



JNP GROUP
CONSULTING ENGINEERS

Flood Risk Assessment

Project: Prickleden Mills
Holmfirth

Client: Eliston Homes Ltd

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 JNP Group has been commissioned by Eliston Homes Ltd to prepare a flood risk assessment for a proposed residential development in Holmfirth, West Yorkshire.

1.1.2 The development comprises the erection of 61 age-restricted apartments with ancillary accommodation including separate residents lounge and manager facilities and associated external works, including the erection of access bridge and riverside walk featuring two pedestrian bridges (within a Conservation Area) as shown in Appendix A.

1.1.3 This report assesses flood risk at the development site from all potential sources and describes the measures adopted in the master planning process to manage such risks. It has been prepared in compliance with current policies and best practices.

1.2 Policy Framework and Key Stakeholders

1.2.1 The *National Planning Policy Framework* (NPPF) sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed.

1.2.2 The NPPF refers to the flood zones which are shown on the Environment Agency Flood Map, and establishes the range of uses which are appropriate, or comparable, land uses for each flood zone.

1.2.3 In decision making, local planning authorities must ensure a sequential approach to site selection and master planning is followed so that development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future users to flood risk.

1.2.4 Where development needs to be in locations where there is a risk of flooding, local planning authorities and developers must ensure development is appropriately flood resilient and resistant, safe for its users for the development's lifetime, and will not increase flood risk elsewhere.

1.2.5 The Environment Agency (EA) is a statutory consultee on applications where there is a risk of flooding from the sea or main rivers.

1.2.6 Lead local flood authorities (LLFAs) are responsible for managing local flood risk from ordinary watercourses, surface water or groundwater, and for preparing local flood risk management strategies. Local planning authorities (LPAs) work with lead local flood authorities to ensure local planning policies are compatible with the local flood risk management strategy.

1.2.7 Kirklees Council is the LLFA and also the local planning authority (LPA).

1.2.8 Where relevant, local planning authorities and developers must also take advice from:

- Sewerage undertakers; to ensure they can assess the impact of new development on their assets and plan any required improvements. Yorkshire Water (YW) is the local sewerage undertaker.

- Reservoir undertakers; to avoid an intensification of development within areas at risk from reservoir failure and ensure they can assess the cost implications of any reservoir safety improvements required due to change in land use downstream of their assets.
- Navigation authorities; in relation to developments adjacent to, or which discharge into, canals (especially where these are impounded above natural ground level).

1.3 Sources of Information

1.3.1 This flood risk assessment has been based on the following sources of information:

- Bespoke topographic survey undertaken by AIRD Group (Ref. M811- Revision C, May 2011);
- Bespoke topographic survey undertaken by Met geo Environmental (Ref. P20-01038 Rev. 01, October 2020);
- British Geological Survey's GeoIndex Tool;
<http://mapapps2.bgs.ac.uk/geoindex/home.html>
- DEFRA / EA's aquifer and source protection data;
<https://magic.defra.gov.uk/MagicMap.aspx>
- Cranfield University's soils data;
[\(http://www.landis.org.uk/soilscapes/\)](http://www.landis.org.uk/soilscapes/)
- FEH's catchment data;
<https://fehweb.ceh.ac.uk/>
- EA's Flood Map for Planning;
<https://flood-map-for-planning.service.gov.uk/>
- EA's Long Term Flood Risk Information;
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>
- Flood risk vulnerability classification
<https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>
- Flood risk assessments: climate change allowances
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>
- EA's Historic Flood Outlines;
<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/RecordedFloodOutlines&Mode=spatial>
<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&Mode=spatial>
- Kirklees SFRA (2016);

- EA's detailed flood risk information (Product 4, April 2021);
- EA flood modelling data (October 2021);
- YW's Asset Location Plan;
- Supplementary Ground Contamination Report & Remediation Strategy. ARC Environmental Ref. 11-516, December 2011.

2 DEVELOPMENT SITE

2.1 Location

2.1.1 The site is located approximately 0.45 km west of Holmfirth town centre (Figure 2.1, Table 2.1). The site covers an area of approximately 1.11 hectares.

Figure 2.1: Site Location

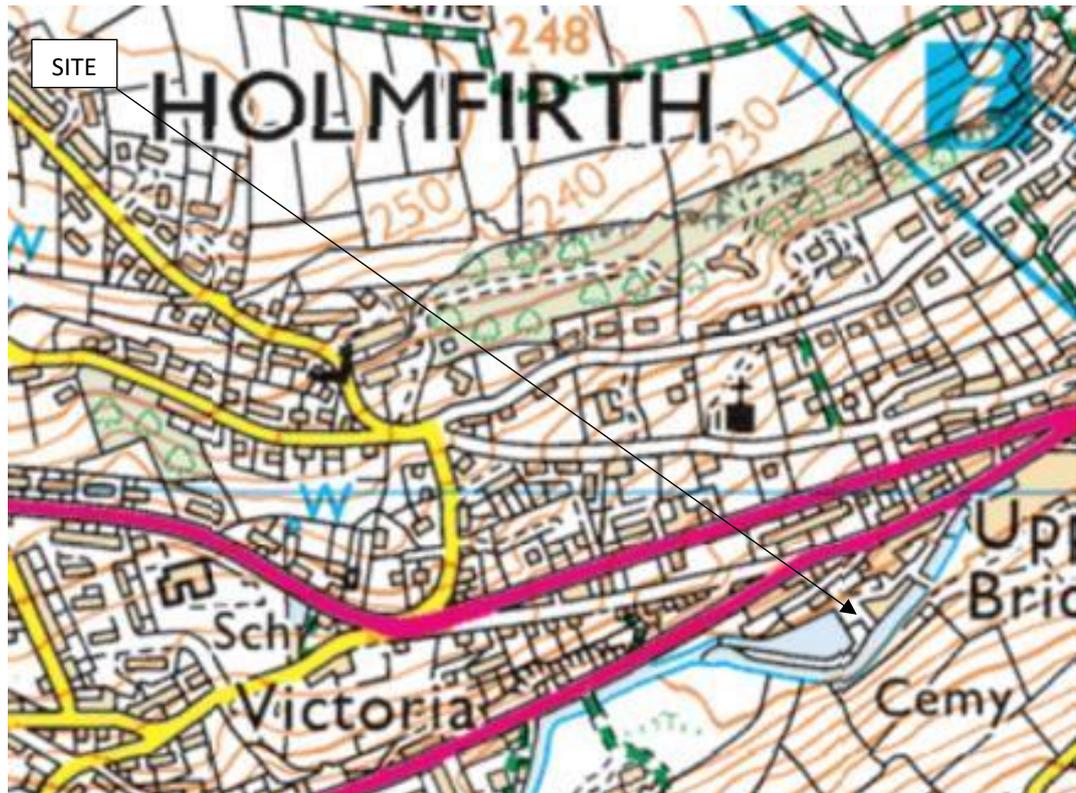


Table 2.1: Site Location

OS X	OS Y	Site Area (ha)	Nearest Postcode
413787	407894	1.11	HD9 2JU

2.1.2 The site is a former mill site; the mill buildings have been demolished leaving a vacant site. In the west of the site is a small mill pond, with a pond wall in the centre of the site.

2.1.3 Land to the south of the river is also included in the application. This is vacant land between the river and a steep wooded bank to the south.

2.1.4 The surrounding land uses are summarised in the following table.

Table 2.2: Surrounding Land Use

Direction	Land Use
North	Residential with Woodhead Road beyond
East	Small industrial unit, River Holm
South	River Holm, bank and fields beyond

Direction	Land Use
West	Residential

2.2 Topography

- 2.2.1 The site is located in the bottom of the valley with steep slopes to the north and south. The site itself is relatively flat. Two topographical surveys have been undertaken at the site in 2011 and 2020. The 2011 survey has a larger extent and includes some of the river features. Demolition has occurred on the site since 2011 so the levels recorded on the 2020 survey for the site are considered to accurately represent current conditions (Appendix B).
- 2.2.2 The western area is dominated by the mill pond which has an inlet from the River Holme in the far west with a mill race connecting this to the pond. The wall to the north of the mill race is 151.69m aOD or higher in this location and the bank to the south, between the mill race and the River Holme, is at 150.0m to 150.5m aOD. At the eastern end of the pond, the top of the bank to the north is c. 150.5m aOD or higher and the pond wall in the east is at 149.9m aOD. The southern bank of the pond is at an elevation between c. 149.7m and 150.0m AOD.
- 2.2.3 The area to the east of the pond wall is lower, at an elevation down to 148.25m aOD. The ground then rises to the north and east.
- 2.2.4 The plot to the south of the river is at an elevation of c. 148.5m to 149.1m aOD, then rises very steeply to the south.

2.3 Geology

- 2.3.1 The geology of the site has been determined by reference to the 1:50,000 scale British Geological Survey (BGS) online Geindex Tool.
- 2.3.2 No artificial or made ground is indicated to be present underlying the site, however, from a ground investigation undertaken on site in 2011, made ground up to 3.2m thick was found. Demolition since then may have contributed to or removed some of this material.
- 2.3.3 The superficial geology of the site to be is indicated to be Alluvium, which is described by the BGS as *“Normally soft to firm, consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel.”*
- 2.3.4 The underlying geology is indicated to be the Readycon Dean Flags, for which the BGS do not provide a lithological description. These are part of the Millstone Grit Group which the BGS describe as *“Fine- to very coarse-grained feldspathic sandstones, interbedded with grey siltstones and mudstones, with subordinate marine shaly mudstone, claystone, coals and seatearths.”*
- 2.3.5 There is a fault to the north of the site running close to the southern side of Woodhead Road.
- 2.3.6 JNP Group have consulted online borehole records held by the BGS. There are no accessible borehole records close to the site.
- 2.3.7 The Environment Agency’s website indicates that the site is underlain by a Secondary A Aquifer. The aquifer status refers to both the Alluvium and Millstone Grit Group.

2.3.8 The Environment Agency define a Secondary-A Aquifer as:

“Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.”

2.3.9 The site’s proximity to groundwater Source Protection Zones (SPZs) was determined by reference to the Environment Agency’s website. These zones show the risk of contamination from any activities that might cause pollution in the area, with the closer the activity, the greater the associated risk. The site is not located within or close to a SPZ

2.4 Hydrology

2.4.1 The River Holme flows west to east along the southern site boundary of the development site. It is classified by the EA as a ‘main river’ and defines a total catchment area of 26 km² at the point where it leaves the vicinity of the site.

2.4.2 There is a weir in the river immediately downstream of the inlet to the mill race with a fall of over 1m over the weir. There is a second weir to the south of the mill pond with a fall of c. 0.6m across the weir.

2.4.3 The water level in the mill pond is at a higher level than the site and is controlled by a sluice gate at the upstream entrance to the pond.

2.4.4 At the mill end of the pond is a further sluice gate, which in the past would have been used to drain the pond through a mill race to operate the mill.

2.4.5 At this end of the mill pond, there is also an overflow pipe discharging into the lower level river where it flows past the site.

3 PROPOSED DEVELOPMENT

- 3.1.1 The proposed development (Figure 3.1 and Appendix A) comprises 61 age-restricted apartments with ancillary accommodation including separate residents lounge and manager facilities and associated external works, including the erection of access bridge and riverside walk featuring two pedestrian bridges (within a Conservation Area).
- 3.1.2 This application comprises a revised scheme to the planning application that was approved in December 2013 (Ref: 2012/90738) and was commenced by the demolition of the existing buildings adjacent to the river. A later variation was approved in January 2018 (Ref: 2018/90031).
- 3.1.3 The proposed apartments are contained within five multi-storey blocks (A to E) with parking beneath some of the blocks and the central garden area, located to the east of the pond wall. A residents lounge is located to the west of these adjacent to the mill pond. Cross sections of the proposed development are also included in Appendix A.
- 3.1.4 Under the Flood Risk and Coastal Change – Annexe 3: Flood Risk Vulnerability Classification, the proposed residential development is classified as more vulnerable.

Figure 3.1: Proposed Development



4 FLOOD RISK ASSESSMENT

4.1 Overview

4.1.1 All potential sources of flood risk at the development site have been assessed based on the information listed in Section 1.3 and are summarised below. The key sources of flood risk to the proposed development are further described in the ensuing sections.

Table 4.1: Potential Sources of Flood Risk

Source	Flood Risk
<i>Coastal</i>	<i>Low risk.</i>
Fluvial	Low to high risk of flooding. Refer to Section 4.3.
Surface Water	Very low to high risk. Refer to Section 4.4.
<i>Groundwater</i>	<i>EA indicate groundwater flooding is unlikely in this area.</i>
Sewers	Site is crossed by a YW sewer. Refer to Section 4.5.
Infrastructure Failure	Potential for flooding from failure of the Digley, Riding Wood, Ramsden and Brownhill Reservoirs. Refer to Section 4.6.

4.2 Climate Change

4.2.1 The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. This includes demonstrating how flood risk will be managed now and over the development’s lifetime, taking climate change into account.

4.2.2 In accordance with the EA’s climate change guidance, the proposed development must take account of the following allowances:

- Peak River Flows (Aire and Calder Management Catchment, development lifespan into 2080s)
 - Central 23%
 - Higher Central..... 31%
 - Upper End 51%
- Peak Rainfall Intensity (Aire and Calder Management Catchment, 1% AEP, 2070s).
 - Central 30%
 - Upper End 45%

4.3 Fluvial Flood Risk

4.3.1 Fluvial flooding occurs when a catchment area receives greater than usual amounts of water (e.g. rainfall or snow melt). When the converging runoff exceeds the conveyance capacity of the receiving channel, water spills onto the surrounding floodplains and fluvial flooding occurs.

4.3.2 Fluvial flooding usually occurs hours or days after heavy and / or prolonged rainfall and its effects often last several hours or days.

- 4.3.3 Besides posing a direct flood risk to floodplain areas, high water levels in watercourses can exacerbate other sources of flood risk by surcharging / locking outfalls, thus preventing the normal discharge of flows or even back flowing into tributary drainage systems.
- 4.3.4 In accordance with the EA's *Flood Map for Planning* (Figure 4.1), most of the site where development is planned is in Flood Zone 1. However, there is an area in the eastern part of the site predicted to be in Flood Zone 2 / 3. The mill pond is also predicted to be in Flood Zone 3 and parts of the land to the south of the river are in Flood Zone 2.
- 4.3.5 The SFRA indicates that the Flood Zone 3 areas are Flood Zone 3a.
- 4.3.6 The site does not benefit from formal flood defences.
- 4.3.7 According to the EA's Historic Flood Outlines map, the site has not flooded historically.

Figure 4.1: EA Flood Map for Planning



- 4.3.8 Predicted flood levels have been provided by the EA (Appendix C). However, further assessment of the flood risk at the site has been undertaken. This work was based on the (1D) hydraulic model developed by JBA on behalf of the Environment Agency (EA) for the *Colne and Holme Flood Mapping* project. The work aimed to establish more accurate, site-specific flood levels for the development at Prickleden Mills, Holmfirth. A report describing the works is included in **Appendix D**.
- 4.3.9 The works concluded that:
- Finished floor levels (FFLs) at the development site (nodes HOLM02_11757 to HOLM02_11682) must be raised to a minimum of 149.58 m aOD to ensure a 600 mm freeboard over the design flood level of 148.98 m aOD (1.0% AEP + 30% climate change allowance). This will also provide a freeboard of 100 mm over the 0.1% AEP flood level of 149.48 m aOD.
 - The northern and eastern banks of the Mill Pond must be raised to a minimum level of 150.51 m aOD to prevent overflows towards the proposed development. This includes freeboards of 600 mm and 330 mm over the maximum flood levels of 149.91 m aOD (1.0% AEP + 30% climate change allowance) and 150.18 m aOD (0.1% AEP).
- 4.3.10 The revised model for the area was reviewed by the EA and found to be satisfactory.
- 4.3.11 The revised proposals for the site (see Appendix A) incorporate finished floor level for the accommodation blocks at 149.58 aOD and 150.53m aOD for the residents lounge, some

600mm plus above the design flood levels. The soffits for the bridges are also set at or above the design flood levels.

- 4.3.12 The management measures proposed to deal with the design flood level of 150.18 m aOD in the west and 149.91 aOD in the east are described in Section 5.2.

4.4 Surface Water Flood Risk

4.4.1 Surface water flooding is a description for excessive overland flows that have yet to enter a natural or manmade receptor (e.g. aquifer, watercourse or sewer). Surface water flooding also occurs when the amount of runoff exceeds the capacity of the collecting system and spills onto overland flow routes.

4.4.2 Surface water flooding is usually the result of very intense, short lived rainfall events, but can also occur during milder, longer lived rainfall events, when collecting systems are at capacity or the ground is saturated. It often results in the inundation of low points in the terrain.

4.4.3 In accordance with the recently released updates to the EA's *Long Term Flood Risk Information* dated February 2025 (Figure 4.2), the development site is currently mostly at very low (< 0.1% AEP) risk of surface water flooding. A small area where the apartment blocks are proposed is predicted to be at low (0.1% to 1.0% AEP) to high (> 3.3% AEP) risk of surface water flooding. This is however a small isolated area and construction on-site will mitigate this risk. Small areas of surface water flooding are also predicted in the mill pond and to the south of the site. Again, construction will mitigate the latter.

4.4.4 Note that the 2025 update to the surface water flooding map shows a reduction in the predicted surface water flood risks compared to previous maps, in particular, there was an overland flow route from the north supposedly impacting the site which was previously flagged by the LLFA as a risk to the site; this is no longer shown to impact the site.

4.4.5 The latest surface water flooding maps also included predicted surface water flooding extents for 2040 to 2060. This map is also shown in Figure 4.2. The predicted flood extents are only slightly larger and / or more likely and do not alter the conclusions above.

4.4.6 The proposed development is designed to be present beyond these dates. However, the drainage strategy will effectively mitigate the surface water flood risk, so this is not considered a risk beyond 2060.

Figure 4.2: Flood Risk from Surface Water



Surface water map

Yearly chance of flooding

- Flood area (extent)
- High chance
- Medium chance
- Low chance

Yearly chance of flooding between 2040 and 2060

- Flood area (extent)
- High chance
- Medium chance
- Low chance

- 4.4.7 The risk of surface water flooding to the development is therefore considered to be low.
- 4.4.8 The risk of surface water flooding from runoff generated within the development site will be managed by the drainage strategy, summarised in report B24120-JNP-XX-XX-RP-C-1006, dated February 2025.
- 4.5 Sewer Flood Risk**
- 4.5.1 Sewer flooding occurs when a manmade drainage system receives greater than usual amounts of water and the overwhelmed system starts overflowing at gullies and manholes, thus generating overland flows.
- 4.5.2 Sewer flooding is usually the result of very intense, short lived rainfall events, but can also occur during milder, longer lived rainfall events, when outfalls become surcharged / locked by high water levels in the receiving feature.
- 4.5.3 In addition to a flood risk, overflowing combined sewers also pose a significant public health and environmental risk.
- 4.5.4 A YW sewer crosses the site. Recent issues with this sewer are not known and should they occur, it will be YW's responsibility to remedy the issue. Should any flooding occur on site,

it will be collected by the surface water drainage system. The risk is therefore considered to be low and further mitigation is not required.

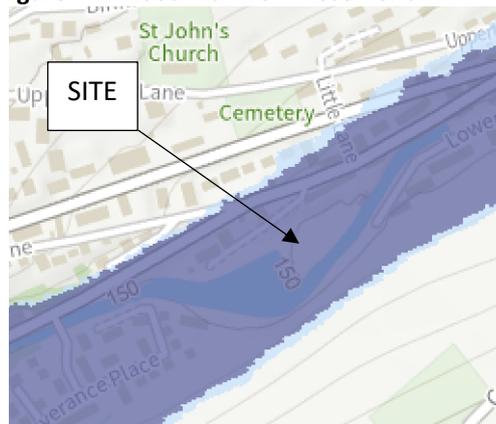
4.6 Infrastructure Failure Flood Risk

4.6.1 Infrastructure failure flooding occurs when a feature holding water above natural ground levels (e.g. reservoir or canal) is overtopped or breached. Infrastructure failure flooding is usually the result of extreme events in excess of the high standards of protection usually considered in the design of such structures (namely reservoirs).

4.6.2 In accordance with the EA's *Long Term Flood Risk Information*, the development site is at risk of flooding from failure of the Yateholme, Digley, Riding Wood, Bilberry, Ramsden and Brownhill Reservoirs, owned and maintained by Yorkshire Water.

4.6.3 Reservoir failures are extremely rare in the UK, as the *Reservoir Act* ensures strict inspection and maintenance of all structures above a certain threshold. Structures under the *Reservoir Act* are also covered by comprehensive emergency plans and warning systems developed in liaison with the relevant civil protection authorities to ensure populations potentially at risk can be safely evacuated in critical situations.

Figure 4.4: Flood Risk from Reservoirs



Reservoirs map

- Extent
- When river levels are normal
- When there is also flooding from rivers

4.6.4 Flood risk from infrastructure failure is mostly managed off-site by the competent authorities. The residual risk from infrastructure failure upstream of the site is deemed low / negligible and adequately managed by measures proposed to deal with other sources of flooding.

4.6.5 The western side of the site is occupied by a mill pond. The condition of the pond is not known although some issues have been identified and an inspection is required.

4.6.6 Proposed modifications to the outlet of the mill pond (see Section 5.2) will require it to be drained. This will be an opportune time to inspect the pond structure and the embankment construction thoroughly. Investigation at the present time whilst the mill pond contains water will be compromised by logistical issues. A non-intrusive inspection has already been carried out which identifies visible defects which will be addressed as part of the development in conjunction with the outcome of the intrusive inspection and investigation works. Once the condition of the existing embankments are known, a scheme for the repair and strengthening works (if necessary) will be prepared and implemented. Recommendations for ongoing inspection and maintenance regime can also be proposed.

5 FLOOD RISK MANAGEMENT

5.1 Sequential and Exception Tests

- 5.1.1 The sequential, risk-based approach to the location of development is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. The aim is to keep development out of medium and high flood risk areas (Flood Zones 2 and 3) and other areas affected by other sources of flooding where possible.
- 5.1.2 Application of the sequential approach in the master planning process, in particular application of the *Sequential Test*, helps ensure that development can be safely and sustainably delivered, and developers do not waste resources promoting proposals which are inappropriate on flood risk grounds.
- 5.1.3 The *Sequential Test* ensures that a sequential approach is followed to steer new development to areas with the lowest probability of flooding. The aim is to steer new development to Flood Zone 1 (areas with a low probability of sea or river flooding). Where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2 (areas with a medium probability of sea or river flooding), applying the *Exception Test* if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 (areas with a high probability of sea or river flooding) be considered, taking into account the flood risk vulnerability of land uses and applying the *Exception Test* if required.
- 5.1.4 [Table 2](#) of the *Flood Risk and Coastal Change Guidance* categorises different types of uses and development according to their vulnerability to flood risk. [Table 3](#) of the *Flood Risk and Coastal Change Guidance* (Table 5.1) maps these vulnerability classes against flood zones to indicate where development is appropriate and where it should not be permitted.

Table 5.1: Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zone	Flood Risk Vulnerability				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test	✓	✓	✓
Zone 3a	Exception Test	✗	Exception Test	✓	✓
Zone 3b	Exception Test	✗	✗	✗	✓

Key:

- ✓ Development is appropriate
- ✗ Development should not be permitted

- 5.1.5 The *Exception Test* is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.
- 5.1.6 Essentially, the two parts of the *Exception Test* require proposed development to show that it will:
- Provide wider sustainability benefits to the community that outweigh flood risk; and
 - Be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.
- 5.1.7 The ensuing sections describe how the sequential approach to the location of development and, where necessary, the second part of the *Exception Test* have been implemented in the proposed development's master planning.

5.2 Fluvial Flood Risk

- 5.2.1 The following fluvial flood risk management measures have been incorporated in the proposed development's masterplan.

Flood Warnings

- 5.2.2 The Environment Agency (EA) operate a flood forecasting and warning service in areas at risk of flooding from rivers or the sea. This service operates 24 hours a day, 365 days a year. The service is a free service and provides flood warnings direct to you via telephone, mobile, email, sms text message and fax. To sign up to the service visit

<https://www.fws.environment-agency.gov.uk/app/olr/register>.

- 5.2.3 The Site Management should register with this service.
- 5.2.4 This service provides three levels of advice on flood risk to sites located within areas that may be impacted. This site is located in on the edge of such an area. The information issued is as follows (from the EA website):
- Flood Alert Areas are geographical areas where it is possible for flooding to occur from rivers, sea and in some locations groundwater. A Flood Alert is issued to warn people of the possibility of flooding and to encourage them to be alert, stay vigilant and make early / low impact preparations for flooding. Flood Alerts are issued earlier than Flood Warnings to provide advance notice of the possibility of flooding and may be issued when there is less confidence that flooding will occur in a Flood Warning Area.
 - Flood Warning Areas are geographical areas where we expect flooding to occur and where we provide a Flood Warning Service. They generally contain properties that are expected to flood from rivers or the sea and in some areas, from groundwater. Specifically, Flood Warning Areas define locations within the Flood Warning Service Limit that represent a discrete community at risk of flooding. A discrete community is a recognised and named geographical community, which can be an urban area, a significant suburb of a large city or a village or a hamlet. The purpose of Flood Warnings is to alert people that flooding is expected and they should take action to protect themselves and their property. Flood Warnings are issued when flooding is expected to occur.

- Severe Flood Warnings are issued to similar areas when there is a danger to life or widespread disruption is expected.

5.2.5 In the areas where flood warnings are provided, the EA aim to provide a lead flood warning time of up to two hours. This time is invaluable in implementing a flood response / evacuation plan and ensuring that people who live in areas at risk of flooding are suitably prepared.

Sequential Test

5.2.6 Most of the development is located in areas indicated as Flood Zone 1. The only parts of the development located in an area designated as Flood Zone 2/3 are:

- Parts of the eastern accommodation block (Block E);
- The access road to this accommodation block; and
- Parts of the car park to the south of the river.

Finished floor levels

5.2.7 The finished floor levels of all the accommodation blocks are set at the 1 in 100 year plus climate change allowance plus freeboard, for the east of the site (i.e. 149.58m aOD).

5.2.8 The finished floor level for the residents lounge is set at 150.53m aOD, slightly above the at the 1 in 100 year plus climate change allowance plus freeboard. Note that the residents lounge is located within Flood Zone 1.

5.2.9 Note that the mill pond wall will also be set at 150.53m aOD slightly above the 1 in 100 year plus climate change allowance plus freeboard, and the mill pond boundary to the south of the millpond will be raised to 149.93m aOD.

Dry access routes

5.2.10 There are pedestrian access routes between the accommodation blocks at 149.58m aOD or higher towards the residents lounge. Ramped access is provided to the east and north of the lounge into the lane behind (north) of the site.

5.2.11 Safe refuge will also be provided on the upper floors of the accommodation blocks if required.

Flood plain compensation

5.2.12 Any floodplain impingement for events up to the 1 in 100 year (Flood Zone 3) level will be compensated on site and it is proposed to replace the lost flood plain storage in the Mill Pond, by lowering the outlet level of the Mill Pond by 400mm.

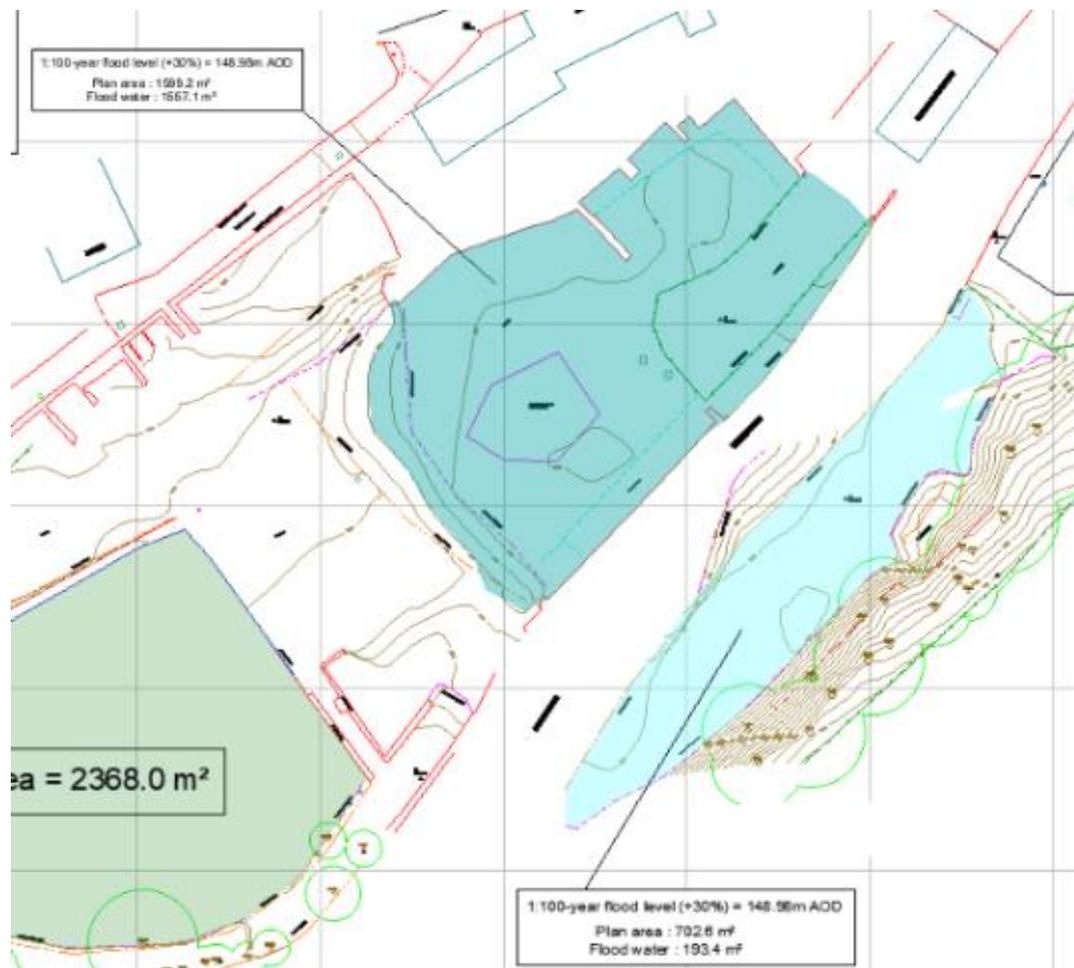
5.2.13 Note that as flow from the mill pond into the river is restricted, this will delay release and effectively attenuate flood water post any flooding event more than a conventional riverside floodplain.

Pre-development

5.2.14 The area of flood plain storage pre-development, up to the 1 in 100 + CC level, is shown in Figure 5.2 and Appendix E. The area and volume has been calculated from the existing topography and is summarised in Table 5.2.

- 5.2.15 The total flood plain storage on the northern bank is 1557.1 m³ and on the southern bank is 193.4 m³.

Figure 5.2: Areas Susceptible to Flooding up to the 1 in 100 Year + CC Level Pre-Development



Post_development

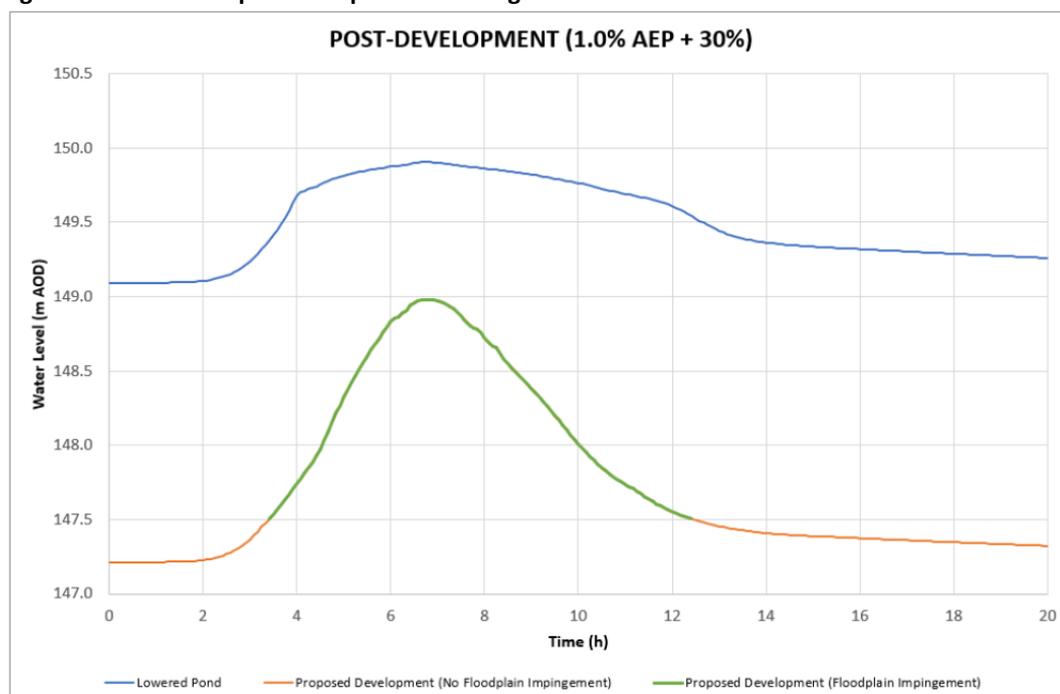
- 5.2.16 On the northern bank, some of the area to the north of Block E will remain lower than the 1 in 100 + CC flood level post development, however this area will be protected by a wall along the river edge with a top of coping height at the 1 in 100 + CC level to prevent flood water entering the developed outside area and the underground car park
- 5.2.17 On the southern bank levels will be lowered to achieve a neutral result in this area.
- 5.2.18 The Mill Pond area is 2,368 m². The outlet will be dropped so that the surface level of the pond will be dropped from 149.47m to 149.0m This will increase flood capacity by 1,113m³
- 5.2.19 The bank between the pond and the river will be increased from 149.73m to 149.93m (this is 1 in 100 years+30% post development level for this area). This will increase flood capacity by 474m³.

Table 5.2: Flood Plain Volumes Pre & Post Development (m³)

	Flood Plain Volume Pre-development	Flood Plain Volume Post-development	Balance
Northern Bank	-1,557.1	0	-1,557
Southern Bank	-193.4	+193.4	0
Mill Pond – lowering water level	0	+1,113	+1,113
Mill Pond – raising bank	0	+474	+474
Total	-1,750.4	+1,780.4	+30

- 5.2.20 The volume lost due to the development is therefore replaced in the pond with a small overall net gain. Due to the site topography, compensation on a level for level basis is not possible.
- 5.2.21 Whilst the proposed compensation storage is located in the pond and therefore higher than the area where the storage is lost, because the river is on a steep gradient, the flows get into the pond throughout the period when flood plain impingement in the eastern part of the site would occur (between 3 and 13 hours), i.e. flood level along site front is greater than 147.5 m aOD, thus providing the necessary floodplain compensation (Figure 5.3).

Figure 5.3 Floodplain Compensation Usage



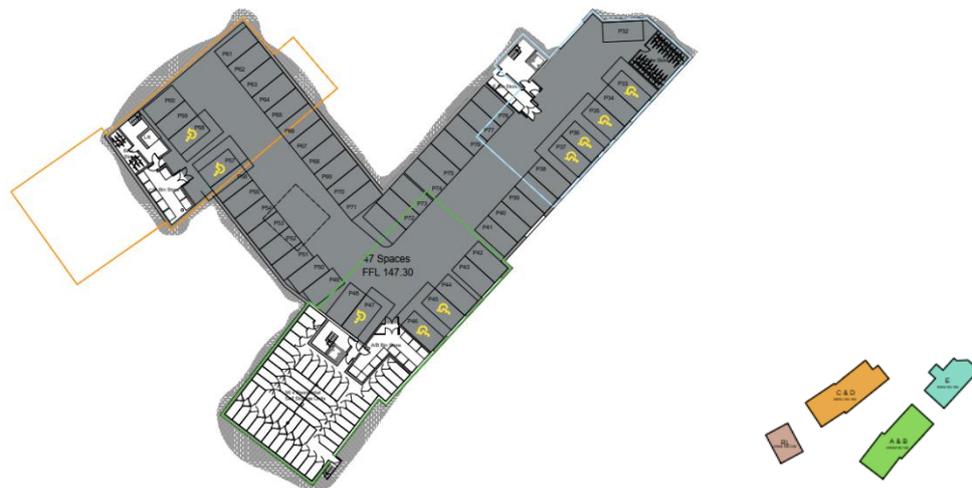
- 5.2.22 The figure above also shows that the lowered pond empties fairly quickly, with more than half of the pond’s total volume available for a subsequent flood within 6 hours of the end of the 1.0% AEP + 30% storm (design event).

- 5.2.23 It should be noted that the existing planning permission for the site does not include any flood plain compensation. This existing planning permission will be built if the current planning application is not approved. The proposed scheme therefore has significant benefits over and above the previously approved scheme.

Basement Car Park

- 5.2.24 An undercroft car park is proposed under Blocks A/B and E and part of Block C/D (Figure 5.4). The floor level of the car park is set at 146.65m aOD. Much of the car park is below ground so flood waters cannot lap against these walls. Water proof construction will prevent any groundwater ingress.
- 5.2.25 Where external ground levels are lower than the top of the car park, so flood water could lap against the wall, the walls will be solid except for the car park entrance, to prevent ingress.
- 5.2.26 Ground levels around the car park entrance will be below the 1 in 100 year +CC flood level. However, flood water will be prevented from flowing into this area by ground levels to the west and a wall along the river to the east of Block E, at or above the 1 in 100 year + CC flood level.
- 5.2.27 The car park entrance will therefore be protected by flood defence measures which do not require human intervention.
- 5.2.28 Drainage from the site discharges into the river. Backflow into low points on the site will be prevented by non-return valves on the outfalls.

Figure 5.4 Location of Undercroft Car Park



Bridges

- 5.2.29 Three bridges are proposed as part of the development to enable vehicular and pedestrian access from the south bank of the river to the north. There was previously a bridge located at the site, which had a deck height of c. 148.5m aOD (2006 modelling report).
- 5.2.30 The soffits of the bridges will be set at the 1 in 100 year + CC level + 600mm freeboard level, considering the flood levels at upstream and downstream nodes. The road bridge is of clear span construction and is 14m long and 7.3m wide.

Exception Test

- 5.2.31 The proposed mitigation measures outlined above ensure the development is safe for its lifetime, without increasing flood risk elsewhere.
- 5.2.32 The second part of the Exception Test is therefore deemed to have been passed.

Flood Warning and Evacuation Plan

- 5.2.33 A Flood Warning and Evacuation Plan will be required for the site to demonstrate how the risks should be assessed and necessary actions before and during a flood event.

5.3 Infrastructure Flood Risk

- 5.3.1 Warnings of upstream infrastructure failure would be issued by the EA in a similar manner to fluvial flood alerts or warnings. The Site Management should sign up to the EA system and follow their advice regarding evacuating the site in the unlikely event of this occurrence.
- 5.3.2 Measures to mitigate the flood risk from the mill pond will again centre around management of the pond with a regular inspection and maintenance programme. Due to the logistical issues outlined in Section 4.6, it is requested that investigation to determine the current condition of the pond, and the subsequent inspection and maintenance plan is conditioned, so it can be based on reliable information.

6 EA CONCERNS

6.1.1 A pre-application discussion was held with the EA. The following contains information about how EA concerns not addressed in the previous section will be addressed.

6.2 Development Close to the River Bank

6.2.1 The EA have indicated that they require a 3m easement along both sides of the bank to enable access to the river for maintenance.

6.2.2 Block A/B is partially set back in excess of 3m from the northern bank, providing this access. Furthermore, a footpath is proposed between this block and the river, extending to between the mill pond and river. This will improve access to this area compared to the current situation.

6.2.3 Block E and the eastern part of Block A/B is located on the edge of the river, and due to access limitations to the north, cannot be moved 3m from the river. The river wall in this area would form part of the building's structure and so would be maintained by the site management.

6.2.4 The site was previously a mill with buildings located up to the river (Figure 6.1). Some of the buildings remained to approximately 15 years ago (as part of the approved scheme). Locating Block E and parts of Block A/B adjacent to the river therefore maintains this principle and a practice which is common in the area.

Figure 6.1 1888-1913 OS Six Inch Map



6.2.5 To the south of the river, a car park is proposed. This will provide the easiest access point to the river, including opposite Block E, as there are no buildings proposed in this area and it is

closest to the vehicular access point for the site. The river is approximately 10m wide in this location so much of the river could be accessed from the southern bank.

- 6.2.6 Access is therefore available from both sides of the river but is restricted on parts of the northern side of the river. However, the development will improve access from the southern side of the river and provides access the river both upstream and downstream. The proposed development is therefore considered to improve access compared to the current situation.

7 CONCLUSIONS AND RECOMMENDATIONS

- 7.1.1 JNP Group has been commissioned by Eliston Homes Ltd. to prepare a Flood Risk Assessment for the proposed Prickleden Mill development in Holmfirth.
- 7.1.2 The site is a brownfield former mill site and is approximately 1.11 ha and is located to the west of the town centre of Holmfirth and spans the River Holm.
- 7.1.3 The nearest natural watercourse is the River Holme which flows through the site from west to east.
- 7.1.4 The proposed development comprises 61 age restricted apartments, external residents lounge, Managers office, residents and visitor parking, new bridge access and a riverside walkway.
- 7.1.5 The Flood Risk Assessment section of this report demonstrates that the risk of flooding from coastal, groundwater and sewer sources is low.
- 7.1.6 Most of the site where development is planned is in Flood Zone 1. However, there is an area in the eastern part of the site predicted to be in Flood Zone 2 / 3. The mill pond is also predicted to be in Flood Zone 3 and parts of the land to the south of the river are in Flood Zone 2. The only parts of the development located in an area designated as Flood Zone 2/3 are parts of the eastern accommodation block (Block E), the access road to this accommodation block and parts of the car park to the south of the river.
- 7.1.7 To mitigate the fluvial flood risk, the following measures are proposed:
- Finished floor levels raised to 1 in 100 year plus climate change plus freeboard level for accommodation blocks;
 - Residents lounge located in FZ1 area and further protected by raising finished floor levels raised to 1 in 100 year plus climate change plus freeboard level;
 - Dry access routes between the accommodation blocks and land to the north for the 1 in 100 year plus climate change flood;
 - Flood plain loss is more than compensated for by flood plain gain;
 - Bridge soffit levels set 1 in 100 year plus climate change plus freeboard level;
 - Recommendations to subscribe to the EA Flood Warning System.
- 7.1.8 As most of the development is located in the Flood Zone 1 area, the Sequential Test is deemed to have been passed.
- 7.1.9 The proposed mitigation measures ensure the development is safe for its lifetime, without increasing flood risk elsewhere. The second part of the Exception Test is therefore deemed to have been passed.
- 7.1.10 Predicted surface water flooding on site is minimal and will be managed by the drainage system. Surface water generated by the development will also be managed by a proposed drainage system.
- 7.1.11 The site is in an area that would be impacted by infrastructure failure upstream. In this unlikely event, warnings of infrastructure failure would be issued by the EA in a similar manner to fluvial flood alerts or warnings.

- 7.1.12 Measures to mitigate the flood risk from the mill pond will again centre around management of the pond with a regular inspection and maintenance programme. It is requested that investigation to determine the current condition of the pond, and the subsequent inspection and maintenance plan is conditioned, so it can be based on reliable information.
- 7.1.13 The EA have indicated that they require a 3m easement along both sides of the bank to enable access to the river for maintenance. This is achievable for most of the site but Block E and parts of Block A/B are located on the edge of the river. The river wall in this area would form part of the building's structure and so would be maintained by the site management. To the south of the river, a car park is proposed. This will provide the easiest access point to the river; the river is up to 10m wide in this location so much of the river could be accessed from the southern bank.
- 7.1.14 This report is intended for the use of the developer of the site in support of their planning application for the site only.

8 LIMITATIONS

- 8.1.1 The information, conclusions and recommendations presented within this report are deemed to be current at the time of issue. No guarantee can be given to the status of this information other than at the time of issuing. Where necessary, the user shall confirm the status of any applicable assessments and consents.
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APPENDIX A: PROPOSED DEVELOPMENT

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PROPOSED SITE PLAN



H	Amended bridge soffit level as per engineers comments	AD	JC	18.02.2025
G	Turning heads amended following highway consultant feedback. Bridge proposal updated.	JF	JC	11.11.2024
F	Amended roof plans shown. Parking to south bank amended following LPA comment.	JF	JC	08.08.2024
E	Amended site plan to show the updated roof plans of each block. Also amended parking P00-P13 and site entrance road width.	AD	JC	06.10.2023
D	Service vehicle tracking shown. Bridge plans updated.	JF	JC	19.06.2023
C	Amended block C3 roof plan to show the modified angled windows on the ground floor and first floor plan.	AD	JC	10.05.2023
B	Site plan amended to show the reduced blocks roof plans and site context and levels changed to suit & 4 new parking places added.	AD	JC	21.09.2022
A	Blocks amended to show reduced pitch and updated layouts. Undercroft parking FFL raised to 147.30. Road bridge deck lowered. New raised bund around lake formed at 150.25. Emergency access road off Woodhead road added. Pedestrian escape route shown to north. Residents lounge raised to 150.53. Mill pond outlet dropped by 400mm to 149.00. Solar PV shown to south roof of all blocks. aerial context added.	JF	JC	25.11.2021

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 DESIGNERS & ARCHITECTS

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Client
ELISTON HOMES

Project
**PRICKLEDEN MILLS
 HOLMFIRTH**

Project No **2659** Drawing No **(100)10** Rev **H**

Description
PROPOSED SITE PLAN

Scale **1:500 @ A1** Date Drawn **APR'21** Drawn By **JF** Authorised By **JC**

Purpose of Issue
 Planning Building Regs Tender Construction Comment Info

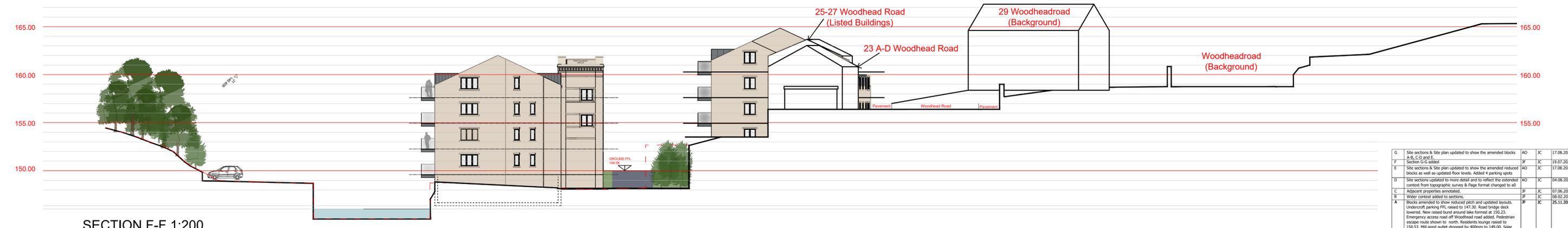
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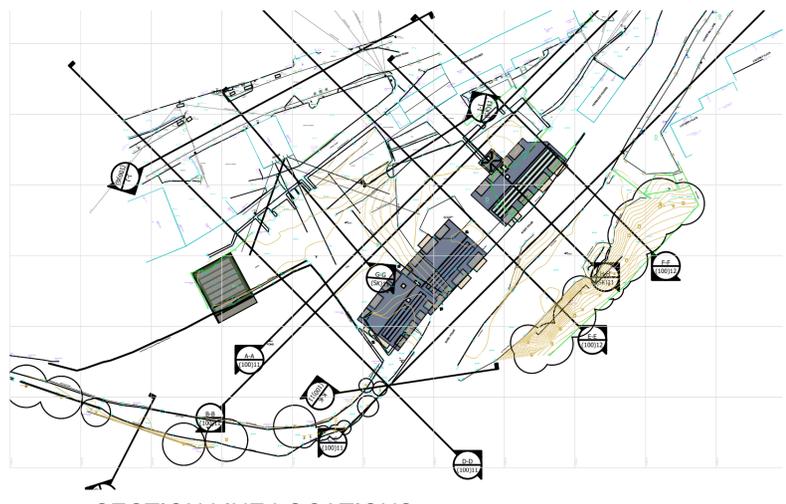
SECTION E-E 1:200



SECTION D-D 1:200



SECTION F-F 1:200



SECTION LINE LOCATIONS

--- EXISTING GROUND LEVEL
— PROPOSED GROUND LEVEL



SECTION I-I 1:200

G	Site sections & Site plan updated to show the amended blocks A-B, C-D and E.	AO	JC	17.08.2022
F	Section G-G added	JF	JC	19.07.2023
E	Site sections & Site plan updated to show the amended reduced blocks as well as updated floor levels. Added 4 parking spots	AO	JC	17.08.2022
D	Site sections updated to more detail and to reflect the extended context from topographic survey & Page format changed to A0	AO	JC	04.08.2022
C	Adjacent properties annotated.	JF	JC	07.06.2022
B	Water context added to sections.	JF	JC	08.02.2022
A	Blocks amended to show reduced pitch and updated layouts. Undercroft parking FFL raised to 147.30. Road bridge deck lowered. New raised bund around lake formed at 150.23. Emergency access road off Woodhead road added. Pedestrian escape route shown to north. Residents lounge raised to 150.53. Mill pond outlet dropped by 400mm to 149.00. Solar PV shown to south roofs of all blocks. South bank levels dropped.	JF	JC	25.11.2021

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Project
PRICKLEDEN MILLS HOLMFIRTH

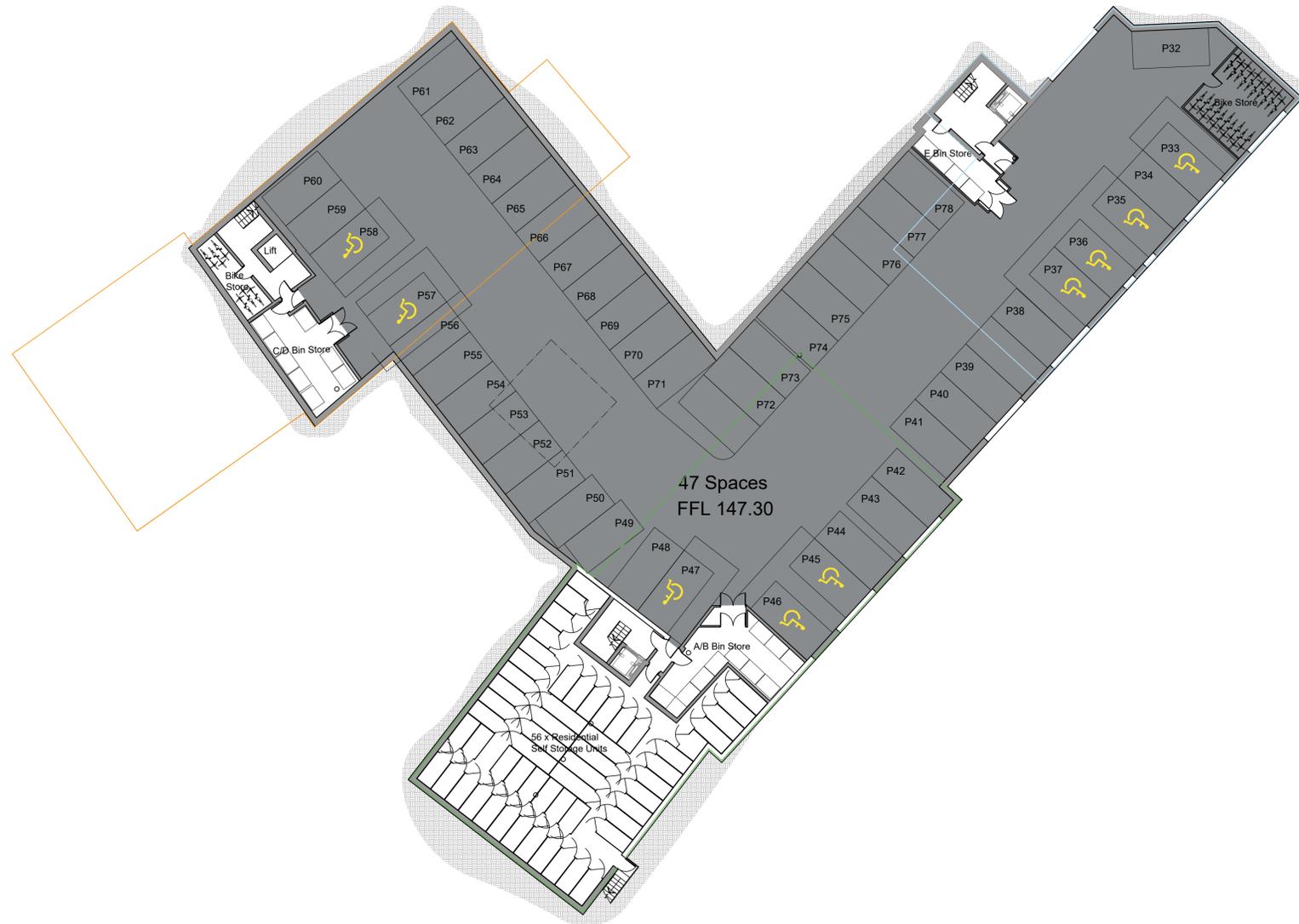
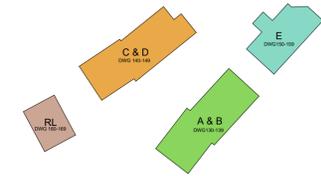
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Description
PROPOSED SITE SECTIONS SHEET 2 OF 2

Scale: **1:200@ A1** Date Drawn: **APR'21** Drawn By: **JF** Authorised By: **JC**

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47 Spaces
 FFL 147.30

56 x Residential
 Self Storage Units

UNDERCROFT CAR PARK

E	Cycle stores added, Block CD stairs updated. Hydro plant room omitted.	JF	JC	06.10.23
D	Structural columns omitted following frame rationalisation.	JF	JC	15.05.2023
C	Amended the main parking layout to match the above blocks. Added a plant room within the storage unit block - removing some of the storage units. Shown indicative hydroelectric pipe.	AO	JC	21.09.2022
B	Block footprints overlaid for clarity.	JF	JC	30.06.2021
A	Bin stores enlarged and double bobbled following LPA comment. Self storage reduced.	JF	JC	21.06.2021

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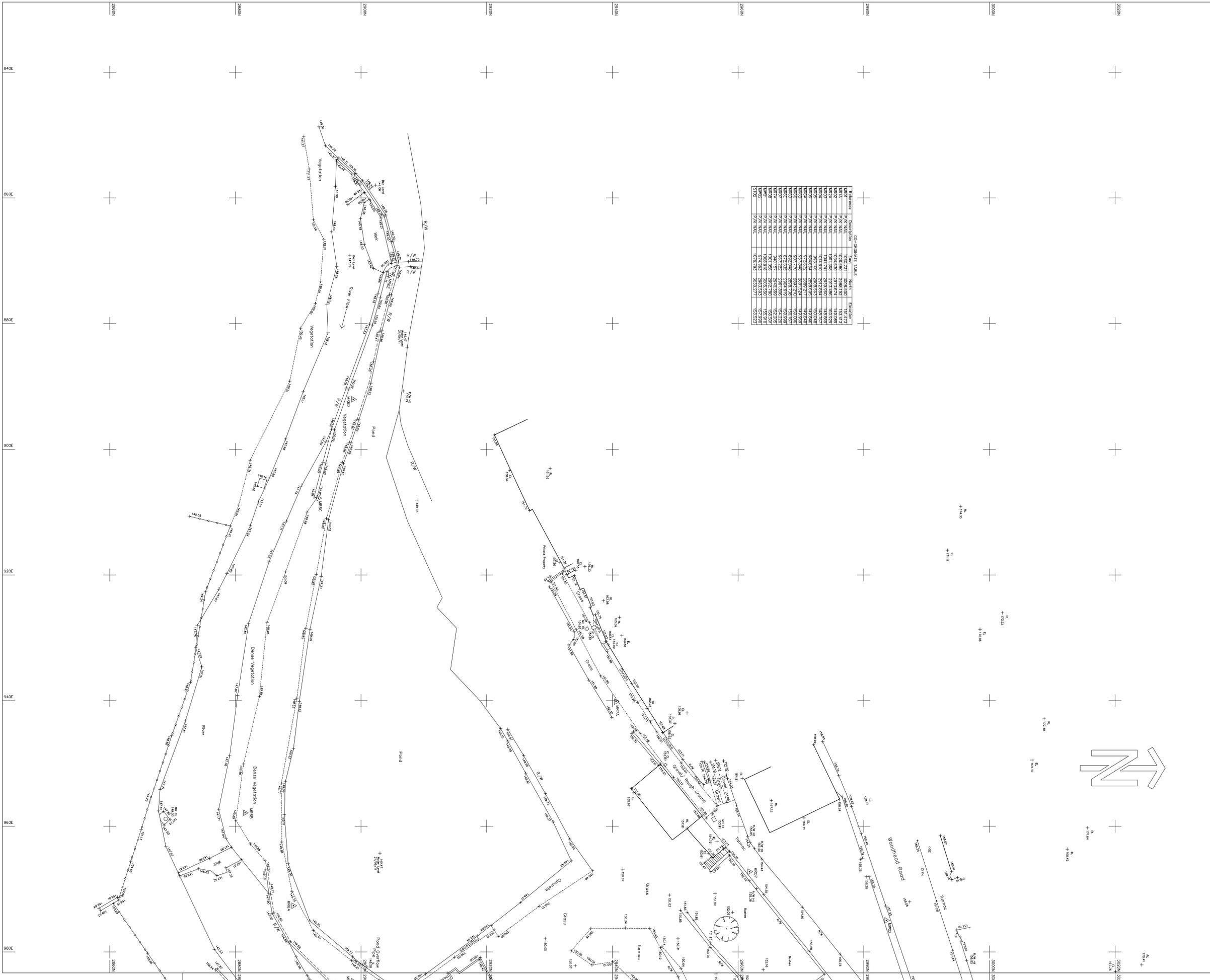
Client	ELISTON HOMES		
Project	PRICKLEDEN MILLS HOLMFIRTH		
Project No	2659	Drawing No	20
Rev	E		

**PROPOSED UNDERCROFT
 GENERAL ARRANGEMENT
 PLAN**

Scale	1:200@ A1	Date Drawn	APR'21	Drawn By	JF	Authorised By	JC
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Purpose of Issue: Planning Building Regs Tender Construction Comment Info

APPENDIX B: TOPOGRAPHICAL SURVEY



Reference	Description	Coordinate	Height	Extension
BM01	Y/P/ NUN	10607731	30083509	151.273
BM02	Y/P/ NUN	10607731	30083509	151.273
BM03	Y/P/ NUN	10617281	29913486	148.929
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BM100	Y/P/ NUN	10617281	29913486	148.929

LEGEND

CONTROL STATIONS	△ ST01
BUSH	⊗
TREE	⊙
DROP KERB	--- DK ---
EMBANKMENT	TOP BANK BOTTOM BANK
OVERHEAD ELECTRICITY LINE	—
OVERHEAD TELEPHONE LINE	—
FOOTPATH	—
FENCE	— F/W —
HEDGE	—
FOLIAGE	—
EXISTING BUILDING	□
CONTOUR	— 10.0 —

AV	Air Valve
B	Bollard
BH	Borehole
BM	Bench Mark
BP	Block Paviments
BS	Bus Stop
BT	BT Inspection Chamber
C/B	Close Boarded Fence
CC	CATV Cover
CL	Cover Level
C/L	Chain Link Fence
CP	Catch Pit
DK	Drop Kerb
DP	Downpipe
EB	Electricity Control Box
EL	Eave Level
EP	Electricity Pole
ER	Earthing Rod
FB	Flower Bed
FH	Fire Hydrant
FL	Floor Level
FR	Flat Roof
FS	Flag Staff
GH	Greenhouse
GL	Ground Level
GP	Gate Post
GR	Grate
GV	Gas Valve
GY	Gully
IC	Inspection Chamber
IL	Invert Level
KO	Kerb Outlet
I/R	Iron Railings
LP	Lamp Post
MH	Man Hole
MK	Marker Post
MS	Mile Stone Marker
NP	Street Name Plate
O/H	Overhead
P	Post Box
PB	Pipe
PE	Pipe
PM	Parking Meter
PS	Paving Slabs
P/R	Post & Rail Fence
P/W	Post & Wire Fence
PYL	Electricity Pylon
RE	Ridge Level
RL	Rodding Eye
RS	Road Sign
RSJ	Reinforced Steel Joist
R/W	Retaining Wall
SC	Stop Cook
SL	Soffit Level
SP	Sign Post
ST	Stop Tap
SV	Stop Valve
SY	Stay Wire
TCB	Telephone Call Box
TH	Trail Hole
TL	Traffic Light
TP	Telegraph Pole
TS	Tree Stump
WL	Water Level
WM	Water Meter
WO	Wash Out

Rev.	Description	By	Date
C	Additional areas added on the site	M.R	23/06/11

BENCH MARK INFORMATION
All levels are based on OSM located on Wall of 23 Woodhead Road



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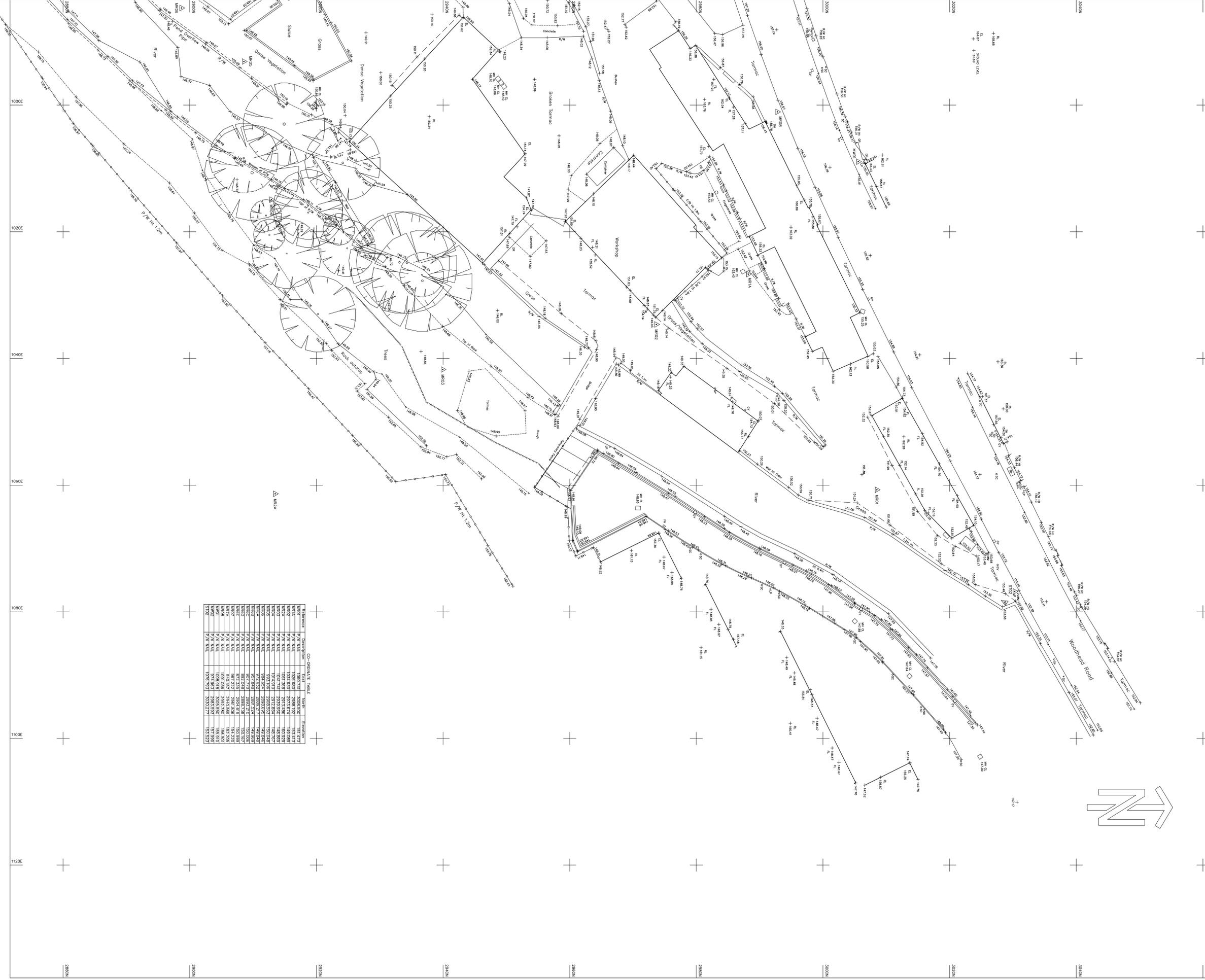
CLIENT: **Architecture + Design Partnership**

PROJECT: **Woodhead Road Holmfirth**

TITLE: **Topographical Survey**

PROJECT NO: **M811 - Revision C**

DRAWN BY: M.R. SCALE: 1:200 @ A0 DATE: 23/06/11
CHECKED BY: SB



LEGEND

CONTROL STATIONS	△ ST01
BUSH	⊗
TREE	⊙
DROP KERB	--- DK ---
EMBANKMENT	--- TOP BANK --- --- BOTTOM BANK ---
OVERHEAD ELECTRICITY LINE	— — — — —
OVERHEAD TELEPHONE LINE	— — — — —
FOOTPATH	— — — — —
FENCE	— — — — —
HEDGE	— — — — —
FOLIAGE	— — — — —
EXISTING BUILDING	□
CONTOUR	⊕

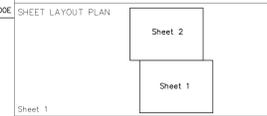
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TCB	Telephone Call Box
TH	Trail Hole
TL	Traffic Light
TP	Telegraph Pole
TS	Tree Stump
WL	Water Level
WM	Water Meter
WO	Wash Out

CO-ORDINATE TABLE

Reference	Easting	Northing
WBPA	1026.820	2298.197
WBPB	1027.820	2298.197
WBPC	1028.820	2298.197
WBPD	1029.820	2298.197
WBPE	1030.820	2298.197
WBPF	1031.820	2298.197
WBPG	1032.820	2298.197
WBPH	1033.820	2298.197
WBPI	1034.820	2298.197
WBPJ	1035.820	2298.197
WBPK	1036.820	2298.197
WBPL	1037.820	2298.197
WBPM	1038.820	2298.197
WBPN	1039.820	2298.197
WBPO	1040.820	2298.197
WBPP	1041.820	2298.197
WBPQ	1042.820	2298.197
WBPR	1043.820	2298.197
WBPS	1044.820	2298.197
WBPT	1045.820	2298.197
WBPU	1046.820	2298.197
WBPV	1047.820	2298.197
WBPW	1048.820	2298.197
WBPX	1049.820	2298.197
WBPY	1050.820	2298.197
WBPZ	1051.820	2298.197
WBQA	1052.820	2298.197
WBQB	1053.820	2298.197
WBQC	1054.820	2298.197
WBQD	1055.820	2298.197
WBQE	1056.820	2298.197
WBQF	1057.820	2298.197
WBQG	1058.820	2298.197
WBQH	1059.820	2298.197
WBQI	1060.820	2298.197
WBQJ	1061.820	2298.197
WBQK	1062.820	2298.197
WBQL	1063.820	2298.197
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WBQN	1065.820	2298.197
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WBQW	1074.820	2298.197
WBQX	1075.820	2298.197
WBQY	1076.820	2298.197
WBQZ	1077.820	2298.197
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WBRB	1079.820	2298.197
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WBRD	1081.820	2298.197
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WBRI	1114.820	2298.197
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WBRI	1120.820	2298.197

Rev.	Description	By	Date
C	Additional areas added on the site		

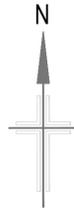
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CLIENT	Architecture + Design Partnership				
PROJECT	Woodhead Road Holmfirth				
TITLE	Topographical Survey				
PROJECT NO	M811 - Revision C				
DRAWN BY	M.R	SCALE	1:200 @ A0	DATE	23/06/11
CHECKED BY	SB				



Notes
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Grid : OS National Grid.
 Using the OS GPS Network and applying OSTN15 transformation and then removing the scale factor for true distances with a one-step transformation centred on ****

Datum : OS Level Datum.
 Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections.

Station Listing

Station	Easting	Northing	Level
B1	413775.031	407900.350	150.357
B2	413837.322	407900.692	148.828
B3	413854.176	407964.303	151.140
B4	413853.800	407928.939	148.782
B5	413878.225	407967.790	149.392
H1	413774.924	407853.763	149.875
H2	413751.508	407846.785	149.909
H3	413728.278	407853.717	149.945
H4	413701.961	407859.826	149.923
H5	413671.820	407868.294	150.968
H6	413797.265	407922.060	156.660
S1	413877.667	407993.069	153.505
S2	413823.737	407920.343	147.942
S3	413790.972	407869.987	149.932

KEY

AR VALVE	AV	KERB OUTLET	KO
BENCH MARK	BM	LAMP POST	LP
BN	BN	MANHOLE (CIRCULAR)	MC
BOLLARD	BO	MANHOLE (RECTANGULAR)	MR
BORE HOLE	BH	MANHOLE (TRIANGULAR)	MT
BUS STOP	BS	MANHOLE (SQUARE)	MS
BUS STOP	BS	MANHOLE (RECTANGULAR)	MR
CABLE TV COVER	CTV	ROODING EYE	RE
CABLE TV SUPPLY	CTS	SIGN POST	SP
COLUMN	CO	TELECOM COVER	TC
DROPPED KERB	DK	TELECOM POLE	TP
EXTRINSIC POINT	EP	THRESHOLD LEVEL	TL
ELECTRICITY COVER	EC	TRAFFIC LIGHT	TL
ELECTRICITY POLE	EP	TRIAL PIT	TP
FIRE HYDRANT	FH	WASH OUT	WO
GAS VALVE	GV	WATER METER	WM
GATE	GA	WATER STOP COCK	WSC
INSPECTION COVER (CIRCULAR)	IC	WATER STOP VALVE	WSV
INSPECTION COVER (RECTANGULAR)	IR		
COVER LEVEL	CL	CHAMBER BASE LEVEL	CB
INVERT LEVEL	IL	WATER SURFACE LEVEL	WSL
UNABLE TO RAISE	UNR	UNABLE TO MEASURE	UNM
GIRTH OF TREE TRUNK	GT	DIAMETER OF TREE TRUNK	DT
HEIGHT TO TOP OF TREE CANOPY	HT	WALTH BOLE TREE	MB

Rev	Date	Drawn	Description	Check

Met
 GEO ENVIRONMENTAL

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Client
 ACUMEN DESIGNERS & ARCHITECTS

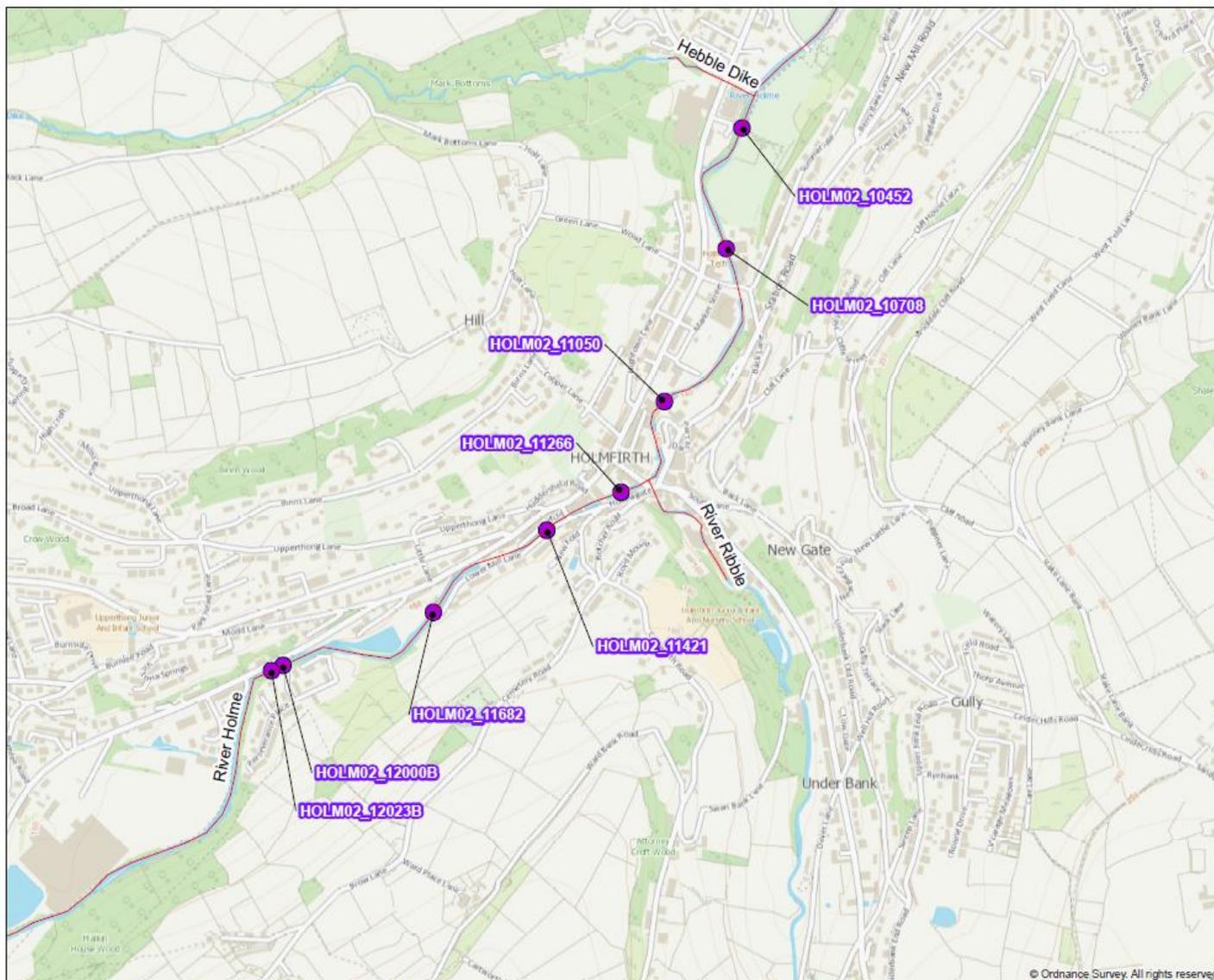
Site
 PRICKLEDON MILLS, WOODHEAD ROAD
 HOLMFIRTH, HD9 2JU

Title
 TOPOGRAPHICAL SURVEY

Survised	BH, HR	Drawn	BH, HR, MR
Check	DA	Date	09/10/2020
Scale	1:200	Job No	P20-01038
		Sheet Size	A0
		Rev	01

APPENDIX C: EA DATA

RFI/202931 Modelled Flood Level Node Point Location Map



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Scale: 1:7,000



when reproduced @ A3



LEGEND

- Main River
- 2010 ASM Colne and Holme Node Points

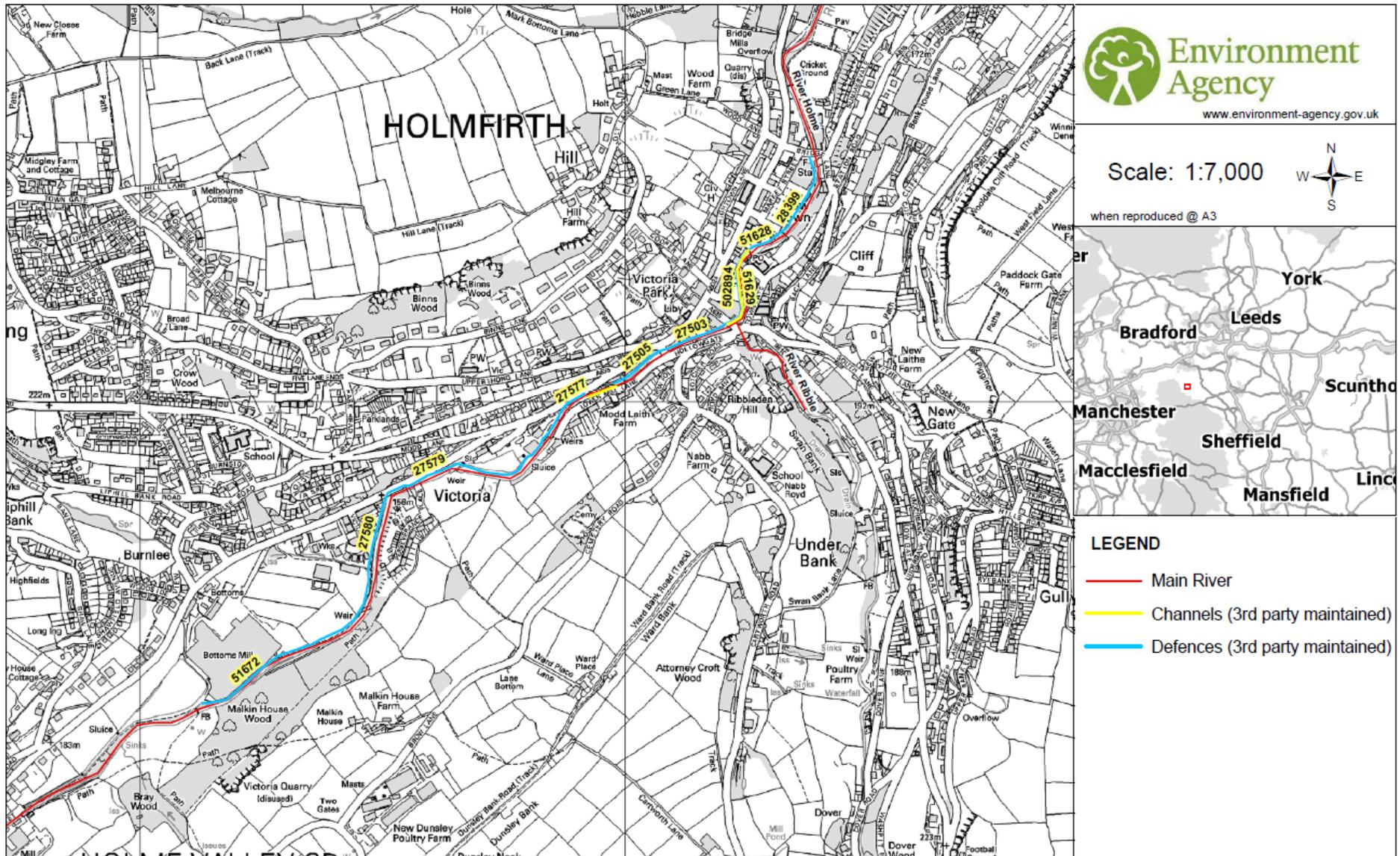
RFI/202931 2010 ASM Colne and Holme Undefended Model Results (Level – mAOD; Flow – m3/s)

Node Point	Annual Exceedance Probability (AEP)									
	10% AEP (1 in 10)		4% AEP (1 in 25)		2% AEP (1 in 50)		1.33% AEP (1 in 75)		1% AEP (1 in 100)	
	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow
HOLM02_10452	133.09	45.92	133.40	56.99	133.48	66.77	133.58	72.43	133.64	75.66
HOLM02_10708	135.40	45.92	135.65	56.98	135.86	66.77	135.98	72.43	136.04	75.67
HOLM02_11050	139.83	45.92	140.06	56.98	140.25	66.76	140.35	72.43	140.40	75.69
HOLM02_11266	142.39	40.05	142.65	50.84	142.88	60.32	143.01	65.59	143.35	68.88
HOLM02_11421	144.53	40.04	144.88	50.84	145.27	60.33	145.73	65.60	146.19	68.63
HOLM02_11682	147.63	40.05	148.10	50.86	148.44	60.34	148.64	65.64	148.78	68.94
HOLM02d12000	151.04	40.05	151.19	50.87	151.33	60.36	151.39	65.64	151.43	68.99
HOLM02d12023	151.35	40.05	151.63	50.87	151.89	60.36	152.02	65.64	152.11	68.99

RFI/202931 2010 ASM Colne and Holme Defended Model Results (Level – mAOD; Flow – m3/s)

Node Point	2010 model										2005 Model	
	Annual Exceedance Probability (AEP)											
	10% AEP (1 in 10)		4% AEP (1 in 25)		2% AEP (1 in 50)		1.33% AEP (1 in 75)		1% AEP (1 in 100)		0.1% AEP (1 in 1000)	
	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow
HOLM02_10452	133.10	46.06	133.40	57.01	133.48	66.74	133.58	72.38	133.64	75.69	133.84	95.30
HOLM02_10708	135.41	46.06	135.65	57.01	135.86	66.76	135.97	72.38	136.04	75.70	136.40	95.30
HOLM02_11050	139.83	46.06	140.06	57.01	140.25	66.77	140.35	72.39	140.40	75.72	140.69	95.30
HOLM02_11266	142.35	40.24	142.62	50.91	142.84	60.34	142.96	65.55	143.03	68.84	143.49	81.70
HOLM02_11421	144.38	40.24	144.71	50.92	145.03	60.34	145.24	65.55	145.44	68.85	146.81	81.70
HOLM02_11682	147.64	40.25	147.91	50.93	148.13	60.34	148.26	65.56	148.34	68.87	0.00	0.00
HOLM02d12000	151.04	40.25	151.20	50.93	151.33	60.35	151.39	65.56	151.43	68.89	0.00	0.00
HOLM02d12023	151.35	40.25	151.63	50.92	151.89	60.35	152.02	65.56	152.11	68.89	0.00	0.00

RFI/202931 Flood Defence Asset Location Map



Scale: 1:7,000

when reproduced @ A3



LEGEND

- Main River
- Channels (3rd party maintained)
- Defences (3rd party maintained)

RFI/202931 Flood Defence Details

ASSET_ID	DESCRIPTION	ASSET_MAIN	AIMS_SUB_T	LENGTH	ACTUAL_DCL	ACTUAL_UCL	PROTECTION	TARGET_CON	OVERALL_CO	DESIGN_SOP
27579		private	high_ground	326.20	0.00	0.00	fluvial	3	3	0
51671		private	high_ground	10.90	0.00	0.00	fluvial	3	2	0
27577		private	high_ground	118.00	0.00	0.00	fluvial	3	3	0
27505		private	high_ground	112.04	0.00	0.00	fluvial	3	3	0
27504		private	high_ground	21.19	0.00	0.00	fluvial	3	2	0
27503		private	high_ground	130.11	0.00	0.00	fluvial	3	3	0
72214		private	high_ground	18.72	0.00	0.00	fluvial	3	2	0
51629		private	high_ground	158.05	0.00	0.00	fluvial	3	2	0
51628		private	high_ground	68.41	0.00	0.00	fluvial	3	3	0
28400		private	high_ground	16.95	0.00	0.00	fluvial	3	2	0
51672		private	high_ground	404.87	0.00	0.00	fluvial	3	3	0
27580		private	high_ground	271.26	0.00	0.00	fluvial	3	3	0
27578		private	high_ground	11.28	0.00	0.00	fluvial	3	3	0
28399		private	high_ground	167.77	0.000	0.000	fluvial	3	2	0
51630		private	simple_culvert	62.44	N/a	N/a	private	3	3	
502894	Culvert	unknown	simple_culvert	177.25	N/a	N/a	unknown	3	2	

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.

Flood History

Flood History – None available

To the best of our knowledge there is no known flood history for this site. Other flooding may have occurred which is not shown. This is the best information currently available. For local drainage information please contact your water utility company and your local council.

Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.

Please note that this record doesn't include any flood extents that may have occurred since 31st December 2020. Given the process of recording, verifying and updating our record from major floods is extensive and may take a considerable amount of time.

Assets

Asset Location Map

Please find attached asset map(s) showing location of all (Agency and non Agency maintained) flood defences and channels.

Description of Works

See attached table with description of the defences and structures shown on the above drawing, including condition ratings, upstream and downstream crest levels, where available.

Risk of Flooding – Environment Agency Defences

The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

Risk of Flooding – Privately Maintained Defences

You will see that the Environment Agency does not maintain any of those defences. However we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences or structures.

Asset Condition Ratings

The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.

Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

Asset Standard of Protection

Please note that the provided Design Standard of Protection is an estimate and should not be relied on. Please note that where available the defended flood extents provide more reliable information relating to the protection offered by the defence (i.e. at which return period the water levels are likely to overtop the defence). If available and required the defended flood extents can be provided on request.

Modelling

River Colne & Holme - Flood Modelling

The River Colne & Holme Flood Mapping Study, Flood Estimation, Modelling and Floodplain Mapping report was produced by Jeremy Ben Associates in March 2006. It was updated in 2010 to incorporate bank level data surveyed in 2009.

See enclosed:

- Model Nodes Location Map.
- Table showing modelled water levels and flows for the 1% (1 in 100), 1.3% (1 in 75), 2% (1 in 50), 4% (1 in 25) and 10% (1 in 10) Annual Exceedance Probabilities (AEP).
- Model Summary Sheets showing the results for the 0.1% Annual Exceedance Probabilities (AEP), as calculated in 2006. These were not updated in 2010.

Please note there are no depth grids currently available for this model.

Please note no breach scenarios were modelled for this study.

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 19 February 2016. 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.

Flood Warning

The site is covered by a Flood Warning. To register to receive this service, you can call Floodline 24 hours a day on 0845 988 1188.

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.

2010 Colne and Holme Model Results RFI: 79420

Defended	2010 model										2005 Model	
	10 Year		25 Year		50 Year		75 year		100 Year		1000 Year	
	10% annual probability		4% annual probability		2% annual probability		1.33% annual		1% annual probability		0.1% annual probability	
Label	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow
HOLM02b10633	134.72	46.06	134.99	57.01	135.20	66.75	135.32	72.38	135.39	75.70	135.76	95.30
HOLM02b10970	139.15	46.06	139.38	57.01	139.58	66.76	139.68	72.38	139.74	75.72	140.10	95.30
HOLM02_11376	144.22	40.24	144.58	50.92	144.93	60.34	145.16	65.54	145.39	68.85	0.00	0.00
HOLM02_11560	145.64	40.24	146.03	50.92	146.35	60.34	146.62	65.55	146.82	68.86	147.80	81.70
HOLM02_11682	147.64	40.25	147.91	50.93	148.13	60.34	148.26	65.56	148.34	68.87	0.00	0.00
HOLM02_11910	150.56	40.25	150.75	50.93	150.91	60.35	151.00	65.56	151.05	68.89	0.00	0.00
HOLM02_12114	152.17	40.25	152.49	50.92	152.76	60.35	152.91	65.55	153.00	68.88	153.33	81.70
HOLM02_12384	156.19	39.32	156.30	50.00	156.36	59.42	156.40	64.63	156.42	67.96	156.48	80.40
HOLM02_12833	160.81	39.32	161.11	50.00	161.36	59.43	161.47	64.63	161.55	67.95	161.81	80.40
HOLM02_13212	166.12	39.33	166.73	50.01	167.37	59.42	167.80	64.64	168.10	67.96	0.00	0.00

Undefended	2010 model									
	10 Year		25 Year		50 Year		75 year		100 Year	
	10% annual probability		4% annual probability		2% annual probability		1.33% annual		1% annual probability	
Label	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow	Max Stage	Max Flow
HOLM02b10633	134.72	45.92	134.99	56.98	135.20	66.77	135.32	72.43	135.39	75.67
HOLM02b10970	139.15	45.92	139.38	56.98	139.58	66.76	139.69	72.43	139.74	75.69
HOLM02_11376	144.43	40.05	144.79	50.84	145.22	60.32	145.70	65.60	146.15	68.64
HOLM02_11560	146.19	40.05	147.18	50.85	147.79	60.33	148.02	65.61	148.17	68.78
HOLM02_11682	147.63	40.05	148.10	50.86	148.44	60.34	148.64	65.64	148.78	68.94
HOLM02_11910	150.56	40.05	150.75	50.87	150.91	60.35	151.00	65.64	151.05	68.99
HOLM02_12114	152.17	40.05	152.49	50.87	152.76	60.36	152.91	65.65	153.00	69.00
HOLM02_12384	156.19	39.12	156.30	49.94	156.36	59.42	156.40	64.72	156.43	68.06
HOLM02_12833	160.81	39.12	161.11	49.94	161.36	59.43	161.48	64.73	161.55	69.74
HOLM02_13212	166.10	39.12	166.73	49.93	167.37	59.43	167.81	64.73	168.11	68.08

n.b: There are no 100yr results for the undefended scenario available.

APPENDIX D: MODELLING REPORT

Job name: Prickleden Mills, Holmfirth

Job No: B24120

Note No: B24120-JNP-XX-XX-RP-C-1003

Date: 30/11/2021

Prepared by: Rodrigo Magno

Subject: Flood Risk Modelling

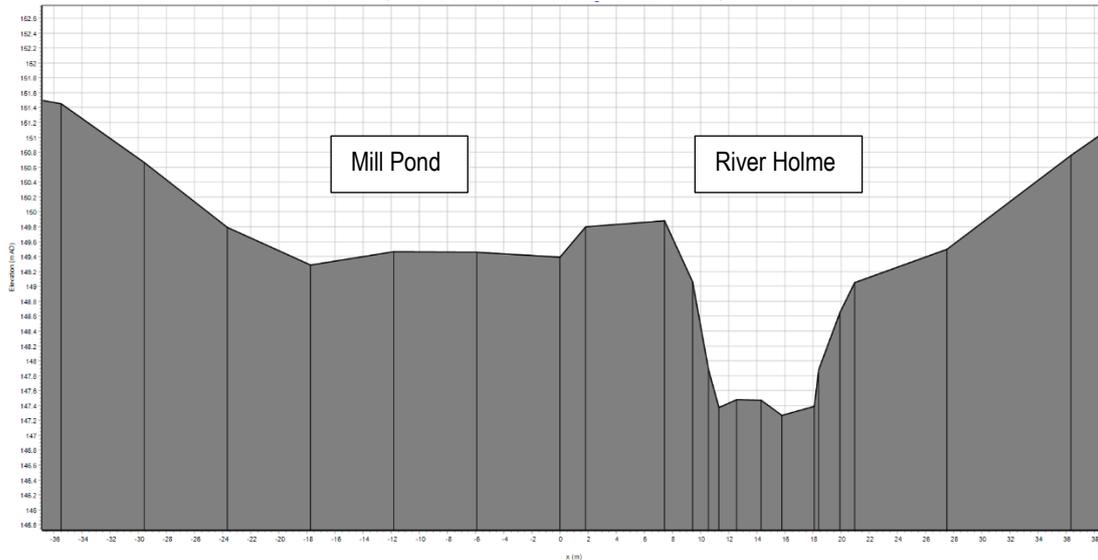
1. Introduction

- 1.1 JNP Group were commissioned by Eliston Homes Ltd. to establish more accurate, site-specific flood levels for the development at Prickleden Mills, Holmfirth.
- 1.2 The work is based on the (1D) hydraulic model developed by JBA on behalf of the Environment Agency (EA) for the *Colne and Holme Flood Mapping* project. The *Colne and Holme Flood Mapping* report (October 2020), modelling outputs and model files (Products 5, 6 and 7) were provided by the EA in October 2021.
- 1.3 The work focuses on the 228 m long reach of the River Holme between the inlet to the Prickleden Mills Pond (node *HOLM02_11910*) and the (old) footbridge at the downstream end of the site (node *HOLM02_11682*), where changes/improvements to the EA model were introduced as described in Section 2.
- 1.4 It is important to note that the hydrological inputs and wider model developed by JBA on behalf of the Environment Agency (EA) for the *Colne and Holme Flood Mapping* project (October 2020) were not reviewed as part of this work.

2. Revised Model (Pre-Development)

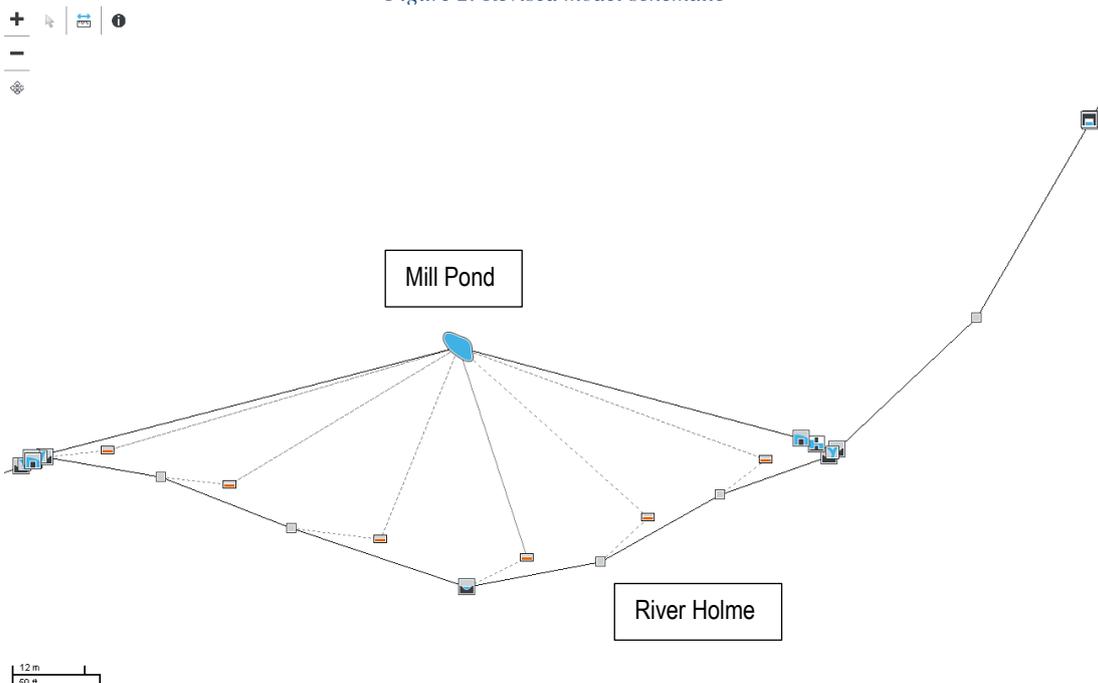
- 2.1 The existing EA model comprises nine nodes along the 228 m long reach of interest, including four surveyed cross-sections (*HOLM02_11910*, *HOLM02_11828*, *HOLM02_11757* and *HOLM02_11682*) and five interpolated cross-sections (*HOLM02i1880*, *HOLM02i11850*, *HOLM02i11810*, *HOLM02i11790* and *HOLM02i11702*).
- 2.2 The Prickleden Mills Pond is (indirectly) represented in the EA model through extended cross-sections (Figure 1). This fails to accurately represent the complex interaction between the River Holme and the Mill Pond.

Figure 1: Indirect representation of the Mill Pond through extended cross-sections
(EA Model, node HOLM02_11828)



- 2.3 The revised model improves the representation of the Mill Pond by replacing the extended cross-sections with a quasi-2D combination of reservoir, spill, and weir nodes (Figure 2).
- 2.4 The main inlet (*Pond_in*) and outlet (*Pond_out*) to the Mill Pond, as well as the bank between the Mill Pond and the River Holme (*11910_LB* to *11790_LB*) were modelled in accordance with the available topographic surveys and on site measurements (Appendix A).
- 2.5 The revised model also takes account of the footbridge at the downstream end of the site (node *HOLM02_11682*) no longer being present since 2012.

Figure 2: Revised model schematic



3. Proposed Development (Post-Development)

3.1 The proposed development comprises the following measures (Appendix B):

-  Raising finished floor levels across the development site out of flood risk from the River Holme.
-  Raising the Mill Pond's northern and eastern banks to prevent overflows towards the proposed development.
-  Lowering the spill level of the Mill Pond's outlet by 400 mm, from 149.4 m AOD to 149.0 m AOD, to compensate the loss of floodplain resulting from raising the development site out of flood risk.

4. Model Predictions

4.1 The models were executed for the 50.0%, 3.3%, 1.0%, 1.0% + 30% and 0.1% AEP storm events. The selected climate change allowance of 30% is between the central (23%) and higher (31%) allowances for the Aire and Alder Management Catchment (2080's) and is in line with the latest guidance for 'more vulnerable' development in Flood Zones 2 and 3a.

4.2 Results at the key nodes of the model are summarised in Table 1 and show that:

-  Removal of the footbridge at the at the downstream end of the site (node HOLM02_11682) has a considerable impact on flood levels along the River Holme for the more extreme storm events.
-  Finished floor levels (FFLs) at the development site (nodes HOLM02_11757 to HOLM02_11682) must be raised to a minimum of 149.58 m AOD to ensure a 600 mm freeboard over the design flood level of 148.98 m AOD (1.0% AEP + 30% climate change allowance). This will also provide a freeboard of 100 mm over the 0.1% AEP flood level of 149.48 m AOD.
-  The northern and easter banks of the Mill Pond must be raised to a minimum level of 150.51 m AOD to prevent overflows towards the proposed development. This includes freeboards of 600 mm and 330 mm over the maximum flood levels of 149.91 m AOD (1.0% AEP + 30% climate change allowance) and 150.18 m AOD (0.1% AEP).

4.3 Results also show that lowering the Mill Pond outlet by 400 mm can provide approximately 1,000m³ of additional storage in extreme storm events, which is sufficient to compensate for the loss of floodplain from raising site levels to achieve the required minimum FFL of 149.58 m AOD. As shown in Table 1, flood levels (and flows) downstream of the proposed development are not affected by the proposed measures.

Table 1 Summary of Results

Node	Annual Exceedance Probability (AEP)														
	50.0% (1 in 2 Year)			3.3% (1 in 30 Year)			1.0% (1 in 100 Year)			1.0% + 30% (1 in 100 Year + 30%)			0.1% (1 in 1000 Year)		
	Maximum Flood Level (m AOD)														
	Pre-Dev EA		Post-Dev	Pre-Dev EA		Post-Dev	Pre-Dev EA		Post-Dev	Pre-Dev EA		Post-Dev	Pre-Dev EA		Post-Dev
Mill Pond	N/A	149.73	149.69	N/A	149.82	149.81	N/A	149.86	149.85	N/A	149.91	149.91	N/A	150.15	150.18
HOLM02_11757 (Site Upstream)	147.73	147.73	147.73	148.27	148.28	148.28	148.56	148.56	148.58	149.21	148.96	148.98	149.61	149.39	149.48
HOLM02_11682 (Site Downstream)	146.98	146.98	146.97	147.65	147.65	147.65	147.97	147.96	147.96	148.98	148.42	148.42	149.55	148.97	148.98

- 4.4 With regards to the proposed footbridges and road bridge across the River Holme, the minimum soffit levels summarised in Table 2 must be used to avoid any impact of the new structures on flood risk (on site or elsewhere), while also providing a minimum freeboard of 600 mm over the estimated 1.0% AEP + 30% climate change allowance flood levels.

Table 2 Proposed Bridges

Structure	Design Flood Level (m AOD) (1.0% AEP + 30% Climate Change)	Minimum Soffit Level (m AOD)
Upstream Footbridge (HOLM02i11850)	149.94	150.54
Downstream Footbridge (HOLM02_11757)	148.98	149.58
Road Bridge (HOLM02i11702)	148.56	149.16

Document Issue Record

Technical Note No	Rev	Date	Prepared	Reviewed	Approved
RP-C-1003	P01	04/11/2021	RM	SLL	SLL
RP-C-1003	P02	29/11/2021	RM	SLL	SLL

List of Appendices

Appendix A Topographic Surveys & On Site Measurements

Appendix B Flood Risk Management & Floodplain Compensation Measures

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Any advice, opinions or recommendations within this document should be read and relied upon only in the context of this document as a whole.

Any comments given within this report are based on the understanding that the proposed works to be undertaken will be as described in the introduction. The information referred to and provided by others and will be assumed to be correct and will not have been checked by JNP Group, JNP Group will not accept any liability or responsibility for any inaccuracy in such information.

Any deviation from the recommendations or conclusions contained in this report should be referred to JNP Group in writing for comment and JNP Group reserve the right to reconsider their recommendations and conclusions contained within. JNP Group will not accept any liability or responsibility for any changes or deviations from the recommendations noted in this report without prior consultation and our full approval.

Mr Victor Grayson
Kirklees Metropolitan Borough Council
Development Management
PO Box B93
Huddersfield
West Yorkshire
HD1 2JR

Our ref: RA/2021/143135/03-L01
Your ref: 2021/92003
Date: 14 June 2022

Dear Victor

ERECTION OF 61 AGE-RESTRICTED APARTMENTS, ANCILLARY ACCOMMODATION AND ASSOCIATED EXTERNAL WORKS (WITHIN A CONSERVATION AREA) – PRICKLEDEN MILLS, WOODHEAD ROAD, HOLMFIRTH, HD9 2JU

Further to my previous response to the above application dated 24 June 2021, we have been in discussion with the applicant and they have submitted additional information. As a result, we have the following comments to make.

FLOOD RISK

We have reviewed the following information submitted to us by the applicant:

- Flood Risk Assessment – Addendum, Project: Prickleden Mills, Holmfirth, Client: Eliston Homes Ltd. Reference: B24120-JNP-XX-XX-RP-C-1005 P03, Rev P03, 16/12/2021.
- Letter report from JPN Group to Eliston Homes Ltd, Ref: B24120-JNP-XX-XX-CO-C-0001 P01/SLL, 25th May 2022.

We have also recently completed a model review and have found the modelling work to be fit for the purpose of supporting a Flood Risk Assessment for a planning application.

Based on the above, we can remove our previous objection relating to flood risk, subject to the inclusion of the following planning conditions.

Environment Agency Position

The proposed development will only meet the National Planning Policy Framework's requirements in relation to flood risk if the following planning conditions are included.

Condition 1

The development shall be carried out in accordance with the Flood Risk Assessment – Addendum, Project: Prickleden Mills, Holmfirth, Client: Eliston Homes Ltd. Reference: B24120-JNP-XX-XX-RP-C-1005 P03, Rev P03, 16/12/2021, and the following mitigation measures it details:

- Finished floor levels for the residential accommodation blocks shall be set no lower than 150.23 metres above Ordnance Datum (AOD), as per Paragraph 5.1.5 of the approved Flood Risk Assessment -Addendum.

- Finished floor levels for the residents' lounge shall be set no lower than 150.53 metres above Ordnance Datum (AOD), as per Paragraph 5.1.5 of the approved Flood Risk Assessment -Addendum.
- Soffit levels for the proposed bridges shall be set in accordance with and no lower than the levels shown in Table 6.1, Paragraph 6.1.3 of the approved Flood Risk Assessment – Addendum.
- Compensatory storage shall be provided in line with Section 4 of the approved Flood Risk Assessment – Addendum. This shall include:
 - Reducing the Mill Pond outlet level and therefore baseline water level to 149.0m AOD, resulting in 1,113m³ of compensatory storage volume.
 - Increasing the height of the embankment between the lake and the river to 149.93m AOD, resulting in an additional 474m³ of storage volume.
 - Increasing the height of the northern and eastern banks of the Mill Pond to 150.51m AOD.
- In line with Paragraph 4.1.19 of the approved Flood Risk Assessment – Addendum, the development shall be constructed so that the basement carpark does not flood during a 1%AEP CC flood event.

Reasons

- To ensure that the proposed development and its users are kept safe from flooding.
- To ensure that the proposed development does not increase flood risk off site.

Condition 2

Apart from draining of the mill pond, the development hereby permitted must not be commenced until the following have been completed, submitted to and approved by the local planning authority:

- Results of an intrusive investigation to establish the existing maintenance requirements of the mill pond embankment to ensure that it will be structurally sound enough to allow the mill pond to fulfil its intended role as flood water storage
- Details of any works required to make the existing embankment sufficiently structurally sound.
- Information to demonstrate that the new raised element of the Mill Pond embankment will be structurally sound enough to fulfil its intended purpose.
- An ongoing inspection and maintenance plan for the mill pond embankment.

The development shall be subsequently maintained, in accordance with the inspection and maintenance plan to be approved.

Reasons

- To ensure that the structural integrity of the Mill Pond Embankment is maintained for the duration of the lifetime of the development.
- To manage the residual risk of flooding associated with failure of the Mill Pond embankment.

Note to LPA

The proposed development, and possibly additional properties, would be at an unacceptable risk of flooding if the Mill Pond Embankment were to fail. We believe that structural details of the proposed embankment, along with an ongoing inspection and maintenance plan should be submitted and approved up front, before planning permission is granted. The applicant has stated that this is not possible for logistical reasons. For this reason, we have recommended Condition 2 above.

In making your decision, you should decide whether you are happy to accept the risk of approving planning permission with this information outstanding. If you aren't then we recommend that you refuse planning permission.

Any inspection and maintenance plan submitted, should be reviewed, and approved as appropriate, by yourselves as the LPA, possibly in conjunction with the LLFA. The Environment Agency do not need to be consulted on this. Our investment in this condition will be satisfied at the point where the LPA/LLFA has approved an inspection and maintenance plan.

BIODIVERSITY/WATER FRAMEWORK DIRECTIVE

In our letter dated 24 June 2021, we also raised concerns relating to biodiversity net gain and the Water Framework Directive. Whilst these matters were discussed in a meeting on 21 December 2021, to date we have not received any further information to address these concerns, therefore our objections remain in place.

Should you require any further information or clarification, please contact me.

Yours sincerely

Mrs Bev Lambert
Sustainable Places - Planning Advisor

Direct e-mail bev.lambert@environment-agency.gov.uk
Team e-mail sp-yorkshire@environment-agency.gov.uk

APPENDIX E: FLOOD PLAIN COMPENSATION

Notes
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Grid : OS National Grid.
 Using the OS GPS Network and applying OSTN15 transformation

Datum : OS Level Datum.
 Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections.

02	15/12/21	DA	NEW DESIGN CALCS	--
Rev	Date	Drawn	Description	Check



Southgate House
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 Leeds E: admin@metgeoenvironmental.com
 West Yorkshire W: www.metgeoenvironmental.com
 LS10 1SW

Client
 ACUMEN DESIGNS AND ARCHITECTS

Site
 PRICKLEDON MILLS, HOLMFIRTH

Title
 FLOOD WATER CALCULATIONS (148.98m flood)
 USING TOPOGRAPHICAL LEVELS

Surveyed	BH, HR	Drawn	BH, HR, MR, DA
Check	DA	Date	09/10/2020
Scale	Job No	Sheet Size	Rev
1:500	P20-01038	A3	02

DWG Ref						
Project Number	Origin	Zone	Level	Desc	Type	Role Sheet
P21-01038	MET	EXT	XX	FLD	M2	G 002

Current: 1:100-year flood level (+30%) = 148.98m AOD
 Total Flood Area : 2,301.8 m²
 Total Flood Volume : 1,750.5 m³

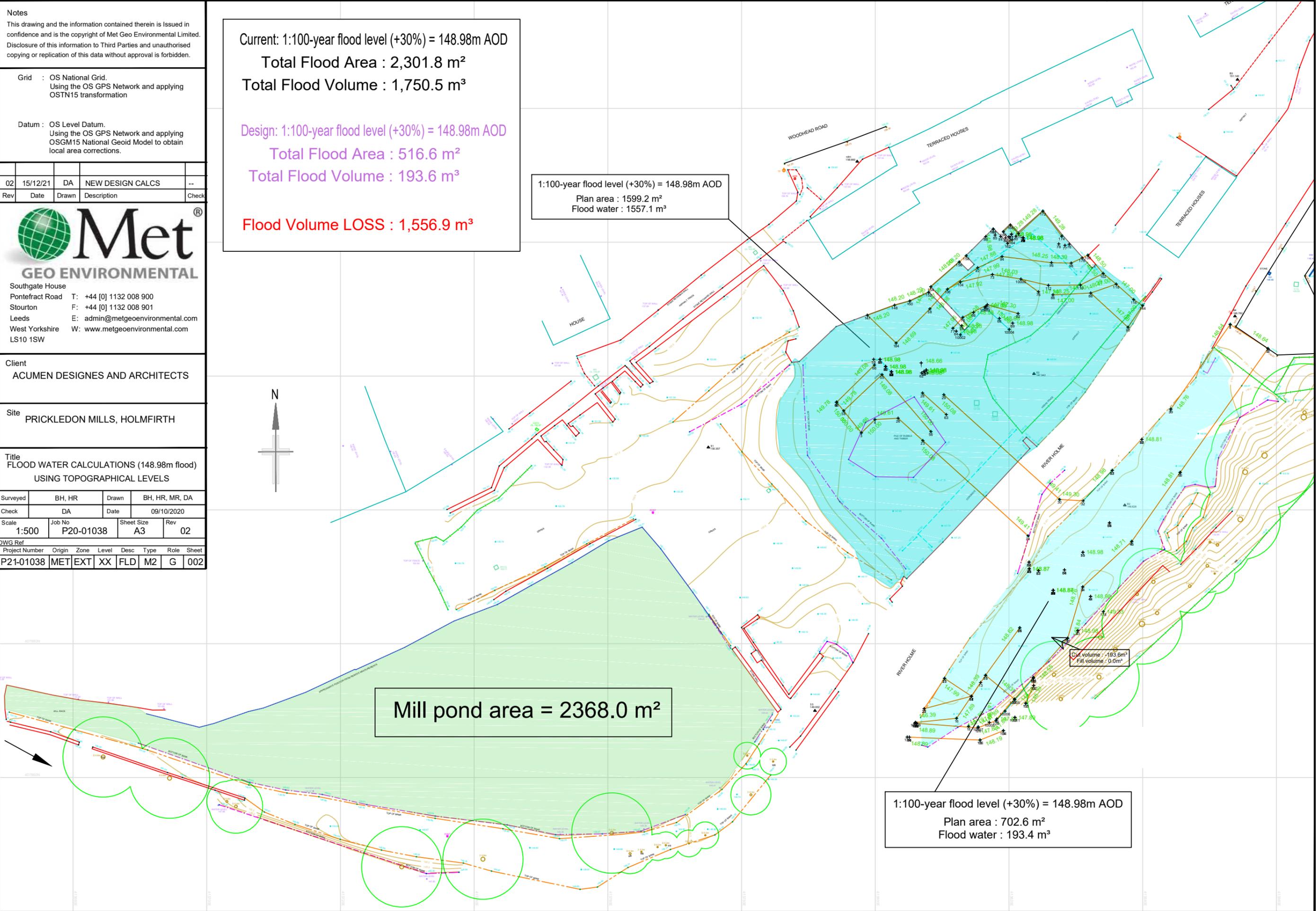
Design: 1:100-year flood level (+30%) = 148.98m AOD
 Total Flood Area : 516.6 m²
 Total Flood Volume : 193.6 m³

Flood Volume LOSS : 1,556.9 m³

1:100-year flood level (+30%) = 148.98m AOD
 Plan area : 1599.2 m²
 Flood water : 1557.1 m³

1:100-year flood level (+30%) = 148.98m AOD
 Plan area : 702.6 m²
 Flood water : 193.4 m³

Mill pond area = 2368.0 m²



Notes
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Grid : OS National Grid.
 Using the OS GPS Network and applying OSTN15 transformation

Datum : OS Level Datum.
 Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections.

Rev	Date	Drawn	Description	Check
02	15/12/21	DA	NEW DESIGN CALCS	--



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 West Yorkshire W: www.metgeoenvironmental.com
 LS10 1SW

Client
 ACUMEN DESIGNERS AND ARCHITECTS

Site
 PRICKLEDON MILLS, HOLMFIRTH

Title
 FLOOD WATER CALCULATIONS (148.98m flood)
 USING DESIGN LEVELS

Surveyed	BH, HR	Drawn	BH, HR, MR, DA
Check	DA	Date	09/10/2020

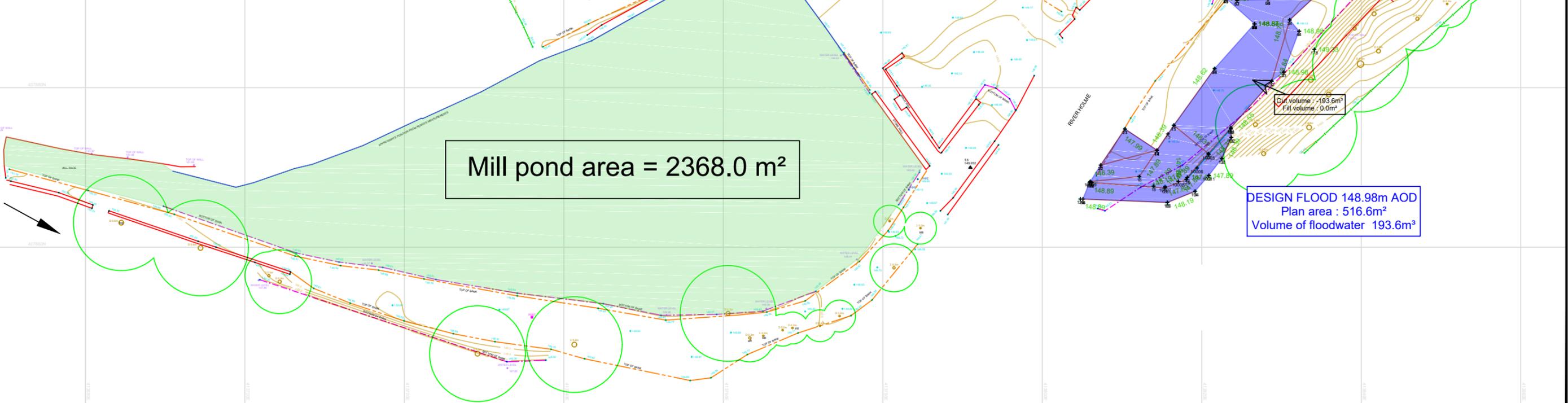
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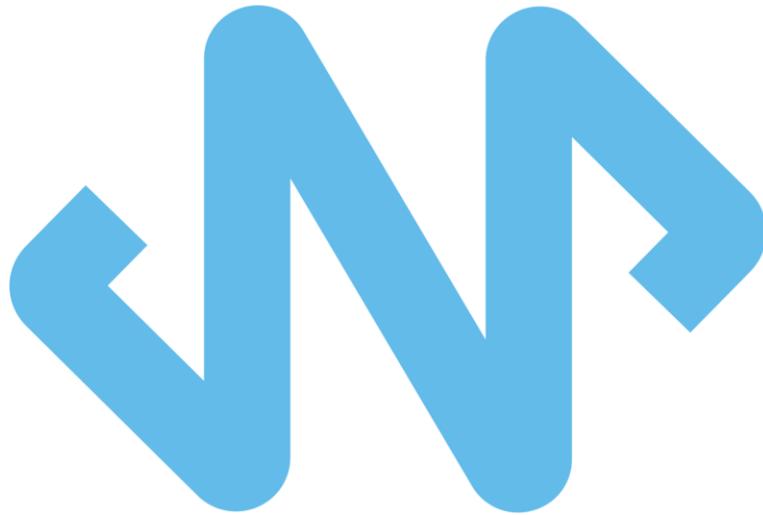
DWG Ref						
Project Number	Origin	Zone	Level	Desc	Type	Role Sheet
P21-01038	MET	EXT	XX	FLD	M2	G 003

Current: 1:100-year flood level (+30%) = 148.98m AOD
 Total Flood Area : 2,301.8 m²
 Total Flood Volume : 1,750.5 m³

Design: 1:100-year flood level (+30%) = 148.98m AOD
 Total Flood Area : 516.6 m²
 Total Flood Volume : 193.6 m³

Flood Volume LOSS : 1,556.9 m³





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