



FLOOD RISK ASSESSMENT

FOR

**WOODHEAD ROAD,
BROCKHOLES, HONLEY**

ON BEHALF OF

**MILLER HOMES
(YORKSHIRE) LIMITED**



ARP ASSOCIATES

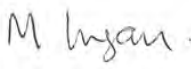
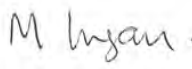
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Flood Risk Assessment for Woodhead Road, Brockholes, Honley

425/58r5h

Revision/Date	Revision F 7 th Mar 2022	Revision G 8 th Mar 2022	Revision H 8 th Mar 2022
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CONTENTS

	Page
1.0 Introduction	4 - 5
2.0 Site Description	6 – 10
3.0 Consultation	11 – 15
4.0 Material Consideration in Respect of NPPF and PPG	16 – 25
5.0 Consideration of Environment Agency Comments	26 – 32
6.0 Flood Mitigation	33 – 34
7.0 Groundwater Management	35 – 37
8.0 Summary	38 - 40

APPENDICES

Appendix A	Site Location Plan
Appendix B	Topographical Survey
Appendix C	Environment Agency Consultation
Appendix D	Water Authority Consultation
Appendix E	Lead Local Flood Authority Consultation
Appendix F	Development Proposals
Appendix G	Surface Water Features
Appendix H	Surface Water Flood Risk Overlay
Appendix J	Environment Agency Data Assessment
Appendix K	Borehole Decommissioning Plan
Appendix L	Borehole Decommissioning Plan

1.0 INTRODUCTION

- 1.1 Miller Homes (Yorkshire) Limited is proposing to develop a site on land off Woodhead Road, Brockholes, Honley, with residential dwellings. The site is over one hectare in size and is classed as Major Development by the Lead Local Flood Authority (LLFA), and a Flood Risk Assessment (FRA) is therefore required to support the planning application.
- 1.2 It is within the general development strategy of the country for development in areas where there is a risk of flooding to be assessed to avoid unacceptable impacts upon the proposed development itself and flood risk elsewhere. Under the National Planning Policy Framework (NPPF) (Communities and Local Government; August 2021) and the associated Planning Practice Guidance (PPG) (Communities and Local Government; July 2021), a Flood Risk Assessment Report should be prepared to consider the risk of flooding from all potential sources and make recommendations for any necessary flood mitigation measures.
- 1.3 ARP Associates have been appointed to implement appropriate consultations, carry out an assessment of the site, and prepare a Flood Risk Assessment Report, in accordance with the requirements of NPPF, to satisfy the requirements of the Planning Authority.
- 1.4 ARP Associates has undertaken previous commissions on this site, and the work included Regulatory Authority consultations, site visits, data assessment and production of this Flood Risk Assessments and Geotechnical reports. This information has been utilised in the formation of this current report where appropriate. During 2021 and early 2022 the FRA was updated a number of times to address comments received by the Developer and Regulatory Authorities, and take account of a revised masterplan.
- 1.5 Comments have been received from the Environment Agency (EA), dated 11 February 2022, based on the previous version of this FRA (425/58r5e dated 7th Jan 2022). The EA comments advised that new model information was available for the area, and requested that the FRA was updated to take account of this information. During February 2022 the EA were therefore consulted upon to request the up to date model information. This FRA now takes account of

the recent model information, and information and commentary relating to the previous “out of date” information has been removed from this updated FRA.

- 1.6 Similarly, additional consultation has been undertaken with the LLFA and the findings are now reflected within this FRA. For simplicity, queries which the LLFA previously raised that have since been addressed are no longer covered in the previous level of detail within this update to the FRA.
- 1.7 It should be noted that the granting of planning permission does not guarantee the availability of flood insurance for new development. The Client is advised to contact their insurers or the Association of British Insurers, to seek advice prior to considering development in any area which may be at risk of flooding.
- 1.8 The report has been initially prepared for the use and reliance of the Client only. The report shall not be relied upon or transferred to any other parties without the written agreement of ARP Associates. For the avoidance of any doubt, where ARP Associates enters into a letter of reliance for the benefit of a third party, that third party will be permitted to rely on the report. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party without ARP Associates consent.
- 1.9 Attention is drawn to the requirements of the Construction Design and Management Regulations 2015, and in particular, the duties and obligations of the Client.

2.0 SITE DESCRIPTION

General

- 2.1 The site, which is centred on Ordnance Survey Grid Reference 414747, 411145 is located on the land adjacent to Woodhead Road, Brockholes, Honley. The site is just south of Huddersfield and the nearest postcode is HD9 7AH.
- 2.2 A site location plan is presented in Appendix A.
- 2.3 The application site is an irregular shaped piece of land and is approximately 8.25ha. It is greenfield, and due to topographical constraints, existing vegetation and ecological constraints, the site is not considered to be fully developable. This is discussed later in the report.

Current Use

- 2.4 The proposed development site comprises arable fields and vegetated areas. No particular farming activities were noted during site investigations.

Boundaries

- 2.5 The site boundaries are generally formed by dense tree lines, bushes and vegetation, dry stone walling and several fences. The proposed development is effectively split into two parcels of land due to the irregular shaped boundary and the location of an existing access track, Smithy Place, which crosses the site. One parcel is located to the north of Smithy Place which is separated by a dry stone wall and a row of mature trees. To the south, the second parcel is also split into two by a dry stone wall.
- 2.6 The site abuts Woodhead Road along the full extent of the western boundary. The site is considerably lower than the road at this location. A retaining embankment runs along the

western boundary, and beyond this to the west is Woodhead Road, at a higher level than the site. The site is bisected roughly east-west by Smithy Place which therefore forms part of the site boundaries in this location, which is towards the south of the site. Smithy Place is partly open to vehicular traffic at the eastern end providing access to residential properties to the east of the site. The remainder of Smithy Place provides pedestrian access along its length, and has a tarmac surface in places with unbound stone for the remainder. The far southern site boundary is against property boundaries of residential dwellings served from Haggard Lane. This joins with Smithy Place Lane, which forms part of the south eastern boundary, and this in turn joins with Smithy Place, described above.

- 2.7 The eastern site boundary is formed by a natural earth embankment and vegetation surrounding the River Holme with the main residential area of Brockholes beyond. The River Holme is considerably lower than the site itself. The embankment drops sharply down to the river along this boundary. The northern boundary partly follows the outlines of neighbouring commercial and industrial properties, with Allsops sheet metal contractor bordering the north-eastern boundary. A commercial development, PA Welding, bisects part of the northwest of the site but is not within the redline boundary of the site. A dense wooded and vegetated area forms the remainder of the northern boundary between these adjacent commercial properties.

Topography and Vegetation

- 2.8 The site falls prominently in a north-eastern direction towards the River Holme, with a steep slope down to the river, which is in a deeper cutting. In the southeast corner, the site is approximately 1m to 2m higher than the adjoining land. Along the western boundary, the site is approximately 4m lower than Woodhead Road.
- 2.9 A copy of the topographical survey information for the site is presented in Appendix B. This survey was originally undertaken in June and additional areas were surveyed and added during October 2021. It shows that there is significant level difference across the site, falling generally to the northeast, towards the River Holme. Along the western boundary there is a

highway retaining wall and embankment where levels rise up approximately four metres to meet Woodhead Road. The highest levels on site are at the southwestern corners, where levels are approximately 137m Above Ordnance Datum (AOD) at the top of this embankment. Levels in the northwest corner are around 126m AOD. Levels are approximately 129m AOD towards the south east boundary of the site. Along the eastern side of the site, there is an embankment (a natural feature) which falls down to the River Holme, with levels along the top of the embankment ranging between approximately 116m AOD – 108m AOD. Measured from southwest to northeast, an indicative existing gradient across the site would be approximately of 1 in 14, with a range of around 25m level difference. The water level in the river on the day of the topographical survey was between approximately 103.9m AOD and 106.3m AOD. Almost 70m of wall is present close to the river, up to a few metres in height in places. This is towards the centre of the eastern site boundary, north of Smithy Place.

- 2.10 Vegetation on the site is generally rough grassland. Extensive mature vegetation in the form of bushes, shrubs and mature trees are located along all boundaries. Rows of mature trees also follow the alignment of Smithy Place. Several sporadically located trees are also present within the development.

Hydrology

- 2.11 The River Holme is present to the east of the site. It is classified as a Main River by the Environment Agency. On the day of the topographical survey, the water level was recorded as being approximately 9m lower than the site at the south eastern site corner of the site. Close to the north-eastern boundary the water level was recorded as being 104.128m AOD.
- 2.12 A small water course was conjectured to be located perpendicular to Woodhead Road in the west of the site. This was shown on the 1892 historical Ordnance Survey Maps. Subsequent intrusive investigation has not found any evidence of any watercourse or culvert, and it has been agreed with the LLFA that there is no evidence of such. This, location corresponds to an area where an abandoned water well is located (also shown on the 1892 maps). This well was located during the intrusive investigation, and was shown to have water flowing from it.

Further investigation and descriptions are detailed within a Stage 2 Geo-Environmental Report prepared by ARP Geotechnical Ltd (reference MLR/07r4, dated March 2021)

Existing Drainage

- 2.13 The site is greenfield and no formal drainage is currently known of within the site.
- 2.14 It is likely that surface water currently falling within the development site would infiltrate to some degree, with the remainder of the surface water following the topographical trend and outfalling into the River Holme.
- 2.15 Yorkshire Water public sewer records (Appendix D) indicate that there are no Yorkshire Water (YW) assets within the site or within Woodhead Road. A 225mm diameter public combined sewer is present in Banks Road to the west of Woodhead Road. There are public sewers serving the properties to the south east of the site within Smithy Place and Smithy Place Lanes, including both combined and surface water sewers. The majority of the flows discharge through a 225mm diameter combined sewer which crosses the River Holme and joins the combined system to the north east of the site and north east of the River Holme. Only properties numbered 6 and 7 Smithy Place Lane are shown to have an alternative outfall, where the public surface water sewer associated with these properties is shown to have a connection into the River Holme.
- 2.16 There are gullies within Woodhead Road to the west of the site, which suggests that a highway drainage system is present. A dye test has been undertaken which indicated that the system is located within the highway corridor and does not enter the site or drain into the site. There is no indication that any gullies outfall into the site. This will be confirmed by CCTV test in due course, which will provide further confirmation of the line and condition of the drainage system. Appropriate remediation measures will be put in place, to the satisfaction of the Regulatory Authorities, to ensure the highways drainage system operates satisfactorily.
- 2.17 As part of previous site assessments, historical maps have been reviewed. The historical plans show an open channel, Mill Race, running through the site from a Mill Pond located to the

north. Part of this section is still visible on the 1955 plans with the outfall section still showing on modern day plans. An existing well and open section of ditch are shown adjacent to Woodhead Road.

2.18 A historical Mill Race with sluice outfalls into the River Holme along the north-eastern boundary.

2.19 Methods to mitigate any flood risk associated with the existing drainage and hydrological features are discussed throughout this report.

3.0 CONSULTATION

Environment Agency

- 3.1 As noted in Section 1 of this report, the Environment Agency (EA) have been consulted a number of times in relation to the planning application for which this Flood Risk Assessment relates to. This updated FRA focusses primarily on the latest updated model information provided by the (EA), which is referenced RFI/2022/250884 and was received on 24th February 2022. In addition to the revised modelling results, the remainder of the Product 4 data was provided under ref RFI 212220 and dated 1st July 2021. Publicly available Environment Agency (EA) data has also been reviewed for reference and extracts from relevant online flood risk mapping and information from both consultations referenced above is included in Appendix C.
- 3.2 The Environment Agency flood map for planning show areas of land that could flood from rivers or the sea and are shaded blue. These areas do not take into account defences, as water can overtop them or the defences can fail in extreme conditions. The Zone classifications are:-
- 3.2.1 Flood Zone 1 - "Low Probability" is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (less than 0.1%).
- 3.2.2 Flood Zone 2 - "Medium Probability" is assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding in any year (1% - 0.1%) and between a 1 in 200 and 1 in 1,000 annual probability of flooding from the sea (0.5% - 0.1%).
- 3.2.3 Flood Zone 3 - "High Probability" is assessed as having a 1 in 100 or greater annual probability of river flooding in any year (greater than 1%) and a 1 in 200 chance or greater annual probability of flooding from the sea (less than 0.5%).

- 3.3 The Environment Agency flood map shows that the site is within Flood Zone 1.
- 3.4 The Environment Agency surface water flood map shows areas where surface water only would be expected to flow or pond in England and Wales. The classifications of risk for surface water flooding are as follows:-
- 3.4.1 Very low - This area has a chance of flooding of less than 1 in 1000 (0.1%) in any given year.
- 3.4.2 Low - This area has a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%) in any given year.
- 3.4.3 Medium - This area has a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%) in any given year.
- 3.4.4 High - This area has a chance of flooding greater than 1 in 30 in any given year (annual probability of flooding 3.3%).
- 3.5 The Environment Agency Risk of Flooding from Surface Water map suggests that the majority of the site is at a 'very low' risk of flooding from surface water. However, a small area of the site to the west of Smithy Place is highlighted as being at 'high' risk of pluvial flooding, and the mapping shows that there is a 'low' risk of pluvial flooding in three narrow bands across the site, following the topographical trend of south to north.
- 3.6 The Environment Agency's online Flood Risk from Reservoirs map has also been reviewed as part of this study. This mapping shows the expected inundation area should a reservoir fail and release its capacity. Part of the eastern side of the site, closest to the River Holme, is located in an area shown to be at risk of flooding from this source.

Water Authority

- 3.7 Consultation was undertaken with Yorkshire Water, which is the Water Authority for this area, and a copy of the response, reference X005534 dated 16th April 2021 is presented in Appendix D for reference.
- 3.8 Yorkshire Water records suggest there are no public sewers within the site. However, it is noted that, due to the change in legislation in October 2011, there may be public sewers within the site boundary which are not recorded on the statutory sewer map, the presence of which should be taken into account in the design of the site.
- 3.9 It is noted that development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the point of discharge to be agreed.
- 3.10 It was confirmed that foul water domestic waste from the proposed development can be discharged to the 150 / 225mm diameter public combined sewer recorded in Smithy Place or Smithy Place Lane. The pumped rate should not exceed 5 (five) litres / second.
- 3.11 It is understood that surface water will discharge to the River Holme located to the east of the site. The Water Authority confirmed that this appears to be the obvious place for surface water disposal (if SuDS are not viable) and while they have no objection to this they cannot agree the rate as it is not discharging to a Yorkshire Water asset.
- 3.12 Yorkshire Water note that further restrictions on surface water disposal from the site may be imposed by other parties. The Water Authority strongly advise the Developer to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Lead Local Flood Authority

- 3.13 Consultation with Kirklees Council, which is the Lead Local Flood Authority (LLFA) for this area, has been undertaken. A copy of the response received, dated 28th April 2021 is presented in Appendix E for reference.
- 3.14 Within the April 2021 response, the LLFA advised there are earlier applications on the Kirklees Planning Applications web site which include detailed negotiations on flood routing in particular. It was noted there is a watercourse/land drainage system that has been identified on site which will need to be incorporated into the layout and will be a constraint.
- 3.15 In terms of surface water attenuation, if the 1 in 100 year event is stored then the LLFA policy is a requirement for a 30% climate change allowance to be considered. No urban creep allowance is required when storing the 1 in 100 year event below ground.
- 3.16 The LLFA confirmed greenfield rates are set at 5l/s/ha for the developable area. They stipulated that there was to be strictly no double counting of landscaped areas to remain around the fringes of the built area, or gardens falling away from the main development. If retaining walls are proposed with drainage behind them that landscaping and gardens need to be removed out of the equation.
- 3.17 The LLFA advised that the design will likely need some perimeter drainage and to pick up the watercourse in a separate drain with a separate outfall.
- 3.18 The exact discharge rate cannot be confirmed until a drawing demonstrating the developable area is provided for the LLFA to scrutinise.
- 3.19 It was also stated that the LLFA would seek clarification that the southern parcel can drain by gravity to the main site.

- 3.20 The LLFA provided further consultation following the initial planning application, and a copy of their response, dated 12th July 2021, is included in Appendix E. A summary of the comments is provided below:
- 3.20.1 The surface water flood risk maps (3rd generation 1 in 100 and 1 in 1000 events) should be superimposed over the layout maps, to clearly identify the risk involved rather than rely on narrative.
 - 3.20.2 All photographs of the watercourse entering the site from under Woodhead Road, including discovered troughs etc., previously submitted, should be packaged together in updated Flood Risk Assessment. The location should be clearly shown on a plan. A discussion with the LLFA should then take place.
 - 3.20.3 All flood routing, from road and field run off entering the site (including the new entrance) should be followed through avoiding property and curtilage, utilising the road network and public open space.
 - 3.20.4 An exceedance event affecting the attenuation should be examined although the LLFA do not foresee a problem with this aspect.
 - 3.20.5 Contours for roads indicate that area around various properties will be problematic. A discussion with the LLFA prior to resubmission is advised (plots 115,26,95,37,69,70 are examples of further analysis including the effects of road humps. High and low spots should be clearly identified).
 - 3.20.6 The EA will need to comment on flood risk from the river Holme and the former mill race.
 - 3.20.7 A more detailed assessment of built area, not double counting landscaped areas falling away from mains drainage was requested at pre-app to justify and agree final discharge rates. The applicant is reminded that although infiltration is not advisable on this site, SUDS as treatment for water quality should be assessed given that SUDS can now be adopted by the Statutory Undertaker.
- 3.21 In addition to the above consultations, a number of emails, phone calls and online meetings have taken place with the LLFA. The findings of these are summarised within this report as necessary.

4.0 MATERIAL CONSIDERATION IN RESPECT OF NPPF AND PPG

Flood Classification

- 4.1 The Environment Agency Flood Map for Planning has identified that the site falls within land assessed as having less than a 1 in 1000 (0.1%) annual probability of river flooding. In accordance with Table 1 of the PPG, the site falls within Flood Zone 1, "low probability".

Proposed End Use

- 4.2 The development proposals for the site are for the construction of residential units with associated access roads and landscaping areas. The current proposal is for 137 properties. The indicative development proposals are illustrated in the Proposed Site Plan in Appendix F.
- 4.3 When applying Table 2 of the PPG, the flood risk vulnerability classification shows that the proposed end use is considered to be "More vulnerable" development under the general designation "Buildings used for dwelling houses".

Sequential Test

- 4.4 As set out in the NPPF, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. As the development site is located within Flood Zone 1, the Sequential Test is considered to be passed.

Exception Test

- 4.5 When the proposed development is evaluated in accordance with Table 3 of the PPG, is determined that there is no requirement to apply the Exception Test to "More Vulnerable" development in Flood Zone 1.

Flood Sources

- 4.6 Flooding from the Sea - The site is not located near enough to the sea to be at risk of flooding from this source.
- 4.7 Flooding from Rivers - The site is located in Flood Zone 1, suggesting a 'low' probability of flooding from rivers. The River Holme is present to the east of the site. It is classified as a Main River by the Environment Agency, and is topographically lower than the site. The site is not shown to be at risk during the present day 1 in 100 year or 1 in 1000 year flood events shown on the online Flood Map for Planning provided on the Environment Agency website. Flood water is shown to be retained in the deep channel in these scenarios, and therefore the site is not considered to be directly at risk from this source.
- 4.8 Flooding from Land - The Environment Agency Risk of Flooding from Surface Water map suggests that the majority of the site is at a 'very low' risk of flooding from surface water. However, a small area of the site to the west of Smithy Place is highlighted as being at 'high' risk of pluvial flooding, and there is a low risk of pluvial flooding in three narrow bands across the site.
- 4.9 To inform further assessment of this risk, as requested by the LLFA, plans have been prepared to show the risk of flooding from surface water based on the existing site topography, overlaid on the proposed site layout. The plans show the predicted flood depth bands for each of the three surface water flood risk scenarios. The plans are presented in Appendix H for reference purposes. It must be noted that the plans have been prepared for spatial comparison of these features and are not representative of the post-development flood risk to the site.
- 4.10 From the plans in Appendix H it can be seen that the small area at 'high' risk of pluvial flooding to the west of Smithy Place is expected to flood to a depth of up to 600mm in the 'low', 'medium' and 'high' risk scenarios. Review of the topographical survey confirms that this area of risk is likely to occur as a result of surface water 'ponding' close to the track and retained levels in this location. The area in question is to be developed as part of the

proposals and will be subject to detailed design and surface water exceedance assessment. As such, the proposed levels in this location will be changed by development of the site, with a formal surface water drainage system provided to manage runoff in this area. On this basis ponding in this area would not be expected in the post-development scenario.

- 4.11 From the plans in Appendix H it can also be seen that the 'low' risk of pluvial flooding, in three narrow bands across the site, follows the topographical trend of the land from south to north, and that these areas are shown to be expected to be less than 150mm in depth. Again, it is expected that the flood risk from this source can be mitigated through development of the site, with a formal surface water drainage system provided to manage runoff in this area, and any residual overland flows accommodated in the design of external works and exceedance flow routes. Therefore, flooding from this source is considered to be at an acceptable level of risk.
- 4.12 Flooding from Groundwater - Flooding from groundwater can happen when groundwater levels are high. This may be due to rainfall in the groundwater source area, conduit flow from artisanal sources, and, on floodplains if river levels are held above the level of the flood plain by embankments.
- 4.13 A Stage 2 Geo-Environmental Report has been prepared by ARP Geotechnical Ltd (reference MLR/07r4, dated March 2021). The report provides much detail regarding groundwater emergence within parts of the site and should be referred to for detail regarding groundwater, although the primary details are summarised below. The report states trial pits and windowless sample boreholes were undertaken and that across the southern and eastern areas of the site, slight groundwater seepages were recorded in TP4 (2016) below 3m depth only. However, in the western parcel of land, water seepages were encountered at most locations, with moderate to heavy flows recorded locally.
- 4.14 The intrusive component of the site investigation was undertaken in February 2021 in a week where there had been minimal rain fall. Regardless of this, the western half of the site was noted to be waterlogged. The topsoil was heavily saturated with areas of standing water present. There were several small clusters of reeds in this area indicating that these ground

conditions were common. It was noted that the surface water run-off from the western parcel of land flows towards woodland beyond the north-eastern boundary. There was no evidence of saturated topsoil or standing water within the southern or eastern parcel of land.

- 4.15 Near the northern boundary, water appeared to be emerging at the surface from a hole in the ground (anecdotal evidence suggests it may have been a historical third party borehole). The water then flowed along the surface steadily north-eastwards towards a wooded area beyond the site boundary, where significant water was present at the surface. A neighbour suggested that the presence of significant surface water in this parcel of land is only a recent issue (as in from the past few years).
- 4.16 There are also historical records suggesting that a well was present in the west of the site and a strip of topsoil was undertaken towards the boundary with Woodhead Road to locate this feature. An area of water emerging was located in this general area. It is suspected that this is the historical well. This feature has not been capped. It is recommended that this be capped in accordance with the EA's guidelines on capping water wells. Further details are provided in this document on how to manage this feature. A small in ground storage trough is associated with this feature. This trough is at the end of a well-run, approximately 50m away that has over time been left to turn into a small overflow run of water. This overflow of water is often mistaken as a small watercourse entering the site off Woodhead Road, however, site investigation has confirmed it is an unnatural feature emanating from the suspected well.
- 4.17 It was also noted that water was present, emerging from under the boundary wall along Woodhead Road. In places the water was flowing from what is assumed to be a highway gully. There was also a point of emergence which corresponds with a crack found in the sewer that runs under Woodhead Road. It has been assumed that this water is not a groundwater emergence, as it ties to surface water features. However, it is noted that this water is likely soaking into the ground in this area, increasing the general ground water levels.

- 4.18 The intrusive investigation looked for evidence of adverse effect from the old mill sluice in the east of the site. There was no evidence that this was still in place or that this was causing any increase in ground water flow or ground water ingress to the site or to the river.
- 4.19 Supplementary discussions with the LLFA have been undertaken, gaining a shared understanding of the routing and mechanisms. Consensus has been agreed with the LLFA that the groundwater and subsequent surface water will be best managed through detailed design of external works and exceedance flow routing, such that the water will be able to continue to flow through the site in a specific and controlled manner. A cut off/ filter drain is proposed to intercept flow and convey the groundwater through the site to outfall into the River Holme, and this arrangement is indicated on ARP Associates exceedance flow design drawings, shown on 0425-58-10.01 Flood Exceedance Route 01 and 02. These drawings are included in Appendix L for reference.
- 4.20 A plan has been prepared to illustrate the various water features noted above, and this is presented in Appendix G. The plan, titled “Water Features Plan” and referenced MLR/07, includes photographs of the water features noted during the site visit. It references a more comprehensive photographic record of the surface water features and demonstrates the locations of the photographs, as requested by the LLFA. The photographs are collated in a document called “Surface Water Features Photo Record”, which is also presented in Appendix G.
- 4.21 Based on the above, a risk of high groundwater and potential groundwater flooding at the site cannot be ruled out. However, the implementation of a robust surface water drainage strategy and ground water reduction strategy with the appropriate design of external levels and drainage will mitigate these risks to an acceptable level.
- 4.22 Flooding from Sewer - There are no public sewers within the site. Based on the topography of the site, any flooding which occurred from the existing sewers within in Banks Road, Smithy Place and Smithy Place Lanes would not be expected to impact upon the proposed development. On this basis the risk of flooding from existing sewers is considered low.

- 4.23 It is possible that any blockage of the on-site drainage system will result in flooding from the lowest cover level of manholes or gullies. This will need to be considered as part of any proposed development.
- 4.24 Flooding from Reservoirs, Canals or Artificial Sources - The Environment Agency produce maps which show the expected inundation area should a reservoir fail and release its capacity. Part of the eastern side of the site is shown to be in an area at risk of flooding from this source. The area at risk shown on the reservoir flood mapping does not rise above the top of the earth embankment present along the eastern side of the site. No development is proposed in this area. Additionally, it should be borne in mind that the chance of such an event occurring is extremely low.
- 4.25 There are no further canals or artificial sources located near to the site. Therefore, the risk of flooding from this source is deemed to be low to the vast majority of the site, and at an acceptable level of risk for the far eastern part of the site where no civil infrastructure is proposed.

Climate Change

- 4.26 NPPF requires that the projected impacts of climate change are taken into account over the lifetime of a development. The NPPF and PPG have indicated that the Global sea level will continue to rise, depending on greenhouse gas emissions, and the sensitivity of the climate system and there will be an increase in river flows and rainfall across the country. United Kingdom climate change guidance was most recently revised in July 2021. Recommended allowances for assessment are set out in Environment Agency publication 'Flood risk assessments: climate change allowances'.
- 4.27 Impact on River Flooding - With regards to peak river flows, a regionalised approach has now been adopted to climate change impacts based upon the management catchment of the proposed development site, the flood risk vulnerability of the proposed development and the present-day Flood Zone classification.

- 4.28 The proposed development site is situated within the Calder and Aire management catchment of the Humber river basin district. An applicable allowance for sites in Flood Zone 1 is not specifically given by the current Environment Agency guidance, however it requires the central allowance to be applied to “more vulnerable” development proposed in sites within Flood Zone 2 and 3a. Therefore, it is reasonable that the impacts of the “central” climate change scenario (50th percentile of potential scenarios) should be considered with respect to the proposed development, as a conservative approach to assessment. Based on the “central” climate change scenario, peak river flows could be expected to increase by 23% by 2115.
- 4.29 As the development is located entirely within Flood Zone 1 and will be topographically higher than the present-day flood extents, although an increase of 23% on the 1 in 100 year flows in the watercourse is most likely to result in a higher 1 in 100 year flood level in the future, it is deemed unlikely to affect the proposed development due to the depth of the watercourse below the developable site area. This is supported by the modelled flood data provided by the Environment Agency (Appendix C) which is discussed further in Section 5 to address specific comments provided by the Environment Agency. In the absence of 23% climate change allowance, the more onerous application of 30% has been used for design and mitigation purposes when considering finished floor levels.
- 4.30 Impact on Rainfall Intensity - In accordance with the revised climate change data, the published figures show that for an expected development life of greater than 50 years, the anticipated increase in rainfall intensity could range from 20% to 40%, subject to the location within the country.
- 4.31 At this stage the outline surface water drainage strategy (discussed further below) has been defined with respect to a 30% allowance, as per the requirements of the LLFA.

Surface Water Drainage

- 4.32 It is a requirement of the NPPF to ensure that surface water run-off from any proposed development has negligible consequence on downstream areas either in terms of impact upon downstream sewer capacity or flood risk impacts due to discharge to a watercourse. The existing and proposed surface water run-off is considered below.
- 4.33 Existing Surface Water Run-off - As set out above the land is arable and appears broadly unused with no known formal drainage system in place. It is likely that surface water currently falling within the development site would infiltrate to some degree, with the majority of the surface water following the topographical trend and outfalling into the River Holme.
- 4.34 The site is considered to be 'greenfield'. A plan which demonstrates the net developable green field run-off area has been prepared by ARP Associates, reference 425/58/SK13. This shows the existing greenfield run-off area to be 4.99ha. For the purpose of defining an appropriate rate of discharge from the proposed drainage system, the LLFA have agreed to the principle of utilising 5l/s/ha of developable area. Following discussion regarding the above calculations, the LLFA confirmed that 25l/s is an acceptable proposed discharge rate from the development. The drawing is included in Appendix L for reference.
- 4.35 Proposed Surface Water Runoff Destination - The proposed means of managing surface water runoff from the proposed development has been considered with respect to the hierarchy set out in Building Regulations Part H (2010).
- 4.36 *Infiltration* – As part of the various site investigations, and as reported in the ARP Geotechnical Ltd Stage 2 Geo-Environmental Report (reference MLR/07r4, dated March 2021), percolation testing was carried out on the site in 2017. The results were highly inconsistent, largely as a result of the variable ground conditions across the site. There was no sustainable and extensive unit with consistently acceptable infiltration rates to support the surface water volumes required. In the light of the unfavourable results, the report advises that the use of

soakaways for surface water disposal is not considered to be feasible for the disposal of surface water on site. The high ground water in the west further confirms that infiltration is not an acceptable primary means of surface water disposal.

- 4.37 *Watercourse* – As infiltration as a primary method of surface water disposal is unfeasible, discharge to a watercourse is considered to be the next option. As set out in Section 2, the River Holme is located to the east of the site. This is considered to be the most practical location for surface water discharge and is agreed in principle with the LLFA and Water Authority. The Environment Agency has specific requirements to allow a future connection into the River Holme. The introduction of any headwalls or works to the River will need the consent of the Environment Agency. It is expected that there will also be a requirement for an eight metre strip to be provided from the top of the river embankment of the watercourse where no development can take place, in order to allow for future improvements or maintenance. With reference to the plan in Appendix J, the proposed development is shown to be outside this 8m extent. The proposed outfall location is also indicated on the plan within Appendix J. It is proposed to set the outfall level of the headwall 600mm above the water level. Based on the surveyed level of 104.138m AOD, the outfall invert would be 104.738m AOD.
- 4.38 *Sewers* - On the basis that surface water is proposed to be discharged to the River Holme, discharge to sewer does not need to be considered. However, foul water is proposed to discharge to the public sewer network.
- 4.39 Proposed Surface Water Drainage - The proposed means of managing surface water runoff from the proposed development is considered within the Foul and Surface Water Drainage Strategy report undertaken by ARP, reference 425/58r6a. The suggested drainage strategy arrangement is indicated on ARP Associates S104 Layout drawings, reference 0425-58-03.01-02 Section 104 Layouts Sheet 01 and 02, included in Appendix L. It is expected that discharging surface water to the River Holme will be the most appropriate measure for discharging proposed surface water. Appropriate flow attenuation and storage will need to be

provided within the site. Detailed calculations and proposals will need to be prepared and submitted to the Planning Authority for approval prior to construction.

- 4.40 Proposed Foul Water Drainage Foul water domestic waste from the proposed development should be discharged to the 150 / 225mm diameter public combined sewer recorded in Smithy Place or Smithy Place Lane. If pumping is required, the pumped rate should not exceed 5 (five) litres / second.
- 4.41 The strategy above is subject to agreement with the Regulatory Authorities.
- 4.42 Further detail on the proposed drainage strategy is given in the ARP Foul and Surface Water Drainage Strategy report (reference 425/58r6) and drawings referenced 0425-58-03.01 Section 104 Layouts Sheet 01 and 02.

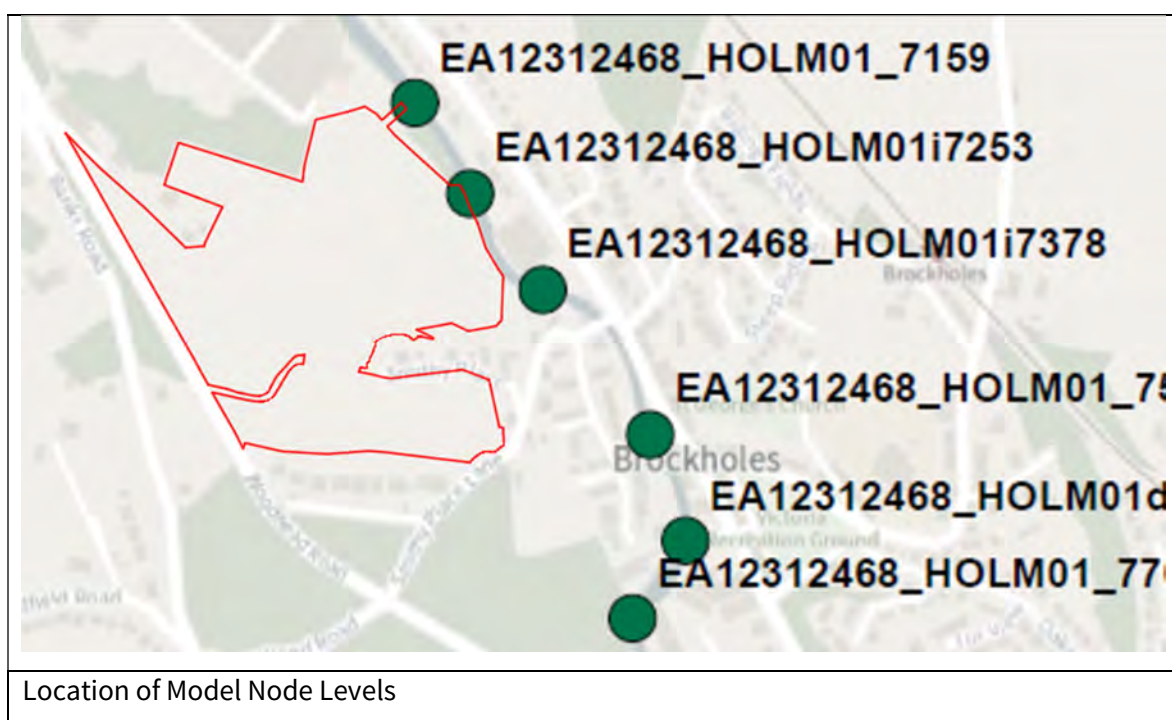
5.0 CONSIDERATION OF ENVIRONMENT AGENCY COMMENTS

- 5.1 As noted earlier with this report, the Environment Agency (EA) have been consulted a number of times in relation to the planning application for which this Flood Risk Assessment relates to. The EA have provided up to date model information, and this section of the FRA now deals primarily with this new data, taking the comments received in turn. This section should be read in conjunction with the plan presented in Appendix J, referenced 425/58/SK12 Environment Agency Data Assessment Layout.

Flood Risk and Finished Floor Levels

- 5.2 The EA advise the following:
- 5.2.1 “the FRA needs to demonstrate in areas of flood zone 1 that finished floor levels (FFLs) are above the 1% plus climate change levels (1% AEP plus CC) to allow for future flood risk”
 - 5.2.2 “the revised climate change allowances published in July 2021 show the allowance for this area is now 23%.
 - 5.2.3 that the flood risk information for the area has been updated, and there are “new River Holme model levels for this area which include the 1% plus 20% and 1% plus 30% climate change levels.”
- 5.3 Therefore, this section of the FRA deals with the following:
- Discusses the new model information,
 - Determines the appropriate model nodes points
 - Defines the new model levels
 - Proposes appropriate minimum finished floor levels based on the EA requirements.
- 5.4 The up to date model information provided by the EA is the 2020 Colne and Holme Flood Mapping Study Model Report, undertaken by JBA Consulting. A Modelled Flood Level Node Point Location Map was provided, showing that in the vicinity of the site there are three model

node points which are appropriate for analysis. The locations of these nodes are shown below.



5.5 The three nodes relevant for analysis are as follows:

Node Reference	Location	Short name for reference
EA12312468_HOLM01i7378	50m Southeast east of plot 90. Furthest upstream.	Upstream
EA12312468_HOLM01i7253	Centre of eastern boundary	Central
EA12312468_HOLM01_7159	North of site, Close to outfall	Downstream

5.6 A summary of the 2020 modelled node levels are below.

Node Points Summary Table

Node Points	HOLM01i7378 (upstream node)	HOLM01i7253 (central node)	HOLM01_7159 (downstream node)
1 in 100	108.87	106.77	106.19
1 in 100+20% CC	109.12	106.98	106.38
1 in 100+30% CC	109.21	107.06	106.45
1 in 100+50% CC	109.41	107.23	106.59
1 in 1000	109.64	107.42	106.75

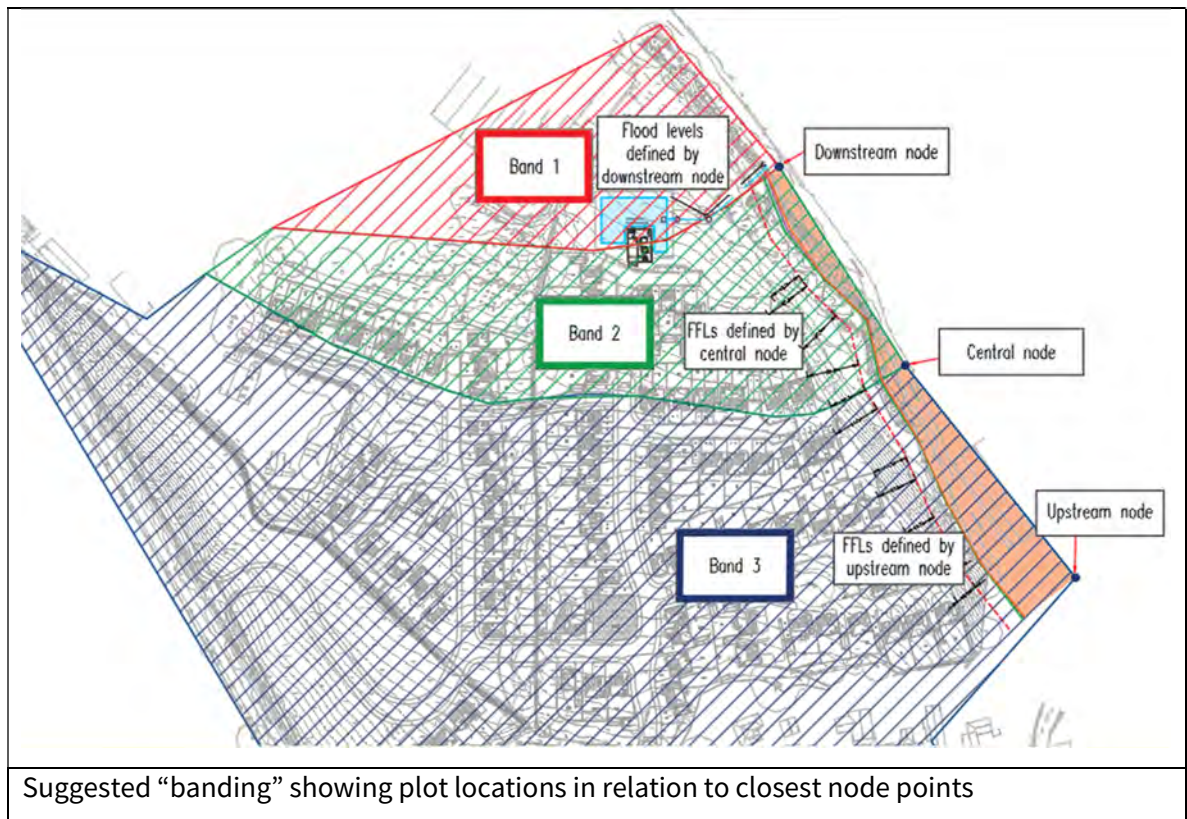
- 5.7 There is no model data provided for the 1 in 100 plus 23% climate change scenario, which is the 23% “central” climate change confirmed by the EA as appropriate for analysis of river flooding. Therefore, the upstream node with 30% climate change modelled has been used. This is a more onerous requirement than 23%, and the location of the upstream node is well placed to form the basis of analysis. Therefore, a 1 in 100 year plus 30% climate change flood levels would be expected to be approximately **107.06m AOD** at the central node, and **109.21m AOD** at the upstream node.
- 5.8 The EA require the minimum finished floor level to be 600mm above the 1 in 100 year flood level plus an appropriate allowance for climate change. In the absence of 23% climate change data, using the 30% climate change data is appropriate.
- 5.9 If a single site wide minimum Finished Floor Level was to be set, then using the upstream node would be most onerous. The level associated with the upstream node (reference EA12312468_HOLM01i7378) for the 1 in 100 plus 30% climate change event plus a 600mm freeboard is 109.81m AOD.
- 5.10 With reference to Appendix J, the lowest proposed FFL on site is currently 110.90m AOD, at Plot 51. This is 1.09m above the suggested minimum FFL defined above. Therefore, it should be noted that the currently designed FFLs for all dwellings are above the 1 in 100 plus 30% climate change event plus a 600mm freeboard of the upstream node. On this basis, the

proposed development dwellings do not negatively impact on the flood risk of the site and are above the design flood level.

- 5.11 These predicted flood levels have been assessed, as indicated on the plan in Appendix J. All proposed dwellings and civils infrastructure are well above the flood levels. On this basis, the proposed development is not at risk from flooding from the river during the 1 in 100 plus 30% climate change event. Therefore the proposed development is not at risk from flooding from the river during the less onerous 1 in 100 plus 23% climate change event.

Additional consideration of Finished Floor Levels

- 5.12 The minimum FFL discussed above is based on the highest upstream node, which gives the most onerous FFL requirement. All dwellings are proposed to be more than 600mm above the upstream node 1:100 plus 30% climate change level. However, due to the length of the site, there are three model nodes present along the eastern site boundary, and it would be appropriate to define minimum FFLs for dwellings based on the nearest nodes. Due to topography, the predicted flood levels vary along the length of the river, such that predicted flood levels and the corresponding required minimum FFL would be lower the further downstream the assessment is undertaken.
- 5.13 Dwellings which are proposed to be located towards the middle of the site are closer to the central node than the upstream or downstream node. Therefore those dwellings should have minimum FFLs set by evaluating the central node. The suggested “banding” of dwellings based on their proximity to the nearest node is shown in the figure below. The banding is determined by following contour lines across the site and using each of the three nodes as a cut-off point.



5.14 As shown above, Plot 68 is just upstream of the central node and Plot 67 is just downstream of the central node. Therefore, this is the suggested cut-off point where the minimum FFL should be evaluated by different nodes. The upstream node should be used for defining minimum FFLs for dwellings south of Plot 68. The banding is shown in more detail in the plan in Appendix J, and summarised in the table below.

Band	Node	Plots
1	Downstream	None. The attenuation tank is proposed in this location.
2	Central	15-27, 46-67
3	Upstream	All other plots (1-14, 28-45, 68-137)

Compensatory Storage

- 5.15 The EA confirmed that the FRA needs to assess if development of the site results in any loss of storage up to and including the 1% AEP plus CC level. The EA confirmed a requirement to demonstrate there is no loss of storage in the 1% plus climate change scenario. The future flood risk due to climate change is discussed above demonstrating that the 1 in 100 year plus 30% climate change flood level may be up to 109.21mAOD , using the upstream node. The flood levels associated with the downstream node would be appropriate for the far northern part of the site.
- 5.16 With reference to Appendix J, the attached plan shows clearly the modelled flood event extent. This shows only the outfall headwall and incoming pipework extend beyond this modelled flood extent. There are no changes to existing ground levels within the 1 in 100 year plus 30% climate change flood extent.
- 5.17 The development plans confirm there will be no re-profiling of land which would result in loss of storage. It is therefore considered that compensatory storage is not required on this scheme.

Distance from Main River

- 5.18 The EA advise that the FRA needs to indicate that the level of the natural high ground will not be altered through development of the site, and that an Environmental Permit will be required from the EA for activities within 8 metres of main river or the flood defence. The latest site masterplan is presented in Appendix F and shows the properties along the eastern boundary of the site in relation to the River Holme. An additional sketch has been prepared to assist with visualising the proximity of dwellings to the river boundary. This is included in Appendix J, and additional elements are discussed below.

5.19 The Asset Map indicates an asset in green, ref “27984” on the south side of River, the north side of site. The 3rd Party Defence information confirms this is “High Ground”. No level information is available.

5.20 It is noted that the closest plots to the River are Plots 51, 67, 68, 87 and 90. These plots are listed in order from lowest existing ground (in the north), to higher ground towards the south. As such, Plot 51 is also the dwelling with the lowest proposed Finished Floor Level (FFL). The table below shows the approximate distance of the dwellings from the 8m stand off from the 1 in 100 plus 30% flood extent.

Plot Number	Distance between Plot and 8m stand-off from 1:100 plus 30% climate change flood extent
51	20.6 metres
67	22.6 metres
68	21.0 metres
87	17.8 metres
90	10.1 metres

5.21 If the maximum extent of flooding during the 1 in 100 year event plus 30% allowance for climate change is regarded as the top of bank, the nearest built development is approximately 18m from top of bank, close to Plot 90. Therefore, there is no development within 8m of the bank.

6.0 FLOOD MITIGATION

6.1 The site falls within Flood Zone 1, and the risk from the majority of sources has been assessed as being low. However, there is a need to consider the potential future fluvial flood levels (due to the potential impacts of climate change), a requirement to consider topography of the site in terms of the potential for surface water to enter buildings, and a potential risk of groundwater flooding has been identified which requires mitigation. The following precautionary mitigation measures are, therefore, recommended:-

- 6.1.1 As above, it is recommended that the minimum Finished Floor Levels should be set at or above the 1 in 100 year plus 30% climate change flood level plus 600mm. For plots north of the central node, this level is based on the central node, and is 107.66m AOD (applied to Plots 15-27 and 46-67). For plots south of the central node, this level is based on the upstream node and is 109.81m AOD (this applies to all other plots).
- 6.1.2 The finished floor levels of buildings shall be raised above general external levels by a minimum of 150mm.
- 6.1.3 The proposed dwellings shall be designed without any basements and the proposed ground floors shall comprise solid concrete slabs or beam and block floors with screed construction.
- 6.1.4 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper levels.
- 6.1.5 A sustainable surface water drainage system shall be provided to manage surface water run-off from the site itself up to the 1 in 100 year plus climate change event (see further details below).

- 6.1.6 External levels should be designed with falls to direct overland flows away from the building entrances where possible, so that any flooding remains in less vulnerable areas such as landscaped areas, car parking areas or roads, where the consequences of surface water flooding would be less significant. Where falls towards buildings are unavoidable, additional cut-off drainage and gullies/channel drains should be provided to prevent water entering buildings during extreme events.
- 6.1.7 A cut off/ filter drain is proposed to intercept flow and convey the water through the site to outfall into the River Holme, and this arrangement is indicated on ARP Associates design drawings, reference 0425-58-03.01-02 Section 104 Layout Sheets 01 and 02. The current flood routing strategy is shown on ARP drawing 425/58/10.04 Flood Routing Layout Full Site, this demonstrates that the surface water flow can pass through the site to outfall as currently occurring without negatively impacting the proposed infrastructure or downstream properties. These drawings are included in Appendix L for reference.
- 6.2 Any mitigation measures, including drainage systems, would require suitable maintenance systems to be implemented, so that the design standard is maintained over the lifetime of the development.

7.0 GROUNDWATER MANAGEMENT

- 7.1 Groundwater management on site is looked at in a two phased approach. Firstly, the emerging groundwater and water ingress on site require addressing to reduce the volume of direct input water into the ground. Secondly, the natural elevation in the groundwater need to be managed to assist the site in becoming free draining and reduce the impact of groundwater. All plans and designs proposed here in are considering the Environment Agency's policies and recommendations with respect to groundwater management.
- 7.2 At present, emerging groundwater is entering the site. To help reduce the risk of flooding and to mitigate the effects of this issue, a plan has been established as part of the Earthworks Strategy. This plan accounts for the site requirements, and also the wider groundwater catchment and infrastructure. There is also surface water from Woodhead Road entering the site due to damaged highway drainage. Appropriate remediation measures will be put in place, to the satisfaction of the Regulatory Authorities, to ensure the highways drainage system operates satisfactorily.
- 7.3 Groundwater abstraction wells and ground water emergence points will need to be sealed prior to commencement of works on site. At present there are two main features that need treatment; a historical borehole in the northwest that has a low but steady flow of artisanal water and the decommissioned well along the western boundary. As these features are tapping an artisanal source, they must be treated in accordance with the Environment Agency's statement on Good Practice for Decommissioning Redundant Boreholes and Wells, December 2012. We note that this is a best practice document, not a regulation, however, the guidance that is provided is approved method of ground water remediation.
- 7.4 Decommissioning for the boreholes and wells is based on packing a well to prevent the emergence of the artesian water. There are four options presented by the EA in this document that range from monitoring to back fill. A diagrammatic representation of these options has been copied from this document for reference, shown below.

7.5 The option recommended for this site is Option C, Low Permeability Backfill. This is considered the lowest maintenance option. Option C also has minimal risk that the borehole will reopen and water will re-emerge. It also has the lowest risk with respect to resident's activities and the well and borehole reopening.

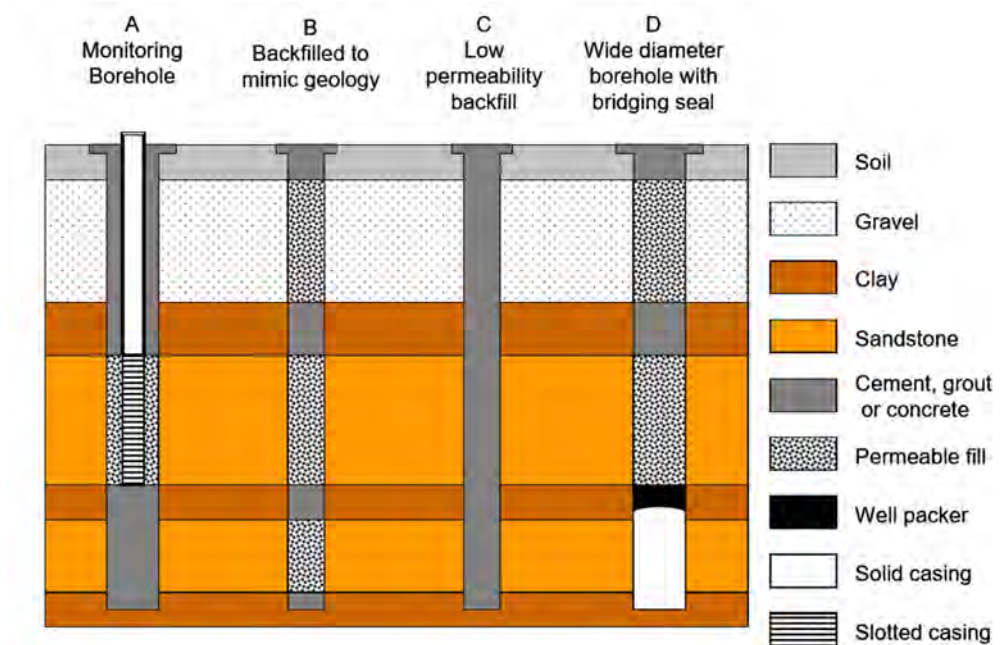


Figure 1 from Environment Agency's statement on Good Practice for Decommissioning Redundant Boreholes and Wells, December 2012.

7.6 Option C requires back fill with a low permeable low reactivity material that can withstand the pressures of the water supply. As the water supply is a limited aquifer (that is, it is not sourced from a primary aquifer that may have abundant resource), a backfill with bentonite is favoured. Bentonite pellets should be tremmied down the borehole using the deep pipe and pour method, where a pipe is inserted to act as a funnel or conduit to distribute bentonite down the hole. The pipe is gradually lifted and more bentonite is poured to ensure filling of the borehole or well. It can be beneficial if a well packer or equivalent is used to reduce the flow of water, if the process is undertaken in the winter months when groundwater is elevated. It is not advised that the borehole or well are pumped on this site prior to treatment, as the pumped residual water will cause flooding on site.

- 7.7 After development of the site, the borehole requiring backfilling in the north will be in the rear garden of a plot. It is recommended that a small well cap is placed on top of the bentonite plug to support longevity of the feature, regardless of how the future residents use the garden. It is the advice of the Environment Agency that the top of the cap is marked with the word 'well' or similar (even if done so crudely with a deep etching) to let any future uses of the site know the type of feature this is. A cap is not recommended for the well in the west as this will be a confined feature following development.
- 7.8 A small in ground storage trough is associated with the decommissioned abstraction well in the west. This trough is at the end of a well-run, approximately 50m away that has over time been left to turn into a small overflow run of water. This overflow of water is often mistaken as a small watercourse entering the site off Woodhead Road, however, site investigation has confirmed it is an unnatural feature that requires decommissioning. The trough is to be dug out and any infrastructure such as blocks, grates or caging is to be removed, and the depression infilled in accordance with the general earthworks specification. The borehole decommissioning plan is shown on the plan in Appendix K for reference.
- 7.9 A land drainage system has been designed for the site to help the groundwater migrate from the west of the site long term, once the emerging ground water has been minimised. The design has slotted 225mm pipe running through the western side of the site, following key features such as roads and retaining walls taking water over to the eastern side of the site. The pipes will be at a depth that does not drain equilibrium groundwater, only elevations of groundwater. These drains feed over to the east of the site where the groundwater will be discharged via a headwall into the River Holme, pending Environment Agency approval and permitting.
- 7.10 The proposed location of these land drains is included on ARP Associates S104 Layout drawings, reference 0425-58-03.01 Section 104 Layouts Sheet 01 and 02. These drawings are included in Appendix L for reference.

8.0 SUMMARY

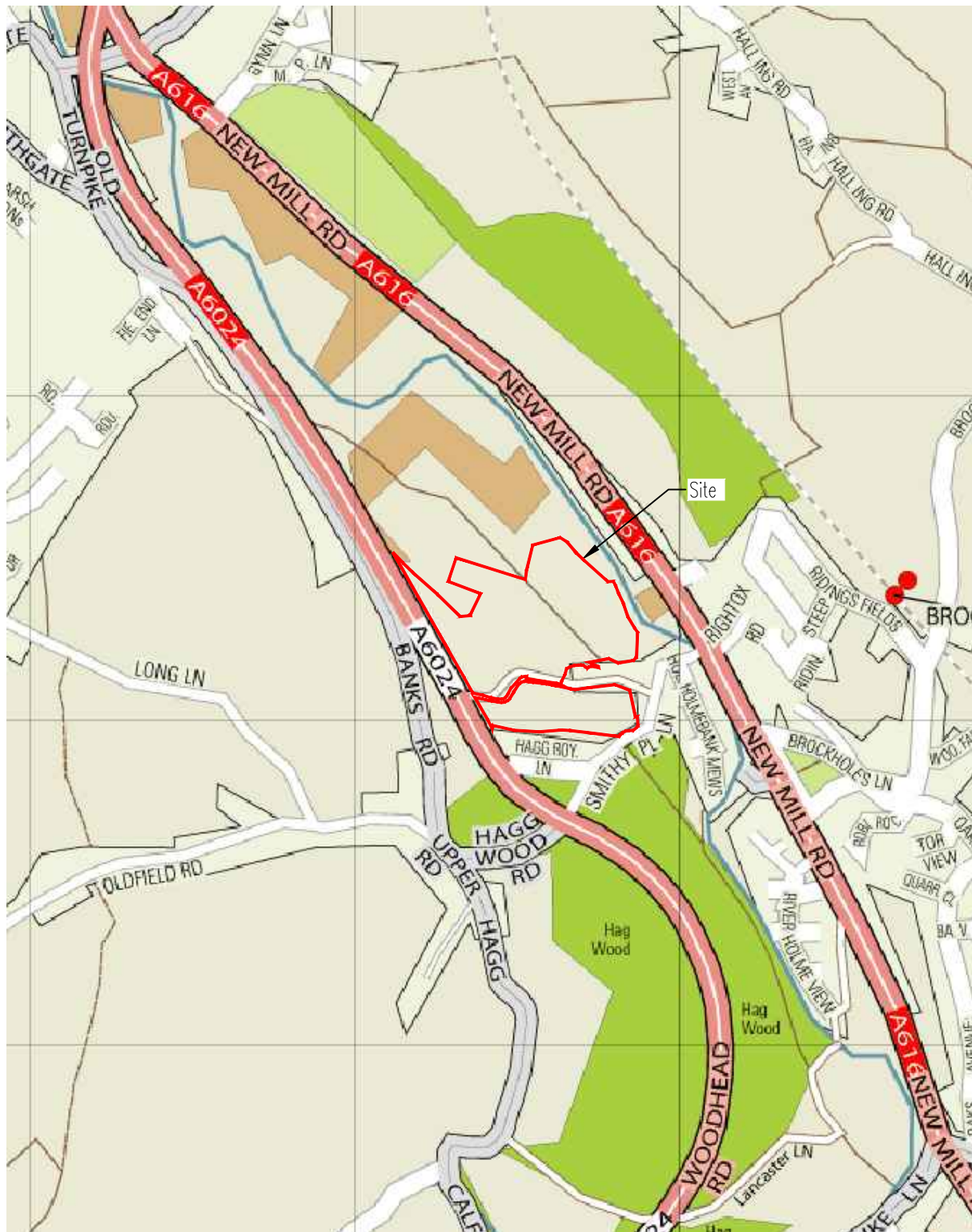
- 8.1 The proposed development is located in Flood Zone 1, indicating a 'low' risk of flooding from rivers and the sea. On this basis, application of the NPPF Sequential Test and Exception Test is not required.
- 8.2 Flood risk from the majority of sources is considered to be low. However, there is a need to consider the topography of the site in terms of the potential for surface water to enter buildings, and a potential risk of groundwater flooding has been identified which requires mitigation. The following precautionary mitigation measures are, therefore, recommended:-
- 8.2.1 It is recommended that the minimum Finished Floor Levels should be set at or above the 1 in 100 year plus 30% climate change flood level plus 600mm. For plots north of the central node, this level is based on the central node, and is 107.66m AOD (applied to Plots 15-27 and 46-67). For plots south of the central node, this level is based on the upstream node and is 109.81m AOD (this applies to all other plots).
- 8.2.2 The finished floor levels of buildings shall be raised above general external levels by a minimum of 150mm.
- 8.2.3 The proposed dwellings shall be designed without any basements and the proposed ground floors shall comprise solid concrete slabs or beam and block floors with screed construction.
- 8.2.4 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper levels.
- 8.2.5 A sustainable surface water drainage systems shall be provided to manage surface water run-off from the site itself up to the 1 in 100 year plus climate change event (see further details below).

- 8.2.6 External levels should be designed with falls to direct overland flows away from the building entrances where possible, so that any flooding remains in less vulnerable areas such as landscaped areas, car parking areas or roads, where the consequences of surface water flooding would be less significant. Where falls towards buildings are unavoidable, additional cut-off drainage and gullies/channel drains should be provided to prevent water entering buildings during extreme events.
- 8.2.7 A cut off/ filter drain is proposed to intercept flow and convey the water through the site to outfall into the River Holme, and this arrangement is indicated on ARP Associates design drawings, reference 0425-58-03.01-02 Section 104 Layout Sheets 01 and 02. The current flood routing strategy is shown on ARP drawing 425/58/10.04 Flood Routing Layout Full Site, this demonstrates that the surface water flow can pass through the site to outfall as currently occurring without negatively impacting the proposed infrastructure or downstream properties. These drawings are included in Appendix L for reference.
- 8.3 The principles of a sustainable surface water management strategy for the proposed development are outlined within the report. Infiltration techniques are unfeasible on this particular site, and direct connection to the River Holme is proposed.
- 8.4 The surface water discharge will be attenuated to a maximum rate of 25l/s as agreed with the relevant authorities.
- 8.5 Surface water storage will be provided by attenuation, to manage surface water up to the 1 in 100 year plus climate change event before discharge to the River Holme. A 30% increase in rainfall intensity has been incorporated into the proposals to account for the projected impacts of climate change. Further detail on the proposed drainage strategy is given in the ARP Foul and Surface Water Drainage Strategy report (reference 425/58r6) and drawings reference 0425-58-03.01 and 02 Section 104 Layouts Sheet 01 and 02.

- 8.6 Any mitigation measures, including drainage systems, would require suitable maintenance systems to be implemented, so that the design standard is maintained over the lifetime of the development.
- 8.7 No special mitigation measures are required for emergency egress during times of flood.
- 8.8 The findings of this report are subject to the approval of the Regulatory Authorities. The detailed design and calculations shall be submitted to the Planning Authority for approval prior to construction on the development site.
- 8.9 Subject to compliance with the above, the proposed development can satisfy the requirements of the National Planning Policy Framework and the Planning Practice Guidance in relation to flood risk.

APPENDIX A

SITE LOCATION PLAN



GRID REFERENCE: 414747, 411145

/	PSC	21.05.21	Issued for information				MI
Rev	By	Date	Amendment				Chk

Title
SITE LOCATION PLAN

Project/Client
WOODHEAD ROAD, BROCKHOLES
MILLER HOMES (YORKSHIRE) LTD


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Scale 1:10,000 @ A4	Drawn PSC
Date MAY 21	Chk. MI
Drg. No. 425/58/NA	Rev —

APPENDIX B

TOPOGRAPHICAL SURVEY

APPENDIX C

ENVIRONMENT AGENCY CONSULTATION

Flood map for planning

Your reference
425/58

Location (easting/northing)
414771/411141

Created
20 May 2021 21:38

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

This means:

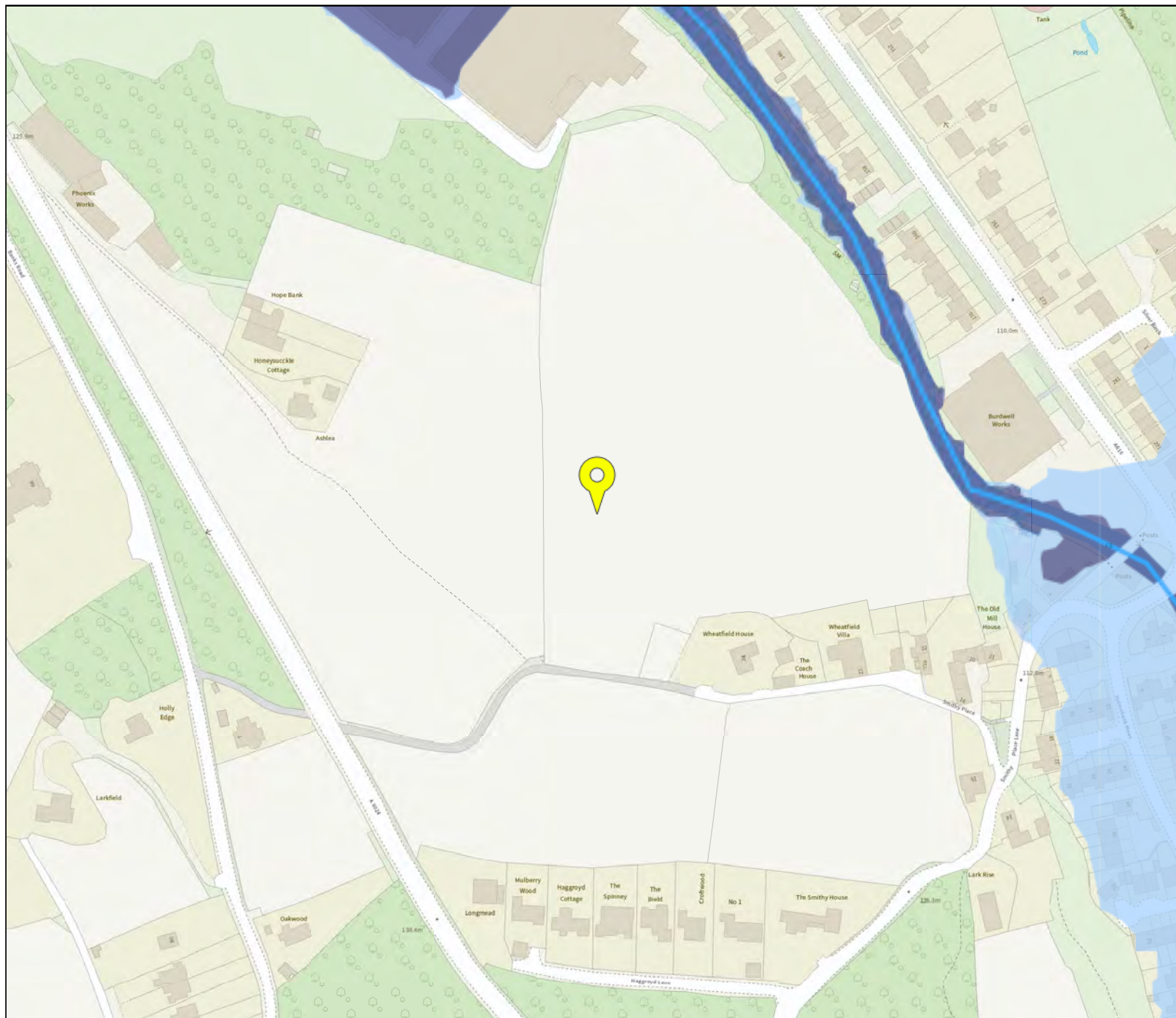
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage 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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<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference
425/58

Location (easting/northing)
414771/411141

Scale
1:2500

Created
20 May 2021 21:38

-  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 20 40 60m



Surface water flood risk: water depth in a high risk scenario

Flood depth (millimetres)

Over 900mm

300 to 900mm

Below 300mm

Location you selected



Surface water flood risk: water depth in a medium risk scenario

Flood depth (millimetres)

Over 900mm 300 to 900mm Below 300mm Location you selected

Flood risk

Location

Low risk: depth

Enter a place or postcode



Surface water flood risk: water depth in a low risk scenario

Flood depth (millimetres)

Over 900mm 300 to 900mm Below 300mm Location you selected

Flood risk

Extent of flooding

▼

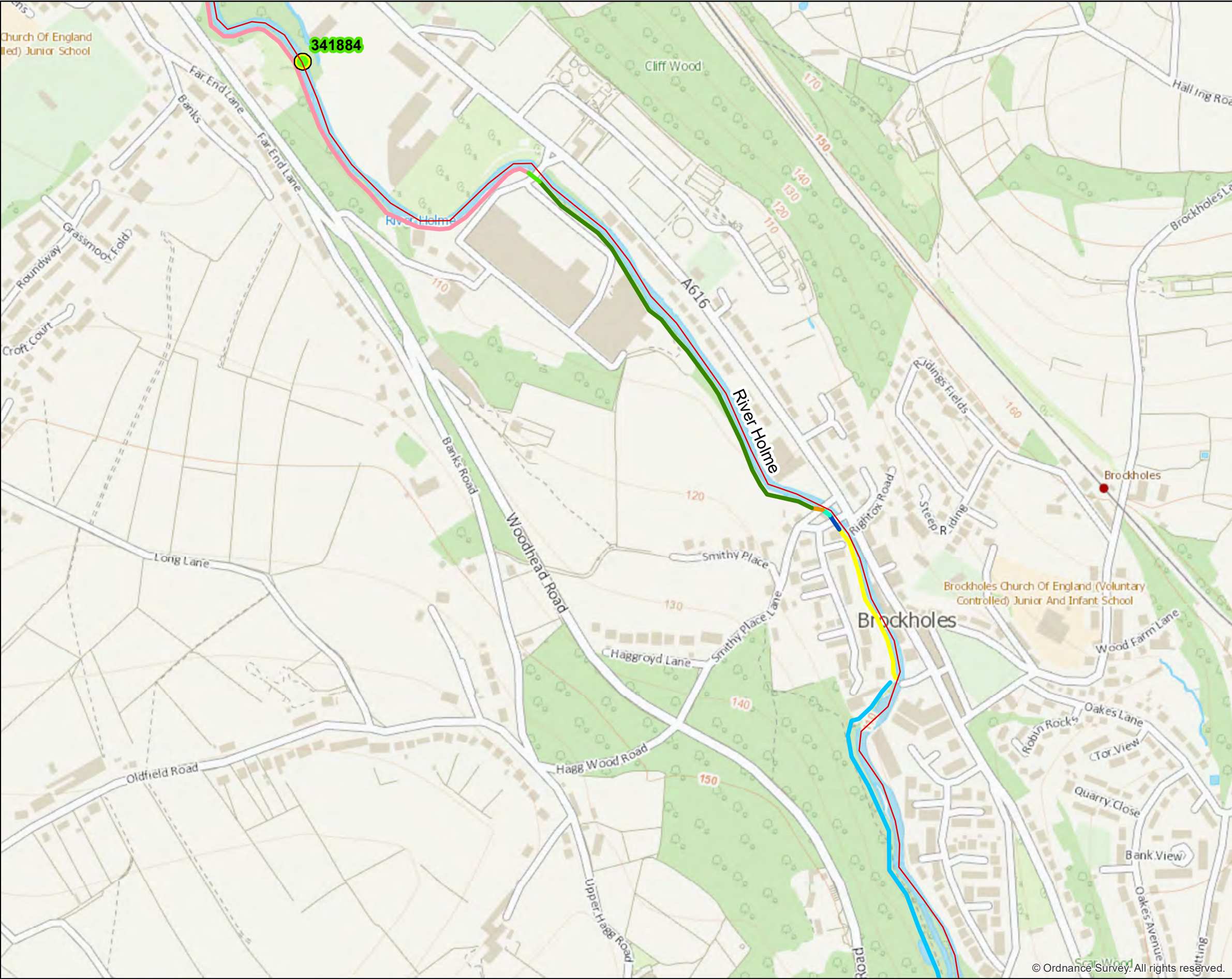
Location

Enter a place or postcode



Extent of flooding from reservoirs

● Maximum extent of flooding ⊕ Location you selected





www.environment-agency.gov.uk

Scale: 1:5,000

when reproduced @ A3





LEGEND

Main River

Structures (3rd party maintained)

Defences (3rd party maintained)

ASSET_ID

27848

27850

27983

27984

27985

49270

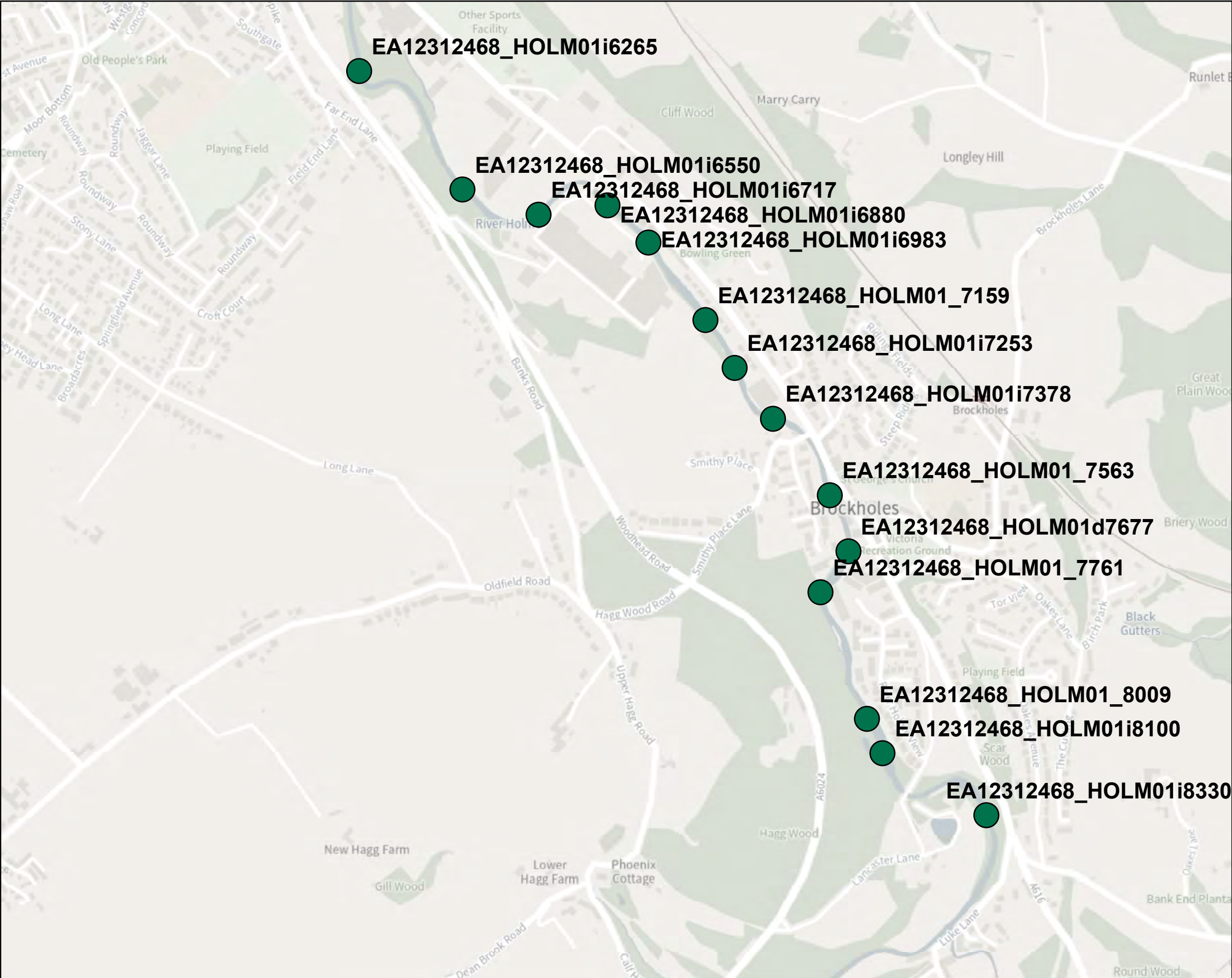
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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506(Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Structures (3rd Party Maintained) - RFI/2021/212220							
ASSET ID	ASSETS TYPE	DESCRIPTION	DESIGN STANDARD OF PROTECTION (SOP)	ASSET MAINTAINER	PROTECTION	TARGET CONDITION	OVERALL CONDITION
341884	weir			private	fluvial	9	2

Defences (3rd Party Maintained) - RFI/2021/212220										
ASSET ID	DESCRIPTION	ASSET MAINTAINER	ASSETS TYPE	LENGTH (m)	ACTUAL Downstream Crest Level (mAOD)	ACTUAL Upstream Crest Level (mAOD)	PROTECTION	TARGET CONDITION	OVERALL CONDITION	DESIGN STANDARD OF PROTECTION (SOP)
27850	high_ground	private	flood_risk_management	499.38			fluvial	3	3	
49271	high_ground	private	flood_risk_management	205.88			fluvial	3	3	
27848	high_ground	private	flood_risk_management	22.02			fluvial	3	2	
49270	high_ground	private	flood_risk_management	10.99			fluvial	3	2	
27985	high_ground	private	flood_risk_management	14.29			fluvial	3	2	
27984	high_ground	private	flood_risk_management	561.77			fluvial	3	3	
50643	high_ground	private	flood_risk_management	904.50			fluvial	3	3	
27983	high_ground	private	flood_risk_management	17.74			fluvial	3	2	





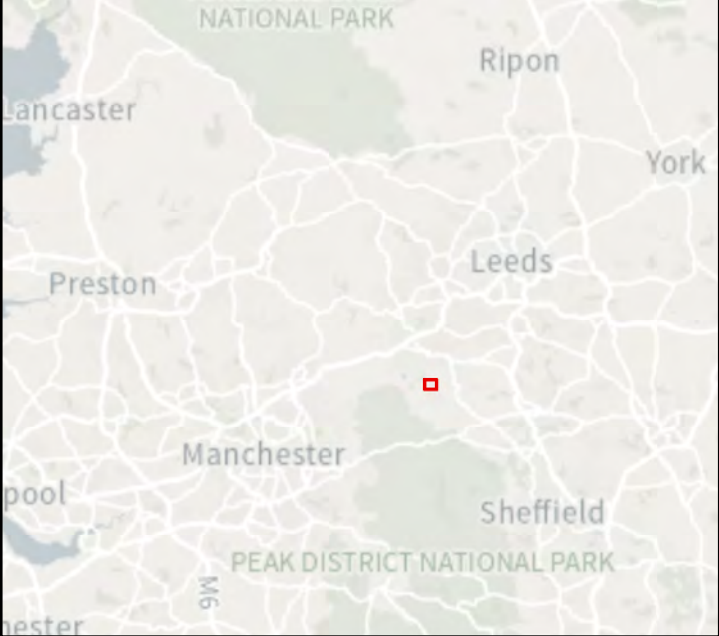
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Scale: 1:7,000



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LEGEND

 NodePoints

NFCDD_NODE_POINT_ID	RETURN_PERIOD	WATER_LEVEL	FLOW
EA12312468_HOLM01i8330	2	115.1	27.16
EA12312468_HOLM01i8330	5	115.27	35.98
EA12312468_HOLM01i8330	10	115.42	42.66
EA12312468_HOLM01i8330	20	115.6	49.92
EA12312468_HOLM01i8330	25	115.66	52.38
EA12312468_HOLM01i8330	30	115.78	55.27
EA12312468_HOLM01i8330	50	115.89	62.11
EA12312468_HOLM01i8330	75	115.99	66.9
EA12312468_HOLM01i8330	100	116.06	71.4
EA12312468_HOLM01i8330	100	116.24	85.31
EA12312468_HOLM01i8330	100	116.32	92.05
EA12312468_HOLM01i8330	100	116.44	105.97
EA12312468_HOLM01i8330	200	116.22	83.48
EA12312468_HOLM01i8330	1000	116.58	122.79
EA12312468_HOLM01i8330	1000	116.75	146.67
EA12312468_HOLM01i8100	2	113.38	27.15
EA12312468_HOLM01i8100	5	113.66	35.97
EA12312468_HOLM01i8100	10	113.85	42.64
EA12312468_HOLM01i8100	20	114.03	49.85
EA12312468_HOLM01i8100	25	114.1	52.3
EA12312468_HOLM01i8100	30	114.17	55.13
EA12312468_HOLM01i8100	50	114.31	61.08
EA12312468_HOLM01i8100	75	114.42	66.73
EA12312468_HOLM01i8100	100	114.5	71.33
EA12312468_HOLM01i8100	100	114.71	85.25
EA12312468_HOLM01i8100	100	114.8	92
EA12312468_HOLM01i8100	100	114.98	105.93
EA12312468_HOLM01i8100	200	114.68	83.42
EA12312468_HOLM01i8100	1000	115.11	122.76
EA12312468_HOLM01i8100	1000	115.27	146.64
EA12312468_HOLM01_8009	2	113.09	27.15
EA12312468_HOLM01_8009	5	113.38	35.96
EA12312468_HOLM01_8009	10	113.57	42.64
EA12312468_HOLM01_8009	20	113.76	49.85
EA12312468_HOLM01_8009	25	113.82	52.3
EA12312468_HOLM01_8009	30	113.89	55.13
EA12312468_HOLM01_8009	50	114.01	61.08
EA12312468_HOLM01_8009	75	114.1	66.72
EA12312468_HOLM01_8009	100	114.16	71.32
EA12312468_HOLM01_8009	100	114.27	85.25
EA12312468_HOLM01_8009	100	114.31	92
EA12312468_HOLM01_8009	100	114.36	105.92
EA12312468_HOLM01_8009	200	114.26	83.42
EA12312468_HOLM01_8009	1000	114.67	122.75
EA12312468_HOLM01_8009	1000	114.8	146.63
EA12312468_HOLM01_7761	2	110.95	27.15
EA12312468_HOLM01_7761	5	111.24	35.96
EA12312468_HOLM01_7761	10	111.46	42.64
EA12312468_HOLM01_7761	20	111.88	50.54
EA12312468_HOLM01_7761	25	111.99	52.3
EA12312468_HOLM01_7761	30	112.11	55.12
EA12312468_HOLM01_7761	50	112.36	61.07
EA12312468_HOLM01_7761	75	112.56	66.7
EA12312468_HOLM01_7761	100	112.71	71.3
EA12312468_HOLM01_7761	100	112.95	85.55
EA12312468_HOLM01_7761	100	113.02	91.97
EA12312468_HOLM01_7761	100	113.14	105.92
EA12312468_HOLM01_7761	200	112.92	83.4
EA12312468_HOLM01_7761	1000	113.29	122.74
EA12312468_HOLM01_7761	1000	113.42	146.62
EA12312468_HOLM01d7677	2	110.26	27.15

EA12312468_HOLM01d7677	5	110.57	35.96
EA12312468_HOLM01d7677	10	110.79	42.64
EA12312468_HOLM01d7677	20	110.98	49.84
EA12312468_HOLM01d7677	25	111.04	52.3
EA12312468_HOLM01d7677	30	111.12	55.11
EA12312468_HOLM01d7677	50	111.27	61.07
EA12312468_HOLM01d7677	75	111.41	66.69
EA12312468_HOLM01d7677	100	111.53	71.28
EA12312468_HOLM01d7677	100	111.82	86.1
EA12312468_HOLM01d7677	100	111.84	92
EA12312468_HOLM01d7677	100	111.89	105.92
EA12312468_HOLM01d7677	200	111.76	83.39
EA12312468_HOLM01d7677	1000	112.54	122.73
EA12312468_HOLM01d7677	1000	112.74	146.6
EA12312468_HOLM01_7563	2	109.61	27.6
EA12312468_HOLM01_7563	5	109.94	36.55
EA12312468_HOLM01_7563	10	110.16	43.35
EA12312468_HOLM01_7563	20	110.39	50.65
EA12312468_HOLM01_7563	25	110.47	53.14
EA12312468_HOLM01_7563	30	110.57	55.98
EA12312468_HOLM01_7563	50	110.76	62.04
EA12312468_HOLM01_7563	75	110.93	67.73
EA12312468_HOLM01_7563	100	111.06	72.42
EA12312468_HOLM01_7563	100	111.56	89.73
EA12312468_HOLM01_7563	100	111.64	93.43
EA12312468_HOLM01_7563	100	111.82	107.59
EA12312468_HOLM01_7563	200	111.39	84.72
EA12312468_HOLM01_7563	1000	112	124.79
EA12312468_HOLM01_7563	1000	112.21	148.98
EA12312468_HOLM01i7378	2	107.94	27.6
EA12312468_HOLM01i7378	5	108.15	36.55
EA12312468_HOLM01i7378	10	108.3	43.35
EA12312468_HOLM01i7378	20	108.47	50.65
EA12312468_HOLM01i7378	25	108.52	53.14
EA12312468_HOLM01i7378	30	108.57	55.97
EA12312468_HOLM01i7378	50	108.68	62.04
EA12312468_HOLM01i7378	75	108.79	67.73
EA12312468_HOLM01i7378	100	108.87	72.42
EA12312468_HOLM01i7378	100	109.12	86.68
EA12312468_HOLM01i7378	100	109.21	93.31
EA12312468_HOLM01i7378	100	109.41	107.57
EA12312468_HOLM01i7378	200	109.08	84.71
EA12312468_HOLM01i7378	1000	109.64	124.79
EA12312468_HOLM01i7378	1000	109.91	148.89
EA12312468_HOLM01i7253	2	105.94	27.6
EA12312468_HOLM01i7253	5	106.14	36.55
EA12312468_HOLM01i7253	10	106.29	43.35
EA12312468_HOLM01i7253	20	106.42	50.65
EA12312468_HOLM01i7253	25	106.46	53.14
EA12312468_HOLM01i7253	30	106.51	55.97
EA12312468_HOLM01i7253	50	106.61	62.04
EA12312468_HOLM01i7253	75	106.7	67.72
EA12312468_HOLM01i7253	100	106.77	72.42
EA12312468_HOLM01i7253	100	106.98	86.68
EA12312468_HOLM01i7253	100	107.06	93.31
EA12312468_HOLM01i7253	100	107.23	107.57
EA12312468_HOLM01i7253	200	106.95	84.71
EA12312468_HOLM01i7253	1000	107.42	124.79
EA12312468_HOLM01i7253	1000	107.68	148.88
EA12312468_HOLM01_7159	2	105.27	27.6
EA12312468_HOLM01_7159	5	105.5	36.55
EA12312468_HOLM01_7159	10	105.65	43.35

EA12312468_HOLM01_7159	20	105.8	50.65
EA12312468_HOLM01_7159	25	105.85	53.14
EA12312468_HOLM01_7159	30	105.91	55.97
EA12312468_HOLM01_7159	50	106.02	62.04
EA12312468_HOLM01_7159	75	106.11	67.72
EA12312468_HOLM01_7159	100	106.19	72.42
EA12312468_HOLM01_7159	100	106.38	86.67
EA12312468_HOLM01_7159	100	106.45	93.3
EA12312468_HOLM01_7159	100	106.59	107.57
EA12312468_HOLM01_7159	200	106.35	84.71
EA12312468_HOLM01_7159	1000	106.75	124.79
EA12312468_HOLM01_7159	1000	106.95	148.88
EA12312468_HOLM01i6983	2	104.44	27.6
EA12312468_HOLM01i6983	5	104.72	36.55
EA12312468_HOLM01i6983	10	104.92	43.34
EA12312468_HOLM01i6983	20	105.1	50.64
EA12312468_HOLM01i6983	25	105.16	53.13
EA12312468_HOLM01i6983	30	105.23	55.96
EA12312468_HOLM01i6983	50	105.34	62.02
EA12312468_HOLM01i6983	75	105.43	67.52
EA12312468_HOLM01i6983	100	105.49	71.92
EA12312468_HOLM01i6983	100	105.62	85.03
EA12312468_HOLM01i6983	100	105.67	91.06
EA12312468_HOLM01i6983	100	105.76	104.11
EA12312468_HOLM01i6983	200	105.6	83.25
EA12312468_HOLM01i6983	1000	105.79	120.33
EA12312468_HOLM01i6983	1000	105.89	141.54
EA12312468_HOLM01i6880	2	103.92	27.6
EA12312468_HOLM01i6880	5	104.18	36.55
EA12312468_HOLM01i6880	10	104.37	43.34
EA12312468_HOLM01i6880	20	104.55	50.64
EA12312468_HOLM01i6880	25	104.61	53.13
EA12312468_HOLM01i6880	30	104.67	55.94
EA12312468_HOLM01i6880	50	104.77	61.66
EA12312468_HOLM01i6880	75	104.84	66.38
EA12312468_HOLM01i6880	100	104.9	69.88
EA12312468_HOLM01i6880	100	105.04	79.7
EA12312468_HOLM01i6880	100	105.11	84.05
EA12312468_HOLM01i6880	100	105.23	93.05
EA12312468_HOLM01i6880	200	105.02	78.39
EA12312468_HOLM01i6880	1000	105.39	104.33
EA12312468_HOLM01i6880	1000	105.61	117.5
EA12312468_HOLM01i6717	2	103.07	27.6
EA12312468_HOLM01i6717	5	103.37	36.55
EA12312468_HOLM01i6717	10	103.57	43.34
EA12312468_HOLM01i6717	20	103.78	50.63
EA12312468_HOLM01i6717	25	103.85	52.95
EA12312468_HOLM01i6717	30	103.93	54.88
EA12312468_HOLM01i6717	50	104.07	57.19
EA12312468_HOLM01i6717	75	104.18	57.94
EA12312468_HOLM01i6717	100	104.26	58.19
EA12312468_HOLM01i6717	100	104.42	60.58
EA12312468_HOLM01i6717	100	104.48	62.31
EA12312468_HOLM01i6717	100	104.58	66.23
EA12312468_HOLM01i6717	200	104.4	59.98
EA12312468_HOLM01i6717	1000	104.68	71.4
EA12312468_HOLM01i6717	1000	104.81	76.67
EA12312468_HOLM01i6550	2	102.26	27.6
EA12312468_HOLM01i6550	5	102.47	36.54
EA12312468_HOLM01i6550	10	102.61	43.34
EA12312468_HOLM01i6550	20	102.75	50.63
EA12312468_HOLM01i6550	25	102.79	52.99

EA12312468_HOLM01i6550	30	102.83	55.54
EA12312468_HOLM01i6550	50	102.89	59.83
EA12312468_HOLM01i6550	75	102.94	62.84
EA12312468_HOLM01i6550	100	102.98	64.94
EA12312468_HOLM01i6550	100	103.07	70.19
EA12312468_HOLM01i6550	100	103.1	72.28
EA12312468_HOLM01i6550	100	103.15	76.2
EA12312468_HOLM01i6550	200	103.06	69.59
EA12312468_HOLM01i6550	1000	103.19	80.59
EA12312468_HOLM01i6550	1000	103.26	84.95
EA12312468_HOLM01i6265	2	99.97	27.6
EA12312468_HOLM01i6265	5	100.28	36.54
EA12312468_HOLM01i6265	10	100.5	43.33
EA12312468_HOLM01i6265	20	100.72	50.62
EA12312468_HOLM01i6265	25	100.79	52.98
EA12312468_HOLM01i6265	30	100.86	55.55
EA12312468_HOLM01i6265	50	101.09	61.37
EA12312468_HOLM01i6265	75	101.25	67.35
EA12312468_HOLM01i6265	100	101.36	72.13
EA12312468_HOLM01i6265	100	101.6	107.28
EA12312468_HOLM01i6265	100	101.61	108.1
EA12312468_HOLM01i6265	100	101.61	108.96
EA12312468_HOLM01i6265	200	101.6	107.08
EA12312468_HOLM01i6265	1000	101.68	124.57
EA12312468_HOLM01i6265	1000	101.82	148.63
EA12312468_HOLM01i8330	5	115.27	35.98
EA12312468_HOLM01i8330	5	115.27	35.98
EA12312468_HOLM01i8330	20	115.6	49.92
EA12312468_HOLM01i8330	20	115.6	49.92
EA12312468_HOLM01i8330	100	116.06	71.4
EA12312468_HOLM01i8330	100	116.06	71.4
EA12312468_HOLM01i8100	5	113.66	35.97
EA12312468_HOLM01i8100	5	113.66	35.97
EA12312468_HOLM01i8100	20	114.03	49.85
EA12312468_HOLM01i8100	20	114.03	49.85
EA12312468_HOLM01i8100	100	114.5	71.33
EA12312468_HOLM01i8100	100	114.5	71.33
EA12312468_HOLM01_8009	5	113.38	35.96
EA12312468_HOLM01_8009	5	113.38	35.96
EA12312468_HOLM01_8009	20	113.76	49.85
EA12312468_HOLM01_8009	20	113.76	49.85
EA12312468_HOLM01_8009	100	114.16	71.32
EA12312468_HOLM01_8009	100	114.16	71.32
EA12312468_HOLM01_7761	5	111.24	35.96
EA12312468_HOLM01_7761	5	111.24	35.96
EA12312468_HOLM01_7761	20	111.88	50.54
EA12312468_HOLM01_7761	20	111.88	50.52
EA12312468_HOLM01_7761	100	112.71	71.3
EA12312468_HOLM01_7761	100	112.71	71.3
EA12312468_HOLM01d7677	5	110.57	35.96
EA12312468_HOLM01d7677	5	110.57	35.96
EA12312468_HOLM01d7677	20	110.98	49.84
EA12312468_HOLM01d7677	20	110.98	49.84
EA12312468_HOLM01d7677	100	111.53	71.28
EA12312468_HOLM01d7677	100	111.53	71.28
EA12312468_HOLM01_7563	5	109.94	36.55
EA12312468_HOLM01_7563	5	109.94	36.55
EA12312468_HOLM01_7563	20	110.39	50.65
EA12312468_HOLM01_7563	20	110.39	50.65
EA12312468_HOLM01_7563	100	111.06	72.42
EA12312468_HOLM01_7563	100	111.06	72.42
EA12312468_HOLM01i7378	5	108.15	36.55

EA12312468_HOLM01i7378	5	108.15	36.55
EA12312468_HOLM01i7378	20	108.47	50.65
EA12312468_HOLM01i7378	20	108.47	50.65
EA12312468_HOLM01i7378	100	108.87	72.42
EA12312468_HOLM01i7378	100	108.87	72.42
EA12312468_HOLM01i7253	5	106.14	36.55
EA12312468_HOLM01i7253	5	106.14	36.55
EA12312468_HOLM01i7253	20	106.42	50.65
EA12312468_HOLM01i7253	20	106.42	50.65
EA12312468_HOLM01i7253	100	106.77	72.42
EA12312468_HOLM01i7253	100	106.77	72.42
EA12312468_HOLM01_7159	5	105.5	36.55
EA12312468_HOLM01_7159	5	105.5	36.55
EA12312468_HOLM01_7159	20	105.8	50.65
EA12312468_HOLM01_7159	20	105.8	50.65
EA12312468_HOLM01_7159	100	106.19	72.42
EA12312468_HOLM01_7159	100	106.19	72.42
EA12312468_HOLM01i6983	5	104.72	36.55
EA12312468_HOLM01i6983	5	104.72	36.55
EA12312468_HOLM01i6983	20	105.1	50.64
EA12312468_HOLM01i6983	20	105.1	50.64
EA12312468_HOLM01i6983	100	105.49	71.92
EA12312468_HOLM01i6983	100	105.49	71.92
EA12312468_HOLM01i6880	5	104.18	36.55
EA12312468_HOLM01i6880	5	104.18	36.55
EA12312468_HOLM01i6880	20	104.55	50.64
EA12312468_HOLM01i6880	20	104.55	50.64
EA12312468_HOLM01i6880	100	104.9	69.88
EA12312468_HOLM01i6880	100	104.9	69.88
EA12312468_HOLM01i6717	5	103.37	36.55
EA12312468_HOLM01i6717	5	103.37	36.55
EA12312468_HOLM01i6717	20	103.78	50.63
EA12312468_HOLM01i6717	20	103.78	50.63
EA12312468_HOLM01i6717	100	104.26	58.19
EA12312468_HOLM01i6717	100	104.26	58.19
EA12312468_HOLM01i6550	5	102.47	36.54
EA12312468_HOLM01i6550	5	102.47	36.54
EA12312468_HOLM01i6550	20	102.75	50.63
EA12312468_HOLM01i6550	20	102.75	50.63
EA12312468_HOLM01i6550	100	102.98	64.94
EA12312468_HOLM01i6550	100	102.98	64.94
EA12312468_HOLM01i6265	5	100.28	36.54
EA12312468_HOLM01i6265	5	100.28	36.54
EA12312468_HOLM01i6265	20	100.72	50.62
EA12312468_HOLM01i6265	20	100.72	50.62
EA12312468_HOLM01i6265	100	101.36	72.13
EA12312468_HOLM01i6265	100	101.36	72.13

Reference: RFI/2022/250884

Thank you for your email. We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please find a sharefile link below that will enable you to download the Product 5 from the 2020 Colne and Holme Flood Mapping Study (JBA Consulting)

<https://ea.sharefile.com/d-sbeb88cd60530476abb20df522387811c>

Please note this link will expire in 30 days.

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Please refer to the tables below for the permitted use of the supplied information.

Name	Product 5
Description	2020 Colne and Holme Flood Mapping Study Model Report
Licence	Environment Agency Conditional Licence
Conditions	1. You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2. Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3. We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentiality of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility

	to check that you are compliant with the Act in respect of this personal data. 5. The location of public water supply abstraction sources must not be published to a resolution more detailed than 1 km². Information about the operation of flood assets should not be published. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as “the Data”. 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. May contain Ordnance Survey data © Crown copyright 2020 Ordnance Survey 100024198.

However, you MUST first check the supporting information and the above link to determine if the conditions on use are suitable for your purposes. If they aren't, this information is not provided with a licence for use, and the data is provided for read right only.

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

Kind regards,



Planning advice for developers – FAQs

INTRODUCTION

Local planning authorities (LPAs) across Yorkshire are required to consult us on [certain planning applications](#) which affect flood risk, groundwater, waste, or water quality.

If your development falls into one of these categories, we'll be invited to comment on your planning application. Your LPA, when considering your application, will take our comments into account.

We've produced this guidance to summarise the environmental issues we're responsible for. The guidance forms part of our free advice service; if you require site-specific or face-to-face advice, we'll need to recover our costs through our [charged advice service](#). Engaging with us early can help you identify the big issues, reduce the chances of subsequent delays and help you design a more sustainable and attractive development.

DEVELOPMENT AND FLOOD RISK

Is my development proposal at risk of flooding?

The [flood map for planning](#) shows where flooding from rivers and the sea may occur. Whilst this map isn't suitable for a detailed flood risk assessment, it'll show which [flood zone](#) your development is located within and therefore will indicate whether further assessment is needed. You should also refer to your LPA's [strategic flood risk assessment](#) which will provide additional local information on flood risk, including the location of functional floodplain and areas which are susceptible to other sources of flooding such as from surface water or reservoirs.

Will my application need to pass the sequential and exception tests?

Local planning authorities apply the [sequential test](#) to steer development towards areas at the lowest risk of flooding. If your proposal is located within flood zones 2 or 3, you should contact your LPA to discuss the sequential test **before** submitting your application. The LPA may require you to submit information with your application in support of the sequential test.

If the LPA confirm that the sequential test has ruled out steering the development to lower risk sites, the development may also need to pass the [exception test](#) by demonstrating that its sustainability benefits outweigh flood risk and that it can be made safe for its lifetime, through the production of a site-specific flood risk assessment. [Planning practice guidance](#) advises when an exception test will be required, which will depend on the [vulnerability of the development](#) and the flood zone it lies within.

Do I need to submit a flood risk assessment with my planning application?

You'll need to submit a flood risk assessment if your application lies within flood zones 2 or 3 or is over 1 hectare within flood zone 1. You'll also need to submit an assessment if your proposal could be affected by sources of flooding other than from rivers or the sea. For certain lower risk applications, we've provided '[flood risk standing advice](#)' which enables local planning authorities to assess flood risk assessments without the need to consult us.

What information should I include in my flood risk assessment?

We recommend that you refer to the checklist for a [site-specific flood risk assessment](#) for detailed advice on what to include in your flood risk assessment. Alongside referring to your LPA's strategic flood risk assessment, you should contact your LPA to find out whether there are any development guidelines which are specific to your locality.

Can I undertake my own flood risk assessment?

Your FRA must be appropriate to the scale, nature and location of the development whilst being credible and fit-for-purpose. Whilst it's possible to undertake your own assessment, most applicants employ suitably experienced professionals. We're not able to recommend specific consultants, but a simple web search should help you source a competent individual or company.

Do I need to consider how climate change will affect my proposal's flood risk?

Yes, you should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account. Please refer to the following [guidance](#) when undertaking your flood risk assessment. In some cases we'll hold the climate change flood data you need. In others you'll need to undertake your own analysis to understand the impacts.

Where can I get modelled or historic flood levels from?

Email our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) to find out whether we have any modelled or historic flood levels available for your development site. A list of the packages of information we're able to provide can be found under the 'get information to complete an assessment' section of the [planning practice guidance](#). They'll aim to provide this information within 20 days. We no longer charge for providing this information.

The risk portrayed by your flood map doesn't seem to reflect the site's actual risk. How do I 'challenge' your flood map?

If you have evidence suggesting that our flood map is inaccurate, please contact our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) who will provide you with any existing data we hold. To formally contest our flood zones, you'll need to submit supporting evidence, such as digital copies of a topographic survey or modelling for quality assurance purposes. Digital files of the proposed new flood zones in ArcMap or MapInfo format should also be supplied. Any new outline data you submit must conform to our flood zones policy, copies of which are available on request.

Whilst we'll usually be happy to review any topographical survey or model prior to the application being submitted, we would have to recover our costs for this work. In some cases where work to review and update our existing models is already underway, we may decline to consider a challenge.

As we have to be certain that the data which informs our flood map is fit-for-purpose, any revisions will need to meet stringent quality checks.

SURFACE WATER AND DRAINAGE

Who's responsible for managing surface water?

[Lead local flood authorities](#) are responsible for providing advice on the management of surface water resulting from new [major](#) development. [Internal drainage boards](#), where established, have permissive powers to manage water levels within their drainage districts, so also play a key role in managing surface water.

Will I need to provide surface water storage and limit the discharge rate?

You should contact your lead local flood authority to discuss surface water discharge rates and storage requirements. Typically, they'll ask that your development does not increase run-off and limits the discharge to the existing greenfield run-off rate (usually 1.4l/s/ha if not calculated).

Do I need to install sustainable drainage systems?

[Sustainable Drainage Systems \(SuDS\)](#) should always be carefully considered in discussion with your lead local flood authority. A SuDS scheme can reduce flood risk, improve water quality, create better habitats for wildlife, and produce pleasant, more amenable places for people.

Infiltration drainage must not, however, pose a risk to groundwater quality. All infiltration SuDS must:

- Meet the groundwater protection criteria set out on [GOV.UK](https://www.gov.uk)
- Not be constructed in ground affected by contamination

Who should I contact about connecting my development to the mains sewer?

Talk to your water company about connecting to their sewerage system. Here are some contact details for water companies operating in the Yorkshire Environment Agency area:

Yorkshire Water	planningconsultation@yorkshirewater.co.uk
Northumbrian Water	developmentenquiries@nwl.co.uk
Severn Trent Water	new.connections@severntrent.co.uk

My development is a long way from the mains sewer. Can I install a 'non-mains' drainage system, such as a package treatment plant?

New development should connect to the public mains sewer wherever possible. Individual treatment plants can deteriorate local water quality and are more challenging to monitor and regulate. If you can't connect to the mains sewer, your planning submission should outline how you will deal with foul drainage discharge. You should include evidence as to why it is not possible to connect to the mains system, including details of any prohibitive costs. Please

note that some 'non-mains' foul water drainage systems will require an environmental permit, irrespective of any planning approval.

OTHER ENVIRONMENTAL CONSIDERATIONS

What other environmental issues will you consider with my planning application?

Your planning application will need to demonstrate that any environmental risks can be managed, through design and construction, for the development's lifetime. Alongside flood risk, the key environmental risks we'll consider are:

- **[Land Contamination](#)**
We're mainly interested in those sites where there is a risk of pollution to controlled waters. You should investigate any contamination to see whether the environmental risk or cost of clean-up (remediation) would hinder your proposal. If contamination is known or suspected, a desktop study, investigation, remediation and other works may be required to enable safe development. Our [model procedures for the management of land contamination](#) provide further information.
- **[Pollution prevention](#)**
Your application should demonstrate how you'll minimise the risk of pollution from all aspects of your development, including construction and

operation phases. Groundwater can be vulnerable to pollution, as well as rivers and streams. Some areas (source protection zones and aquifers) are especially sensitive to pollutants as they typically supply public drinking water. To find out whether your development is located in an area sensitive to groundwater pollution, visit our interactive [maps](#). Advice on groundwater protection can be found on [GOV.UK](#)

- **Fisheries, biodiversity, geomorphology and protected species**

If your proposal is likely to affect the ecology of a main river, you'll need to carry out a risk assessment. This assessment should show that your development can proceed without demonstrable harm, and should propose mitigation, compensation or enhancements where required. A survey should be carried out if any protected species are thought to be nearby. If this survey confirms the presence of protected species or their habitat, measures should be taken to manage the development's risks. Natural England are the statutory consultee for other biodiversity-related matters. Further information on their remit can be found on [GOV.UK](#)

- **Water framework directive**

If your proposal affects ground or surface waterbodies, you'll need to consider the [Water Framework Directive](#) (WFD) and the actions set out in the [Humber River Basin Management Plan](#). You'll also need to submit a [WFD Assessment](#) demonstrating how the development will prevent deterioration and improve the waterbody's ecological status.

- **River buffer zone**

Your development should ensure that an 8m strip of land (planted with locally appropriate, native species) is left undisturbed next to the bank of any main river. This 'river corridor' will improve habitat connectivity and will ensure we're able to access the bank for any future flood defence construction and maintenance.

- **Culverting**

We're opposed to culverting. Culverts degrade watercourses' ecology and prevent the movement of wildlife and fish. As culverts can easily become blocked, they increase flood risk. They're also difficult to inspect and maintain. We may object to any planning applications involving culverting on a main river and may refuse to grant an environmental permit. Existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Will I need any other Environment Agency permits for my development?

You might need an environmental permit if your development manages or produces waste or emissions that pollute the air, water or land or is work that affects a [main river](#) or a sea defence. The lead local flood authority is responsible for any consents relating to ordinary watercourses.

The [Environmental Permitting Regulations \(England and Wales\) 2015](#) cover water discharges, groundwater activities, flood risk activities, radioactive substances, waste, mining waste and installations. They also include provision for a number of directives including batteries. Further information, including contact details for further permitting related enquiries, can be found [here](#).

As planning and permitting decisions are often closely linked, we have issued detailed [guidance for developments requiring planning permission and environmental permits](#). This guidance explains how, when responding to planning consultations that require environmental permits, we will advise of three possible positions:

- No major permitting concerns
- More detailed consideration is required and parallel tracking is recommended
- Don't proceed – unlikely to grant a permit.

PRE-APPLICATION ADVICE

Can you provide site-specific advice, review a submission document, or attend a site meeting before I submit my planning application?

We encourage you to seek pre-application advice as it can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. If you'd like to take advantage of this service, please email our Sustainable Places team so that we can provide further details and estimated costs.

Please note that any pre-application guidance we provide doesn't represent our final view in relation to any future planning application. We recommend that you seek your own expert advice prior to submitting your application.

Who should I contact for further information?

Yorkshire planning enquiries: sp-yorkshire@environment-agency.gov.uk

General enquiries: 03708 506 506

Environment Agency, Lateral, 8 City Walk, Leeds LS11 9AT
<https://www.gov.uk/government/organisations/environment-agency>

The Flood Map for Planning

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-map-for-planning.service.gov.uk> or downloaded in GIS format under an open data licence from the following address: <https://data.gov.uk/publisher/environment-agency>

Please type Flood Map for Planning in the search box.

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
 - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
 - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.
2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
 - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
 - and/or indicates the greatest recorded historic flood, whichever is greater.
3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.
4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

Modelling

2020 Colne and Holme Flood Mapping Study (JBA Consulting)

We have provided Model Results (Undefended Scenario) from the 2020 Colne and Holme Flood Mapping Study.

The Levels are in Metres above Ordnance Datum.

The Flows are in Cubic Metres per Second.

We have provided a copy of the Model Report (Product 5). This can be accessed via the Sharefile link below :

<https://ea.sharefile.com/d-sbeb88cd60530476abb20df522387811c>

There is a Conditional Data Licence associated with the provision of the Report. This sets out the Terms and Conditions for the use of the Data.

Climate Change

Updated guidance on how climate change could affect flood risk to new development - '[Flood risk assessments: climate change allowances](#)' was published on gov.uk on 21 July 2021. You should confirm the flood risk vulnerability classification and lifetime of your proposed development in line with NPPF and apply the appropriate climate change allowances.

Bespoke Flood Risk Assessment (FRA) advice:

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: sp-yorkshire@environment-agency.gov.uk). Charges may apply for any advice that is provided, this currently stands at £100 per hour per person. The [.gov.uk](#) pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

Other

Surface Water Map

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

Surface Water Drainage

The Lead Local Flood Authority is the statutory consultee for planning matters relating to surface water drainage, therefore it is recommended they should be consulted separately regarding this.

Surface water discharge from new development should ideally 'mimic' the pre-development situation using a sustainable drainage system so that the flow and volume of water in watercourses is not increased.

A permit may be required, under the Environmental Permitting Regulations 2016 from the Environment Agency for any proposed works or structures in, under, over or within eight metres of a 'main river' (e.g. a new outfall). A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Risk of Flooding from Reservoirs Map

Outlines and simplified depth and velocity maps can be viewed on our website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2>

Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.

A map showing the outlines can also be provided on request.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from <http://environment.data.gov.uk/ds/survey/index.jsp#/survey> (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at:

<https://www.gov.uk/guidance/owning-a-watercourse>

Ordnance Survey Data

Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

APPENDIX D

WATER AUTHORITY CONSULTATION



YorkshireWater

Mr P Carter
ARP Associates
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH
paulcarter@arpassociates.co.uk

Yorkshire Water Services
Developer Services
Pre-Development Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482

Fax:

Your Ref:
Our Ref: X005534

Email:
technical.sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

16th April 2021

Dear Mr Carter,

**Land off Woodhead Road, Brockholes, Honley, HD9 7AH – Pre-Planning
Sewerage Enquiry U200549**

Thank you for your recent enquiry. Our charge of £157.00 will be added to your account with us, reference ARP013. You will receive an invoice for your account in due course.

Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records. The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:



Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

Foul Water

Foul water domestic waste can discharge to the 150/225 mm diameter public combined sewer recorded in Smith Place or Smithy Place Lane, pumped rate should not exceed 5 (five) litres/second.

Surface Water

It is understood that surface water will discharge to the River Holme located to the east of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable). While we have no objection to this I cannot agree the rate as it's not discharging to a Yorkshire Water asset.

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Other Observations

An off-site foul and surface water sewer may be required which may be provided by the developer and considered for adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991 for which an application must be made in writing. For further information, please telephone 0345 120 84 82.



YorkshireWater

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption – a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

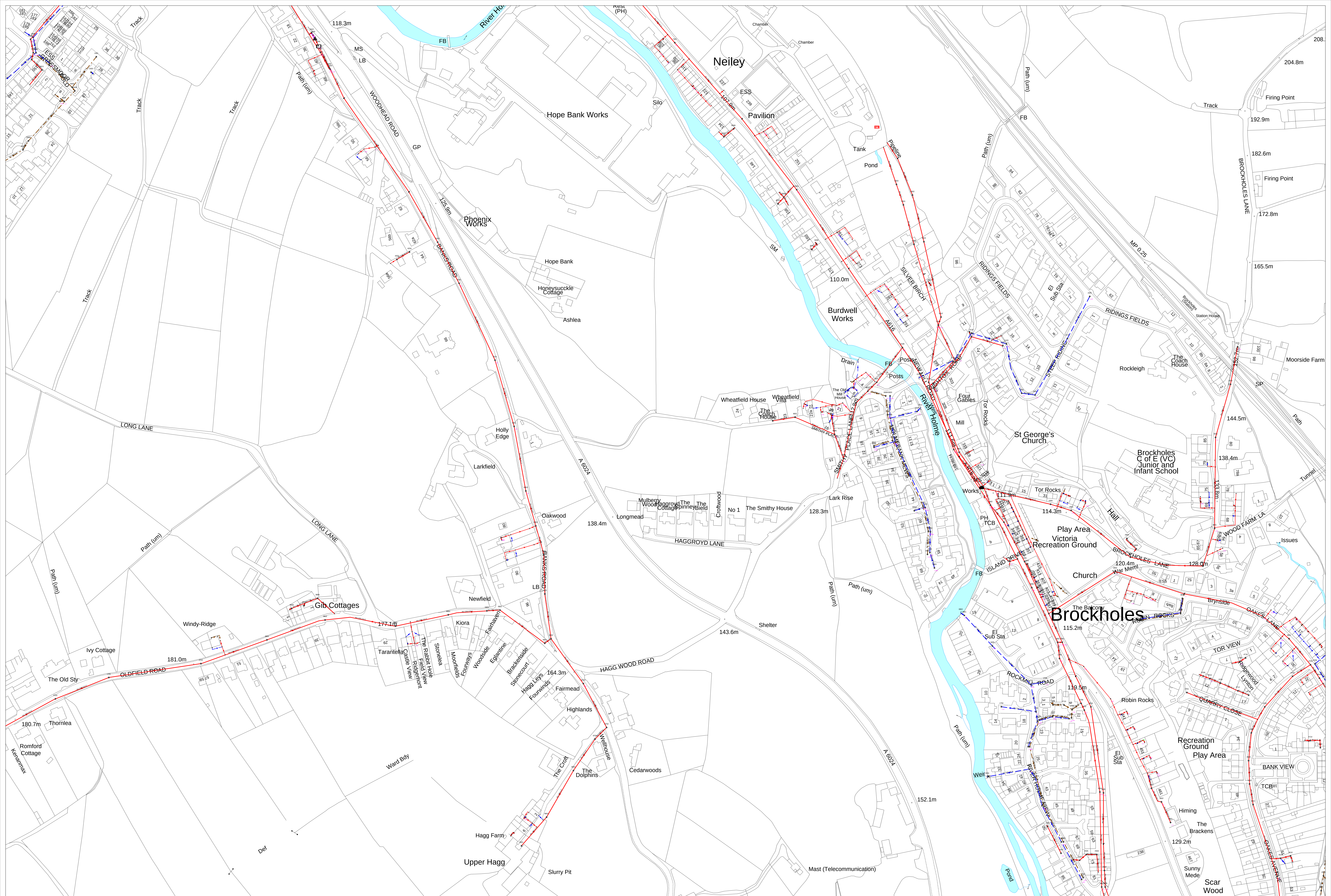
The site is within an area that may be affected by river, coastal or estuarine flooding. We would advise you to contact the Environment Agency for details.

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may apply on line or obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

All the above comments are based upon the information and records available at the present time and is subject to formal planning approval agreement. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith. Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours sincerely

Chris Roberts
Development Services Technician



APPENDIX E

LEAD LOCAL FLOOD AUTHORITY CONSULTATION

Paul Carter

From: Paul Farndale <Paul.Farndale@kirklees.gov.uk>
Sent: Wednesday 28 April, 2021 11:05 am
To: Paul Carter
Cc: Martin Ingram
Subject: RE: 425-58 Woodhead Rd, Brockholes, Honley - LLFA consultation [Filed 29 Apr 2021 09:24]

Hello Paul,

Please have a look at earlier applications on the Kirklees Planning Applications web site. There is detailed negotiations on flood routing in particular and also there is a watercourse/land drainage system that has been identified on site which will need to be incorporated into the layout and will be a constraint.

If we are storing the 1 in 100 then 30% is in our policy for climate change. No urban creep is required when storing the 1 in 100 event below ground.

I can confirm greenfield rates are set at 5l/s/ha for the developable area. Strictly no double counting of landscaped areas to remain around the fringes of the built area, or gardens falling away from the main development. If you are going to have retaining walls and drainage behind them that take all landscaping and gardens out of the equation. You are likely to need some perimeter drainage and to pick up the watercourse in a separate drain with a separate outfall.

I cannot confirm the exact discharge rate until you confirm the above and shade a map accordingly showing the area you feel qualifies so I can scrutinise it.

I take it 380.2l/s is a typo. For example 5 ha would be 25l/s. I will need to know that the southern parcel can drain by gravity to the main site.

Regards,

PF

Note deep surface water ponding adjacent to Smithies Place which will need picking up in an FRA. You will definitely need to justify a layout for flood routing and try if we can not to let water in off the main road. You will need to consult with Section 38 on this to see if a ramp up to maintain flows across the entrance is feasible. This will limit the risk involved.

From: Paul Carter <PaulCarter@arpassociates.co.uk>
Sent: 26 March 2021 17:11
To: Paul Farndale <Paul.Farndale@kirklees.gov.uk>
Cc: Martin Ingram <MartinIngram@arpassociates.co.uk>
Subject: 425-58 Woodhead Rd, Brockholes, Honley - LLFA consultation

Good Afternoon

Our Client is proposing to develop a site situated on land off Woodhead Road, Brockholes, Honley, HD9 7AH. The site has a net developable area of 5.47ha and is centred on Ordnance Survey Grid Reference 414747, 411145. Attached is a development masterplan, topographical survey and historical agreements with YW for your consideration. ARP has been appointed to undertake a Flood Risk

**Consultation Response from KC,
Lead Local Flood Authority**
2021/92206 Land Off, Woodhead Road, Honley, Holmfirth
Erection of 146 homes with open space, landscaping and associated infrastructure
**Date Responded: 12th July
2021**
**Responding Officer: Paul
Farndale**
Responding Ref:

Kirklees Flood Management & Drainage acting as Lead Local Flood Authority requires FURTHER INFORMATION on flood risk assessment in order to support this application subject to appropriate conditions.

As directed in a pre-planning enquiry, the surface water flood risk maps (3rd generation 1 in 100 and 1 in 1000 events) should be superimposed over the layout maps, to clearly identify the risk involved rather than rely on narrative.

All photographs of the watercourse entering the site from under Woodhead Road, including discovered troughs etc., previously submitted, should be packaged together in updated Flood Risk Assessment. The location should be clearly shown on a plan. A discussion with the LLFA should then take place as to the route any culverted section or open section should take as a tributary to the river Holme.

A direct open route along current pre-development contour patterns should be favoured where reasonably practicable. Other interception drainage will need to connect this tributary and its pathway should have a separate outfall to the surface water drainage unless agreed otherwise with Yorkshire Water. Any riparian aspect to this infrastructure will need to be managed long term by a management company set up under section 106 of the Town and Country Planning Act 1990. Flood Routing for this aspect should be clearly shown in the FRA.

All flood routing, from road and field run off entering the site (including the new entrance) should be followed through avoiding property and curtilage, utilising the road network and public open space.

This includes blockage scenarios from main drainage runs of surface water sewers and watercourse and land drainage within the site boundary.

Finally, an exceedance event affecting the attenuation should be examined although we do not foresee a problem with this aspect.

Contours for roads indicate that area around various properties will be problematic. A discussion with the LLFA prior to resubmission is advised (plots 115,26,95,37,69,70 are examples of further analysis including the effects of road humps. High and low spots should be clearly identified).

The EA will need to comment on flood risk from the river Holme and the former mill race.

A more detailed assessment of built area, not double counting landscaped areas falling away from mains drainage was requested at pre-app to justify and agree final discharge rates. The applicant is reminded that although infiltration is not advisable on this site, SUDS as treatment for water quality should be assessed given that SUDS can now be adopted by the Statutory Undertaker.

APPENDIX F

DEVELOPMENT PROPOSALS



millerhomes		Brockholes Increase Numbers Sk 2		STEN ARCHITECTURE	
FREE SALE					
Housetype	Description	Sqft.	Number	Total Sq ft	% of Mix
3 BED Mews					
Overmont	2 Bed Mews	819	6	4914	5.5
Kington Semi	3 Bed Corner	869	6	5214	5.5
3 BED Detached					
Eaton	3 Bed Corner	1,016	16	16256	14.5
Tiverton	3 Bed Detached	972	9	8748	8.2
4 BED					
Maplewood	4 Bed Detached	1,269	15	19035	13.6
Oakwood	4 Bed Detached	1,388	10	13880	9.1
Sherwood	4 Bed Detached	1,400	13	18200	11.8
Cedarwood	4 Bed Detached	1,448	16	23168	14.5
5 BED					
Castelford	5 Bed Detached	1,601	11	17611	10.0
Thetford	5 Bed Detached	1,674	8	13392	7.3
SUB TOTAL			110	140418	100.0
AFFORDABLE					
Housetype	Description	Sqft.	Number	Total Sq ft	% of Mix
2 Bedroom Properties					
Rosamond	2 Bed Semi/Mews	761	16	12176	59.3
3 Bedroom Properties					
Harrison	3 Bed Semi/Mews	907	11	9977	40.7
SUB TOTAL			27	22153	100.0
Total			137	162571	

Notes:

DRAWING LEGEND: -

- Denotes Development Boundary

450mm Knee rail - please refer to boundary treatment plan for additional details

1200mm railing - please refer to boundary treatment plan for additional details

Boundary fences - please refer to boundary treatment plan for additional details

Boundary wall & fence panel - please refer to boundary treatment plan for additional details

- Denotes lockable 1.8m Garden Gates

- Denotes Highway Ramp

- Denotes Change of Highway surface material please refer to external materials plan for additional details

- Denotes extent of tagging for bin storage

- Denotes affordable unit

- Denotes PROW as per the definitive right of way map

- Denotes Location of trodden path

- Denotes Location of public open space

- Denotes Proposed tree, refer to FDA Landscape Plan RD-2401-1

Denotes bollards/removable bollards

Tree to be removed on advice from the Tree Constraints Plan and 16820) or as necessary for construction of infrastructure.

Tree to be retained contrary to advice from the Tree Constraints Plan.

Tree to be retained.

Root Protection Area (RPA)

Dry Stone wall to be removed

Dry Stone wall to be retained and made good with stone from removed dry stone wall.

Drainage Easement

Retaining walls

Bin presentation points located in accordance with Kinkies waste management design guide for new developments October 2020 version 5

BP

REFER TO MILLER HOMES DRAWING 09 POS TYPOLOGIES PLAN FOR IDENTIFIED AREAS OF PUBLIC OPEN SPACE.

J

House type change to plots 25/26 garage removed in accordance with LFA requirements. Footpath added to highway between plots 58/10 Bollards removed, turning area added. Bin presentation points added, parking numbers increased to plots 66/67 all accordance with Kinkies highways requests

AP

25.02.22

H

Overton 3 bed removed, 2 bed overmont added schedule updated. Offsite Tress added to outfall location landscaping added, bollards added RPA added

AP

05.01.22

G

Landscaping and engineering information overlaid

TS

02.12.21

F

Numbers reduced to 137/mo. General update to mitigate levels, LPA comments addressed

BMS

27.10.21

E

Updated in accordance with miller comments and updated by Miller Homes

AP

08.06.21

D

Proposed site entrance and tree information updated to latest design

TS

20.05.21

C

Red line removed, tree information updated inline with Miller tree removal plan.

TS

19.05.21

B

Red line updated to millers issue of 17.05.21

TS

18.05.21

A

Position of plot 105 amended.

TS

13.05.21

REV.

DESCRIPTION

BY:

DATE:

STEN ARCHITECTURE

STEN Architecture Ltd
The Coach House
100 The Street
Holly Edge, Wakefield
WF1 1PS
Tel: 01924 590985

Website: www.sten-architecture.co.uk
Twitter: [sten_arch](https://twitter.com/sten_arch)
Facebook: [stenarchitect](https://facebook.com/stenarchitect)
LinkedIn: [Sten Architecture](https://linkedin.com/company/sten-architecture)

CLIENT:

miller homes

SITE:

Woodhead Road
Holly

TITLE:

Planning LAYOUT

SCALE AT A3:

1:500

DATE:

07.05.21

DRAWN:

TS

CHECKED:

SH

PROJECT NO:

2108

DRAWING NO:

2108.01

REVISION:

J

Scaled @ 1:500
10m 20m 50m

APPENDIX G

SURFACE WATER FEATURES

Section 1 - Boundary Wall



Photograph 1: Water flowing beneath boundary wall along Woodhead Road exposed during site investigation undertaken on the 23rd February 2021, facing west.



Photograph 2: Same location as photograph 1 facing southeast. 23rd February 2021.



Photograph 3: View from the cycle path/pavement of Woodhouse Road facing northwest. 23rd February 2021.



Photograph 4: Water flowing from beneath the boundary wall. 24th February 2021.



Photograph 5: Close up of water flowing from beneath the boundary wall. 23rd February 2021



Photograph 6: Close up water flowing beneath the boundary wall, following removal of more soil. No evidence of a pipe beneath the wall observed. 23rd February 2021



Photograph 7: Photograph taken from the top of the boundary wall facing downslope towards the northeast. 23rd February 2021.

Section 2 – Water emerging from ground



Photograph 8: Water emerging from a hole in the ground before flowing towards the northeastern boundary, facing northeast.



Photograph 9: Water emerging from a hole in the ground, facing southwest.



Photograph 10: Surface water ponding within field down slope of photograph 8.



Photograph 11: Water flowing down towards wooded area beyond the northeastern boundary.

Section 3 – Surface water ponding within wooded area off site.



Photograph 12: Water flowing from the northeastern boundary of the site downslope to the NE into the wooded area off site, facing southwest (towards the site).



Photograph 13: Extensive surface water ponding within the wooded area beyond the northeastern boundary of the site, facing southwest (towards the site).



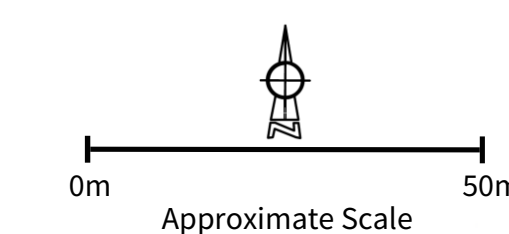
Photograph 14: Extensive surface water ponding within the wooded area beyond the northeastern boundary of the site, facing northeast.



Photograph 15: Surface water within wooded area flowing towards the northeast.



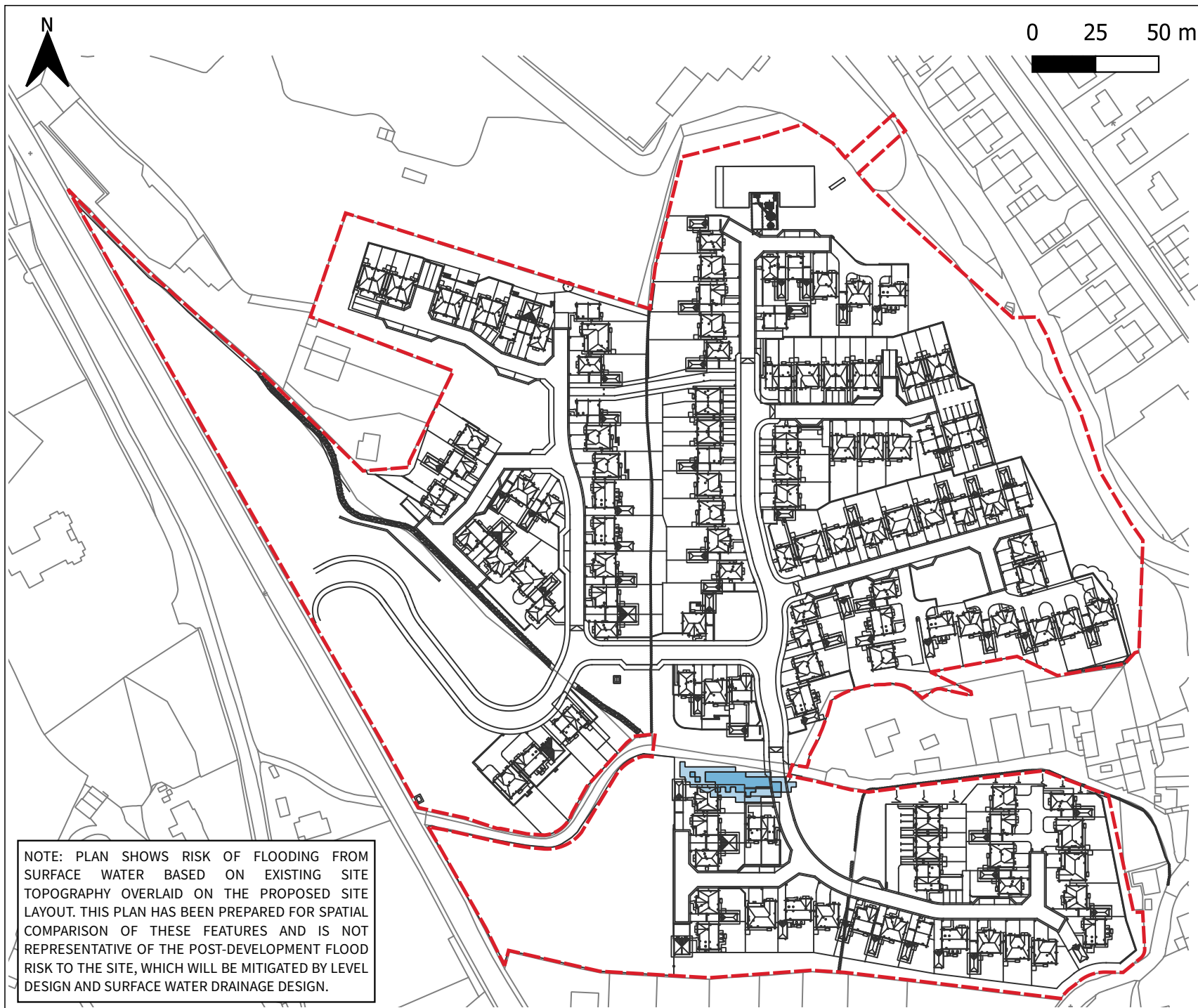
Photograph 16: Extremely boggy ground towards northeastern boundary of wooded area beyond the site boundary.



ARP ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS Northwest House · 5-6 Northwest Business Park · Servia Hill · Leeds LS6 2QH Telephone : 0113 245 8498 Fax : 0113 244 3864 E-Mail : leeds@arpassociates.co.uk	
Project WOODHOUSE ROAD HONLEY	
Client MILLER HOMES (YORKSHIRE) LTD	
Title SURFACE WATER FEATURES	
Date AUGUST 2021	
Drawn OG	Scale AS SHOWN
Job No. MLR/07	

APPENDIX H

SURFACE WATER FLOOD RISK OVERLAY



Key

 Site Boundary

RoFSW 1:30 yr depth (m):

0.00 - 0.15

0.15 - 0.30

0.30 - 0.60

0.60 - 0.90

0.90 - 1.20

>1.20



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Project

**SMITHY PLACE,
BROCKHOLES**

Client

**MILLER HOMES
(YORKSHIRE) LTD**

Title **UPDATED FLOOD MAP
FOR SURFACE WATER
1 IN 30 YEAR DEPTHS**

Date

MARCH 2022

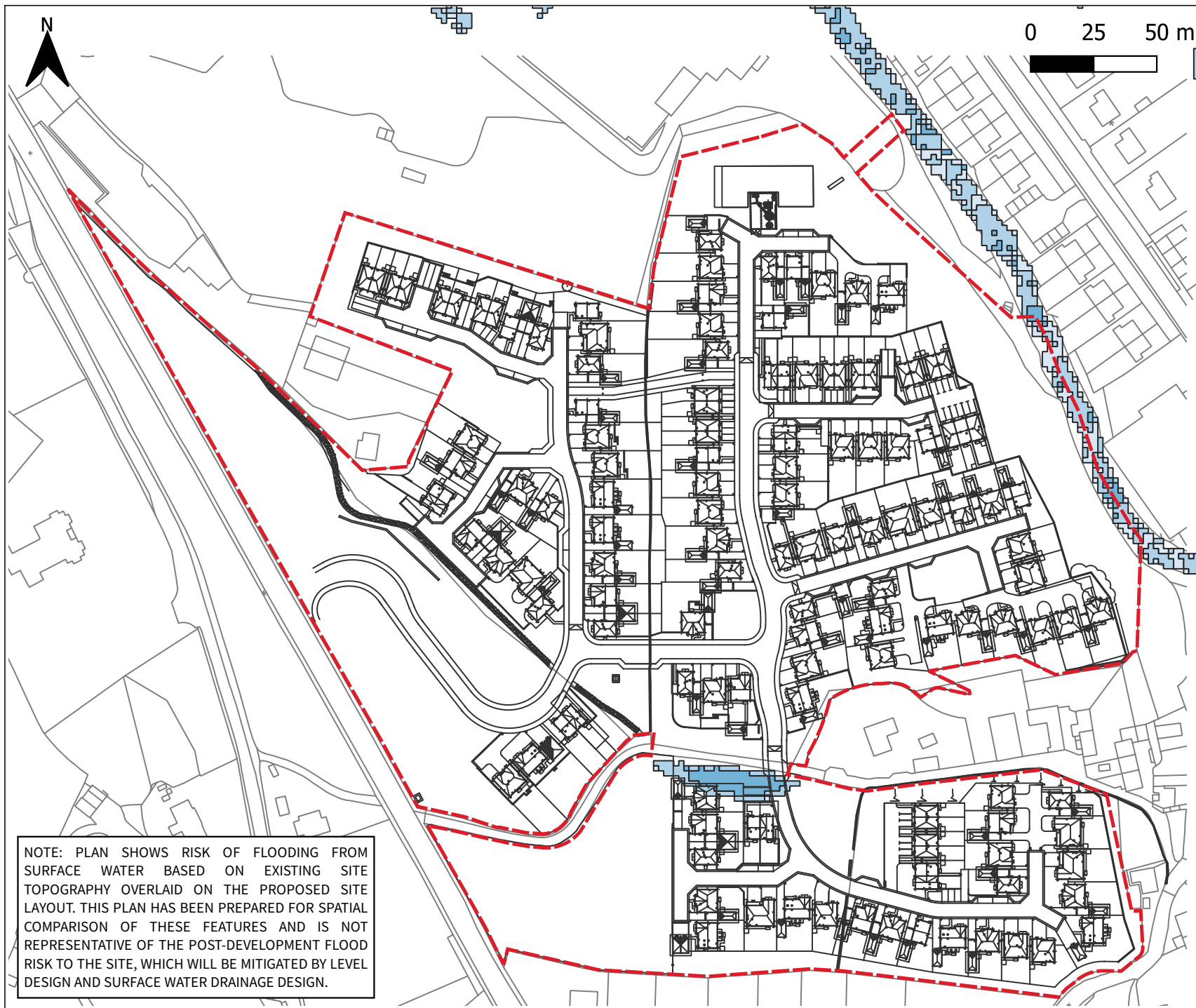
Drawn

MGW

AS SHOWN

Job No.

428/58



Key

 Site Boundary

RoFSW 1:100 yr depth (m):

 0.00 - 0.15

 0.15 - 0.30

 0.30 - 0.60

 0.60 - 0.90

 0.90 - 1.20

 >1.20

ARP

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www.arpassociates.co.uk

Project

SMITHY PLACE,
BROCKHOLES

Client

MILLER HOMES
(YORKSHIRE) LTD

Title UPDATED FLOOD MAP
FOR SURFACE WATER
1 IN 100 YEAR DEPTHS

Date

MARCH 2022

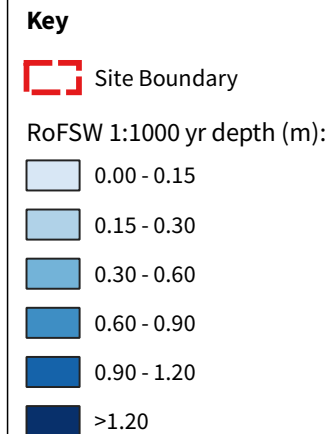
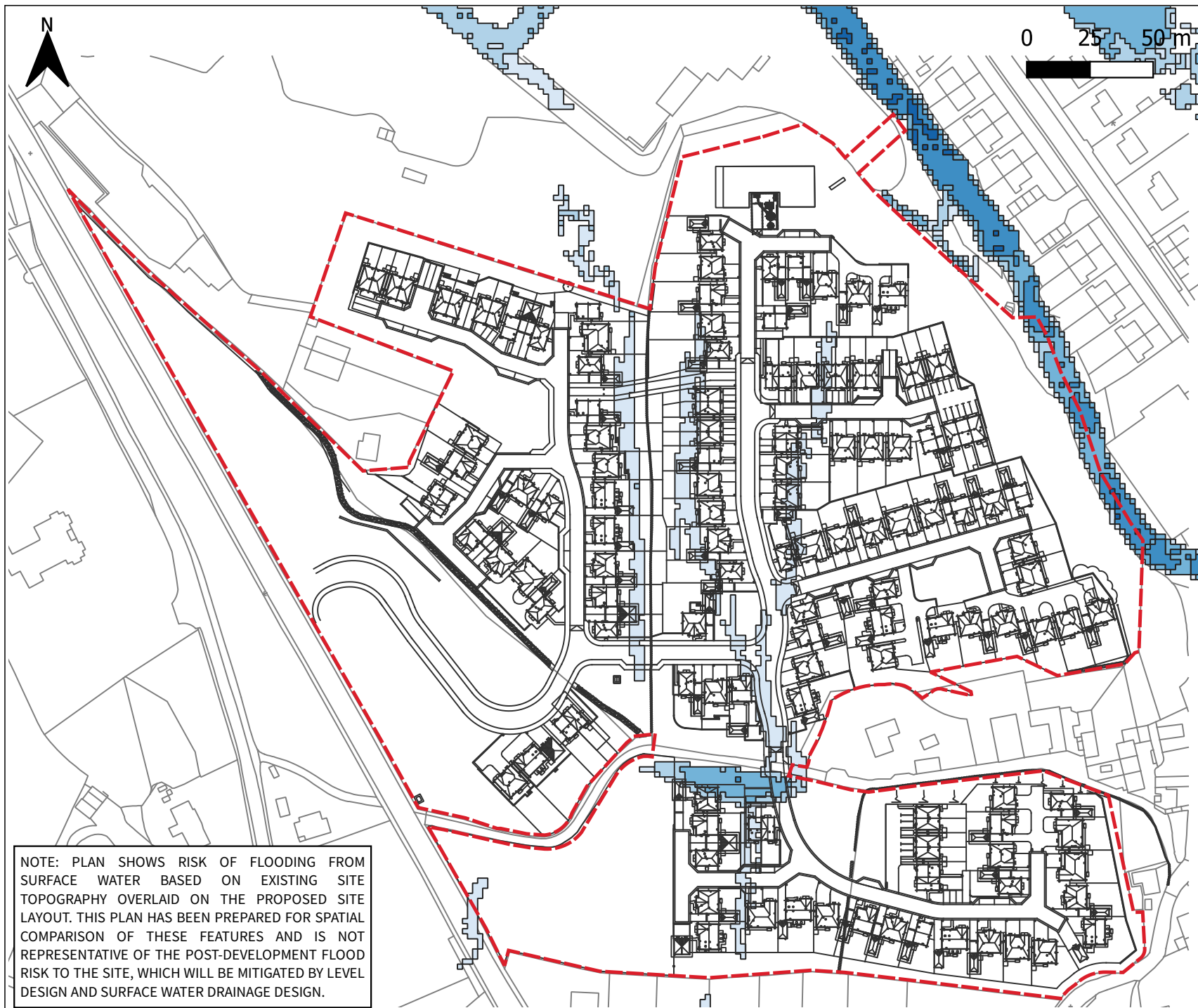
Drawn

MGW

AS SHOWN

Job No.

428/58



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Chartered Consulting Engineers

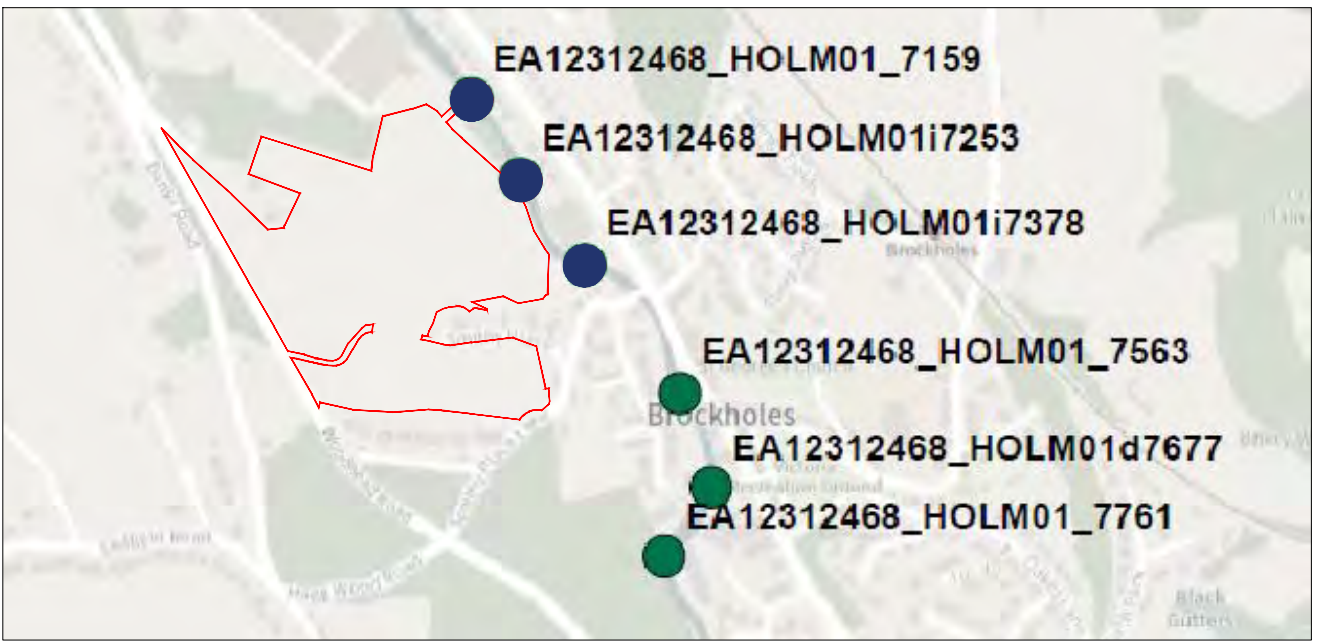
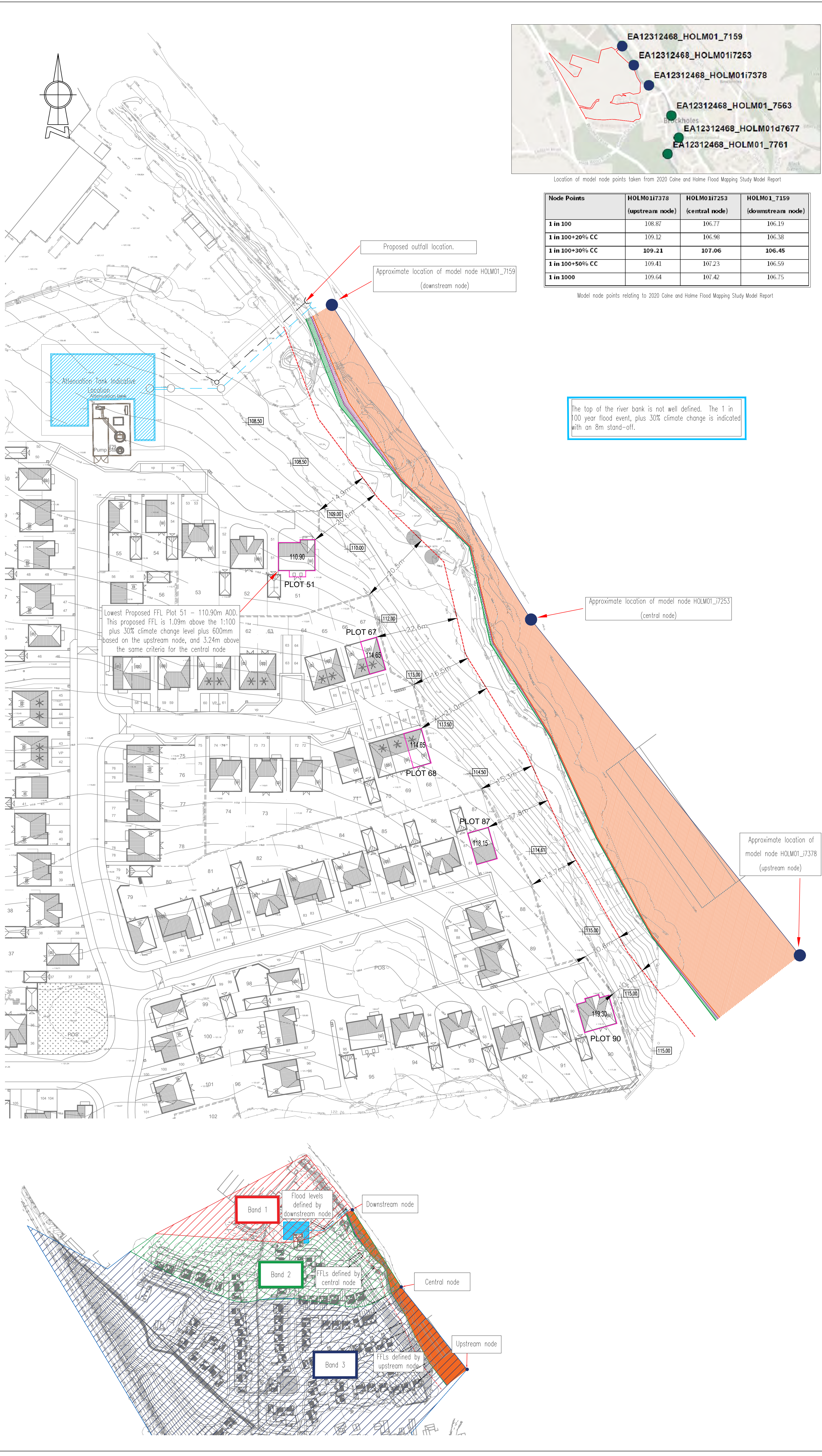
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www.arpassociates.co.uk

Project	SMITHY PLACE, BROCKHOLES	
Client	MILLER HOMES (YORKSHIRE) LTD	
Title	UPDATED FLOOD MAP FOR SURFACE WATER 1 IN 1000 YEAR DEPTHS	
Date	MARCH 2022	
Drawn	MGW	AS SHOWN
Job No.	428/58	

NOTE: PLAN SHOWS RISK OF FLOODING FROM SURFACE WATER BASED ON EXISTING SITE TOPOGRAPHY OVERLAID ON THE PROPOSED SITE LAYOUT. THIS PLAN HAS BEEN PREPARED FOR SPATIAL COMPARISON OF THESE FEATURES AND IS NOT REPRESENTATIVE OF THE POST-DEVELOPMENT FLOOD RISK TO THE SITE, WHICH WILL BE MITIGATED BY LEVEL DESIGN AND SURFACE WATER DRAINAGE DESIGN.

APPENDIX J

ENVIRONMENT AGENCY DATA ASSESSMENT



Location of model node points taken from 2020 Colne and Holme Flood Mapping Study Model Report

Node Points	HOLM017378 (upstream node)	HOLM017253 (central node)	HOLM01_7159 (downstream node)
1 in 100	108.87	106.77	106.19
1 in 100+20% CC	109.12	106.98	106.38
1 in 100+30% CC	109.21	107.06	106.45
1 in 100+50% CC	109.41	107.23	106.59
1 in 1000	109.64	107.42	106.75

Model node points relating to 2020 Colne and Holme Flood Mapping Study Model Report

The top of the river bank is not well defined. The 1 in 100 year flood event, plus 30% climate change is indicated with an 8m stand-off.

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KEY

All flood extents use the values from the 2020 Colne and Holme Flood Mapping Study Model Report. Three intermediate points have been interpolated between each node to define the flood outlines

1 in 100 year modelled flood extent.

1 in 100 year plus 30% climate change modelled flood extent.

1 in 1000 year modelled flood extent.

1 in 100 year modelled flood extent.

1 in 100 year plus 30% climate change modelled flood extent.

1 in 1000 year modelled flood extent.

8m stand off from the 1:100 year plus 30% Climate Change modelled flood extent.

Distance between the 8m stand off from the 1:100 year plus 30% Climate Change modelled flood extent to nearest retaining walls and closest plots

Approximate locations of model node points relating to 2020 Colne and Holme Flood Mapping Study Model Report

Proposed dwellings closest to the river

Existing Ground Levels (Spot levels taken from topographical survey)

Indicative Attenuation tank location and extent. Proposed outfall location indicated

General Notes

1. This drawing is based on Architects layout "Planning Layout" Revision J 02.03.22.

2. This drawing is based on Topographical Survey by Haycock+Todd June 2021, updated in October 2021.

3. This drawing is based on ARP Associates AutoCAD design files, which are subject to change during the design process.

4. Refer to ARP Flood Risk Assessment report, reference 425/58r5

SUBJECT TO
DETAILED DESIGN
AND APPROVAL OF
THE REGULATORY
AUTHORITIES

E	PSC	07.03.22	Updated to new EA model data, new planning layout, nodes added	MI	MI
D	PSC	28.02.22	Updated to new EA model data	MI	MI
C	PSC	07.01.22	Updated to client's comments rec. 04.01.22 and drawing renumbered	MI	MI
B	PSC	08.12.21	Updated to new planning layout	MI	MI
A	PSC	12.08.21	Issued for Approval	MI	MI
/	PSC	05.08.21	Issued for approval	MI	MI
Rev	By	Date	Revision	Chk	Apvd

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TITLE

ENVIROMENT AGENCY
DATA ASSESSMENT
LAYOUT

PROJECT

WOODHEAD ROAD,
BROCKHOLES

CLIENT

MILLER HOMES
(YORKSHIRE) LTD

DRAWING STATUS

PRELIMINARY

Scale

1:500 @ A1

Date

AUG 21

Drawn

PSC

Chk.

MI

Drg. No.

0425/58/SK12

Rev

E

APPENDIX K

BOREHOLE DECOMMISSIONING PLAN

Decommissioning

Each situation is different in terms of its location, geological setting, borehole construction, dimensions, hazards and, very importantly, intended site afteruse. Therefore the most appropriate abandonment procedure will vary from site to site. It is strongly recommended that you engage the services of a proficient well contractor with a good knowledge of the local geology and well abandonment procedures. For large boreholes and wells you may need to seek engineering advice. (Note that structural aspects are outside the scope of this guidance.)

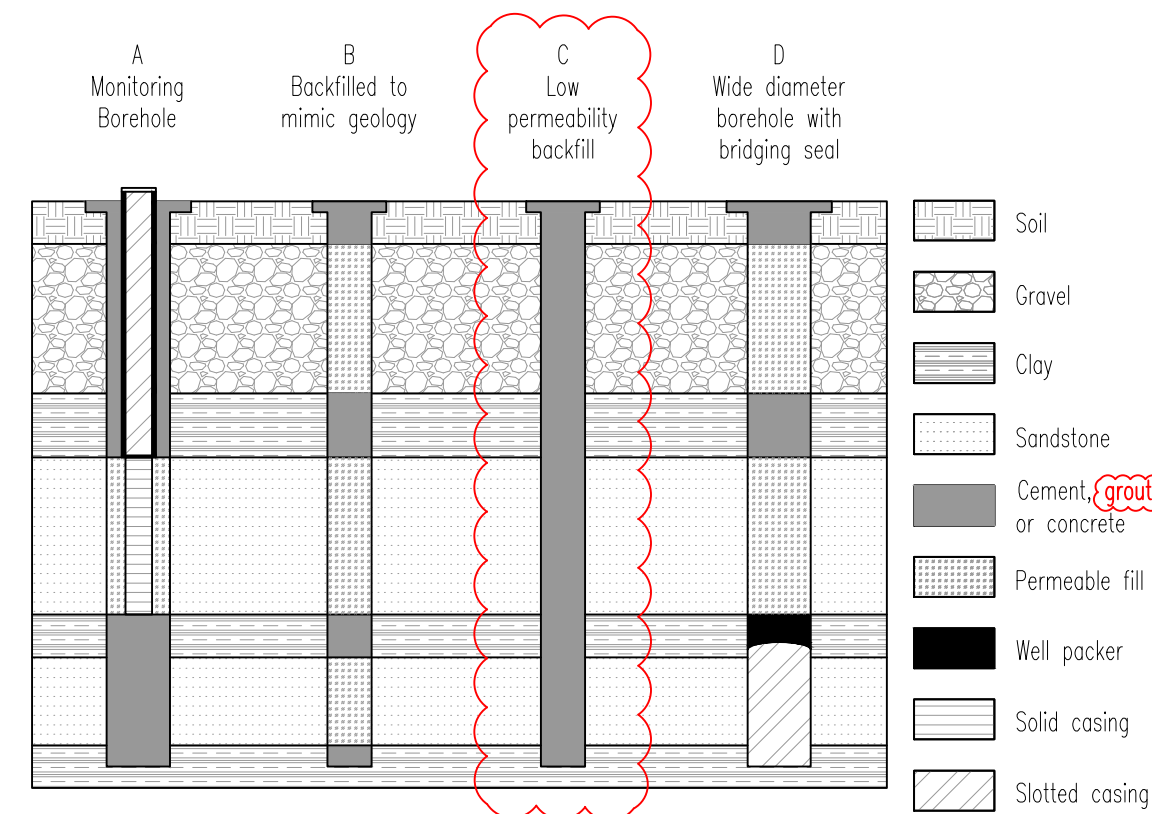
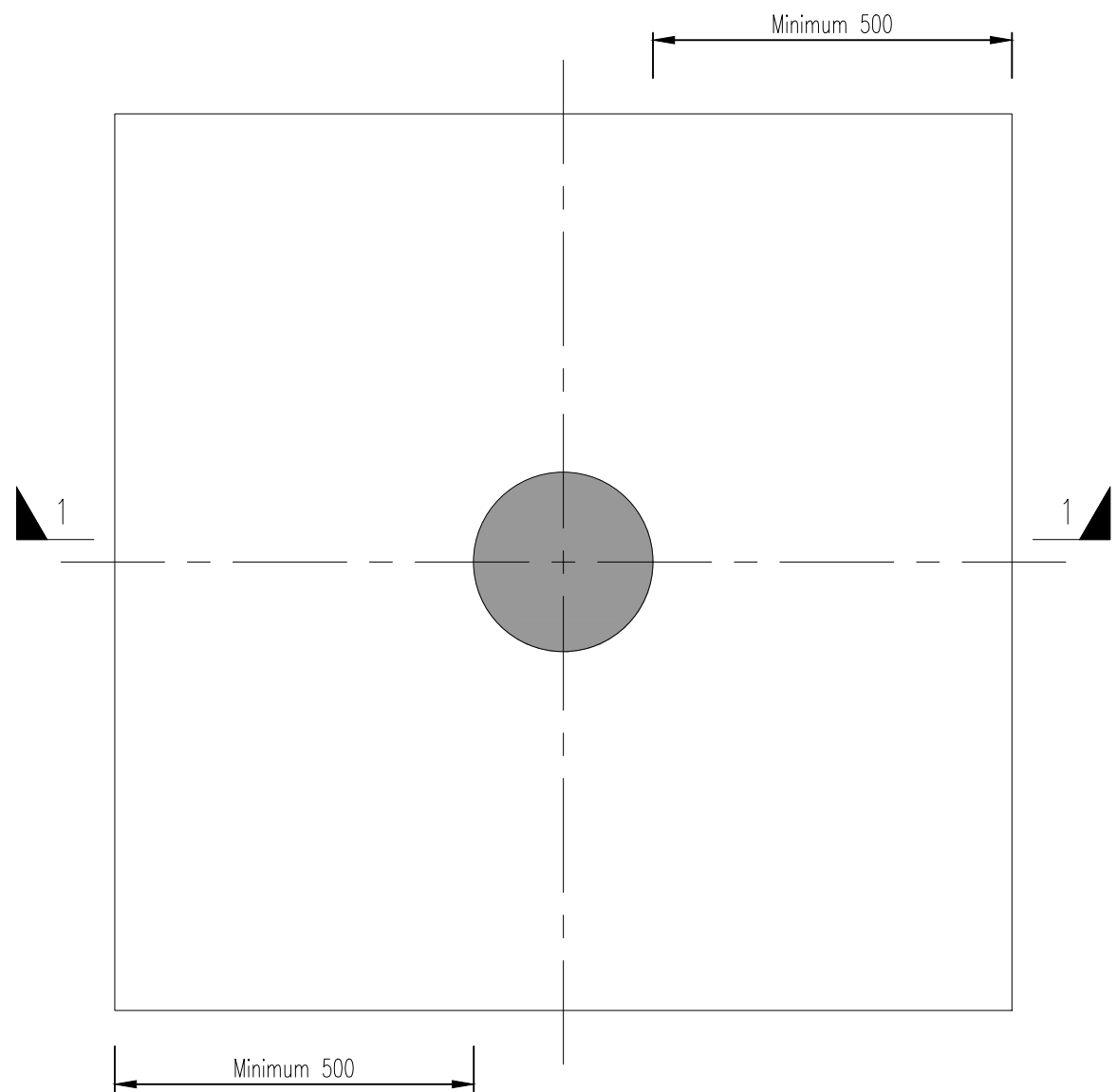


Figure 1: Schematic options (B-D) for decommissioning wells and boreholes
Detail taken from Good practice for decommissioning Boreholes and Wells (EA October 2012)



- N O T E S
1. This drawing is to be read in conjunction with all relevant drawings, details prepared by ARP associates for this project.

2. Do not scale from this drawing use figured dimensions only.

3. All dimensions are in millimetres, uno. all levels are in metres ood uno. All levels and dimensions are to be confirmed at site prior to construction.

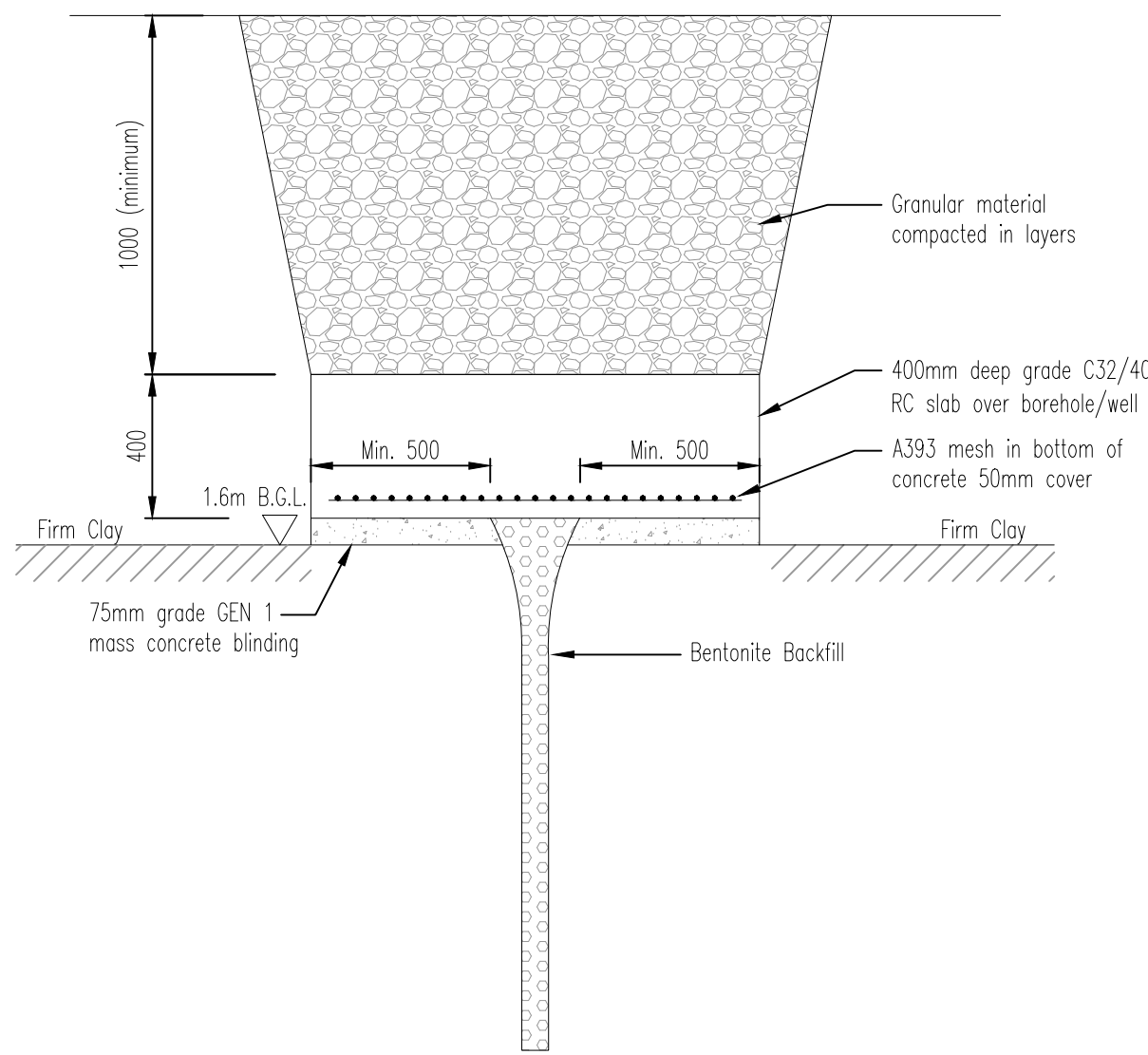
4. All concrete to be in accordance with BS EN 206-1:2000, reinforcement to BS 4449:2005, Reinforcing mesh to be in accordance with BS4483:2005.

5. Option C is to be utilised for decommissioning the Well and Borehole.

6. The concrete cap should extend at 0.5m (500mm) either side of the Borehole/Well.



WATER WELL AND BOREHOLE LOCATION PLAN
(1:1250)



SECTION 1-1
SHOWING DECOMMISSIONED BOREHOLE
(N.T.S.)

FOR THE WATER WELL
DECOMMISSIONING AND CAPPING DETAIL
PLEASE SEE DRAWING 425/58/79

A	PSC	08.03.22	Site Layout updated	MI	MI
/	JC	15.02.22	Issued for Information and Comments	JD	JD
Rev	By	Date	Revision	Chk	Apvd

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Chartered Consulting Engineers

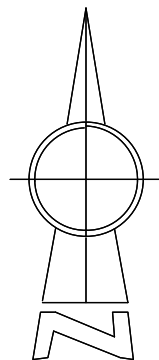
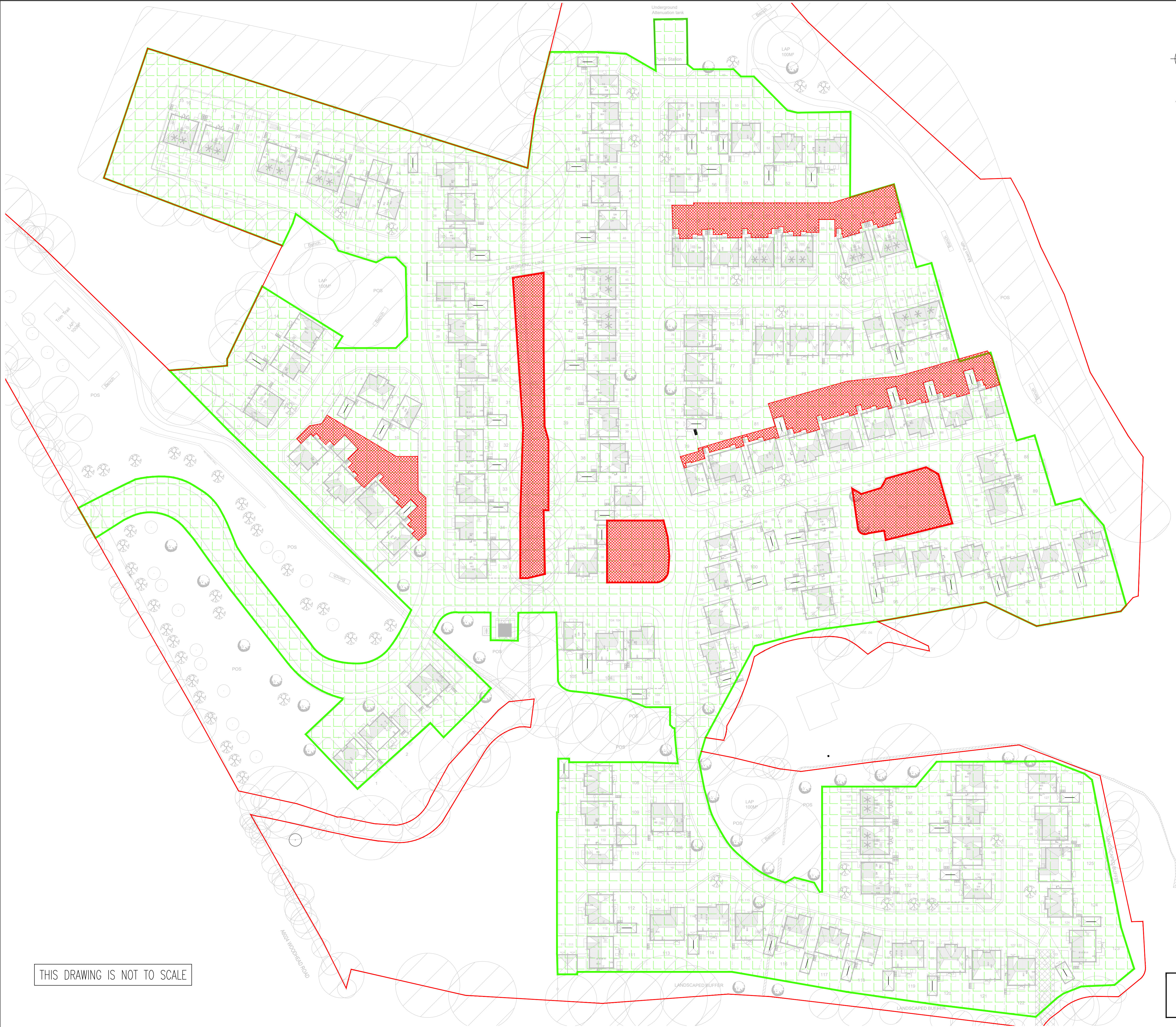
Northwest House • 5 & 6 Northwest Business Park • Servia Hill, Leeds • LS6 2QH
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TITLE GA & RC DETAILS OF BOREHOLE DECOMMISSIONING AND CAPS		
PROJECT WOODHEAD ROAD, BROCKHOLES		
CLIENT MILLER HOMES (YORKSHIRE) LTD		
DRAWING STATUS PRELIMINARY		
Scale AS SHOWN @ A1	Date FEB 22	Drawn JC Chk. JD
Drg. No. 425/58/78		Rev A

APPENDIX L

ARP ASSOCIATES DESIGN DRAWINGS



N
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ATTENTION IS DRAWN TO THE REQUIREMENTS OF THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015 AND THE DUTIES AND RESPONSIBILITIES CONTAINED THEREIN

Net Developable Area

53,410m²

Area deducted from calculation

POS/Landscaping
Gardens with Land drainage
& Retaining walls

3,467m²

Greenfield Run-off calculation

4.994ha x 5l/s/ha = 25l/s

B	MI	15.02.22	Greenfield run-off area amended		MI
A	MI	14.02.22	Greenfield run-off area amended		MI
/	MI	06.01.22	Issued for approval	PC	MI
Rev	By	Date	Revision	Chk	Apvd

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TITLE

NET DEVELOPABLE AREA
GREENFIELD RUN-OFF

PROJECT

WOODHEAD ROAD
BROCKHOLES

CLIENT

MILLER HOMES
(YORKSHIRE LTD)

DRAWING STATUS

PRELIMINARY

Scale

NOT TO SCALE

Date

MI

Drawn

MI

Chk.

Drg. No.

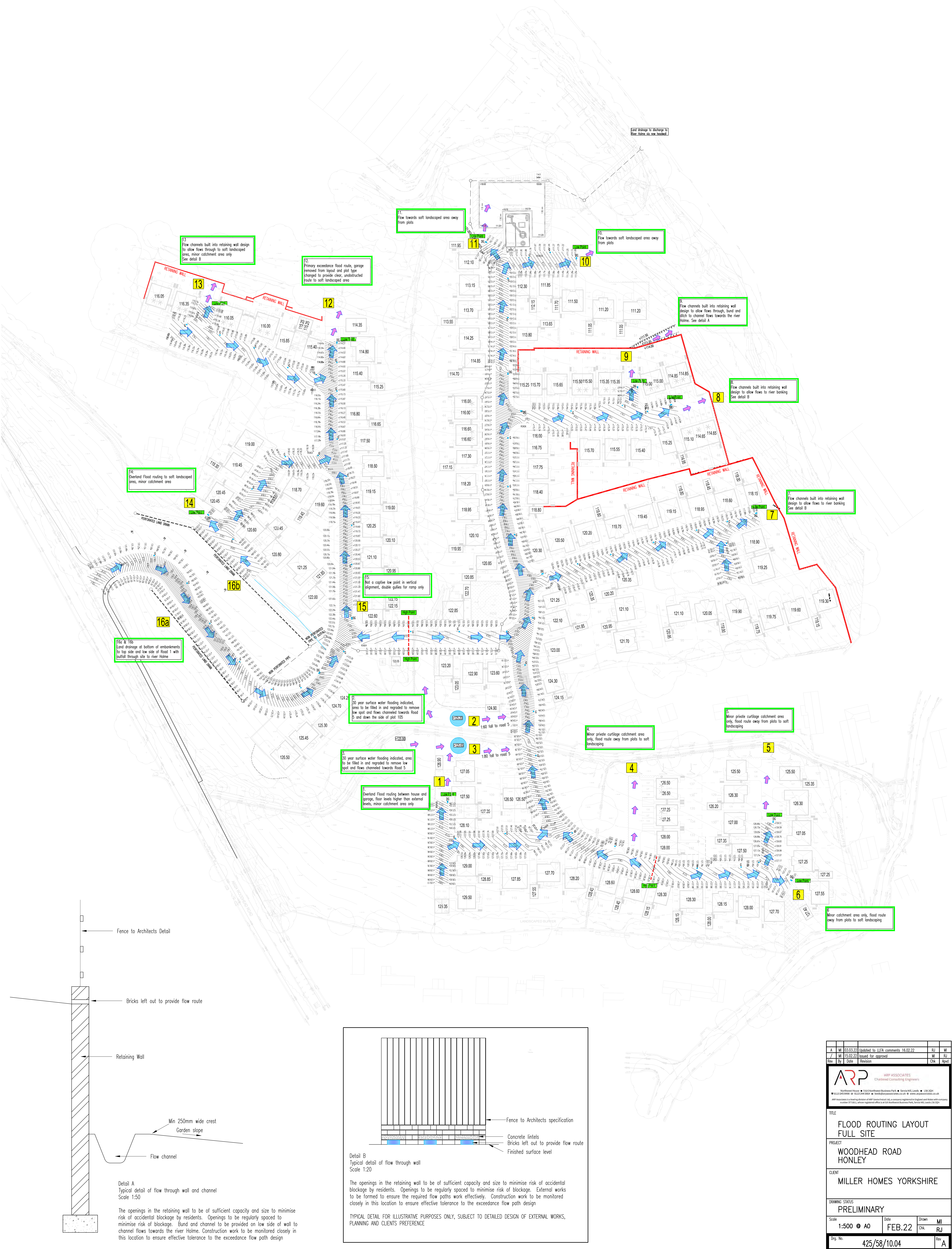
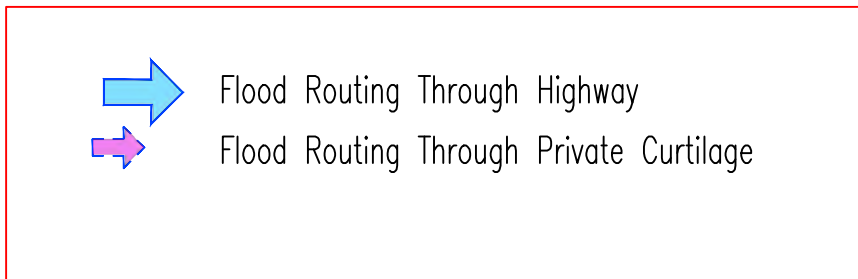
425/58/SK13

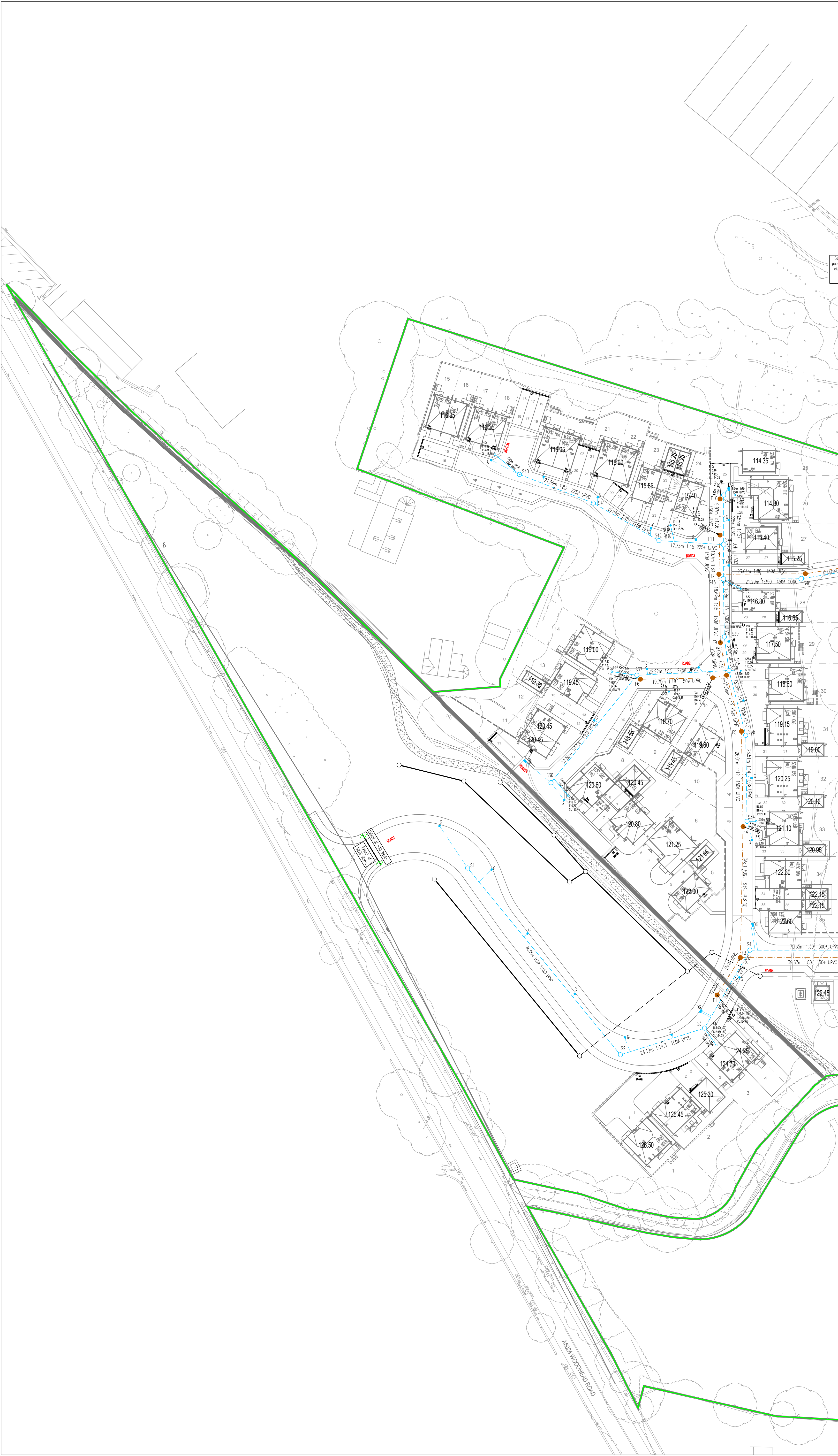
Rev

A

SUBJECT TO THE
APPROVAL OF
ALL RELEVANT
AUTHORITIES

THIS DRAWING IS NOT TO SCALE





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Storm water manhole

●

Foul water manhole

—

Storm water sewer

—

Foul water sewer

—

Combined sewer

■

Gully

■

Yard gully

—

Channel Drain
(min B125 grade cover)

①

Drainage crossover reference

1.

For longitudinal sections refer to drawing 0425/58/06.

2.

No services are to be sited directly over, or within 1m of, an adoptable sewer or manhole.

3.

Private drainage connections to adoptable sewers to be via 45° junction.

4.

Off site manholes already built must have invert levels checked prior to connection to the off site drainage.

5.

Any connections to existing sewers/manholes are to be supervised by Yorkshire Water.

6.

All connections to proposed public sewers to be minimum 150mm.

7.

Any land drain or water course on site to be diverted as not to pass under proposed buildings. Diversion to be approved and inspected on site by the Local Authority.

Yorkshire Water General Notes

1.

All adoptable sewer works and material to be in accordance with "Code for Adoption". The relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.

2.

Manhole covers shall have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.

3.

Filled ground must be filled and consolidated under the supervision, and to the satisfaction, of Yorkshire Water before any sewer works are carried out.

4.

Cover slabs must carry the BSI Kitemark or will be rejected by the Yorkshire Water inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600x600mm for the Yorkshire Water specified cover size. Please refer to the Concrete Pipe Systems Association (CPSA), "Technical Bulletin" issued autumn 2004 for kitemarked cover slab opening sizes.

5.

The adoptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.

6.

Sewers must have 5 metres clearance from trees and hedges, (please also refer to Figure 2.3 on page 33 in "Sewers for Adoption" 6th Edition for restrictions on tree planting adjacent to Sewers).

7.

Sewers to be laid in Class "S" bedding (150mm granular bed and surround). Where depth of cover to top of the sewer is less than 1.2m in highways and verges (or less than 900mm in none vehicular access areas) then a concrete slab should be provided above the granular bed and surround.

8.

Adoptable plastic sewer pipes to be BSI Kitemarked (Certified to WIS 4-35-01 and BS EN 13476). Adoptable sewer pipes to be laid in maximum 3 metre lengths unless there is a specific operational need to be longer lengths.

9.

Plastic channel sections in manholes are not acceptable and clayware is preferable. Plastic channels are difficult to set in concrete and a satisfactory finish cannot be obtained on the benching.

10.

The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate the connections and bends.

11.

Yorkshire Water policy is not to accept type "C" brick manhole and 1050mm dia manhole rings. Instead it is preferred that you use a type "B" manhole with 1200mm dia or 1500mm dia rings with the opening sited over the channel where depth of cover to pipe soffit is 1-1.5m.

12.

Surface water and foul rising mains to be provided with marker tape above the rising mains.

13.

If plastic pipes are to be used then the following should apply:-
a. All adoptable sewers to be BSI Kitemarked (certified to WIS 4-35-01).
b. Bedding and backfill material to conform to the requirements of Water Industry Specification 4-08-02 (Table A2)

14.

Where plastic pipes are proposed for adoptable sewers, structural calculations for the plastic pipes and a site investigation report to prove that the ground condition is suitable for the plastic pipes are to be produced.

15.

Where plastic pipes are installed into the ground prior to getting full technical approval, the developer must provide a CCTV survey of the prospectively adoptable sewers and a deformation test (Light-Line test) of the plastic pipes.

16.

Demarcation chambers to be a min. 450mm dia chamber for 100mm foul and 150mm surface water pipes up to 1.2m deep. For depths greater than 1.2m, restricted access opening to 350mm is required for safety reasons.

17.

Maximum depth of demarcation chamber to be 2m, where depth exceeds 2m, manhole to be constructed as type B manhole.

18.

Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.

19.

Yorkshire Water is not obliged to accept filter drain/land drainage runoff into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage runoff will therefore be required and you will have to liaise with the Land Drainage Authority/Land Drainage Section with regard to the disposal of the filter drain/land drainage runoff is required.

20.

Sulphate resisting cement (C20-DC2) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.

21.

The minimum crushing strength for clay pipes should be as follows : 100mm dia. 40kN/m, 150mm dia. 40kN/m, 225mm dia. 45kN/m and 300mm dia. 72kN/m. The minimum crushing strength for concrete pipes should be - (Class 120 to EN 1916/BS5911-1 2002). Plastic pipes should conform to WIS 4-35-01 and BS EN13476.

22.

All levels of existing drainage to be confirmed prior to work commencing on site.

23.

The contractor must allow for any fee's required for road and sewer opening permits, sewer connections and make the appropriate applications.

24.

Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).

NOTE

Lateral sewers to be Plastidrain (110 & 160 O.D.) in UPVC and manufactured by Hepworth or similar approved by Yorkshire Water. Demarcation chamber to be polypropylene Non-Entry Inspection Chamber up to 2.0m depth manufactured by Wavin or similar approved by Yorkshire Water to BS EN 13596-1:2003.

NOTE

There should be enough clearance to accommodate the bedding for both pipes, approx 300mm. If crossover is near the rocker then the clearance needed may be increased.

SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

C	JMG	04.03.22	Drawing revised to suit new layout	RJ	M
B	RJ	07.01.22	Drainage outfall revised	RJ	M
A	RJ	23.12.21	Drawing revised to suit new layout	RJ	M
/	RJ	06.08.21	Issued for approval	RJ	M
Rev	By	Date	Revision	Chk	Apvd

ARP

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TITLE

SECTION 104 LAYOUT
SHEET 1 OF 2

PROJECT

WOODHEAD ROAD,
BROCKHOLES

CLIENT

MILLER HOMES
(YORKSHIRE) LTD

DRAWING STATUS

PRELIMINARY

Scale	Date	Drawn
1:500 @ A1	AUG 21	RJ
	Chk.	RJ

Drg. No.	Rev
0425/58/03.01	C



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Storm water manhole

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Foul water manhole

—

Storm water sewer

—

Foul water sewer

—

Combined sewer

■

Gully

■

Yard gully

—

Channel Drain
(min B125 grade cover)

①

Drainage crossover reference

1.

For longitudinal sections refer to drawing 0425/58/06.

2.

No services are to be sited directly over, or within 1m of, an adaptable sewer or manhole.

3.

Private drainage connections to adaptable sewers to be via 45° junction.

4.

Off site manholes already built must have invert levels checked prior to connection to the off site drainage.

5.

Any connections to existing sewers/manholes are to be supervised by Yorkshire Water.

6.

All connections to proposed public sewers to be minimum 150mm.

7.

Any land drain or water course on site to be diverted as not to pass under proposed buildings. Diversion to be approved and inspected on site by the Local Authority.

Yorkshire Water General Notes

1.

All adaptable sewer works and material to be in accordance with "Code for Adoption", The relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.

2.

Manhole covers shall/must have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.

3.

Filled ground must be filled and consolidated under the supervision, and to the satisfaction, of Yorkshire Water before any sewer works are carried out.

4.

Cover slabs must carry the BSI Kitemark or will be rejected by the Yorkshire Water inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600x600mm for the Yorkshire Water specified cover size. Please refer to the Concrete Pipe Systems Association (CPSA), "Technical Bulletin" issued autumn 2004 for Kitemarked cover slab opening sizes.

5.

The adaptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.

6.

Sewers must have 5 metres clearance from trees and hedges, (please also refer to Figure 2.3 on page 33 in "Sewers for Adoption" 6th Edition for restrictions on tree planting adjacent to Sewers).

7.

Sewers to be laid in Class "S" bedding (150mm granular bed and surround). Where depth of cover to top of the sewer is less than 1.2m in highways and verges (or less than 900mm in none vehicular access areas) then a concrete slab should be provided above the granular bed and surround.

8.

Adaptable plastic sewer pipes to be BSI Kitemarked (Certified to WIS 4-35-01 and BS EN13476). Adaptable sewer pipes to be laid in maximum 3 metre lengths unless there is a specific operational need to be by longer lengths.

9.

Plastic channel sections in manholes are not acceptable and clayware is preferable. Plastic channels are difficult to set in concrete and a satisfactory finish cannot be obtained on the bedding.

10.

The chamber size of manholes with more than one connection in them may need to be increased to accommodate the connections and bends.

11.

Yorkshire Water policy is not to accept type "C" brick manhole and 1050mm dia manhole rings. Instead it is preferred that you use a type "B" manhole with 1200mm dia or 1500mm dia rings, with the opening sized over the channel where depth of cover to pipe soffit is 1-1.5m.

12.

Surface water and foul rising mains to be provided with marker tape above the rising mains.

13.

If plastic pipes are to be used then the following should apply:-
a. All adaptable sewers to be BSI Kitemarked (certified to WIS 4-35-01).
b. Bedding and backfill material to conform to the requirements of Water Industry Specification 4-08-02 (Table A2).

14.

Where plastic pipes are proposed for adaptable sewers, structural calculations for the plastic pipes and a site investigation report to prove that the ground condition is suitable for the plastic pipes are to be produced.

15.

Where plastic pipes are installed into the ground prior to getting full technical approval, the developer must provide a CCTV survey of the prospectively adaptable sewers and a deformation test (Light-Line test) of the plastic pipes.

16.

Demarcation chambers to be a min. 450mm dia chamber for 100mm foul & 150mm surface water pipes up to 1.2m deep. For depths greater than 1.2m, restricted access opening to 350mm is required for safety reasons.

17.

Maximum depth of demarcation chamber to be 2m, where depth exceeds 2m, manhole to be constructed as type B manhole.

18.

Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.

19.

Yorkshire Water is not obliged to accept filter drain/land drainage runoff into the public sewer network or adaptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage runoff will therefore be required and you will have to liaise with the Land Drainage Authority/Land Drainage Section with regard to the disposal of the filter drain/land drainage runoff is required.

20.

Sulphate resisting cement (C20-D22) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.

21.

The minimum crushing strength for clay pipes should be as follows : 100mm dia. 40kN/m, 150mm dia. 40kN/m, 225mm dia. 45kN/m and 300mm dia. 72kN/m. The minimum crushing strength for concrete pipes should be - (Class 120 to EN 1916/BS5911-1 2002). Plastic pipes should conform to WIS 4-35-01 and BS EN13476.

22.

All levels of existing drainage to be confirmed prior to work commencing on site.

23.

The contractor must allow for any fee's required for road and sewer opening permits, sewer connections and make the appropriate applications.

24.

Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).

NOTE

Lateral sewers to be Plastidrain (110 & 160 O.D.) in UPVC and manufactured by Hepworth or similar approved by Yorkshire Water. Demarcation chamber to be polypropylene Non-Entry Inspection Chamber up to 2.0m depth manufactured by Wavin or similar approved by Yorkshire Water to BS EN 13596-1:2003.

NOTE

There should be enough clearance to accommodate the bedding for both pipes, approx 300mm. If crossover is near the rocker then the clearance needed may be increased.

S52 FLOW CONTROL DATA

MANUFACTURER	HYDRO INTERNATIONAL
TELEPHONE	01275 878371
TYPE	HYDRO-BRAKE OPTIMUM
FLOW/HEAD	25.0 l/s @ 3.500m
HYDRO REF	SHE-0183-2500-3500-2500

To be installed in accordance with manufacturers specifications and recommendations before the manhole cover slab is installed

SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

C JMC 04.03.22 Drawing revised to suit new layout RJ M

B RJ 07.01.22 Drainage outfall revised RJ M

A RJ 23.12.21 Drawing revised to suit new layout RJ M

/ RJ 06.08.21 Issued for approval RJ M

Rev By Date Revision Chk Apvd

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ARP Associates is a trading division of ARP Geotechnical Ltd, a company registered in England and Wales with company number 3713813, whose registered office is at 5/5 Northwest Business Park, Servia Hill, Leeds LS6 2QH

TITLE

SECTION 104 LAYOUT
SHEET 2 OF 2

PROJECT

WOODHEAD ROAD,
BROCKHOLES

CLIENT

MILLER HOMES
(YORKSHIRE) LTD

DRAWING STATUS

PRELIMINARY

Scale

1:500 @ A1

Date

AUG 21

Drawn

RJ

Chk.

RJ

Drg. No.

0425/58/03.02

Rev

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