Abbeydale
Building Environment Consultants

FLOOD RISK ASSESSMENT REPORT

A628 DODWORTH ROAD CROSSROADS, BARNSLEY

SOUTH YORKSHIRE

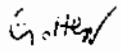
Report 151069FR July 2018

Client:
Design and Transportation
Barnsley Metropolitan Borough Council
Westgate Plaza
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S70 9FA

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FLOOD RISK ASSESSMENT REPORT
A628 DODWORTH ROAD CROSSROADS, BARNSLEY
SOUTH YORKSHIRE
Report 151069FR July 2018

DOCUMENT VERIFICATION

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Qualifications:	MSci/ FGS	BSc MSc FGS C.Geol
Position:	Engineer	MD
Signature:		

SUMMARY

Site Grid Ref:	432713E 406242N	**Site Level (m AOD)**	144	**Site Area (Ha)**	7
Development proposed:	New Highway.				

Past site development:		Clay pits infilled for use as recreational grounds.
Ground Conditions	**Made Ground:**	Made ground and clay pit infill anticipated.
	Superficials:	Not anticipated.
	Bedrock:	Middle Coal Measures.
	Shallowest coal:	Dunsil Coal outcrops in west of of site dipping to ~21m bgl in east of site. Thin Coal outcrops in centre of site.
	Groundwater:	Perched water anticipated within infilled clay pits.
	Drainage:	Soakaway potential considered low. Consider attenuation of highway runoff and drain into the existing sewers.
	Flood Risk:	Risk of being flooded or causing flooding is low.

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A628 DODWORTH ROAD CROSSROADS, BARNSLEY
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1. INTRODUCTION

On the instruction of Barnsley Metropolitan Borough Council (BMBC), a flood risk assessment was carried out by Abbeydale Building Environment Consultants Ltd for the reconfiguration of the crossroads between Dodworth Road and Pogmoor Road/Broadway, in Barnsley, South Yorkshire.

The site is located on the west side of Barnsley and is centred on National Grid Reference 432713E 406242N at approximately 144m AOD. The site covers an area of approximately 7 Ha.

This report was produced on behalf of our client, BMBC and their advisors and financiers and should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale BEC Ltd and our client. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

The comments and recommendations presented in this flood risk assessment report are based on the findings of a review of available information. There may be other conditions prevailing on the site which have not been recorded by the available information and therefore have not been taken into account by this report. Responsibility cannot be accepted for unrecorded information.

When writing this report the proposed development was for a new highway scheme at, or close to, existing ground levels. If there are changes to these proposals, then some modification to the comments and recommendations given may be required.

A Desk Study report has been previously prepared by Abbeydale BEC for this site (Ref: 151069DS, dated October 2017) which has been taken as read. Where information has been used or referenced from this previous report it is clearly cited in the text.

2. OBJECTIVES

This report has been undertaken to evaluate the impact that the proposed development will have on the flood potential for the site and surrounding areas.

3. THE SITE

The proposed highway is to be constructed on a rectangular shaped parcel of land located on the north side of the crossroads between Pogmoor Road and Dodworth Road/Broadway and covering approximately 7 Ha. The site is currently occupied by

Penny Pie Park. Ground levels across the site, while hummocky, are essentially level with a slight slope towards the east. See Fig 1.

4. HISTORY

The historical setting of the site and surrounding area is summarised below. For a more detailed assessment the previous desk study should be consulted.

The earliest OS map of 1855 shows the site to be largely unoccupied, with a sandstone quarry in the south eastern corner of the site.

Between 1861-1872 White Hill or Penny Pie Colliery was located within the site boundary, assumed to be centred around the two shafts seen on the 1893 map.
In 1893 the site is occupied by a brick works. To the south and east of the brick works two clay pits are shown which expanded until the brickworks closed by 1956. The clay pits on site were backfilled with domestic waste.

5. HYDROGEOLOGY & FLOOD MAPS

As outlined in the desk study report, the Environment Agency (EA) indicate the bedrock is indicated to form a secondary A aquifer (formerly minor aquifer). The site is located within a high Groundwater vulnerability zone.

The site is not located within a groundwater source protection zone and there are no recorded licensed drinking water abstractions within 250m of the site.

The site is located within EA Flood Risk Zone 1. The nearest Zone 2 areas are Dodworth Dike at 80m AOD located 1250m to the south and the Dearne River at 45m AOD located 2125m to the northeast. The watershed between the two is located about 250m to the south.

Relevant EA maps are appended.

6. SITE LEVEL SURVEY

A site survey has been provided for the site. See Fig 1. These show the site to have a gentle slope towards the east ranging from 141m to 142m AOD on Pogmoor Road, reducing to 137m at its lowest point adjacent to Grosvenor Walk on the eastern boundary. Just beyond the northern site boundary the is a 3-4m embankment down to a railway line. A 3-4m embankment is also shown adjacent to the eastern site boundary.

7. PROPOSED DEVELOPMENT

The proposed development is to modify the junction between Dodworth Road and Pogmoor Road adjacent to the southwest corner of the site. The proposals feature additional highways built across the infilled clay pits, at or close to current ground levels. See Fig 2. The planned development is therefore not proposing to change the natural slope.

BMBC have provided a drawing, HD/7122127/C-1 (Fig 2), which shows the area of proposed highway to be drained into the Yorkshire Water system is 10,100m².

8. SITE INSPECTION

As part of the previous Phase 1 Desk Study assessment, a site walkover was undertaken on the 30th of October 2017. The proposed highway is to be constructed on a rectangular shaped parcel of land located on the north side of the crossroads between Pogmoor Road and Dodworth Road/Broadway and covering approximately 7 Ha. See Fig 2.

The site is currently occupied by Penny Pie Park, with a children's play area and sports pitch located toward the northwest corner of the site. An electricity substation is located within the park, just to the north of the crossroads. The sites surface is covered by grass and is undulating, especially in the eastern part of the site where the ground is hummocky.

The park has a gradient of about 1:75(v:h) with its highest point at 141m-142m on Pogmoor Road and lowest point adjacent to Grosvenor Walk at 137m AOD.

The site is bound to the west by Pogmoor Road/Broadway, and to the south by Dodworth Road. Beyond these roads, and to the east of the site, are residential houses. To the north of the site is a railway line.

The park is outlined by mature trees along most of its perimeter.

9. SOURCES OF POTENTIAL FLOODING

The proposed development is close to the top of the watershed which is located about 250m to the south at 148m to 150m AOD. Of concern is the potential increase in runoff from the increased area of the highway and the potential of flooding the lower ground to the east.

1. Surface water runoff

These potential flood risks are discussed in turn in Sections 9.1 below and in overall terms in Section 9.2.

9.1 Site surface runoff

At present site surface runoff appears to drain into the ground with little to no provision for it to be channelled into existing drainage systems which have only been observed around the perimeter of the site along the highways. The current park isn't known to flood.

No streams or surface water features other than controlled water, such as highway gully drains, have been identified in the local area.

The proposed developments include an additional 10,100m² of highway to be drained. Therefore there is a need to either return the surface water into the ground or pass it into the existing Yorkshire Water drainage system that crosses the site. To meet SUDs requirements several soakaway tests will be undertaken to determine the suitability of the ground to accept the anticipated 30% increase in peak flow resulting from the highway hardstands. However, as the Desk Study has identified the site to mainly consist of infilled clay pits the potential for suitable strata being found is considered low. Therefore consideration will need to be given to attenuate the water collected from the highway and to gain agreement to drain into the existing sewers/ surface water system. The ultimate aim should be to reduce the risk of site surface runoff potentially affecting the lower ground to the east.

9.2 Overall Potential To Flood

As discussed above no natural surface water features have been identified in the locality of the site. The site is located close to the top of the watershed and is in excess of 90m above the Dearne River located 2125m from the site, which drains the area to the east. The higher ground to the south and east is mainly housing with associated gardens and has a negligible risk of causing flooding to the site. Therefore the overall risk of being or causing flooding is low, provided the area of increased highway surface area is controlled.

10. PROPERTY FLOOD RISK

Of potential concern are the houses served by Grosvenor Walk. In addition to the highway drainage proposed consideration could be given to forming a bund along the eastern boundary of the site to limit the risk of surface water to flow beyond the park boundary to a negligible risk.

Report **151069FR** July 2018.

FIGURES



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Rev.	By	Amendments	Date

BARNSLEY
Metropolitan Borough Council

Project
M1 JUNCTION 37
PHASE 1

Drawing title
TOPOGRAPHICAL SURVEY

Scale	Drawn	Checked	Date
1:1250	GSJ		March 2018

Drawing No.
HD/7122127/C/TOPO

File

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Fig 1

OSGR: 432761, 406289

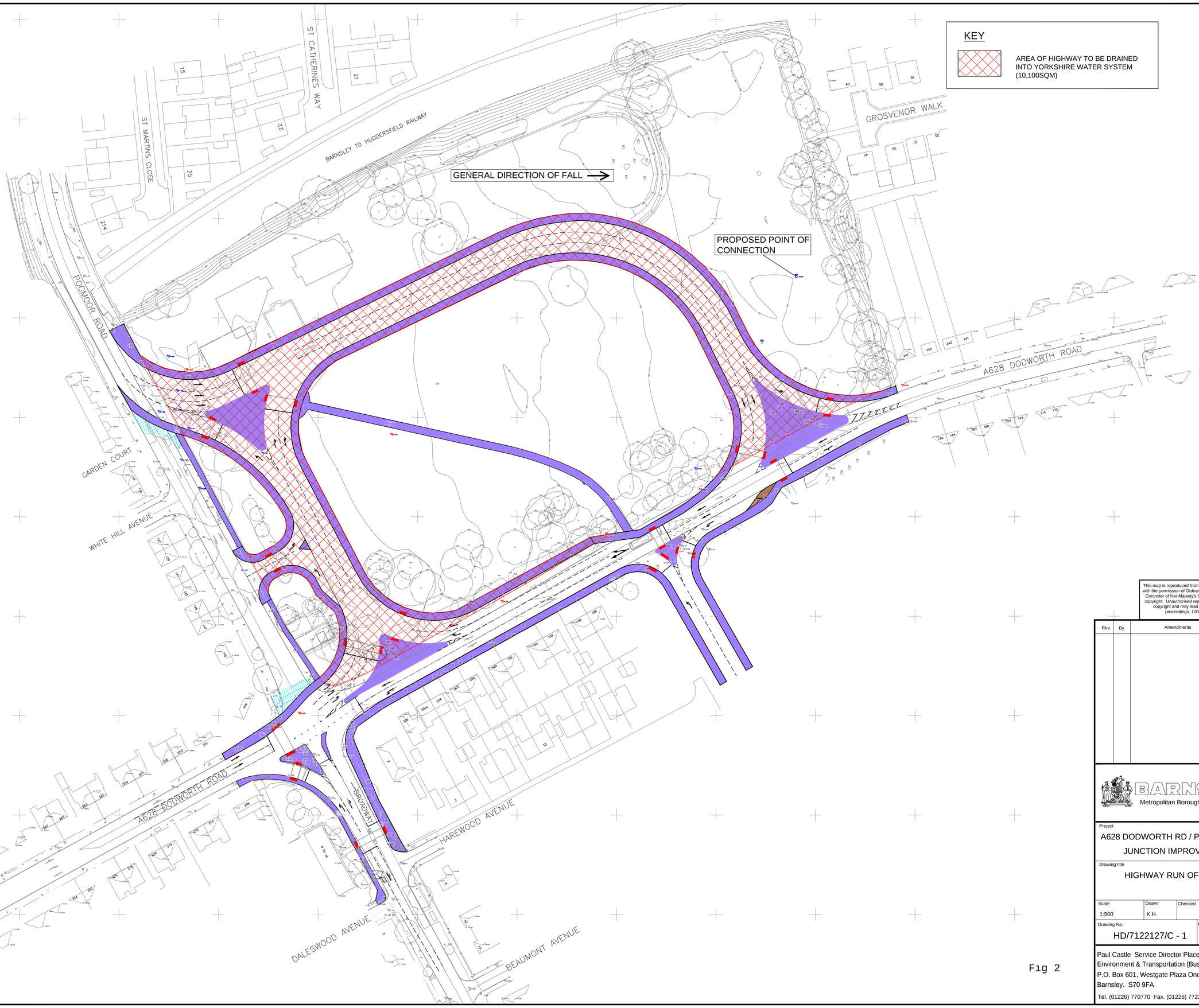


Fig 2

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Rev.	By	Amendments	Date

BARNSLEY
Metropolitan Borough Council

Project
A628 DODWORTH RD / POGMOOR RD
JUNCTION IMPROVEMENT

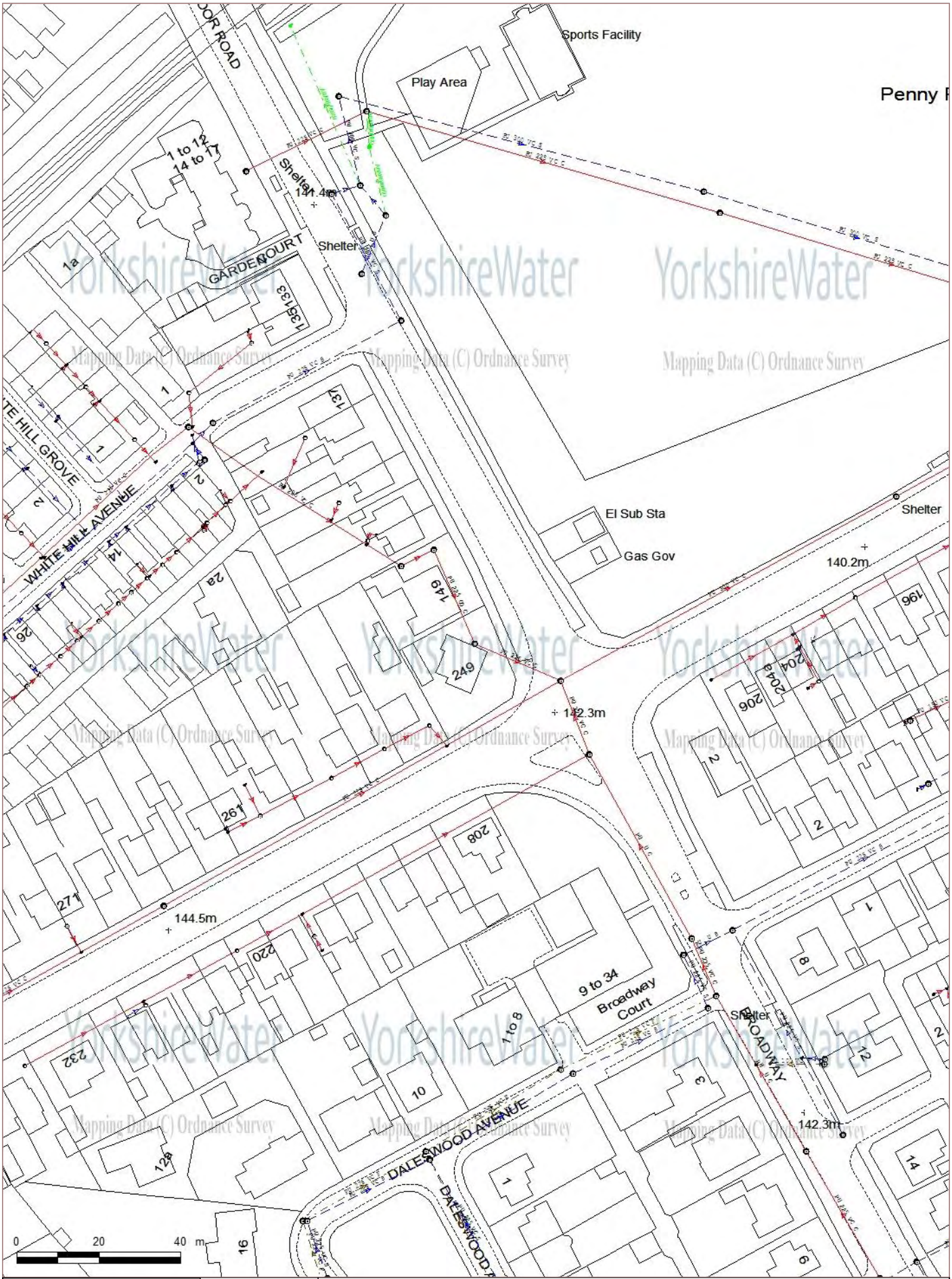
Drawing title
HIGHWAY RUN OFF AREA

Scale	Drawn	Checked	Date
1:500	K.H.		APRIL 2018

Drawing No.	Revision	File
HD/7122127/C - 1		

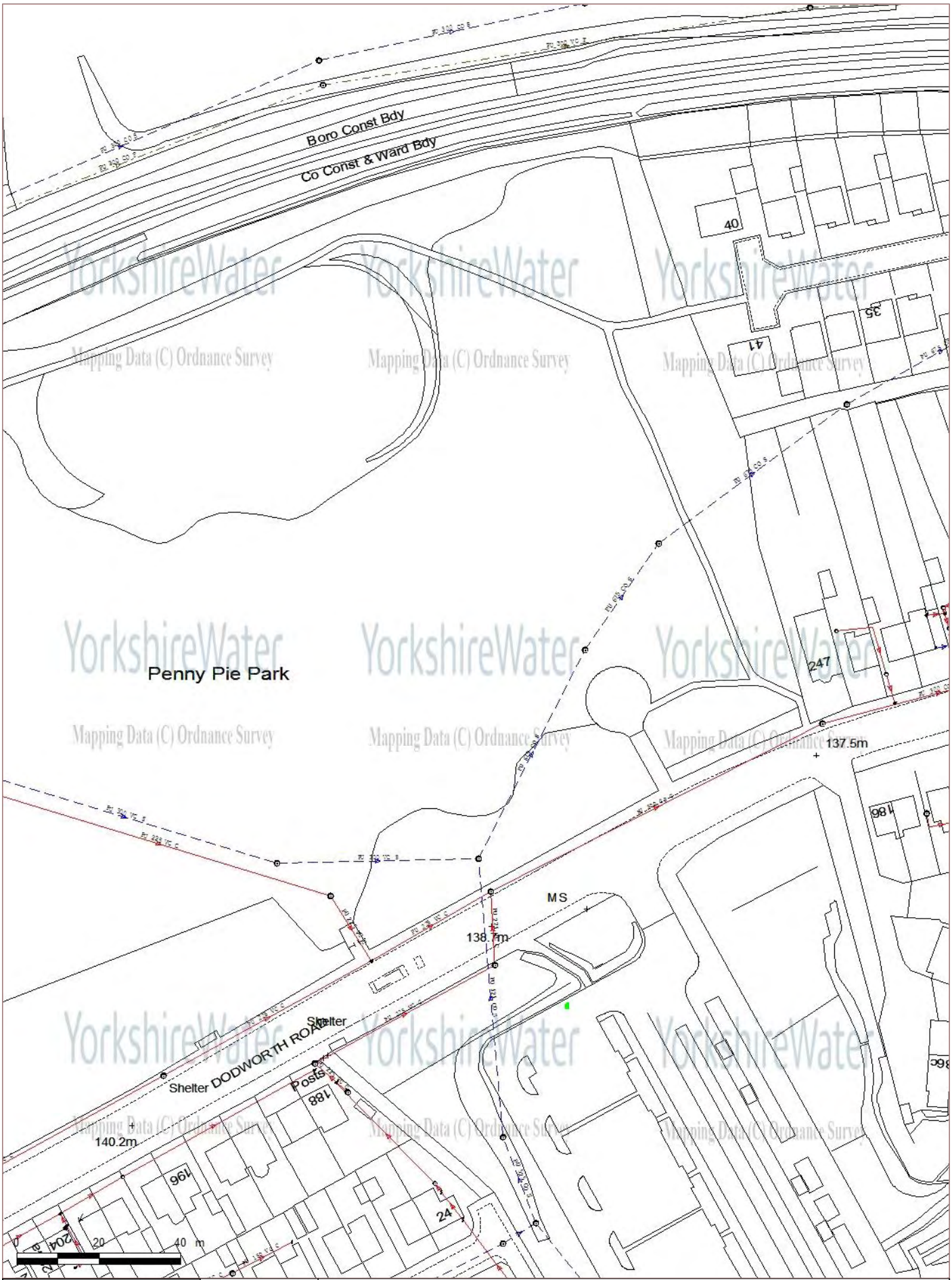
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YORKSHIRE WATER UTILITIES



YorkshireWater
Mapping Data (C) Ordnance Survey

Yorkshire Water PO Box 500 Halifax Road Bradford BD6 2LZ	Originator: JONESG1 Centre: 432651 , 406172 Scale 1:1250 Date Requested: 7th February 2018
	This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connection is shown.
	Sewers (1)
M1 J37 Phase 1	Contains OS data © Crown Copyright and database right 2015. All rights reserved Ordnance Survey Licence number 100022432.



YorkshireWater
Mapping Data (C) Ordnance Survey

Yorkshire Water PO Box 500 Halifax Road Bradford BD6 2LZ	Originator: JONESG1 Centre: 432830 , 406313 Scale 1:1250 Date Requested: 7th February 2018
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	Sewers (2)
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Halifax Road
Bradford BD6 2LZ

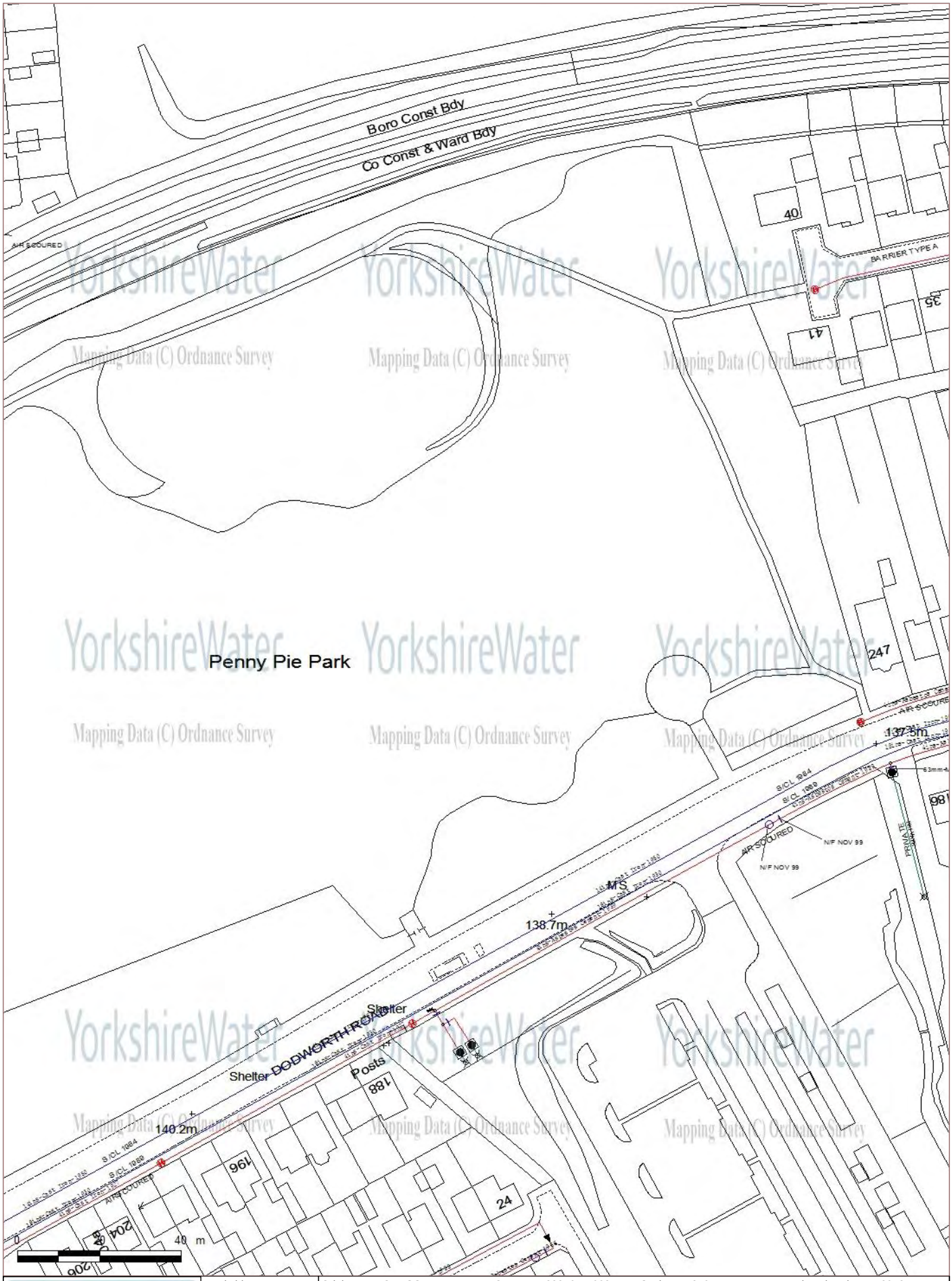
M1 J37 Phase 1

Originator: JONESG1 Centre: 432683 , 406186 Scale 1:1250 Date Requested: 7th February 2018

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Mains (1)

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YorkshireWater	Yorkshire Water PO Box 500 Halifax Road Bradford BD6 2LZ	Originator: JONESG1 Centre: 432816 , 406311 Scale 1:1250 Date Requested: 7th February 2018
		This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connection is shown.
		Mains (2)
M1 J37 Phase 1		Contains OS data © Crown Copyright and database right 2015. All rights reserved Ordnance Survey Licence number 100022432.

EA MAPS

Flood map for planning

Your reference	Location (easting/northing)	Created
151069	**432755/406328**	**31 Jul 2018 11:05**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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Environment Agency

Flood map for planning

Your reference
151069

Location (easting/northing)
432755/406328

Scale
1:25000

Created
31 Jul 2018 11:05

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 200 400 600m

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BARNSLEY ROAD DRAINAGE PROPOSALS

10.0 ROAD DRAINAGE AND WATER ENVIRONMENT

10.1 Introduction

10.1.1 An assessment on the likely significant effects of the proposed development upon existing water resources and drainage will be carried out with the aim of avoiding and reducing potential impacts and selecting appropriate means to prevent significant predicted impacts.

Consideration will be given to:

- the construction and operational phases of the scheme:
- Effects of routine runoff on surface water
- Effects of routine runoff on groundwater
- Pollution Impacts from spillages
- Assessing flood impacts

10.2 The Study Area

10.2.1 The study area is the site. Extent to be determined by the desk based assessment. This will incorporate local land drainage, water courses, existing highway drainage.

10.3 Methodology

10.3.1 The assessment will comply with DMRB Volume 11.3.10 Road Drainage and the Water Environment (HD45/09). A desk base assessment will be undertaken to review information currently available. The assessment will include collection of existing data and records from regulatory authorities such as the Environment Agency, Yorkshire Water, Land Drainage Authority and Barnsley Metropolitan Borough Council.

10.3.2 The regulatory framework will be considered.

10.3.3 Existing drainage and groundwater system will be reviewed to identify the likely receptors, their sensitivity effects of the proposed development. The assessment will then determine likely impacts and any mitigation which may be required.

10.3.4 A spillage pollution risk assessment during construction will be undertaken in accordance with Method D in DMRB Volume 11.3.10. (HD45/09).

10.3.5 Consultation with the Environment Agencies Flood Map confirms the site is not at risk of

flooding and does not lie within a flood plain. The EA indicate that the site area has a low chance of flooding from external sources.

However a Flood Risk Assessment will be undertaken in accordance with Planning Policy Statement 25: Development and Flood Risk, to assess the flood risks associated with the development together with any mitigation that may be required.

10.4 Baseline Conditions

10.4.1 A desktop study and field survey has been undertaken to fully determine baseline conditions.

10.4.2 The scheme is located in a relatively level location and in close proximity to Junction 37 M1 cutting.

10.4.3 Drainage / sewer pipes exist crossing the site, foul & surface water and a watercourse exists nearby.

10.4.4 Anticipated ground conditions mean that soakaways are considered not suitable. An attenuation storage feature / Balancing Pond will be required (SUDS) with the highway being drained by Combined Kerb and Drainage Blocks and gullies with conventional pipework to the outfalls etc.

10.5 Likely Significant Effects

10.5.1 Consideration has been given to potential increased surface water run-off and pollution risk from the proposed junction improvements and potential changes and impacts this may have on local ecology and the existing drainage system.

10.5.2 The following key issues have been identified:

- Options for drainage to be assessed in accordance with the drainage hierarchy with SUDs being the preferred option with disposal to watercourses as an alternative and connection to existing sewers being the final consideration.

- Land acquisition requirements for attenuation facilities have been assessed

and can be accommodated within Barnsley Metropolitan Borough Council owned land.

- Any requirements to enter third party land to improve receiving watercourses will be sought prior to site work commencing.

10.6 Mitigation and Enhancement

10.6.1 Drainage of the proposed scheme is by SUDs / attenuation, intention is to provide this feature within the main gyratory section of the scheme.

10.6.2 Further investigation has determined no land acquisition for attenuation will be required.

10.6.3 The proposed scheme outfall is by way of the existing pipework and ultimately to a watercourse.

10.6.4 The construction process has the highest risk of significant environmental impact on receiving surface waters as described above. Provided reasonable precautions in line with the EA's recommendations are incorporated from an early stage of the construction, adverse impacts resulting from this aspect of the site development will be negligible. Provision of settling ponds will allow the suspended solids to settle and can remove the majority of silt particles. Carefully planned and controlled de-watering of the site following rain can help to minimise effects on the surrounding areas. Provided these steps are taken to prevent silt laden site run-off water from reaching the receiving watercourses any adverse impact of the construction process in this respect should be negligible.

10.6.5 Appropriate storage and security of fuel/oil and construction materials. The requirement to consult with the EA will be included in all contracts relating to the site. Established practice is to locate fuel tanks within a bonded enclosure, providing 110% of the capacity of the tank, at a reasonable distance (min 10m) from any watercourses. The additional volume allows for some rainwater accumulation, which will be removed to a suitable disposal point on a regular basis. The security of filling, delivery and other valves and pipes will be ensured. The duration of storage on site will be kept to a minimum.

10.6.6 Additionally wheel cleaning at the egress from the site should prevent mud being spread onto the existing road and therefore into the existing drainage system.

10.6.7 Provided reasonable steps are taken to prevent site material spreading beyond the existing site limits, any adverse effects from this operation will be slight to negligible and of short duration.

10.6.8 Attenuation of flows into existing watercourses will be achieved by use of underground storage facilities.

10.7 Residual Impacts

10.7.1 Surface waters will receive run-off from the scheme for a long period. Limiting discharges from the completed scheme to the watercourses are to be agreed with the Environment Agency and or the Land Drainage Authority as appropriate. These discharges will be consented and a discharge standard retained. Therefore, the residual impact for surface waters is considered negligible. Similarly, it is not expected that there will be any residual impact on groundwater.

10.8 Summary

10.8.1 Proposed scheme drainage is to be dealt with within the site confines with a sustainable urban drainage system.

10.8.2 It is intended to renew / protect existing pipework crossing the line of the new highway.

10.8.3 The main carriageways will be drained by use of combined drainage and kerb blocks and road gullies where required.

Environment Agency

Flood map for planning

Your reference	Location (easting/northing)	Created
DODWORTH ROAD	**432754/406267**	**5 Jun 2018 10:13**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

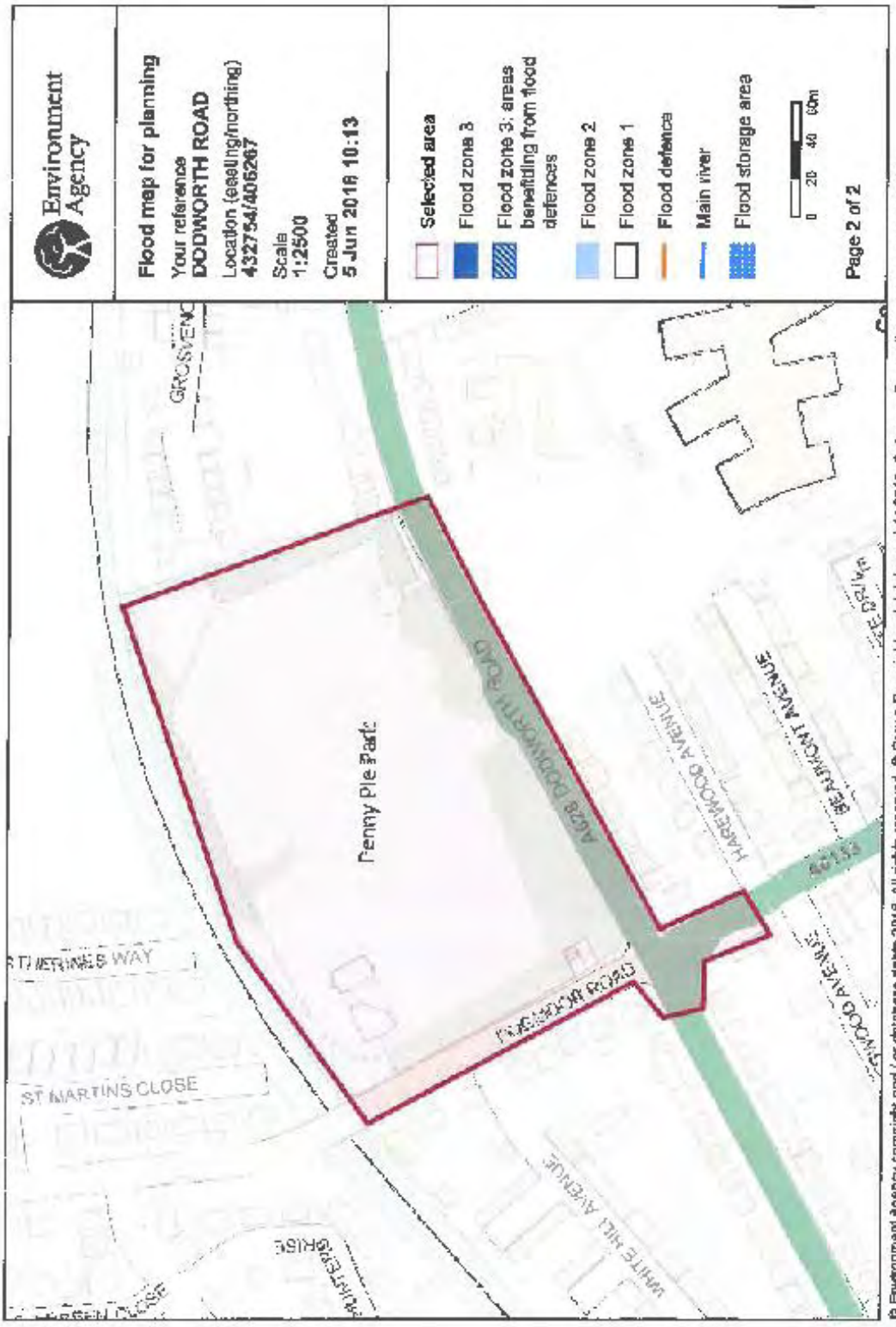
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- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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Environment Agency
Flood map for planning
Your reference
DODWORTH ROAD
Location (easting/northing)
432754/406267
Scale
1:2500
Created
5 Jun 2018 10:13
Selected area
Flood zone 3
Flood zone 3; areas benefitting from flood defences
Flood zone 2
Flood zone 1
Flood defence
Main river
Flood storage area
0 20 40 60m
Page 2 of 2
Penny Pie Park
A628 DODWORTH ROAD
ST MARTINS CLOSE
HAREWOOD AVENUE
WHITE HILL AVENUE
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