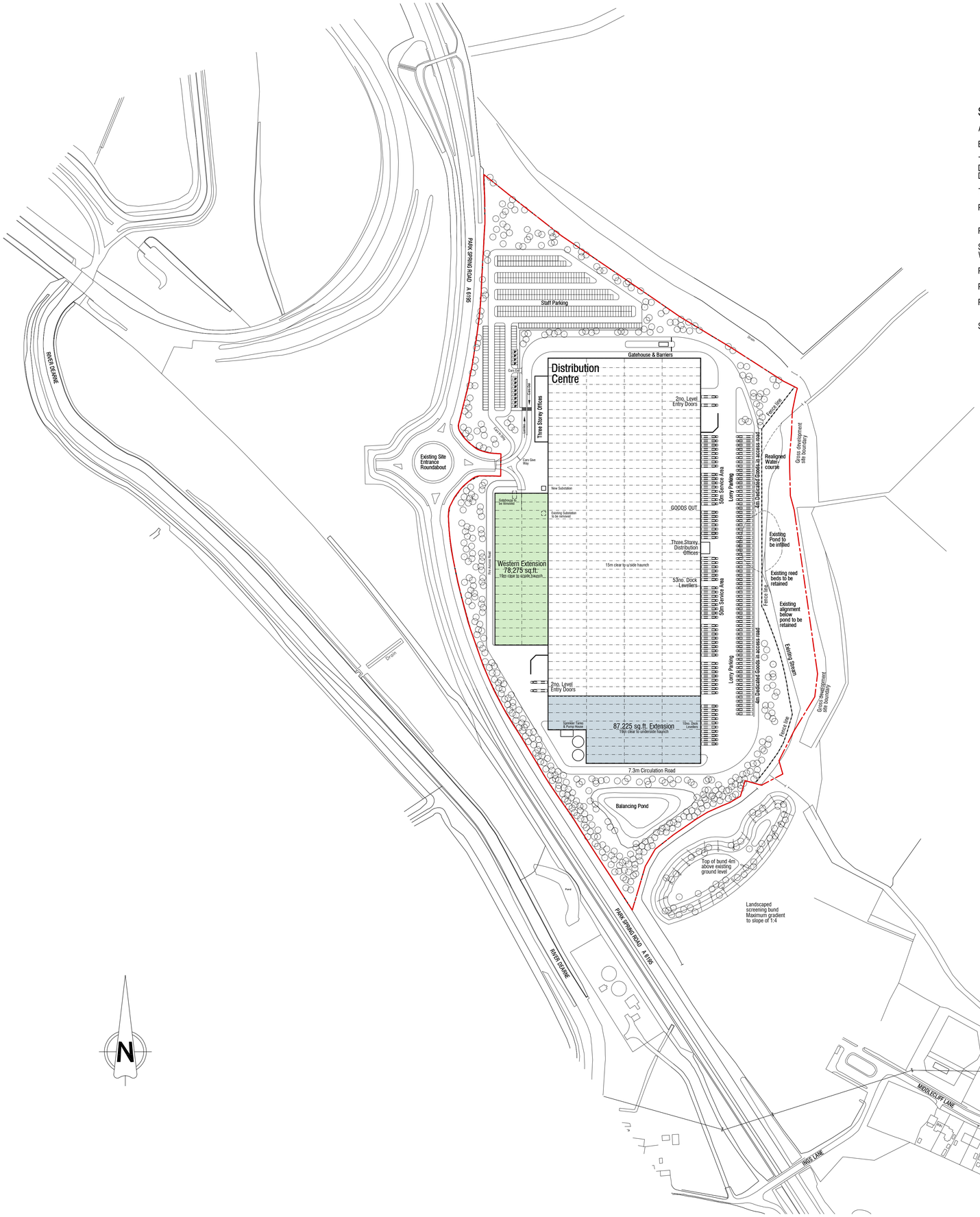
Drawing Status	Date Created	Drawing Scale
Final Issue	11 January 2006	1:500

Drawing Number	Rev
14833 /A0 / 1601	F

Project Leader	Drawn By	Initial Review
JKC	WL	RSL

Appendix B

Proposed Development Plan



notes

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Schedule of Accomodation

All areas are gross internal.

Existing		
Three Storey Offices	25,000 sq.ft	2,323 sq.m
Distribution Centre	500,000 sq.ft	46,451 sq.m
Distribution Offices	2,700 sq.ft	2,51 sq.m
Total	527,700 sq.ft	49,025 sq.m
Parking		392no. Car Parking Spaces 67no. Lorry Parking Spaces
Proposed Extension		
Southern Extension to DC	87,225 sq.ft	8,103 sq.ft.
Western Extension to DC	78,275 sq.ft	7,272 sq.m
Proposed Total Extension to DC	165,500 sq.ft	15,375 sq.m
Proposed Total Distribution Centre	693,200 sq.ft	64,400 sq.m
Parking		74no. Car Parking Spaces
Site Area	37.90 acres	15.34 Hectares

no. date revision by

aja architects

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client

EVANDER PROPERTIES

project

Proposed Extension
for ASOS.COM
Houghton Main
South Yorkshire

drawing

Site Layout Plan

scale 1:1000 @ a1 drawn mjl

checked date 4/4/12

no

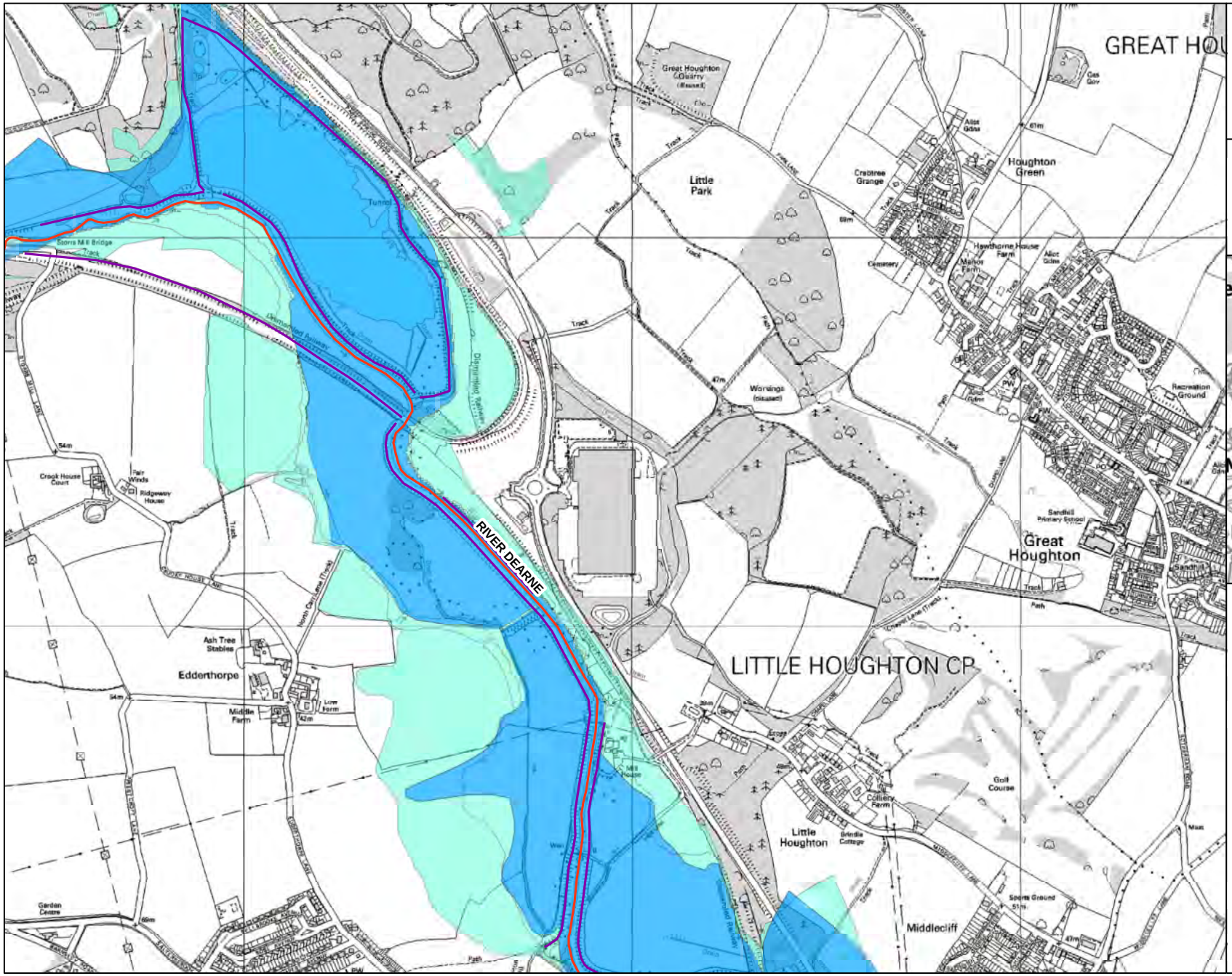
5252 - 009

PRELIMINARY

Appendix C

Environment Agency Consultation Response

Flood Map centered on Little Houghton, Barnsley - Date Created: 26/06/2012 [Ref: 22621]



Environment Agency

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Scale: 1:10,000

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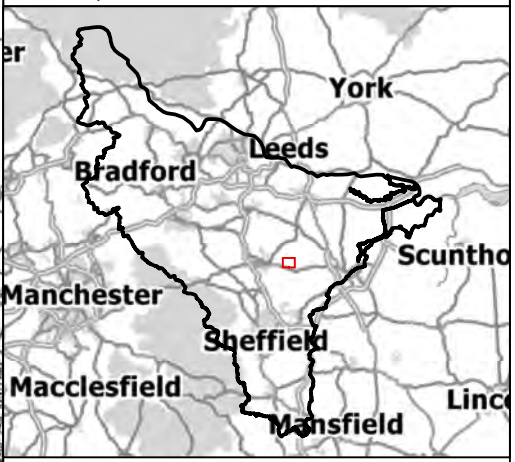

LEGEND

- Main River
- Flood Zone 2 (FZ2)
- Flood Zone 3 (FZ3)
- Flood Map Flood Defences

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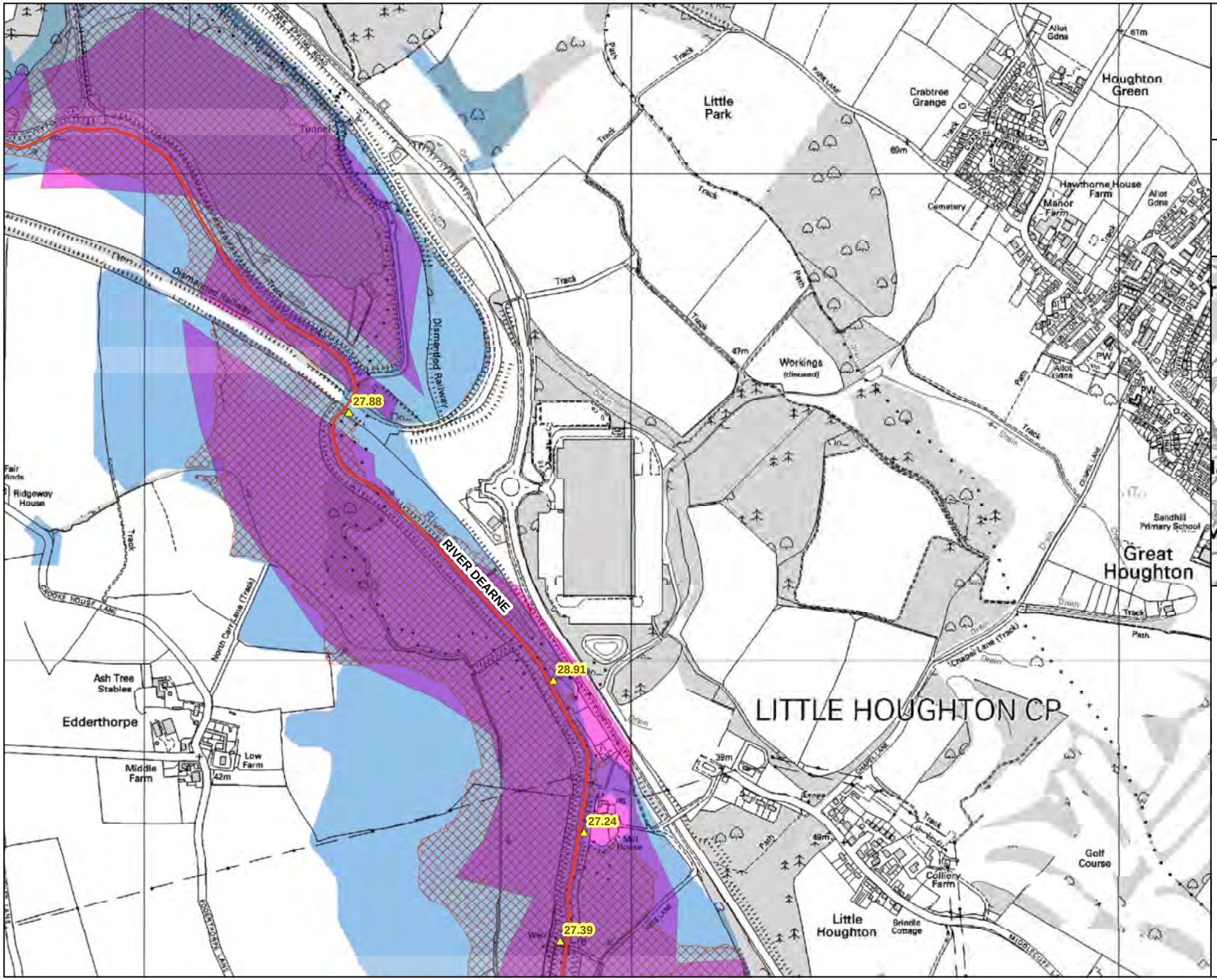
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood History Map, Little Houghton - dated: 26/06/2012 [Ref: 22621]



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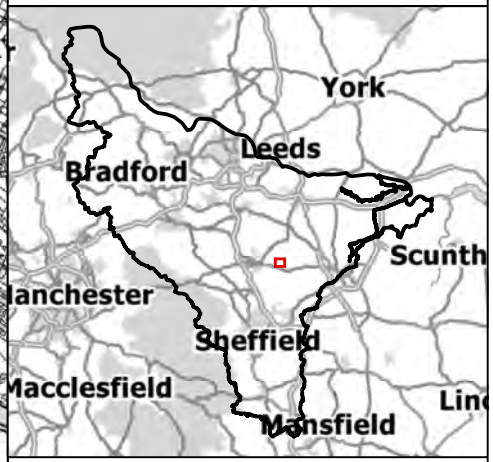

Flood Extents

Legend

- Main River
- Autumn 2000 Flood Event Flood Extent
- Autumn 2000 Flood Event Flood Level (m)
- 2007 Flood Events Flood Extent
- River Don 1947 Flood Event Flood Extent

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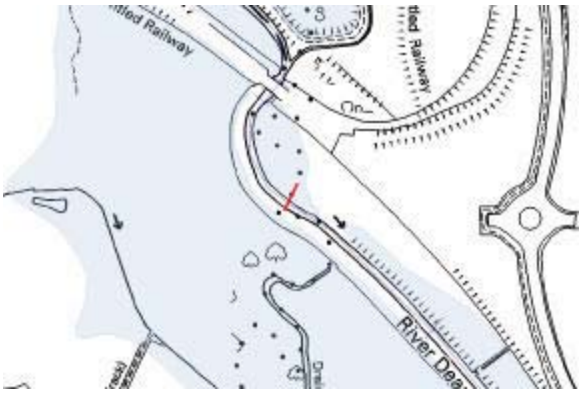
Location Plan



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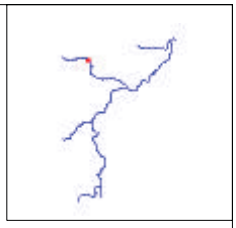
Cross Section References



River: DRN

Reach: 01

Chainage: 14806

Section Type: SECTION

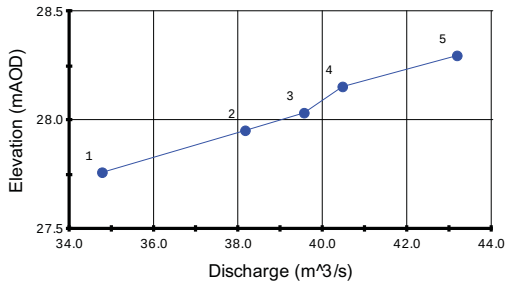
OS NGR: SE 41440 06383

Survey Dwg Ref: N/A

Photograph Ref: DEAR_14806.JPG

Next
Section D/s: 14554
Section U/s: 14998D

Rating Curve



Number represents model profile number

Summary of Results

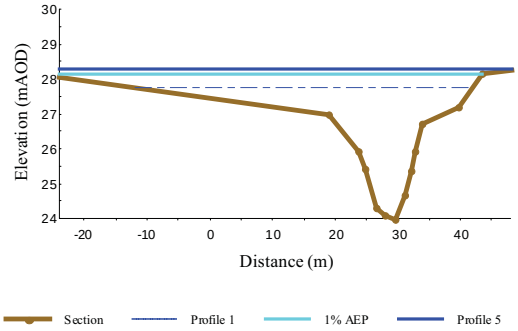
Profile No	AEP (%)	Flow (m^3/s)	Water Level (mAOD)	Velocity (m/s)
1	4.00	34.8	27.762	0.79
2	2.00	38.2	27.953	0.80
3	1.33	39.6	28.034	0.80
4	1.00	40.5	28.154	0.80
5	0.67	43.2	28.296	0.80

Level of Left Bank 28.060 mAOD

Level of Right Bank 27.850 mAOD

AEP: Annual Exceedance Probability = 1/T, where T = Return Period (Years)

Cross Section Profile



DRN: 01: CROSS SECTION NUMBER 14806

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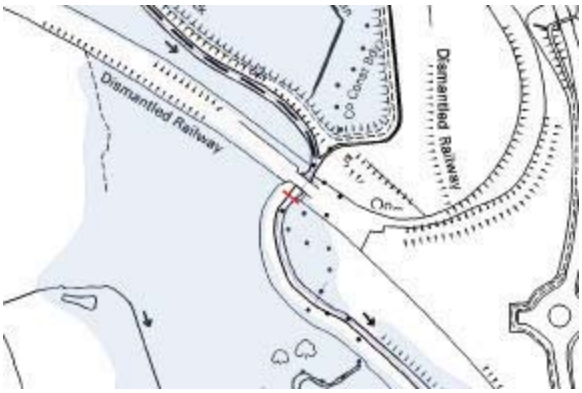
Environment Agency - North East Region
Re-working of the River Don Model
ISIS Hydraulic Model Summary Sheet

Location Plan



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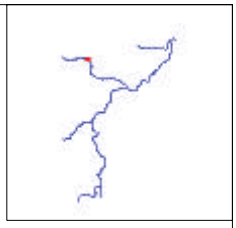
Cross Section References



River: DRN

Reach: 01

Chainage: 14998D

Section Type: SECTION

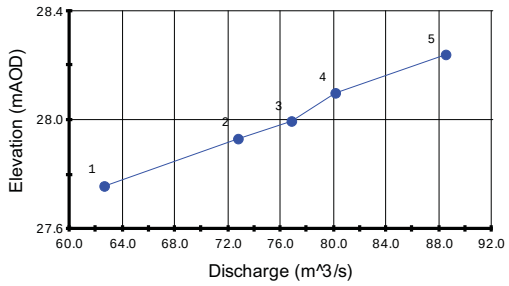
OS NGR: SE 41402 06509

Survey Dwg Ref: N/A

Photograph Ref: DEAR_14998b.JPG

Next
Section D/s: 14806
Section U/s: 14998U

Rating Curve



Number represents model profile number

Summary of Results

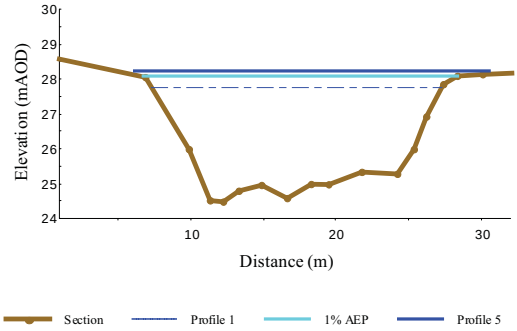
Profile No	AEP (%)	Flow (m^3/s)	Water Level (mAOD)	Velocity (m/s)
1	4.00	62.7	27.759	1.37
2	2.00	72.8	27.932	1.53
3	1.33	76.8	27.997	1.61
4	1.00	80.1	28.099	1.65
5	0.67	88.5	28.240	1.74

Level of Left Bank 28.060 mAOD

Level of Right Bank 27.850 mAOD

AEP: Annual Exceedance Probability = 1/T, where T = Return Period (Years)

Cross Section Profile



DRN: 01: CROSS SECTION NUMBER 14998D

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Print Date: 21/05/2004

RFI/2012/22621
River Don Flood Risk Mapping Study 2004

Modelled results

	Water Levels (mAOD)
Cross Section Label	**1 in 200yr (0.5%AEP)**
DRN01_14998d	28.29
DRN01_14806	28.34

Appendix D

Proposed Drainage Strategy

14833A - Houghton Main Evander Properties Warehouse Extension

Prepared by Michael Stacey and reviewed by Richard Leathers 22-8-12

Proposed Drainage Strategy

Existing Site

The existing development comprises a distribution centre with an access road to the north and lorry parking and service areas to the east and west and a further lorry park to the south. A car park for site operatives and management is located to the north west of the site.

The distribution centre roof is drained by a high-level siphonic roof drainage system, with half the roof area drained to the north and half to the south, a gravity system then feeds a balancing pond located to the south of the site.

The lorry parking/service areas and car park are drained by Gatic slot drains and a gravity system which pass through interceptors prior to joining the roof gravity system.

All site surface water is routed through a wet balancing pond to the south corner of the site, where it is attenuated prior to discharge to the local water course.

The original design was based upon attenuation for the entire site impermeable area, with restricted outgoing flow for all storm events up to 1 in 100 years of 218 l/s.

Proposed Extension

The proposed redevelopment comprises two extensions of the distribution centre to the south and west over the existing lorry parks plus the addition of an access road around them as well as an extension of the existing car park to the north. The two building extensions are to a higher roof level, which dictates the re-routing of existing siphonic pipe work at high level and some influence on the outlets.

The existing gravity sewer serving the northern roof of the distribution centre and the car park passes beneath the proposed extension to the west and will therefore be abandoned downstream of the manhole immediately north of the extension.

From this point the existing sewer will feed into a new gravity system installed to serve the extension to the car park, which will run to the west of the new extension to the balancing pond.

The western extension will be drained by siphonics to the south and will tie into the new gravity sewer.

The existing southern roof siphonics will be diverted at roof level to the east due to the new extension having a higher roof level, from there a new gravity system will run to the balancing pond. The existing eastern lorry park sewer will tie into the new system from the manhole downstream of

the interceptor with the rest of the existing sewer being abandoned. The extension to the south will drain by siphonics and tie into the new gravity system to the east.

The redevelopment will increase the sites impermeable area by 8,709 m^2 from 94,275m^2 to 102,984 m^2. The increase in impermeable area will require the free volume within the balancing pond to increase by **500 m^3** from 2,700m^3 to 3,200 m^3. This will be achieved by extending the existing pond in a south-westerly direction.

In establishing the new additional volume required the net increase in impermeable area has been considered in the storage calculations. For the net additional area, a 1 in 100 year storm plus 10% increase to rainfall intensity due to climate change (building life of 30 years) has considered, whilst the original concept of 1 in 100 year storage is maintained for the existing contributing area. This assessment has accounted for the differing return period by multiplying the net increased area of 8,709m^2 by 10% to 9,580m^2 to directly account for the climate change of this new area. The total of this 'enhanced' net increase in area and the existing area equates to 103,855m^2. This is then been simulated for all storm events up to 1 in 100 years , which determined an increase in free volume for the pond of 500m^3. The' free storage volume' is volume above permanent wet level and below the freeboard level.

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key:

- Existing Site Impermeable Area
- Proposed Extension/redevelopment
- Increase in Impermeable Area

Note:
Existing impermeable area = 94275m^2
Increase in impermeable area = 8709m^2
Impermeable are after redevelopment = 102984m^2

Rev	Description	By	Ckd	Date
A	Clients Logo Changed	LW	RSL	31.08.12

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Client: EVANDER PROPERTIES

Project: Houghton Main Evander Properties Warehouse Extension

Title: Comparison of Existing and Proposed Impermeable Areas

Status	Scale	Date Created
Preliminary	1:1000 @A1	22.08.12
Project Leader	**Drawn By**	**Checked by**
ASD	MPS	RSL
Drawing Number		**Rev**
NK014833A _SK001		A

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N

Key:
- New Surface Water Manhole
- New Class 1 By Pass Interceptor
- New Surface Water Pipe
- High-level Siphonic Pipework Collecting Roof Drainage
- Existing Surface Water Pipe
- Abandoned/Removed Surface Water Pipe
- Existing Surface Water Manhole
- Existing Interceptor
- Existing Slot Drain
- New Development

Fence line

Fence line

Fence line

Drain

218l/s max restricted outlet flow.

New extension roof drainage

Existing roof drainage

Existing attenuation pond free volume = 2,700m³.
Free volume after post extension = 3,200m³.

Proposed increase in attenuation pond extent

Existing roof/yard drainage diverted into new drainage run

Existing yard drainage diverted into new drainage run

New car park extension drainage

New extension roof drainage

Pond

Drain

Rev	Description	By	Ckd	Date
A	Client Logo Changed	LW	RSL	31.08.12

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Client: EVANDER PROPERTIES

Project: Houghton Main Evander Properties Warehouse Extension

Title: Proposed Drainage Layout - Schematic Plan for F.R.A.

Status	Scale	Date Created
Preliminary	1:1000 @A1	22.08.12
Project Leader	Drawn By	Checked by
ASD	MPS	RSL

Drawing Number: NK014833A _ SK003

Rev: A

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Figure 1

Site Location Plan

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Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T +44 (0)161 874 3737 F +44 (0)161 877 3959 W rpsgroup.com

Client: Evander Properties Ltd

Date: August 2012 Scale: NTS

Project: Proposed Extension for ASOS Barnsley

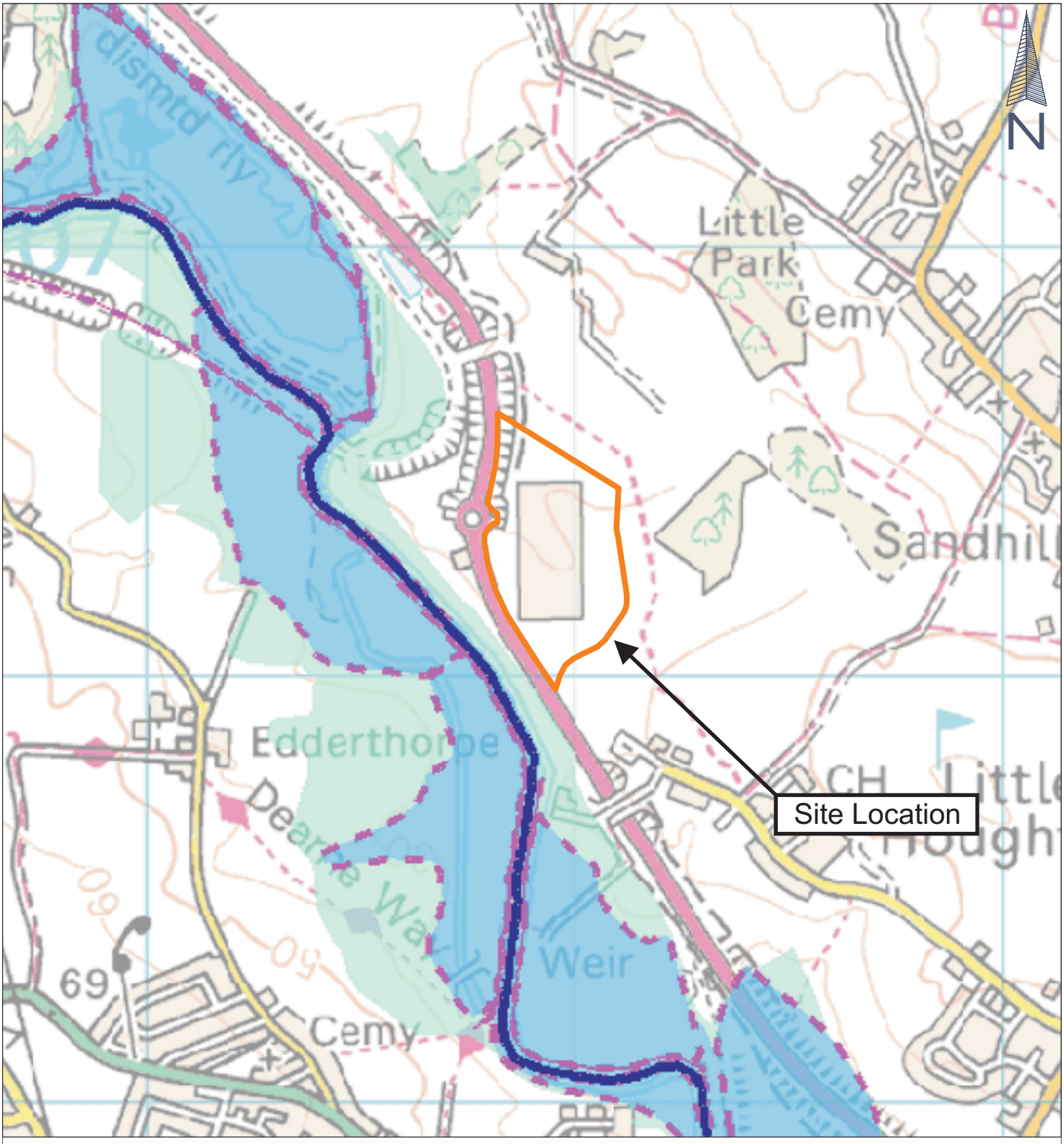
Figure: 01 Rev: 00

Title: Site Location

Job Ref: RCEF22047

Figure 2

Environment Agency Flood Map



RPS
Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T +44 (0)161 874 3737 F +44 (0)161 877 3959 W rpsgroup.com

Client: Evander Properties Ltd

Date: August 2012 Scale: NTS

Project: Proposed Extension to ASOS Barnsley

Figure: 02 Rev: 00

Title: Environment Agency Flood Map

Job Ref: RCEF22047